Epping Forest District Council

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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

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Report Reference Number	WK/202331028
Date	June 2023

Executive Summary: Air Quality in Our Area

Air Quality in Epping Forest District

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 343,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

The main pollutant of concern in Epping Forest District is nitrogen dioxide, which is produced by road vehicles. It is monitored across the district by diffusion tubes. Results for 2022 show that concentrations at the majority of the monitoring locations (37) have decreased since 2021. Two sites have recorded the same concentration as last year, and a two have recorded a small increase in concentrations. This is in line with predicted national trends. The results in the various towns and villages are presented in Appendix A, Figures A.1a to A.1h.

The Council retains one small Air Quality Management Area (AQMA) near the B1393 / Theydon Road junction at Bell Common, Epping. The annual mean concentration of nitrogen dioxide measured here during 2022 was 38µg/m^3. This is significantly below the 60µg/m^3 concentration which is used to indicate that the hourly objective is likely to be exceeded (Defra (2022) Local Air Quality Management Technical Guidance (TG22) Chapter 7, 7.97) and also 5% under the annual mean objective concentration of 40µg/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

As a result, Epping Forest District Council propose to revoke the management area in respect of the exceedance of the hourly objective, however the AQMA designation in respect of the annual mean objective will remain until sufficient evidence has been collected to demonstrate that its exceedance in the future is unlikely.

Details of AQMA, Epping Forest District Council (No.2) can be found at: EssexAir.org.uk alternatively a map showing its location can be found in Appendix D of this report. This AQMA includes 2 properties, which according to council records currently each have 2 adult occupants who therefore could potentially be exposed to elevated concentrations of nitrogen dioxide.

In January 2022 one additional nitrogen dioxide diffusion tube monitoring location was set up on the façade of a residential property at 76 Roding Road, Loughton. This was done in response to a complaint of high traffic volumes causing poor air quality. This location reported a concentration of 16.0µg/m^3 in 2022, which is well below the annual mean objective concentration. Monitoring will continue here for a further 12 months to ensure that the concentration does not increase significantly.

Where the Councils Development Management service department refer planning applications to Environmental Health, they are screened to determine if there is potential for the proposed development to have a negative impact on human health due to poor air quality. Such applications are both those that are likely to increase pollution in an area as well as those that bring additional people to an area of existing pollution, and include applications for new residential properties, schools, commercial and industrial activities. Where it is considered likely that negative impacts may result, applicants are required to undertake a quantitative assessment of the proposed development and the associated likely changes in traffic movements. Assessments include measures to be implemented which will mitigate all negative air quality impacts resulting from the development. Measures such as electric vehicle charge points, filtration systems and the use of sustainable power sources may be included as part of a mitigation package. If insufficient mitigation is included in the application, Environmental Health would recommend that the development control team refuse the application. All sites given consent during 2022 were assessed in respect of air quality where it was considered that there was potential for a development to have a negative impact, and comments were provided to the Development Control team.

The Council continues to work with our partners including Essex County Council and the Environment Agency on environmental protection and air quality matters. In particular, we are working together in respect of an effective permanent solution to further the reduction of nitrogen dioxide concentrations within AQMA Epping Forest District Council No.2.

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 Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Whilst we consider the migration to electric vehicles as crucial to the reduction of nitrogen dioxide, we are also actively encouraging road users to turn their engines off whilst stationary rather than allow their engines to idle. We have produced a number of posters which continue to be rotated around various hotspots in the district to provide a visual reminder to drivers.

Traffic levels along the B1393 are the main reason for the elevated concentrations of nitrogen dioxide at the AQMA Epping Forest District Council No.2. Figure 3.1 provides a chart illustrating traffic flows on Epping High Road. It shows that whilst traffic volumes are slightly less than before the pandemic, fluctuations are largely tracking those seen pre-

[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

pandemic. It could therefore be assumed that traffic seen in 2022 reflects the "new normal" due to many people now working from home on a regular basis.

The Council continues to encourage its own officers to work from home for much of the week, providing a limited number of desks at the Civic Offices which are available to be booked as required. This reduced capacity office has enabled a reduction in the number of parking spaces at the Civic Offices, which further encourages those attending the offices to utilise local sustainable transport options. Staff have also been encouraged to sign up to the Councils car share scheme for those attending the offices.

The Council has 9 electric vehicle charge points located across 4 sites for its fleet and staff use. This includes vehicle to grid charging.

The Council has published a revised Air Quality action Plan following a revised Source Apportionment Assessment. The Action Plan includes a range of new measures focussing on reducing concentrations of nitrogen dioxide in the AQMA Epping Forest District Council No.2 (Bell Common), as well as across the district. We are in discussions with partners with a view to exploring the possibilities of taking steps that will directly improve traffic flow through the AQMA at Bell Common.

In addition, measures are aimed at developing appropriate infrastructure to support the anticipated increased uptake in electric and plug-in hybrid vehicles, as well as promoting sustainable transport choices for use by both local businesses and residents.

The measures identified in the new Air Quality Action Plan are reported in table 2.2 of this document.

The Council continues to employ a Sustainable Transport Officer and a Climate Change Officer whose actions feed into this report.

Conclusions and Priorities

The results from diffusion tube monitoring undertaken show that the annual mean concentration of nitrogen dioxide in the district decreased at 37 out of 41 of the sites during 2022 compared to the concentrations measured during 2021.

It is likely that the pandemic may have had a permanent impact on travel patterns for many people who now find that they are either working from home for much of the week or have a more flexible working pattern that does not require them to travel in peak traffic periods.

The Highways authority advise that whilst traffic levels are roughly equal to those on the roads pre-pandemic, fewer cars have been using the roads during rush hours, which should help to reduce congestion and associated pollution.

The concentration of nitrogen dioxide at '(3) Epping Bell Vue' which is representative of AQMA Epping Forest District Council No.2, decreased dramatically in 2020 as a direct result of the lockdown imposed during the height of the COVID-19 pandemic. However, if we ignore the result from 2020, looking at the general trend across the last 5 years, there is a steady decrease in concentrations at this location (see Figure A.1a). The annual mean concentration recorded in 2022 ($38\mu g/m^3$) was the first year (apart from 2020) where the concentration measured under the objective. It is likely that the decreasing trend is due to both the uptake of cleaner vehicles and the long term shift in travel behaviours as a result of the pandemic.

No exceedances were identified in the district, and therefore the Council does not propose to declare any further AQMAs at this time.

The Council now proposes to revoke the declaration of the AQMA in respect of the hourly mean concentration of nitrogen dioxide. This revocation is considered to be appropriate following 5 consecutive years during which the annual mean concentration of nitrogen dioxide measured below $60\mu g/m^3$, the concentration considered by Defra (Local Air Quality Management Technical Guidance TG22 Chapter 7, 7.97) to represent an exceedance of the hourly objective.

Planning applications that had the potential to have a likely significant effect on the Epping Forest Special Area of Conservation were assessed in accordance with the Habitats Regulations and advice provided by Natural England.

The main priorities for EFDC in 2023 are:

- Develop an effective strategy for ensuring that future annual mean concentrations of nitrogen dioxide do not exceed the objective despite the development of sites identified in the Local Plan, which is likely to increase traffic using the B1393 / Theydon Road junction at Bell Common, Epping.

- Continue work to increase electric vehicle charging points in the district. This will involve collaboration with the Councils Fleet Manager, the Sustainable Transport officer, Parking and Estates teams, and the County Council.

- Complete the real time monitoring at two receptor sites in close proximity to the Epping Ongar Heritage Railway, and report back on the findings.

The challenges that EFDC anticipate are in respect of implementing effective actions that directly target air quality in the AQMA. The approach to date has been to promote measures that improve air quality district wide, which may only have a limited impact on concentrations at the AQMA. Since the COVID-19 pandemic, many people have not returned to their previous travel habits, and the change in commuter patterns together with an increased uptake of low emissions vehicles has lead to a reduction in the annual average concentration of nitrogen dioxide in the AQMA during 2022. It appears that these working patterns may be the new normal. Despite the improvements that they bring, Epping Forest District Council will continue to work towards a further reduction in concentrations to bring about a long-term improvement in nitrogen dioxide concentrations, especially in the vicinity of the AQMA at Bell Common, Epping.

Local Engagement and How to get Involved

With an increased awareness of environmental matters in recent years, has come an increase in interest from residents as to what is being done to minimise the effects of pollution in the local area.

The Council plays a pivotal role in addressing air quality issues, but the effectiveness of measures will be determined by the level of their adoption through behaviour change. There are many ways in which members of the public can act to reduce their impact on local air quality:

- Riding bicycles, walking or scooting to work and school.

- Use public transport rather than a private vehicle or taxi,

- Turning your vehicles engine off when you are stationary. Not only does idling use fuel and cost money, it pollutes the environment, and is illegal.

- Consider changing to an electric vehicle. There may be grants available to assist with the cost of doing so.

- Compost your garden waste rather than burning it. Using compost in your garden brings other benefits to your environment too.

- Use central heating to heat your home rather than relying on a log burner.

- If you must use a log burner make sure it is serviced regularly and always use the appropriate fuel for your appliance. Make sure that all fuel is fully dry before burning it as this will improve combustion, increase the heat produced and reduce pollution.

- Reduce household energy bills and reduce pollution by turning down the thermostat in your home by one or two degrees when the outside temperature allows.

- Improving your home's insulation may help to reduce heating bills. You may be eligible for a grant to improve insulation.

- Consider installing solar panels or a heat pump to your property. This will reduce your contribution to air pollution as well as your ongoing fuel bills.

The Essex Air Web site provides useful information with regards to air quality in the various district and unitary authorities in Essex: http://www.essexair.org.uk/

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Epping Forest District Council with the support and agreement of the following officers and departments:

- Sustainable Transport
- Climate Change
- Development Management service
- Planning Policy and Implementation Teams
- GIS Team
- Essex County Council Highways

This ASR has been seen by officers at the Wellbeing, Public Health and Communities Department at Essex County Council, on behalf of the Director of Public Health. They have not raised any concerns with regards to its contents.

If you have any comments on this ASR please send them to Environmental Health at:

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1 Local Air Quality Management

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 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.

A summary of AQMAs declared by Epping Forest District Council can be found in Table 2.1. The table presents a description of the AQMA that is currently designated within Epping Forest District Council. Appendix D: Maps of Monitoring Locations and the AQMA provides a map of AQMA Epping Forest District Council No. 2 and also the air quality monitoring locations in relation to this AQMA. At present, the air quality objectives pertinent to the current AQMA designations are as follows:

- NO_2 annual mean
- NO_2 hourly mean

Another AQMA (Epping Forest AQMA) had previously been declared in 2008, in respect of the nitrogen dioxide annual mean concentration affecting 7 residential properties on the High Street, Epping. It was subsequently revoked in 2011 following a Detailed Assessment which demonstrated that it was not required. Details of both the current and previous AQMAs can be found at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=99.

- We propose to revoke AQMA Epping Forest District Council No.2 in respect of the hourly mean objective only. As the annual mean concentration at this location has been below 60 µg/m^3 for 5 years, this provides us with confidence that the hourly objective is unlikely to be exceeded in the future (Defra (2022) Local Air Quality Management Technical Guidance (TG22) Chapter 7, 7.97)

- The designation in respect of the annual mean objective at AQMA Epping Forest District Council No.2 will remain in place.

- No other declarations are required at present.

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
AQMA Epping Forest District Council No. 2	Declared 1st August 2010	NO2 Annual Mean	An area encompassing 2 properties at the junction of Epping High Road and Theydon Road.	NO	68 µg/m^3	No Exceedance	1 year	Epping Forest District Council Air Quality Action Plan March 2023	https://www.eppingforestdc.gov.uk/wp-content/uploads/2023/06/Air-Quality-Action-Plan-final.pdf
AQMA Epping Forest District Council No. 2	Declared 1st August 2010	NO2 1 Hour Mean	An area encompassing 2 properties at the junction of Epping High Road and Theydon Road.	NO	68µg/m^3 (see comment 1 below)	No Exceedance	5 years	Epping Forest District Council Air Quality Action Plan March 2023	https://www.eppingforestdc.gov.uk/wp-content/uploads/2023/06/Air-Quality-Action-Plan-final.pdf

☒ **Epping Forest District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **Epping Forest District Council confirm that all current AQAPs have been submitted to Defra.**

2.2 Progress and Impact of Measures to address Air Quality in Epping Forest District Council

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

"The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

1. Trends are clearly presented and discussed and a robust comparison with air quality objectives is provided.
2. The diffusion tube mapping is comprehensive and clearly demonstrates the monitoring network. AQMA boundaries are also clearly shown on the map. It would be beneficial to add a key to these to provide additional clarity.
3. The report could include the number of people who would be exposed to the exceedance of the air quality objectives i.e. number of residents within the AQMA where there are exceedances.
4. No automatic monitoring is undertaken within the AQMA, therefore it is difficult to determine whether there are any exceedances of the 1-hour mean NO_2 objective. The current diffusion tube has not reported a concentration of greater than 60µg/m^3 since 2017. The Council could consider installing a temporary automatic monitoring, or additional diffusion tube locations to provide some additional supporting evidence.
5. The current AQAP was adopted in 2012. The Council is progressing updating this and have completed a Source Apportionment assessment to support this. The Council should aim to submit a draft submission of the AQAP to Defra as soon as possible.
6. For clarity, it would be helpful for the Council to state why distance correction has not been completed at the exceeding location – i.e. as it is located at a site of relevant exposure.
7. The Council has reviewed their monitoring network, and this is welcomed. The Council should continue to review this on an annual basis to ensure that any new or developing hotspot areas can be captured."

Epping Forest District Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 37 measures are included within Table 2.2, with the type of measure and the progress Epping Forest District Council have made during the reporting year of 2022 presented. Where there have been,

or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2. It should be noted however that the Action Plan was only published in March 2023 and therefore progress on may of the measures is either in the early stages or in some cases work has yet to start.

More detail on these measures can be found in the Epping Forest District Council Air Quality Action Plan 2023 at https://www.eppingforestdc.gov.uk/environment/aqap/

The following documents produced by Epping Forest District Council also address measures relating to air quality in the district:

- Epping Forest District Local Plan 2011 to 2033 https://www.eppingforestdc.gov.uk/planning-and-building/planning-policy/adopted-local-plan-march-2023/
- Epping Forest District Council Interim Air Pollution Mitigation Strategy https://www.eppingforestdc.gov.uk/planning-and-building/planning-policy/statement-on-the-adoption-of-the-interim-air-pollution-mitigation-strategy/
- Epping Forest District Council Climate Change Action Plan 2021 https://www.eppingforestdc.gov.uk/wp-content/uploads/2023/02/Climate-Change-Action-Plan-Final.pdf

As Epping Forest District Council's revised Action Plan was only published earlier this year, there has been limited progress on the actions to date. The following measures are however likely to be completed over the course of the next reporting year:

- Assessment of the feasibility of introducing non road mobile machinery (NRMM) emissions planning guidance for large developments. By requiring developers to only use non road machinery that meets certain standards, pollution from large developments is reduced.
- Installation of energy efficiency measures in low income, low efficiency homes using grant funding. With greater energy efficiency, residents will use less fuel in heating their homes and create less pollution in the process.

Epping Forest District Council's priorities for the coming year are

- Develop an effective strategy for ensuring that future annual mean concentrations of nitrogen dioxide do not exceed the objective despite the development of sites identified in the Local Plan, which is likely to increase traffic using the B1393 / Theydon Road junction at Bell Common, Epping.

- Continue work to increase electric vehicle charging points in the district. This will involve collaboration with the Councils Fleet Manager, the Sustainable Transport officer, Parking and Estates teams, and the County Council.

- Complete the real time monitoring at two receptor sites in close proximity to the Epping Ongar Heritage Railway, and report back on the findings.

Epping Forest District Council worked to implement these measures in partnership with the following stakeholders during 2022:

- Essex County Council
- Qualis Property Management
- City of London, Epping Forest Conservators
- Local Bus and Taxi Companies
- Local Housing Associations
- Freight Operators

The principal challenges and barriers to implementation that Epping Forest District Council anticipates facing are

- ➤ The processes and timescales for bringing forward adjustments to the road network in association with Local Plan development and therefore improve traffic flow through the Bell Common area

- ➤ Effective partnership working where interests and required outcomes differ.

- ➤ Financial costs of implementing preferred options for measures to reduce pollution concentrations.

- ➤ A site has been allocated in the adopted Local Plan for large scale residential development some 0.5km to the south-east of the AQMA. This is likely to result in an increase in traffic using the local road network in the vicinity of the AQMA. Epping Forest Councils Environmental Health Team will liaise with the Councils Planning

Service in order to mitigate the impacts of the development however it will not be possible to remove all new sources of pollution.

➢ Effects of the COVID-19 pandemic on travel patterns in the long term.   The full effects on long term transport patterns are still unknown. Data collected to date does indicate that congestion in rush hour may be improved when compared to pre-covid data collected on the Epping High Road at Bell Common, Epping. If travel behaviours do revert back to those seen pre-covid, this may lead to an increase in concentrations of nitrogen dioxide at the AQMA location.

➢ Transport for London intend to expand the Ultra Low Emission Zone in London with effect from August 2023. This will bring the northern boundary of the zone up to the southern border of Greater London with Epping Forest District. The impact that this will have on the air quality in our district is unknown, although the modelling Transport for London has provided suggests that there will not be a negative impact.

Epping Forest District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in AQMA Epping Forest District Council No.2. Whilst a Source Apportionment Assessment undertaken by Bureau Veritas in 2021 stated an estimated compliance date of 2024, as compliance was achieved in 2022, we would hope to maintain this concentration, but ideally see a further reduction in concentrations of nitrogen dioxide at the AQMA.

The Source Apportionment Assessment is available at http://www.essexair.org.uk/

Table 2.2 – 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
A01	Continue providing a demand responsive transport service (DRT)	Alternatives to private vehicle use	Bus based Park & Ride	2023	2024	Epping Forest District Council Epping Forest Community Transport Essex County Council	Epping Forest District Council (subsidized) and fare revenue	NO	Not Funded	< £10k	Implementation	Reduced private vehicle usage Reduced tailpipe and brake wear emissions Reduced traffic congestion	Passenger numbers	This service is reviewed annually. The DaRT87 service is unfunded as of April 23 and operating only a skeleton service for people already signed up to it.	lack of demand for buses post Covid.
A02	Promote Essex Car Share Scheme (Liftshare)	Alternatives to private vehicle use	Car & lift sharing schemes	2022	2028	Epping Forest District Council Essex County Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduced private vehicle usage Reduced tailpipe and brake wear emissions Reduced traffic congestion	No of members in scheme	EFDC Employees car sharing scheme was promoted May 2022. 6 signed up to the scheme.	Limited effectiveness as most employees work from home for a significant portion of the week.
A03	Review the Council's grey fleet and where feasible reduce its usage	Alternatives to private vehicle use	Other	2023	2024	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced grey vehicle usage, associated emissions to air & traffic congestion	Review completed by 2024 with summary of possible options	Review in progress	
A04	Review the Council fleet and move towards cleaner vehicles when possible	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2023	2024	Epping Forest District Council Qualis Group	Epping Forest District Council Qualis Group	NO	Funded	< £10k	Planning	Cleaner vehicles, fewer emissions to air	No of cleaner fuel vehicles in fleet	Vehicles as of July 2023: 52% Diesel; 4% Hybrid; 44% Electric	EFDC no longer responsible for Housing Repairs Fleet (now under Qualis Property Solutions) Grounds Maintenance fleet only reported here
A05	Work with ECC to ensure schools have travel plans and encourage the use of Modeshift STARS programme	Alternatives to private vehicle use	Other	2023	2028	Essex County Council Epping Forest District Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Implementation	Fewer vehicles driving children to school Reduced air pollution around schools and surrounding areas Reduced road congestion	No of Schools Signed up to the scheme	EFDC promotion to schools has not yet commenced in addition to the engagement already done by Essex CC	4 Schools sighed up by Essex County Council to date

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
A06	Support and influence Essex County Council's Epping Forest District Cycling Action Plan	Alternatives to private vehicle use	Other	2023	2028	Essex County Council Epping Forest District Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Implementation	Increased modal shift to cycling will remove motor vehicles from the roads	None	Promotions undertaken in respect of Bike Month, Cycle to work scheme & Essex's new sustainability app	
A07	Improve experiences of EFDC staff working remotely to reduce the need to commute and travel for business	Alternatives to private vehicle use	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduced vehicles on roads as employees working from home	none	Jan 1- Dec 31 2022: 95.97% of ICT survey respondents 'very satisfied' with the service provided	
A08	Work with ECC and developers to ensure the provision of infrastructure to support walking, cycling and public transport use	Alternatives to private vehicle use	Other	2023	2024	Essex County Council Epping Forest District Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Planning	Encourage a reduction of vehicle usage	None	Phase 1: LCWIP (Local Cycling Walking Implementation Plan) being produced.	Phase 2: Once LCWIP finalised, a bid will be made with Active Travel England for funding to make required changes
A09	Promote car free days	Alternatives to private vehicle use	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Encourage a reduction of vehicle usage	One car free day event delivered per year	planning on delivering one for this financial year	Delivery to coincide with national promotions where possible
B01	Continuing environmental permitting activities throughout the District	Environmental Permits	Other	2023	2040	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduction in emmissions to air	All permitted activities inspected in line with risk assessment timetable	All permitted activities inspected by specified date required	
B02	Continue to promote and enforce anti idling	Public Information	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduction of tailpipe emissions	Minimum 1 anti idling event per year	Anti Iding held 15/06/23	event was purely promotional in 2022
B03	Review and consult on Hackney Carriage/Private Hire policy to include a transitional requirement for minimum euro 6 emission vehicles and encourage low/zero emission vehicles.	Promoting Low Emission Transport	Taxi Licensing conditions	2023	2026	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduction of tailpipe emissions	Review with conclusions and recommendations completed by 2024	Taxi Tariff Policy is currently being updated. This Review will follow its completion.	Currently looking to align policies and tariffs with other Essex A=authorities.
B04	Ensure Smoke Control areas are promoted within the District and	Public Information	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded		Planning	Reduced smoke from chimneys in	At least 2 social media campaigns per year	Updated council website in Sept 2022 to include information on	Further Updates required following the

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
	enforce when necessary											Smoke Control Areas		open fires and wood burning stoves and how to reduce emissions	Environment Act 2021
B05	Work with colleagues in Trading Standards to ensure the Domestic Solid Fuels Regulations are complied with	Promoting Low Emission Plant	Regulations for fuel quality for low emission fuels for stationary and mobile sources	2023	2028	Essex County Council, Epping Forest District Council	Essex County Council, Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced emissions from chimneys in Smoke Control Areas	Pass intelligence of any premises suspected of supplying non-compliant fuel to Trading Standards	No intelligence received to date	Attended Defra workshop regarding smoke control and enforcement
C01	Introduce a Local Plan policy requiring submission and implementation of Routing Management Plans (for construction and operational phases) to manage the sustainable delivery of goods and materials	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	2023	2024	Essex County Council, Epping Forest District Council	Essex County Council, Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced HGVs on smaller roads in closer proximity to residential properties	Routing Management plan submitted as part of planning application for large developments	Policy T1 of Local Plan requires a Route Management Strategies to support applications for certain types of development	Supported by Councils Validation Checklist, NPPF and NPPG.
C02	Work with ECC to lower bus emissions	Promoting Low Emission Transport	Other	2023	2028	Essex County Council DfT	Essex County Council DfT				Planning	Cleaner vehicles, fewer emissions to air	Bus fleet at least euro 6 compliant by 2028		Need to follow up on the Essex County Council Bus Service Improvement Plan 2021 to 2026
C03	Register fleet with FORS (Fleet Operators Recognition Scheme)	Freight and Delivery Management	Other	2023	2024	Qualis Group	Qualis Group	NO	Funded	< £10k	Implementation		Number of drivers who use the system		
D01	Ensure air quality is taken into account as a material consideration in planning decision making	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduced Exposure due to reduced emissions & location of receptors	Planning Guidance on air quality produced The number of Air Quality Assessments submitted in accordance with the Planning Application Local Validation Checklist	All planning applications require screening or full assessment	Air quality has been taken into consideration as part of the Local Plan and planning policy.
D02	Assess the feasibility of introducing air quality neutral	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning		Planning Guidance on air quality produced The number of Air Quality	Not started yet	Primarily based on London policy, there is no national policy to support

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
	planning guidance for developments												Assessments submitted in accordance with the Planning Application Local Validation Checklist		this action currently. Heavy reliance on NPPF 174(e) where "development should, wherever possible, help to improve local environmental conditions" will be needed
D03	Ensure large developments have and follow a construction management plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Minimise Dust from Contruction sites	Fewer resident complaints 100% of developments having a CMP when required	Being delivered.	Need to improve the recording of how many CMPs are reviewed / complaints received annually
D04	Assess the feasibility of introducing a non road mobile machinery (NRMM) emissions planning guidance for large developments	Policy Guidance and Development Control	Other policy	2023	2023	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning		Feasibility exercise completed by end of 2023	Feasibility study not commenced yet	
D05	Limit parking spaces for new developments in sustainable locations, ensure that provision of EV charge points is maximised, cycle storage and associated facilities are provided in accordance with ECC standards	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Epping Forest District Council, Essex County Council	Epping Forest District Council, Essex County Council	NO	Funded	< £10k	Planning	Reduction of polution associated with road traffic	Production of an electric vehicle charging point strategy	ECC EV Charging Strategy in consultation. EFDC working on their draft policy. New local plan refers to reduced parking spaces in new developments will be expected to have reduced parking / car free developments	
D06	Encourage the uptake of zero emission / net zero carbon technology in new developments	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced emissions from petrol and diesel vehicle usage	Number of planning applications where the submitted Sustainability Checklist states that a Medium or High Quality	Planning Applications are now required to complete a sustainability checklist.	Need to create a system of recording

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
														rating will be achieved	
D07	Support the measures within the Council's Interim Air Pollution Mitigation Strategy	Policy Guidance and Development Control	Other policy	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Minimise air pollution in the Epping Forest SAC area	Monitoring around the EFSAC shows decreased pollution levels	Monitoring is ongoing; data will be available towards the end of 2023.	Local plan ensures that the air pollution mitigation strategy is taken into consideration within the planning regime
D08	Support the measures within the Council's Climate Change Action Plan as well as the Essex Climate Action Plan	Policy Guidance and Development Control	Other policy	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Work to minimise the impact of climate change on Epping Forest District	Calculation of emission reductions	Climate Change Action Plan still fairly new and calculations not yet available	
D09	Secure the provision and implementation of Travel Plans in accordance with Local Plan policy	Policy Guidance and Development Control	Other policy	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduction in pollution from transport as modal shift to sustainable transport methods is facilitated	Increase in number of trips by means other than private vehicle	Travel plans are provided to support planning applications, as required by Planning Policy.	Need to improve the recording how many travel plans are submitted
E01	Increase the amount of public EV charge points in the District	Promoting Low Emission Plant	Other Policy	2023	2028	Essex County Council Epping Forest District Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduction in pollution from transport as more people convert to electric vehicles	Adoption of Epping Forest District Electric Vehicle Charging Strategy DfT EV public charger statistics figure to increase annually	EFDC draft strategy currently being produced As of May 2021, EFDC had 34 EV public charging points. As of April 2023, EFDC has 39 EV public charge points	EFDC has agreements with a number of companies to instal and operate charge points at various locations in the district.
E02	Assess the suitability of installing cleaner energy and heating technology on council owned sites	Promoting Low Emission Plant	Other Policy	2023	2030	Epping Forest District Council Qualis Group	Epping Forest District Council Qualis Group	NO	Funded	> £10 million	Planning	Reduction in air pollution as houses move away from fossil fuels	Number of properties with improved SAP score	Properties are being upgraded as funds allow.	All properties are to achieve EPC band C (minimum SAP score 69) or above by 2030. No fossil fuel heating will be used by 2050.
E03	Maintain council utilities under renewable energy tariffs	Promoting Low Emission Plant	Other Policy	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduced emissions / increased investment in sustainable methods	Reviewed every year to confirm renewable energy tariffs	Electricity tariffs have been on 100% Renewable tariffs for a couple of years.	2023 this has been moved to a Zero Carbon for Business tariff, which is renewable energies and nuclear.

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
E04	Work with local residents associations, businesses, schools, and housing associations to bid for zero emission technology	Promoting Low Emission Plant	Other Policy	2023	2028	Epping Forest District Council, Qualis Group, Essex County Council	Epping Forest District Council, Qualis Group, Essex County Council	NO	Funded	< £10k	Planning	Reduced emmissions from sustainable technology usage	Min 1 bid per year (where bids are available)	Not started yet	
E05	Installation of energy efficiency measures in low income, low efficiency homes using grant funding	Promoting Low Emission Plant	Other Policy	2023	2028	Epping Forest District Council, Great South East Net Zero Hub, Qualis Group	Department for Energy Security & Net Zero (DESNZ), Grest South East Net Zero Hub	NO	Funded	£1 million - £10 million	Planning	Reduced energy requirements resulting in less emisisons	Number of measures installed per year	(1) Home insulation and energy efficient measures are being installed as part of a £6m regeneration project (2) Sustainable Warmth Scheme enabled residents to apply for assistance to improve energy efficiency	(1) Limes Farm regeneration project includes tree planting & landscaping also (2) HUG2 Sceme to replace Sustainable Warmth
E06	Assess if procurement policies can include a preference for zero/low emission suppliers/products	Promoting Low Emission Plant	Other Policy	2023	2023	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced Emissions from EFDC activities	Assessment completed by end of 2023, if feasible procurement document updated by 2028	Not started yet	
F01	Work with our Public Health colleagues to increase awareness of air quality around our District	Public Information	Other	2023	2028	Epping Forest District Council, Essex County Council	Epping Forest District Council, Essex County Council	NO	Funded	< £10k	Planning	Reduced Emissions due to behaviour change	At least one public awareness campaign per year	Not started yet	Part of the Epping Forest Built & Natural Environment Action Group which brings different groups together to reduce health inequalities in the District.
F02	Ensure the Director of Public Health signs off on Annual Status Reports and Air Quality Action Plans	Public Information	Other	2023	2028	Epping Forest District Council Essex County Council	Epping Forest District Council Essex County Council	NO	Funded	< £10k	Implementation	Transparency and information sharing assisting joined up working	Reports signed off when needed	The director of Public Health will have sight of this document prior to its submission.	
F03	Conduct air quality audits at schools around our District	Other	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Planning	Reduced emissions from schools	No of schools audited	Not started yet	

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
F04	Ensure air quality is included in the JSNA	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2023	2028	Essex County Council Epping Forest District Council	Essex County Council Epping Forest District Council	NO	Funded	< £10k	Implementation	Reduced emissions from improved targeting of resources	inclusion in JSNA	Included but need to ensure this is up to date	
F05	Continue to monitor air quality throughout the District for both human health and the EFSAC	Other	Other	2023	2028	Epping Forest District Council	Epping Forest District Council	NO	Funded	< £10k	Implementation	Idetification of problem areas will ensure continued focus	monitoring undertaken in line with programme	Monitoring is ongoing	Annual reviews of locations are undertaken to ensure relevance

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.

Epping Forest District Council is taking the following measures to address PM$_{2.5}$:

Existing / Ongoing Measures:

➢ Authorisation of officers to issue fixed penalty notices in respect of idling vehicles on the public highway

➢ Effective regulation of Part B and Part A2 regulated activities including solvent emission activities.

➢ Investigation of complaints regarding, and regular reviews to search for unpermitted industrial activities.

➢ Investigation of complaints in relation to commercial activities that produce particulate matter, and work with operators to reduce their impact on the environment.

➢ Investigation of complaints and effective regulation in respect of industrial and domestic bonfires.

➢ Investigation of complaints, provision of information and effective regulation of smoke control areas (Loughton and Waltham Abbey).

➢ Participation in 'Clean Air Day' anti-idling promotion initiatives with a focus outside schools is an annual occurrence however due to the ongoing impact of COVID-19 on resources, our 2022 Clean Air Day campaign was undertaken via the distribution of electronic promotional material. This was resumed in 2023.

➢ Consideration of planning applications to ensure that appropriate air quality mitigation measures have been identified in the application, and will be incorporated into the development to minimise the impact of the development on air quality

- Consideration of planning applications in respect of dust creation from demolition and construction activities on building sites and ensuring the appropriate mitigation strategies are employed.

- Update the Council's website, improving information for both residents and local businesses to enable them to make better informed decisions with regards to air quality, in particular the burning of solid fuels and the changes to enforcement in respect of Smoke Control Areas.

- The measures listed above in section 2.2 and Table 2.2 will have co-benefits on $PM_{2.5}$ concentrations as they impact sources of particulate pollution.

- Attendance of the Essex Pollution Group meetings where issues such as air quality are discussed with other local authorities, Essex County Council and the Environment Agency.

The above measures will link to the Public Health Outcomes Framework Indicator 'D01 : Fraction of mortality attributable to particulate air pollution' and help to bring about a reduction in particulate air pollution ($PM_{2.5}$).

The latest Public Health Outcomes Framework Indicator for Epping Forest shows that the district has a higher percentage of mortality attributed to particulate air pollution than both the East of England and England. The percentage has been tracking above the regional and national percentages in recent years. The percentages shown below represent a reduction from those published for 2020.

The percentages for 2021 are as follows:

Epping Forest District	5.9%
East of England	5.5%
England	5.5%

No information for 2022 is available at the time of writing this report.
Further information regarding this indicator can be found at:

https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/1/gid/1000043/pat/6/par/E12000006/ati/501/are/E07000072/yrr/1/cid/4/tbm/1

As Epping Forest District Council did not undertake monitoring of particulate matter (either PM_{10} or $PM_{2.5}$) during 2022, we are reliant on Defra background maps which provide modelled $PM_{2.5}$ concentrations for each 1km grid square. These maps, which can be found at https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

show a maximum modelled $PM_{2.5}$ background for Epping Forest District of 11.34 µg/m^3 in 2022. The location of this concentration was grid reference 542500 192500, which covers part of Chigwell, to the east of the M11 motorway and including West Hatch High School. Much of this area is school playing fields and other green space.

Whilst we are unable to determine the effectiveness of measures in reducing concentrations of $PM_{2.5}$, modelling for this location shows a decrease over the last 5 years (2018: 12.16µg/m^3, 2019: 11.90µg/m^3, 2020: 11.65µg/m^3; 2021: 11.49µg/m^3; 2022: 11.34µg/m^3). It is anticipated that the measures already being taken in respect of other pollutants will assist in the reduction of both primary $PM_{2.5}$ and secondary $PM_{2.5}$.

As the District comprises of a mainly urban south and mainly rural north, the approaches to reduce $PM_{2.5}$ will differ according to the sources present in the local area. As much $PM_{2.5}$ within the district will have originated outside of the district, we will continue to work with neighbouring authorities to achieve a consistent approach to air quality improvement.

The district has a number of historical Smoke Control Areas that cover much of the densely populated parts of Waltham Abbey and Loughton. Maps showing the locations of the smoke control areas together with a list of roads that have been designated as such, can be found on the District Councils website at https://www.eppingforestdc.gov.uk/environment/smoke-control-areas/ . Information and advice is targeted at the residents of these areas as well as encouraging others who enquire with regards to best practice. The Environment Act 2021 addresses the sale of fuels that are burnt within a Smoke Control Area. As these fuels are required to meet criteria aimed at minimising pollution, it is hoped that this will have a positive impact upon particulate $PM_{2.5}$ concentrations in Epping Forest District.

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

This section sets out the monitoring undertaken within 2022 by Epping Forest District 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

Epping Forest District Council started automatic monitoring of pollutant concentrations at 2 locations in October 2022. This is anticipated to be a short term (12 month) project in order to determine levels of Particulate Matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide and sulphur dioxide at receptor locations adjacent to a heritage railway (Epping Ongar Railway). The monitoring locations are in the vicinity of the 2 main stations where the railway operates both steam and diesel locomotives. Local residents have approached the Council due to concerns that its operation may have a negative impact on their environment.

This programme is being undertaken by external consultants and will be reported upon following its completion. At the time of writing this report no ratified data is available.

3.1.2 Non-Automatic Monitoring Sites

Epping Forest District Council undertook non- automatic (i.e. passive) monitoring of nitrogen dioxide (NO_2) at 42 sites during 2022. **Error! Reference source not found.** in HYPERLINK \l "_Appendix_A:_Monitoring"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.

The graphs in Appendix A (Figures A.1a to A.1h) show the trends of annual mean nitrogen dioxide concentrations over the last 5 years (where available) at all sites. It can be seen from these graphs that concentrations at 37 sites decreased in 2022, whilst 2 stayed the same and 2 showed a slight increase from the concentrations recorded in 2021.

The 2022 annual mean concentration of nitrogen dioxide at the AQMA Epping Forest District Council No.2 decreased from 41µg/m^3 in 2021 to 38.0µg/m^3 in 2022. This is 2µg/m^3 below the annual mean objective of 40µg/m^3. Assuming that the concentration in 2020 was an outlier due to the impact of the COVID-19 pandemic, and traffic has now returned to normal (albeit a "new" normal), there has been a steady reduction in annual average nitrogen dioxide concentrations over the last 5 years. This is illustrated on Figure A.1a in Appendix A. Epping Forest District Council will continue to monitor concentrations at this location in order to obtain sufficient evidence for a revocation of the AQMA designation in respect of the annual mean objection in the future.

The Highways Department at Essex County Council have provided the following chart which illustrates traffic flow along the Epping High Road (which passes the AQMA at Bell Common), comparing 2019, 2020, 2021 and 2022.

Figure 3.1 – Traffic Flows on Epping High Road 2019 to 2022
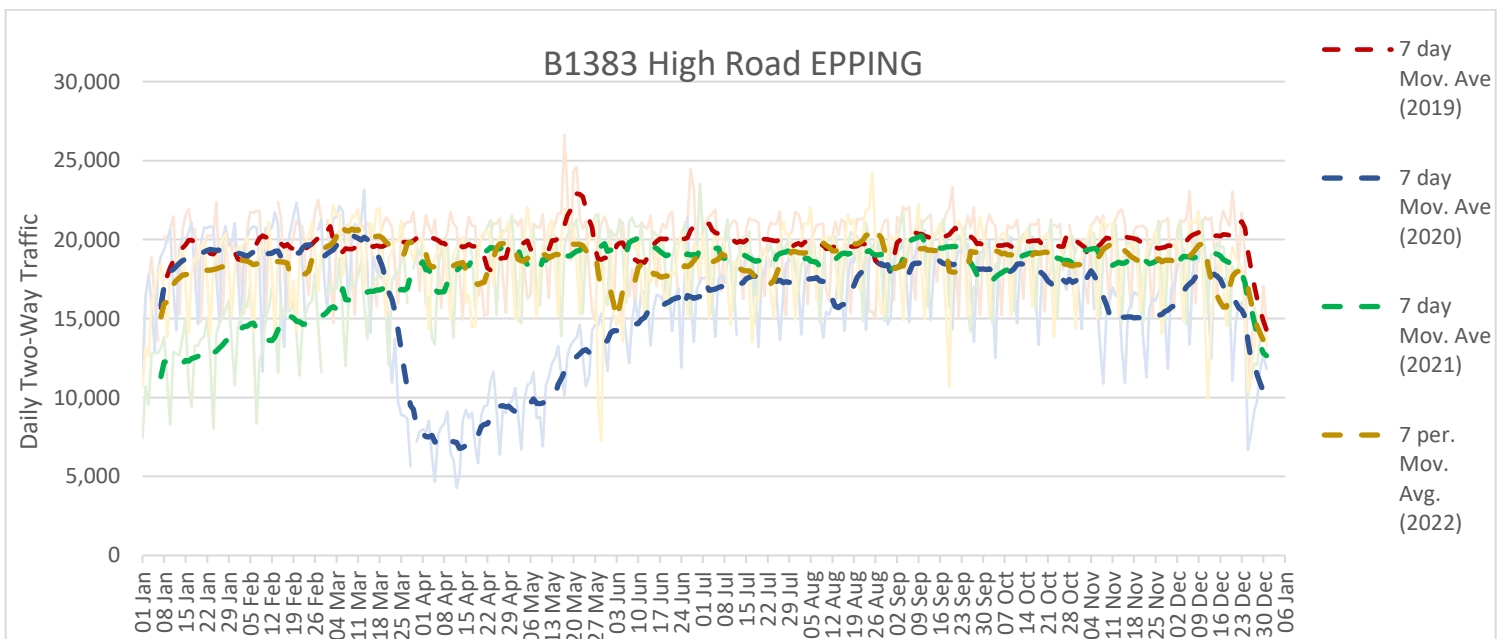
The beige dashed line represents the 2022 seven day average traffic and shows that overall traffic numbers although slightly lower, largely tracked those in 2019 before the

pandemic. Traffic shown in blue is that recorded in 2020. This clearly shows a reduction in traffic as a result of the national lockdown. The slight reduction in traffic in 2021 and 2022 when compared to 2019 may be explained by the increase in home working which has largely continued to date.

As 2022 was the 5th year in which the annual mean concentration of nitrogen dioxide at (3) Bell Vue, High Road, Bell Common, Epping (the AQMA) was below 60µg/m^3, it is proposed to move to a revocation of the declaration of the AQMA in relation to the hourly mean objective. Whilst there may still be some fluctuations around the annual mean objective, it is considered highly unlikely that concentrations will increase to such a level that will lead to a further breach of the hourly objective. This does assume that any further development in the area is required to incorporate effective mitigation measures to ensure that it does not have a negative impact on the local environment.

Whilst the annual mean nitrogen dioxide concentration was below the objective during 2022, we require further evidence that this objective will not be exceeded in the future before a revocation for this objective will be considered.

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$_2$)

All monitoring data presented in this report has been properly ratified and corrected for bias where applicable.

Table A.2 in Appendix A compares 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).

The full 2022 Diffusion tube 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.

All results obtained during 2022 were below both the hourly objective and the annual mean objective for nitrogen dioxide.

The only result within 10% of the annual mean objective, was that measured at the monitoring location in the AQMA (AQMA Epping Forest District Council No. 2) at Bell Common, Epping. The concentration at this location was 38µg/m^3. As this location is representative of relevant exposure, it was not necessary to undertake a distance correction calculation.

The majority of sites (37 out of 42) measured a decrease in concentrations from those recorded in 2021. Only 2 sites recorded an increase in annual mean concentrations from that recorded in 2021. These were (29) 3 Queens Terrace, Epping Road A414, Ongar and (39) 224 High Street, Epping (Church's Butchers). Two further sites recorded the same concentration as in 2021. These were (6) 1 Canes Cottages, Canes Lane A414, Hastingwood and (12) 66 Tempest Mead, North Weald. 2022 was the first year of measurement for the other location.

We continue to use the national bias adjustment factor as we do not have the ability to calculate a figure locally. This figure enables us to account for the inherent uncertainty involved in diffusion tube monitoring and report an adjusted concentration in line with Defra guidance (TG16, paragraph 7.78). Appendix C provides further detail on bias adjustment.

Data capture during 2022 was greater than 75% for all sites with the exception of (15) Albion House, Sewardstone Road, Sewardstone. An Annualisation calculation was undertaken for this site using the Diffusion Tube Data Processing Tool provided by Defra. This approach is in line with Technical Guidance Note LAQM TG20, box 7.9.

As the 2022 monitoring data shows that no additional sites measured concentrations of nitrogen dioxide greater than the objective, no further designations are required at this time.

Following a review of monitoring sites, no additional locations were set up or indeed removed at the end of 2022. It was considered that the monitoring programme was

appropriate and no concerns regarding additional locations had been received from members of the public.

The results obtained during 2022 have enabled Epping Forest District Council to conclude that whilst the AQMA designation in respect of the annual mean concentration of nitrogen dioxide should remain at the current time, the designation in respect of the hourly average concentration can be revoked.

3.2.2 Particulate Matter (PM$_{10}$)

Particulate matter (PM$_{10}$) monitoring is not undertaken in the district.

3.2.3 Particulate Matter (PM$_{2.5}$)

Particulate matter (PM$_{2.5}$) monitoring is not undertaken in the district.

3.2.4 Sulphur Dioxide (SO$_2$)

Sulphur dioxide (SO$_2$) monitoring is not undertaken in the district.

Appendix A: Monitoring Results

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1a, 1b, 1c	105 Hainault Road (junction with Fencepiece Road), Chigwell	Kerbside	544234	192236	NO2	No	8.5	1.0	No	2.0
2a, 2b, 2c	15 High Street, Epping	Urban Background	545555	201732	NO2	No	0.0	13.7	No	2.0
3a, 3b, 3c	Bell Vue, High Road, Bell Common, Epping	Roadside	544928	201281	NO2	Yes, AQMA Epping Forest District Council No.2	0.0	1.8	No	2.0
4a, 4b, 4c	254 High Street, Epping (Ladbrokes)	Roadside	546196	202355	NO2	No	0.0	5.6	No	2.5
5a, 5b, 5c	202 High Street, Epping (Superdrug)	Roadside	546058	202193	NO2	No	0.0	4.0	No	2.5
6a, 6b, 6c	1 Canes Cottages, Canes Lane A414, Hastingwood	Urban Background	547838	206819	NO2	No	0.0	15.6	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
7a, 7b	1 Church Hill, Loughton	Roadside	542505	196668	NO2	No	2.5	4.2	No	2.0
8a, 8b	72 Church Hill, Loughton	Roadside	542664	196868	NO2	No	0.0	12.7	No	2.0
9a, 9b, 9c	249 High Road,Loughton (Timpson)	Roadside	542339	196360	NO2	No	0.0	6.4	No	2.5
10a, 10b	252 High Road, Loughton (Love Brownies)	Roadside	542373	196478	NO2	No	0.0	5.7	No	2.5
11a, 11b	5 Goldings Hill, Loughton	Roadside	543091	197316	NO2	No	4.8	1.0	No	2.5
12a, 12b, 12c	66 Tempest Mead, North Weald	Urban Background	549648	203671	NO2	No	4.2	1.0	No	2.0
13a, 13b, 13c	20 High Street, Roydon	Roadside	540919	209956	NO2	No	0.8	1.2	No	2.0
14a, 14b, 14c	Burles Farm, Netherhall Road, Roydon	Urban Background	539711	208662	NO2	No	16.0	1.7	No	2.0
15a, 15b	Albion Terrace, Sewardstone Road, Sewardstone	Roadside	537727	196187	NO2	No	3.1	4.6	No	2.0
17a, 17b, 17c	14 The Elms, Waltham Abbey	Urban Background	541320	200020	NO2	No	0.0	55.8	No	2.0
18a, 18b	4 Leaview, Waltham Abbey (Abbeyview)	Roadside	537808	200644	NO2	No	6.1	1.5	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
19a, 19b	34 Hayden Road, Waltham Abbey	Roadside	538386	199557	NO2	No	0.0	12.0	No	2.0
20a, 20b, 20c	2 Lodge Lane, Waltham Abbey	Roadside	538710	199860	NO2	No	7.3	0.5	No	2.0
21a, 21b	110 Roundhills, Waltham Abbey	Urban Background	538954	199973	NO2	No	6.7	1.0	No	2.0
22a, 22b	26 Victoria Road, Buckhurst Hill (opposite Underground Station)	Roadside	541719	193979	NO2	No	7.0	1.6	No	2.0
23a, 23b, 23c	St Johns Sch, High Road, Buckhurst Hill	Roadside	540902	194240	NO2	No	11.0	2.5	No	2.0
25a, 25b, 25c	Regency Lodge, Roding Lane, Buckhurst Hill	Roadside	541913	194020	NO2	No	5.0	2.0	No	2.0
26a, 26b, 26c	131 High Street, Ongar (at Bottleneck)	Roadside	555253	202921	NO2	No	0.0	1.0	No	2.0
27a, 27b, 27c	3 Queens Terrace, Epping Road A414, Ongar	Roadside	555125	203944	NO2	No	0.0	7.0	No	2.0
31a, 31b, 31c	Station House, Station Approach, Epping Underground Station, Epping	Other	546196	201563	NO2	No	0.0	1.5	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)
32a, 32b, 32c	Copped Hall, High Road, Bell Common, Epping	Roadside	544709	201139	NO2	No	4.5	3.0	No	2.0
33a, 33b, 33c	281 Fencepiece Road, Chigwell	Roadside	544238	192212	NO2	No	0.0	10.0	No	2.5
34a, 34b, 34c	414 Fencepiece Road, Chigwell (Sherrell House)	Roadside	544268	192247	NO2	No	0.0	12.5	No	2.0
35a, 35b, 35c	120 Manor Road, Chigwell	Roadside	544183	192231	NO2	No	5.5	2.0	No	2.5
36a, 36b, 36c	107 High Street, Ongar (Anchor)	Roadside	555231	202875	NO2	No	0.0	2.0	No	2.5
37a, 37b, 37c	149 High Street, Ongar (Queen Bee)	Roadside	555253	202964	NO2	No	0.0	5.5	No	2.5
38a, 38b, 38c	204 High Street, Ongar (Watsons)	Roadside	555265	203108	NO2	No	0.0	2.5	No	2.0
39a, 39b, 39c	224 High Street, Epping (Church's Butchers)	Roadside	546107	202254	NO2	No	0.0	4.0	No	2.0
40a, 40b, 40c	154 High Street, Epping (was Lloyds Bank)	Roadside	545991	202095	NO2	No	0.0	5.0	No	2.5
41a, 41b, 41c	259 High Street, Epping (Holland & Barrett)	Roadside	546075	202253	NO2	No	0.0	10.0	No	2.5
42a, 42b, 42c	Laurels, 2 Nazeing Road, Nazeing	Roadside	539015	205995	NO2	No	15.0	2.0	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)
43a, 43b, 43c	4 North Street, Nazeing	Roadside	539084	206058	NO2	No	12.0	1.5	No	2.5
44a, 44b, 44c	Parsonage Court, Rectory Lane, Loughton	Roadside	543989	196472	NO2	No	0.0	9.8	No	2.0
45a, 45b, 45c	18 Chigwell Lane, Loughton (off Colson Road)	Roadside	544119	196133	NO2	No	3.5	2.0	No	2.5
46a, 46b, 46c	The Woodbine Public House, Honey Lane, Waltham Abbey	Roadside	541301	199731	NO2	No	0.0	5.0	No	2.5
47a, 47b, 47c	76 Roding Road, Loughton	Roadside	542634	195492	NO2	No	0.0	6.5	No	2.0

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
1a, 1b, 1c	544234	192236	Kerbside	100	76.6	39.2	38.9	30.0	29.6	25.5
2a, 2b, 2c	545555	201732	Urban Background	100	74.7	24.5	23.9	18.1	17.9	16.8
3a, 3b, 3c	544928	201281	Roadside	100	100.0	**54.8**	**47.6**	32.5	**41.0**	38.0
4a, 4b, 4c	546196	202355	Roadside	100	93.4	28.3	28.2	21.3	20.0	19.8
5a, 5b, 5c	546058	202193	Roadside	100	85.4	35.9	33.5	24.0	24.8	24.3
6a, 6b, 6c	547838	206819	Urban Background	100	100.0	21.8	20.1	16.1	16.9	15.9
7a, 7b	542505	196668	Roadside	100	100.0	25.4	22.4	17.4	17.9	16.3
8a, 8b	542664	196868	Roadside	100	100.0	23.2	21.2	16.8	17.9	16.5
9a, 9b, 9c	542339	196360	Roadside	100	86.8	32.4	28.0	21.2	20.4	19.2
10a, 10b	542373	196478	Roadside	100	93.4	32.0	28.3	21.7	22.3	20.0
11a, 11b	543091	197316	Roadside	100	86.8	38.8	34.4	28.0	28.8	28.0
12a, 12b, 12c	549648	203671	Urban Background	100	86.8	16.0	15.1	11.5	12.1	11.9

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 2022 (%) [2]	2018	2019	2020	2021	2022
13a, 13b, 13c	540919	209956	Roadside	100	86.8	22.7	20.5	16.1	16.8	16.8
14a, 14b, 14c	539711	208662	Urban Background	100	76.6	17.0	15.8	13.4	13.2	12.4
15a, 15b	537727	196187	Roadside	100	66.5	30.3	27.2	22.6	23.2	23.0
17a, 17b, 17c	541320	200020	Urban Background	100	93.4	27.9	25.7	17.0	21.4	19.1
18a, 18b	537808	200644	Roadside	100	83.2	24.6	23.8	18.9	19.6	17.2
19a, 19b	538386	199557	Roadside	100	93.4	27.1	26.0	20.4	22.2	21.5
20a, 20b, 20c	538710	199860	Roadside	100	85.4	30.5	30.2	22.5	24.6	22.9
21a, 21b	538954	199973	Urban Background	100	81.9	26.8	28.2	21.0	20.8	17.8
22a, 22b	541719	193979	Roadside	100	100.0	28.7	25.2	19.4	21.5	18.3
23a, 23b, 23c	540902	194240	Roadside	100	83.2	29.2	25.7	20.1	20.6	17.9
25a, 25b, 25c	541913	194020	Roadside	100	100.0	37.3	33.3	26.1	27.1	23.5
26a, 26b, 26c	555253	202921	Roadside	100	85.4	38.3	33.4	27.8	31.3	25.6
27a, 27b, 27c	555125	203944	Roadside	100	91.8	26.7	24.2	18.3	18.7	19.9
31a, 31b, 31c	546196	201563	Other	100	100.0	-	37.9	25.3	28.2	26.1

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 2022 (%) [2]	2018	2019	2020	2021	2022
32a, 32b, 32c	544709	201139	Roadside	100	100.0	-	30.9	23.2	22.2	20.5
33a, 33b, 33c	544238	192212	Roadside	100	100.0	-	30.3	25.0	23.9	21.8
34a, 34b, 34c	544268	192247	Roadside	100	81.9	-	21.6	16.9	17.5	16.6
35a, 35b, 35c	544183	192231	Roadside	100	91.8	-	34.9	24.3	25.5	21.8
36a, 36b, 36c	555231	202875	Roadside	100	92.6	-	34.1	24.7	26.1	23.6
37a, 37b, 37c	555253	202964	Roadside	100	83.2	-	28.4	19.8	21.3	20.2
38a, 38b, 38c	555265	203108	Roadside	100	100.0	-	30.0	19.5	21.6	21.4
39a, 39b, 39c	546107	202254	Roadside	100	89.8	-	34.9	22.6	22.6	23.4
40a, 40b, 40c	545991	202095	Roadside	100	82.4	-	33.0	24.3	21.7	21.6
41a, 41b, 41c	546075	202253	Roadside	100	100.0	-	34.9	22.7	23.9	21.7
42a, 42b, 42c	539015	205995	Roadside	100	93.4	-	-	23.0	22.3	22.3
43a, 43b, 43c	539084	206058	Roadside	100	93.4	-	-	21.0	21.7	20.0
44a, 44b, 44c	543989	196472	Roadside	100	100.0	-	-	16.9	17.0	16.5
45a, 45b, 45c	544119	196133	Roadside	100	92.6	-	-	17.9	18.6	18.4

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 2022 (%) [2]	2018	2019	2020	2021	2022
46a, 46b, 46c	541301	199731	Roadside	100	81.9	-	-	-	28.1	27.0
47a, 47b, 47c	542634	195492	Roadside	100	93.4	-	-	-	-	16.0

☒ **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 NO₂ Concentrations

Figure A.1a

Air Quality Management Area, Bell Common, Epping

Figure A.1b

Figure A.1b — Epping. Annual Mean Average NO2 Concentration (ug/m3) by Monitoring Location for years 2018–2022 with Annual Mean Objective.

Figure A.1c

LAQM Annual Status Report 2023

Figure A.1d

Buckhurst Hill & Chigwell

Figure A.1e

Figure caption: Waltham Abbey & Sewardstone

Figure A.1f

Ongar

Figure A.1g

North Weald & Hastingwood
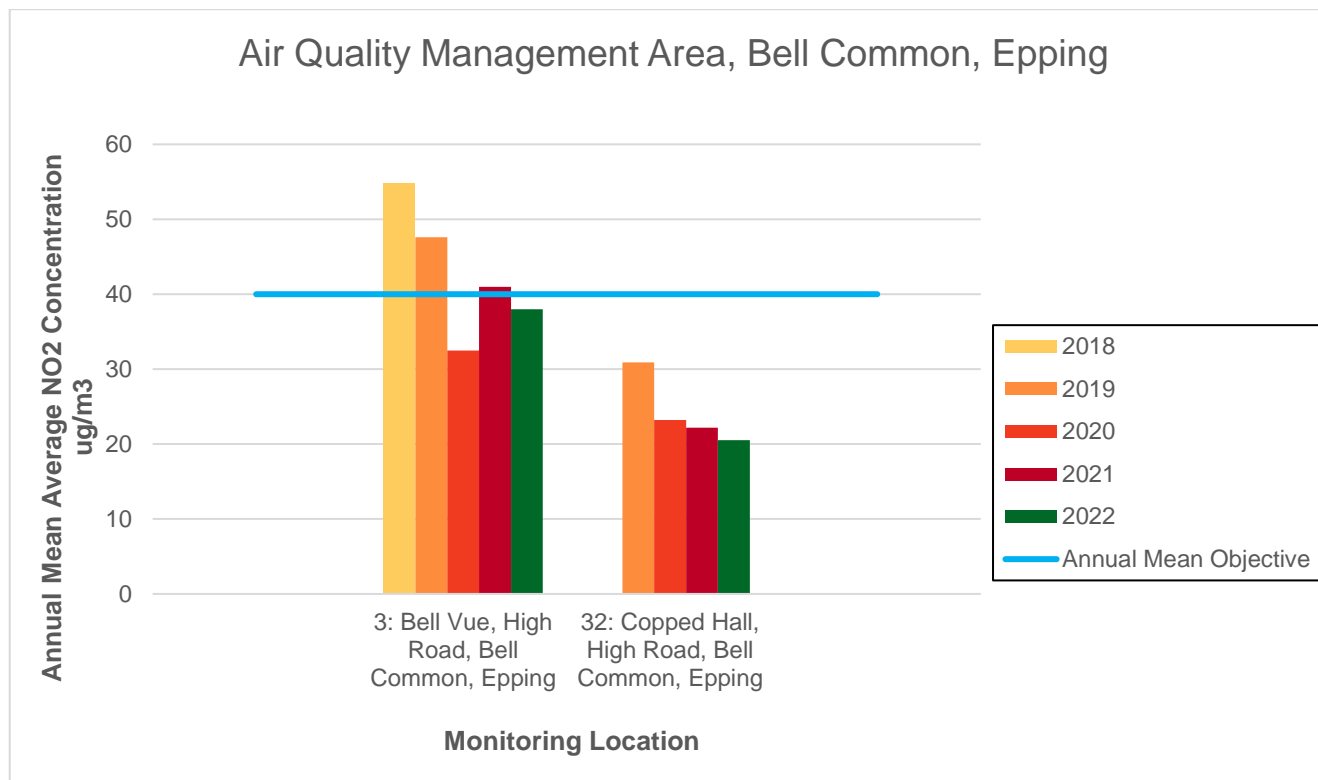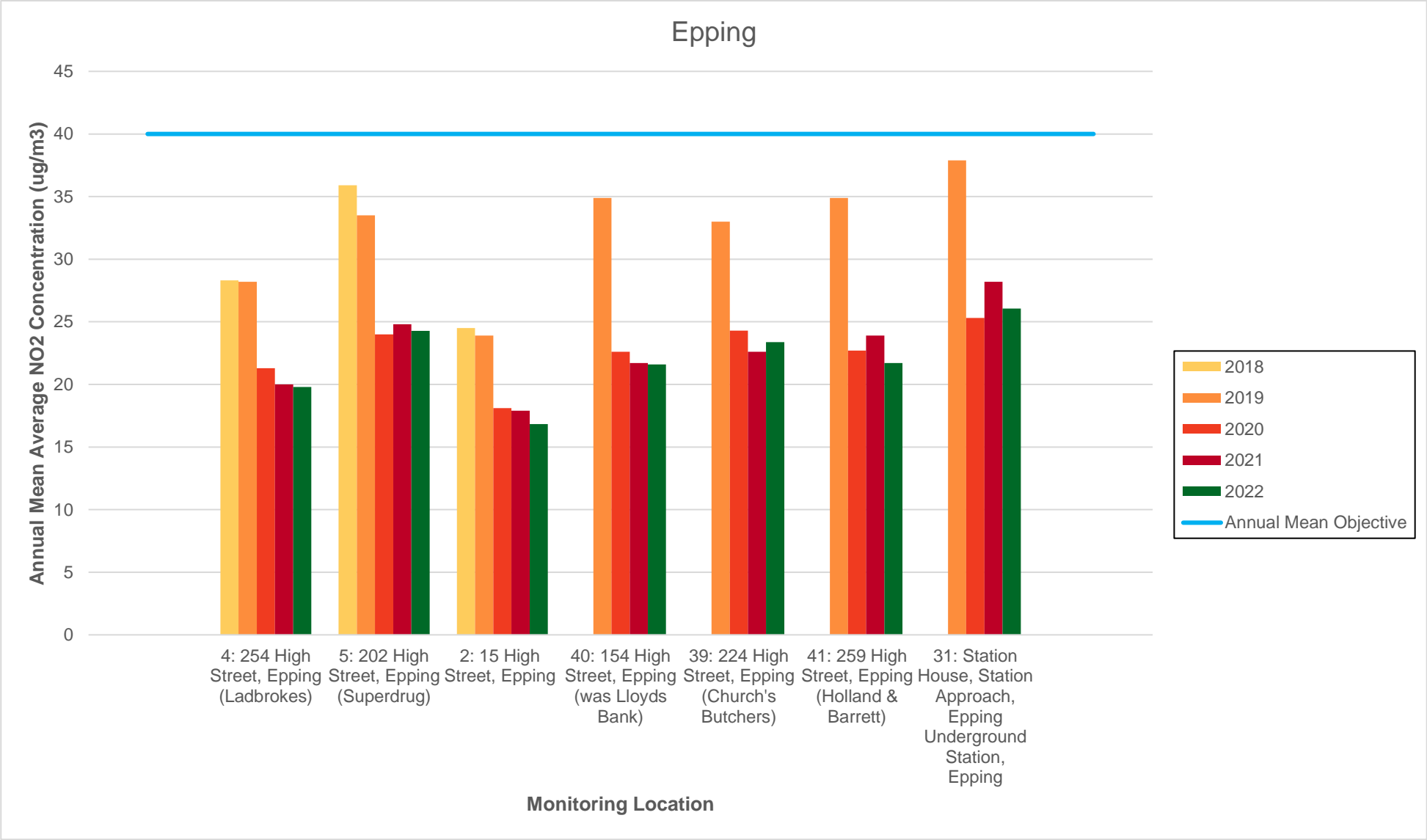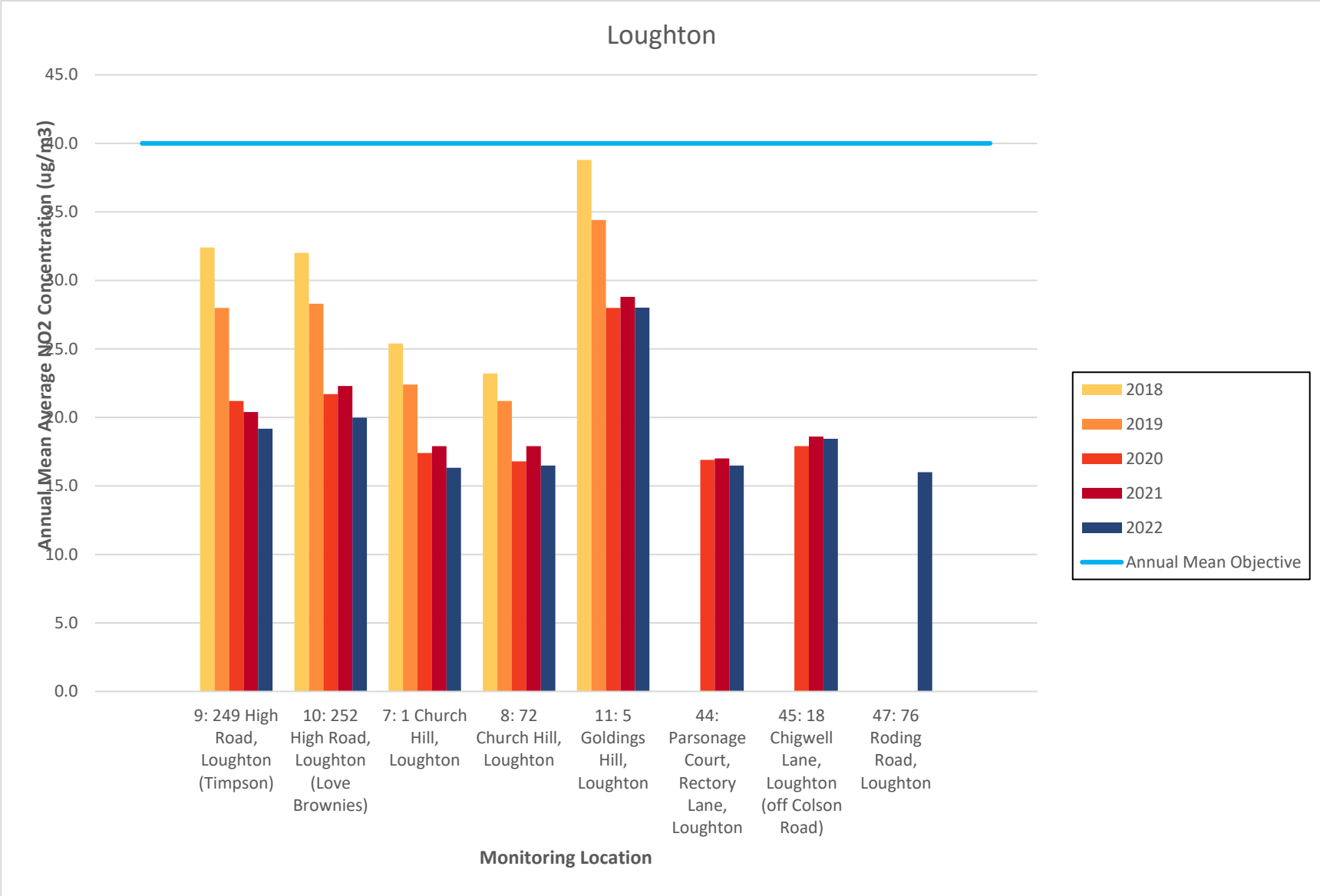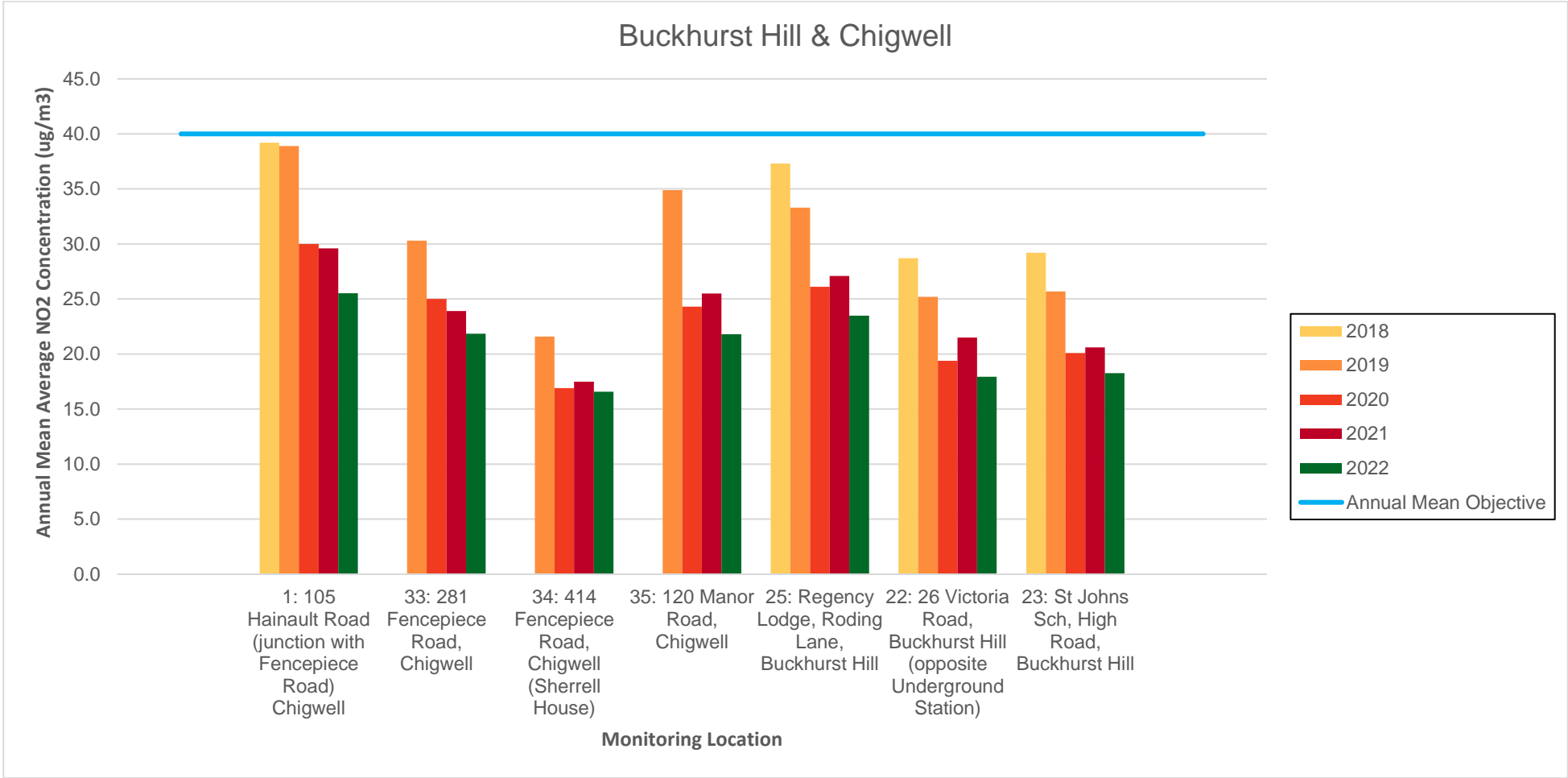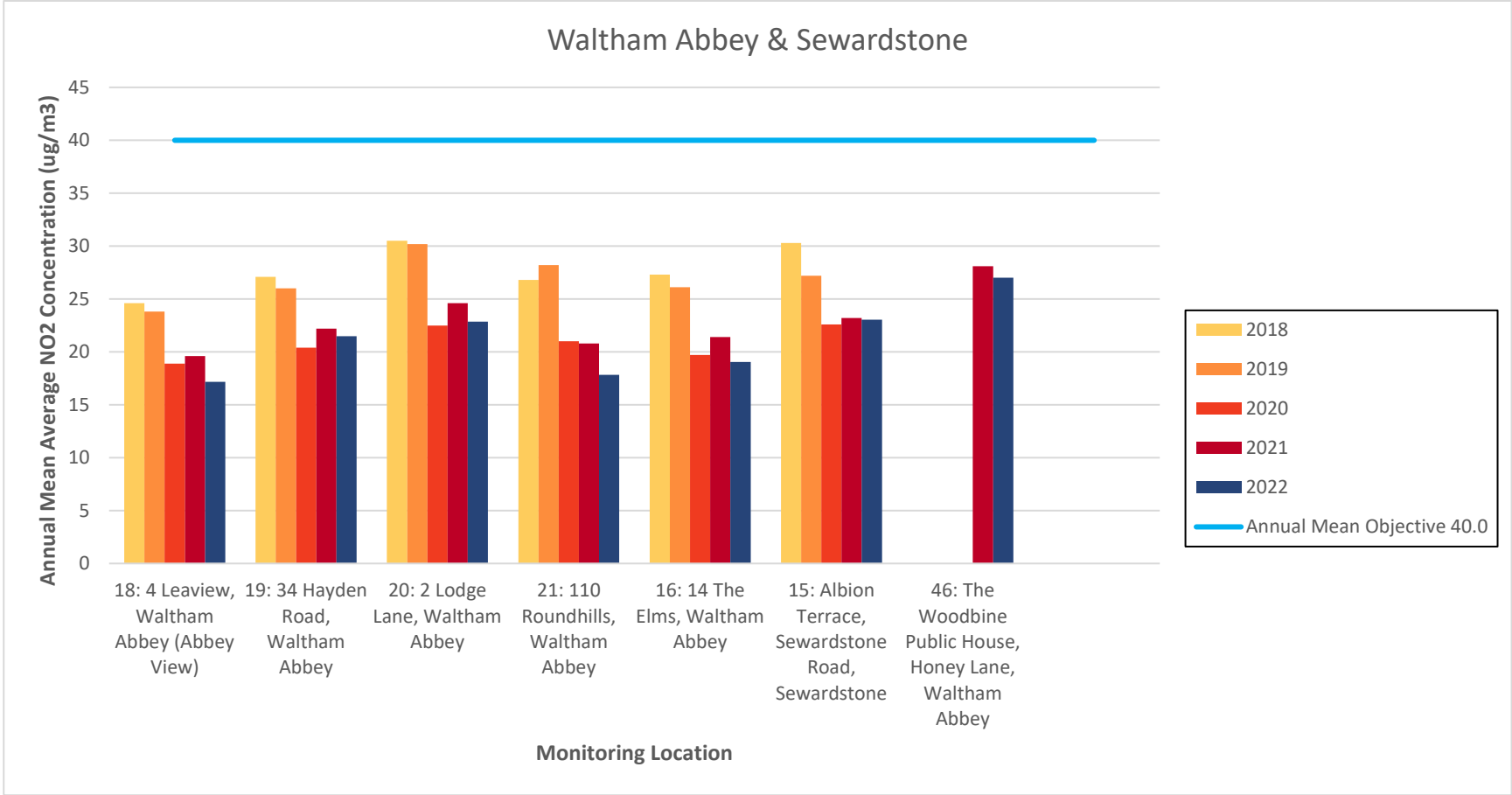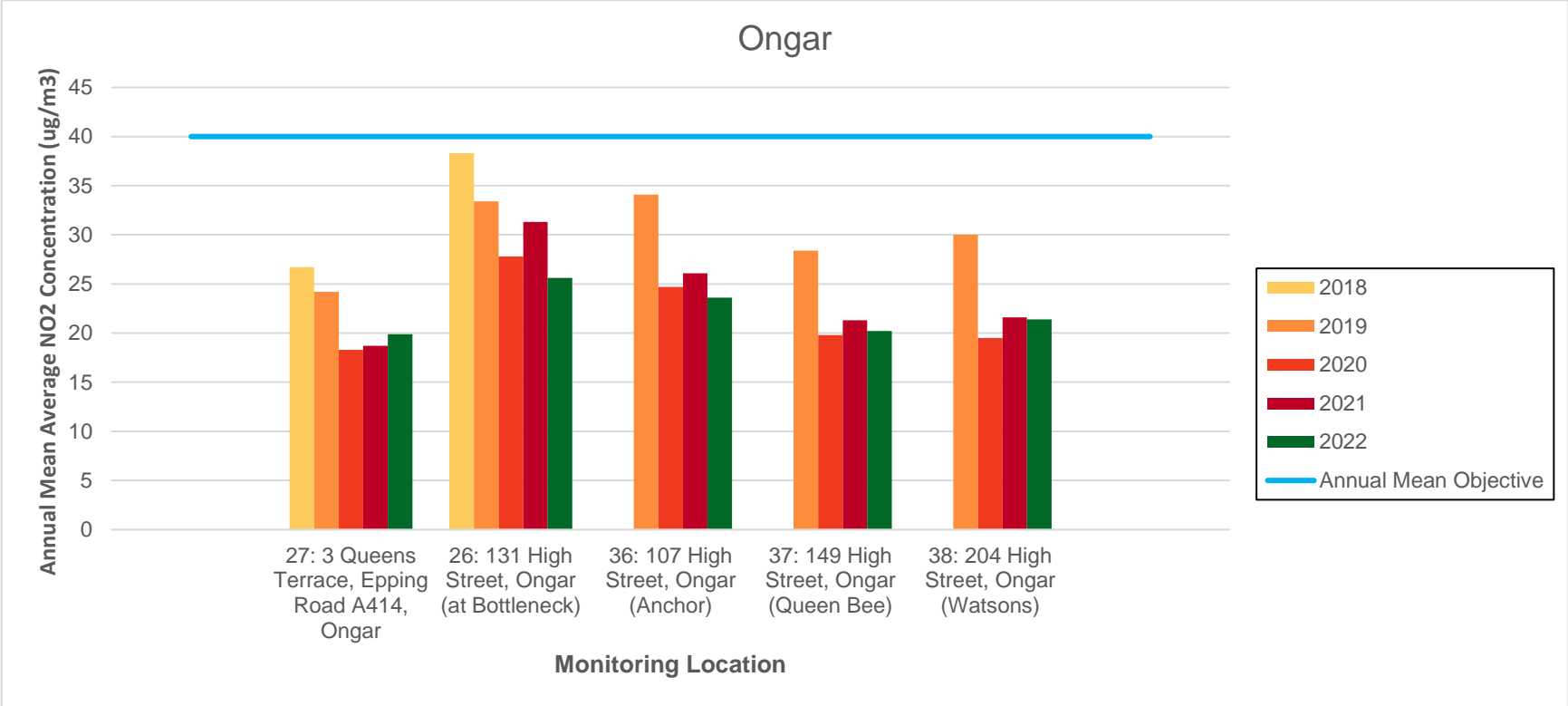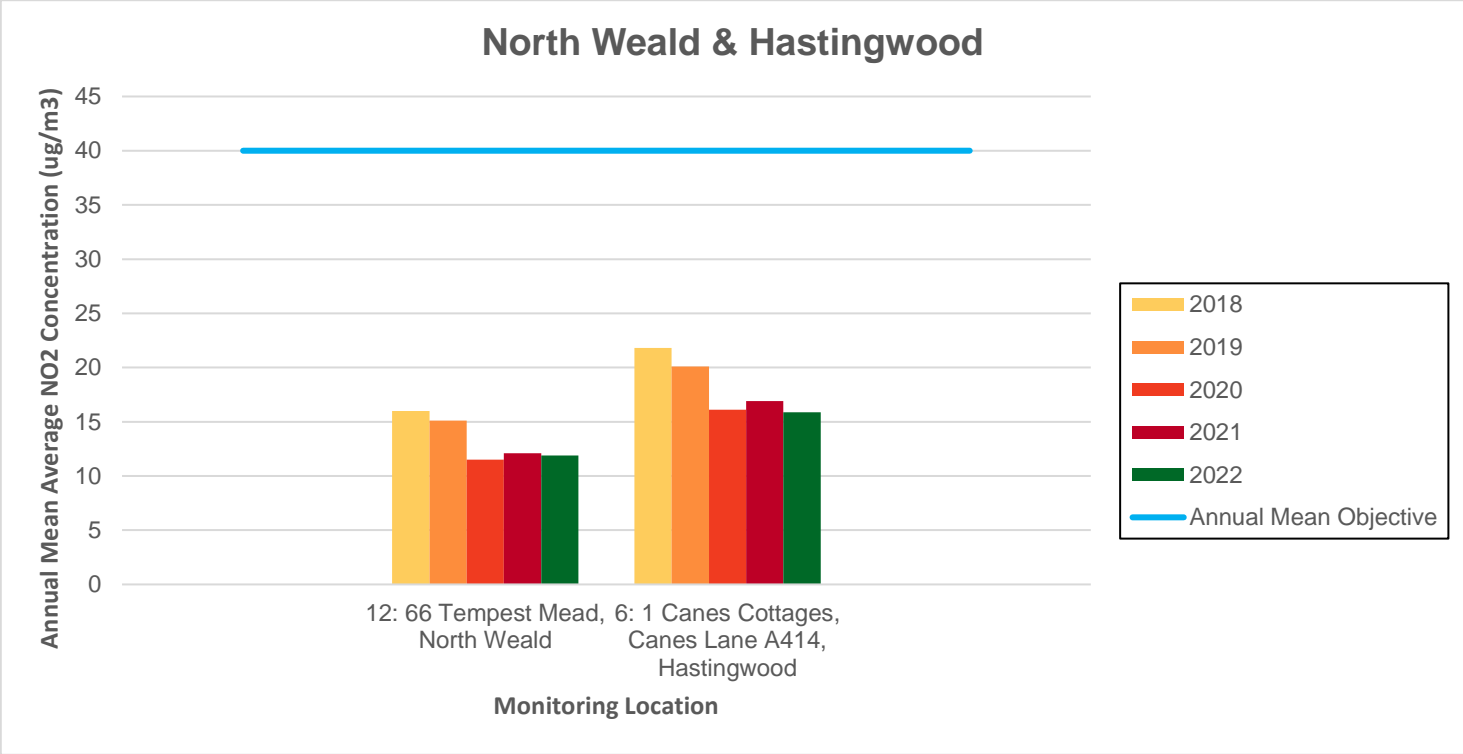
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Figure A.1h
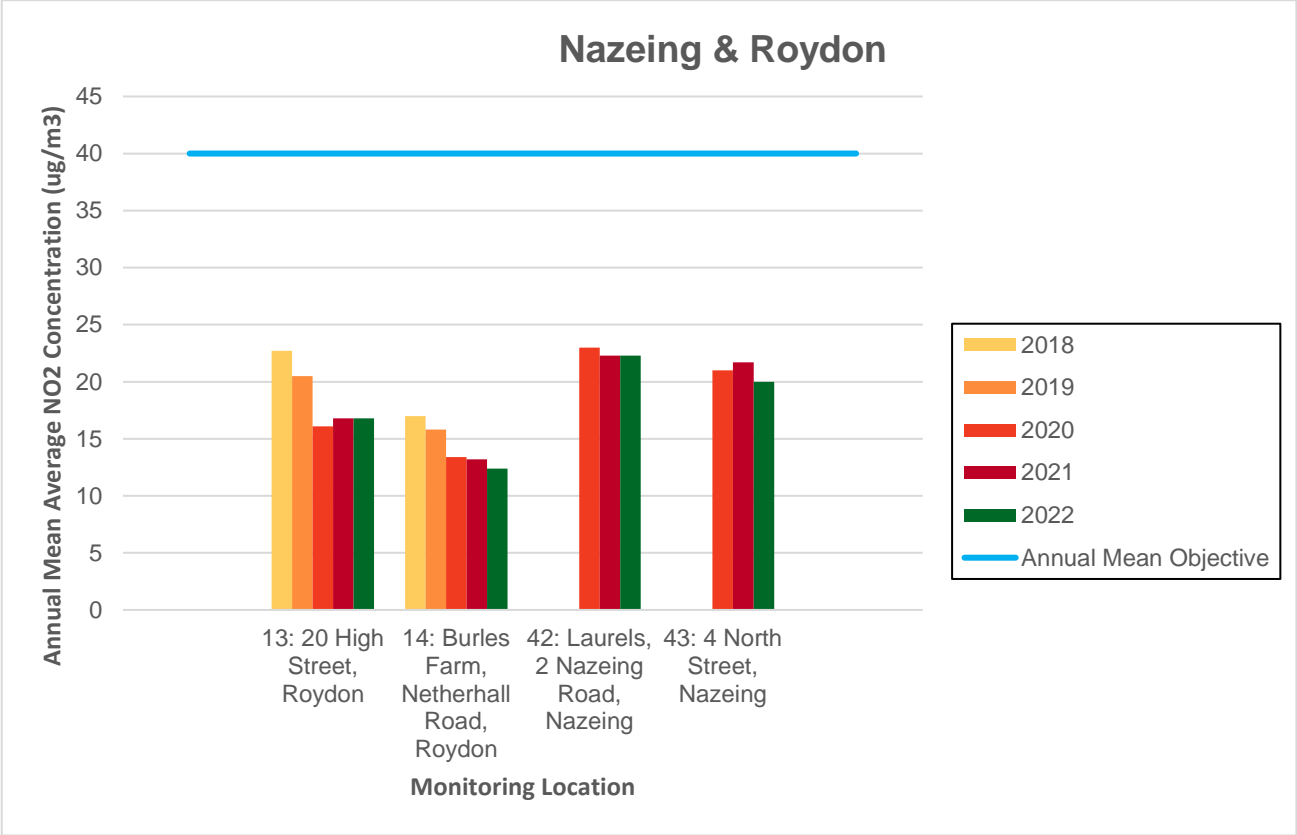
Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

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
1a	544234	192236	47.0	39.1	32.8	28.6	26.5		26.7	30.9	34.0	36.2			-	-	-	Triplicate Site with 1a, 1b and 1c - Annual data provided for 1c only
1b	544234	192236	44.4	38.1	35.1	29.2	28.9		26.5	30.6	34.1	35.7			-	-	-	Triplicate Site with 1a, 1b and 1c - Annual data provided for 1c only
1c	544234	192236		36.4	38.5	27.5	28.1		27.9	30.2	34.0	33.9			33.6	25.5	-	Triplicate Site with 1a, 1b and 1c - Annual data provided for 1c only
2a	545555	201732	33.8	25.6		16.3	18.9	20.0	16.7	19.5	18.6			25.8	-	-	-	Triplicate Site with 2a, 2b and 2c - Annual data provided for 2c only
2b	545555	201732	33.6	27.7		19.2	19.5	19.3	16.2	17.8	21.3			29.4	-	-	-	Triplicate Site with 2a, 2b and 2c - Annual data provided for 2c only
2c	545555	201732	34.8	28.4		19.6	19.2	17.0	12.4	18.5	19.7			29.3	22.2	16.8	-	Triplicate Site with 2a, 2b and 2c - Annual data provided for 2c only
3a	544928	201281	56.2	59.3	49.5	44.3	51.5	48.4	48.2	45.8	49.1	53.1	40.8	46.9	-	-	-	Triplicate Site with 3a, 3b and 3c - Annual data provided for 3c only
3b	544928	201281	62.4	57.0	54.0	43.5	48.0	49.1	49.1	46.9	45.6	53.1	48.0	50.4	-	-	-	Triplicate Site with 3a, 3b and 3c - Annual data provided for 3c only
3c	544928	201281	63.1	55.9	50.5	44.6	48.1	50.8	46.1	43.9	47.3	52.4	56.5	40.9	50.0	38.0	-	Triplicate Site with 3a, 3b and 3c - Annual data provided for 3c only
4a	546196	202355	29.0		25.9	20.0		25.5		23.3	21.7	28.7		34.8	-	-	-	Triplicate Site with 4a, 4b and 4c - Annual data provided for 4c only
4b	546196	202355	34.7	32.4	24.6		22.1	24.9	19.7	23.1	21.8	31.9		34.4	-	-	-	Triplicate Site with 4a, 4b and 4c - Annual data provided for 4c only
4c	546196	202355	32.9		22.5	20.7	23.1	25.7	19.5	23.0		30.2		32.9	26.0	19.8	-	Triplicate Site with 4a, 4b and 4c - Annual data provided for 4c only
5a	546058	202193	42.3	31.0		27.9	27.5	32.2	27.3	33.6	30.5	33.7		33.0	-	-	-	Triplicate Site with 5a, 5b and 5c - Annual data provided for 5c only
5b	546058	202193	34.2	31.0		28.4	25.7	33.0	26.8	33.9	33.9	33.9		37.0	-	-	-	Triplicate Site with 5a, 5b and 5c - Annual data provided for 5c only

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
5c	546058	202193	41.4			30.4	25.9	31.0	27.8	32.6	31.6	34.9		34.6	31.9	24.3	-	Triplicate Site with 5a, 5b and 5c - Annual data provided for 5c only
6a	547838	206819	30.5	24.9	21.4	18.8	20.4	15.9	14.8	16.5	20.1	21.7	21.1	26.1	-	-	-	Triplicate Site with 6a, 6b and 6c - Annual data provided for 6c only
6b	547838	206819	29.9	22.8	19.1	17.2	21.9	16.0	14.6	17.1	19.5	20.6	20.6	23.1	-	-	-	Triplicate Site with 6a, 6b and 6c - Annual data provided for 6c only
6c	547838	206819	31.0	24.4	20.2	19.1	24.1	16.0	14.8	17.0	19.9	21.8	21.9	27.7	20.9	15.9	-	Triplicate Site with 6a, 6b and 6c - Annual data provided for 6c only
7a	542505	196668	32.3	23.9	27.2	21.3	16.2		14.9	18.0	18.7	22.2	24.6	28.8	-	-	-	Duplicate Site with 7a and 7b - Annual data provided for 7b only
7b	542505	196668	31.8	25.9	23.4	21.9	16.8	14.2	14.3	17.3	18.9	21.9	22.7	24.1	21.5	16.3	-	Duplicate Site with 7a and 7b - Annual data provided for 7b only
8a	542664	196868	35.7	26.1	26.0	18.4	18.2	15.2	15.3	15.9	19.2	21.9	19.7	24.5	-	-	-	Duplicate Site with 8a and 8b - Annual data provided for 8b only
8b	542664	196868	35.0	25.8	23.5	19.6	17.7	16.1	13.5	16.6	18.3	22.1	25.7	30.9	21.7	16.5	-	Duplicate Site with 8a and 8b - Annual data provided for 8b only
9a	542339	196360	37.1	26.8	31.3	23.1	21.2		17.7	23.6	24.6	25.3		30.0	-	-	-	Triplicate Site with 9a, 9b and 9c - Annual data provided for 9c only
9b	542339	196360	33.3	25.2	31.9	24.2	19.6		18.8	22.3	25.5	25.6		25.1	-	-	-	Triplicate Site with 9a, 9b and 9c - Annual data provided for 9c only
9c	542339	196360	31.3	26.1	27.5	22.3	21.4		19.2	23.5	23.7	25.2		24.9	25.2	19.2	-	Triplicate Site with 9a, 9b and 9c - Annual data provided for 9c only
10a	542373	196478	37.3	33.6	22.8	23.2	25.2		21.8	20.7	24.4	28.3	23.9	28.0	-	-	-	Duplicate Site with 10a and 10b - Annual data provided for 10b only
10b	542373	196478	36.6	31.4	26.9	22.6	25.2		19.7	22.3	24.4	27.4	23.7	29.2	26.3	20.0	-	Duplicate Site with 10a and 10b - Annual data provided for 10b only
11a	543091	197316	45.8	33.2	45.2	37.7	31.8		29.1	38.6	35.7	36.8		32.8	-	-	-	Duplicate Site with 11a and 11b - Annual data provided for 11b only
11b	543091	197316	44.1	36.0	41.9	36.7	30.2		30.4	37.6	34.8	36.9		41.9	36.9	28.0	-	Duplicate Site with 11a and 11b - Annual data provided for 11b only
12a	549648	203671	27.3	18.1	14.5	12.5	13.1		10.6	11.7	12.7	16.9		19.8	-	-	-	Triplicate Site with 12a, 12b and 12c - Annual data provided for 12c only
12b	549648	203671	24.3	19.2	14.2	11.6	13.1		10.5	11.2	13.1	16.5		20.4	-	-	-	Triplicate Site with 12a, 12b and 12c - Annual data provided for 12c only
12c	549648	203671	28.3	19.0	15.4	12.1	11.9		10.2	10.4	12.8	17.1		21.0	15.7	11.9	-	Triplicate Site with 12a, 12b and 12c - Annual data provided for 12c only

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
13a	540919	209956	37.2	23.6	25.0	18.3	16.7		15.2	17.7	17.1	20.7		27.3	-	-	-	Triplicate Site with 13a, 13b and 13c - Annual data provided for 13c only
13b	540919	209956	34.7	23.6	25.2	18.5	17.3		15.5	17.4	19.2	21.8		30.3	-	-	-	Triplicate Site with 13a, 13b and 13c - Annual data provided for 13c only
13c	540919	209956	35.4	22.7	23.9	18.2	16.7		15.3	17.8	18.8	21.4		30.8	22.1	16.8	-	Triplicate Site with 13a, 13b and 13c - Annual data provided for 13c only
14a	539711	208662	23.4	19.0	17.6	11.5	14.1		13.3	13.8	14.3	18.5			-	-	-	Triplicate Site with 14a, 14b and 14c - Annual data provided for 14c only
14b	539711	208662	25.1	20.8	18.9	11.4	15.2		12.3	13.7	13.8	18.7			-	-	-	Triplicate Site with 14a, 14b and 14c - Annual data provided for 14c only
14c	539711	208662	25.2	21.1	12.9	12.4	14.5		11.7	13.4	13.3	20.1			16.3	12.4	-	Triplicate Site with 14a, 14b and 14c - Annual data provided for 14c only
15a	537727	196187	45.6	28.0	35.3		23.8			27.2	31.0	36.1	35.8		-	-	-	Duplicate Site with 15a and 15b - Annual data provided for 15b only
15b	537727	196187	40.6	29.3	33.0		26.5			25.1	33.5	33.9	29.2		32.1	23.0	-	Duplicate Site with 15a and 15b - Annual data provided for 15b only
17a	541320	200020	36.4	27.3	24.1	25.2	23.6	18.6	19.7	21.0	26.0	25.0		30.3	-	-	-	Triplicate Site with 17a, 17b and 17c - Annual data provided for 17c only
17b	541320	200020	31.7	27.5	23.1	24.4	24.3	19.2	19.4	22.5	25.2	23.4		29.9	-	-	-	Triplicate Site with 17a, 17b and 17c - Annual data provided for 17c only
17c	541320	200020	39.9	31.1	26.3	24.1	25.9	18.0	20.6	20.3	24.5	23.1		25.7	25.1	19.1	-	Triplicate Site with 17a, 17b and 17c - Annual data provided for 17c only
18a	537808	200644	28.9	30.0	28.2	18.5	20.1	17.4	15.6	18.7	17.8	27.8			-	-	-	Duplicate Site with 18a and 18b - Annual data provided for 18b only
18b	537808	200644	38.2	28.5	25.2	19.9	19.9		15.6	17.7	18.7	27.7			22.6	17.2	-	Duplicate Site with 18a and 18b - Annual data provided for 18b only
19a	538386	199557	42.0	25.7	33.2	29.8	21.1		25.2	29.0	30.1	25.9	24.5	33.0	-	-	-	Duplicate Site with 19a and 19b - Annual data provided for 19b only
19b	538386	199557	34.1	26.4	34.1	28.1	22.0		23.5	26.4	29.0	23.3	22.6	33.2	28.3	21.5	-	Duplicate Site with 19a and 19b - Annual data provided for 19b only
20a	538710	199860	44.2	30.7	30.8	30.8	24.9		22.5		29.7	28.6	20.8	34.3	-	-	-	Triplicate Site with 20a, 20b and 20c - Annual data provided for 20c only
20b	538710	199860	43.9	37.5	30.3	27.8	28.0		24.4		29.5	29.1	18.7	35.1	-	-	-	Triplicate Site with 20a, 20b and 20c - Annual data provided for 20c only
20c	538710	199860	39.1	38.2	28.9	28.3	26.3		22.8		29.4	27.5	24.9	35.6	30.1	22.9	-	Triplicate Site with 20a, 20b and 20c - Annual data provided for 20c only

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
21a	538954	199973		31.6	30.2	18.8	21.9	20.3	18.0	20.5	23.3		10.2	33.6	-	-	-	Duplicate Site with 21a and 21b - Annual data provided for 21b only
21b	538954	199973		34.1	32.1	20.6	21.4	20.0	18.6	21.9	25.1		12.6	34.1	23.4	17.8	-	Duplicate Site with 21a and 21b - Annual data provided for 21b only
22a	541719	193979	36.6	28.3	32.1	24.1	19.2	18.3	16.6	17.0	21.0	25.1	26.0	28.0	-	-	-	Duplicate Site with 22a and 22b - Annual data provided for 22b only
22b	541719	193979	36.4	25.9	30.2	23.5	19.1	15.6	17.3	17.5	21.1	21.8	29.0	27.1	24.0	18.3	-	Duplicate Site with 22a and 22b - Annual data provided for 22b only
23a	540902	194240	39.2	26.3	27.4	21.2	20.4		17.8	19.5	20.9	24.4			-	-	-	Triplicate Site with 23a, 23b and 23c - Annual data provided for 23c only
23b	540902	194240	42.8	27.3	27.1	17.6	21.9	18.9	17.7	17.2	19.3	27.4			-	-	-	Triplicate Site with 23a, 23b and 23c - Annual data provided for 23c only
23c	540902	194240	38.6	27.8	26.4	18.7	24.1	18.8	17.3	17.9	18.6	26.9			23.6	17.9	-	Triplicate Site with 23a, 23b and 23c - Annual data provided for 23c only
25a	541913	194020	60.5	39.4	34.9	25.8	25.8	27.3	25.3	23.5	23.9	32.3	27.1	37.9	-	-	-	Triplicate Site with 25a, 25b and 25c - Annual data provided for 25c only
25b	541913	194020	49.9		31.2	25.8	26.8	26.5		24.3	25.9	33.2	30.5	29.3	-	-	-	Triplicate Site with 25a, 25b and 25c - Annual data provided for 25c only
25c	541913	194020	43.4	39.4	31.5	23.5	27.7	25.7		22.6	26.6	31.6	34.3	29.7	30.9	23.5	-	Triplicate Site with 25a, 25b and 25c - Annual data provided for 25c only
26a	555253	202921	48.7	37.8	37.0	35.0	16.5	33.5			34.5			40.5	-	-	-	Triplicate Site with 26a, 26b and 26c - Annual data provided for 26c only
26b	555253	202921	48.7		36.2	27.5	17.5	33.6	33.1			36.0		36.9	-	-	-	Triplicate Site with 26a, 26b and 26c - Annual data provided for 26c only
26c	555253	202921	47.6	38.3	37.6	35.8	16.1	33.8			34.5	36.4		40.6	33.7	25.6	-	Triplicate Site with 26a, 26b and 26c - Annual data provided for 26c only
27a	555125	203944	32.4		32.3	21.9	25.8	20.2	19.9	20.4	22.2	31.2	28.3	25.7	-	-	-	Triplicate Site with 27a, 27b and 27c - Annual data provided for 27c only
27b	555125	203944	36.2		32.4	23.5	26.8	21.7	19.8	22.7	23.6	26.7	30.9	29.7	-	-	-	Triplicate Site with 27a, 27b and 27c - Annual data provided for 27c only
27c	555125	203944	37.7		30.2	23.4	27.7	21.1	19.9	19.8	24.5	26.8	28.6	29.0	26.2	19.9	-	Triplicate Site with 27a, 27b and 27c - Annual data provided for 27c only
31a	546196	201563	41.4	33.6	38.8	34.8	28.6	32.1	30.0	30.7	32.9	34.8		37.5	-	-	-	Triplicate Site with 31a, 31b and 31c - Annual data provided for 31c only
31b	546196	201563	37.8	32.2	37.9	33.9	30.6	32.0	29.2	28.8	28.8	39.0	41.8		-	-	-	Triplicate Site with 31a, 31b and 31c - Annual data provided for 31c only

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
31c	546196	201563	39.7	26.6	39.9	31.5	30.6	33.0	30.4	32.0	32.0	37.1	39.0		34.3	26.1	-	Triplicate Site with 31a, 31b and 31c - Annual data provided for 31c only
32a	544709	201139	38.2	33.3	30.0	24.5	25.0	23.3	20.8	24.3	22.0	29.7	33.2	26.3	-	-	-	Triplicate Site with 32a, 32b and 32c - Annual data provided for 32c only
32b	544709	201139	40.9	36.4	32.9	20.8	23.1	23.4	19.5	22.3	19.6	31.9	32.9	23.8	-	-	-	Triplicate Site with 32a, 32b and 32c - Annual data provided for 32c only
32c	544709	201139	36.9	33.3	25.9	24.8	19.9	21.8	21.4	24.0	21.4	27.5	24.9	30.9	27.0	20.5	-	Triplicate Site with 32a, 32b and 32c - Annual data provided for 32c only
33a	544238	192212	44.2	33.6	30.5	24.2	25.4	24.8	20.9	21.0	26.0	31.2	32.6	29.9	-	-	-	Triplicate Site with 33a, 33b and 33c - Annual data provided for 33c only
33b	544238	192212	46.5	35.2	26.3	23.0	26.7	22.1	18.2	22.1	26.8	30.4	31.4	32.0	-	-	-	Triplicate Site with 33a, 33b and 33c - Annual data provided for 33c only
33c	544238	192212	47.0	34.4	29.6	24.7	26.0	22.7	21.0	21.3	23.8	28.4	36.1	34.7	28.7	21.8	-	Triplicate Site with 33a, 33b and 33c - Annual data provided for 33c only
34a	544268	192247	37.6	23.0	24.2	17.8	17.7	14.7	12.9		17.6	24.5	27.1		-	-	-	Triplicate Site with 34a, 34b and 34c - Annual data provided for 34c only
34b	544268	192247	36.7	20.8	24.1	16.6	18.5	15.2	14.5		18.0	24.6	26.3		-	-	-	Triplicate Site with 34a, 34b and 34c - Annual data provided for 34c only
34c	544268	192247	38.0	23.9	26.0	16.3	18.0	15.5	14.8		17.1	25.1	27.6		21.8	16.6	-	Triplicate Site with 34a, 34b and 34c - Annual data provided for 34c only
35a	544183	192231	43.9		27.8	22.8	25.4	21.5	22.8	24.3	26.0	34.6	37.1	35.5	-	-	-	Triplicate Site with 35a, 35b and 35c - Annual data provided for 35c only
35b	544183	192231	42.9		27.6	17.2	25.9	22.0	22.0	23.8	27.9	33.1	29.9	33.4	-	-	-	Triplicate Site with 35a, 35b and 35c - Annual data provided for 35c only
35c	544183	192231	43.8		26.7	22.6	28.6	22.2	22.9	23.8	27.0	32.8	32.6	36.5	28.7	21.8	-	Triplicate Site with 35a, 35b and 35c - Annual data provided for 35c only
36a	555231	202875		37.9	33.7	29.6	28.6	27.8	27.4	31.8	30.2	33.8	33.7	34.4	-	-	-	Triplicate Site with 36a, 36b and 36c - Annual data provided for 36c only
36b	555231	202875		31.9	33.6	31.9	28.9	27.2	27.5	33.5	29.4	31.5	31.2	31.6	-	-	-	Triplicate Site with 36a, 36b and 36c - Annual data provided for 36c only
36c	555231	202875		33.0	30.9	29.7	27.5	26.7	28.6	31.3	32.3	32.0	27.3	38.0	31.0	23.6	-	Triplicate Site with 36a, 36b and 36c - Annual data provided for 36c only
37a	555253	202964	40.3		27.1	24.2		23.7	23.8	23.6	25.8	26.3			-	-	-	Triplicate Site with 37a, 37b and 37c - Annual data provided for 37c only
37b	555253	202964	40.2	29.1	25.6	24.3	25.2	25.2	22.6	25.8	25.5	25.5			-	-	-	Triplicate Site with 37a, 37b and 37c - Annual data provided for 37c only

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
37c	555253	202964	41.5		23.5	26.9	24.2	19.7	25.4	25.7	21.9	21.8			26.6	20.2	-	Triplicate Site with 37a, 37b and 37c - Annual data provided for 37c only
38a	555265	203108	39.5		32.9	23.8	22.0	24.4		26.0	25.5	28.3	35.3	35.6	-	-	-	Triplicate Site with 38a, 38b and 38c - Annual data provided for 38c only
38b	555265	203108	34.6	30.7	32.5	25.7	23.4	23.0	21.8	24.6	30.3	29.6	34.4	27.0	-	-	-	Triplicate Site with 38a, 38b and 38c - Annual data provided for 38c only
38c	555265	203108	35.4		34.6	23.7	23.3	22.5	18.1	25.6	25.5	28.3	30.9	33.4	28.2	21.4	-	Triplicate Site with 38a, 38b and 38c - Annual data provided for 38c only
39a	546107	202254	34.4	29.2	33.7	26.9	26.3	30.0	25.5	31.3	28.6	34.9	36.0		-	-	-	Triplicate Site with 39a, 39b and 39c - Annual data provided for 39c only
39b	546107	202254	38.7	30.3	35.8	25.0	26.4	29.5	26.4	31.2	28.5	35.8	35.3		-	-	-	Triplicate Site with 39a, 39b and 39c - Annual data provided for 39c only
39c	546107	202254	33.3	32.4	34.3	23.0	26.6	29.7	25.9	30.4	29.3	35.7	35.0		30.8	23.4	-	Triplicate Site with 39a, 39b and 39c - Annual data provided for 39c only
40a	545991	202095		28.5	32.9	27.3		25.4	24.1	28.5	29.1	32.5	32.9		-	-	-	Triplicate Site with 40a, 40b and 40c - Annual data provided for 40c only
40b	545991	202095		26.9	33.1	27.4	25.2	26.4	24.8	29.5	28.3	32.7	29.6		-	-	-	Triplicate Site with 40a, 40b and 40c - Annual data provided for 40c only
40c	545991	202095			36.0	26.5	24.2	26.3	24.0	29.0	28.9	31.5	28.2		28.4	21.6	-	Triplicate Site with 40a, 40b and 40c - Annual data provided for 40c only
41a	546075	202253	36.4	31.4	27.6	27.8	22.0	24.1	23.6	27.0	27.9	32.1	32.1	35.3	-	-	-	Triplicate Site with 41a, 41b and 41c - Annual data provided for 41c only
41b	546075	202253	36.5	34.9	26.1	28.0	23.4	23.9	23.4	26.0	27.0	33.5	23.2	29.9	-	-	-	Triplicate Site with 41a, 41b and 41c - Annual data provided for 41c only
41c	546075	202253	44.8	30.4	25.0	28.0	23.3	24.8	25.9	24.9	27.8	32.2	24.7	33.4	28.6	21.7	-	Triplicate Site with 41a, 41b and 41c - Annual data provided for 41c only
42a	539015	205995	38.2	34.0	31.1	25.1	26.3	25.1	25.9	26.6	27.2	30.8		31.6	-	-	-	Triplicate Site with 42a, 42b and 42c - Annual data provided for 42c only
42b	539015	205995	47.1	33.8	31.9	25.4	26.4	24.7	24.9	25.4	25.6	26.8		29.9	-	-	-	Triplicate Site with 42a, 42b and 42c - Annual data provided for 42c only
42c	539015	205995	45.1	35.7	31.0	25.8	26.6	23.2	23.7	25.2	27.0	29.7		31.1	29.3	22.3	-	Triplicate Site with 42a, 42b and 42c - Annual data provided for 42c only
43a	539084	206058	33.7		28.4	24.0	23.2	23.0	22.4	22.7	25.6	26.4		29.5	-	-	-	Triplicate Site with 43a, 43b and 43c - Annual data provided for 43c only
43b	539084	206058	37.5	27.2	25.7	25.0	21.7	21.5	20.5	25.1	25.5	27.8		30.4	-	-	-	Triplicate Site with 43a, 43b and 43c - Annual data provided for 43c only

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
43c	539084	206058	39.0	25.8	32.9	22.9	22.0	21.7	19.3	23.8	23.9	30.4		32.6	26.3	20.0	-	Triplicate Site with 43a, 43b and 43c - Annual data provided for 43c only
44a	543989	196472	30.9	23.8	19.8	16.6	17.9	18.4	14.4	17.1	19.2	26.2	21.2	29.3	-	-	-	Triplicate Site with 44a, 44b and 44c - Annual data provided for 44c only
44b	543989	196472	36.4	24.9	21.3	15.8	19.0	16.7	15.6	12.6	18.8	26.4	21.4	29.1	-	-	-	Triplicate Site with 44a, 44b and 44c - Annual data provided for 44c only
44c	543989	196472	37.3	26.4	23.0	16.3	18.8	17.8	14.5	15.5	19.8	25.7	24.4	28.7	21.7	16.5	-	Triplicate Site with 44a, 44b and 44c - Annual data provided for 44c only
45a	544119	196133	38.1	26.1	26.9	22.0	18.6	17.4	17.0	19.3		24.9	26.5	30.4	-	-	-	Triplicate Site with 45a, 45b and 45c - Annual data provided for 45c only
45b	544119	196133	36.0	24.6	29.7	21.5	19.5	17.7	16.4	18.9		23.4	26.7	34.0	-	-	-	Triplicate Site with 45a, 45b and 45c - Annual data provided for 45c only
45c	544119	196133	31.9	26.6	29.9	21.0	18.9	16.9	16.8	19.5		24.6	27.0	32.3	24.3	18.4	-	Triplicate Site with 45a, 45b and 45c - Annual data provided for 45c only
46a	541301	199731	50.7	35.2	39.6	37.7	35.4	33.7	29.5		38.6	34.0	26.5		-	-	-	Triplicate Site with 46a, 46b and 46c - Annual data provided for 46c only
46b	541301	199731	43.6	36.7	41.9	32.9	33.2	31.0	31.6		38.3	34.0	19.0		-	-	-	Triplicate Site with 46a, 46b and 46c - Annual data provided for 46c only
46c	541301	199731	51.2	38.9	37.2	37.0	34.1	36.3	30.8		38.0	35.8	23.4		35.5	27.0	-	Triplicate Site with 46a, 46b and 46c - Annual data provided for 46c only
47a	542634	195492	28.3	22.4	24.4	18.2	16.5		14.8	16.7	18.3	20.4	19.2	27.6	-	-	-	Triplicate Site with 47a, 47b and 47c - Annual data provided for 47c only
47b	542634	195492	32.8	23.3	21.1	17.9	17.5		14.9	15.9	18.2	20.9	23.1	28.6	-	-	-	Triplicate Site with 47a, 47b and 47c - Annual data provided for 47c only
47c	542634	195492	33.0	22.8	24.7	19.5	16.1		15.4	16.0	18.4	21.6	21.1	24.0	21.0	16.0	-	Triplicate Site with 47a, 47b and 47c - Annual data provided for 47c only

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

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

☒ **National bias adjustment factor used.**

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

☒ **Epping Forest District Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **<u>bold and underlined</u>**.

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 Epping Forest District Council During 2022

Epping Forest District Council has not identified any new sources relating to air quality with the reporting year of 2022.

Additional Air Quality Works Undertaken by Epping Forest District Council During 2022

Heritage Railway Air Quality Monitoring Project

In October 2022 an independent consultant was commissioned to undertake a real time monitoring project at 2 receptor locations in the vicinity of the stations at either end of the Epping Ongar Railway. The railway is a private business operating a Heritage Railway providing recreational trips and experience days using diesel and steam locomotives.

The monitoring being undertaken is in respect of nitrogen dioxide, particulate matter and sulphur dioxide. Analysers have been set up in the gardens of residents who live adjacent to the railway in order to measure concentrations of pollutants that they are being exposed to. At the time of writing this report, no data has been ratified. A separate report will be produced once the project has been completed.

QA/QC of Diffusion Tube Monitoring

The supplier used for diffusion tubes was SOCOTEC and the method of preparation was 50% TEA in acetone.

SOCOTEC participates in the AIR NO2PT laboratory performance scheme. Rounds AIR PT AR049 and AIR PT AR050 relate to January / February 2022 and May / June 2022 respectively. SOCOTEC prescribes 2 sets of tests (2 x 4 test samples on each round). The

results for these rounds were good, with 100% performance recorded. No results have been published for subsequent dates.

Epping Forest District Council undertook its monitoring programme in adherence with the 2022 Diffusion tube monitoring calendar.

Precision and Accuracy of Diffusion Tube Data

The monthly diffusion tube results have been checked for precision and accuracy using the tool provided by Defra for this purpose. This is in line with Chapter 7 of Technical Guidance LAQM.TG22, NOX and NO2 Monitoring, NO2 by diffusion tubes. Where the tool identifies that the results are poor, data has been removed from the Annual NO_2 2022 Diffusion Tube Results (ug/m3) in Table B.1.

The precision and accuracy calculations for each site are provided on the following pages:

Tube ID 1 105 Hainault Road, Chigwell (junction with Fencepiece Road)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	47	44.4		45.7	1.84	4.02	16.52	Good
2	01/02/2022	03/03/2022	39.1	38.1	36.4	37.9	1.37	3.60	3.39	Good
3	03/03/2022	01/04/2022	32.8	35.1	38.5	35.5	2.87	8.09	7.12	Good
4	01/04/2022	04/05/2022	28.6	29.2	27.5	28.4	0.86	3.03	2.14	Good
5	04/05/2022	10/06/2022	26.5	28.9	28.1	27.8	1.22	4.39	3.04	Good
6	10/06/2022	04/07/2022	26.7	28.4	2.9	19.3	14.26	73.74	35.42	Poor Precision
7	04/07/2022	01/08/2022	26.7	26.5	27.9	27.0	0.76	2.80	1.88	Good
8	01/08/2022	30/08/2022	30.9	30.6	30.2	30.6	0.35	1.15	0.87	Good
9	30/08/2022	26/09/2022	34	34.1	34	34.0	0.06	0.17	0.14	Good
10	26/09/2022	04/11/2022	36.2	35.7	33.9	35.3	1.21	3.43	3.01	Good
11	04/11/2022	28/11/2022	36.2	10.9	8.2	18.4	15.45	83.79	38.37	Poor Precision
12	28/11/2022	04/01/2023	32.6	38.3	23.5	31.5	7.46	23.72	18.54	Poor Precision
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	105 Hainault Road, Chigwell

Jaume Targa, for AEA
Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 34   µgm^{-3}
 Average Precision (CV):   3
 Adjusted Tube average: µgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 31   µgm^{-3}
 Average Precision (CV):   18
 Adjusted Tube average: µgm^{-3}

Tube ID 2 15 High Street, Epping

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
						Diffusion Tubes Measurements				Data Quality Check
1	05/01/2022	01/02/2022	33.8	33.6	34.8	34.1	0.64	1.89	1.60	Good
2	01/02/2022	03/03/2022	25.6	27.7	28.4	27.2	1.46	5.35	3.62	Good
3	03/03/2022	01/04/2022	19.3	29.8	22.9	24.0	5.34	22.23	13.25	Poor Precision
4	01/04/2022	04/05/2022	16.3	19.2	19.6	18.4	1.80	9.81	4.47	Good
5	04/05/2022	10/06/2022	18.9	19.5	19.2	19.2	0.30	1.56	0.75	Good
6	10/06/2022	04/07/2022	20	19.3	17	18.8	1.57	8.36	3.90	Good
7	04/07/2022	01/08/2022	16.7	16.2	12.4	15.1	2.35	15.57	5.84	Good
8	01/08/2022	30/08/2022	19.5	17.8	18.5	18.6	0.85	4.59	2.12	Good
9	30/08/2022	26/09/2022	18.6	21.3	19.7	19.9	1.36	6.83	3.37	Good
10	26/09/2022	04/11/2022								
11	04/11/2022	28/11/2022	25.1	11.3	30.8	22.4	10.03	44.76	24.91	Poor Precision
12	28/11/2022	04/01/2023	25.8	29.4	29.3	28.2	2.05	7.28	5.09	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	15 High Street Epping

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
   Tube Precision:
   Bias factor A:
   Bias B:
Information about tubes to be adjusted
   Diffusion Tube average: 22 μgm^{-3}
   Average Precision (CV):   7
   Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
   Tube Precision:
   Bias factor A:
   Bias B:
Information about tubes to be adjusted
   Diffusion Tube average: 22 μgm^{-3}
   Average Precision (CV):   12
   Adjusted Tube average: μgm^{-3}

Tube ID 3 Bell Vue, High Road, Bell Common, Epping

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
						Diffusion Tubes Measurements				**Data Quality Check**
1	05/01/2022	01/02/2022	56.2	62.4	63.1	60.6	3.80	6.27	9.43	Good
2	01/02/2022	03/03/2022	59.3	57	55.9	57.4	1.73	3.02	4.31	Good
3	03/03/2022	01/04/2022	49.5	54	50.5	51.3	2.36	4.60	5.87	Good
4	01/04/2022	04/05/2022	44.3	43.5	44.6	44.1	0.57	1.29	1.41	Good
5	04/05/2022	10/06/2022	51.5	48	48.1	49.2	1.99	4.05	4.95	Good
6	10/06/2022	04/07/2022	48.4	49.1	50.8	49.4	1.23	2.50	3.07	Good
7	04/07/2022	01/08/2022	48.2	49.1	46.1	47.8	1.54	3.22	3.82	Good
8	01/08/2022	30/08/2022	45.8	46.9	43.9	45.5	1.52	3.33	3.77	Good
9	30/08/2022	26/09/2022	49.1	45.6	47.3	47.3	1.75	3.70	4.35	Good
10	26/09/2022	04/11/2022	53.1	53.1	52.4	52.9	0.40	0.76	1.00	Good
11	04/11/2022	28/11/2022	40.8	48	56.5	48.4	7.86	16.23	19.52	Good
12	28/11/2022	04/01/2023	46.9	50.4	40.9	46.1	4.80	10.43	11.94	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Bell Vue, Epping**

Version 04 - February 2011

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%	Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 50 μgm^{-3}	**Diffusion Tube average:** 50 μgm^{-3}
Average Precision (CV): 5	**Average Precision (CV):** 5
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average:** μgm^{-3}

Tube ID 4 254 High Street, Epping (Ladbrokes)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	29	34.7	32.9	32.2	2.91	9.05	7.24	Good
2	01/02/2022	03/03/2022		32.4						
3	03/03/2022	01/04/2022	25.9	24.6	22.5	24.3	1.72	7.05	4.26	Good
4	01/04/2022	04/05/2022	20		20.7	20.4	0.49	2.43	4.45	Good
5	04/05/2022	10/06/2022		22.1	23.1	22.6	0.71	3.13	6.35	Good
6	10/06/2022	04/07/2022	25.5	24.9	25.7	25.4	0.42	1.64	1.03	Good
7	04/07/2022	01/08/2022		19.7	19.5	19.6	0.14	0.72	1.27	Good
8	01/08/2022	30/08/2022	23.3	23.1	23	23.1	0.15	0.66	0.38	Good
9	30/08/2022	26/09/2022	21.7	21.8		21.8	0.07	0.33	0.64	Good
10	26/09/2022	04/11/2022	28.7	31.9	30.2	30.3	1.60	5.29	3.98	Good
11	04/11/2022	28/11/2022	29.2	31.9	11.9	24.3	10.85	**44.60**	26.96	**Poor Precision**
12	28/11/2022	04/01/2023	34.8	34.4	32.9	34.0	1.00	2.94	2.49	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**254 High Street Epping Ladbrokes**

Version 04 - February 2011

Adjusted measurement (95% confidence level)	Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%	with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 25 μgm^{-3}	Diffusion Tube average: 25 μgm^{-3}
Average Precision (CV): 3	Average Precision (CV): 7
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 5 202 High Street, Epping (Superdrug)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean
						Diffusion Tubes Measurements			
1	05/01/2022	01/02/2022	42.3	34.2	41.4	39.3	4.44	11.30	11.03
2	01/02/2022	03/03/2022	31	31		31.0	0.00	0.00	0.00
3	03/03/2022	01/04/2022	42.8	25.5	39.1	35.8	9.11	**25.45**	22.63
4	01/04/2022	04/05/2022	27.9	28.4	30.4	28.9	1.32	4.58	3.29
5	04/05/2022	10/06/2022	27.5	25.7	25.9	26.4	0.99	3.74	2.45
6	10/06/2022	04/07/2022	32.2	33	31	32.1	1.01	3.14	2.50
7	04/07/2022	01/08/2022	27.3	26.8	27.8	27.3	0.50	1.83	1.24
8	01/08/2022	30/08/2022	33.6	33.9	32.6	33.4	0.68	2.04	1.69
9	30/08/2022	26/09/2022	30.5	33.9	31.6	32.0	1.73	5.42	4.31
10	26/09/2022	04/11/2022	33.7	33.9	34.9	34.2	0.64	1.88	1.60
11	04/11/2022	28/11/2022	13.8	7.9	27.8	16.5	10.22	**61.95**	25.39
12	28/11/2022	04/01/2023	33	37	34.6	34.9	2.01	5.77	5.00
13									

Data Quality Check

Diffusion Tubes Precision Check

Good
Good
Poor Precision
Good
Good
Good
Good
Good
Good
Good
Poor Precision
Good

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	202 High Street, Epping (Superdrug)

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
   Tube Precision:
   Bias factor A:
      Bias B:
Information about tubes to be adjusted
   Diffusion Tube average: 32 μgm^{-3}
   Average Precision (CV):   4
   Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
   Tube Precision:
   Bias factor A:
      Bias B:
Information about tubes to be adjusted
   Diffusion Tube average: 31 μgm^{-3}
   Average Precision (CV):   11
   Adjusted Tube average: μgm^{-3}

Tube ID 6 1 Canes Cottages, Hastingwood

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

				Diffusion Tubes Measurements							Data Quality Check
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean		Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	30.5	29.9	31	30.5	0.55	1.81	1.37		Good
2	01/02/2022	03/03/2022	24.9	22.8	24.4	24.0	1.10	4.56	2.73		Good
3	03/03/2022	01/04/2022	21.4	19.1	20.2	20.2	1.15	5.69	2.86		Good
4	01/04/2022	04/05/2022	18.8	17.2	19.1	18.4	1.02	5.56	2.54		Good
5	04/05/2022	10/06/2022	20.4	21.9	24.1	22.1	1.86	8.41	4.62		Good
6	10/06/2022	04/07/2022	15.9	16	16	16.0	0.06	0.36	0.14		Good
7	04/07/2022	01/08/2022	14.8	14.6	14.8	14.7	0.12	0.78	0.29		Good
8	01/08/2022	30/08/2022	16.5	17.1	17	16.9	0.32	1.91	0.80		Good
9	30/08/2022	26/09/2022	20.1	19.5	19.9	19.8	0.31	1.54	0.76		Good
10	26/09/2022	04/11/2022	21.7	20.6	21.8	21.4	0.67	3.12	1.65		Good
11	04/11/2022	28/11/2022	21.1	20.6	21.9	21.2	0.66	3.09	1.63		Good
12	28/11/2022	04/01/2023	26.1	23.1	27.7	25.6	2.34	9.11	5.80		Good
13											

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**1 Canes Cottages, Canes Lane, Hastingwood**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 21 μgm^{-3}
 Average Precision (CV):   4
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 21 μgm^{-3}
 Average Precision (CV):   4
 Adjusted Tube average: μgm^{-3}

Tube ID 7 1 Church Hill, Loughton

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	32.3	31.8		32.1	0.35	1.10	3.18	Good
2	01/02/2022	03/03/2022	23.9	25.9		24.9	1.41	5.68	12.71	Good
3	03/03/2022	01/04/2022	27.2	23.4		25.3	2.69	10.62	24.14	Good
4	01/04/2022	04/05/2022	21.3	21.9		21.6	0.42	1.96	3.81	Good
5	04/05/2022	10/06/2022	16.2	16.8		16.5	0.42	2.57	3.81	Good
6	10/06/2022	04/07/2022	<0.7	14.2						
7	04/07/2022	01/08/2022	14.9	14.3		14.6	0.42	2.91	3.81	Good
8	01/08/2022	30/08/2022	18	17.3		17.7	0.49	2.80	4.45	Good
9	30/08/2022	26/09/2022	18.7	18.9		18.8	0.14	0.75	1.27	Good
10	26/09/2022	04/11/2022	22.2	21.9		22.1	0.21	0.96	1.91	Good
11	04/11/2022	28/11/2022	24.6	22.7		23.7	1.34	5.68	12.07	Good
12	28/11/2022	04/01/2023	28.8	24.1		26.5	3.32	12.56	29.86	Good
13										

Data Quality Check — Diffusion Tubes Precision Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	**1 Church Hill, Loughton**

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%	Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 22 μgm^{-3}	Diffusion Tube average: 22 μgm^{-3}
Average Precision (CV): 4	Average Precision (CV): 4
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 8 72 Church Hill, Loughton

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	35.7	35		35.4	0.49	1.40	4.45	Good
2	01/02/2022	03/03/2022	26.1	25.8		26.0	0.21	0.82	1.91	Good
3	03/03/2022	01/04/2022	26	23.5		24.8	1.77	7.14	15.88	Good
4	01/04/2022	04/05/2022	18.4	19.6		19.0	0.85	4.47	7.62	Good
5	04/05/2022	10/06/2022	18.2	17.7		18.0	0.35	1.97	3.18	Good
6	10/06/2022	04/07/2022	15.2	16.1		15.7	0.64	4.07	5.72	Good
7	04/07/2022	01/08/2022	15.3	13.5		14.4	1.27	8.84	11.44	Good
8	01/08/2022	30/08/2022	15.9	16.6		16.3	0.49	3.05	4.45	Good
9	30/08/2022	26/09/2022	19.2	18.3		18.8	0.64	3.39	5.72	Good
10	26/09/2022	04/11/2022	21.9	22.1		22.0	0.14	0.64	1.27	Good
11	04/11/2022	28/11/2022	19.7	25.7		22.7	4.24	18.69	38.12	Good
12	28/11/2022	04/01/2023	24.5	30.9		27.7	4.53	16.34	40.66	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	72 Church Hill, Loughton

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%	Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 22 μgm^{-3}	Diffusion Tube average: 22 μgm^{-3}
Average Precision (CV): 6	Average Precision (CV): 6
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 9 249 High Road, Loughton (Timpson)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
									Data Quality Check	
1	05/01/2022	01/02/2022	37.1	33.3	31.3	33.9	2.95	8.69	7.32	Good
2	01/02/2022	03/03/2022	26.8	25.2	26.1	26.0	0.80	3.08	1.99	Good
3	03/03/2022	01/04/2022	31.3	31.9	27.5	30.2	2.39	7.89	5.93	Good
4	01/04/2022	04/05/2022	23.1	24.2	22.3	23.2	0.95	4.11	2.37	Good
5	04/05/2022	10/06/2022	21.2	19.6	21.4	20.7	0.99	4.76	2.45	Good
6	10/06/2022	04/07/2022	11.1	23.8	<0.7	17.5	8.98	**51.46**	80.68	**Poor Precision**
7	04/07/2022	01/08/2022	17.7	18.8	19.2	18.6	0.78	4.18	1.93	Good
8	01/08/2022	30/08/2022	23.6	22.3	23.5	23.1	0.72	3.13	1.80	Good
9	30/08/2022	26/09/2022	24.6	25.5	23.7	24.6	0.90	3.66	2.24	Good
10	26/09/2022	04/11/2022	25.3	25.6	25.2	25.4	0.21	0.82	0.52	Good
11	04/11/2022	28/11/2022	11.4	15.4	25.9	17.6	7.49	**42.63**	18.60	**Poor Precision**
12	28/11/2022	04/01/2023	30	25.1	24.9	26.7	2.89	10.83	7.18	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**249 High Road, Loughton**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 25 μgm^{-3}
  Average Precision (CV):   5
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 24 μgm^{-3}
  Average Precision (CV):   12
  Adjusted Tube average: μgm^{-3}

Tube ID 10 252 High Road, Loughton (Love Brownies)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

										Data Quality Check
	Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	37.3	36.6		37.0	0.49	1.34	4.45	Good
2	01/02/2022	03/03/2022	33.6	31.4		32.5	1.56	4.79	13.98	Good
3	03/03/2022	01/04/2022	22.8	26.9		24.9	2.90	11.67	26.05	Good
4	01/04/2022	04/05/2022	23.2	22.6		22.9	0.42	1.85	3.81	Good
5	04/05/2022	10/06/2022	25.2	25.2		25.2	0.00	0.00	0.00	Good
6	10/06/2022	04/07/2022	23.5	<0.7						
7	04/07/2022	01/08/2022	21.8	19.7		20.8	1.48	7.16	13.34	Good
8	01/08/2022	30/08/2022	20.7	22.3		21.5	1.13	5.26	10.16	Good
9	30/08/2022	26/09/2022	24.4	24.4		24.4	0.00	0.00	0.00	Good
10	26/09/2022	04/11/2022	28.3	27.4		27.9	0.64	2.29	5.72	Good
11	04/11/2022	28/11/2022	23.9	23.7		23.8	0.14	0.59	1.27	Good
12	28/11/2022	04/01/2023	28	29.2		28.6	0.85	2.97	7.62	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**252 High Road, Loughton**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)	**Adjusted measurement (95% confidence level)**
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	**Tube Precision:**
Bias factor A:	**Bias factor A:**
Bias B:	**Bias B:**
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 26 μgm^{-3}	**Diffusion Tube average:** 26 μgm^{-3}
Average Precision (CV): 3	**Average Precision (CV):** 3
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average:** μgm^{-3}

Tube ID 11 5 Goldings Hill, Loughton

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	45.8	44.1		45.0	1.20	2.67	10.80	Good
2	01/02/2022	03/03/2022	33.2	36		34.6	1.98	5.72	17.79	Good
3	03/03/2022	01/04/2022	45.2	41.9		43.6	2.33	5.36	20.97	Good
4	01/04/2022	04/05/2022	37.7	36.7		37.2	0.71	1.90	6.35	Good
5	04/05/2022	10/06/2022	31.8	30.2		31.0	1.13	3.65	10.16	Good
6	10/06/2022	04/07/2022	1.1	29.6		15.4	20.15	**131.29**	181.06	**Poor Precision**
7	04/07/2022	01/08/2022	29.1	30.4		29.8	0.92	3.09	8.26	Good
8	01/08/2022	30/08/2022	38.6	37.6		38.1	0.71	1.86	6.35	Good
9	30/08/2022	26/09/2022	35.7	34.8		35.3	0.64	1.81	5.72	Good
10	26/09/2022	04/11/2022	36.8	36.9		36.9	0.07	0.19	0.64	Good
11	04/11/2022	28/11/2022	33.6	19.5		26.6	9.97	**37.55**	89.58	**Poor Precision**
12	28/11/2022	04/01/2023	32.8	41.9		37.4	6.43	17.23	57.81	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**5 Goldings Hill, Loughton**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)	Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 37 μgm^{-3}	Diffusion Tube average: 34 μgm^{-3}
Average Precision (CV): 4	Average Precision (CV): 18
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 12 66 Tempest Mead, North Weald

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
						Diffusion Tubes Measurements				Data Quality Check
1	05/01/2022	01/02/2022	27.3	24.3	28.3	26.6	2.08	7.82	5.17	Good
2	01/02/2022	03/03/2022	18.1	19.2	19	18.8	0.59	3.12	1.46	Good
3	03/03/2022	01/04/2022	14.5	14.2	15.4	14.7	0.62	4.25	1.55	Good
4	01/04/2022	04/05/2022	12.5	11.6	12.1	12.1	0.45	3.74	1.12	Good
5	04/05/2022	10/06/2022	13.1	13.1	11.9	12.7	0.69	5.46	1.72	Good
6	10/06/2022	04/07/2022	11.5	<0.8	5.8	8.7	4.03	46.60	36.21	Poor Precision
7	04/07/2022	01/08/2022	10.6	10.5	10.2	10.4	0.21	2.00	0.52	Good
8	01/08/2022	30/08/2022	11.7	11.2	10.4	11.1	0.66	5.91	1.63	Good
9	30/08/2022	26/09/2022	12.7	13.1	12.8	12.9	0.21	1.62	0.52	Good
10	26/09/2022	04/11/2022	16.9	16.5	17.1	16.8	0.31	1.81	0.76	Good
11	04/11/2022	28/11/2022	18.2	12	12.8	14.3	3.37	23.53	8.38	Poor Precision
12	28/11/2022	04/01/2023	19.8	20.4	21	20.4	0.60	2.94	1.49	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	66 Tempest Mead, North Weald

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 16 μgm^{-3}
Average Precision (CV): 4
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 15 μgm^{-3}
Average Precision (CV): 9
Adjusted Tube average: μgm^{-3}

Tube ID 13 20 High Street, Roydon

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	37.2	34.7	35.4	35.8	1.29	3.61	3.20	Good
2	01/02/2022	03/03/2022	23.6	23.6	22.7	23.3	0.52	2.23	1.29	Good
3	03/03/2022	01/04/2022	25	25.2	23.9	24.7	0.70	2.83	1.74	Good
4	01/04/2022	04/05/2022	18.3	18.5	18.2	18.3	0.15	0.83	0.38	Good
5	04/05/2022	10/06/2022	16.7	17.3	16.7	16.9	0.35	2.05	0.86	Good
6	10/06/2022	04/07/2022	13.1	13.8	52.8	26.6	22.72	**85.53**	56.44	**Poor Precision**
7	04/07/2022	01/08/2022	15.2	15.5	15.3	15.3	0.15	1.00	0.38	Good
8	01/08/2022	30/08/2022	17.7	17.4	17.8	17.6	0.21	1.18	0.52	Good
9	30/08/2022	26/09/2022	17.1	19.2	18.8	18.4	1.12	6.07	2.77	Good
10	26/09/2022	04/11/2022	20.7	21.8	21.4	21.3	0.56	2.61	1.38	Good
11	04/11/2022	28/11/2022	26.1	6.2	4.1	12.1	12.14	**100.06**	30.16	**Poor Precision**
12	28/11/2022	04/01/2023	27.3	30.3	30.8	29.5	1.89	6.42	4.70	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	20 High Street, Roydon

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 22 μgm^{-3}
Average Precision (CV): 3
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 22 μgm^{-3}
Average Precision (CV): 18
Adjusted Tube average: μgm^{-3}

Tube ID 14 Burles Farm, Netherhall Road, Roydon

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

			Diffusion Tubes Measurements							Data Quality Check
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	23.4	25.1	25.2	24.6	1.01	4.12	2.51	Good
2	01/02/2022	03/03/2022	19	20.8	21.1	20.3	1.14	5.59	2.82	Good
3	03/03/2022	01/04/2022	17.6	18.9	12.9	16.5	3.16	19.17	7.84	Good
4	01/04/2022	04/05/2022	11.5	11.4	12.4	11.8	0.55	4.68	1.37	Good
5	04/05/2022	10/06/2022	14.1	15.2	14.5	14.6	0.56	3.81	1.38	Good
6	10/06/2022	04/07/2022	<0.7	4	11.6	7.8	5.37	68.90	48.28	Poor Precision
7	04/07/2022	01/08/2022	13.3	12.3	11.7	12.4	0.81	6.50	2.01	Good
8	01/08/2022	30/08/2022	13.8	13.7	13.4	13.6	0.21	1.53	0.52	Good
9	30/08/2022	26/09/2022	14.3	13.8	13.3	13.8	0.50	3.62	1.24	Good
10	26/09/2022	04/11/2022	18.5	18.7	20.1	19.1	0.87	4.56	2.17	Good
11	04/11/2022	28/11/2022	7.9	20.8	17.3	15.3	6.67	43.51	16.57	Poor Precision
12	28/11/2022	04/01/2023	15.4	23	22.3	20.2	4.20	20.76	10.43	Poor Precision
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Burles Farm, Netherhall Road, Roydon**

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 16 μgm^{-3}
Average Precision (CV): 6
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 16 μgm^{-3}
Average Precision (CV): 16
Adjusted Tube average: μgm^{-3}

Tube ID 15 Albion Terrace, Sewardstone Road, Sewardstone

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	45.6	40.6		43.1	3.54	8.20	31.77	Good
2	01/02/2022	03/03/2022	28	29.3		28.7	0.92	3.21	8.26	Good
3	03/03/2022	01/04/2022	35.3	33		34.2	1.63	4.76	14.61	Good
4	01/04/2022	04/05/2022								
5	04/05/2022	10/06/2022	23.8	26.5		25.2	1.91	7.59	17.15	Good
6	10/06/2022	04/07/2022	22.5	6		14.3	11.67	81.88	104.83	Poor Precision
7	04/07/2022	01/08/2022	21.6	9.2		15.4	8.77	56.94	78.78	Poor Precision
8	01/08/2022	30/08/2022	27.2	25.1		26.2	1.48	5.68	13.34	Good
9	30/08/2022	26/09/2022	31	33.5		32.3	1.77	5.48	15.88	Good
10	26/09/2022	04/11/2022	36.1	33.9		35.0	1.56	4.44	13.98	Good
11	04/11/2022	28/11/2022	35.8	29.2		32.5	4.67	14.36	41.93	Good
12	28/11/2022	04/01/2023	37.4	25.4		31.4	8.49	27.02	76.24	Poor Precision
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Albion Terrace, Sewardstone**

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 32 μgm^{-3}
  Average Precision (CV):   7
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 29 μgm^{-3}
  Average Precision (CV):   20
  Adjusted Tube average: μgm^{-3}

Tube ID 17 14 The Elms, Waltham Abbey

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	36.4	31.7	39.9	36.0	4.11	11.43	10.22	Good
2	01/02/2022	03/03/2022	27.3	27.5	31.1	28.6	2.14	7.47	5.31	Good
3	03/03/2022	01/04/2022	24.1	23.1	26.3	24.5	1.64	6.68	4.07	Good
4	01/04/2022	04/05/2022	25.2	24.4	24.1	24.6	0.57	2.31	1.41	Good
5	04/05/2022	10/06/2022	23.6	24.3	25.9	24.6	1.18	4.79	2.93	Good
6	10/06/2022	04/07/2022	18.6	19.2	18	18.6	0.60	3.23	1.49	Good
7	04/07/2022	01/08/2022	19.7	19.4	20.6	19.9	0.62	3.14	1.55	Good
8	01/08/2022	30/08/2022	21	22.5	20.3	21.3	1.12	5.29	2.79	Good
9	30/08/2022	26/09/2022	26	25.2	24.5	25.2	0.75	2.97	1.86	Good
10	26/09/2022	04/11/2022	25	23.4	23.1	23.8	1.02	4.29	2.54	Good
11	04/11/2022	28/11/2022	14.1	23.9	23	20.3	5.42	**26.64**	13.46	**Poor Precision**
12	28/11/2022	04/01/2023	16.8	20.9	17.8	18.5	2.14	11.59	5.32	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA
Version 04 - February 2011

Site Name/ ID:	**14 The Elms, Waltham Abbey**

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 24 μgm^{-3}
  Average Precision (CV):   6
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 24 μgm^{-3}
  Average Precision (CV):   7
  Adjusted Tube average: μgm^{-3}

Tube ID 18 4 Leaview, Waltham Abbey (Abbeyview)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	28.9	38.2		33.6	6.58	19.60	59.08	Good
2	01/02/2022	03/03/2022	30	28.5		29.3	1.06	3.63	9.53	Good
3	03/03/2022	01/04/2022	28.2	25.2		26.7	2.12	7.95	19.06	Good
4	01/04/2022	04/05/2022	18.5	19.9		19.2	0.99	5.16	8.89	Good
5	04/05/2022	10/06/2022	20.1	19.9		20.0	0.14	0.71	1.27	Good
6	10/06/2022	04/07/2022	17.4	<0.7						
7	04/07/2022	01/08/2022	15.6	15.6		15.6	0.00	0.00	0.00	Good
8	01/08/2022	30/08/2022	18.7	17.7		18.2	0.71	3.89	6.35	Good
9	30/08/2022	26/09/2022	17.8	18.7		18.3	0.64	3.49	5.72	Good
10	26/09/2022	04/11/2022	27.8	27.7		27.8	0.07	0.25	0.64	Good
11	04/11/2022	28/11/2022	12.4	32.4		22.4	14.14	63.13	127.06	Poor Precision
12	28/11/2022	04/01/2023	22.7	31.9		27.3	6.51	23.83	58.45	Poor Precision
13										

Data Quality Check — Diffusion Tubes Precision Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	4 Leaview, Waltham Abbey

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 23 μgm^{-3}
 Average Precision (CV):   5
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 23 μgm^{-3}
 Average Precision (CV):   12
 Adjusted Tube average: μgm^{-3}

Tube ID 19 34 Hayden Road, Waltham Abbey

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	42	34.1		38.1	5.59	14.68	50.19	Good
2	01/02/2022	03/03/2022	25.7	26.4		26.1	0.49	1.90	4.45	Good
3	03/03/2022	01/04/2022	33.2	34.1		33.7	0.64	1.89	5.72	Good
4	01/04/2022	04/05/2022	29.8	28.1		29.0	1.20	4.15	10.80	Good
5	04/05/2022	10/06/2022	21.1	22		21.6	0.64	2.95	5.72	Good
6	10/06/2022	04/07/2022	<0.7	5.4						
7	04/07/2022	01/08/2022	25.2	23.5		24.4	1.20	4.94	10.80	Good
8	01/08/2022	30/08/2022	29	26.4		27.7	1.84	6.64	16.52	Good
9	30/08/2022	26/09/2022	30.1	29		29.6	0.78	2.63	6.99	Good
10	26/09/2022	04/11/2022	25.9	23.3		24.6	1.84	7.47	16.52	Good
11	04/11/2022	28/11/2022	24.5	22.6		23.6	1.34	5.70	12.07	Good
12	28/11/2022	04/01/2023	33	33.2		33.1	0.14	0.43	1.27	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	34 Hayden Road, Waltham Abbey

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 28 μgm^{-3}
Average Precision (CV):   5
Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 28 μgm^{-3}
Average Precision (CV):   5
Adjusted Tube average: μgm^{-3}

Tube ID 20 2 Lodge Lane, Waltham Abbey

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environmen
From the AEA group

Period	Diffusion Tubes Measurements									Data Quality Check
	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	44.2	43.9	39.1	42.4	2.86	6.75	7.11	Good
2	01/02/2022	03/03/2022	30.7	37.5	38.2	35.5	4.14	11.68	10.29	Good
3	03/03/2022	01/04/2022	30.8	30.3	28.9	30.0	0.98	3.28	2.45	Good
4	01/04/2022	04/05/2022	30.8	27.8	28.3	29.0	1.61	5.55	3.99	Good
5	04/05/2022	10/06/2022	24.9	28	26.3	26.4	1.55	5.88	3.86	Good
6	10/06/2022	04/07/2022	20.9	23.6	15.2	19.9	4.29	21.55	10.65	Poor Precision
7	04/07/2022	01/08/2022	22.5	24.4	22.8	23.2	1.02	4.40	2.54	Good
8	01/08/2022	30/08/2022								
9	30/08/2022	26/09/2022	29.7	29.5	29.4	29.5	0.15	0.52	0.38	Good
10	26/09/2022	04/11/2022	28.6	29.1	27.5	28.4	0.82	2.88	2.03	Good
11	04/11/2022	28/11/2022	20.8	18.7	24.9	21.5	3.15	14.69	7.83	Good
12	28/11/2022	04/01/2023	34.3	35.1	35.6	35.0	0.66	1.87	1.63	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	2 Lodge Lane, Waltham Abbey

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 30 μgm^{-3}
 Average Precision (CV): 6
 Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 29 μgm^{-3}
 Average Precision (CV): 7
 Adjusted Tube average: μgm^{-3}

Tube ID 21 110 Roundhills, Waltham Abbey

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	32.8	46.5		39.7	9.69	24.43	87.04	**Poor Precision**
2	01/02/2022	03/03/2022	31.6	34.1		32.9	1.77	5.38	15.88	Good
3	03/03/2022	01/04/2022	30.2	32.1		31.2	1.34	4.31	12.07	Good
4	01/04/2022	04/05/2022	18.8	20.6		19.7	1.27	6.46	11.44	Good
5	04/05/2022	10/06/2022	21.9	21.4		21.7	0.35	1.63	3.18	Good
6	10/06/2022	04/07/2022	20.3	20		20.2	0.21	1.05	1.91	Good
7	04/07/2022	01/08/2022	18	18.6		18.3	0.42	2.32	3.81	Good
8	01/08/2022	30/08/2022	20.5	21.9		21.2	0.99	4.67	8.89	Good
9	30/08/2022	26/09/2022	23.3	25.1		24.2	1.27	5.26	11.44	Good
10	26/09/2022	04/11/2022	73.5	32		52.8	29.34	55.63	263.65	**Poor Precision**
11	04/11/2022	28/11/2022	10.2	12.6		11.4	1.70	14.89	15.25	Good
12	28/11/2022	04/01/2023	33.6	34.1		33.9	0.35	1.04	3.18	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**110 Roundhills, Waltham Abbey**

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 23 μgm^{-3}
  Average Precision (CV):   5
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 27 μgm^{-3}
  Average Precision (CV):   11
  Adjusted Tube average: μgm^{-3}

Tube ID 22 26 Victoria Road, Buckhurst Hill (opposite Underground Station)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	36.6	36.4		36.5	0.14	0.39	1.27	Good
2	01/02/2022	03/03/2022	28.3	25.9		27.1	1.70	6.26	15.25	Good
3	03/03/2022	01/04/2022	32.1	30.2		31.2	1.34	4.31	12.07	Good
4	01/04/2022	04/05/2022	24.1	23.5		23.8	0.42	1.78	3.81	Good
5	04/05/2022	10/06/2022	19.2	19.1		19.2	0.07	0.37	0.64	Good
6	10/06/2022	04/07/2022	18.3	15.6		17.0	1.91	11.26	17.15	Good
7	04/07/2022	01/08/2022	16.6	17.3		17.0	0.49	2.92	4.45	Good
8	01/08/2022	30/08/2022	17	17.5		17.3	0.35	2.05	3.18	Good
9	30/08/2022	26/09/2022	21	21.1		21.1	0.07	0.34	0.64	Good
10	26/09/2022	04/11/2022	25.1	21.8		23.5	2.33	9.95	20.97	Good
11	04/11/2022	28/11/2022	26	29		27.5	2.12	7.71	19.06	Good
12	28/11/2022	04/01/2023	28	27.1		27.6	0.64	2.31	5.72	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA
Version 04 - February 2011

Site Name/ ID: 26 Victoria Road, Buckhurst Hill

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 24 μgm^{-3}
Average Precision (CV): 4
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 24 μgm^{-3}
Average Precision (CV): 4
Adjusted Tube average: μgm^{-3}

Tube ID 23 St Johns School, High Road, Buckhurst Hill

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	39.2	42.8	38.6	40.2	2.27	5.65	5.64	Good
2	01/02/2022	03/03/2022	26.3	27.3	27.8	27.1	0.76	2.81	1.90	Good
3	03/03/2022	01/04/2022	27.4	27.1	26.4	27.0	0.51	1.90	1.27	Good
4	01/04/2022	04/05/2022	21.2	17.6	18.7	19.2	1.84	9.63	4.58	Good
5	04/05/2022	10/06/2022	20.4	21.9	24.1	22.1	1.86	8.41	4.62	Good
6	10/06/2022	04/07/2022	<0.7	18.9	18.8	18.9	0.07	0.38	0.64	Good
7	04/07/2022	01/08/2022	17.8	17.7	17.3	17.6	0.26	1.50	0.66	Good
8	01/08/2022	30/08/2022	19.5	17.2	17.9	18.2	1.18	6.48	2.93	Good
9	30/08/2022	26/09/2022	20.9	19.3	18.6	19.6	1.18	6.02	2.93	Good
10	26/09/2022	04/11/2022	24.4	27.4	26.9	26.2	1.61	6.13	3.99	Good
11	04/11/2022	28/11/2022	29.5	18.1	10.4	19.3	9.61	**49.70**	23.87	**Poor Precision**
12	28/11/2022	04/01/2023	25.5	18.7	30.7	25.0	6.02	**24.10**	14.95	**Poor Precision**
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**St Johns School, High Road, Buckhurst Hill**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level) **Without periods with CV larger than 20%**
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 24 μgm^{-3}
Average Precision (CV): 5
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level) **with all data**
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 23 μgm^{-3}
Average Precision (CV): 10
Adjusted Tube average: μgm^{-3}

Tube ID 25 Regency Lodge, Roding Lane, Buckhurst Hill

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

						Diffusion Tubes Measurements				Data Quality Check

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	60.5	49.9	43.4	51.3	8.63	16.84	21.44	Good
2	01/02/2022	03/03/2022	39.4		39.4	39.4	0.00	0.00	0.00	Good
3	03/03/2022	01/04/2022	34.9	31.2	31.5	32.5	2.06	6.32	5.11	Good
4	01/04/2022	04/05/2022	25.8	25.8	23.5	25.0	1.33	5.30	3.30	Good
5	04/05/2022	10/06/2022	25.8	26.8	27.7	26.8	0.95	3.55	2.36	Good
6	10/06/2022	04/07/2022	27.3	26.5	25.7	26.5	0.80	3.02	1.99	Good
7	04/07/2022	01/08/2022	25.3							
8	01/08/2022	30/08/2022	23.5	24.3	22.6	23.5	0.85	3.62	2.11	Good
9	30/08/2022	26/09/2022	23.9	25.9	26.6	25.5	1.40	5.50	3.48	Good
10	26/09/2022	04/11/2022	32.3	33.2	31.6	32.4	0.80	2.48	1.99	Good
11	04/11/2022	28/11/2022	27.1	30.5	34.3	30.6	3.60	11.76	8.95	Good
12	28/11/2022	04/01/2023	37.9	29.3	29.7	32.3	4.85	15.03	12.06	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Regency Lodge, Roding Lane, Buckhurst Hill**

Version 04 - February 2011

Adjusted measurement (95% confidence level)	Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%	with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 31 μgm^{-3}	Diffusion Tube average: 31 μgm^{-3}
Average Precision (CV): 7	Average Precision (CV): 7
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 26 131 High Street, Ongar (at bottleneck)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	48.7	48.7	47.6	48.3	0.64	1.31	1.58	Good
2	01/02/2022	03/03/2022	37.8		38.3	38.1	0.35	0.93	3.18	Good
3	03/03/2022	01/04/2022	37	36.2	37.6	36.9	0.70	1.90	1.74	Good
4	01/04/2022	04/05/2022	35	27.5	35.8	32.8	4.58	13.97	11.37	Good
5	04/05/2022	10/06/2022	16.5	17.5	16.1	16.7	0.72	4.32	1.79	Good
6	10/06/2022	04/07/2022	33.5	33.6	33.8	33.6	0.15	0.45	0.38	Good
7	04/07/2022	01/08/2022		33.1						
8	01/08/2022	30/08/2022								
9	30/08/2022	26/09/2022	34.5		34.5	34.5	0.00	0.00	0.00	Good
10	26/09/2022	04/11/2022		36	36.4	36.2	0.28	0.78	2.54	Good
11	04/11/2022	28/11/2022	21.6	34.2	32.3	29.4	6.79	**23.13**	16.87	**Poor Precision**
12	28/11/2022	04/01/2023	40.5	36.9	40.6	39.3	2.11	5.36	5.24	Good
13										

Data Quality Check

Diffusion Tubes Precision Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	131 High Street Ongar

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 35 μgm^{-3}
 Average Precision (CV):   3
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 35 μgm^{-3}
 Average Precision (CV):   5
 Adjusted Tube average: μgm^{-3}

Tube ID 27 3 Queens Terrace, A414, Ongar

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	32.4	36.2	37.7	35.4	2.73	7.71	6.79	Good
2	01/02/2022	03/03/2022	24.6		2.6	13.6	15.56	114.38	139.77	Poor Precision
3	03/03/2022	01/04/2022	32.3	32.4	30.2	31.6	1.24	3.93	3.09	Good
4	01/04/2022	04/05/2022	21.9	23.5	23.4	22.9	0.90	3.91	2.23	Good
5	04/05/2022	10/06/2022	25.8	26.8	27.7	26.8	0.95	3.55	2.36	Good
6	10/06/2022	04/07/2022	20.2	21.7	21.1	21.0	0.75	3.60	1.88	Good
7	04/07/2022	01/08/2022	19.9	19.8	19.9	19.9	0.06	0.29	0.14	Good
8	01/08/2022	30/08/2022	20.4	22.7	19.8	21.0	1.53	7.30	3.80	Good
9	30/08/2022	26/09/2022	22.2	23.6	24.5	23.4	1.16	4.95	2.88	Good
10	26/09/2022	04/11/2022	31.2	26.7	26.8	28.2	2.57	9.10	6.38	Good
11	04/11/2022	28/11/2022	28.3	30.9	28.6	29.3	1.42	4.86	3.53	Good
12	28/11/2022	04/01/2023	25.7	29.7	29	28.1	2.14	7.59	5.31	Good
13										

Diffusion Tubes Measurements

Data Quality Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**3 Queens Terrace, Epping Road, Ongar**

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 26 μgm^{-3}
  Average Precision (CV): 5
  Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
  Bias factor A:
   Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 25 μgm^{-3}
  Average Precision (CV): 14
  Adjusted Tube average: μgm^{-3}

Tube ID 31 Station House, Station Approach, Epping (Epping Underground Station)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	41.4	37.8	39.7	39.6	1.80	4.54	4.47	Good
2	01/02/2022	03/03/2022	33.6	32.2	26.6	30.8	3.70	12.03	9.20	Good
3	03/03/2022	01/04/2022	38.8	37.9	39.9	38.9	1.00	2.58	2.49	Good
4	01/04/2022	04/05/2022	34.8	33.9	31.5	33.4	1.71	5.11	4.24	Good
5	04/05/2022	10/06/2022	28.6	30.6	30.6	29.9	1.15	3.86	2.87	Good
6	10/06/2022	04/07/2022	32.1	32	33	32.4	0.55	1.70	1.37	Good
7	04/07/2022	01/08/2022	30	29.2	30.4	29.9	0.61	2.05	1.52	Good
8	01/08/2022	30/08/2022	30.7	28.8	32	30.5	1.61	5.28	4.00	Good
9	30/08/2022	26/09/2022	32.9	28.8	32	31.2	2.15	6.90	5.35	Good
10	26/09/2022	04/11/2022	34.8	39	37.1	37.0	2.10	5.69	5.22	Good
11	04/11/2022	28/11/2022		41.8	39	40.4	1.98	4.90	17.79	Good
12	28/11/2022	04/01/2023	37.5							
13										

Data Quality Check

Diffusion Tubes Precision Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**Station House, Station Approach, Epping**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)	**Adjusted measurement (95% confidence level)**
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 34 μgm^{-3}	Diffusion Tube average: 34 μgm^{-3}
Average Precision (CV): 5	Average Precision (CV): 5
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 32 Copped Hall, High Road, Bell Common, Epping

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	38.2	40.9	36.9	38.7	2.04	5.28	5.07	Good
2	01/02/2022	03/03/2022	33.3	36.4	33.3	34.3	1.79	5.21	4.45	Good
3	03/03/2022	01/04/2022	30	32.9	25.9	29.6	3.52	11.88	8.74	Good
4	01/04/2022	04/05/2022	24.5	20.8	24.8	23.4	2.23	9.53	5.53	Good
5	04/05/2022	10/06/2022	25	23.1	19.9	22.7	2.58	11.37	6.40	Good
6	10/06/2022	04/07/2022	23.3	23.4	21.8	22.8	0.90	3.93	2.23	Good
7	04/07/2022	01/08/2022	20.8	19.5	21.4	20.6	0.97	4.72	2.41	Good
8	01/08/2022	30/08/2022	24.3	22.3	24	23.5	1.08	4.58	2.68	Good
9	30/08/2022	26/09/2022	22	19.6	21.4	21.0	1.25	5.95	3.10	Good
10	26/09/2022	04/11/2022	29.7	31.9	27.5	29.7	2.20	7.41	5.47	Good
11	04/11/2022	28/11/2022	33.2	32.9	24.9	30.3	4.71	15.52	11.69	Good
12	28/11/2022	04/01/2023	26.3	23.8	30.9	27.0	3.60	13.34	8.95	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Copped Hall Belll Common, Epping**

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 27 μgm^{-3}
  Average Precision (CV):   8
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 27 μgm^{-3}
  Average Precision (CV):   8
  Adjusted Tube average: μgm^{-3}

Tube ID 33 281 Fencepiece Road, Chigwell

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Data Quality Check — Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	44.2	46.5	47	45.9	1.49	3.25	3.71	Good
2	01/02/2022	03/03/2022	33.6	35.2	34.4	34.4	0.80	2.33	1.99	Good
3	03/03/2022	01/04/2022	30.5	26.3	29.6	28.8	2.21	7.68	5.49	Good
4	01/04/2022	04/05/2022	24.2	23	24.7	24.0	0.87	3.65	2.17	Good
5	04/05/2022	10/06/2022	25.4	26.7	26	26.0	0.65	2.50	1.62	Good
6	10/06/2022	04/07/2022	24.8	22.1	22.7	23.2	1.42	6.11	3.52	Good
7	04/07/2022	01/08/2022	20.9	18.2	21	20.0	1.59	7.93	3.95	Good
8	01/08/2022	30/08/2022	21	22.1	21.3	21.5	0.57	2.65	1.41	Good
9	30/08/2022	26/09/2022	26	26.8	23.8	25.5	1.55	6.08	3.86	Good
10	26/09/2022	04/11/2022	31.2	30.4	28.4	30.0	1.44	4.81	3.58	Good
11	04/11/2022	28/11/2022	32.6	31.4	36.1	33.4	2.44	7.32	6.07	Good
12	28/11/2022	04/01/2023	29.9	32	34.7	32.2	2.41	7.47	5.98	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	281 Fencepiece Road, Chigwell

Version 04 - February 2011

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%	Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 29 μgm^{-3}	Diffusion Tube average: 29 μgm^{-3}
Average Precision (CV): 5	Average Precision (CV): 5
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 34 414 Fencepiece Road, Chigwell (Sherrell House)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
						Diffusion Tubes Measurements				**Data Quality Check**
1	05/01/2022	01/02/2022	37.6	36.7	38	37.4	0.67	1.78	1.65	Good
2	01/02/2022	03/03/2022	23	20.8	23.9	22.6	1.59	7.07	3.96	Good
3	03/03/2022	01/04/2022	24.2	24.1	26	24.8	1.07	4.32	2.66	Good
4	01/04/2022	04/05/2022	17.8	16.6	16.3	16.9	0.79	4.70	1.97	Good
5	04/05/2022	10/06/2022	17.7	18.5	18	18.1	0.40	2.24	1.00	Good
6	10/06/2022	04/07/2022	14.7	15.2	15.5	15.1	0.40	2.67	1.00	Good
7	04/07/2022	01/08/2022	12.9	14.5	14.8	14.1	1.02	7.26	2.54	Good
8	01/08/2022	30/08/2022	15.2	16.4	9.1	13.6	3.91	**28.85**	9.72	**Poor Precision**
9	30/08/2022	26/09/2022	17.6	18	17.1	17.6	0.45	2.57	1.12	Good
10	26/09/2022	04/11/2022	24.5	24.6	25.1	24.7	0.32	1.30	0.80	Good
11	04/11/2022	28/11/2022	27.1	26.3	27.6	27.0	0.66	2.43	1.63	Good
12	28/11/2022	04/01/2023	27.7	24.3	15	22.3	6.57	**29.44**	16.33	**Poor Precision**
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	**414 Fencepiece Road, Chigwell**

Adjusted measurement (95% confidence level)	**Adjusted measurement** (95% confidence level)
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 22 μgm^{-3}	Diffusion Tube average: 21 μgm^{-3}
Average Precision (CV): 4	Average Precision (CV): 8
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 35 120 Manor Road, Chigwell

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	43.9	42.9	43.8	43.5	0.55	1.27	1.37	Good
2	01/02/2022	03/03/2022								
3	03/03/2022	01/04/2022	27.8	27.6	26.7	27.4	0.59	2.14	1.46	Good
4	01/04/2022	04/05/2022	22.8	17.2	22.6	20.9	3.18	15.23	7.89	Good
5	04/05/2022	10/06/2022	25.4	25.9	28.6	26.6	1.72	6.46	4.28	Good
6	10/06/2022	04/07/2022	21.5	22	22.2	21.9	0.36	1.65	0.90	Good
7	04/07/2022	01/08/2022	22.8	22	22.9	22.6	0.49	2.19	1.23	Good
8	01/08/2022	30/08/2022	24.3	23.8	23.8	24.0	0.29	1.20	0.72	Good
9	30/08/2022	26/09/2022	26	27.9	27	27.0	0.95	3.52	2.36	Good
10	26/09/2022	04/11/2022	34.6	33.1	32.8	33.5	0.96	2.88	2.40	Good
11	04/11/2022	28/11/2022	37.1	29.9	32.6	33.2	3.64	10.96	9.04	Good
12	28/11/2022	04/01/2023	35.5	33.4	36.5	35.1	1.58	4.50	3.93	Good
13										

Diffusion Tubes Measurements

Data Quality Check

Diffusion Tubes Precision Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	**120 Manor Road, Chigwell**

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 29 μgm^{-3}
 Average Precision (CV):   5
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 29 μgm^{-3}
 Average Precision (CV):   5
 Adjusted Tube average: μgm^{-3}

Tube ID 36 107 High Street, Ongar (Anchor)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	35.6	19.3	42.5	32.5	11.91	36.69	29.59	Poor Precision
2	01/02/2022	03/03/2022	37.9	31.9	33	34.3	3.19	9.32	7.93	Good
3	03/03/2022	01/04/2022	33.7	33.6	30.9	32.7	1.59	4.85	3.95	Good
4	01/04/2022	04/05/2022	29.6	31.9	29.7	30.4	1.30	4.28	3.23	Good
5	04/05/2022	10/06/2022	28.6	28.9	27.5	28.3	0.74	2.60	1.83	Good
6	10/06/2022	04/07/2022	27.8	27.2	26.7	27.2	0.55	2.02	1.37	Good
7	04/07/2022	01/08/2022	27.4	27.5	28.6	27.8	0.67	2.39	1.65	Good
8	01/08/2022	30/08/2022	31.8	33.5	31.3	32.2	1.15	3.58	2.86	Good
9	30/08/2022	26/09/2022	30.2	29.4	32.3	30.6	1.50	4.89	3.72	Good
10	26/09/2022	04/11/2022	33.8	31.5	32	32.4	1.21	3.73	3.01	Good
11	04/11/2022	28/11/2022	33.7	31.2	27.3	30.7	3.23	10.49	8.01	Good
12	28/11/2022	04/01/2023	34.4	31.6	38	34.7	3.21	9.25	7.97	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	107 High Street, Ongar (Anchor)

Version 04 - February 2011

Adjusted measurement (95% confidence level) Without periods with CV larger than 20%	Adjusted measurement (95% confidence level) with all data
Bias calculated using 0 periods of data	Bias calculated using 0 periods of data
Tube Precision:	Tube Precision:
Bias factor A:	Bias factor A:
Bias B:	Bias B:
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 31 μgm^{-3}	Diffusion Tube average: 31 μgm^{-3}
Average Precision (CV): 5	Average Precision (CV): 8
Adjusted Tube average: μgm^{-3}	Adjusted Tube average: μgm^{-3}

Tube ID 37 149 High Street, Ongar (Queen Bee)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	40.3	40.2	41.5	40.7	0.72	1.78	1.80	Good
2	01/02/2022	03/03/2022		29.1						
3	03/03/2022	01/04/2022	27.1	25.6	23.5	25.4	1.81	7.12	4.49	Good
4	01/04/2022	04/05/2022	24.2	24.3	26.9	25.1	1.53	6.09	3.80	Good
5	04/05/2022	10/06/2022		25.2	24.2	24.7	0.71	2.86	6.35	Good
6	10/06/2022	04/07/2022	23.7	25.2	19.7	22.9	2.84	12.43	7.06	Good
7	04/07/2022	01/08/2022	23.8	22.6	25.4	23.9	1.40	5.87	3.49	Good
8	01/08/2022	30/08/2022	23.6	25.8	25.7	25.0	1.24	4.96	3.09	Good
9	30/08/2022	26/09/2022	25.8	25.5	21.9	24.4	2.17	8.89	5.39	Good
10	26/09/2022	04/11/2022	26.3	25.5	21.8	24.5	2.40	9.79	5.96	Good
11	04/11/2022	28/11/2022	17.3	27	27.3	23.9	5.69	**23.84**	14.13	**Poor Precision**
12	28/11/2022	04/01/2023	12.4	23	15.6	17.0	5.44	**31.98**	13.51	**Poor Precision**
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Data Quality Check

Diffusion Tubes Precision Check

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	149 High Street, Ongar (Queen Bee)

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 26 μgm^{-3}
 Average Precision (CV):   7
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 25 μgm^{-3}
 Average Precision (CV):   11
 Adjusted Tube average: μgm^{-3}

Tube ID 38 204 High Street, Ongar (Watsons)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
							Diffusion Tubes Measurements			**Data Quality Check**
1	05/01/2022	01/02/2022	39.5	34.6	35.4	36.5	2.63	7.20	6.53	Good
2	01/02/2022	03/03/2022		30.7						
3	03/03/2022	01/04/2022	32.9	32.5	34.6	33.3	1.12	3.35	2.77	Good
4	01/04/2022	04/05/2022	23.8	25.7	23.7	24.4	1.13	4.62	2.80	Good
5	04/05/2022	10/06/2022	22	23.4	23.3	22.9	0.78	3.41	1.94	Good
6	10/06/2022	04/07/2022	24.4	23	22.5	23.3	0.98	4.23	2.45	Good
7	04/07/2022	01/08/2022		21.8	18.1	20.0	2.62	13.11	23.51	Good
8	01/08/2022	30/08/2022	26	24.6	25.6	25.4	0.72	2.84	1.79	Good
9	30/08/2022	26/09/2022	25.5	30.3	25.5	27.1	2.77	10.23	6.88	Good
10	26/09/2022	04/11/2022	28.3	29.6	28.3	28.7	0.75	2.61	1.86	Good
11	04/11/2022	28/11/2022	35.3	34.4	30.9	33.5	2.32	6.93	5.77	Good
12	28/11/2022	04/01/2023	35.6	27	33.4	32.0	4.47	13.96	11.10	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**204 High Street, Ongar (Watsons)**

Version 04 - February 2011

Adjusted measurement (95% confidence level) **Without periods with CV larger than 20%**	**Adjusted measurement (95% confidence level)** **with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	**Tube Precision:**
Bias factor A:	**Bias factor A:**
Bias B:	**Bias B:**
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 28 μgm^{-3}	**Diffusion Tube average:** 28 μgm^{-3}
Average Precision (CV): 7	**Average Precision (CV):** 7
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average:** μgm^{-3}

Tube ID 39 244 High Street, Epping (Church's Butchers)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
										Data Quality Check
1	05/01/2022	01/02/2022	34.4	38.7	33.3	35.5	2.85	8.05	7.09	Good
2	01/02/2022	03/03/2022	29.2	30.3	32.4	30.6	1.63	5.31	4.04	Good
3	03/03/2022	01/04/2022	33.7	35.8	34.3	34.6	1.08	3.13	2.69	Good
4	01/04/2022	04/05/2022	26.9	25	23	25.0	1.95	7.81	4.84	Good
5	04/05/2022	10/06/2022	26.3	26.4	26.6	26.4	0.15	0.58	0.38	Good
6	10/06/2022	04/07/2022	30	29.5	29.7	29.7	0.25	0.85	0.63	Good
7	04/07/2022	01/08/2022	25.5	26.4	25.9	25.9	0.45	1.74	1.12	Good
8	01/08/2022	30/08/2022	31.3	31.2	30.4	31.0	0.49	1.59	1.23	Good
9	30/08/2022	26/09/2022	28.6	28.5	29.3	28.8	0.44	1.51	1.08	Good
10	26/09/2022	04/11/2022	34.9	35.8	35.7	35.5	0.49	1.39	1.23	Good
11	04/11/2022	28/11/2022	36	35.3	35	35.4	0.51	1.45	1.27	Good
12	28/11/2022	04/01/2023	21.4	34	34.7	30.0	7.48	24.92	18.59	Poor Precision
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**224 High Street Epping, (Church's Butchers)**

Jaume Targa, for AEA
Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 31 μgm^{-3}
  Average Precision (CV): 3
  Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 31 μgm^{-3}
  Average Precision (CV): 5
  Adjusted Tube average: μgm^{-3}

Tube ID 40 154 High Street, Epping (was Lloyds Bank)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	26.5	40.7	38.5	35.2	7.64	21.69	18.99	Poor Precision
2	01/02/2022	03/03/2022	28.5	26.9		27.7	1.13	4.08	10.16	Good
3	03/03/2022	01/04/2022	32.9	33.1	36	34.0	1.73	5.10	4.31	Good
4	01/04/2022	04/05/2022	27.3	27.4	26.5	27.1	0.49	1.82	1.23	Good
5	04/05/2022	10/06/2022		25.2	24.2	24.7	0.71	2.86	6.35	Good
6	10/06/2022	04/07/2022	25.4	26.4	26.3	26.0	0.55	2.12	1.37	Good
7	04/07/2022	01/08/2022	24.1	24.8	24	24.3	0.44	1.79	1.08	Good
8	01/08/2022	30/08/2022	28.5	29.5	29	29.0	0.50	1.72	1.24	Good
9	30/08/2022	26/09/2022	29.1	28.3	28.9	28.8	0.42	1.45	1.03	Good
10	26/09/2022	04/11/2022	32.5	32.7	31.5	32.2	0.64	1.99	1.60	Good
11	04/11/2022	28/11/2022	32.9	29.6	28.2	30.2	2.41	7.98	5.99	Good
12	28/11/2022	04/01/2023	32.5		23.1	27.8	6.65	23.91	59.72	Poor Precision
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Version 04 - February 2011

Site Name/ ID:	**154 High Street Epping (was Lloyds Bank)**

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 28 μgm^{-3}
  Average Precision (CV):   3
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 29 μgm^{-3}
  Average Precision (CV):   6
  Adjusted Tube average: μgm^{-3}

Tube ID 41 259 High Street Epping (Holland & Barrett)

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

			Diffusion Tubes Measurements							Data Quality Check
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	36.4	36.5	44.8	39.2	4.82	12.29	11.98	Good
2	01/02/2022	03/03/2022	31.4	34.9	30.4	32.2	2.36	7.33	5.87	Good
3	03/03/2022	01/04/2022	27.6	26.1	25	26.2	1.31	4.98	3.24	Good
4	01/04/2022	04/05/2022	27.8	28	28	27.9	0.12	0.41	0.29	Good
5	04/05/2022	10/06/2022	22	23.4	23.3	22.9	0.78	3.41	1.94	Good
6	10/06/2022	04/07/2022	24.1	23.9	24.8	24.3	0.47	1.95	1.17	Good
7	04/07/2022	01/08/2022	23.6	23.4	25.9	24.3	1.39	5.72	3.45	Good
8	01/08/2022	30/08/2022	27	26	24.9	26.0	1.05	4.05	2.61	Good
9	30/08/2022	26/09/2022	27.9	27	27.8	27.6	0.49	1.79	1.23	Good
10	26/09/2022	04/11/2022	32.1	33.5	32.2	32.6	0.78	2.40	1.94	Good
11	04/11/2022	28/11/2022	32.1	23.2	24.7	26.7	4.76	17.87	11.84	Good
12	28/11/2022	04/01/2023	35.3	29.9	33.4	32.9	2.74	8.33	6.80	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**259 High Street Epping (Holland & Barrett)**

Version 04 - February 2011

Adjusted measurement (95% confidence level)	Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	**Tube Precision:**
Bias factor A:	**Bias factor A:**
Bias B:	**Bias B:**
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 29 μgm^{-3}	**Diffusion Tube average:** 29 μgm^{-3}
Average Precision (CV): 6	**Average Precision (CV):** 6
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average:** μgm^{-3}

Tube ID 42 Laurels, 2 Nazeing Road, Nazeing

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	38.2	47.1	45.1	43.5	4.67	10.74	11.60	Good
2	01/02/2022	03/03/2022	34	33.8	35.7	34.5	1.04	3.03	2.59	Good
3	03/03/2022	01/04/2022	31.1	31.9	31	31.3	0.49	1.57	1.23	Good
4	01/04/2022	04/05/2022	25.1	25.4	25.8	25.4	0.35	1.38	0.87	Good
5	04/05/2022	10/06/2022	26.3	26.4	26.6	26.4	0.15	0.58	0.38	Good
6	10/06/2022	04/07/2022	25.1	24.7	23.2	24.3	1.00	4.12	2.49	Good
7	04/07/2022	01/08/2022	25.9	24.9	23.7	24.8	1.10	4.44	2.74	Good
8	01/08/2022	30/08/2022	26.6	25.4	25.2	25.7	0.76	2.94	1.88	Good
9	30/08/2022	26/09/2022	27.2	25.6	27	26.6	0.87	3.28	2.17	Good
10	26/09/2022	04/11/2022	30.8	26.8	29.7	29.1	2.07	7.10	5.13	Good
11	04/11/2022	28/11/2022	20.8	9.8	18.2	16.3	5.75	**35.34**	14.28	**Poor Precision**
12	28/11/2022	04/01/2023	31.6	29.9	31.1	30.9	0.87	2.83	2.17	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	Laurels, 2 Nazeing Road, Nazeing

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 29 μgm^{-3}
 Average Precision (CV):   4
 Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
 Tube Precision:
 Bias factor A:
 Bias B:
Information about tubes to be adjusted
 Diffusion Tube average: 28 μgm^{-3}
 Average Precision (CV):   6
 Adjusted Tube average: μgm^{-3}

Tube ID 43 4 North Street, Nazeing

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	33.7	37.5	39	36.7	2.73	7.44	6.79	Good
2	01/02/2022	03/03/2022		27.2	25.8	26.5	0.99	3.74	8.89	Good
3	03/03/2022	01/04/2022	28.4	25.7	32.9	29.0	3.64	12.54	9.04	Good
4	01/04/2022	04/05/2022	24	25	22.9	24.0	1.05	4.38	2.61	Good
5	04/05/2022	10/06/2022	23.2	21.7	22	22.3	0.79	3.56	1.97	Good
6	10/06/2022	04/07/2022	23	21.5	21.7	22.1	0.81	3.69	2.02	Good
7	04/07/2022	01/08/2022	22.4	20.5	19.3	20.7	1.56	7.54	3.88	Good
8	01/08/2022	30/08/2022	22.7	25.1	23.8	23.9	1.20	5.03	2.98	Good
9	30/08/2022	26/09/2022	25.6	25.5	23.9	25.0	0.95	3.82	2.37	Good
10	26/09/2022	04/11/2022	26.4	27.8	30.4	28.2	2.03	7.20	5.04	Good
11	04/11/2022	28/11/2022	20.6	32.5	12.7	21.9	9.97	**45.44**	24.76	**Poor Precision**
12	28/11/2022	04/01/2023	29.5	30.4	32.6	30.8	1.59	5.17	3.96	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: 4 North Street, Nazeing

Jaume Targa, for AEA
Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 26 μgm^{-3}
Average Precision (CV): 6
Adjusted Tube average: μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 0 periods of data
Tube Precision:
Bias factor A:
Bias B:
Information about tubes to be adjusted
Diffusion Tube average: 26 μgm^{-3}
Average Precision (CV): 9
Adjusted Tube average: μgm^{-3}

Tube ID 44 Parsonage Court, Rectory Lane, Loughton

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean
1	05/01/2022	01/02/2022	30.9	36.4	37.3	34.9	3.46	9.94	8.61
2	01/02/2022	03/03/2022	23.8	24.9	26.4	25.0	1.31	5.21	3.24
3	03/03/2022	01/04/2022	19.8	21.3	23	21.4	1.60	7.49	3.98
4	01/04/2022	04/05/2022	16.6	15.8	16.3	16.2	0.40	2.49	1.00
5	04/05/2022	10/06/2022	17.9	19	18.8	18.6	0.59	3.16	1.46
6	10/06/2022	04/07/2022	18.4	16.7	17.8	17.6	0.86	4.89	2.14
7	04/07/2022	01/08/2022	14.4	15.6	14.5	14.8	0.67	4.49	1.65
8	01/08/2022	30/08/2022	17.1	12.6	15.5	15.1	2.28	15.14	5.67
9	30/08/2022	26/09/2022	19.2	18.8	19.8	19.3	0.50	2.61	1.25
10	26/09/2022	04/11/2022	26.2	26.4	25.7	26.1	0.36	1.38	0.90
11	04/11/2022	28/11/2022	21.2	21.4	24.4	22.3	1.79	8.03	4.45
12	28/11/2022	04/01/2023	29.3	29.1	28.7	29.0	0.31	1.05	0.76
13									

Data Quality Check
Diffusion Tubes Precision Check
Good
Good
Good
Good
Good
Good
Good
Good
Good
Good
Good
Good

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**Parsonage Court, Rectory Lane, Loughton**

Version 04 - February 2011

Adjusted measurement   (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 22 μgm^{-3}
  Average Precision (CV):   5
  Adjusted Tube average: μgm^{-3}

Adjusted measurement   (95% confidence level)
with all data
Bias calculated using 0 periods of data
  Tube Precision:
  Bias factor A:
  Bias B:
Information about tubes to be adjusted
  Diffusion Tube average: 22 μgm^{-3}
  Average Precision (CV):   5
  Adjusted Tube average: μgm^{-3}

Tube ID 45 18 Chigwell Lane, Loughton

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

									Data Quality Check
Diffusion Tubes Measurements									**Diffusion Tubes Precision Check**
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	
1	05/01/2022	01/02/2022	38.1	36	31.9	35.3	3.15	8.92	7.83	Good
2	01/02/2022	03/03/2022	26.1	24.6	26.6	25.8	1.04	4.04	2.59	Good
3	03/03/2022	01/04/2022	26.9	29.7	29.9	28.8	1.68	5.82	4.17	Good
4	01/04/2022	04/05/2022	22	21.5	21	21.5	0.50	2.33	1.24	Good
5	04/05/2022	10/06/2022	18.6	19.5	18.9	19.0	0.46	2.41	1.14	Good
6	10/06/2022	04/07/2022	17.4	17.7	16.9	17.3	0.40	2.33	1.00	Good
7	04/07/2022	01/08/2022	17	16.4	16.8	16.7	0.31	1.83	0.76	Good
8	01/08/2022	30/08/2022	19.3	18.9	19.5	19.2	0.31	1.59	0.76	Good
9	30/08/2022	26/09/2022	1.6	23.4	23.1	16.0	12.50	77.97	31.05	**Poor Precision**
10	26/09/2022	04/11/2022	24.9	23.4	24.6	24.3	0.79	3.27	1.97	Good
11	04/11/2022	28/11/2022	26.5	26.7	27	26.7	0.25	0.94	0.63	Good
12	28/11/2022	04/01/2023	30.4	34	32.3	32.2	1.80	5.59	4.47	Good
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Jaume Targa, for AEA

Site Name/ ID:	**18 Chigwell Lane, Loughton**

Version 04 - February 2011

Adjusted measurement (95% confidence level)	**Adjusted measurement (95% confidence level)**
Without periods with CV larger than 20%	**with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	**Tube Precision:**
Bias factor A:	**Bias factor A:**
Bias B:	**Bias B:**
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 24 μgm^{-3}	**Diffusion Tube average: 24 μgm^{-3}**
Average Precision (CV): 4	**Average Precision (CV): 10**
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average: μgm^{-3}**

Tube ID 46 The Woodbine Public House, Honey Lane, Waltham Abbey

Adjustment of DUPLICATE or TRIPLICATE Tubes

AEA Energy & Environment
From the AEA group

	Diffusion Tubes Measurements								Data Quality Check
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check
1	05/01/2022	01/02/2022	50.7	43.6	51.2	48.5	4.25	8.76	10.56	Good
2	01/02/2022	03/03/2022	35.2	36.7	38.9	36.9	1.86	5.04	4.62	Good
3	03/03/2022	01/04/2022	39.6	41.9	37.2	39.6	2.35	5.94	5.84	Good
4	01/04/2022	04/05/2022	37.7	32.9	37	35.9	2.59	7.23	6.44	Good
5	04/05/2022	10/06/2022	35.4	33.2	34.1	34.2	1.11	3.23	2.75	Good
6	10/06/2022	04/07/2022	33.7	31	36.3	33.7	2.65	7.87	6.58	Good
7	04/07/2022	01/08/2022	29.5	31.6	30.8	30.6	1.06	3.46	2.63	Good
8	01/08/2022	30/08/2022	22.7	38.1	37.1	32.6	8.62	**26.41**	21.41	**Poor Precision**
9	30/08/2022	26/09/2022	38.6	38.3	38	38.3	0.30	0.78	0.75	Good
10	26/09/2022	04/11/2022	34	34	35.8	34.6	1.04	3.00	2.58	Good
11	04/11/2022	28/11/2022	26.5	19	23.4	23.0	3.77	16.41	9.36	Good
12	28/11/2022	04/01/2023	39.3	32.3	25.2	32.3	7.05	**21.85**	17.51	**Poor Precision**
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	**The Woodbine Public House, Waltham Abbey**

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement **(95% confidence level)** **Without periods with CV larger than 20%**	**Adjusted measurement** **(95% confidence level)** **with all data**
Bias calculated using 0 periods of data	**Bias calculated using 0 periods of data**
Tube Precision:	**Tube Precision:**
Bias factor A:	**Bias factor A:**
Bias B:	**Bias B:**
Information about tubes to be adjusted	*Information about tubes to be adjusted*
Diffusion Tube average: 36 μgm^{-3}	**Diffusion Tube average:** 35 μgm^{-3}
Average Precision (CV): 6	**Average Precision (CV):** 9
Adjusted Tube average: μgm^{-3}	**Adjusted Tube average:** μgm^{-3}

Diffusion Tube Annualisation

Where recorded data capture is less than 75%, it is necessary to annualise the results to adjust for the missing data. Only one location, (15) Albion Terrace, Sewardstone Road, Sewardstone had less than 75% data, and therefore required annualising. This calculation was undertaken using data from continuous analysers on the AURN network, located at Wicken Fen, Haringey Priory Park South and Borehamwood Meadow Park. The annualisation factors are provided in Table C.1

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

Site ID	Annualisation Factor Wicken Fen	Annualisation Factor Haringey Priory Park South	Annualisation Factor Borehamwood Meadow Park	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean
15a	0.9371	0.9551	0.9398	-	0.9440	-	-
15b	0.9371	0.9551	0.9398	-	0.9440	32.1	30.3

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR has 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.

Epping Forest District Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by Epping Forest District 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	6/23	0.76
2021	National	6/22	0.78
2020	National	09/21	0.76
2019	National	09/20	0.75
2018	National	03/19	0.76

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 Epping Forest District required distance correction during 2022. Only one location, (3) Bell Vue, High Street, Bell Common Epping, was within 10% of the annual mean objective, and the diffusion tubes at this location are at the point of relevant exposure.

Appendix D: Maps of Monitoring Locations and the AQMA

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

District Wide – All locations
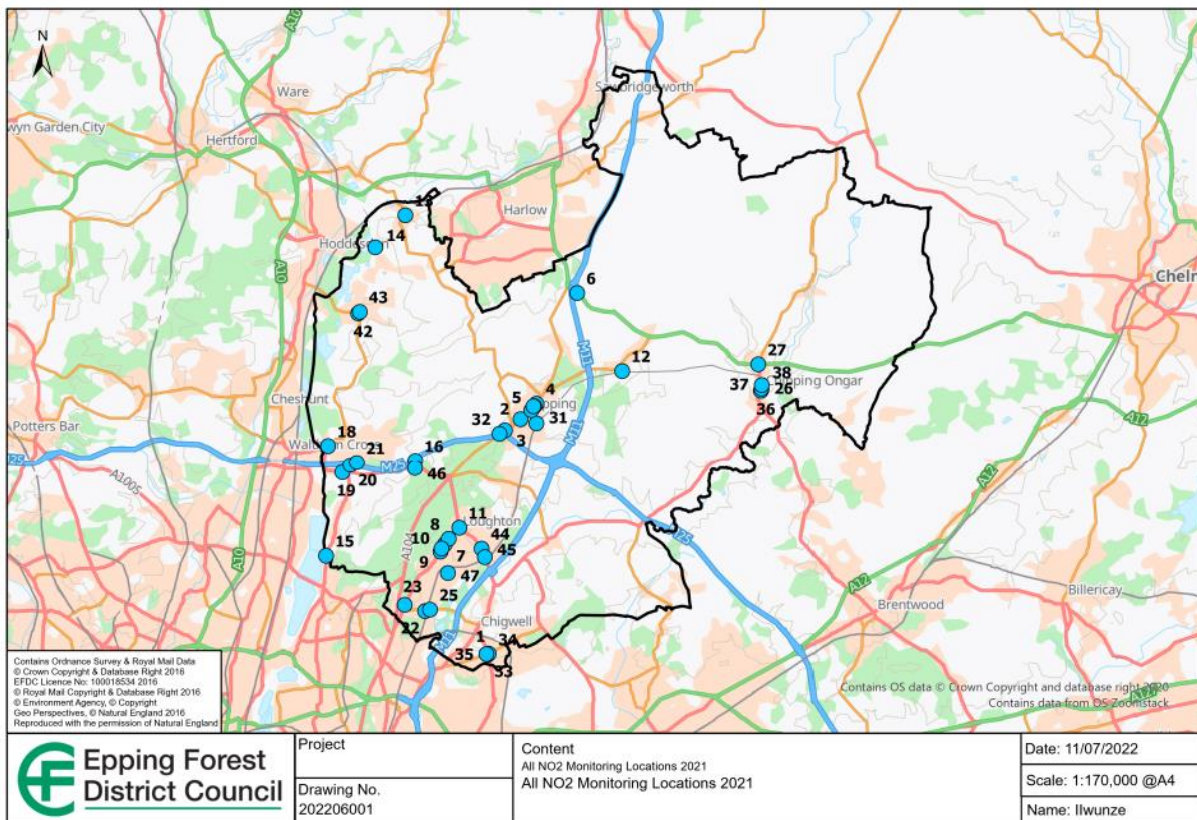
For information regarding location names, please see the following larger scale maps:

AQMA Epping Forest No2. Bell Common

3: Bell Vue, Epping High Street, Bell Common, Epping

Red area: Air Quality Management Area

Epping
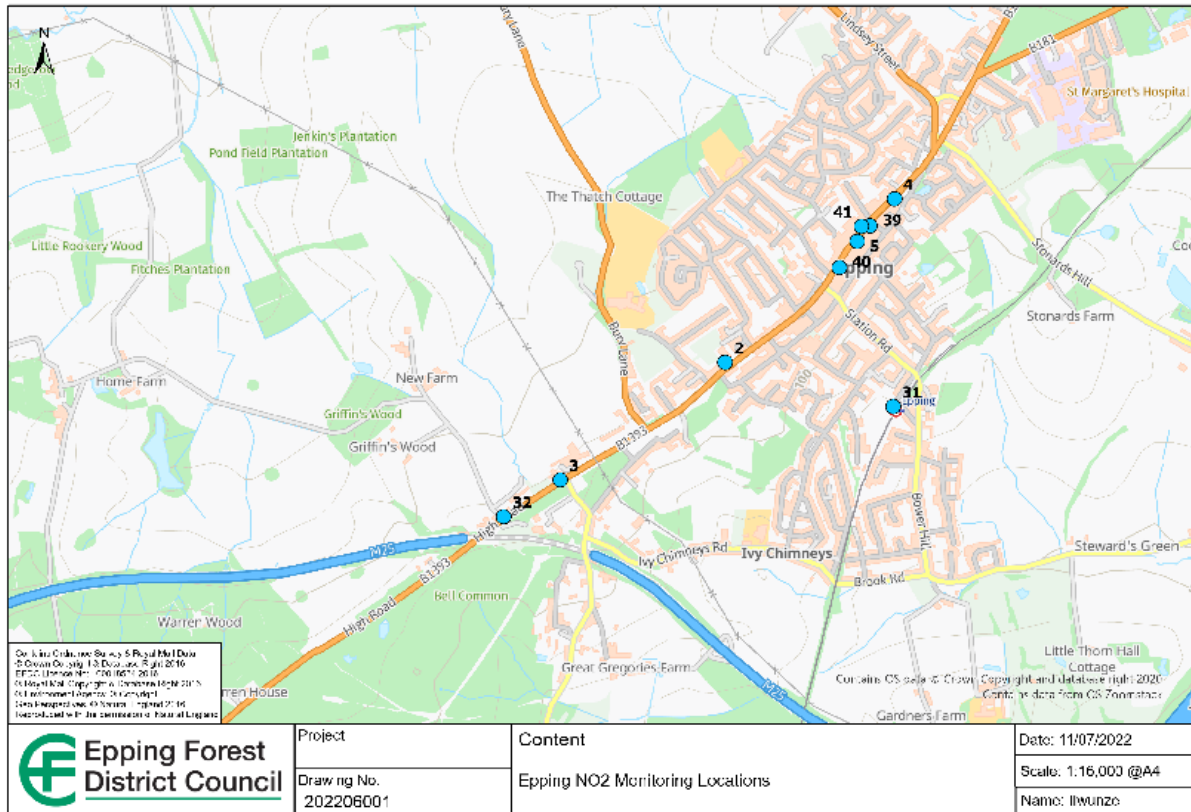
2: 15 High Street, Epping

3: Bell Vue, High Road, Bell Common, Epping

4: 254 High Street, Epping (Ladbrokes)

5: 202 High Street, Epping (Superdrug)

31: Station Road, Station Approach, Epping Underground Station, Epping

32: Copped Hall, High Road, Bell Common, Epping

39: 224 High Street, Epping (Church's Butchers)

40: 154 High Street, Epping (was Lloyds Banks)

41: 259 High Street, Epping (Holland & Barrett)

Hastingwood
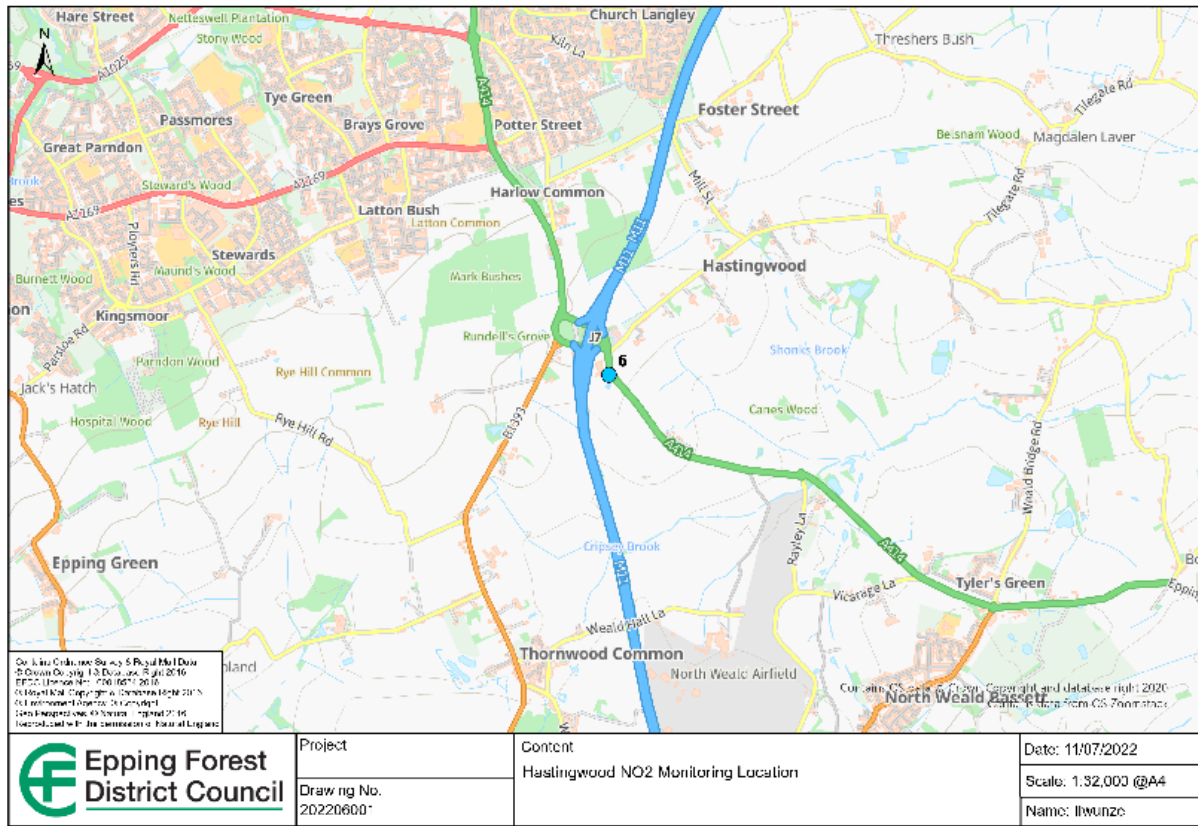
6: 1 Canes Cottages, Cnaes Lane A414 Hastingwood

Loughton
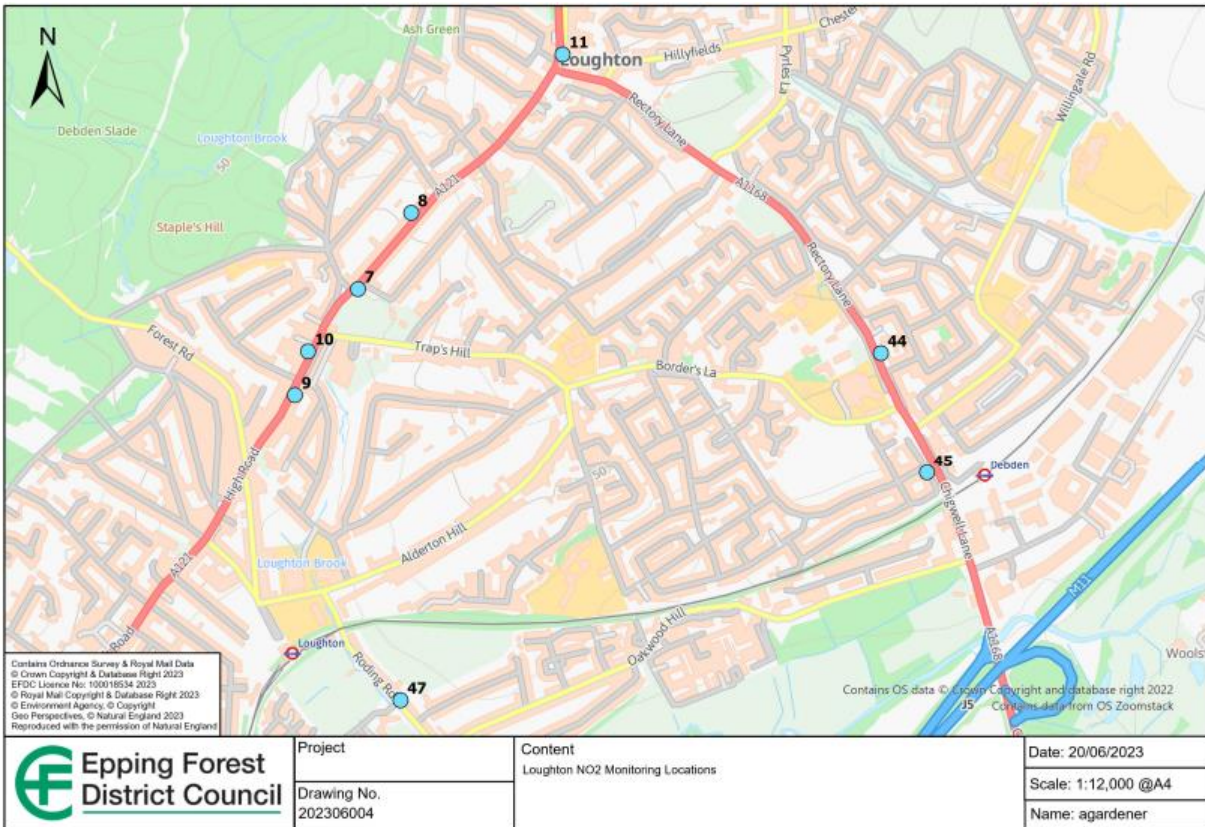
7: 1 Church Hill, Loughton

8: 72 Church Hill, Loughotn

9: 249 High Road, Loughton (Timpson)

10: 252 High Road, Loughton (Love Brownies)

11: 5 Goldings Hill, Loughton

44: Parsonage Court, Rectory Lane, Loughton

45: 18 Chigwell Lane, Chigwell, (odd Colson Road)

Roydon
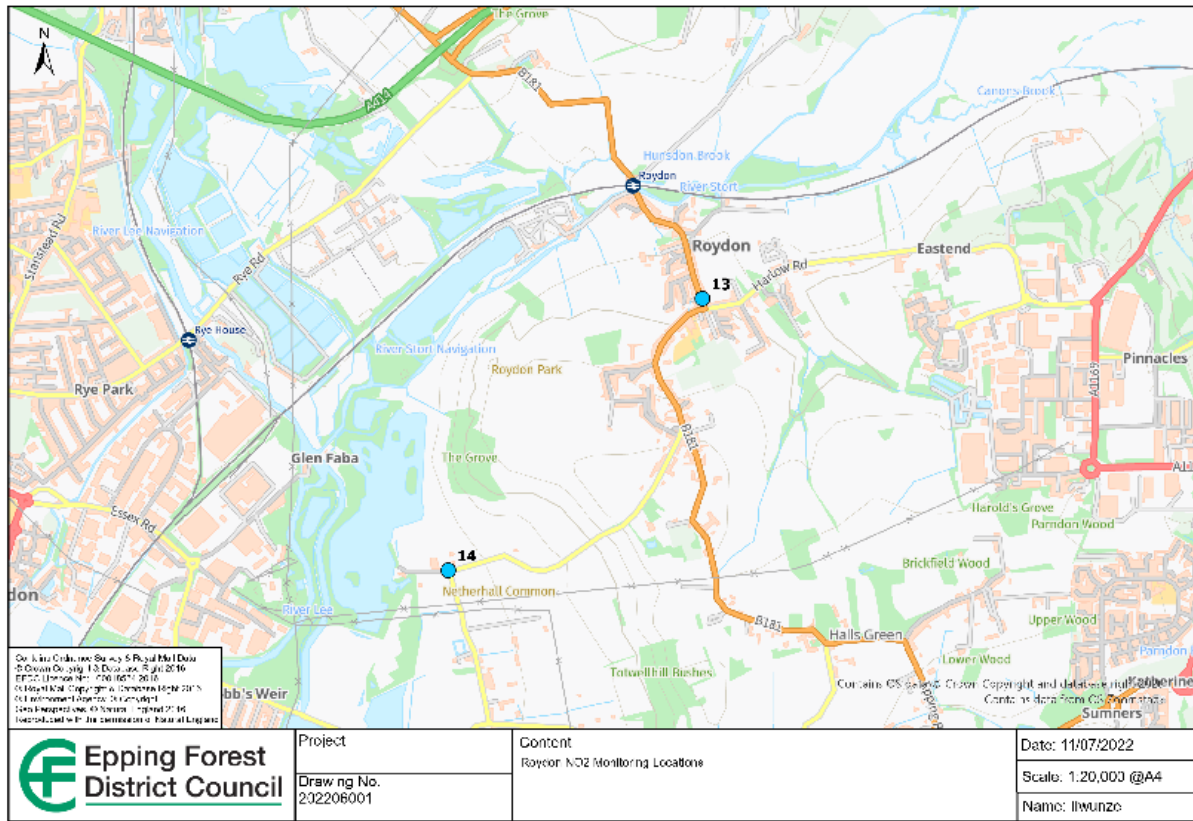
13: 20 High Street, Roydon

14: Burles Farm, Netherhall Road, Roydon

Sewardstone
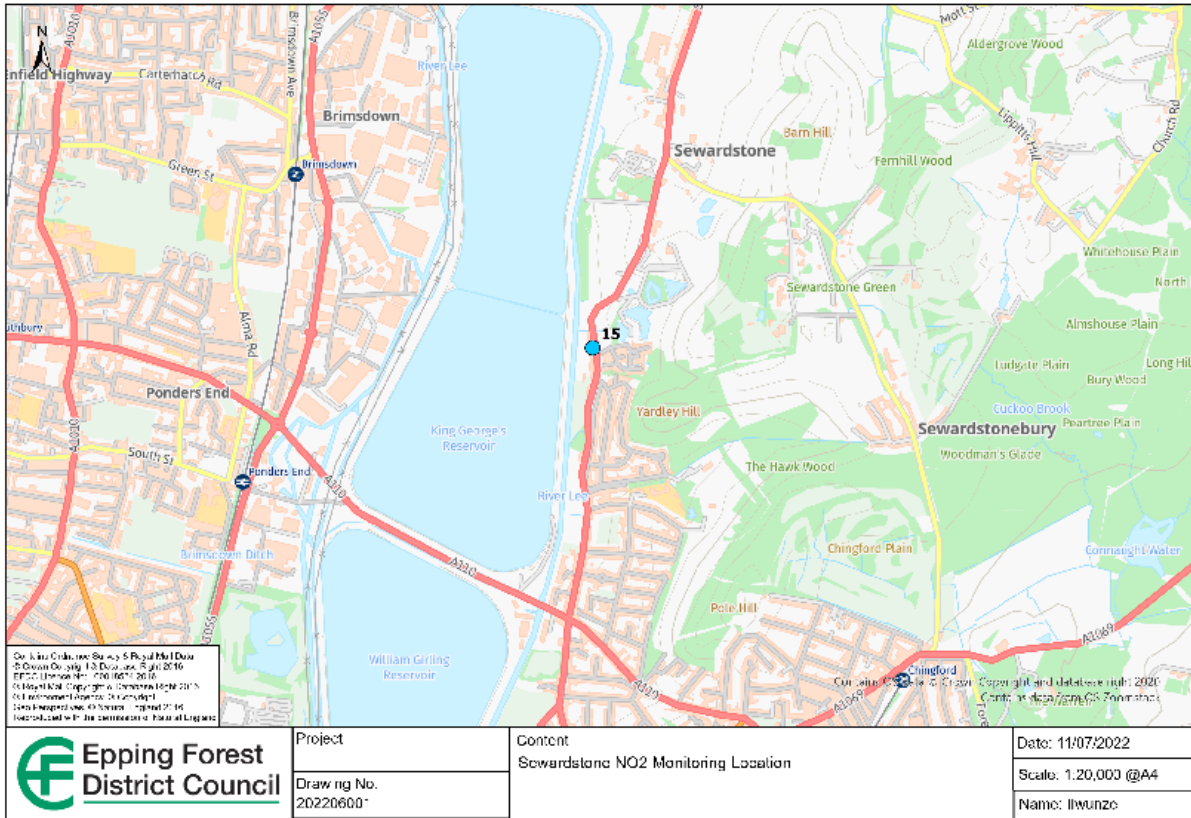
15: Albion Terrace, Sewardstone Road, Sewardstone

Waltham Abbey, Honey Lane
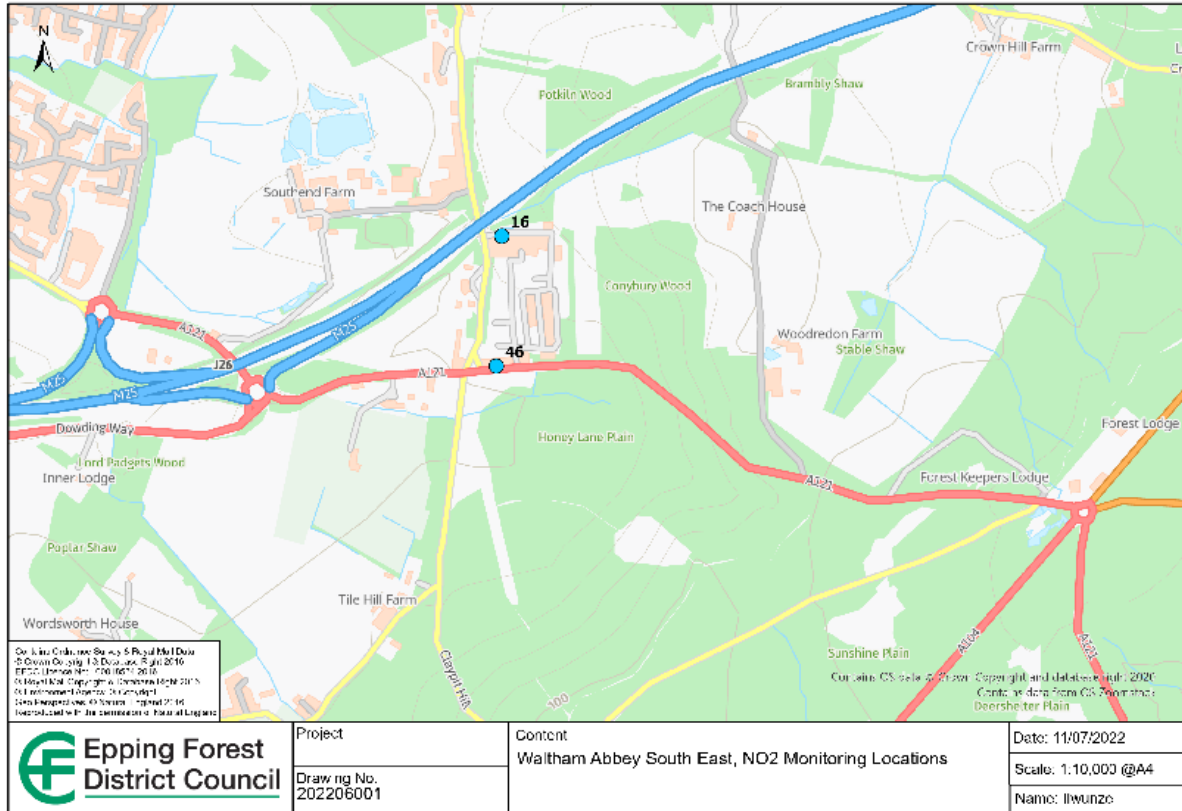
16: 14 The Elms, Waltham Abbey

46: The Woodbine Public House, Honey Lane, Waltham Abbey

Waltham Abbey
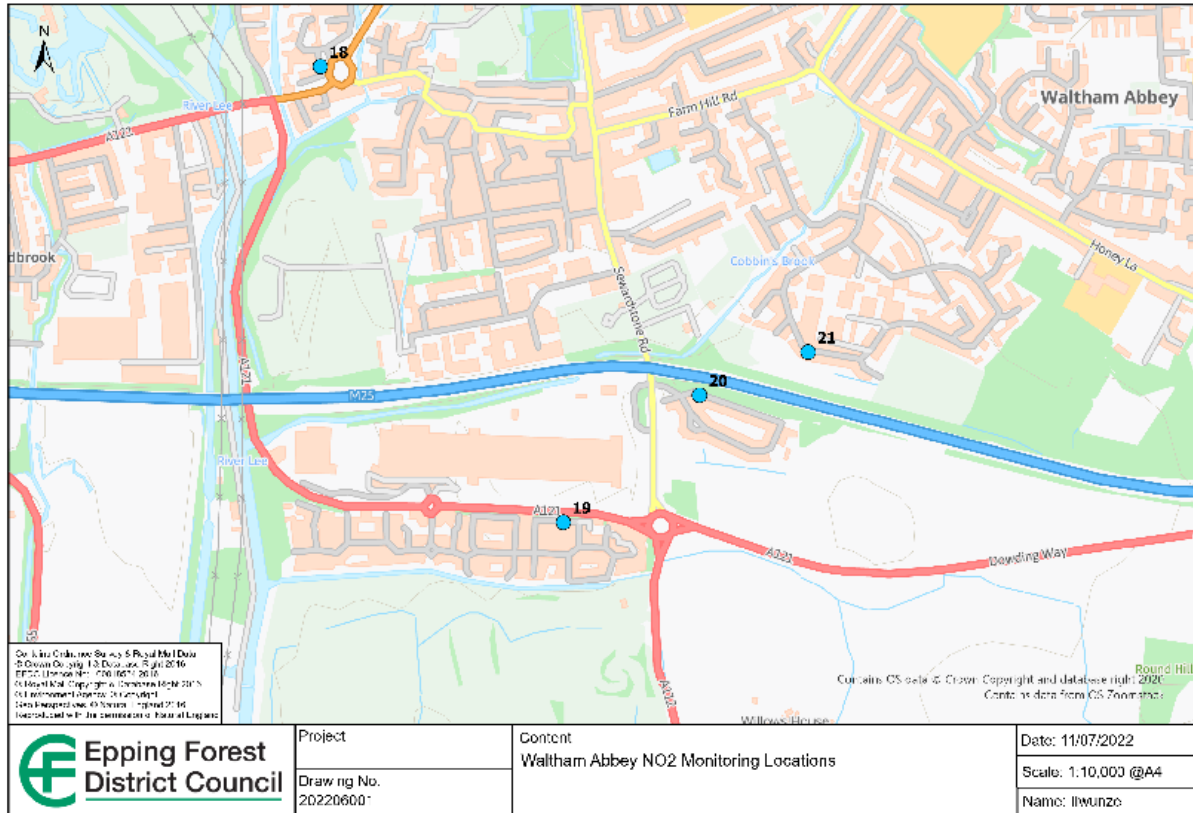
18: 4 Leaview, Waltham Abbey (Abbeyview)

19: 34 Hayden Road, Waltham Abbey

20: 2 Lodge Lane, Waltham Abbey

21: 110 Roundhills, Waltham Abbey

Chigwell

101
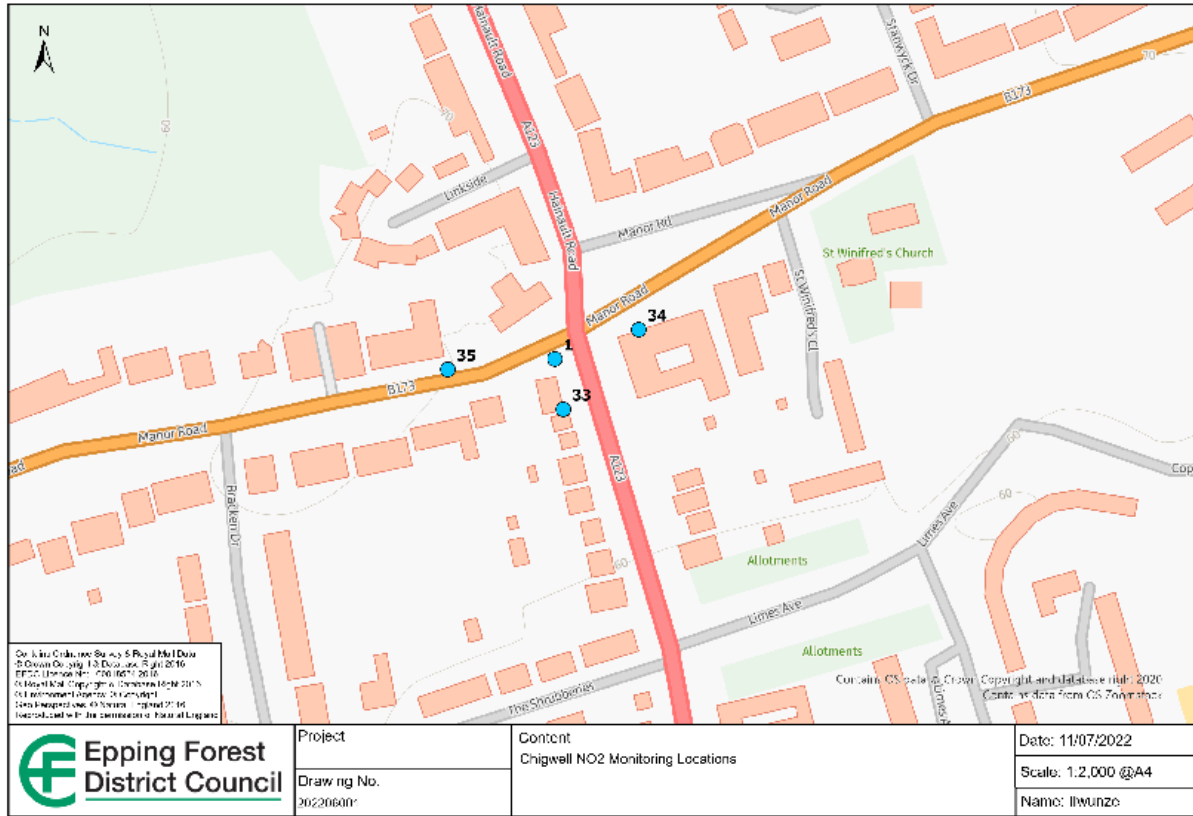
1 105 Hainault Road, Chigwell (junction with Fencepiece Road)

33: 281 Fencepiece Road, Chigwell

34: 414 Fencepiece Road, Chigwell (Sherrell House)

35: 120 Manor Road, Chigwell

Buckhurst Hill
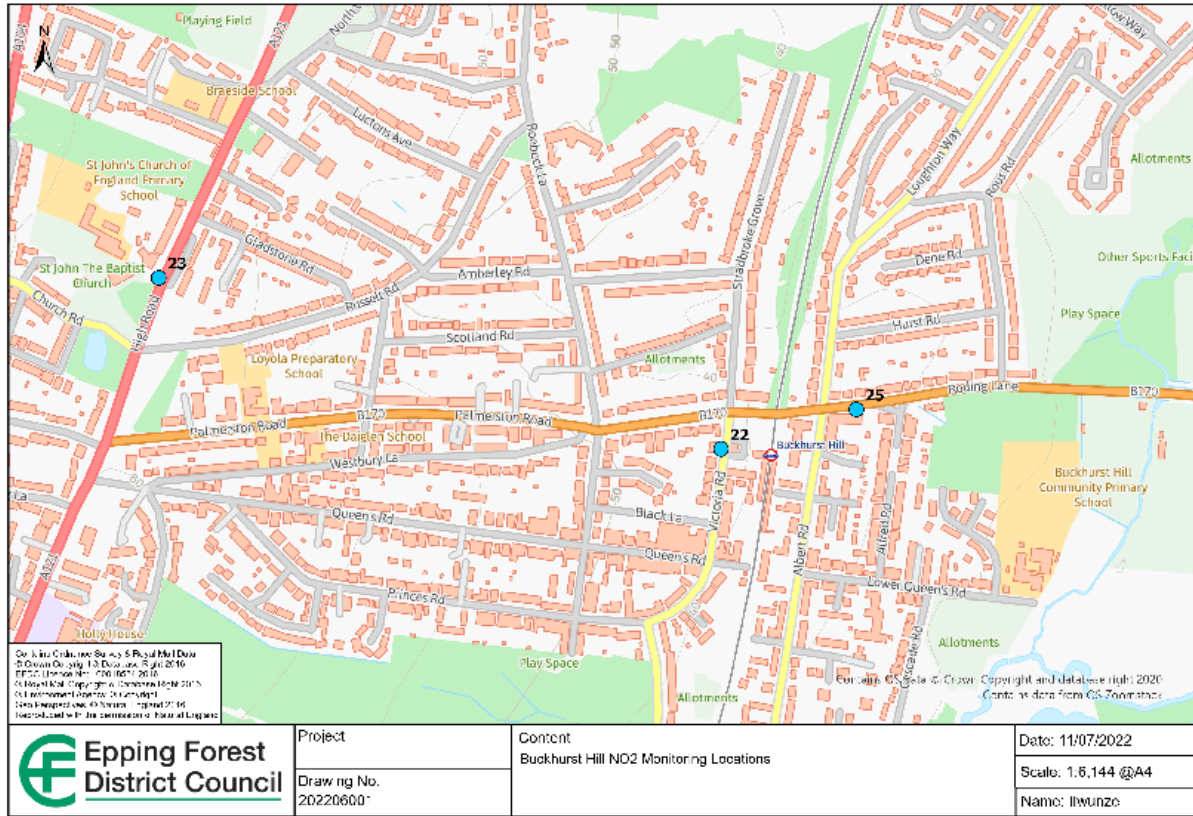
22: 26 Victoria Road, Buckhurst Hill, (opposite underground station)

23: St Johns School, Buckhurst Hill

25: Regency Lodge, Roding Lane, Buckhurst Hill
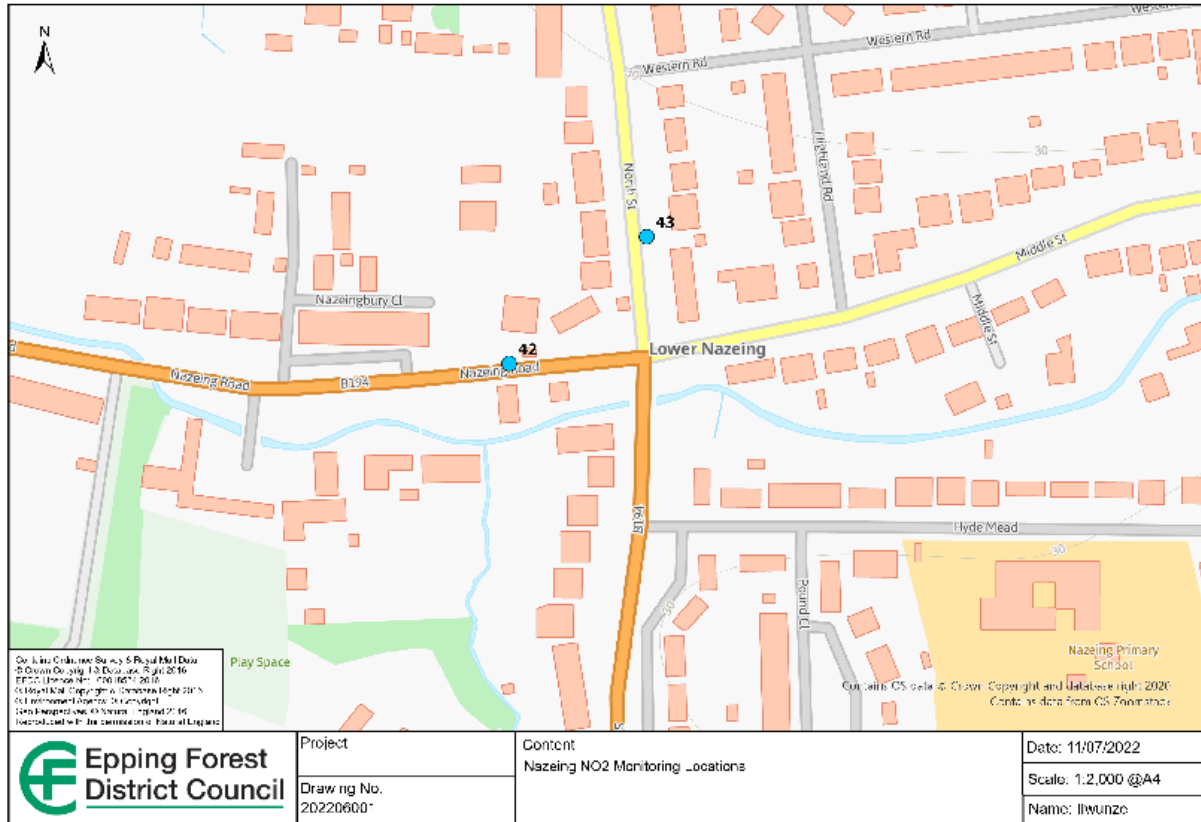
Ongar
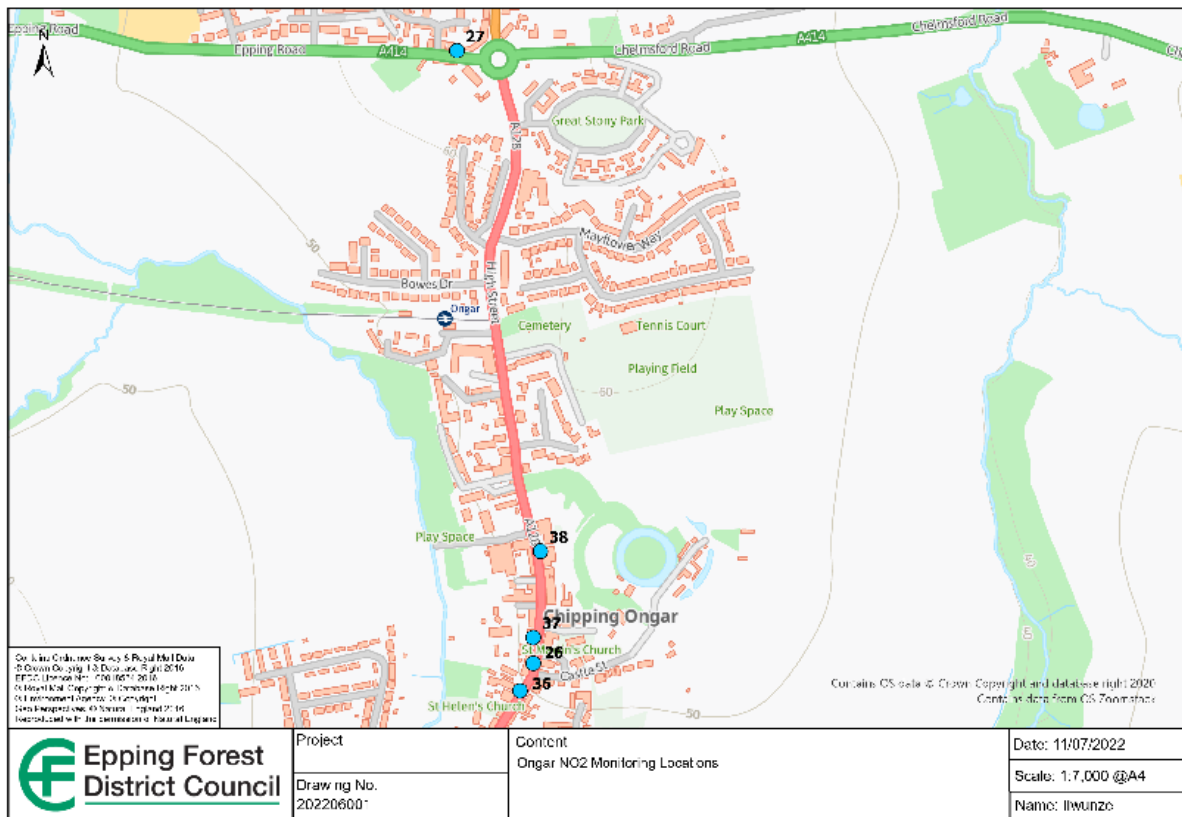
26: 131 High Street, Ongar (at Bottleneck)

27: 3 Queens Terrace, A414, Ongar

36: 107 High Street, Ongar (Anchor)

37:149 High Street, Ongar (Queen Bee)
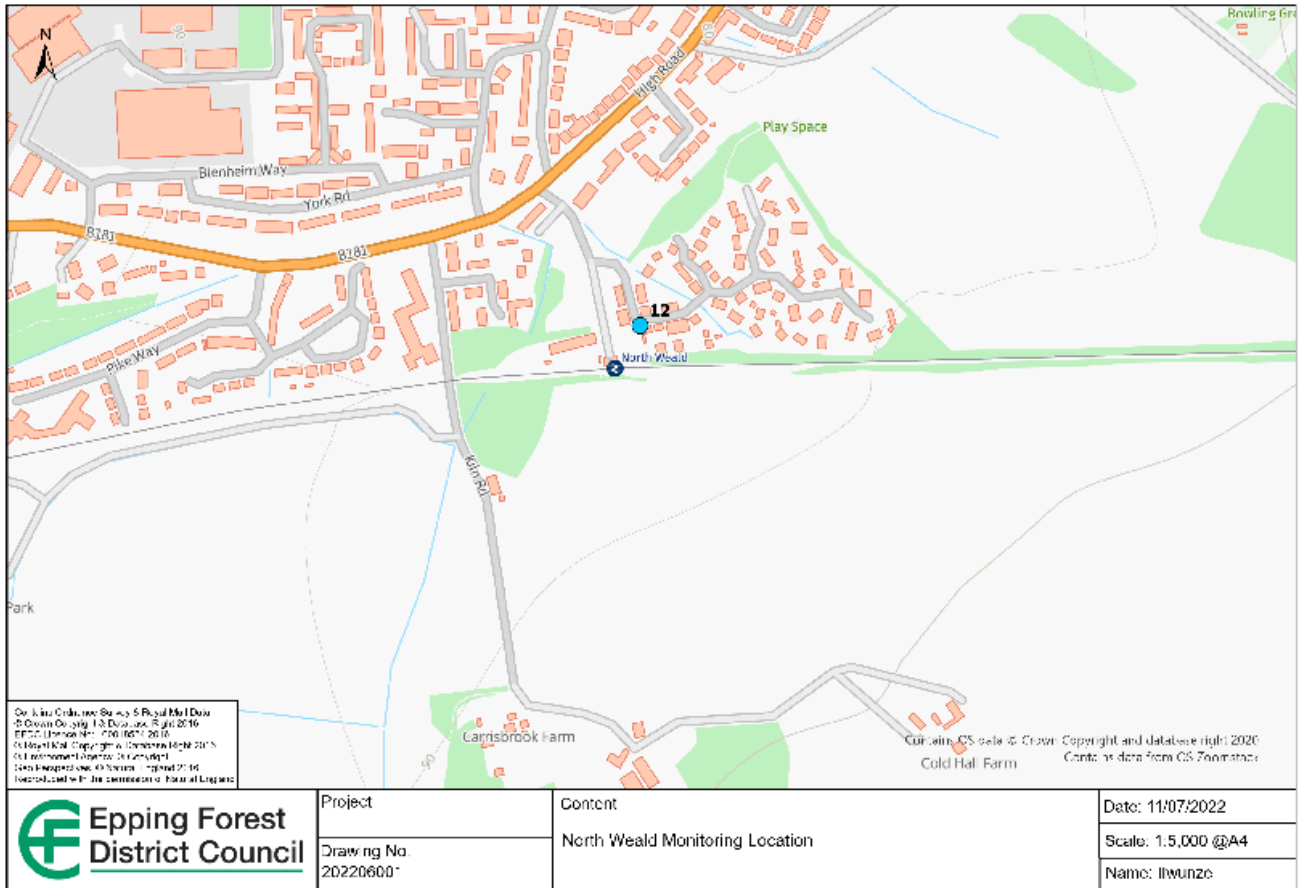
38: 204, High Street, Ongar, (Watsons)

Nazeing

42: Laurels, 2 Nazeing Road, Nazeing

43: 4 North Street, Nazeing

North Weald

12: 66 Tempest Mead, North Weald

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

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

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[7] 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
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.
- Epping Forest District Council Source Apportionment Assessment November 2021, Bureau Veritas AIR12173979