



**2018 Air Quality Annual
Status Report (ASR):
Medway Council**

June 2018



Experts in air quality
management & assessment

Document Control

Client	Medway Council	Principal Contact	Stuart Steed
---------------	----------------	--------------------------	--------------

Job Number	J2572
-------------------	-------

Report Prepared By:	Nicole Holland and Dr Clare Beattie
----------------------------	-------------------------------------

Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J2572C/1/F2	28 June 2018	Final	Penny Wilson (Associate Director)

This report has been prepared by Air Quality Consultants Ltd on behalf of the Client, taking into account the agreed scope of works. Unless otherwise agreed, this document and all other Intellectual Property Rights remain the property of Air Quality Consultants Ltd.

In preparing this report, Air Quality Consultants Ltd has exercised all reasonable skill and care, taking into account the objectives and the agreed scope of works. Air Quality Consultants Ltd does not accept any liability in negligence for any matters arising outside of the agreed scope of works. The Company operates a formal Quality Management System, which is certified to ISO 9001:2008, and a formal Environmental Management System, certified to ISO 14001:2015. R15.

When issued in electronic format, Air Quality Consultants Ltd does not accept any responsibility for any unauthorised changes made by others.

When printed by Air Quality Consultants Ltd, this report will be on Evolve Office, 100% Recycled paper.

Air Quality Consultants Ltd
23 Coldharbour Road, Bristol BS6 7JT Tel: 0117 974 1086
119 Marylebone Road, London NW1 5PU Tel: 020 3873 4780
aqc@aqconsultants.co.uk

Registered Office: 23 Coldharbour Road, Bristol BS6 7JT
 Companies House Registration No: 2814570

Medway 2018 Air Quality Annual Status Report (ASR)

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

Executive Summary: Air Quality in Our Area

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environmental Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) and the relevant Policy and Technical Guidance documents.

This document is Medway Council's Annual Status Report (ASR). Results from monitoring undertaken by the Council are presented and sources of air pollution are identified. The 2018 ASR determines those changes since the last ASR that could lead to the risk of an air quality objective being exceeded.

Following the outcome of the 2016 ASR and a subsequent Detailed Assessment, an AQMA ('Four Elms Hill AQMA') was declared on 1st November 2017 for exceedances of the annual mean nitrogen dioxide objective; this AQMA covers part of Four Elms Hill, Chattenden, including the properties adjacent to parts of Four Elms Hill (A228), Main Road (A228) and Peninsula Way (A228).

This ASR confirms that nitrogen dioxide concentrations continue to exceed the annual mean objective at some locations within Medway. In 2017, the (distance corrected) exceedances of the objective mostly occurred adjacent to the roads covered by the 'Central Medway' Air Quality Management Area (AQMA), with exceedances also occurring within the 'Four Elms Hill' AQMA and adjacent to the roads covered by the 'Gillingham' and 'Rainham' AQMAs, therefore, it is judged that these AQMAs should remain.

A number of new emissions sources became present during 2017, however, there are no significant changes to the dominant source of emissions within Medway, which is major roads.

Air Quality in Medway

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}.

It has been estimated that poor air quality in the UK causes more than 50,000 deaths per year, and probably causes more mortality and morbidity than passive smoking, road traffic accidents or obesity. Particulate pollution alone in the UK has been estimated to reduce the life expectancy of every person by an average of 7 – 8 months, with estimated equivalent health costs of up to £20

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

billion each year. Latest estimates from Public Health England suggest that in Medway there are 125 deaths each year attributable to particulate pollution³.

Medway Council is a unitary authority which is situated in Kent in the South East of England. It is the largest single conurbation in the southeast, outside of London, and serves a population of approximately 280,000 people. The area is predominantly urban and includes the towns of Chatham, Gillingham, Rainham, Rochester and Strood. It also includes industrial areas and port facilities, including Thamesport and the Hoo Peninsula.

Medway is recognised as part of the developing Thames Gateway Region, and is an area of significant regeneration. It is well served by transport links to London by the M2 motorway and the A2 trunk road. A network of subsidiary routes connects with other towns and small centres of population across Kent. The north Kent rail link connects Medway to London and the south coast, and the Channel Tunnel Rail Link passes through the district.

The main source of air pollution in the district is road traffic emissions from major roads, notably the M2, A2, A228, A229, A230 and A289. Medway suffers from significant congestion, particularly in the town centres. Other pollution sources, including commercial, industrial and domestic sources, also contribute to background pollution concentrations.

Nitrogen dioxide is the main pollutant of concern within Medway, with concentrations of all other pollutants measured being below the relevant objectives. In 2017 exceedances of the annual mean nitrogen dioxide objective were measured at 14 monitoring sites (eight when distance corrected to represent relevant exposure). All exceedances measured were at sites located adjacent to the roads covered by an AQMA. A weak trend of decreasing measured concentrations of nitrogen dioxide is apparent at most sites from 2011 to 2017.

Medway has declared four AQMAs (Central Medway AQMA, High Street, Rainham AQMA, Pier Road, Gillingham AQMA and Four Elms Hill, Chattenden AQMA), all for exceedances of the annual mean nitrogen dioxide objective. Further details of these AQMAs are available at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=157. Medway Council has developed an Air Quality Action Plan (AQAP)⁴, which includes measures to improve the air quality within Medway. In December 2017 Medway Council also adopted the Medway Air Quality Communications Strategy; this plan details a series of recommended communications activities and is designed to support Medway AQAP.

Medway Council largely manages air quality within its area through the Medway Local Plan (2003) Policy BNE24 'Air Quality', to ensure that new developments do not exacerbate existing air quality

³ Medway Health and Wellbeing Board report, Air Quality Update, 20 February 2018

⁴ Medway Air Quality Action Plan (2015) is available at https://www.medway.gov.uk/downloads/file/1982/medway_air_quality_action_plan_2015.

issues. The Council also uses the technical guidance document 'Medway Air Quality Planning Guidance', issued by the Council in 2016, to deal with planning applications that could impact air quality. Additionally, the Council works to manage local air quality through the implementation of the Medway AQAP and supporting Medway Air Quality Communications Strategy. Medway Council is also working with Public Health colleagues to prioritise action on air quality in its area to help reduce the health burden from air pollution.

Actions to Improve Air Quality

The Medway AQAP sets out a list of measures that Medway Council will implement to improve air quality within Medway. Medway Council has taken forward measures during the current reporting year of 2017 in pursuit of improving local air quality. Since the last ASR (2017) the following measures have been completed:

- Measure No. 1: 'Review Regional Freight Strategy'; and
- Measure No. 29: 'Develop an Air Quality Communications Strategy with Public Health'.

A key action taken by Medway Council to improve air quality since the last ASR (2017) is the development and adoption in December 2017 of the Medway Air Quality Communication Strategy. The Strategy is designed to provide support in achieving the aims of the Medway AQAP (2015) through stimulating changes in the way people and organizations view air pollution. The Strategy includes three key Objectives and a number of key messages and details a series of recommended communications activities to increase the awareness of the health impacts of air pollution amongst identified key stakeholders and specific local groups affected by air pollution.

The Medway Air Quality Planning Guidance aims to improve air quality by taking a positive lead to incentivise and accelerate the uptake of electric vehicles. As such, certain developments coming forward through the planning process are now required to install charging points as standard air quality mitigation, providing local charging infrastructure for those living and working in Medway.

Medway Council intends to implement further measures to improve air quality within Medway in the future. These include measures that aim to improve Medway's air quality through freight and delivery management, transport planning and infrastructure, improving vehicle fleet efficiency, promoting travel alternatives, promoting low emission transport, traffic management, promoting travel alternatives and alternatives to private vehicle use, policy, guidance and development control and public information.

Since the last ASR reduction in pollutant emissions as a result of individual measures have been estimated to be between <1% and 10%, where estimates are possible.

Conclusions and Priorities

Many challenges still lie ahead for Medway Council in terms of making a positive contribution to improving air quality. Whilst a weak trend of decreasing measured concentrations of nitrogen dioxide is apparent at most sites from 2011 to 2017, monitoring results for 2017 demonstrate that air quality within Medway continues to exceed the annual mean nitrogen dioxide objective at some locations adjacent to roads covered by the four AQMAs currently declared. Although, it should be noted that measured pollutant concentrations remain below the national objectives at all monitoring sites located outside the declared AQMAs (when distance-corrected to represent relevant exposure), and numerous sites within them. No changes to the number and / or extent of the AQMAs currently declared are recommended.

Road transport is the dominant source of pollution within Medway's AQMAs, and reducing road traffic emissions is, therefore, the key air quality priority. Another significant challenge is accommodating the large demand for development in Medway. This is likely to put existing areas of poor air quality under additional pressure, and could negate the actions that the Council is implementing to improve air quality. For this reason, continuing the implementation of the Medway Air Quality Planning Guidance is a high priority, prior to the adoption of a new Local Plan for Medway (currently under development).

Medway Council's priorities for the coming year are to continue with the work on the measures outlined in the AQAP.

Whilst local authorities have a key role to play in delivering air quality improvements, further support is needed with regards to national and international policies to effect the necessary behavioral change, and reduce vehicle emissions, for example through taking action to ensure the implementation of effective emission control systems, accelerated fleet renewal and the rebalancing of the UK vehicle fleet as a whole towards cleaner technologies.

Local Engagement and How to Get Involved

Medway Council has recently developed the Medway Air Quality Communication Strategy, which the Council uses to manage local engagement (as discussed above) and to gauge the current level of public interest and understanding of air quality.

Members of the public can help to improve air quality in Medway by using sustainable transport options, such as walking cycling and using public transport. Medway Council encourages people to car share whenever possible, and the Council has a database for commuter car sharing (<https://liftshare.com/uk/community/medway>).

Further information on local air quality can be obtained from the Kent Air website (<http://www.kentair.org.uk/>).

Contents

1	Local Air Quality Management	8
2	Actions to Improve Air Quality	9
3	Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	37
4	Appendices	42

Tables

Table 2.1:	Declared Air Quality Management Areas	10
Table 2.2:	Progress on Measures to Improve Air Quality Contained within the Air Quality Action Plan (2015)	15
Table A1.1:	Details of Automatic Monitoring Sites	43
Table A1.2:	Details of Non-Automatic Monitoring Sites	44
Table A1.3:	Annual Mean NO ₂ Monitoring Results	48
Table A1.4:	1-Hour Mean NO ₂ Monitoring Results	51
Table A1.5:	Annual Mean PM ₁₀ Monitoring Results	51
Table A1.6:	24-Hour Mean PM ₁₀ Monitoring Results	53
Table A1.7:	PM _{2.5} Monitoring Results	55
Table A1.8:	SO ₂ Monitoring Results	57
Table A2.1:	NO ₂ Monthly Diffusion Tube Results for 2017	58
Table A3.1:	Changed / Additional Pollutant Sources in 2017	61
Table A3.2:	Local Bias Adjustment Factor Calculation	64
Table A3.3:	Rochester Stoke Annualisation Factors	65
Table A3.4:	Southend-on-Sea Annualisation Factors	66
Table A3.5:	London Bexley Annualisation Factors	67
Table A3.6:	Average Annualisation Factors	67
Table A5.1:	Air Quality Objectives in England	75

Figures

Figure 3.1:	Trends in Measured Annual Mean Nitrogen Dioxide Concentrations at Medway Automatic Monitoring Sites	39
Figure 3.2:	Trends in Measured Annual Mean PM ₁₀ Concentrations	40

Figure 3.3: Trends in Measured Annual Mean PM_{2.5} Concentrations..... 41

Figure A1.1: Trends in Annual Mean NO₂ Concentrations 50

Figure A1.3: Trends in Annual Mean PM₁₀ Concentrations..... 52

Figure A1.4: Trends in Number of 24-Hour Mean PM₁₀ Results > 50 µg/m³ 54

Figure A1.5: Trends in Annual Mean PM_{2.5} Concentrations 56

Figure A4.1: Map of Automatic Monitoring Sites and AQMA Locations within Medway. 69

Figure A4.2: Map of Diffusion Tube Monitoring Site within Medway (North)..... 70

Figure A4.4: Location of Monitoring Sites within Central Medway AQMA 71

Figure A4.5: Location of Monitoring Sites within Gillingham AQMA 72

Figure A4.6: Location of Monitoring Sites within Rainham AQMA..... 73

Figure A4.7: Location of Monitoring Sites within Four Elms Hill AQMA..... 74

1 Local Air Quality Management

- 1.1 This report provides an overview of air quality in Medway during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) (HMSO, 1995) and the relevant Policy and Technical Guidance documents.
- 1.2 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 Medway Council to improve air quality and any progress that has been made.
- 1.3 The statutory air quality objectives applicable to LAQM in England can be found in Table A5.1 in Appendix A5.

2 Actions to Improve Air Quality

Air Quality Management Areas

- 2.1 AQMAs are declared when there is an exceedance of an air quality objective. After declaration, the authority must prepare an AQAP within 12 months, setting out measures it intends to put in place in pursuit of compliance with the objectives.
- 2.2 A summary of AQMAs declared by Medway Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/agma/local-authorities?la_id=157. Alternatively, see Appendix A4, which includes a map of air quality monitoring locations in relation to the AQMAs.

Table 2.1: Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by HE ^a ?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Central Medway AQMA	29/06/2010	NO ₂ annual mean	Rochester	A large central AQMA which includes the previous AQMAs of Frindsbury Road, Cuxton Road, Strood Centre, Rochester Centre and Chatham Centre which have been slightly extended, but also includes the new areas of Luton Road, Chatham, High Street, Chatham and Rainham Road, Chatham.	YES	58.4 ^b / 62.1 ^c	µg/m ³	51.0 (51.0 ^d)	µg/m ³	Air Quality Action Plan 2015	15/12/2015	https://www.medway.gov.uk/downloads/file/1982/medway-air-quality-action-plan-2015
Rainham AQMA	29/06/2010	NO ₂ annual mean	Rainham	An area running along the High Street in Rainham.	YES	52.9 ^b / 48.0 ^c	µg/m ³	45.4 (45.4 ^d)	µg/m ³			
Gillingham AQMA	29/06/2010	NO ₂ annual mean	Gillingham	An area along Pier Road in Gillingham	YES	52.7 ^b / 52.9 ^c	µg/m ³	42.9 (42.2 ^d)	µg/m ³			

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by HE ^a ?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Four Elms Hill AQMA	01/11/2017	NO ₂ annual mean	Chattenden	Part of Four Elms Hill, Chattenden	YES	52.0 ^e / 48.3 ^f	µg/m ³	50.8 (41.2 ^d)	µg/m ³	An AQAP to support the Four Hills AQMA has not yet been developed by Medway Council. Preparation of a new AQAP is anticipated to commence in 2018/19 in conjunction with the development of the new Medway Local Plan.		

^a Highways England.

^b Value presented is the maximum concentration measured within the AQMA as presented in Medway Council's 'Further Assessment of Air Quality for Central, Rainham and Gillingham AQMAs, 2011' document (i.e. based on 2009 data). It should be noted that these values have not been distance corrected.

^c Value presented is the maximum concentration modelled within the AQMA as presented in Medway Council's 'Further Assessment of Air Quality for Central, Rainham and Gillingham AQMAs, 2011' document.

^d Distance corrected to represent relevant exposure.

^e Value presented is the maximum concentration measured within the AQMA as presented in Air Quality Consultants Ltd. 'Detailed Assessment of Air Quality at Four Elms Hill, Chattenden' for Medway Council (2016) (i.e. based on 2015 data). It should be noted that these values have not been distance corrected.

^f Value presented is the maximum concentration modelled at a sensitive receptor within the AQMA as presented in Air Quality Consultants Ltd. 'Detailed Assessment of Air Quality at Four Elms Hill, Chattenden' for Medway Council (2016) (i.e. based on 2015 data).

Medway Council confirm the information on UK-Air regarding their AQMAs is up to date, with the exception of the link to the current AQAP.

Progress and Impact of Measures to address Air Quality in Medway

AQAP Measures

- 2.3 Medway 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, as part of the AQAP (2015), are set out in Table 2.2. Further details on these measures can be found in the AQAP.
- 2.4 Two key measures as set out by the AQAP have recently been completed:
- Measure No. 1: 'Review Regional Freight Strategy'. This included the development, with Kent County Council, of a draft revised regional Freight Action Plan and tackling the movement of freight through the Medway draft Network Management Plan 2017 – 2020; and
 - Measure No. 29: 'Develop an Air Quality Communications Strategy with Public Health'. A communications strategy has now been produced and is to be launched in 2018.
- 2.5 The completion of Measure No. 29 (to develop an Air Quality Communications Strategy with Public Health) is considered to be a key action taken by Medway Council in 2017, and its implementation will be important in future years. The Strategy is designed to provide support in achieving the aims of the Medway AQAP (2015) through stimulating changes in the way people and organizations view air pollution. The Strategy includes three key Objectives⁵ and a number of key messages and details a series of recommended communications activities to increase the awareness of the health impacts of air pollution amongst identified key stakeholders and specific local groups affected by air pollution. The development of the Strategy included a review of existing campaigns and assets, research and best practice regarding communicating with the public, an online survey and a resident engagement day. Implementation of the Strategy is due to commence in June 2018 with 'Clean Air Day' and will be focused around the 'KentAir' and 'Care for Air Kent & Medway' websites, with a focus on increasing subscribers to the free pollution forecast service (sign-up via the KentAir website), particularly amongst vulnerable groups.
- 2.6 Medway Council does not expect any of the specific measures set out in the AQAP to be completed over the course of the next reporting year, though progress should continue to be made on a number of on-going measures, with a focus on incorporating appropriate policies to support improving air quality within the Local Plan (currently under development). Other on-going measures include the following (see Table 2.2 for further details):

⁵ Objective 1: To increase awareness about air pollution and how our target audience can safeguard themselves from the harm it causes; Objective 2: To motivate people to improve the air quality in Medway; and Objective 3: To include air quality planning in future developments and strategies planned by Medway Council.

- Heavy Goods Vehicle (HGV) route optimisation;
- HGV Sat Nav review;
- monitor % HGVs through AQMAs;
- investigate the feasibility of a Quality Bus Partnership (or equivalent) with the local bus operator;
- increase proportion of Euro V, and subsequent (or equivalent) buses in fleet;
- increase bus patronage;
- improve bus flow and reliability;
- review taxi licensing conditions;
- annual audit of taxi fleet;
- annually report number and location of roadworks in or around AQMAs;
- report Annual Average Daily Traffic (AADT) annually;
- link Automatic Number Plate Recognition (ANPR) vehicle class data to provide detailed source apportionment to support feasibility study work;
- promoting and monitoring cycling and walking;
- develop and continue walk or cycle to school scheme and events;
- develop and continue healthy walk scheme and cycle scheme;
- increase Ultra-Low Emissions Vehicle (ULEV) component within Medway fleet;
- review of Medway Procurement Policy to ensure positive support for ULEV and third party emission reduction;
- develop and improve school travel plans;
- promote car sharing to reduce the number of trips;
- review and re-write relevant planning policies and develop a supplementary planning document to reflect this action plan and relevant and related corporate strategies;
- improve then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups' businesses, schools, public, vulnerable groups, members and internal managers;
- development of promotional material to support Eco-driving within businesses;

- set up AQAP Steering Group and book six monthly meetings with stakeholders;
- engage with business, internal members and managers as priority;
- integrate, where appropriate, AQAP target into internal service plans;
- identify corporate policies and strategies where consultation of changes is requested and notify accountable department; and
- develop business case for evaluation or quantification studies to take forward.

- 2.7 There are currently no AQAP measures that have overrun their estimated completion date (see Table 2.2 for further details).
- 2.8 There are a number of challenges and barriers to implementation that Medway Council anticipates facing, principle of which are funding / budget constraints, staff resources and a reliance on continued monitoring by DfT (see Table 2.2 for further details).
- 2.9 The measures discussed above and outlined in Table 2.2 will help to improve air quality within Medway, however, it is currently not known as to when compliance with the air quality objectives will be achieved within the four declared AQMAs.

Table 2.2: Progress on Measures to Improve Air Quality Contained within the Air Quality Action Plan (2015)

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	Review Regional Freight Strategy	Freight and Delivery Management	Other	Medway Council Integrated Transport and Kent County Council	2016	2017-2020	Completed or not	5%	Complete. Medway Council worked with Kent County Council on a draft revised regional Freight Action Plan (including Medway). Consultation and adoption was undertaken in 2017. Link to draft plan http://consultations.kent.gov.uk/consult.ti/freightactionplan/consultationHome . Movement of freight also tackled locally through the Medway draft Network Management Plan for 2017-2020. The draft plan aims to tackle road congestion, and performance indicators, such as journey times, traffic data, cycle count data, air quality monitoring data can be used as a means of measuring the plans impact against a baseline scenario.	2020	-
2	Heavy Goods Vehicle (HGV) route optimisation	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Medway Council Integrated Transport and Kent County Council	n/a	2017-2020. Ongoing for life of plans under no.1 above.	Completed or not	-	Ongoing. Tackled through no.1 above.	2020. Ongoing for life of plans under no.1 above.	-
3	HGV Sat Nav review	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Medway Council Integrated Transport and Kent County Council	n/a	2017-2020. Ongoing for life of plans under no.1 above.	Completed or not	-	Ongoing. Tackled through no.1 above.	2020. Ongoing for life of plans under no.1 above.	-

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
4	Monitor % HGV's through AQMA's	Freight and Delivery Management	Other	Medway Council Integrated Transport, DfT	n/a	Ongoing	Completed or not	-	HGV flows are not monitored by Medway Council. However, DfT data are available for a number of locations on the Medway road network, and includes locations within/near to AQMA's. The DfT data shows significant reductions in the % 's of HGV's in many areas of Medway, including in the Medway AQMA's. In contrast, the % of HGV's on the strategic M2 motorway have been increasing. Ongoing analysis of HGV traffic flow data could be used to determine effectiveness of no.1-3 above, and whether further intervention/review is required.	Ongoing	Relies on continued monitoring by DfT
5	Investigate the feasibility of a Quality Bus Partnership (or equivalent) with the local bus operator	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	Medway Council Integrated Transport	2018/19	2019/20	Completed or not	-	The Council does not have a formal Quality Bus Partnership, however all bus operators are signed up to a Punctuality Improvement Partnership, and regular bus operator meetings and roadworks meetings have continued. A wide range of issues are discussed at these meetings with regards to the efficient running of the local bus services. Following visits to other QMP meetings in Kent, the setting up of a QBP for Medway has been discussed with operators who are supportive of the principle. This continues to be investigated.	Unknown	Relies on support from local bus operator and Medway council.

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
6	Increase proportion of Euro V, and subsequent (or equivalent) buses in fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	Medway Council Integrated Transport	Ongoing	Unknown	Annual fleet status.	5%	2017 saw a number of local bus operators investing in and rolling out cleaner vehicles for operation in Medway: Arriva-Arriva (who operate approx 95% of all Medway services) introduced 28 new Euro 6 vehicles during 2017, with the total fleet comprising 23% Euro 6 and 32% Euro 5 ; ASD coaches 6 new Euro 6 mini buses to serve the Medway home to school transport routes and Medway motility services, 37% of the ASD fleet in 2017 was Euro 5 or better; NU Venture purchased a number of vehicles in 2017 that came retrofitted to Euro 5, and around 30% of the fleet was Euro 5 at the end of 2017 with more expected during 2018; Clarkes of London operated 11 vehicles in Medway in 2017 (All Euro V) which are expected to be replaced by the operator for Euro 6 vehicles by the end of the year; Kings Ferry operated 72 vehicles in Medway during 2017, consisting of 51% Euro 5 and 59% Euro 6. These changes in the bus fleets are positive, and the ongoing trend in replacement by the operators is to be monitored further to identify if intervention is necessary to accelerate renewal of the fleets. This may require external funding for new buses/retrofitting.	Ongoing	Operator investment budgets. External funding is likely to be required to support the smaller bus operators in renewal/refitting of their vehicle fleets.

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
7	Increase bus patronage	Promoting Travel Alternatives	Other	Medway Council Integrated Transport	Ongoing	Ongoing	Annual bus patronage figures	-	Bus patronage figures can fluctuate year to year for a variety of reasons. The last four financial years are: 2014/15 8,676,271; 2015/16 8,709,267; 2016/17 8,902,079, 2017/18 8,383,939. Despite increases over the 2014-2017 period, patronage fell back significantly during 2017/18. There could be a number of factors causing this fall, although patronage outside London fell by 3% over the last year. Factors thought to be behind this fall nationally include the rising car ownership of older persons, older persons qualification age for bus passes increasing, increasing cost of fares and increased competition from private hire vehicles. Locally within Medway there has been an unprecedented level of utility works on main corridors, and regeneration works (with more to come) which could have had an impact on the reliability of services. Arriva continue to promote of contactless fare payment for their services, and it is expected that this will be introduced in Medway in the coming year.	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
8	Improve bus flow and reliability	Transport Planning and Infrastructure	Bus route improvements	Medway Council Integrated Transport	Ongoing	Ongoing	Number of bus infrastructure improvements	-	Bus infrastructure improvements can have a complementary role in improving patronage by providing better stop facilities and improved information for passengers. The programme of bus stop infrastructure improvements continued during 2017, including new shelter and raised kerb boarders to make bus travel more attractive and speed up boarding times.	Ongoing	Reliant on continued budget provision for improvements to be made.
9	Review taxi licensing conditions	Promoting Low Emission Transport	Taxi Licensing conditions	Medway Council Licensing	2018/19	Unknown	Completed or not	-	The Medway Air Quality Steering Group have discussed how the lack of progress during 2016 can be addressed. The Environmental Protection Team have investigated further and have proposed that a Taxi ULEV Feasibility Study is carried out, and used as the basis for reviewing the Medway taxi licensing policy and conditions, and to identify what infrastructure is required to support operators. No budget is available currently to carry out the study, and the council will investigate external grant funding for the study when made available through national programmes.	Unknown	Funding required for ULEV feasibility study.

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
10	Annual audit of taxi fleet	Promoting Low Emission Transport	Other	Medway Council Licensing	2018/19	Unknown	Percent ULEV in annual audit of taxi fleet	-	Historic fleet information has been obtained from the Licensing Team. Analysis of the information is needed to identify any trends in the numbers of ULEVs present in the taxi fleet before any interventions are investigated. A comprehensive audit and analysis of the current Medway fleet would be undertaken as part of the above ULEV feasibility study.	Unknown	Detailed fleet analysis required. External funding may be required to support drivers/companies to renewal/retrofit vehicles, and provide supporting infrastructure (EV charging points). Funding required for ULEV feasibility study.
11	Carry out maintenance of E-mote system to protect asset for future use	Traffic Management	Other	Medway Council Integrated Transport	Unknown	Unknown	Completed or not	8-10%	No action is being proposed at present to progress this measures. The E-motes have not been operative for several years since a pilot project was carried out in Medway. There are currently no plans, or funding available to carry out maintenance of the system.	Unknown	No budget is available for this measure. The E-mote system would also have to be a beneficial traffic management tool for this measure to be progressed.

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	Annually report number and location of roadworks in or around AQMA's	Traffic Management	Other	Medway Council Intergrated Transport	2016/17	2017	Completed or not	-	No further action is proposed as this is not a SMART indicator. However, a Street Works Permit scheme was introduced by the Council in January 2017 as a traffic management tool to reduce the disruption caused by work on the highway. Contractors are required to obtain a permit before work commences, and day of the week/time restrictions are in place for Traffic Sensitive Streets, where permits will only be issued where there is to be compliance with the time restrictions.	Ongoing	Ongoing implementation of permit scheme required.
13	Report AADT annually	Traffic Management	Other	Medway Council Intergrated Transport	Unknown	Unknown	Completed or not	-	No further action is proposed as this is not a SMART indicator. However, performance indicators for the draft Network Management Plan (see no.1 above) are more appropriate going forward (journey times etc.). DfT traffic flow data are also available for many locations/roads in Medway.	Ongoing	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.

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
14	Link ANPR vehicle class data to provide detailed source apportionment to support feasibility study work	Traffic Management	Other	Medway Council Integrated Transport	As required	As required	Completed or not	-	ANPR has not worked for several years, and has never been capable of giving vehicle split classifications. Traffic master data and base map software are used to obtain results. This is based on phone signal data, and is not for every vehicle. It provides journey times and volumes only. Dedicated surveys therefore may be required for future studies or source apportionment work. More detailed Dft data are however available for a number of locations/roads within Medway.	Ongoing	Regular reporting of internal indicators required. Relies on continued monitoring by DfT.
15	Promoting and monitoring cycling and walking	Promoting Travel Alternatives	Promotion of cycling	Medway Council Safer Journeys Team,	Ongoing	Ongoing	Medway mode of travel data	1%	See supplementary information.	Ongoing	-
16	Develop and continue walk or cycle to school scheme and events	Promoting Travel Alternatives	School Travel Plans	Medway Council Safer Journeys Team	Ongoing	Ongoing	Number of schools participating	-	See supplementary information.	Ongoing	-
17	Develop and continue healthy walk scheme and cycle scheme	Promoting Travel Alternatives	Promotion of cycling	Medway Council Supporting Healthy Weight Team	Ongoing	Ongoing	Number of individuals involved	-	See supplementary information.	Ongoing	-
18	Run internal Eco-driving courses	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Medway Council Business Development and Environmental Protection	Unknown	Unknown	Number of drivers on training courses	<1%	No progress has been made during 2017.	Unknown	No budget available for this measure.

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
19	Engage with business to promote Eco-driving	Vehicle Fleet Efficiency	Driver training and ECO driving aids	Medway Council Business Development	Unknown	Unknown	Number of business engaged	-	No progress has been made during 2017. However, development of this measure is expected under no.29 below.	Unknown	Budget constraints.
20	Increase ULEV component within Medway fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Medway Council Procurement	2018/19	2019/20	Number of ULEV within Medway fleet	-	Medway Council currently do not have any ULEVs. The EU class is not currently logged but the fuel type is estimated at over 90% diesel. There are contracts which Medway Council award where there is an initiative within the industry to deploy ULEVs. The number of ULEVs is heavily dependent on the councils Procurement activities, which has so far failed to result in a switch to cleaner vehicles. The Medway Air Quality Steering Group have discussed progressing this measure as a priority, and The Environmental Protection Team have recommended that a council wide fleet review, carried out by the Energy Saving Trust, could provide the basis for further work on this measure. The review is free to local authorities who meet the criteria. The fleet review project is to be investigated further during 2018.	Unknown	-

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
21	Review of Medway Procurement Policy to ensure positive support for ULEV and third party emission reduction	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Medway Council Procurement	2018/19	2019/20	Completed or not	-	A Procurement Strategy covering 2016-2021 has been produced. No obvious support for ULEV and third party emissions reduction. This will need to be explored further. The councils procurement of services, vehicles etc would be included in the proposed Energy Saving Trust fleet review above.	Unknown	-
22	Develop and improve school travel plans	Promoting Travel Alternative -s	School Travel Plans	Medway Council Safer Journeys Team	Ongoing	Ongoing	Number of schools with active travel plans	-	90% of all schools in Medway have previously developed a school travel plan, and there is a continued requirement to produce these in accordance with planning applications that impact upon the travel and transport needs associated with school journeys.	Ongoing	Relies on significant changes occurring that require planning permission
23	Review and align Medway Travel Plan with AQAP	Promoting Travel Alternative -s	Workplace Travel Planning	Medway Council Business Development Team?	Unknown	Unknown	Completed or not	-	No progress has been made during 2017. No budget is allocated to travel planning, and no staff availability to promote this.	Unknown	No budget available for this measure.
24	Develop work place travel plans	Promoting Travel Alternative -s	Workplace Travel Planning	Medway Council Business Development Team?	Unknown	Unknown	Number of businesses with a travel plan	-	No progress has been made during 2017. No budget is allocated to travel planning, and no staff availability to promote this.	Unknown	No budget available for this measure.
25	Promote car sharing and reduce the number of trips	Alternative -s to private vehicle use	Car & lift sharing schemes	Medway Council Intergrated Transport	2018/19	2018/19	Number registered on Liftshare scheme	-	No progress has been made during 2017.	Unknown	No budget available for this measure.

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
26	Review and re-write relevant planning policies and develop a supplementary planning document to reflect this action plan and related corporate strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Medway Council Planning and Environmental Protection	Ongoing	Ongoing	Number of relevant policies reviewed and re-written that are beneficial to air quality	-	New air quality planning guidance was adopted in April 2016, emphasising mitigation of impacts using a damage costs approach. Under Medway's lead, a workshop for local authority planners, air quality officers and councillors was delivered in February 2017, in conjunction with the Kent & Medway Air Quality Partnership, and the Low Emissions Partnership, to increase uptake of the guidance across the region and to look at opportunities to improve the guidance. Work on the new Medway Local Plan has continued, with detailed work on the air quality assessment for each development scenario outlined in the 'Development Strategy Document: Regulation 18 Consultation Report' expected to take place over Autumn 2018. This work will run in parallel to transport modelling to inform the Strategic Transport Assessment (STA). Emerging planning policy for Air Quality and Sustainable Transport set out in Local Plan consultation documents.	Ongoing	Requires implementation and recording of policy on decision notices.

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
27	Improve and then maintain awareness of the health and financial impacts of air pollution to all stakeholder groups; businesses, schools, public, vulnerable groups, members, and internal managers	Public Information	Other	Medway Council	Ongoing	Ongoing	Number of notifications and consultations carried out	-	See 29 below. A new Air Quality Communications Strategy has been produced by the council, in a joint project between the Environmental Protection Team and Public Health. Implementation of the strategy should include initiatives for this measure. The council supported the first national Clean Air Day in 2017, and this included promotion of the day to stakeholders.	Ongoing	-
28	Development of promotional material to support Eco-driving within businesses	Vehicle Fleet Efficiency	Other	Medway Council Environmental Protection, Public Health and Communications	2018/19	2018/19	Number of press releases, reports on websites, presentations delivered, workshops delivered and leaflets dropped	<1%	No progress has been made during 2017. However, development of this measure is expected under no.29 below.	Unknown	-
29	Develop and air quality communications strategy with public relations team	Public Information	Other	Medway Council Communications and Environmental Protection	2017/18	2018/19	Completed or not	-	Complete. A communications strategy has been produced, and is to be launched in 2018.	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
30	Set up AQAP Steering Group and book 6 monthly meetings with stakeholders	Policy Guidance and Development Control	Other policy	Medway Council Environmental Protection	2016	Ongoing	Completed or not	-	Quarterly meetings booked with stakeholders for the second year of Steering Group through to June 2018. Frequency of meetings, membership, terms of reference etc to be reviewed by the group at 4th quarter meeting.	Ongoing	-
31	Engage with business, internal members and managers as priority	Public Information	Via other mechanisms	Medway Council Communications and Environmental Protection	2018/19	2018/19	Number of events and presentations where the AQAP has been represented	-	The council supported the first national Clean Air Day in 2017, and this included promotion of the day to stakeholders. Further development of this measure is expected under no.29 above.	Unknown	-
32	Integrate, where appropriate, AQAP target into internal service plans	Policy Guidance and Development Control	Other policy	Medway Council Performance Hub and Environmental Protection	Ongoing	Ongoing	Number of service plans with AQAP related actions included	-	The AQAP features in the Environmental Protection Team service plan. Work required to identify if appropriate to integrate AQAP into other service plans going forward.	Ongoing	-
33	Identify corporate policies and strategies where consultation of changes is requested and notify accountable department	Policy Guidance and Development Control	Other policy	Medway Council Environmental Protection	Ongoing	Ongoing	Number identified	-	Input provided into ongoing development of the new Local Plan and development of new air quality policy, and consultation for Strood Riverside Development Brief.	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
34	Develop business case for evaluation or quantification studies to take forward 2016-2017	Other	Other	Medway Council Environmental Protection	Ongoing	Ongoing	Completed or not	-	See supplementary information.	Ongoing	Budget constraints. Staff resources.

Additional Measures

Medway Air Quality Steering Group

- 2.10 A Steering Group, Chaired by the Assistant Director of Front Line Services, was established in 2016 to provide oversight, and facilitate further development of measures in the action plan. The Steering Group consists of representatives from key council services including, amongst others, Environmental Protection, Public Health, Planning and Integrated Transport, who have agreed to work together with the shared goal of seeking to improve air quality in Medway through behavioural, strategic and infrastructure change.

Development and Implementation of new air quality planning guidance

- 2.11 In conjunction with a review of the Kent & Medway Air Partnership's (K&MAQP) planning guidance, Medway published new air quality planning guidance in 2016. The guidance was developed in response to changes in national planning policy, brought about by the National Planning Policy Framework. The guidance aims to improve local air quality by:

- Introducing a method for assessing the air quality impacts of developments, which includes the quantification of impacts, calculation of damage costs, and the identification of mitigation measures to be implemented to negate the impact of development on air quality;
- ensuring cumulative impacts are included in assessments; and
- providing clarity and consistency of the process for developers, the local planning authority and local communities.

- 2.12 The Medway guidance exists as a template for all members of the K&MAQP, and is designed to be used as technical guidance, or for adoption as Supplementary Planning Guidance, and encourages mitigation measures to be implemented where necessary.

- 2.13 The guidance was published in April 2016, and has been used extensively in the consideration of planning applications coming forward in Medway which are likely to have an air quality impact. As a result, significant levels of air quality mitigation are being secured for new developments. A key feature of the Medway guidance is that it requires the implementation of standard air quality mitigation, which includes the installation of electric vehicles charging points, helping to incentivise and accelerate the uptake of electric vehicles.

- 2.14 The guidance can be found here:

https://www.medway.gov.uk/info/200140/environment/416/air_quality/2

- 2.15 To promote use of the guidance across Kent and Medway, the council worked with the K&MAQP, and the Low Emissions Partnership, to deliver a Low Emissions Planning Workshop in 2017. The aim of the workshop was to increase uptake amongst the other Kent authorities yet to adopt it, and

look at further opportunities to improve the guidance in light of new tools and materials being developed by the Low Emissions Partnership.

Local Enterprise Partnership funding

- 2.16 Medway has developed a package of schemes as part of a Local Enterprise Partnership (LEP) bid for the Government's Local Growth Fund (LGF). Funding of over £68 million was granted to the Kent & Medway federated area for projects that commenced in 2015/16. £28.6 million of this funding has been allocated for five schemes in Medway, four of which could have a positive impact on air quality, these include:

A289 Four Elms Roundabout to Medway Tunnel Journey Time and Network Improvements

- 2.17 Four Elms roundabout is adjacent to the Four Elms Hill AQMA. Queues from the Four Elms roundabout currently extend into the AQMA. Improvements along the route will reduce queued traffic in the AQMA. Subject to approvals and final confirmation of funding, the current outline programme indicates that works are likely to start in early 2020 and complete by March 2021.

Medway City Estate Connectivity Improvement Measures

- 2.18 Phase 1 of the project is now complete. Works undertaken include:
- Extension of Anthony's Way Exit Lanes;
 - new traffic signals on the westbound entrance to Medway Tunnel;
 - adjustments to the timing of existing traffic signals on Maritime Way; and
 - installation of new CCTV cameras on Anthony's Way.
- 2.19 Initial indications are that there has been an improvement in traffic flow and a reduction in queueing traffic waiting to exit the estate since the traffic signals were introduced at the entrance to the westbound Medway Tunnel in October 2016. The scope of Phase 2 is still to be agreed and is scheduled for completion by March 2020. On completion it is anticipated that there will be a slight improvement in air quality levels as a result of a reduction in traffic congestion and possible mode shift.

Strood Town Centre Journey Time and Accessibility Enhancements

- 2.20 Currently underway, this project is scheduled for completion by March 2019. It is anticipated that traffic control measures will have a positive impact on journey times and air quality.

Medway Cycling Action Plan

- 2.21 A programme to extend and improve the existing cycle network has been delivered throughout 2017. By enhancing the quality and safety of facilities for cyclists it is anticipated that more people will choose to cycle which will make the local road network operate more efficiently. This will contribute to improved air quality. Cycle count data is currently being received and will be analysed to identify the impact of cycle route development and promotion.
- 2.22 An annual event took place on 17/6/2017 at Medway Park, Gillingham promoting cycling involving cycle themed activities. The event marked the launch of Medway's Cycling Action Plan and recreational cycle trail. Road Safety representatives and Bikeability Officers were on hand to support the event.

Walking and Cycling

- 2.23 Medway Council continued to carry out a significant amount of activity supporting delivery of the action plan measures relating to walking and cycling during 2017. The work carried out in this area by the Road Safety and Safer Journeys Team (SJT) in Integrated Transport is backed up with complementary walking and cycling initiatives lead by the Public Health Team. A summary of progress for 2017 is provided below:

Walking Bus/Green Footsteps

- 2.24 At the end of March 2017, there were 585 people participating on the Walking Bus with a total of 34 active Walking Bus routes operating within Medway. An additional 114 school classes in Medway signed up to the Super 'WOW' (Walk on Wednesday) initiatives, with approximately 3,420 children from Medway taking part. By September 2017 a total of 15 Medway schools signed up to the initiative with approximately 4,616 children from Medway involved, a 35% increase compared to the previous academic year.

Cars off the Road

- 2.25 Active travel initiatives have significantly reduced the number of school journeys by car in Medway with 66,286 car journey savings in Medway according to figures generated via the KM Charity Team school data portal during the 2016/17 academic year.

National Walk to School Week, 15-19 May 2017

- 2.26 The SJT promoted this campaign to Medway Schools during May in partnership with Living Streets and the KM Charity Team. Local focus activities included the 'Walk2Count Challenge', encouraging schools to compete for the highest percentage of walks over the duration. St Margaret's CE Juniors in Rainham won the primary school category (75.2% walked). The Victory Academy in Chatham won the secondary school category (82.5% walked) and for the first time, Hempstead Juniors were recognised as the 'most improved school' (68.5% walked) having

achieved an increase of 26.8% when compared to a previous result. Certificate presentations were made to the winning schools.

Sustrans The Big Pedal 20-31 March 2017

- 2.27 Medway's SJT encouraged Medway schools to register for the event, promoted via email and social media.

Bikeability / Bikeability Balance 2016/17

- 2.28 A total of 1,126 children in Medway received Bikeability Level 1 and 2 courses. Bikeability now being delivered within Special Educational Needs [SEN] establishments in Medway. An additional 174 Bikeability Balance places were delivered to Medway pupils in Key Stage 1, which forms one of the DfT Bikeability Plus modules delivered in Medway.

International Walk to School Month 2017

- 2.29 In October 2017, during the International Walk to School Month campaign, the Council's SJT encouraged primary and secondary schools in Medway to compete for the highest percentage of walks over the campaign period. As a result 2,237 car journeys were removed from Medway's roads by the participating primary schools.

Scooter Skills sessions

- 2.30 Delivered to 418 children in Key Stage 1 during the 2016/17 academic year.

Road Safety education

- 2.31 Delivered to a total of 7,577 primary school children in Medway between during the 2016/17 academic year.

School Crossing Patrol service

- 2.32 35 School Crossing Patrols employed across 42 recognised sites operating throughout Medway in conjunction with the school journey.

Medway Big Ride / Cycling Action Plan

- 2.33 Annual event took place on 17 June 2017 at Medway Park, Gillingham involving cycle themed activities. The event marked the launch of Medway's Cycling Action Plan and recreational cycle trail. Road Safety representatives and Bikeability Officers were on hand to support the event.

Social Media

- 2.34 'Transport for Medway' Facebook page now includes regular traffic and active travel updates relevant to the Integrated Transport service, with 139 unique user likes during 2017. Our Twitter

platform has achieved a wider audience since, with a total of 1,260 followers in 2017 compared to 922 followers the previous year.

Public Health Initiatives

- 2.35 Medway Public Health delivers a range of complementary active travel initiatives to encourage more active lifestyles through the Supporting Healthy Weight (Adults) team. These initiatives include walking, cycling and Nordic style walking schemes.

Walks

- 2.36 Medway Health Walks range from 10-75 minutes to suit all abilities, including people recovering from illness. These social walks are led by trained volunteer walk leaders and are organised to support people to get the most enjoyment out of walking

Current number of walks: 25

Current number of walkers on system: 3,409

New walkers signed up April 2017-March 2018: 252

Cycle Routes

- 2.37 The Public Health cycling groups are aimed at encouraging people back to cycling who have not cycled for a while due to age, illness, lack of fitness or a busy lifestyle. The rides run all year round and are led by trained cycle leaders on flat routes.

Current number of routes: 3

Number of cyclists on database: 320

Number of new cyclists April 2017-March 2018: 42

Nordic Walking

- 2.38 Nordic walking is a more intensive form of walking using a pair of specially designed walking poles. The walks take place on flat routes and are suitable for all ages.

Number of courses: 1 per week

Number of sessions at Capstone Park: 2 per week

Number of walkers trained 2017-2018: 63

Number of attendees at Capstone on Tuesdays (advanced session): 310

Number of attendees at Capstone on Fridays (beginners): 608

Kent Health and Wellbeing Board

- 2.39 Medway Council is part of the Kent Health and Wellbeing Board, which brings together County and District Councillors, senior officers from the NHS Area Team, Clinical Commissioning Groups, Social Care and Public Health and members of the Local Healthwatch. The Board produced the Kent Joint Health and Wellbeing Strategy, which sets out how the multidisciplinary teams can align their plans to improve public health and tackle key health issues over the coming years.

The Public Health Outcomes Framework

- 2.40 Medway Council is working with Public Health colleagues to prioritise action on air quality in its area to help reduce the health burden from air pollution. The Public Health Outcomes Framework (PHOF) is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The approach used in partnership with Public Health colleagues includes the encouragement of active travel, which will also have wider public health benefits captured in other indicators such as increased physical activity (indicator 2.13) and reducing excess weight at various ages (indicators 2.06 and 2.12), as well as improving air quality within the borough.

Kent and Medway Air Quality Partnership

- 2.41 Medway Council is also part of the Kent and Medway Air Quality Partnership (K&MAQP), which aims to deliver a consistent approach to tackling air pollution across the County, sharing knowledge and information between Kent County Council, district councils, health authorities, Highways England, the Environment Agency, Public Health England and various consultants and research partners. The Kent and Medway Air Quality Monitoring Network (K&MAQMN) coordinates a number of sites monitoring pollution across the County, supported by two AURN monitoring stations in Medway measuring concentrations of PM_{2.5}. Data for the network are reported through its dedicated website, KentAir, which can be found at <http://www.kentair.org.uk/>.

Further Plans

Kent Local Transport Plan 2016 - 2031

- 2.42 The Local Transport Plan for Kent (2017) also prioritises air quality, including the aim to “*implement measures to improve local air quality*” as part of its overarching policy to deliver the specific outcome ‘Outcome 5: Better Health and Wellbeing’. It is intended that the actions proposed within the plan to achieve this intended outcome through the management of transport will generate improvements in air quality, and this will include improvements in concentrations of PM_{2.5}.

Medway Local Plan

- 2.43 The Medway Local Plan (2003) includes the following policies that are intended to improve air quality within Medway:
- Policy BNE2: Amenity Protection states that “*All developments should secure the amenities of its future occupants, and protect those amenities enjoyed by nearby and adjacent properties. The design of development, should have regard to...ii)airborne emissions consisting of fumes, smoke, soot, ash, dust and grit traffic...[and]...generation*”;
 - Policy BNE24: Air Quality states that “*Development likely to result in airborne emissions should provide a full and detailed assessment of the likely impact of these emissions. Development will not be permitted when it is considered that unacceptable effects will be imposed on the health, amenity or natural environment of the surrounding area, taking into account the cumulative effects of other proposed or existing sources of air pollution in the vicinity*”; and
 - Policy T14: Travel Plans states that “*Travel Plans will be required for all developments which require a transport assessment or as otherwise require by the Council’s vehicle parking standards, including...smaller developments...which would generate additional traffic movements in or near to Air Quality Management Areas or other areas specifically targeted for a reduction in road traffic...*”;
- 2.44 Medway Council is currently in the process of developing a new Local Plan to replace the 2003 Local Plan. This has included work on drafting new policies to promote air quality improvements and sustainable transport.

PM_{2.5}: Local Authority Approach to Reducing Emissions and/or Concentrations

- 2.45 As detailed in Policy Guidance LAQM.PG16 Chapter 7 (Defra, 2016a), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5 µm 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.
- 2.46 Contained within the AQAP are a variety of measures that are aimed at managing emissions from road traffic. Measures intended to tackle road traffic pollution emissions (including PM_{2.5} emissions) include a variety of traffic management measures, freight and delivery management measures, transport planning and infrastructure measures, vehicle fleet efficiency measures, measures to promote travel alternatives and alternatives to private vehicle use and measures to promote low emission transport. Other measures being implemented by Medway Council, including the establishment of Medway Air Quality Steering Group, the development and

implementation of new air quality planning guidance, local enterprise partnership funding, activity supporting walking and cycling and public health initiatives, will also help to reduce concentrations of PM_{2.5} within Medway. Medway Council also support the Local Transport Plan for Kent (2017) and has developed a Local Plan which the Council is in the process of updating; both of these plans include measures aimed at improving air quality through the management of road traffic, which will have a positive impact on concentrations of PM_{2.5}.

- 2.47 Medway Council is part of the Kent Health and Wellbeing Board, which works to improve public health through tackling key health issues (including poor air quality), and the K&MAQP, which aims to tackle air pollution across the County, and works with Public Health colleagues to prioritise action on air quality in its area, taking into consideration the PHOF, which includes an indicator based on the effect of PM_{2.5} on mortality (indicator 3.01).

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

Summary of Monitoring Undertaken

3.1 This section sets out the monitoring that has taken place and how it compares with objectives.

Automatic Monitoring Sites

3.2 Medway Council undertook automatic (continuous) monitoring at two sites during 2017. Table A1.1 in Appendix A1 shows the details of the sites. National monitoring results are available at <https://uk-air.defra.gov.uk/networks/network-info?view=aurm>.

3.3 Maps showing the location of the monitoring sites are provided in Appendix A4. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix A3.

Non-Automatic Monitoring Sites

3.4 Medway Council undertook non-automatic (passive) monitoring of NO₂ at 36 sites during 2017. Table A1.2 in Appendix A1 shows the details of the sites.

3.5 Maps showing the location of the monitoring sites are provided in Appendix A4. 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 A3.

Individual Pollutants

3.6 The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on the adjustments applied are provided in Appendix A3.

Nitrogen Dioxide (NO₂)

3.7 Table A1.3 in Appendix A1 compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40 µg/m³.

3.8 For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix A2.

3.9 Table A1.4 in Appendix A1 compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200 µg/m³, not to be exceeded more than 18 times per year.

- 3.10 Measured concentrations at both automatic monitoring sites were below the annual mean objective in 2017. Measured concentrations were also below the annual mean objective at 22 of the 36 NO₂ diffusion tube monitoring sites, increasing to 28 out of 36 sites when distance-corrected to represent relative exposure.
- 3.11 Of the 14 sites at which an exceedance was measured in 2017, eight sites are located adjacent to roads covered by Central Medway AQMA (reducing to five sites when distance-corrected), three sites are located within Four Elms Hill AQMA (reducing to one site when distance-corrected), one site is located adjacent to a road covered by Gillingham AQMA and one site is located adjacent to a road covered by Rainham AQMA. Only one site (DT20⁶) is located a significant distance from an AQMA (approximately 134 m to the west of Central Medway AQMA), and the measured concentration at this site falls below the annual mean objective when distance-corrected to represent relevant exposure.
- 3.12 Of the eight exceeding sites located adjacent to Central Medway AQMA, five sites (DT06, DT17, DT18, DT19 and DT28⁷) experienced increases in annual mean concentrations (ranging from 0.1 – 2.3 µg/m³ change) between 2016 and 2017, two sites (DT02 and DT03⁸) experienced decreases in annual mean concentrations (ranging from 0.7 – 4.0 µg/m³ change) and at one site (DT36⁹) no measurements were undertaken in 2016. Of the exceeding three sites within Four Elms Hill AQMA, one site (DT24¹⁰) experienced a slight decrease in annual mean concentrations (0.1 µg/m³ change) between 2016 and 2017, whilst at the two sites (DT32 and DT33¹¹) no measurements were undertaken in 2016. The one exceeding site located adjacent to Gillingham AQMA (DT25¹²) experienced a substantial increase in annual mean concentration (6.4 µg/m³ change) between 2016 and 2017, causing an exceedance at this site where previously there have been none since measurements began in 2015. The one exceeding site located adjacent to Rainham AQMA (DT01¹³) experienced an increase in annual mean concentration (3.2 µg/m³ change) between 2016 and 2017.
- 3.13 There were no measured exceedances of the 1-hour objective in 2017 by either of the automatic monitoring sites. Furthermore, measured annual mean concentrations at all diffusion tube

⁶ DT20 – Lamp post adjacent to 33 London Road, Strood.

⁷ DT06 – 19 Star Hill, DT28 – Lamp post NDL49 adjacent 9 New Road, Chatham, DT17 – Lamp post adjacent 159 Rainham Road, Gillingham (Canterbury Street junction), DT18 – Lamp post adjacent 4b Luton Road (Luton Arches junction), DT19 – 5 London Road, Strood (Dentist).

⁸ DT02 – High Street, Strood (Tanning Studio), DT03 – 46 High Street, Strood (Heating Shop).

⁹ DT36 – Lamp post HKA8, High Street, Strood.

¹⁰ DT24 – Sign post RS106 adjacent A1 Main Road, Chattenden.

¹¹ DT32 – Lamp post FEA016 adjacent 6 Balls Cottages, Main Road, Chattenden, DT33 – Lamp post FEA20 adjacent 2 Broadwood Road, Chattenden.

¹² DT25 – Lamp post PAS23 adjacent 2A Pier Road.

¹³ DT01 – 60 High Street, Rainham.

monitoring sites were below $60 \mu\text{g}/\text{m}^3$, indicating that an exceedance of the 1-hour mean objective is unlikely.

- 3.14 Exceedances of the annual mean objective were measured at all four of the AQMAs declared within Medway (including when distance-corrected to represent relevant exposure). Furthermore, increases in the concentrations measured from 2016 to 2017 were measured at sites within Central Medway AQMA, Rainham AQMA and Gillingham AQMA. As such, the current declared AQMAs should remain.
- 3.15 Both automatic monitoring sites show a weak overall trend of decreasing measured annual mean concentrations from 2011 to 2017 (see Figure 3.1). This trend is also apparent in the measured concentrations at diffusion tube monitoring sites (bias adjusted and annualised¹⁴), (see Figure A1.1). However, some sites (notably DT13¹⁵) do exhibit a stronger trend of decrease over this period.

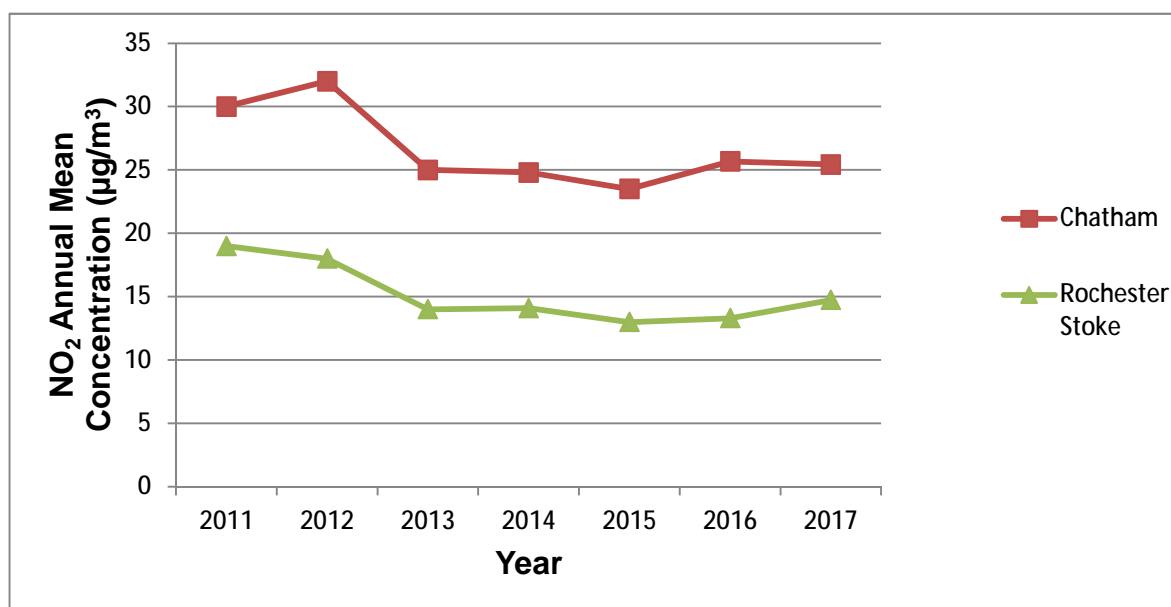


Figure 3.1: Trends in Measured Annual Mean Nitrogen Dioxide Concentrations at Medway Automatic Monitoring Sites

Particulate Matter (PM₁₀)

- 3.16 Table A1.5 in Appendix A1 compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of $40 \mu\text{g}/\text{m}^3$.
- 3.17 Table A1.6 in Appendix A1 compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of $50 \mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times per year.

¹⁴ For comparison with previous years, 2017 monitoring data have not been distance-corrected).

¹⁵ DT13 – Stoke AQ station, rural site.

- 3.18 Measured concentrations at both monitoring sites were well below the annual and 24-hour mean air quality objectives in 2017.
- 3.19 Measured annual mean concentrations of PM_{10} over the past seven years are presented in Figure 3.2. There is a weak trend of decreasing concentrations at the Chatham monitoring site from 2013 to 2015, however, there has been an increase in concentrations since then. There is no obvious trend at the Rochester Stoke monitoring site, with 2017 concentrations remaining similar to those measured in 2011.

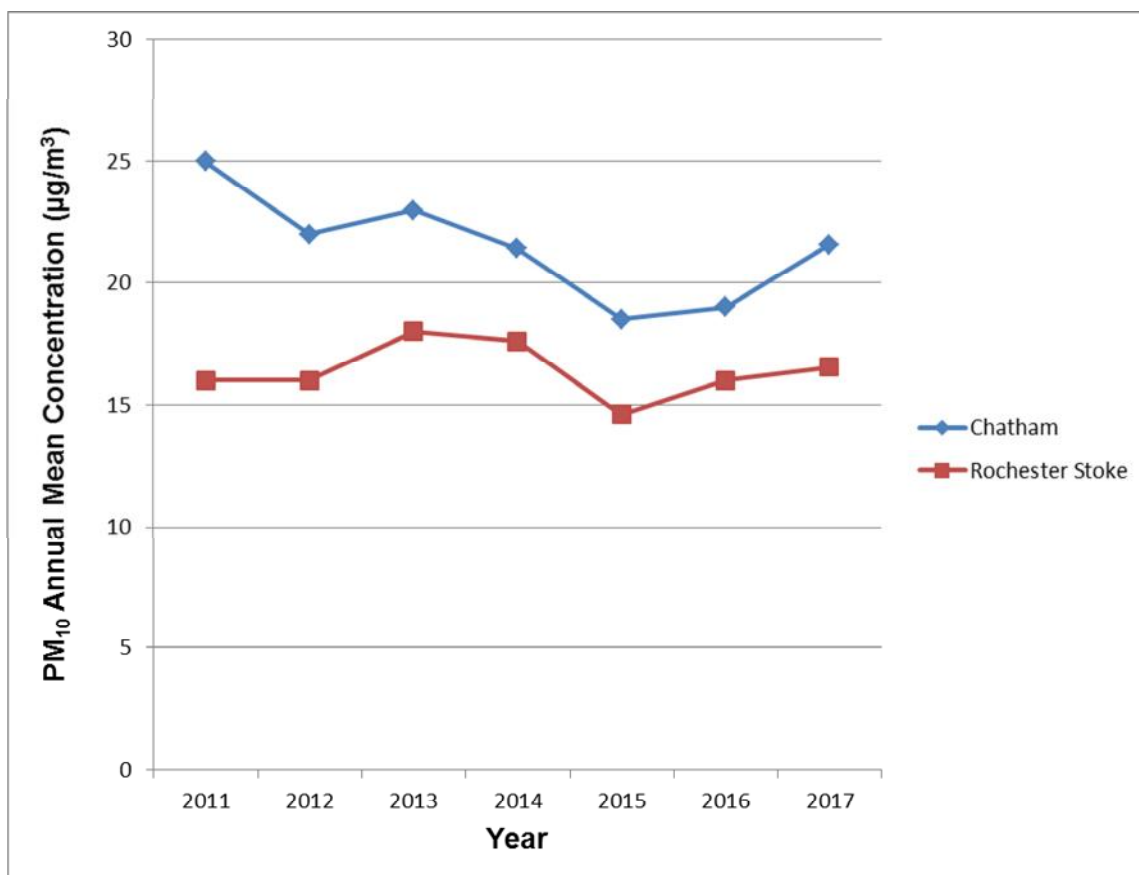


Figure 3.2: Trends in Measured Annual Mean PM_{10} Concentrations

Particulate Matter ($PM_{2.5}$)

- 3.20 Table A1.7 in Appendix A1 presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.
- 3.21 Measured annual mean concentrations of $PM_{2.5}$ over the past seven years are presented in Figure 3.3. There is a trend of decreasing concentrations at the Chatham site from 2011 to 2016, however this site did record an increased concentration in 2017. The Rochester Stoke site shows an overall trend of decreasing concentrations from 2011 to 2017.

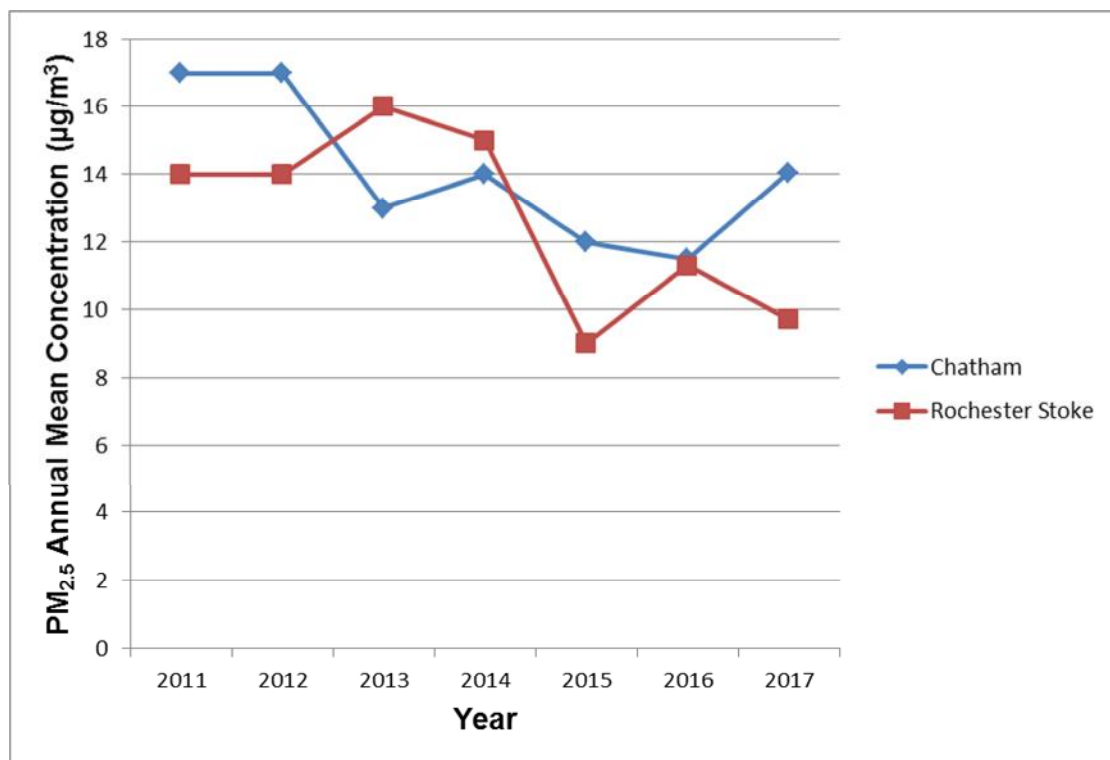


Figure 3.3: Trends in Measured Annual Mean PM_{2.5} Concentrations

Sulphur Dioxide (SO₂)

- 3.22 Table A1.8 in Appendix A1 compares the ratified continuous monitored SO₂ concentrations for 2017 with the air quality objectives for SO₂.
- 3.23 In 2017 there were no measured exceedances of the 15-minute mean, 1-hour mean or 24-hour mean objectives for SO₂.

4 Appendices

A1	Monitoring Results	43
A2	Full Monthly Diffusion Tube Results for 2017	58
A3	Supporting Technical Information / Air Quality Monitoring Data QA/QC	61
A4	Maps of Monitoring Locations and AQMAs	69
A5	Summary of Air Quality Objectives in England	75

A1 Monitoring Results

Table A1.1: 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) ^a	Distance to kerb of nearest road (m) ^b	Inlet Height (m)
Chatham	Chatham (AURN)	Urban Traffic	577437	166993	NO ₂ , PM ₁₀ , PM _{2.5}	YES ^c	Chemiluminescent analyser FDMS (until November 2016 then BAM) FDMS (until November 2016 then BAM)	0	4	2.5
Rochester Stoke	Rochester Stoke (AURN)	Rural Background	583158	176314	NO ₂ , PM ₁₀ , PM _{2.5} , SO ₂ , O ₃	NO	Chemiluminescent analyser FDMS FDMS UV fluorescent analyser UV fluorescent analyser	0	N/A	2.5

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

^b N/A if not applicable.

^c Located adjacent to a road covered by an AQMA.

Table A1.2: Details of Non-Automatic Monitoring Sites

Old Site ID	New Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ^a	Distance to kerb of nearest road (m) ^b	Tube Collocated with a Continuous Analyser?	Height (m)
NA1S1	DT01	60 High Street, Rainham	Roadside	581568	165952	NO ₂	YES	0	2.5	NO	2.3
NA1S2	DT02	High Street, Strood (Training Centre)	Roadside	573482	169282	NO ₂	YES	0	2.5	NO	2.5
NA1S3	DT03	46 High Street, Strood (Heating shop)	Roadside	573793	169164	NO ₂	YES	0	2.1	NO	2.5
NA1S7	DT04	30-32 Luton Road (Funeral Directors)	Roadside	576565	167336	NO ₂	YES	0	2.9	NO	2.5
NA1S8	DT05	27 High Street, Luton	Roadside	577426	166506	NO ₂	YES	0	2	NO	2.5
NA1S9	DT06	18 Star Hill	Roadside	574589	168087	NO ₂	YES	0	3.3	NO	2.5
NA1S10	DT07	92 Cuxton Road, Strood	Roadside	573078	168908	NO ₂	YES	0	4.2	NO	2.2
NA1S12	DT08	Railway Street, Chatham	Roadside	575642	167779	NO ₂	YES	0	5.5	NO	3
NA1S14	DT09	Chatham AQ Station	Roadside	577434	166993	NO ₂	YES	0	3.3	YES	2.5
NA1S20	DT10	Flat, 4 New Road, Chatham	Roadside	575681	167691	NO ₂	YES	0	8.2	NO	4
NA1S22	DT11	High Street, Chatham (Orbit Housing)	Roadside	576393	167495	NO ₂	YES	0	3.1	NO	2.5
NA1S23	DT12	28 Frindsbury Road	Roadside	573865	169646	NO ₂	YES	0	3.1	NO	2.1
NA1S24	DT13	Stoke AQ Station	Rural	583152	176305	NO ₂	NO	0	N/A	YES	2.5
NA1S30	DT14	Corporation Street	Roadside	574493	168510	NO ₂	YES	1.4	4.3	NO	2.5

Old Site ID	New Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ^a	Distance to kerb of nearest road (m) ^b	Tube Collocated with a Continuous Analyser?	Height (m)
NA1S31	DT15	Lamp post adjacent White Horse pub, 95 High Street, Rainham	Roadside	581709	165922	NO ₂	YES	1	2.4	NO	2.5
NA1S32	DT16	Care Home, 117 High Street, Rainham	Roadside	581843	165886	NO ₂	YES	0	4.9	NO	2.5
NA1S33	DT17	Lamp post adjacent 159 Rainham Road, Gillingham (Canterbury Street junction)	Roadside	577768	166922	NO ₂	YES	2.8	1.9	NO	2.5
NA1S34	DT18	Lamp post adjacent 4b Luton Road (Luton Arches junction)	Roadside	576508	167404	NO ₂	YES	1	1.8	NO	2.5
NA1S37	DT19	5 London Road, Strood (Dentist)	Roadside	573329	169294	NO ₂	YES	0	2.5	NO	2.5
-	DT20	Lamp post adjacent 33 London Road, Strood	Roadside	573168	169305	NO ₂	NO	6.7	1.7	NO	2
NAS7	DT21	88 Spire Way, Wainscott	Roadside	574999	170882	NO ₂	NO	0	29	NO	2.2
NAS8	DT22	Joy Lodge, Four Elms Hill	Roadside	575488	171616	NO ₂	YES	0	12	NO	1.2
NAS9	DT23	1 Omaha Place, Wainscott	Roadside	575044	171351	NO ₂	NO	0	34	NO	2.1
NAS17	DT24	Sign post RS106 adjacent 1A Main Road, Chattenden	Kerbside	575948	171847	NO ₂	YES	2.2	0.5	NO	2.6

Old Site ID	New Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ^a	Distance to kerb of nearest road (m) ^b	Tube Collocated with a Continuous Analyser?	Height (m)
NAS27	DT25	Lamp post PAS23 adjacent 2A Pier Road	Roadside	577908	169285	NO ₂	YES	0.4	3.3	NO	2.3
NAS30	DT26	Lamp post PAS512 adjacent 24 Pier Road	Roadside	578007	169262	NO ₂	YES	6.8	2.6	NO	2.4
NAS31	DT27	Lamp post PAS22 adjacent Liberty Quays, Pier Road	Roadside	577880	169319	NO ₂	YES	4.6	3.8	NO	2.4
NA1S17	DT28	Lamp post NDL49 adjacent 9 New Road, Chatham	Roadside	575737	167670	NO ₂	YES	6.4	1	NO	2.5
NA1S18	DT29	Lamp post NDJ4 adjacent Trinity College, New Road Avenue	Roadside	574760	167892	NO ₂	YES	6.1	2.9	NO	2.5
NA1S35	DT30	Lamp post NDK6 adjacent Tuition Centre, New Road Avenue / Manor Road junction	Roadside	575473	167837	NO ₂	YES	0	3.1	NO	2.5
-	DT31	7 Highview Drive, Chatham	Roadside	574788	164568	NO ₂	NO	0	8.4	NO	2.5
-	DT32	Lamp post FEA016 adjacent 6 Balls Cottages, Main Road, Chattenden	Roadside	575903	171802	NO ₂	YES	8.4	1.9	NO	2.4
-	DT33	Lamp post FEA20 adjacent 2 Broadwood Road, Chattenden	Roadside	575971	171833	NO ₂	YES	2.4	1.8	NO	2.6

Old Site ID	New Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ^a	Distance to kerb of nearest road (m) ^b	Tube Collocated with a Continuous Analyser?	Height (m)
-	DT34	Lamp post CP019, Corporation Street	Roadside	574499	168495	NO ₂	YES	N/A ^c	2.2	NO	2.1
-	DT35	Sign post adjacent McDonalds, Commercial Road, Strood	Roadside	573518	169176	NO ₂	YES	8	1.5	NO	2.2
-	DT36	Lamp post HKA8, High Street, Strood	Roadside	573573	169262	NO ₂	YES	4.8	1.2	NO	2

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

^b N/A if not applicable.

^c Currently there is no relevant exposure nearby as the site is being redeveloped.

Table A1.3: Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	NO ₂ Annual Mean Concentration (mg/m ³) ^c				
					2013	2014	2015	2016	2017
Chatham	Urban Traffic	Automatic	98.2	98.2	25	24.8	23.5	25.7	25.4
Rochester Stoke	Rural Background	Automatic	95.9	95.9	14	14.1	13	13.3	14.7
DT01	Roadside	Diffusion Tube	100	100	42.7	44.7	43.4	42.2	45.4
DT02	Roadside	Diffusion Tube	100	100	46.9	44.4	42	47	43.0
DT03	Roadside	Diffusion Tube	100	100	54.8	56.2	53.9	51.7	51.0
DT04	Roadside	Diffusion Tube	100	100	35.4	38.2	36.8	38.6	37.9
DT05	Roadside	Diffusion Tube	91.7	91.7	35.2	34.8	33.2	33	34.2
DT06	Roadside	Diffusion Tube	100	100	47.7	54.1	51	50.9	51.0
DT07	Roadside	Diffusion Tube	100	100	40.1	37.8	36.9	39.4	38.8
DT08	Roadside	Diffusion Tube	66.7	66.7	39.3	40.3	39.7	39.3	38.8
DT09	Roadside	Diffusion Tube	100	100	27.6	26.2	27.7	25.6	25.5
DT10	Roadside	Diffusion Tube	83.3	83.3	35.2	34.8	32.6	34	32.4
DT11	Roadside	Diffusion Tube	100	100	34.2	35.2	36.3	35.6	35.7
DT12	Roadside	Diffusion Tube	100	100	37.5	37.7	36.3	36.6	35.5
DT13	Rural	Diffusion Tube	66.7	66.7	19.3	16.9	17	12.2	13.8
DT14	Roadside	Diffusion Tube	66.7	33.3	29.4	28.9	29.9	30.8	29.2
DT15	Roadside	Diffusion Tube	91.7	91.7	35.2	34.4	34.4	35.3	36.0
DT16	Roadside	Diffusion Tube	91.7	91.7	28.4	26.9	25.8	28.6	28.6
DT17	Roadside	Diffusion Tube	83.3	83.3	43.2	43.7	45	43.5	45.3
DT18	Roadside	Diffusion Tube	100	100	45.9	45.4	45.4	46.3	48.0
DT19	Roadside	Diffusion Tube	100	100	44.9	49.2	49	47.4	48.0
DT20	Roadside	Diffusion Tube	100	100	44.7	46.2	46	48.5	51.0
DT21	Roadside	Diffusion Tube	100	100	N/A	N/A	21.5	23.4	22.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	NO ₂ Annual Mean Concentration (mg/m ³) ^c				
					2013	2014	2015	2016	2017
DT22	Roadside	Diffusion Tube	100	100	N/A	N/A	31	29	31.0
DT23	Roadside	Diffusion Tube	100	100	N/A	N/A	24.7	27	25.3
DT24	Kerbside	Diffusion Tube	100	100	N/A	N/A	52	50.9	50.8
DT25	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	37.6	36.5	42.9
DT26	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	25.8	33.6	28.1
DT27	Roadside	Diffusion Tube	100	100	N/A	N/A	37.6	33.5	39.1
DT28	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	39.6	41.9
DT29	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	35.9	35.4
DT30	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	N/A	24.5	38.2
DT31	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	N/A	26.5
DT32	Roadside	Diffusion Tube	100	100	N/A	N/A	N/A	N/A	47.5
DT33	Roadside	Diffusion Tube	91.7	91.7	N/A	N/A	N/A	N/A	43.5
DT34 ^d	Roadside	Diffusion Tube	16.7	8.3	N/A	N/A	N/A	N/A	37.3
DT35	Roadside	Diffusion Tube	100	25	N/A	N/A	N/A	N/A	30.2
DT36	Roadside	Diffusion Tube	100	25	N/A	N/A	N/A	N/A	45.3

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

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

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b 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%).

^c Means for diffusion tubes have been corrected for bias. Where possible, means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 (Defra, 2016b) if valid data capture for the full calendar year is less than 75%. See Appendix A3 for details.

^d It has not been possible to annualise DT34, as only one month of data is available for 2017 (annualisation requires a minimum of three months of data to be available for the diffusion tube being annualised, as specified in LAQM.TG16). As such, 2017 monitoring data for this site should be treated with caution.

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%, where possible.

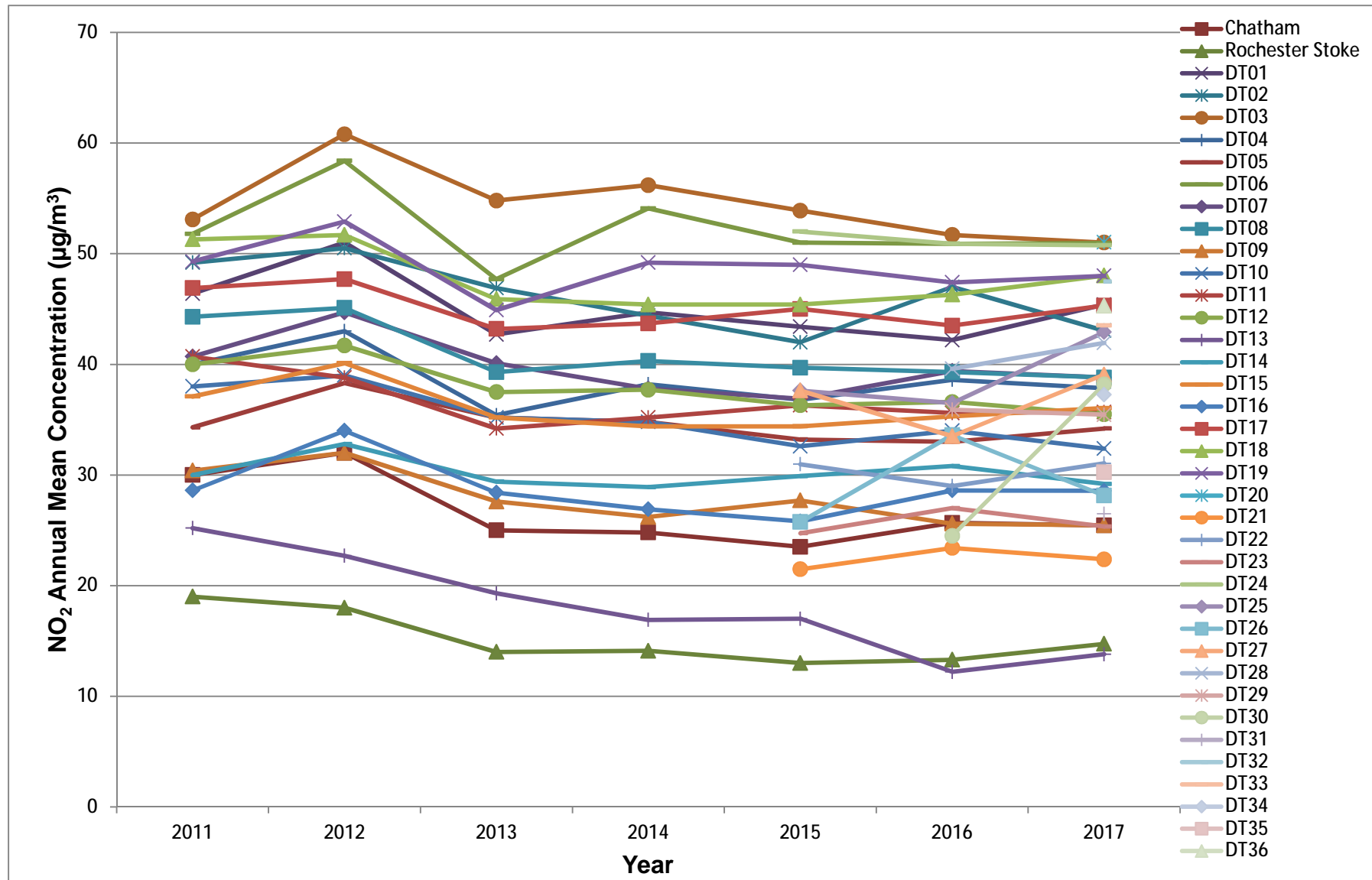


Figure A1.1: Trends in Annual Mean NO₂ Concentrations

Table A1.4: 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	NO ₂ 1-Hour Means > 200 µg/m ³				
					2013	2014	2015	2016	2017
Chatham	Urban Traffic	Automatic	98.2	98.2	0	0	0	0	0
Rochester Stoke	Rural Background	Automatic	95.9	95.9	0	0	0	0	0

Notes: Exceedances of the NO₂ 1-hour mean objective (200 µg/m³, not to be exceeded more than 18 times/year) are shown in **bold**.

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

Table A1.5: Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	PM ₁₀ Annual Mean Concentration (µg/m ³)				
				2013	2014	2015	2016	2017
Chatham	Urban Traffic	95.3	95.3	23	21.4	18.5	19.1	21.6
Rochester Stoke	Rural Background	91.8	91.8	18	17.6	14.6	15.8	16.6

Notes: Exceedances of the PM₁₀ annual mean objective of 40 µg/m³ are shown in **bold**.

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b 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%).

Annualisation has been conducted where data capture is <75%

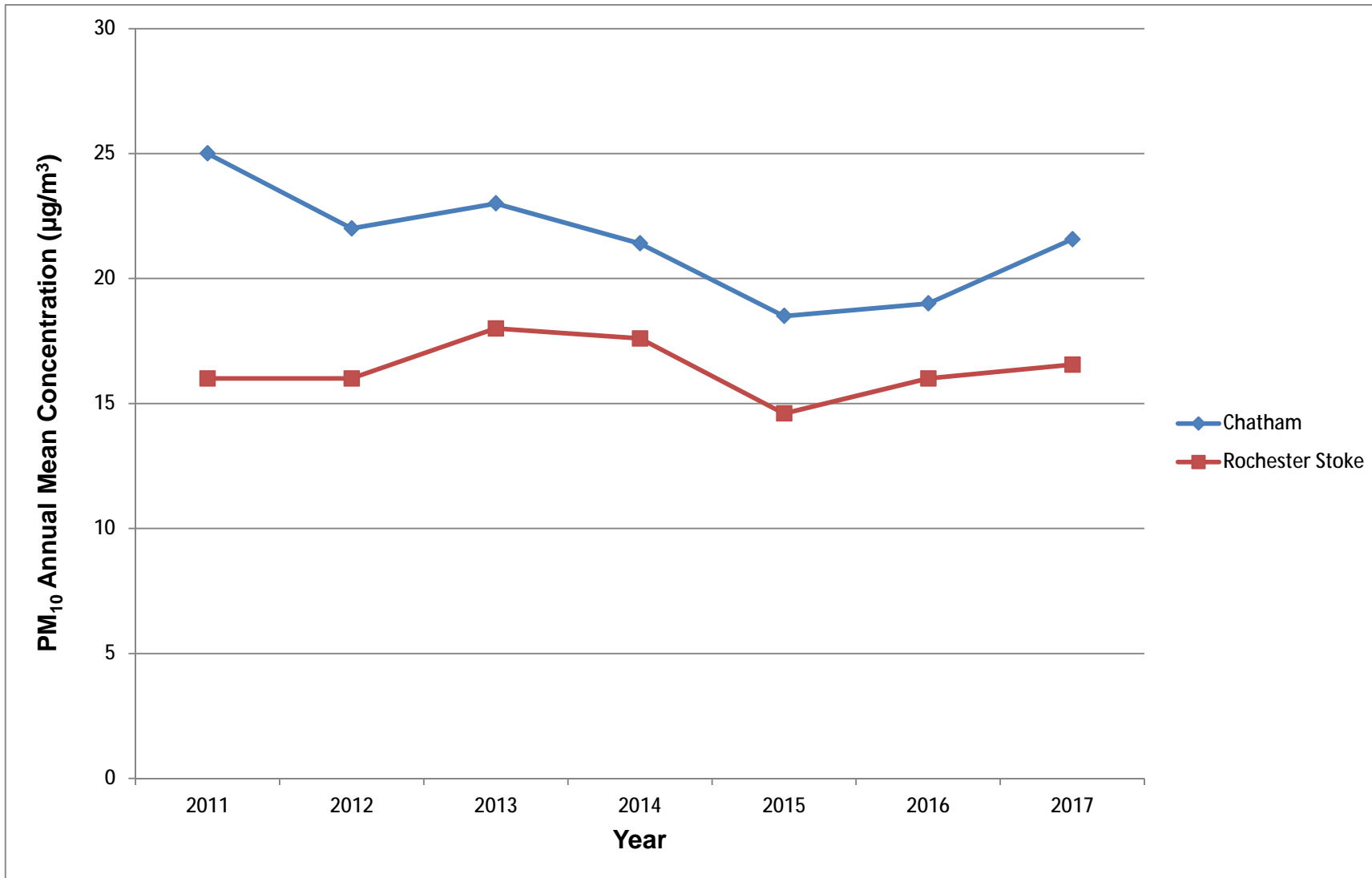


Figure A1.2: Trends in Annual Mean PM₁₀ Concentrations

Table A1.6: 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	PM ₁₀ 24-Hour Means > 50 µg/m ³ ^c				
				2013	2014	2015	2016	2017
Chatham	Urban Traffic	95.3	95.3	10	15	4	3	7
Rochester Stoke	Rural Background	91.8	91.8	3	8	2 (24)	4 (32)	4

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50 µg/m³, not to be exceeded more than 35 times/year) are shown in **bold**.

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b 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%).

^c If the period of valid data capture is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

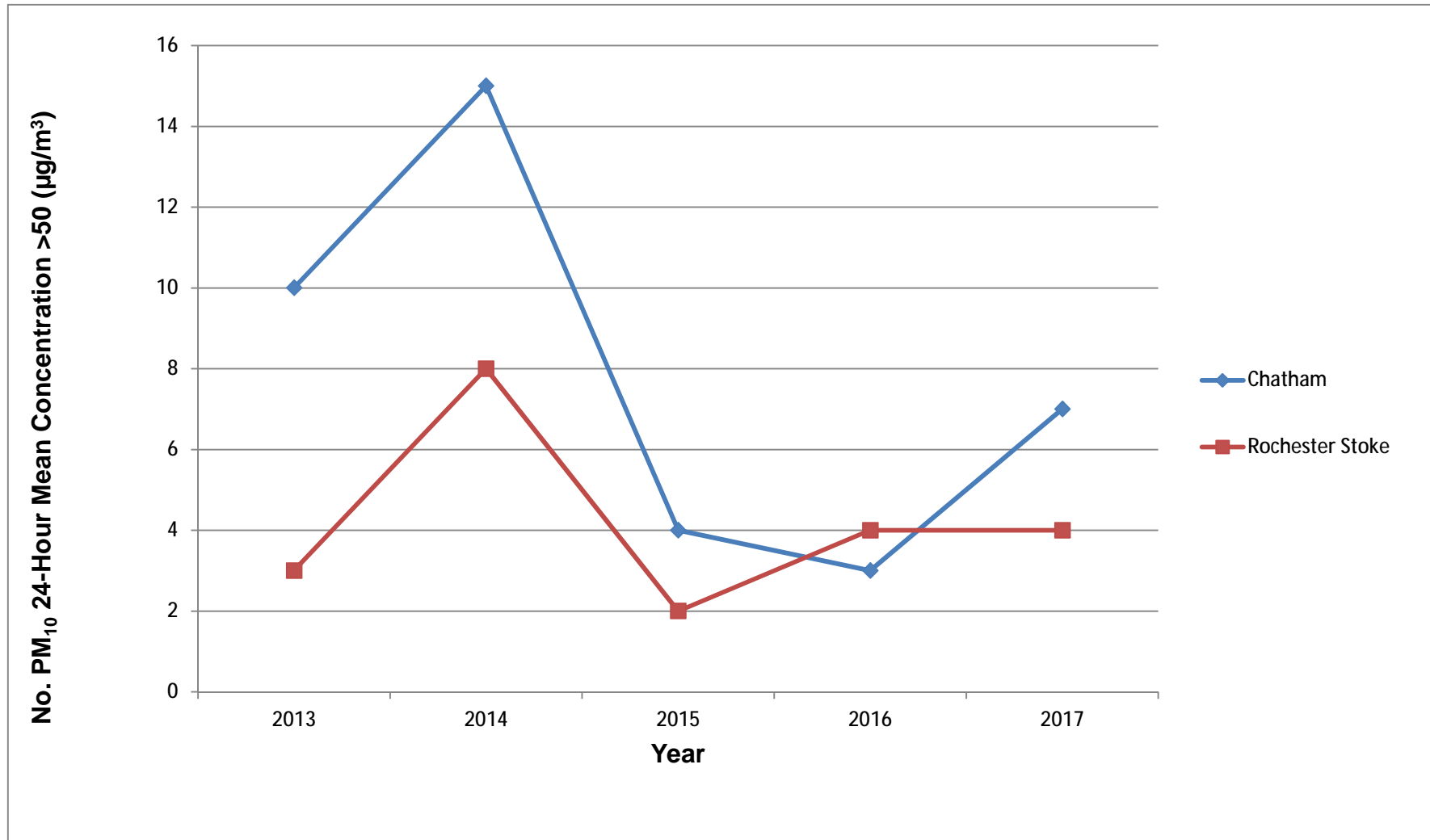


Figure A1.3: Trends in Number of 24-Hour Mean PM₁₀ Results > 50 µg/m³

Table A1.7: PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	PM _{2.5} Annual Mean Concentration (mg/m ³) ^c				
				2013	2014	2015	2016	2017
Chatham	Urban Traffic	94.5	94.5	13	14	11.8	11.5	14.1
Rochester Stoke	Rural Background	89.6	89.6	16	15	8.9	11.3	9.7

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b 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%).

Annualisation has been conducted where data capture is <75%

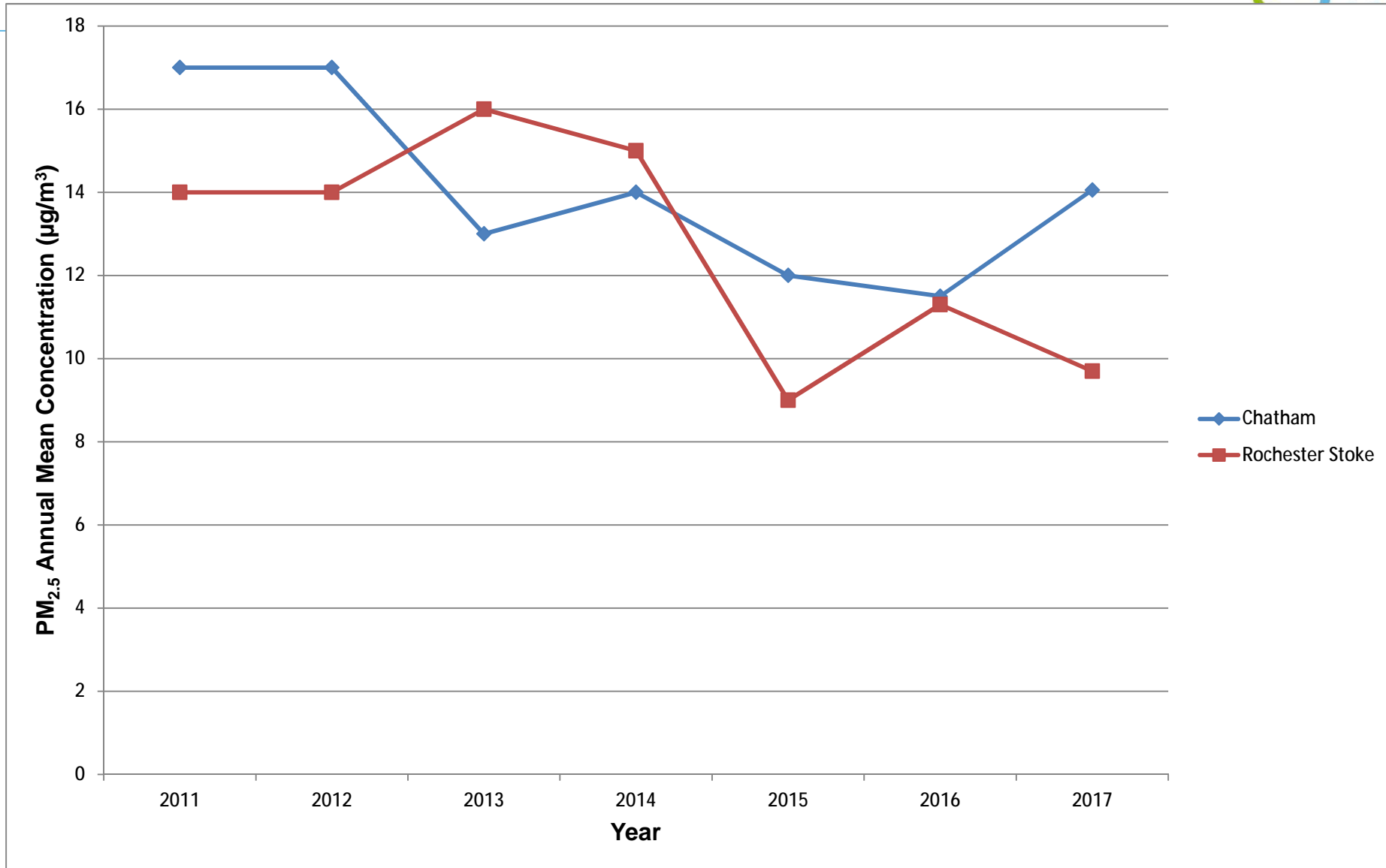


Figure A1.4: Trends in Annual Mean PM_{2.5} Concentrations

Table A1.8: SO₂ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ^a	Valid Data Capture 2017 (%) ^b	Number of Exceedances 2017 (percentile in bracket)		
				15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
Rochester Stoke	Rural Background	94.6	94.6	0	0	0

Notes: Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year).

^a Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b 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%).

A2 Full Monthly Diffusion Tube Results for 2017

Table A2.1: NO₂ Monthly Diffusion Tube Results for 2017

Site ID	NO ₂ Mean Concentrations (mg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw data	Bias Adjusted and Annualised ^a	Distance Corrected to Nearest Exposure ^b
DT01	86.1	58.5	61.0	59.0	48.9	52.1	49.6	54.5	53.3	64.8	62.5	57.2	59.0	45.4	45.4
DT02	79.8	56.1	59.0	64.8	59.4	52.9	46.0	50.9	42.9	50.7	58.7	49.7	55.9	43.0	43.0
DT03	97.1	64.4	73.8	73.2	67.1	58.2	49.2	61.5	66.7	58.5	68.5	56.8	66.3	51.0	51.0
DT04	75.7	53.5	54.1	53.2	44.8	41.1	37.5	40.2	47.3	44.7	53	44.8	49.2	37.9	37.9
DT05	65.7	49.4	45.2	42.4	42	34.5		39.1	40.2	36.6	51.1	42.3	44.4	34.2	34.2
DT06	92.8	67.6	62.6	69.4	62.9	60.4	60.1	55	61.8	65.5	75.2	60.8	66.2	51.0	51.0
DT07	64.5	52.7	51.4	57.9	49.5	44.3	43.7	46.6	48	47.2	54.4	44.8	50.4	38.8	38.8
DT08	70.4	57.9	54.4	50.7	44.4	43.2	42.1					44.5	51.0	38.8	38.8
DT09	57.4	39	36.4	33.5	30.4	32.6	29.9	29.7	34	34.8	44.3	34.3	36.4	25.5	25.5
DT10	61.8		49.9	39.8	42.9	33.1	33.2		37.7	45.8	48	28.4	42.1	32.4	32.4
DT11	75.9	45.8	53.4	45.7	42	41.3	30.8	41.4	45.7	42.4	53	38.9	46.4	35.7	35.7
DT12	74.3	54.2	49	39.8	45.2	39.4	31.6	40.3	44.5	41.9	49.1	43.6	46.1	35.5	35.5
DT13	56.9	27.3	25.5	18.7			14	18.3	21.3			28.6	26.3	13.8	13.8 ^c
DT14	63.6	42.1	36.6	40.5									45.7	29.2	28.2
DT15	75.4	45.2	47.2		45.4	39.4	37.9	42.9	44.6	42	56.4	38.5	46.8	36.0	34.1
DT16	52	38.1	40	39.5		27	24.6	34	33.3	35.1	47	37.5	37.1	28.6	28.6
DT17	88.5	56.4	54.7		52.2		49.4	58	57.7	56.7	64.8	50.1	58.9	45.3	39.1
DT18	89.7	65.8	73.6	62.6	55.1	54.3	47.9	57.2	58.9	56.9	71	55.5	62.4	48.0	44.9

Site ID	NO ₂ Mean Concentrations (mg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw data	Bias Adjusted and Annualised ^a	Distance Corrected to Nearest Exposure ^b
DT19	67.5	64.2	66.6	59.9	59.7	60.9	56.8	58.9	56.3	68.9	67.6	60.7	62.3	48.0	48.0
DT20	101.9	64.6	72.2	66.7	64.8	61.7	55.6	56.6	63.7	62.7	63.1	61.7	66.3	51.0	38.8
DT21	50	36.3	32.9	26.5	24.6	21	20.6	26	24.4	25.7	33.9	26.8	29.1	22.4	22.4
DT22	57.2	40	48.8	37.7	36.8	39.2	33.3	35.2	37.3	39	41.9	37.4	40.3	31.0	31.0
DT23	59.3	34.9	37.4	27.9	37.1	27.1	25.8	30	30.8	29.5	26.1	29	32.9	25.3	25.3
DT24	93.2	74.3	66.4	67.7	60	65.1	59.5	71.6	71	73.8	79.4	9.2	65.9	50.8	40.6
DT25	95.4	50.5	47.1	52	46.6	45.3		53.2	54.5	53.2	62.3	52.9	55.7	42.9	42.1
DT26	70	36.7	38.4	31.3	34	29.2	24.8		25.7	33.7	43.1	35.1	36.5	28.1	24.6
DT27	86.6	56.1	58.6	58.9	45.7	37.3	31.3	44.8	39.5	41.2	62.3	46.7	50.8	39.1	34.5
DT28	86	57.3	55.1	54.3	60.2	45.3	42.6	50.8	48.2	47.6	58.4	47.9	54.5	41.9	32.5
DT29	82	49.1	53.5	46.6	36.6	34.9	32.7	39	34.6	41	56.7	45.7	46.0	35.4	29.9
DT30	68.9	53.5	56.9	52.5	49.2	42	38.9		48.4	43.2	53.8	38.3	49.6	38.2	38.2
DT31	59.5	37.9	38.1	32.2	23.9	24.3	23.8	30	32.2	35.1	41.8	34	34.4	26.5	26.5
DT32	94.6	67.7	35.4	98.8	54.9	56.1	49.7	51.9	62.4	63.9	63.2	41.2	61.7	47.5	35.4
DT33	85.2		61.2	61.6	50.8	45.3	43.4	51.9	57.9	46.6	57.6	60.3	56.5	43.5	38.3
DT34												48.4	48.4	37.3	37.3 ^c
DT35										41.4	49.1	43.2	44.6	30.2	25.0 ^d
DT36										72.5	65.6	62.1	66.7	45.3	35.9 ^d

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

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

^a All sites have been adjusted using the national bias adjustment factor for ESG Didcot, 50% TEA in acetone method (0.77), with the exceptions of DT09 which uses a local adjustment factor based on Chatham automatic monitoring site (0.70) and DT13 which uses a local adjustment factor based on Rochester Stoke automatic monitoring site (0.53). See Appendix A3 for further details on bias adjustment and annualisation.

- b Distance corrected to nearest relevant public exposure.
- c It has not been possible to distance correct this site as there is currently no nearby relevant exposure.
- d At the nearest site of relevant exposure only the 1-hour objective is applicable, therefore, only the 1-hour mean will apply.

- Local bias adjustment factor used**
- National bias adjustment factor used**
- Annualisation has been conducted where data capture is <75%, where possible**
- Where applicable, data has been distance corrected for relevant exposure**

A3 Supporting Technical Information / Air Quality Monitoring Data QA/QC

Changed / Additional Pollutant Sources

Changed and new sources of pollution have been investigated and any changes to existing sources or new sources are listed below:

Table A3.1: Changed / Additional Pollutant Sources in 2017

Changed / Additional Pollutant Sources	Screening Assessment Required	Any Changes to Monitoring / Fast Track AQMA Declaration
Industrial Installations (new installations and those with significantly increased emissions)		
Pacadar Ltd, P/B/072 – bulk cement installation. Although permitted in 2017 this source was not operational in 2017.	No	No
Fugitive / uncontrolled sources		
MC/17/3029 and MC/17/3676 (MC/12/0020) – Kingsnorth Quarry, Stoke Road, Hoo: Extraction and processing of sand and gravel and installation of a ready mixed concrete plant.	This proposed development was withdrawn by the applicant. As such no screening assessment, changes to monitoring and / or fast track AQMA declaration is necessary.	
MC/17/2565 – Alpha Jetty, Salt Lane, Cliffe: Jetty extension.	An air quality assessment (AQA) was undertaken. The AQA does not require any changes to monitoring and / or fast track AQMA declaration, however, it does require further consideration of the potential effects of NO _x within the Ecological Impact Assessment. The Ecological Impact Assessment does not require any changes to air quality monitoring and / or fast track AQMA declaration.	
MC/17/3599 – Salt Lane, Cliffe: Cement batching plant application (although there has been similar historic use in this area).	An Environmental Impact Assessment (EIA) is required for this proposed development, should any changed to monitoring and / or fast track AQMA declaration be necessary this will be identified by the EIA.	
MC/17/4073 – Thamesport, Isle of Grain: Screening opinion for an aggregates processing, storage and transfer installation.	An EIA is required for this proposed development, should any changed to monitoring and / or fast track AQMA declaration be necessary this will be identified by the EIA.	
New developments		
MC/17/1115- 7 The Brook, Chatham, ME4 4LA. Objection raised on air quality grounds. Permission granted.	Medway Council is currently considering undertaking additional monitoring if the development is implemented. The result may be an extension to the Central Medway AQMA if exposure is above the nitrogen dioxide annual mean objective.	

Changed / Additional Pollutant Sources	Screening Assessment Required	Any Changes to Monitoring / Fast Track AQMA Declaration
Industrial Installations (new installations and those with significantly increased emissions)		
MC/17/0278- The Royal Oak, 53 Cooling Road, Strood, Rochester, ME2 4RP. Mitigation secured by condition.	New developments are assessed through the planning process. Any significant increases at relevant locations will be identified by the current monitoring network.	
MC/17/4424- Stoke Road, Hoo. Air quality assessment submitted. Yet to be determined.		
MC/17/2872- Canterbury Street. Air quality assessment submitted. Mitigation secured by condition.		
MC/17/0962- Land south of Merryboys Road, Cliffe Woods, Rochester, ME3 7TP. Mitigation secured by condition.		
MC/17/1460- 63 Luton Road, Chatham, ME4 5AG. In an AQMA. Mitigation conditions recommended but not included on permission.		
MC/17/0949- 140-142 Frindsbury Road, Rochester, ME2 4JD. Permission refused. Appeal lodged.		
MC/17/1605- Loxley House, 219 New Road, Chatham, ME4 4QA. Potential air quality impacts, but unable to address through prior approval/prior notification.		
MC/17/3000- Old George Court, Main Road, Chattenden. In an AQMA. Mitigation conditions recommended, not all included on permission.		
MC//17/3065- 108 Cuxton Road, Strood, Rochester. Permission refused.		
MC/17/3068- 59 Rainham Road, Gillingham, ME7 5LS. In an AQMA. Mitigation conditions recommended, not all included on permission.		
MC/17/3687- Berengrave Nursery, Berengrave Lane, Rainham, ME8 7NL. Air quality assessment submitted. Mitigation secured by conditions.		
MC/17/3807- 156 Luton Road, Luton, Chatham, ME4 5BP. In an AQMA. Mitigation conditions recommended but not included on permission.		
MC/17/3808- 154 Luton Road, Luton, Chatham, ME4 5BP. In an AQMA. Mitigation conditions recommended but not included on permission.		
MC/17/3806- 159 Luton Road, Luton, Chatham, ME4 5AE. In an AQMA. Mitigation conditions recommended but not included on permission.		
MC/17/3144- 189 Luton Road, Luton, Chatham, ME4 5AE. In an AQMA. Mitigation conditions recommended but not included on permission.		
MC/17/0416- 99 Land to the north of High Street, Newington, ME9 7JJ (consultation from Swale Borough Council). Objections raised by Medway Council, including on air quality impacts.		
MC/17/1978- 25 Corporation Street, Rochester, ME1 1ND. In an AQMA. Air quality assessment submitted. Mitigation conditions recommended. Yet to be		

Changed / Additional Pollutant Sources	Screening Assessment Required	Any Changes to Monitoring / Fast Track AQMA Declaration
Industrial Installations (new installations and those with significantly increased emissions)		
determined.		
MC/17/3484- Hempstead Valley Shopping Centre, Hempstead Valley Drive, Hempstead. Air quality assessment submitted. Mitigation conditions included on permission.		
MC/17/3431- 41 Railway Street, Chatham, ME4 4RP. In AQMA. Potential air quality impacts, but unable to address through prior approval/prior notification.		
MC/17/3949- 133 Luton Road, Luton, Chatham. In AQMA. Air quality issues raised. Yet to be determined.		
MC/17/4272- Land rear of 315 Luton Road, Luton, Chatham, ME4 5BL. Near to AQMA. Mitigation conditions recommended. Permission refused. Appeal in progress.		

There were no changed or new sources of the following types in 2017:

- Road sources, including:
 - Narrow congested streets with residential properties close to the kerb;
 - busy streets where people may spend 1-hour or more close to traffic;
 - roads with a high flow of buses and / or heavy goods vehicles (HGVs);
 - junctions;
 - new roads constructed since the last round of Review and Assessment;
 - roads with significantly changed traffic flow;
 - bus and coach stations;
- other transport sources, including
 - airports;
 - railway (diesel and steam trains);
 - ports (shipping);
- the following types of industrial sources:
 - major petrol storage depots;
 - petrol stations;
 - poultry farms; and
- commercial and domestic sources, including:
 - biomass combustion (including domestic solid-fuel burning for PM₁₀);
 - CHP installations; and
 - Domestic solid-fuel burning (SO₂).

Diffusion Tube Bias Adjustment Factors

Measurements from co-located diffusion tubes and automatic monitors at Chatham (AURN) and Rochester Stoke (AURN) monitoring sites have been compared to determine local bias adjustment factors.

Table A3.2: Local Bias Adjustment Factor Calculation

Monitoring Site	Diffusion Tube Annual Mean Concentration (mg/m ³)	Automatic Annual Mean Concentration (mg/m ³)	Adjustment Factor
Chatham	36	26	0.70
Rochester Stoke	26	14	0.53

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the LAQM Helpdesk. The National Diffusion Tube Bias Adjustment Factor Spreadsheet (Version 03/18) was used to obtain an overall adjustment factor of 0.77 for 2017. This overall factor is based on 27 co-location studies where the tube preparation method and analysis laboratory used were the same as those used by Medway Council.

The national bias adjustment factor (0.77) is based on a greater number of studies than the local adjustment factors and, for most areas within Medway, is, therefore, considered to be more reliable. Furthermore, the national factor is higher than either of the two local adjustment factors and, therefore, provides a worst-case approach.

Based on the above, the national bias adjustment factor has been applied to all sites, with the exception of the co-located tubes, to which the local adjustment factor of 0.70 and 0.53 were applied to the Chatham AQ Station site (DT09) and the Rochester Stoke AQ Station site (DT13) were applied respectively.

Diffusion Tube Annualisation

Diffusion tube monitoring sites have been annualised as per Technical Guidance LAQM.TG16 in instances where valid data capture was less than 75% (and at least 25%).

Sites DT08, DT13, DT14, DT35 and DT36 have been annualised against automatic monitoring sites 'Rochester Stoke', 'Southend-on-Sea' and 'London Bexley', which fulfil the criteria specified by LAQM.TG16 guidance of being long-term continuous background monitoring sites with data capture over 85% for 2017, preferably forming part of the AURN network. It has not been possible to annualise DT34 (which had valid data capture in 2017 of 8.3%) as only one month of valid data was available; LAQM.TG16 requires that at least 3 months of valid data be present for annualisation to be undertaken.

Three adjustment factors (one for each of the automatic sites used) have been calculated for each diffusion tube site based on the ratio of the mean concentration measured by the automatic sites during the monitoring period for which data for the diffusion tube site was available and annual mean concentrations measured by the automatic sites (see Table A3.3, A3.4 and A3.5). An average of the three adjustment factors was then calculated (see Table A3.6) and applied to the diffusion tube bias adjusted annual means.

Table A3.3: Rochester Stoke Annualisation Factors

2017 Month	Automatic Mean NO ₂ Conc. (mg/m ³)	Raw Diffusion Tube Mean NO ₂ Conc. (mg/m ³)					Automatic Mean NO ₂ Conc. (mg/m ³) when Diffusion Tube Data is Available				
		DT 08	DT 13	DT 14	DT 35	DT 36	DT 08	DT 13	DT 14	DT 35	DT 36
January	31.3	70.4	56.9	63.6	-	-	31.3	31.3	31.3	-	-
February	16.4	57.9	27.3	42.1	-	-	16.4	16.4	16.4	-	-
March	12.9	54.4	25.5	36.6	-	-	12.9	12.9	12.9	-	-
April	11.8	50.7	18.7	40.5	-	-	11.8	11.8	11.8	-	-
May	12.3	44.4	-	-	-	-	12.3	-	-	-	-
June	12.3	43.2	-	-	-	-	12.3	-	-	-	-
July	8.8	42.1	14.0	-	-	-	8.8	8.8	-	-	-
August	10.7	-	18.3	-	-	-	-	10.7	-	-	-
September	11.7	-	21.3	-	-	-	-	11.7	-	-	-
October	12.6	-	-	-	41.4	72.5	-	-	-	12.6	12.6
November	21.8	-	-	-	49.1	65.6	-	-	-	21.8	21.8
December	15.6	44.5	28.6	-	43.2	62.1	15.6	15.6	-	15.6	15.6
AVERAGE:	14.8	51.0	26.3	45.7	44.6	66.7	15.2	14.9	18.1	16.7	16.7
ANNUALISATION FACTOR:							0.98	1.00	0.82	0.89	0.89

Table A3.4: Southend-on-Sea Annualisation Factors

2017 Month	Automatic Mean NO ₂ Conc. (mg/m ³)	Raw Diffusion Tube Mean NO ₂ Conc. (mg/m ³)					Automatic Mean NO ₂ Conc. (mg/m ³) when Diffusion Tube Data is Available				
		DT 08	DT 13	DT 14	DT 35	DT 36	DT 08	DT 13	DT 14	DT 35	DT 36
January	39.5	70.4	56.9	63.6	-	-	39.5	39.5	39.5	-	-
February	25.0	57.9	27.3	42.1	-	-	25.0	25.0	25.0	-	-
March	20.7	54.4	25.5	36.6	-	-	20.7	20.7	20.7	-	-
April	16.9	50.7	18.7	40.5	-	-	16.9	16.9	16.9	-	-
May	16.3	44.4	-	-	-	-	16.3	-	-	-	-
June	13.4	43.2	-	-	-	-	13.4	-	-	-	-
July	11.5	42.1	14	-	-	-	11.5	11.5	-	-	-
August	16.9	-	18.3	-	-	-	-	16.9	-	-	-
September	16.4	-	21.3	-	-	-	-	16.4	-	-	-
October	18.5	-	-	-	41.4	72.5	-	-	-	18.5	18.5
November	27.6	-	-	-	49.1	65.6	-	-	-	27.6	27.6
December	22.2	44.5	28.6	-	43.2	62.1	22.2	22.2	-	22.2	22.2
AVERAGE:	20.4	51.0	26.3	45.7	44.6	66.7	20.7	21.1	25.5	22.8	22.8
ANNUALISATION FACTOR:							0.99	0.97	0.80	0.90	0.90

Table A3.5: London Bexley Annualisation Factors

2017 Month	Automatic Mean NO ₂ Conc. (mg/m ³)	Raw Diffusion Tube Mean NO ₂ Conc. (mg/m ³)					Automatic Mean NO ₂ Conc. (mg/m ³) when Diffusion Tube Data is Available				
		DT 08	DT 13	DT 14	DT 35	DT 36	DT 08	DT 13	DT 14	DT 35	DT 36
January	35.5	70.4	56.9	63.6	-	-	35.5	35.5	35.5	-	-
February	24.3	57.9	27.3	42.1	-	-	24.3	24.3	24.3	-	-
March	27.9	54.4	25.5	36.6	-	-	27.9	27.9	27.9	-	-
April	26.2	50.7	18.7	40.5	-	-	26.2	26.2	26.2	-	-
May	22.8	44.4	-	-	-	-	22.8	-	-	-	-
June	17.8	43.2	-	-	-	-	17.8	-	-	-	-
July	15.0	42.1	14	-	-	-	15.0	15.0	-	-	-
August	18.9	-	18.3	-	-	-	-	18.9	-	-	-
September	21.5	-	21.3	-	-	-	-	21.5	-	-	-
October	22.5	-	-	-	41.4	72.5	-	-	-	22.5	22.5
November	36.3	-	-	-	49.1	65.6	-	-	-	36.3	36.3
December	27.7	44.5	28.6	-	43.2	62.1	27.7	27.7	-	27.7	27.7
AVERAGE:	24.7	51.0	26.3	45.7	44.6	66.7	24.6	24.6	28.5	28.9	28.9
ANNUALISATION FACTOR:							1.00	1.00	0.87	0.86	0.86

Table A3.6: Average Annualisation Factors

DT08	DT13	DT14	DT35	DT36
0.99	0.99	0.83	0.88	0.88

QA/QC of Automatic Monitoring

The Chatham (AURN) site is calibrated every two weeks and the Rochester Stoke (AURN) site every three months.

QA/QC of Diffusion Tube Monitoring

Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance. The diffusion tubes are supplied and analysed by ESG Didcot utilising the 50% Triethanolamine (TEA) in acetone preparation method. ESG Didcot is a UKAS accredited laboratory which participates in the WASP scheme.

Distance from Road Calculation

A number of the roadside diffusion tube monitoring sites measuring nitrogen dioxide concentrations in 2017 were not located at sites of relevant public exposure. As such, it is necessary to distance

correct the measured concentrations at these sites in order to estimate concentrations experienced at the nearest relevant exposure to these sites. These estimated concentrations can then be compared to the relevant air quality objectives to establish whether or not an exceedance is likely to have taken place.

Distance correction calculation have been undertaken for each nitrogen dioxide monitoring site that is not representative of relevant exposure using Defra's 'NO₂ with Distance from Roads Calculator Tool v4.2', which requires the following inputs:

- Distance from the monitoring site to the kerb (m);
- distance from the closest relevant exposure to the kerb (m);
- the local annual mean background nitrogen dioxide concentration ($\mu\text{g}/\text{m}^3$), determined using Defra's background maps; and
- the measured annual mean nitrogen dioxide concentration at the site ($\mu\text{g}/\text{m}^3$).

The distance corrected 2017 nitrogen dioxide annual mean concentrations are presented in Table A2.1.

A4 Maps of Monitoring Locations and AQMAs

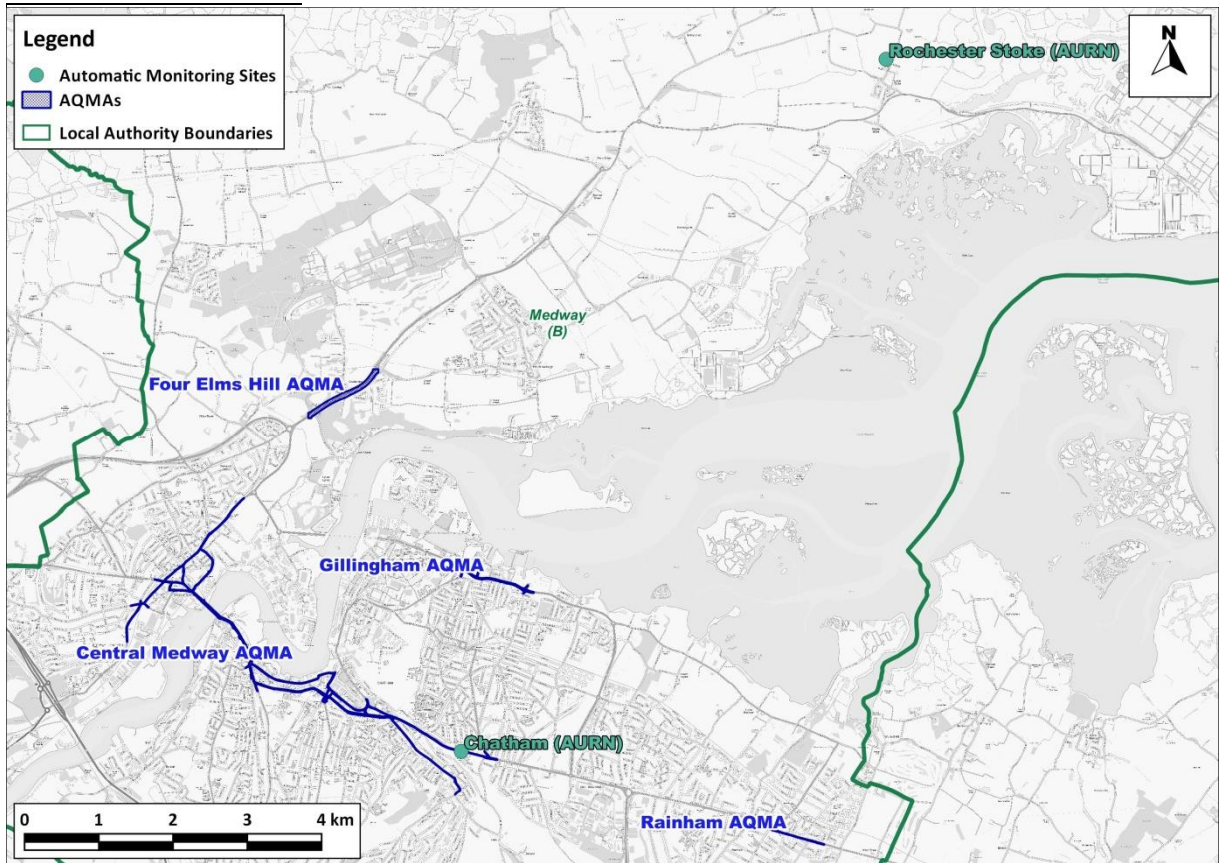


Figure A4.1: Map of Automatic Monitoring Sites and AQMA Locations within Medway

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0. Ordnance Survey licence number 100046099.

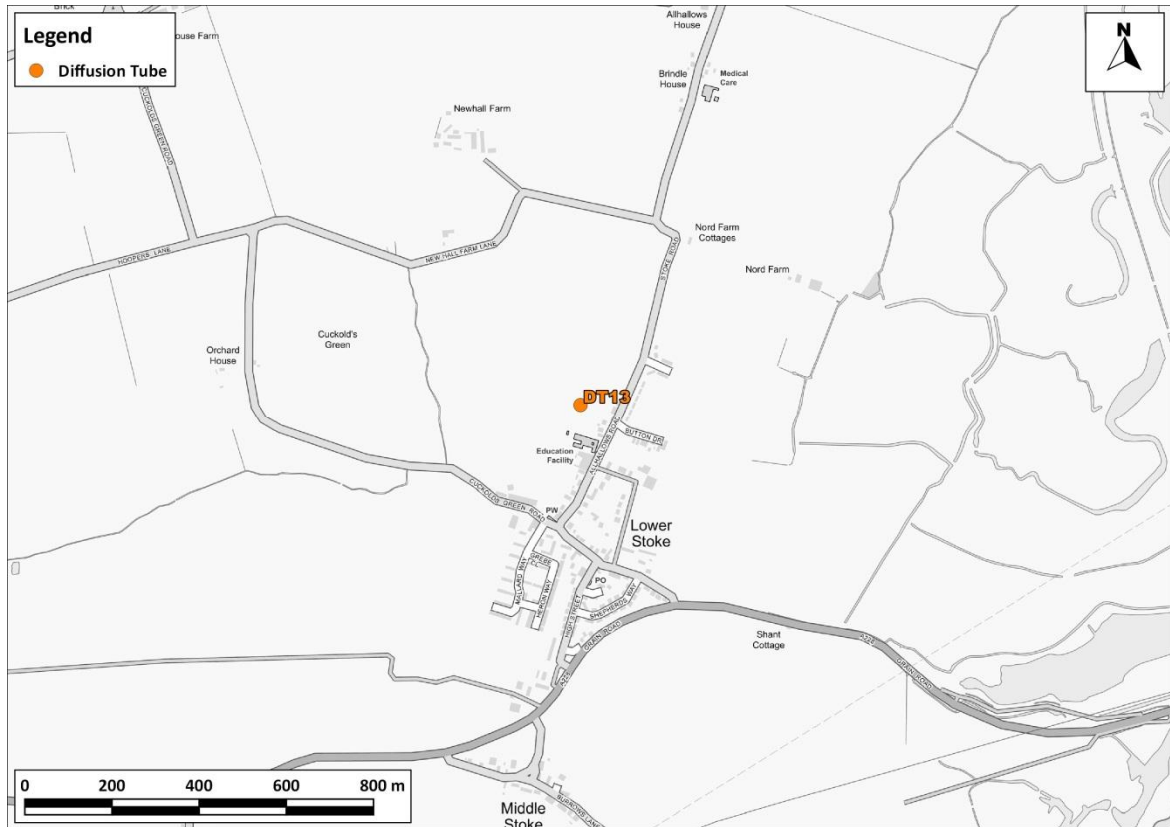


Figure A4.2: Map of Diffusion Tube Monitoring Site within Medway (North)

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0. Ordnance Survey licence number 100046099.

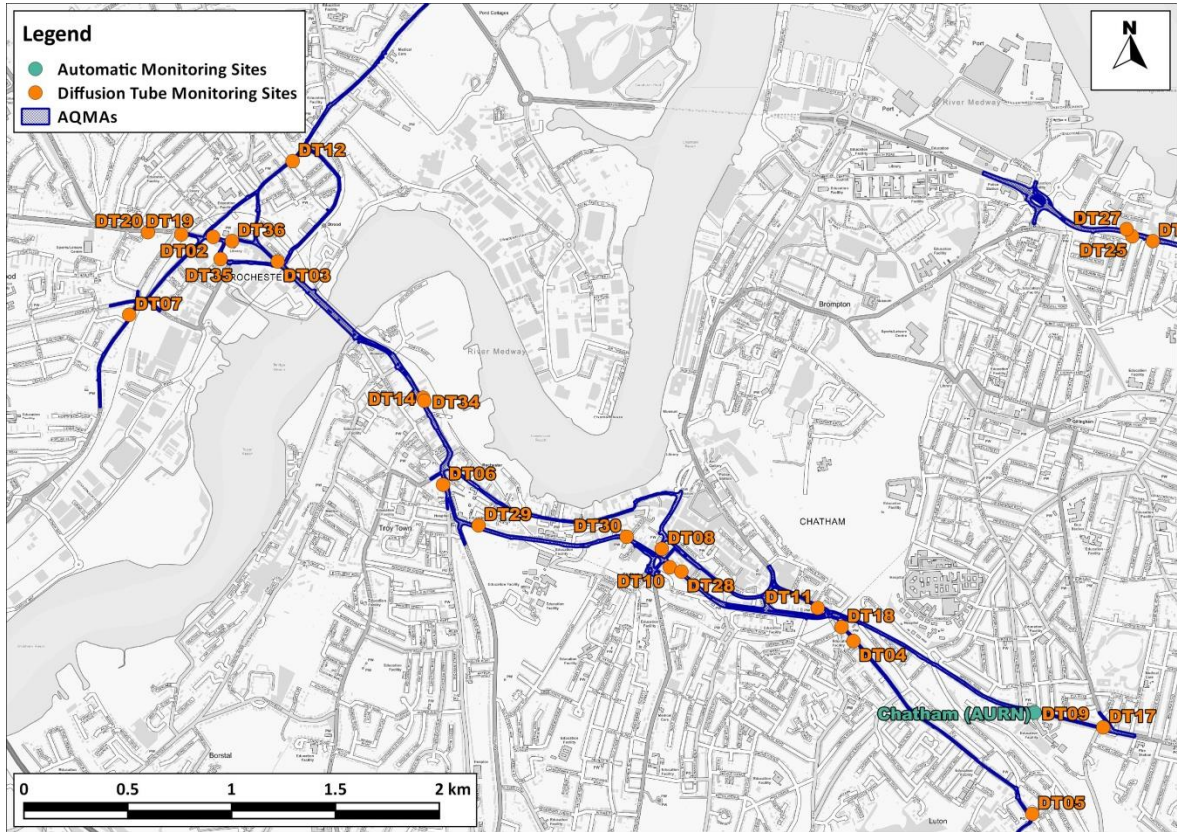


Figure A4.3: Location of Monitoring Sites within Central Medway AQMA

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0.

Ordnance Survey licence number 100046099.

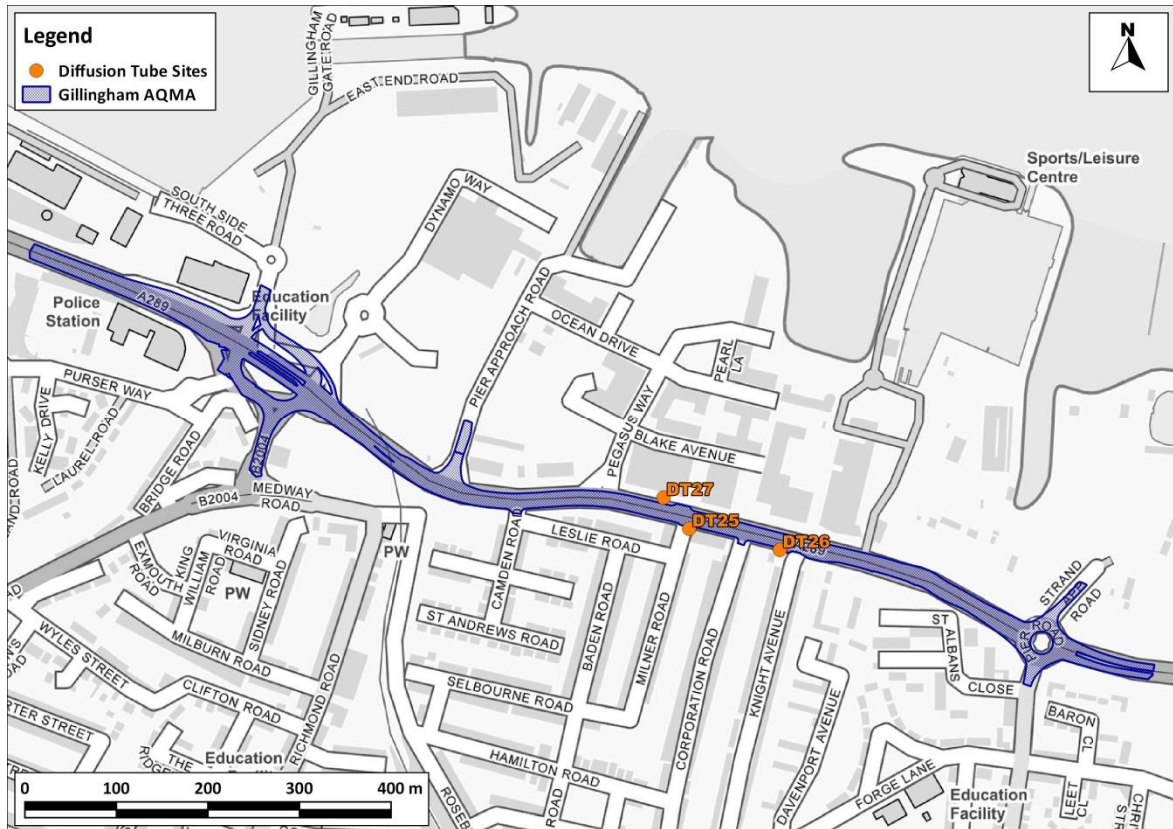


Figure A4.4: Location of Monitoring Sites within Gillingham AQMA

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0. Ordnance Survey licence number 100046099.

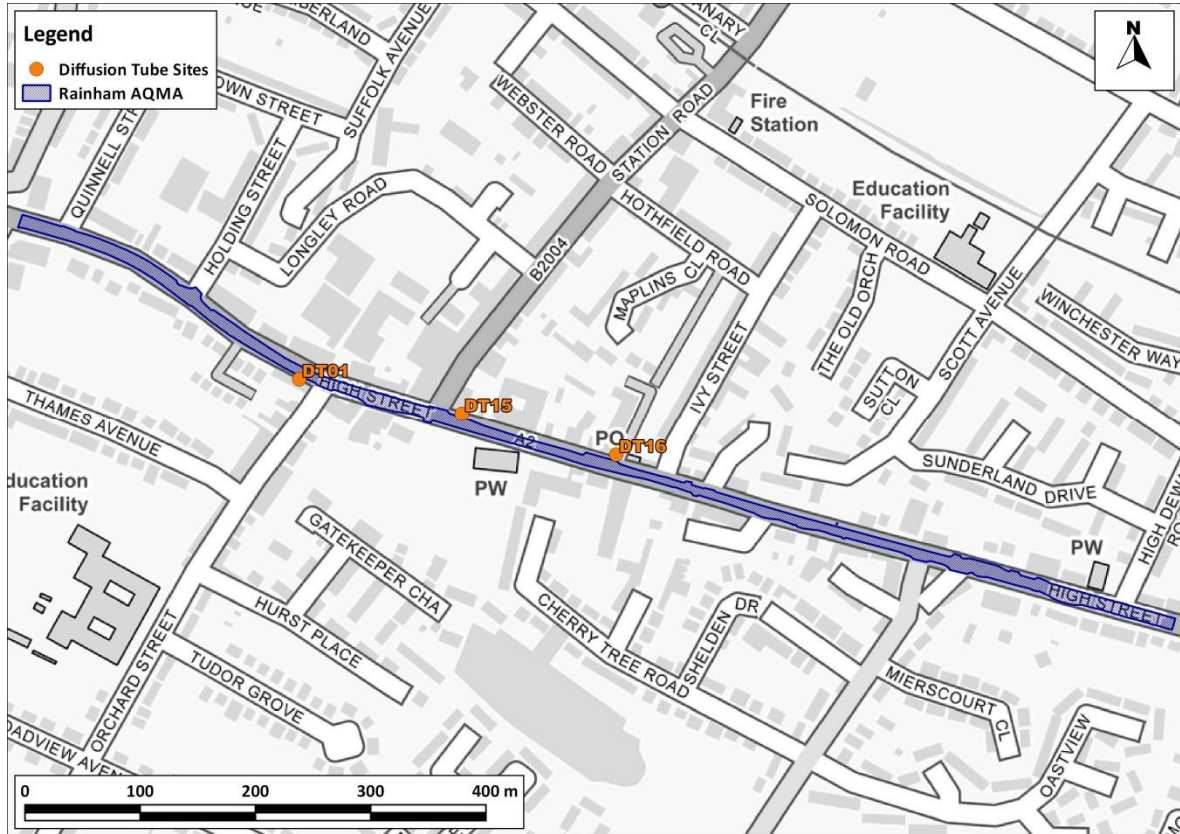


Figure A4.5: Location of Monitoring Sites within Rainham AQMA

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0. Ordnance Survey licence number 100046099.

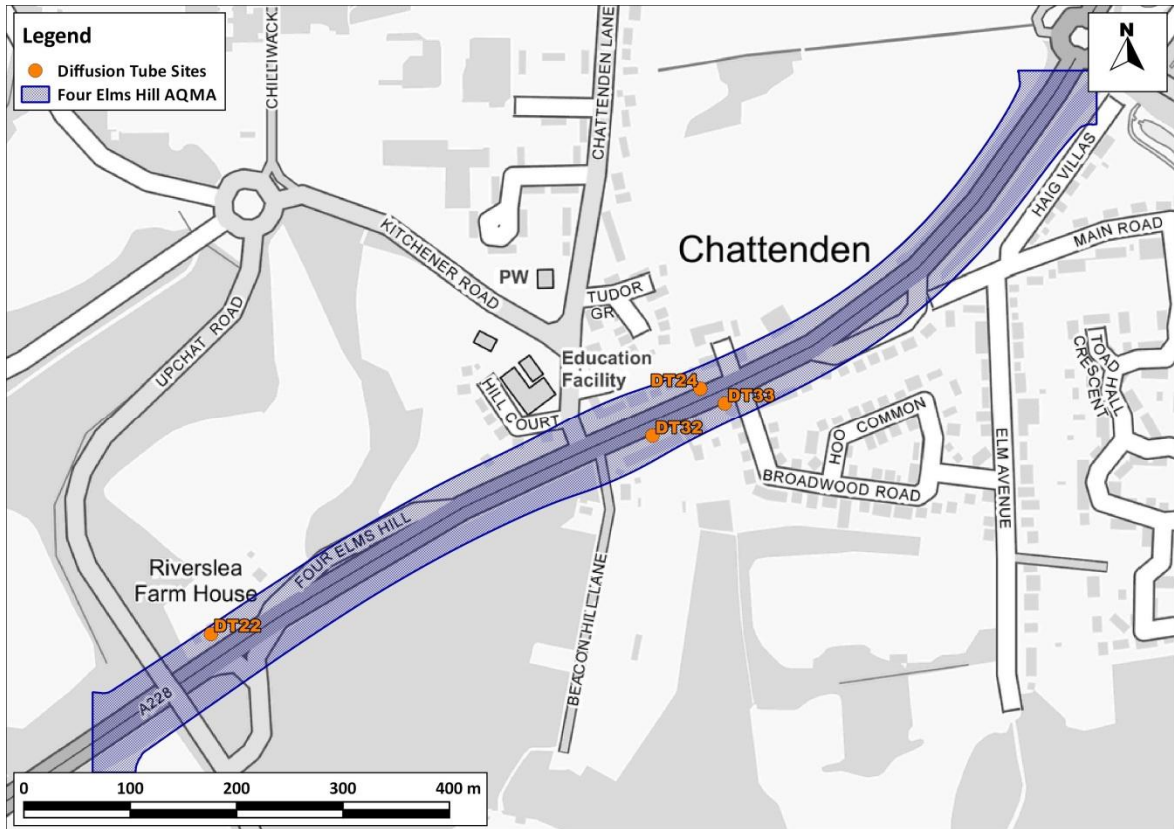


Figure A4.6: Location of Monitoring Sites within Four Elms Hill AQMA

Contains Ordnance Survey data © Crown copyright and database right 2016. Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v1.0. Ordnance Survey licence number 100046099.

A5 Summary of Air Quality Objectives in England

Table A5.1: Air Quality Objectives in England

Pollutant	Time Period	Objective ^a
Nitrogen Dioxide (NO₂)	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
Particulate Matter (PM₁₀)	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
Sulphur Dioxide (SO₂)	1-hour Mean	350 µg/m ³ not to be exceeded more than 24 times a year
	24-hour Mean	125 µg/m ³ not to be exceeded more than 3 times a year
	15-minute Mean	266 µg/m ³ not to be exceeded more than 35 times a year

^a The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

AQC	Air Quality Consultants
AQMA	Air Quality Management Area
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EU	European Union
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
$\mu\text{g}/\text{m}^3$	Microgrammes per cubic metre
NO	Nitric oxide
NO₂	Nitrogen dioxide
NOx	Nitrogen oxides (taken to be NO ₂ + NO)
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
QA/QC	Quality Assurance and Quality Control
SO₂	Sulphur Dioxide
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

References

Defra. (2016a). *Local Air Quality Management Policy Guidance (PG16)*.

Defra. (2016b). *Local Air Quality Management Technical Guidance (TG16)*.

HMSO. (1995). *Environment Act*.