2018 Air Quality Annual Status Report (ASR)

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

October 2018

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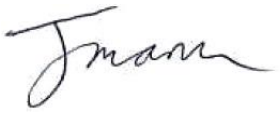
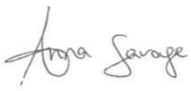
Prepared by:  ..... Checked by:  .....

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Executive Summary: Air Quality in Our Area

Air Quality in Rother

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

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

The District of Rother is the second-largest district in East Sussex, and one of the most rural districts in England. Road traffic is the dominant source of air pollution in the area, the major routes being the A21, the A28, the A265, the A258, the A27 and the A268. The main pollutants of concern with respect to road traffic are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). Currently, there are no areas in Rother where members of the public are exposed to levels of these pollutants in excess of the UK Air Quality Objectives.

Rother District Council manages local air quality in close collaboration with East Sussex County Council, which provided part of the monitoring until 2014, and with the Sussex Air Quality Partnership (Sussex Air). The partnership provides assistance to members and information to the public via its web-site with recent air quality data, news updates, educational resources, links and other services such as airAlert.

In recent years, local monitoring has identified elevated levels of NO_2 at three roadside locations (Rye South Undercliff, High Street Flimwell and A2100 Beauport Park). NO_2 levels at these locations in 2013 and 2014 exceeded, or were close to exceeding the UK Air Quality Objective for annual mean NO_2. In 2015, all monitoring locations in the District achieved the objective, with concentrations lower than 40 µg/m^3. In 2016 however, concentrations exceeded the objective at A2100

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

Beauport Park and High Street Flimwell, although concentrations in 2017 returned to below the objective at these locations and all others.

PM_{10} is monitored in Rother at De La Warr Road, Bexhill, and in recent years concentrations have been generally low (well below the UK annual mean objectives), with no significant increasing or decreasing tendency, although there is some year-on-year variability.

As in other suburban and rural areas of East Sussex, ozone (O_3) is of considerable concern. Ozone is monitored at Rye Harbour, where high levels have been monitored since 2011.

A large area of the countryside in the District is within the High Weald Area of Outstanding Natural Beauty (AONB). The impact of traffic-related air pollution on some of these areas has been assessed in past years. Current and future traffic flows are not expected to put the Pevensey Levels Special Area of Conservation (SAC) at risk from excessive nitrogen deposition.

Actions to Improve Air Quality

Rother District Council is helping the public to avoid the worst effects of ozone pollution by monitoring ozone levels at Rye Harbour, and informing the public of pollution events through the airAlert pollution warning service. This service is provided and maintained through the Sussex Air partnership. As of March 2018 the airAlert service had 971 registered subscribers in Sussex, 46 of which are from the Rother District. Rother, along with other Sussex Air partners, are in discussions relating to a potential upgrade of the Sussex Air website, which would further improve the quality of information accessible to the general public on air quality matters.

Rother District Council, together with Sussex Air and other local authorities across Sussex and Kent, supports the Energise Network, an integrated network of electric charging points for vehicles. Charging points are now located across East and West Sussex, Kent, Surrey, Greater London and neighbouring counties.

Rother District Council contributes to the Air Quality and Emissions Mitigation Guidance for Sussex. The guidance supports the principles of the Sussex Air Quality Partnership to improve air quality across Sussex, encourage emissions reductions and improve the environment and health of the population. Other actions being implemented to improve public health include promoting active modes of

transportation like walking, cycling and using public transport, as well as car clubs and car sharing.

Conclusions and Priorities

Annual mean NO_2 concentrations recorded at continuous monitors and diffusion tubes in Rother District are within the air quality annual mean objective of 40 µg/m^3, and there were no exceedances of the short term hourly objective.

There were also no exceedances of either the annual mean or daily mean PM_{10} objectives in 2017, or for the previous years from 2013.

In conclusion, monitoring has shown that air quality in Rother District continues to meet the air quality objectives at locations of relevant exposure. Rother District is committed to taking action to nonetheless improve air quality, in particular through involvement with the Sussex Air Quality Partnership. Priority measures and actions for the District include the roll-out and expansion of electric charging points via the Energise Network, collaboration between departments on health improvement, climate change, environment and transport, and maintaining and updating the website, airAlert scheme and monitoring network.

The main challenge for air quality management in Rother District is likely to be the careful management of planning applications and developments through detailed and rigorous air quality assessments, particularly where multiple developments may occur close together, in order to help maintain the generally good levels of local air quality that are currently experienced across the District.

Local Engagement and How to get Involved

Everyone concerned about air quality in Rother and the rest of Sussex can find real-time information on pollution levels on the Sussex Air website sussex-air.net. People are encouraged to sign up for advance warnings with the airAlert service at airalert.info. Warnings are provided by text or voice message, email, or using an Android or iOS app. The service is also available to schools and is a great way to get everyone engaged in thinking about the importance of air quality.

Drivers planning to replace their vehicles are encouraged to consider low and ultra-low emission vehicles, such as electric cars, plug-in hybrids and extended-range electric vehicles. The Energise Network provides members with access to more than

150 electric vehicle charging points across the South East. These include most local authority charge points in Kent, Surrey and Sussex, plus a number of Southern Rail fast chargers. For more details, please visit https://www.zap-map.com/charge-points/public-charging-point-networks/energise-network/.

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1 Local Air Quality Management

This report provides an overview of air quality in Rother District during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Rother District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

Rother District currently does not have any AQMAs, because previous monitoring and modelling studies have not indicated any likelihood of the UK air quality objectives being exceeded.

Since Rother District has no AQMAs, no formal Air Quality Action Plan has been implemented for the District.

2.2 Progress and Impact of Measures to address Air Quality in Rother District

Defra's appraisal of last year's ASR[4] concluded that the report was well structured and provided the required information as specified in the guidance, with acceptable conclusions reached. The appraisal identified potential for a review of the monitoring programme in light of NO_2 concentrations being generally well below the AQO, to identify potential new locations of relevant exposure in areas with congested traffic. Rother District conducted this review and added two new diffusion tube locations in 2017.

Rother District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Rother District Council is a member of the Sussex Air Quality Partnership (Sussex Air), which produced an air quality strategic plan 2010 to 2015[5]. Rother District Council contributed to the development of this strategy, which aims to provide a consistent approach to air quality across a number of district councils.

[4] 2017 Rother District Annual Status Report (ASR), available at: http://www.rother.gov.uk/article/193/Air-Quality
[5] Sussex Air Quality Partnership Air Quality Strategic Plan 2010 http://www.sussex-air.net/Reports/SAQP_Vision_Strategy_2015.pdf

This plan has 5 key objectives:

1. Provide advice and support and improve the expertise and knowledge base
2. Project development and implementation
3. Partnership working
4. Develop cross cutting work on health improvement, climate change, environment and transport
5. Communicate air quality issues and initiatives in Sussex.

Key completed measures are:

1. Website

   Rother District Council supports the Sussex Air Quality website (http://www.sussex-air.net), which provides access to air quality statistics and relevant local information and improves public awareness of air quality.

2. airAlert

   Rother District Council supports the airAlert air pollution warning service, offered by the Sussex Air Quality Partnership to vulnerable people, schools, health professionals and general public in Sussex. The airAlert service provides warnings based on ozone levels monitored within the Rother District at Rye Harbour. As of July 2017 the service had 921 registered subscribers, 46 of which are from the Rother District.

3. Local ozone monitoring

   High ozone levels can cause difficulty in breathing for vulnerable people with existing breathing or heart conditions. Rother District Council monitors ozone levels at the Rye Harbour rural monitoring station. Data from this station is available on the Sussex-Air website and feeds into the airAlert service.

4. Guidance

   Rother District Council contributed to the Air Quality and Emissions Mitigation Guidance for Sussex, first published in 2013 and updated in 2014. The guidance is helping to mitigate potential air quality impacts from developments across Sussex. It is also contributing to improving public health by promoting active

modes of transportation like walking, cycling and using public transport, as well as car clubs and car sharing.

5. Energise Network.

   Energise was established as a public/private sector partnership by local authorities across Sussex, Surrey and Kent and was led by the Sussex Air Partnership, to help support the promotion of electric vehicle uptake in the region, by making access simpler. Electric car charging points are now located across East and West Sussex, Kent, Surrey, Greater London and neighbouring counties.

6. Garden Bonfires

   Rother District Council, in partnership with Wealden District Council, published in 2013 public-facing material discouraging the practice of burning garden waste, and encouraging sustainable alternatives such as composting and recycling.

Together with neighbouring local authorities, Rother District Council has been assessing the air quality impacts of new traffic and development on protected natural habitats and designated sites in the District, in particular the Pevensey Levels (Special Area of Conservation (SAC) and Ramsar site), the Dungeness SAC and the Dungeness to Pett Level Special Protection Area (SPA).

Key completed measures regarding protected habitats are:

1. Pevensey Levels Assessment

Rother District Council commissioned in 2009 a study[6] to assess the potential air quality impact on the Pevensey Levels of increases in traffic on the A259 associated with planned population growth up to 2026. The conclusion was that an increase in nitrogen deposition and NOx concentrations is likely, but these will still be below the Critical Levels set by the Habitats Directive[7], therefore there is unlikely to be a significant effect on the Ramsar site.

[6] Rother District Council, Hastings Borough Council. Wealden District Council and Eastbourne Borough Council (2009). Appropriate Assessment and Air Quality Local to the Pevensey Levels Ramsar Site. Available at: http://www.wealden.gov.uk/nmsruntime/saveasdialog.aspx?lID=14305&sID=5509

[7] EC Habitats Directive 1992, interpreted into British law by the Conservation (Natural Habitats &c) Regulations 1994 (as amended in 2007).

2. Dungeness Sites Protection

Rother District Council currently screens all business development applications in the Port of Rye for their potential to have adverse effects on the integrity of the Dungeness internationally-designated sites. The main focus is on traffic and shipping emissions, and where necessary, makes recommendations for mitigation measures to be implemented[8].

Rother District Council is a programme partner for East Sussex County Council's 'Active Access for Growth' programme to deliver cycling and walking initiatives in key areas which includes South Wealden and Bexhill/Hastings.

One of the 3 key objectives of the programme includes 'to demonstrate an alignment to health, air quality, and reduce vehicle emissions' via the following initiatives. Starting with those introduced in 2017:

- Pedal Power - Cycle/Electric Cycle Loan Scheme (including associated research by Brighton University on type and duration of journeys/energy expenditure)
- Living Streets 'Walk Doctors' – Journey planning
- Living Streets – Active Travel Maps
- Walking & Cycling – Challenges & Pledges
- East Sussex Wheels 2 Work – Moped/Motorcycle Loan
- Independent Travel Training – Integrated Travel
- Discounted public transport travel
- Walking & Cycling Leader Training
- East Sussex Cycle Hubs – Bikeability Plus Services
- Transition travel activities - secondary
- Use of sustainable travel apps & other technology
- Student led Walking & Cycling Campaigns
- Walking & cycling challenges – 'Free your Feet'

[8] Rother District Council (2014). Local Plan – Core Strategy. Adopted 29th September 2014.

- Living Streets - Community Audit Scheme: to identify safer walking & cycling routes
- East Sussex County Council - Community Grant Scheme – Active Access – supporting local walking and cycling initiatives (such as cycle refurbishment)
- Community walking & cycling challenges
- South Downs National Park - Led Walks/Rides

A new initiative for 2018:

- Sustrans - Active steps scheme

Rother District Council expects the following updates over the course of the next reporting year:

- The development of the National Coastal Path from Eastbourne to Camber to link to existing walks and cycle routes such as the 1066 Walks and Coastal Cultural Trail.
- Regulation 123 of the Community Infrastructure Levy (CIL) Regulations requires charging authorities to set out a list of those projects or types of infrastructure that it intends to fund either wholly or partially through the CIL levy. Rother's preferred CIL spending relevant to Air Quality is as follows:

  Rail:

  - Access improvements to stations which may include additional car parking, cycle and
  - pedestrian access and facilities based on findings of East Sussex County Council (ESCC) Station Audit and plans of train
  - Operating companies.
  - Bus, Cycling and Walking Infrastructure:
  - Bus stop accessibility
  - Bus shelters
  - Passenger information and electronic ticketing
  - Speed management measures

- Passenger and public security and safety

Bus, Cycling and Walking Infrastructure:

- Bus stop accessibility
- Bus shelters
- Passenger information and electronic ticketing
- Speed management measures
- Passenger and public security and safety
- Bus reliability measures
- Passenger access and information improvements to railway stations
- Cycle network improvements
- Public realm improvements
- Safety infrastructure outside schools
- Rights of way improvements

- Improvements to walking and cycling infrastructure to ensure connectivity and accessibility of new development into existing networks, communities, town and secondary centres, employment & social infrastructure in accordance with Rother's Cycling and Walking Strategy.
- Management of cross town traffic congestion in Battle. Improved traffic management. Implement measures to increase use of sustainable transport in accord with LTP3.
- Introduce measures to tackle heavy congestion in Rye town centre during the summer. Increase sustainable transport provision in the town in accord with LTP3.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Air Quality and Emissions Mitigation Guidance for Sussex	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Sussex Air Quality Partnership		2014	N/A	N/A		Completed	
2	Air Quality Strategic Plan 2010	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Sussex Air Quality Partnership		2010 - 2015	N/A	N/A		Ongoing	
3	Sussex Air website	Public Information	Via the Internet	Sussex Air Quality Partnership			N/A	N/A		Ongoing	
4	airAlert	Public Information	Via other mechanisms	Sussex Air Quality Partnership			921 registered subscribers, 46 from Rother District	N/A		Ongoing	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Energise Network	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Sussex Air Quality Partnership			N/A	N/A		Ongoing	
6	Garden Bonfires	Public Information	Via leaflets	Rother District Council		2013	N/A	N/A		Completed	
7	Council Policy for Homeworking	Promoting Travel Alternatives	Encourage / Facilitate home-working	Rother District Council			N/A	N/A		Ongoing	
8	Active Rother	Promoting Travel Alternatives	Promotion of Cycling	Rother District Council		2016	N/A	N/A		Ongoing	
9	CIL Spending	Transport Planning and Infrastructure	Bus Route Improvements	Rother District Council			N/A	N/A		Ongoing	
10	Hastings and Bexhill 5km coastal cycle route	Transport Planning and Infrastructure	Cycle Network	Rother District Council		2018	N/A	N/A		Ongoing	
11	CIL Spending	Transport Planning and Infrastructure	Public Transport Improvements - Interchanges, stations and services	Rother District Council			N/A	N/A		Ongoing	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
12	Rothers Cycling and Walking Strategy	Promoting Travel Alternatives	Promotion of Walking	Rother District Council			N/A	N/A		Ongoing	

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Rother District Council is taking the following measures to address $PM_{2.5}$:

- Continuing to support the Energise Network of electric vehicle charging points, together with the Sussex Air Quality Partnership;
- Requiring the assessment of $PM_{2.5}$ as part of Air Quality Assessments for planning applications to inform emission mitigation strategies.
- Publishing information discouraging the burning of garden waste and encouraging sustainable alternatives such as composting and recycling.

Further measures will be considered in future years.

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

3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how it compares with objectives. For reference, maps of Rother District's monitoring locations are provided in Appendix D.

3.1.1 Automatic Monitoring Sites

Rother District undertook automatic (continuous) monitoring at 2 sites during 2017: De La Warr Road, Bexhill (RY2, monitoring NO_2 and PM_{10}) and Rye Harbour (RY1, monitoring ozone (O_3)). Fine particulate matter ($PM_{2.5}$) is currently not monitored in the District. Table A.1 in Appendix A shows the details of the automatic monitoring sites.

Both stations are part of the Sussex Air Quality Monitoring Network (SAQMN), managed on behalf of Sussex Air by King's College London Environmental Research Group (KCL-ERG). Regional monitoring results are available at www.sussex-air.net.

Data capture for 2017 was good, as outlined below:

- De La Warr Road, Bexhill: 99.4% for NO_2, 98.5% for PM_{10}; and
- Rye Harbour: 94.6% for O_3.

Further details on how the monitors are calibrated and how the data has been adjusted or annualised are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Rother District Council undertook non-automatic (passive) monitoring of NO_2 at 20 sites during 2017, which includes two new sites. Triplicate diffusion tubes are co-located with the De La Warr Road automatic monitoring station for the derivation of a local bias adjustment factor.

Due to repeated tube theft at Rye Cinque Ports Street (DT19), monitoring was ceased at this site at the end of 2016. This site was later reinstated in a slightly different location along Cinque Ports Street in May 2017, where data capture has significantly improved. The diffusion tube at Rye South Undercliff (DT21) was

relocated in September 2016 to another (new) location (A259 Bowling Green, Rye; DT30) due to a temporary issue with accessing the site. The Rye South Undercliff (DT21) diffusion tube site was reinstated at the original location in March 2017 after issues with access to the site had been resolved, and monitoring continued at the new DT30 site.

A second new diffusion tube site (DT31) was also commissioned in March 2017 at 128 Barnhorn Road, Bexhill.

Table A.2 in Appendix A shows the details of the sites. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

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

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

The results indicate that the annual mean NO_2 concentrations at the De La Warr Road, Bexhill automatic monitoring site were well within the UK air quality objective (40 µg/m^3) in all years between 2013 and 2017.

All diffusion tube sites achieved the air quality objective in 2017, with the highest concentration of 39.1 µg/m^3 monitored at DT3 (Beauport Park). There were exceedances of the objective in 2013 at DT21 (Rye South Undercliff) and in 2016 at DT3 (Beauport Park) and DT12 (High St Flimwell), however it should be noted that these exceedances are based on the monitored concentrations at the diffusion tube site; when distance-corrected for relevant exposure, annual mean NO_2

concentrations in all years from 2013 to 2017 are well within the objective. Appendix B provides details of distance-corrected annual mean NO_2 concentrations in 2017.

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

The De La Warr Road, Bexhill automatic monitoring site did not exceed the 200 µg/m^3 standard in any year in the 2013 to 2017 period.

Diffusion tubes cannot provide hourly measurements of NO_2; however, the Defra Technical Guidance states that where annual mean NO_2 concentrations measured by diffusion tubes exceed 60 µg/m^3 there is a likelihood that the 1-hour objective may be exceeded. All of the annual mean NO_2 concentrations at diffusion tube monitoring locations between 2013 and 2017, inclusive, were well below 60 µg/m^3 and so the 1-hour objective is very unlikely to have been exceeded. The results indicate that the 1-hour NO_2 air quality objective is unlikely to be exceeded at any location in the district.

3.2.2 Particulate Matter (PM_{10})

PM_{10} concentrations are monitored at the De La Warr Road, Bexhill site. Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. The results indicate that annual mean PM_{10} concentrations were well below the UK air quality objective between 2013 and 2017.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year. These results show that the De La Warr Road site achieved the daily PM_{10} objective every year from 2013 to 2017.

3.2.3 Particulate Matter ($PM_{2.5}$)

There is no $PM_{2.5}$ monitoring undertaken within Rother District. The annual mean PM_{10} concentrations measured at the De La Warr Road site have been used to estimate $PM_{2.5}$ annual average concentrations by using the nationally-derived correction ratio of 0.7 suggested in Defra's Technical Guidance. Based on this assumption, the estimated annual mean $PM_{2.5}$ concentrations during the 2013 to

2017 period were in the range of 13 µg/m^3 to 18 µg/m^3 (see Table A.7 in Appendix A).

3.2.4 Sulphur Dioxide (SO_2)

Monitoring of sulphur dioxide is not carried out at any location within the district. Therefore, no results are presented in this section.

3.2.5 Ozone (O_3)

Table A.8 in Appendix A presents the ratified continuous monitored O_3 concentrations for the past 5 years at the Rye Harbour rural site. Due to low data capture during 2015 there are no results presented for that year. Between 2013 and 2017, the annual mean O_3 concentrations ranged from 51 µg/m^3 to 57 µg/m^3. There is no annual mean objective or target value for O_3.

Table A.9 in Appendix A compares the ratified continuous monitored running 8-hour mean O_3 concentrations for the past 5 years with the UK Air Quality Objective of 100 µg/m^3, not to be exceeded on more than 10 days per year. The monitoring results show that the Rye Harbour monitoring site exceeded the O_3 running 8-hour mean objective in 2013, 2016 and 2017. The highest number of days above the standard was in 2017, with 24 days.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
RY1	Rye Harbour	Rural	594440	119150	O3	N	UV Absorption	N/A	N/A	3.5
RY2	De La Warr Road	Roadside	575595	108054	NO2, PM10	N	Chemi-luminiscence	N (2m)	1m	2.02

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DT2	North of Northam	Kerbside	583515	126517	NO_2	N	10	1	NO	1.87
DT3	A2100 Beauport Park	Kerbside	577608	114083	NO_2	N	>150	1	NO	1.83
DT4	A269 Battle Hospital	Kerbside	573071	115896	NO_2	N	40	1	NO	2.1
DT5	B2089 West of Rye	Kerbside	590753	119799	NO_2	N	50	1	NO	2.2
DT7	Holliers Hill, Bexhill	Kerbside	574296	108917	NO_2	N	10	1	NO	2.38
DT8	A259 New Winchelsea Road, Rye	Kerbside	592926	120868	NO_2	N	10	1	NO	1.8
DT9	A21 Robertsbridge	Kerbside	574057	124328	NO_2	N	40	1	NO	1.77
DT10	Catsfield Church	Kerbside	574775	115925	NO_2	N	15	1	NO	2.06
DT12	High St Flimwell	Kerbside	571431	131224	NO_2	N	5	1	NO	1.97
DT13	Battle Wellington Gardens	Urban Background	574357	116222	NO_2	N	30	N/A	NO	2.12
DT14	Battle A2100	Kerbside	574509	116846	NO_2	N	10	1	NO	2.17
DT16	Battle High Street	Kerbside	574775	115925	NO_2	N	0	1	NO	2.37
DT17	Rye North Salts	Urban Background	592339	120975	NO_2	N	15	1	NO	2.14

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DT19	Rye Cinque Ports Street	Urban Background	592121	120543	NO_2	N	8	N/A	NO	2.1
DT21	Rye South Undercliff	Kerbside	591255	120273	NO_2	N	2	1	NO	2.27
DT22	Bexhill-on-Sea Sackville Road	Kerbside	573985	107409	NO_2	N	2	1	NO	2.06
DT25	A259 Bexhill-on-Sea	Kerbside	573871	108033	NO_2	N	20	1	NO	2.06
DT27	Bexhill Triplicate 1	Kerbside	575595	108060	NO_2	N	15	1	YES	2.04
DT28	Bexhill Triplicate 2	Kerbside	575595	108060	NO_2	N	15	1	YES	2.04
DT29	Bexhill Triplicate 3	Kerbside	575595	108060	NO_2	N	15	1	YES	2.04
DT30	A259 Bowling Green, Rye	Kerbside	592248	120525	NO_2	N	0	1	NO	2
DT31	128 Barnhorn Road, Bexhill	Kerbside	570366	107817	NO_2	N	10	1	NO	2

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
RY2	Kerbside	Automatic	99.4	99.4	26.0	22.5	19.8	25.2	21.8
DT2	Kerbside	Diffusion Tube	100.0	100.0	18.2	20.8	18.4	23.5	19.5
DT3	Kerbside	Diffusion Tube	66.7	66.7	22.2	38.4	35.5	**51.4**	39.1
DT4	Kerbside	Diffusion Tube	100.0	100.0	21.9	28.8	24.8	26.9	21.4
DT5	Kerbside	Diffusion Tube	83.3	83.3	18.3	21.8	19.7	27.1	26.7
DT7	Kerbside	Diffusion Tube	100.0	100.0	18.8	24.6	16.3	24.6	21.2
DT8	Kerbside	Diffusion Tube	91.7	91.7	21.9	-	-	25.9	20.8
DT9	Kerbside	Diffusion Tube	91.7	91.7	16.1	26.6	22.1	30.6	25.8
DT10	Kerbside	Diffusion Tube	100.0	100.0	17.5	17.0	12.7	16.0	13.9
DT12	Kerbside	Diffusion Tube	100.0	100.0	25.7	39.8	29.0	**43.1**	32.3
DT13	Urban Background	Diffusion Tube	100.0	100.0	15.4	12.8	13.1	14.5	12.9
DT14	Kerbside	Diffusion Tube	100.0	100.0	35.7	33.1	29.6	37.0	29.6
DT16	Kerbside	Diffusion Tube	100.0	100.0	18.3	18.8	17.0	20.2	16.9
DT17	Urban Background	Diffusion Tube	100.0	100.0	16.7	13.8	13.0	17.9	15.0
DT19	Urban Background	Diffusion Tube	66.7	66.7	30.4	-	-	-	26.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
DT21	Kerbside	Diffusion Tube	83.3	83.3	**43.8**	39.9	34.3	34.6	34.9
DT22	Kerbside	Diffusion Tube	91.7	91.7	31.0	32.2	27.4	37.6	29.0
DT25	Kerbside	Diffusion Tube	100.0	100.0	38.8	-	-	38.0	29.7
DT27	Kerbside	Diffusion Tube	100.0	100.0	30.2	23.8	24.5	26.6	22.3
DT28	Kerbside	Diffusion Tube	91.7	91.7	29.2	25.2	23.8	25.6	20.7
DT29	Kerbside	Diffusion Tube	100.0	100.0	28.9	27.2	23.2	26.1	22.2
DT30	Kerbside	Diffusion Tube	91.7	91.7	-	-	-	-	24.5
DT31	Kerbside	Diffusion Tube	83.3	83.3	-	-	-	-	25.4

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

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

Notes:

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

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

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

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

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations (RY2 De La Warr Road Continuous Monitoring Site)

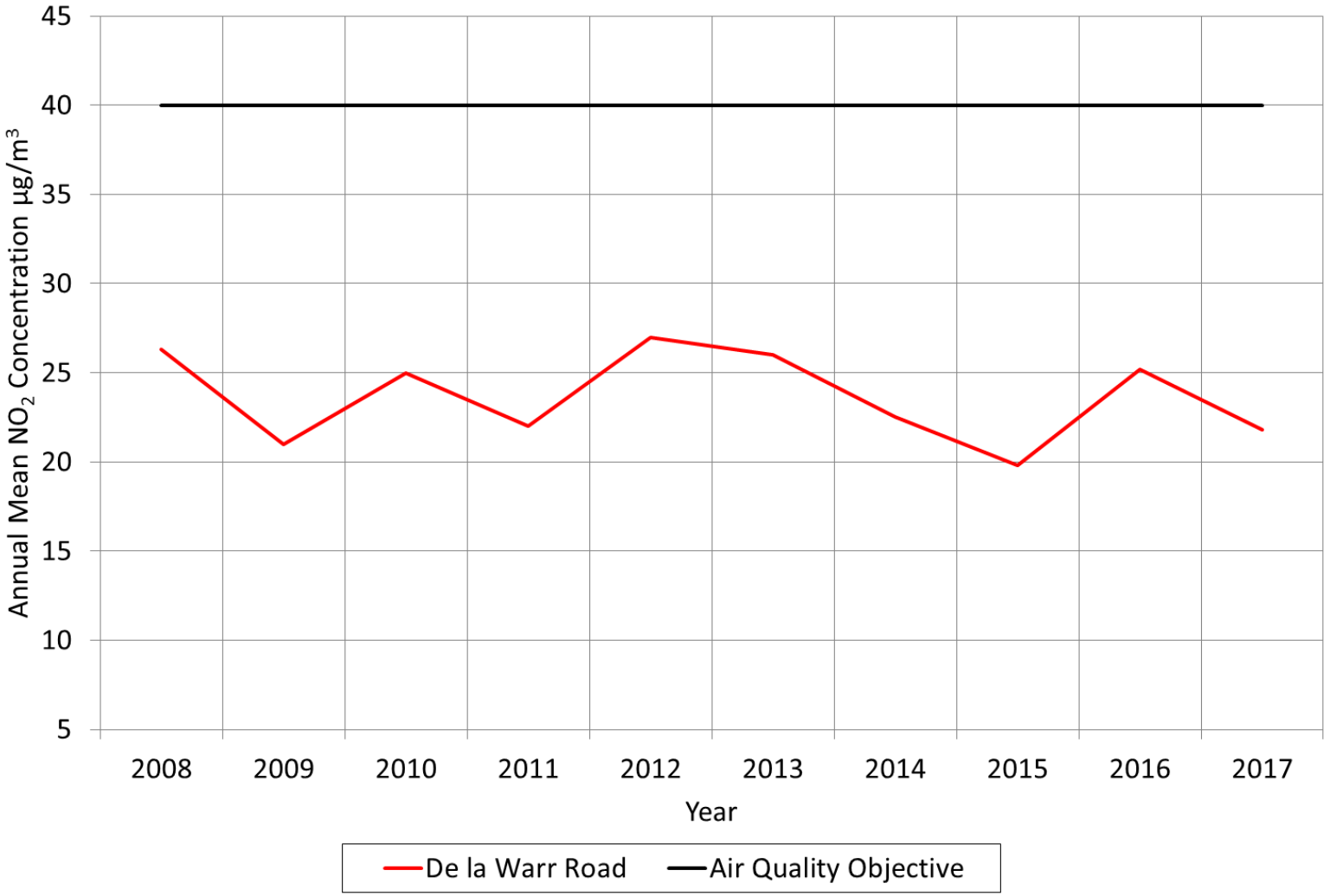


Figure A.2 – Trends in Annual Mean NO_2 Concentrations (Diffusion Tube Sites)

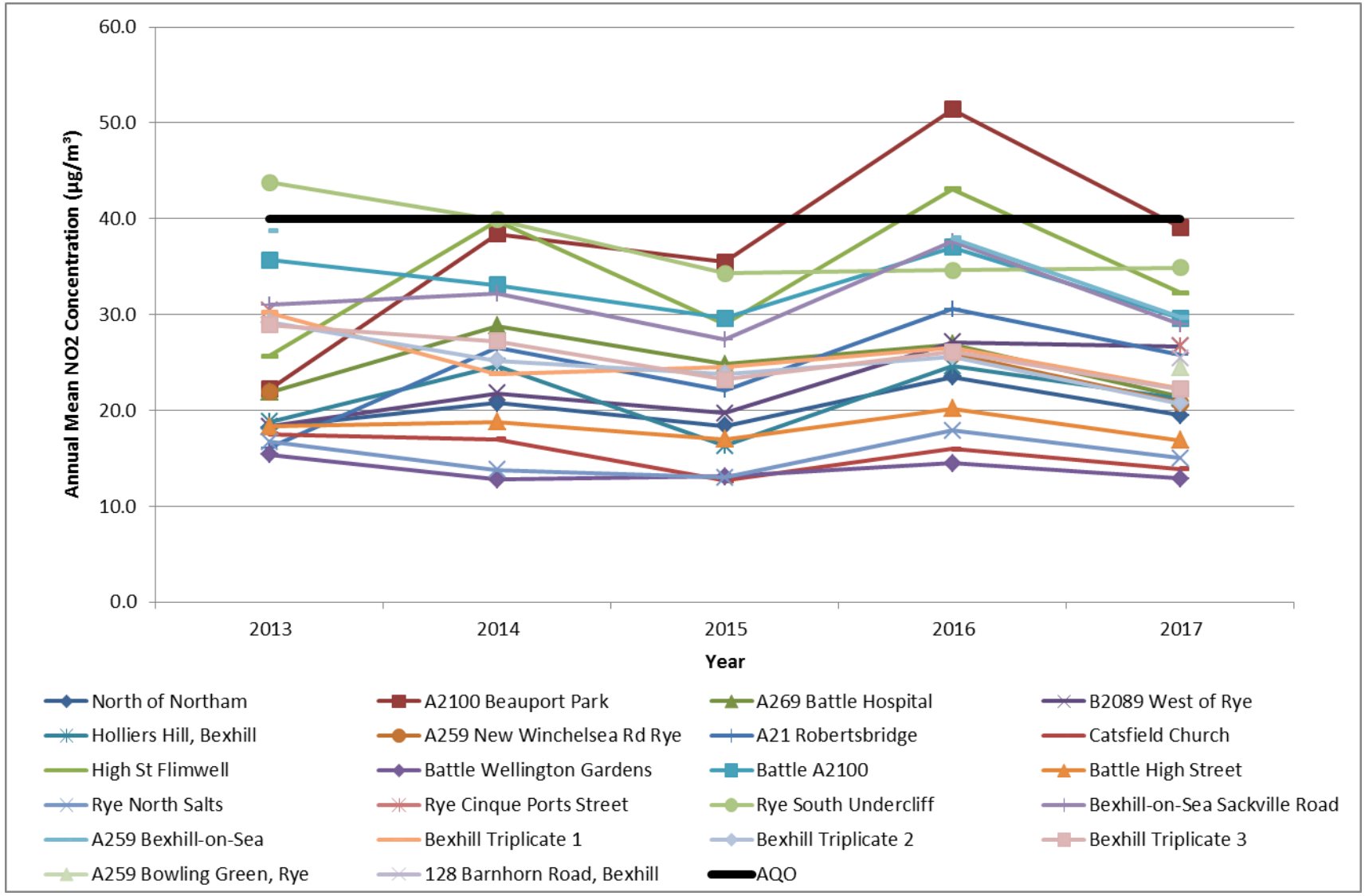


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2013	2014	2015	2016	2017
RY2	Kerbside	Automatic	99.4	99.4	0	0 (105) (3)	0 (100) (3)	0	0

Notes:

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

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

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

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

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
RY2	Kerbside	98.5	98.5	25.2	19.0 (3)	24.3 (3)	18.1 (3)	21.4 (3)

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

Notes:

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

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

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

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.3 – Trends in Annual Mean PM_{10} Concentrations

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2013	2014	2015	2016	2017
RY2	Kerbside	98.5	98.5	7	0 (30) (3)	2 (33) (3)	0 (27) (3)	4

Notes:

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

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

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

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
RY2	Kerbside	98.5	98.5	17.6	13.3	17.0	12.7	15.0

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

Notes:

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

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

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.4 – Trends in Annual Mean $PM_{2.5}$ Concentrations

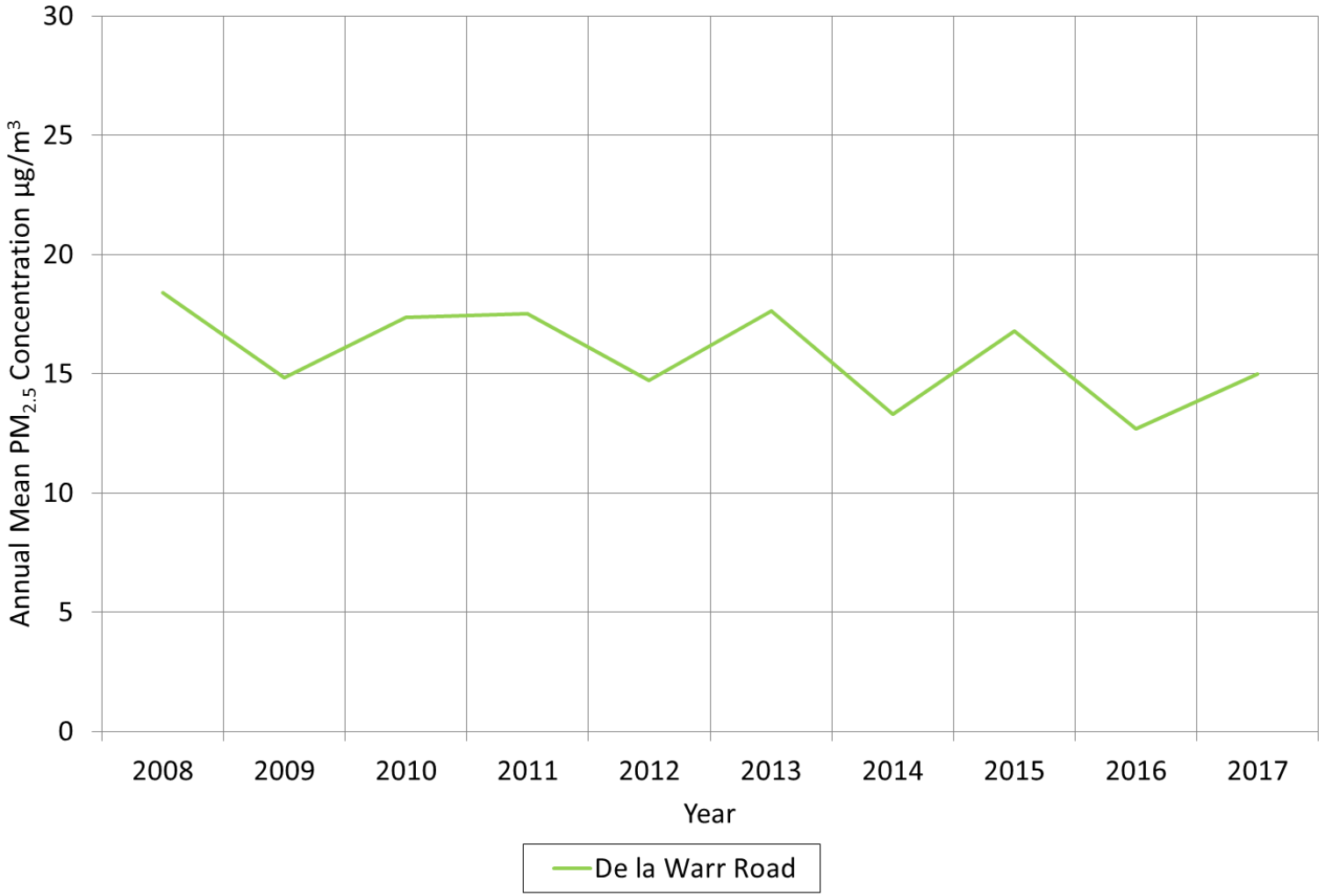


Table A.8 – Annual Mean O_3 Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	O_3 Annual Mean Concentration (µg/m^3) (3)				
				2013	2014	2015	2016	2017
RY1	Rural	94.2	94.2	51	57	-	55 (3)	54

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

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

(3) All means have been "annualised" as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.9 – Running 8-Hour Mean O_3 Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	Days With O_3 Running 8-Hour Means > 100 µg/m^3				
				2013	2014	2015	2016	2017
RY1	Rural	94.2	94.2	**12**	2	-	**17**	**24**

Notes: Exceedances of the O_3 running 8-hour mean objective (100 µg/m^3 not to be exceeded more than 10 days/year) are shown in **bold.**

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.90) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT2	25.4	24.5	18.8	24.3	20.8	18.1	14.1	26.8	17.1	19.8	29.3	21.6	21.7	19.5	13.5
DT3		41.0		45.2	45.2	44.0	30.8	44.8			47.9	36.4	41.9	39.1	14.5
DT4	26.0	22.6	22.1	23.9	20.6	25.4	19.4	23.7	23.1	24.0	29.4	25.4	23.8	21.4	11.0
DT5	34.0	32.0	32.7		29.7	31.6	24.7	30.7	28.6		29.4	24.1	29.7	26.7	11.2
DT7	34.2	27.9	24.0	23.4	20.6	20.3	15.7	20.8	20.6	20.1	28.8	26.3	23.6	21.2	16.3
DT8	35.1	25.7	23.8		21.6	21.6	18.9	19.6	21.3	21.0	25.7	19.7	23.1	20.8	14.9
DT9	42.0		23.8	31.1	18.6	30.0	25.2	29.5	31.3	25.5	34.9	24.4	28.7	25.8	12.1
DT10	24.8	16.6	14.2	15.4	13.0	13.8	11.7	12.9	11.5	13.7	20.8	16.8	15.4	13.9	10.5
DT12	49.0	33.5	33.0	39.7	36.1	33.3	30.3	34.4	39.3	31.6	41.5	28.8	35.9	32.3	23.7
DT13	23.1	17.9	14.4	13.7	12.5	11.6	9.9	10.6	10.2	13.1	17.9	16.2	14.3	12.9	12.9
DT14	42.4	32.9	29.1	31.5	29.4	29.9	29.0	30.6	34.9	32.3	41.7	31.7	32.9	29.6	19.3
DT16	26.8	21.2	19.5	16.4	16.7	15.7	14.7	15.7	16.3	17.0	24.8	20.4	18.8	16.9	16.9
DT17	26.6	18.3	14.6	14.1	15.4	13.6	11.2	23.2	11.0	13.8	20.2	18.3	16.7	15.0	15.0
DT19					24.2	24.5	21.7	24.8	23.5	26.6	30.7	28.6	25.6	26.7	26.7
DT21			39.0	39.5	41.1	40.0	34.3	42.6	37.8	37.4	42.8	33.7	38.8	34.9	29.0

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.90) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT22	45.0	27.3	30.7	33.5	34.4	32.4	24.0		29.7	25.6	36.1	35.5	32.2	29.0	24.8
DT25	39.7	32.8	35.0	37.8	31.3	33.2	23.7	28.6	29.6	29.4	38.3	36.5	33.0	29.7	17.7
DT27	37.3	27.4	23.7	23.6	24.1	21.6	16.3	18.7	18.6	23.1	31.1	32.4	24.8	22.3	15.8
DT28	27.2	25.0	21.5	22.1	23.5	24.0	16.5	20.5	19.2	20.8	32.7		23.0	20.7	15.1
DT29	38.8	23.3	22.5	22.3	23.1	23.7	17.2	20.1	19.3	21.5	32.1	32.2	24.7	22.2	15.8
DT30	35.0	26.2		23.7	22.8	21.7	19.7	23.2	25.5	31.7	37.7	31.9	27.2	24.5	24.5
DT31			28.1	33.8	25.6	28.7	23.4	26.9	25.4	25.8	33.1	31.2	28.2	25.4	16.9

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

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

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

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

Diffusion Tube Bias Adjustment Factors

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under-reading ambient concentrations, thereby allowing a correction to be made.

Rother District Council has a co-location of triplicate diffusion tubes alongside the automatic continuous analyser at De La Warr Road, Bexhill. In 2017, data capture at the continuous monitoring site was almost 100% and therefore sufficient to allow a valid local bias adjustment factor[9] to be derived. The local bias adjustment factor was calculated to be 0.90. Figure 1 shows the calculation for the local bias adjustment factor.

Figure 1: Local Diffusion Tube Bias Adjustment Factor for Rother District Council in 2017.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		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 Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	06/01/2017	01/02/2017	37.3	27.2	38.8	34	6.3	18	15.7	37.7	95.8	Good	Good
2	01/02/2017	28/02/2017	27.4	25.0	23.3	25	2.0	8	5.1	23.6	99.7	Good	Good
3	28/02/2017	29/03/2017	23.7	21.5	22.5	23	1.1	5	2.7	20.9	99.7	Good	Good
4	29/03/2017	26/04/2017	23.6	22.1	22.3	23	0.8	3	2.0	21.8	99.9	Good	Good
5	26/04/2017	31/05/2017	24.1	23.5	23.1	24	0.5	2	1.2	19.4	99.9	Good	Good
6	31/05/2017	28/06/2017	21.6	24.0	23.7	23	1.3	6	3.3	17.6	99.3	Good	Good
7	28/06/2017	03/08/2017	16.3	16.5	17.2	17	0.5	3	1.2	14.2	99.8	Good	Good
8	03/08/2017	31/08/2017	18.7	20.5	20.1	20	1.0	5	2.4	15.0	98.7	Good	Good
9	31/08/2017	27/09/2017	18.6	19.2	19.3	19	0.4	2	1.0	18.9	99.8	Good	Good
10	27/09/2017	02/11/2017	23.1	20.8	21.5	22	1.2	5	2.9	20.0	100.0	Good	Good
11	02/11/2017	07/12/2017	31.1	32.7	32.1	32	0.8	3	2.0	29.3	99.6	Good	Good
12	07/12/2017	02/01/2018	32.4		32.2	32	0.2	1	1.5	24.7	99.5	Good	Good
13													

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

Overall survey --> Good precision

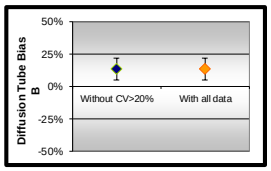
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.9 (0.84 - 0.97)
Bias B	11% (3% - 20%)
Diffusion Tubes Mean:	24 µgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	22 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	22 (21 - 24) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.9 (0.84 - 0.97)
Bias B	11% (3% - 20%)
Diffusion Tubes Mean:	24 µgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	22 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	22 (21 - 24) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

[9] Defra (2017), Local bias adjustment calculator, available at: https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html

A national bias adjustment factor was also considered for use, obtained from the national database of bias adjustment factors (version 09/18)[10]. Figure 2 shows the national bias adjustment factor for the same laboratory (Gradko) and tube preparation method (20% TEA in water) used by Rother District Council. The national bias adjustment factor is 0.87.

Figure 2: National Diffusion Tube Bias Adjustment Factor for Rother District Council in 2017.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 09/18

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of March 2019

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in **blue** at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop- up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2017	UB	Bracknell Forest Borough Council	11	19	16	23.0%	G	**0.81**
Gradko	20% TEA in water	2017	R	Bracknell Forest Borough Council	12	47	39	21.7%	G	**0.82**
Gradko	20% TEA in water	2017	R	Brighton & Hove City Council	11	51	50	1.6%	G	**0.98**
Gradko	20% TEA in water	2017	R	Wokingham Borough Council	11	39	37	4.6%	G	**0.96**
Gradko	20% TEA in water	2017	UC	Southampton City Council	11	31	29	5.3%	G	**0.95**
Gradko	20% TEA in water	2017	R	Preston City Council	12	31	26	23.3%	G	**0.81**
Gradko	20% TEA in water	2017	R	Monmouthshire County Council	9	42	33	26.6%	G	**0.79**
Gradko	20% TEA in water	2017	R	Cheshire West and Chester	11	36	36	1.4%	G	**0.99**
Gradko	20% TEA in water	2017	UI	Crawley Borough Council	12	28	28	-1.2%	G	**1.01**
Gradko	20% TEA in water	2017	R	Borough Council of King's Lynn & West Norfolk	12	29	25	16.0%	G	**0.86**
Gradko	20% TEA in water	2017	R	Bath & North East Somerset	12	45	45	-0.2%	G	**1.00**
Gradko	20% TEA in water	2017	R	NOTTINGHAM CITY COUNCIL	12	38	41	-6.6%	G	**1.07**
Gradko	20% TEA in water	2017	R	Lancaster City Council	12	35	32	9.7%	G	**0.91**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	12	54	52	3.3%	S	**0.97**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	11	35	33	7.0%	G	**0.93**
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	9	33	29	14.3%	G	**0.87**
Gradko	20% TEA in water	2017	UB	Thurrock Borough Council	11	30	28	8.0%	S	**0.93**
Gradko	20% TEA in water	2017	R	Dudley MBC	12	50	50	0.8%	G	**0.99**
Gradko	20% TEA in water	2017	UB	Dudley MBC	12	24	19	26.6%	G	**0.79**
Gradko	20% TEA in water	2017	R	City of Lincoln Council	12	42	31	33.2%	G	**0.75**
Gradko	20% TEA in water	2017	R	Gedling Borough Council	12	35	31	10.1%	G	**0.91**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	36	37	-2.7%	G	**1.03**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	29	25	17.5%	G	**0.85**
Gradko	20% TEA in water	2017	R	Gateshead Council	12	34	35	-5.3%	G	**1.06**
Gradko	20% TEA in water	2017	R	LB Hounslow	12	65	54	22.2%	G	**0.82**
Gradko	20% TEA in water	2017	R	LB Hounslow	12	59	53	10.6%	G	**0.90**
Gradko	20% TEA in water	2017	B	LB Hounslow	11	28	30	-6.0%	G	**1.06**
Gradko	20% TEA in water	2017	R	LB Hounslow	11	43	34	28.8%	G	**0.78**
Gradko	20% TEA in water	2017	B	LB Hounslow	9	38	33	14.9%	G	**0.87**
Gradko	20% TEA in water	2017	R	LB Hounslow	11	52	42	24.4%	G	**0.80**
Gradko	20% TEA in water	2017	UB	Liverpool	11	20	17	15.2%	G	**0.87**
Gradko	20% TEA in water	2017	R	North Ayrshire Council	12	26	21	23.2%	G	**0.81**
Gradko	20% TEA in water	2017	R	South Gloucestershire Council	12	25	23	10.3%	G	**0.91**
Gradko	20% TEA in water	2017	KS	Marylebone Road Intercomparison	12	101	79	28.6%	G	**0.78**
Gradko	20% TEA in water	2017	R	Ards and North Down Borough Council	11	40	25	59.2%	G	**0.63**
Gradko	20% TEA in water	2017	UC	Belfast City Council	12	32	25	27.5%	G	**0.78**
Gradko	20% TEA in water	2017	R	Lisburn & Castlereagh City Council	12	41	27	51.9%	G	**0.66**
Gradko	20% TEA in water	2017	R	The Highland Council	11	24	21	15.1%	G	**0.87**
Gradko	20% TEA in water	2017	R	The Highland Council	10	36	39	-7.9%	G	**1.09**
Gradko	20% TEA in water	2017		**Overall Factor[3] (39 studies)**				Use		**0.87**

Discussion of Choice of Factor to Use

In 2017, it was possible to derive a local bias adjustment factor as well as the national bias adjustment factor obtained from the national database. Both the locally-derived and national bias adjustment factors were very similar in 2017, and so on the basis of applying a more conservative factor to raw diffusion tube concentrations, and

[10] Defra (2017), National bias adjustment factor database, available at: https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

the fact that the local factor is more appropriate to use when available and more likely to take into account effects local to the District, the local bias factor of 0.90 was used.

PM Monitoring Adjustment

The PM_{10} data from the TEOM continuous analyser at De La Warr Road (RY2) has been corrected using the volatile correction model[11] (VCM) to ensure gravimetric equivalence.

Short-term to Long-term Data Adjustment

Data capture for the DT3 A2100 Beauport Park diffusion tube site in 2017 was 67%, and so annualisation was carried out using data from three continuous NO_2 analysers in background sites within 50 miles: Eastbourne – Holly Place (EB3), Lullington Heath (LH), and Brighton Preston Park (BRT3), which had 99%, 98% and 98% data capture, respectively. The periods used in the annualisation calculation were February, April – August, November – December. The average ratio of the annual mean to the period mean is the adjustment factor used. The details of this adjustment calculation are given in Table C.2.

Table C.1 – Period Adjustment of 2017 NO_2 Data for DT3 (A2100 Beauport Park) diffusion tube monitoring site.

Site ID	Annual Mean Concentration (µg/m^3)	Period Mean Concentration (µg/m^3)	Annual Mean to Period Mean Ratio
EB3	12.2	11.5	1.06
LH	7.6	7.4	1.03
BRT3	16.7	16.3	1.02
Average Ratio			1.04

Data capture for the DT19 Rye Cinque Ports Street diffusion tube site in 2017 was 67%, and so annualisation was carried out using data from three continuous NO_2 analysers in background sites within 50 miles: Eastbourne – Holly Place (EB3), Lullington Heath (LH), and Brighton Preston Park (BRT3), which had 99%, 98% and 98% data capture, respectively. The period used in the annualisation calculation was

[11] King's College London Volatile Correction Model. Information available at: http://www.volatile-correction-model.info/

May – December. The average ratio of the annual mean to the period mean is the adjustment factor used. The details of this adjustment calculation are given in Table C.2.

Table C.2 – Period Adjustment of 2017 NO_2 Data for DT19 (Rye Cinque Ports Street) diffusion tube monitoring site.

Site ID	Annual Mean Concentration (µg/m^3)	Period Mean Concentration (µg/m^3)	Annual Mean to Period Mean Ratio
EB3	12.1	10.2	1.19
LH	7.6	6.5	1.18
BRT3	16.7	15.2	1.10
Average Ratio			1.16

QA/QC of Automatic Monitoring

As previously described in Section 2.1, monitoring stations within East Sussex are part of the SAQMN and, therefore, measurements made at these sites are traceable to national standards and operational procedures defined for the regional network.

QA/QC of Diffusion Tube Monitoring

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme.

Rother District Council used Gradko International for the supply and analysis of diffusion tubes, with a 20% triethanolamine (TEA) in water preparation. In all of the 8 most recent AIR PT testing rounds running from September 2016 until August 2018, Gradko achieved 100% satisfactory results, so there is high confidence in the accuracy of the diffusion tube results.

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

Figure D.1 – Monitoring Locations in Rother District – Overview

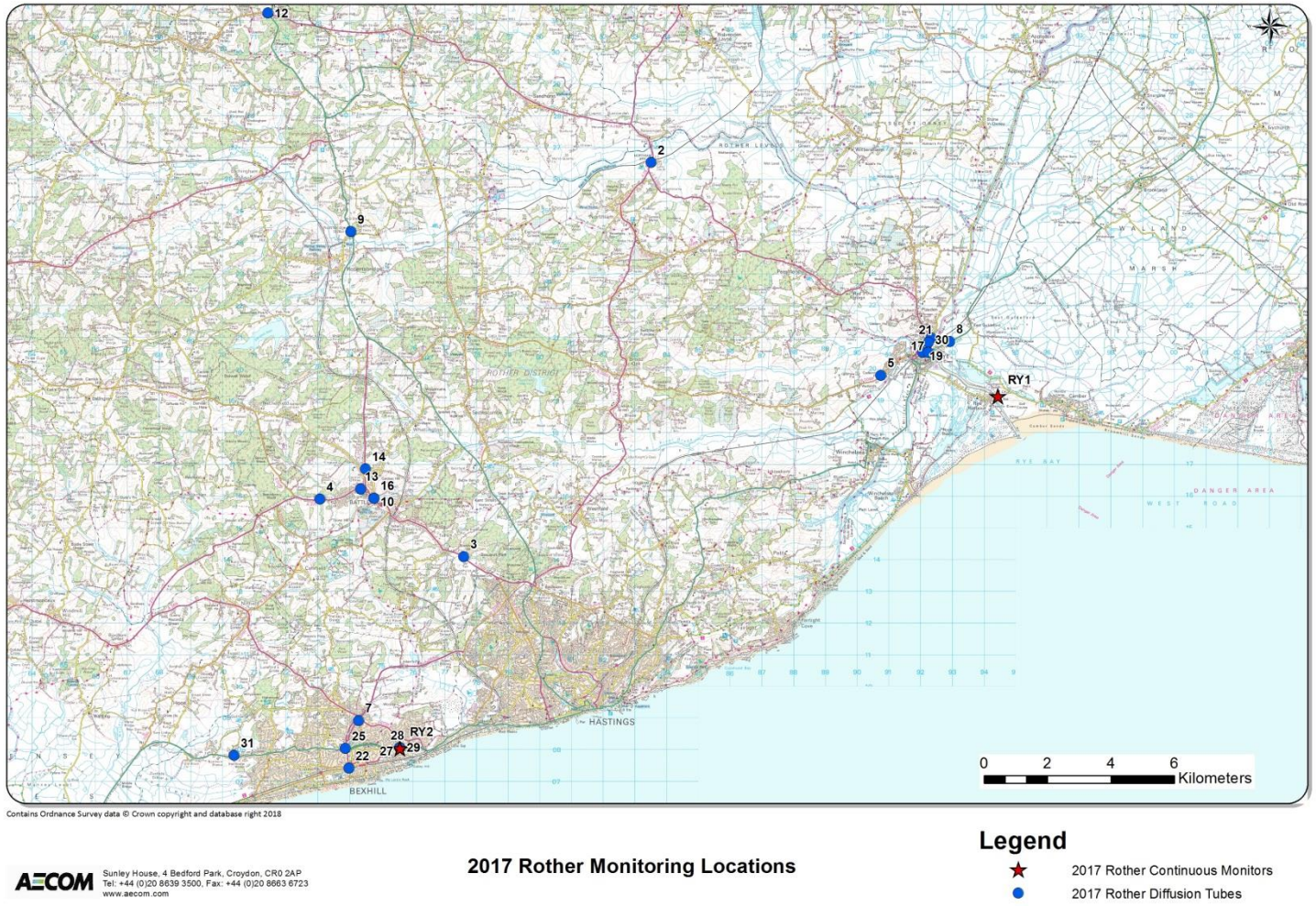


Figure D.2 – Monitoring Locations in Rother District – Rye

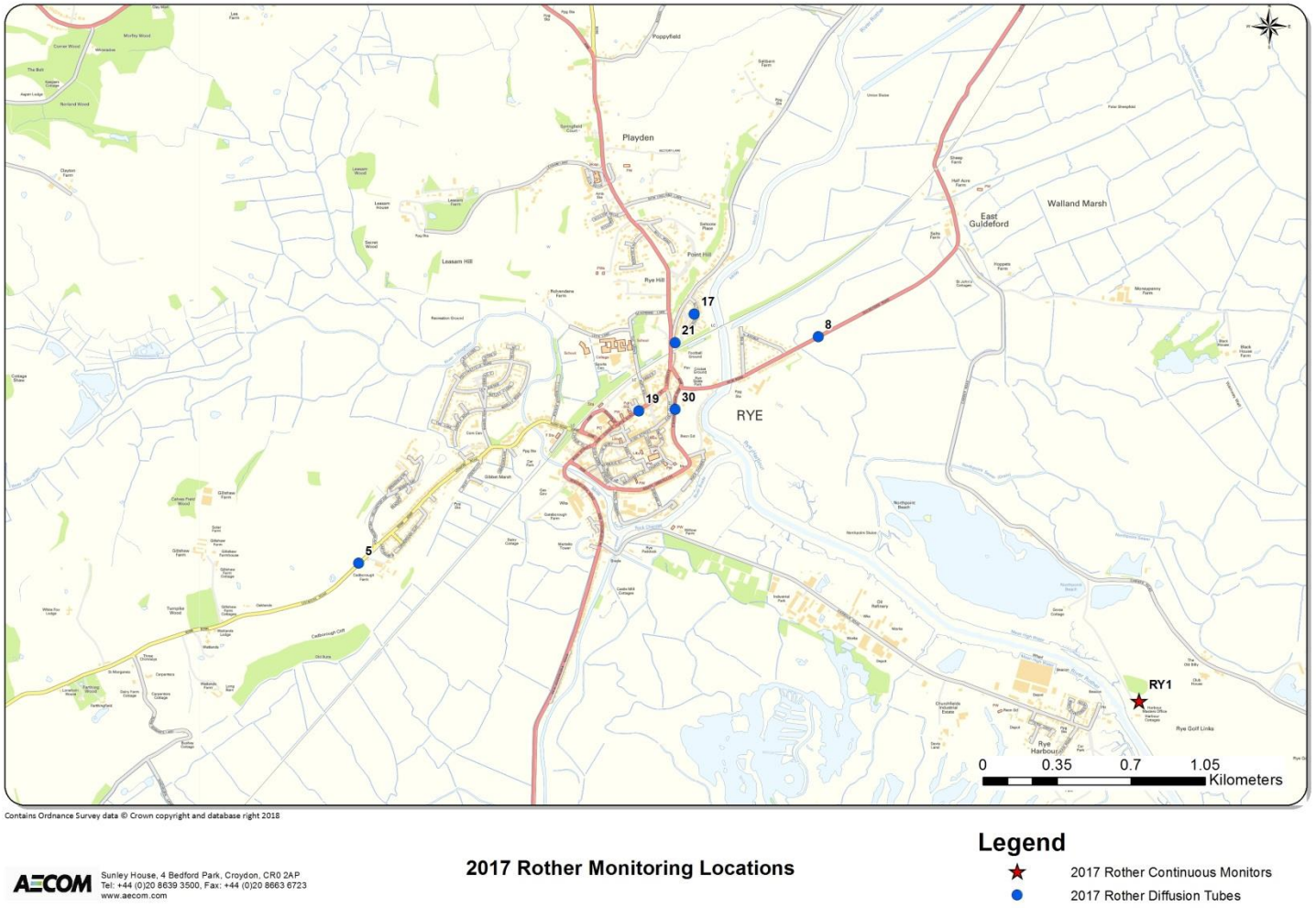


Figure D.3 – Monitoring Locations in Rother District – Battle and Bexhill

AECOM
Sunley House, 4 Bedford Park, Croydon, CR0 2AP
Tel: +44 (0)20 8639 3500, Fax: +44 (0)20 8663 6723
www.aecom.com

2017 Rother Monitoring Locations

Legend

- 2017 Rother Continuous Monitors
- 2017 Rother Diffusion Tubes

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[12]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[12] 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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
CIL	Community Infrastructure Levy
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 (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

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4. 2017 Rother District Annual Status Report (ASR), available at: http://www.rother.gov.uk/article/193/Air-Quality
5. Sussex Air Quality Partnership Air Quality Strategic Plan 2010 http://www.sussex-air.net/Reports/SAQP_Vision_Strategy_2015.pdf
6. Rother District Council, Hastings Borough Council. Wealden District Council and Eastbourne Borough Council (2009). Appropriate Assessment and Air Quality Local to the Pevensey Levels Ramsar Site. Available at: http://www.wealden.gov.uk/nmsruntime/saveasdialog.aspx?lID=14305&sID=5509
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9. Defra (2017), Local bias adjustment calculator, available at: https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html
10. Defra (2017), National bias adjustment factor database, available at: https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
11. King's College London Volatile Correction Model. Information available at: http://www.volatile-correction-model.info/