



2016 Air Quality Annual Status Report (ASR)

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

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Report Reference number	SDC_ASR2016
Date	January 2017

Executive Summary: Air Quality in Our Area

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

Air Quality in Sevenoaks

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

The primary source of air pollution within the district is from nitrogen dioxide and particulate matter from road traffic. The district is traversed by three major motorways and these have a considerable flow of continental HGVs using the port at Dover and the Channel Tunnel. Local journeys, school runs, commuting to London or connection with London contribute significantly to a number of hot spots in Sevenoaks, Swanley and Westerham.

Nitrogen dioxide diffusion tube monitoring has shown 16 roadside locations where results are above objective levels, all of which are within current AQMA's. Automatic monitoring for both nitrogen dioxide and PM10 are all below the objective levels. The vast majority of all monitoring sites show a reduction in pollution across the district in comparison to previous years.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

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

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Actions to Improve Air Quality

The primary source of air pollution within the district from road traffic. The district is traversed by three major motorways and these have a considerable flow of continental HGVs using the port at Dover and the Channel Tunnel. Many of the actions require the input of highways authorities. Sevenoaks District Council continues to work closely with Kent County Council Highways. Air quality is a theme that is fed into the Sevenoaks Joint Transport Board.

As well as actions to improve air quality Sevenoaks District Council also operates a scheme with an aim to improve health and reduce exposure to air pollution.

Sevenoaks District Council provides a free messaging service that will send free messages to mobile or home telephones to inform vulnerable people that poor air quality is predicted in the area.

Local Priorities and Challenges

Where there is congestion on the M25 and/or the M26 traffic overspill onto the local road network occurs, particularly on roads such as the A25. There are several historic towns located along the A25 where residential dwellings are located in very close proximity to the kerb of the road.

The District Council is in the process of developing its Local Development Framework (LDF). The Core Strategy of the LDF was adopted in February 2011.

The LDF Core Strategy seeks to direct development towards settlements and locations with the greatest range of jobs, shops and services and which provide the most viable opportunities for travel by modes other than the car. This provides an opportunity to reduce the need to travel by car and, therefore, cut congestion and air quality problems linked to vehicle emissions. The Allocations and Development Management Plan: Draft for Submission proposes sites for new development in accordance with these policies of the Core Strategy

Core Strategy Policy SP2 proposes that the design and location of new development will take account of the need to improve air quality in accordance with the Air Quality

Action Plan 2009. Planning permission will be refused where unacceptable impacts on air quality cannot be overcome by mitigation.

Policy SP2 of the Core Strategy also sets out the District Council's support for measures to enhance the safety and convenience of public and community transport and improve facilities for cyclists and pedestrians.

Sevenoaks Local Plan includes policies which seek to reduce emissions across the district, these include:

- Focussing new development within the built confines of existing settlements to reduce the need to travel and therefore associated emissions.
- Retention of existing employment sites to provide residents the opportunity to work locally.
- Supporting public transport schemes and alternative forms of travel through the Sevenoaks Transport Strategy and Cycling Strategy.
- Retention and improvement of local services and facilities.
- Developments within areas of poor air quality or developments which may have an adverse impact on air quality will be required to include mitigation measures to reduce the impact to an acceptable level. Refuse permission for developments where the impacts remain unacceptable.
- Emerging policy which supports the inclusion of Electrical Vehicle Charging points within new development.

The Government published the National Planning Policy Framework in March 2012. It states that 'planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'.

Kent County Council published its draft Local Transport Plan (LTP4) in 2016, which highlighted the following transport priorities for Sevenoaks.

- Alleviate congestion in Swanley with traffic management control.
- New railway station and guided busway for Swanley.

- New pedestrian footbridge over the railway line at Swanley to connect to the town centre.
- Bat & Ball Railway Station improvements.
- M26 capacity improvements through the use of smart or managed motorway system.
- Heavy Goods monitoring system on A25
- Junction improvements outside Sevenoaks station and on the High Street/Pembroke Road junction.
- Sevenoaks traffic signal optimisation.

How to Get Involved

Members of the public can help to improve air quality by making small changes to their everyday lives. Walking and cycling instead of making car journeys will reduce the amount of traffic on the local roads and reducing emissions and also helping to improve the congestion. Other small changes include not allowing car engines to idle when vehicles are stationary.

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1 Local Air Quality Management

This report provides an overview of air quality in Sevenoaks during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Sevenoaks District 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:

<http://www.sevenoaks.gov.uk/services/community-and-living/pollution/air-quality> or see a full list at <http://uk-air.defra.gov.uk/aqma/list>.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
AQMA 1	NO ₂ annual mean		Junction 3 of the M25 to the district boundary with Tonbridge and Malling Borough Council including part of the A20 at Farningham.	http://www.sevenoaks.gov.uk/services/community-and-living/pollution/air-quality
AQMA 2	NO ₂ annual mean		County border with Surrey to district border with Dartford, including Junctions 3, 4 and 5 and the extension of Junction 5 to connect with the A25 at Bessel's Green	http://www.sevenoaks.gov.uk/services/community-and-living/pollution/air-quality
AQMA 3	NO ₂ annual mean		M26 - from junction 5 of the M25 to the district boundary with Tonbridge and Malling Borough Council	http://www.sevenoaks.gov.uk/services/community-and-living/pollution/air-quality
AQMA 4	NO ₂ annual mean	Swanley	Swanley Bypass - from junction 3 of the M25 to the district boundary with the London Borough of Bromley	http://www.sevenoaks.gov.uk/services/community-and-living/pollution/air-quality

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
AQMA 6	PM ₁₀		Junction 5 to Kent / Surrey border	http://www.sevenoaks.gov.uk/service/s/community-and-living/pollution/air-quality
AQMA 8	NO ₂ annual mean	Swanley	Swanley – London Road (East); High Street; Bartholomew Way and parts of Central town area	http://www.sevenoaks.gov.uk/service/s/community-and-living/pollution/air-quality
AQMA 10	NO ₂ annual mean	Sevenoaks	Sevenoaks – High Street	http://www.sevenoaks.gov.uk/service/s/community-and-living/pollution/air-quality
AQMA 13	NO ₂ annual mean		The entire length of the A25 from the border with Tonbridge and Malling in the east to the border with Tandridge in the west.	http://www.sevenoaks.gov.uk/service/s/community-and-living/pollution/air-quality
AQMA 14	NO ₂ annual mean	Swanley	The junction of London Road and Birchwood Road, Swanley.	http://www.sevenoaks.gov.uk/service/s/community-and-living/pollution/air-quality

2.2 Progress and Impact of Measures to address Air Quality in Sevenoaks

Sevenoaks District Council has taken forward a number of measures during the current reporting year of 2015 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in their respective Action Plans

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	The Sevenoaks Joint Transport Board will continue to consider and review options and proposals made under the Traffic Management Act and the LTP as well as via the Member/Officer air quality working group and both liaise and lobby KCC Highways Services to establish scheme acceptance, prioritisation and funding	Traffic management	Other	SDC	2009-13	2009-13	N/A	<0.4 µg/m³	Ongoing	N/A	
2	The District Council will continue to consider the impact new developments have on air quality and take appropriate steps to minimise any increase in air	Traffic Management	Other	SDC	2009-13	2009-13	N/A	<0.4 µg/m³	Ongoing	N/A	
3	Set up an internal working group to identify, implement and monitor air quality mitigation measures secured by Section 106 Agreement .	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SDC	2009-13	2009-13	N/A	<0.4 µg/m³	Working group set up and meeting regularly.	N/A	Working group set up and meeting regularly

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4	For the KCC/SDC Member/officer air quality working group to make recommendations to the JTB regarding suitable traffic reducing proposals	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	SDC	2009-10	2011-13	N/A	<0.2 µg/m³	Ongoing	Ongoing	Regular liaison and reporting of air quality issues to JTB
5	The Council will demonstrate best practice in the purchase and operation of its own vehicle fleet in order to cut harmful emissions where possible	Traffic Management	UTC, Congestion management, traffic reduction	SDC	Ongoing	Ongoing	N/A	No specific target	Ongoing	Ongoing	
6	The District Council will continue to promote and publicise schemes including working with partners where appropriate to encourage a reduction in car use	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	SDC	2009-13	2009-13	N/A	No specific target	Ongoing	Ongoing	
7	Reducing congestion and improving air quality as a result through parking schemes	Promoting Travel Alternatives	Personalised Travel Planning	SDC	Ongoing	Ongoing	N/A	No specific target	Ongoing	Ongoing	

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8	The District Council will promote a number of initiatives to reduce energy consumption, improve energy efficiency and recycling and develop its carbon management role	Traffic Management	Emission based parking or permit charges	SDC	Ongoing	Ongoing	N/A	<0.2 µg/m³	Ongoing	Ongoing	
9	Continue to improve and raise the level of knowledge and publicity relating to air pollution	Policy Guidance and Development Control	Other policy	SDC	Ongoing	Ongoing	N/A	No specific target set	Ongoing	Ongoing	
10	AirAlert: Provide AQ health warning for vulnerable people advising them about pollution levels in their area.	Public Information	Other	SDC	Ongoing	Ongoing	N/A	No specific target set	Ongoing	Ongoing	

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

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

Sevenoaks District Council is working on producing a new Air Quality Action Plan that will include appropriate measures to reduce PM_{2.5} as well as other priority pollutants.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Sevenoaks District Council undertook automatic (continuous) monitoring at 3 sites during 2015. Table A.1 in Appendix A shows the details of the sites.

National monitoring results are available at <https://uk-air.defra.gov.uk/data/>

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

3.1.2 Non-Automatic Monitoring Sites

Sevenoaks District Council undertook non- automatic (passive) monitoring of NO₂ at 50 sites during 2015. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix C. Trends from previous years monitoring can be seen in appendix F.

3.2.1 Nitrogen Dioxide (NO₂)

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

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

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

Nitrogen dioxide diffusion tube monitoring has shown 16 roadside locations where results are above objective levels, all of which are within current AQMA's.

Automatic monitoring for nitrogen dioxide is below the objective levels with only one breach of the 1 hour mean objective recorded at the Bat & Ball site. However due to air conditioning problems at the Bat & Ball site, data capture for the year was only 61%.

Data for this site has been annualised following guidance in Local Air Quality Management Technical Guidance (TG16).

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

There were no recorded breaches of either the annual or 24 hour mean objectives at any of the monitoring locations. The Sevenoaks quarry site commenced monitoring in July 2015, and so data capture for the year is only 45%.

3.2.3 Particulate Matter (PM_{2.5})

PM_{2.5} is not currently monitored for.

3.2.4 Sulphur Dioxide (SO₂)

Sulphur Dioxide is no longer monitored.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	Greatness	Urban background	553603	156774	NO _x , NO, NO ₂ , PM ₁₀ , O ₃	N	TEOM	Y	46m	1.8
CM2	Bat & Ball	Roadside	553044	156690	NO _x , NO, NO ₂ , PM ₁₀	Y	TEOM	N - (30m)	8m	1.8
CM3	Sevenoaks Quarry	Roadside	553195	157195	PM ₁₀	N	BAM	N - (6m)	1m	1.8

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT2	High Street South 1 (Guitar) Sevenoaks	Roadside	553141	154263	NO2	Y	Y	1	N	2m
DT3	Garvock Drive Sevenoaks	Urban Background	552467	154167	NO2	N	Y	0	N	2m
DT27	High Street South 2 (Sev School) Sevenoaks	Roadside	553139	154259	NO2	Y	Y	3	N	2.5m
DT28	High Street North 2 (Sev Sennockian) Sevenoaks	Kerbside	552045	154883	NO2	Y	N (2m)	0.5	N	2.5m
DT29	High Street North 3 (Water Trough) Sevenoaks	Roadside	553073	155026	NO2	Y	N (3m)	2	N	2.5m
DT48	73 London Road (Brunch) Sevenoaks	Roadside	552867	154863	NO2	Y	Y	1.5	N	2m
DT49	20 London Road (Butchers) Sevenoaks	Roadside	553018	154654	NO2	Y	Y	2	N	2m
DT51	130 London Road (Opp Car Sales) Sevenoaks	Kerbside	552662	155153	NO2	Y	N (3m)	0.5	N	2.5m
DT52	142 London Road (Lulworth) Sevenoaks	Roadside	552506	155272	NO2	Y	N (6m)	2	N	2.5m
DT77	Montreal Road/ Amherst Hill	Roadside	551529	155967	NO2	N	N (4m)	2	N	2.5m

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
	Sevenoaks									
DT87	Bradbourne Vale Road South	Roadside	551640	156335	NO2	Y	N (10m)	2.5	N	2.5m
DT88	Bradbourne Vale Road North	Roadside	552963	156583	NO2	Y	N (20m)	1.5	N	2.5m
DT90	4a St Johns Hill Sevenoaks	Roadside	553140	155898	NO2	N	N (4m)	1.5	N	2.5m
DT23	Bat & Ball 1 Sevenoaks (Ferrari)	Roadside	553059	156624	NO2	Y	Y	4	N	2.5m
DT30	Bat & Ball 2 Otford Road Sevenoaks	Roadside	553019	155692	NO2	Y	N (7m)	3	N	2.5m
DT31	Bat & Ball 3 Seal Road Sevenoaks	Roadside	553154	156685	NO2	Y	N (1.5m)	1.5	N	2.5m
DT32	Bat & Ball 4 St Johns Sevenoaks	Roadside	553151	156558	NO2	Y	Y	1.5	N	2.5m
DT5	Riverhead 2 (Laundry) North West	Kerbside	551414	156197	NO2	Y	N (1.5m)	0.5	N	2.5m
DT6	Riverhead 3 (Opp shops) East	Roadside	551440	156165	NO2	Y	N (6m)	3	N	2.5m
DT42	62 London Road Riverhead	Roadside	551318	156373	NO2	Y	N (2m)	2	N	2.5m
DT76	Worships Hill/ Witches Lane, Riverhead	Roadside	551026	155710	NO2	Y	N (36m)	2	N	2.5m
DT7	High Street East 1 (Road Sign) Seal	Roadside	555092	156694	NO2	Y	Y	1	N	2.5m
DT8	High Street West 1	Roadside	554991	156726	NO2	Y	N (3m)	3	N	2.5m

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
	(Garage) Seal									
DT33	High Street East 2 (Pizza) Seal	Roadside	555068	156711	NO2	Y	Y	1.5	N	2m
DT34	High Street West 2 (Dorton House) Seal	Roadside	554637	156780	NO2	Y	N (7m)	2	N	2.5m
DT35	Seal Hollow Road/ A25	Roadside	554093	156798	NO2	Y	N (18m)	2.5	N	2.5m
DT43	Miners Arms, London Road, Dunton Green	Roadside	551281	156860	NO2	Y	N (2.5m)	2	N	2.5m
DT54	57 London Road, Dunton Green	Roadside	551216	157007	NO2	Y	N (8m)	2	N	2.5m
DT74	Westerham Road, (Devon Cott) Bessels Green	Roadside	550782	155585	NO2	Y	N (8m)	2	N	2.5m
DT86	59 Westerham Road, Bessels Green	Roadside	550872	155585	NO2	Y	Y	1.5	N	2m
DT71	204 Main Road, Sundridge	Roadside	548251	155354	NO2	Y	N (1.5m)	1	N	2.5m
DT12	Station Road (M25) Brasted	Roadside	546815	155866	NO2	Y	N (42m)	7m to M25	N	2m
DT84	West End Brasted	Roadside	546802	155000	NO2	Y	Y	1	N	2.5m
DT85	Chart Lane Brasted	Roadside	547097	155099	NO2	Y	Y	1	N	2.5m
DT24	High Street, (Wells Close) Westerham	Roadside	544415	153914	NO2	Y	N (3m)	1	N	2.5m
DT25	Vicarage Hill, Westerham	Roadside	544770	154000	NO2	Y	N (3m)	1	N	2.5m
DT36	Market Square, Westeham	kerbside	544594	154025	NO2	Y	N (3m)	1	N	2.5m
DT13	Wested Lane, Swanley	Roadside	552610	167700	NO2	Y	N (14m)	5	N	2.5m

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT14	Wadard Terrace, Button St Swanley	Roadside	553109	167880	NO2	Y	N (15m)	115m to M25	N	2.5m
DT39	Bartholomew Way, Swanley	Roadside	551492	168695	NO2	Y	N (13m)	2	N	2.5m
DT40	London Road 1 (traffic lights) Swanley	Kerbside	551592	168162	NO2	Y	N (2m)	0.5	N	2.5m
DT41	London Road 2 (Bus) Swanley	Roadside	552174	168162	NO2	Y	N (6m)	1.5	N	2.5m
DT81	Farningham Hill Road, Swanley	Urban	553416	167615	NO2	Y	N (17m)	27m to M20	N	2.5m
DT83	Jessamine Terrace, Birchwood Road Swanley	Roadside	550298	169582	NO2	Y	N (0.5m)	1	N	2.5m
DT93	Pucknells, Birchwood Road, Swanley	Roadside	550283	169743	NO2	N	N (10m)	2	N	2.5m
DT94	Birchwood Road Junction London Road	Roadside	550258	169575	NO2	Y	N (10m)	2	N	2m
DT95	Malvern, Birchwood Road, Swanley	Roadside	550377	169479	NO2	Y	N (20m)	2	N	2.5m
DT26	Farningham Hill (A20)	Roadside	554217	167252	NO2	Y	Y	5m to A20/ 90m to M20	N	2m
BC1	Greatness AQ Station 1	Urban Background	553603	156774	NO2	N	Y	46	Y	2m
BC2	Greatness AQ Station 2	Urban Background	553603	156774	NO2	N	Y	46	Y	2m
BC3	Greatness AQ Station 3	Urban Background	553603	156774	NO2	N	Y	46	Y	2m
BC4	Bat & Ball AQ Station 1	Roadside	553044	156690	NO2	Y	N (30m)	8	Y	2m
BC5	Bat & Ball AQ Station 2	Roadside	553044	156690	NO2	Y	N (30m)	8	Y	2m
BC6	Bat & Ball AQ Station 3	Roadside	553044	156690	NO2	Y	N (30m)	8	Y	2m

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

(2) N/A if not applicable

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
CM1	Urban Background	Automatic	96	96	19	19	20	17	17
CM2	Roadside	Automatic	61	61	30	29	31	29	31.8 ³
DT2	Roadside	Diffusion Tube	100	100	64.1	64.6	62	56.7	53.6
DT3	Urban Background	Diffusion Tube	100	100	13.7	14.9	14.3	12.3	10.8
DT5	Kerbside	Diffusion Tube	92	92	54.7	53.5	50.2	48.2	42.8
DT6	Roadside	Diffusion Tube	100	100	51	51.5	51.6	47.1	44.1
DT7	Roadside	Diffusion Tube	100	100	53.3	56.5	51	49.5	44.3
DT8	Roadside	Diffusion Tube	100	100	36.2	38.2	36.8	31.6	31.1
DT12	Roadside	Diffusion Tube	100	100	50.5	53.7	44.2	43.3	46.5
DT13	Roadside	Diffusion Tube	100	100	42.4	40.1	40.7	37.1	31.4
DT14	Roadside	Diffusion Tube	100	100	43.3	41.9	36	35.4	32.4
DT23	Roadside	Diffusion Tube	100	100	43.4	43.1	43.9	38.8	35.6
DT24	Roadside	Diffusion Tube	100	100	46.5	39.2	43.8	35.0	32.7
DT25	Roadside	Diffusion Tube	100	100	33.9	36.3	35.8	30.1	28.3
DT26	Roadside	Diffusion Tube	100	100	44.5	48	46.3	42.3	41.7
DT27	Roadside	Diffusion Tube	100	100	46.2	45	41.8	39.4	37.2
DT28	Kerbside	Diffusion Tube	100	100	48.2	51.8	49.8	46.0	42.4
DT29	Roadside	Diffusion Tube	100	100	31.2	33.6	32.5	30.0	27.8
DT30	Roadside	Diffusion Tube	100	100	39.1	42.5	39.9	35.1	32.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
DT31	Roadside	Diffusion Tube	100	100	57.5	60.2	54.1	52.0	46.9
DT32	Roadside	Diffusion Tube	100	100	59.3	60.8	55.9	55.3	49.9
DT33	Roadside	Diffusion Tube	100	100	50.2	53.8	48.4	46.7	42.5
DT34	Roadside	Diffusion Tube	100	100	37.4	39.7	37	35.3	30.9
DT35	Roadside	Diffusion Tube	100	100	41.7	44	40.3	40.5	36.3
DT36	Kerbside	Diffusion Tube	100	100	55.2	55.3	55.8	51.7	44.6
DT39	Roadside	Diffusion Tube	92	92	45.8	42.3	42.4	38.4	34.7
DT40	Kerbside	Diffusion Tube	83	83	52.1	54.8	51.6	48.5	42.3
DT41	Roadside	Diffusion Tube	100	100	46.4	45.7	43.5	43.0	37.5
DT42	Roadside	Diffusion Tube	100	100	46	47.1	41.9	44.4	37.1
DT43	Roadside	Diffusion Tube	83	83	36.1	36.2	36.8	33.9	28.0
DT48	Roadside	Diffusion Tube	92	92	37.6	35.8	34.1	32.6	25.6
DT49	Roadside	Diffusion Tube	100	100	36.4	33.3	38.5	34.9	30.4
DT51	Kerbside	Diffusion Tube	100	100	42.8	43.3	38.9	39.2	36.1
DT52	Roadside	Diffusion Tube	100	100	42.2	41.4	42.7	39.6	37.9
DT54	Roadside	Diffusion Tube	100	100	39	43	36.8	38.1	35.6
DT71	Roadside	Diffusion Tube	100	100	40.4	38.8	39.9	32.4	29.8
DT74	Roadside	Diffusion Tube	100	100	47	48	41.9	39.7	35.5
DT76	Roadside	Diffusion Tube	100	100	39.5	45.3	43.1	36.2	35.6
DT77	Roadside	Diffusion Tube	100	100	48.1	44.8	46.5	42.8	40.7
DT81	Urban Background	Diffusion Tube	92	92	40.9	40.5	36.1	32	32.2
DT83	Roadside	Diffusion Tube	100	100	59.7	62.1	51.8	48.8	55.6
DT84	Roadside	Diffusion Tube	92	92	35.3	38.7	41.2	34.9	32.8
DT85	Roadside	Diffusion Tube	100	100	56.7	56.2	58.9	48.3	45.0
DT86	Roadside	Diffusion Tube	100	100	49.7	46.5	42.7	39.4	36.7
DT87	Roadside	Diffusion Tube	100	100	58	56.7	55.7	53.8	48.1

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2011	2012	2013	2014	2015
DT88	Roadside	Diffusion Tube	100	100	40.1	39.8	36.8	35.1	29.1
DT90	Roadside	Diffusion Tube	92	92	41.4	41	40.9	35.3	32.4
DT93	Roadside	Diffusion Tube	100	100	32.5	32.8	32.4	31.5	29.3
DT94	Roadside	Diffusion Tube	100	100	41.9	37.6	36.5	35.1	33.7
DT95	Roadside	Diffusion Tube	100	100	40.2	39.6	36.6	35.2	34.1

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

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

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2011	2012	2013	2014	2015
CM1	Urban Background	Automatic	96	96	0	0	0	0	0
CM2	Roadside	Automatic	61	61	0	0	0	1	1

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

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

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

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

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2011	2012	2013	2014	2015
CM1	Urban Background	71	71	23	20	20	19	21
CM2	Roadside	96	96	25	-	22	21	21
CM3	Roadside	45	45	-	-	-	-	27*

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

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

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

* data not annualised.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2011	2012	2013	2014	2015
CM1	Urban Background	71	71	13	12	4	5	2
CM2	Roadside	96	96	18	8	-	4	3
CM3	Roadside	45	45	-	-	-	-	4

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2015

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
2	88.2	87.2	74.3	61.3	57.1	47.7	48.4	57.4	73.1	74.8	68.5	56	66.2	53.6
3	18.4	17.1	18.1	12.8	8.3	8.6	8.9	10.4	15.0	17.8	13.4	11.0	13.3	10.8
5	56	64	#	48.3	52.5	50.9	52.2	49	57.4	52.7	52.9	45.1	52.8	42.8
6	58.2	60.2	56.4	57.5	57.9	41.5	44.6	51	60.9	71.7	51	42.3	54.4	44.1
7	67.3	65.8	61.6	52.7	41.2	50.3	49.5	47.2	58.9	59	54.4	47.7	54.6	44.3
8	53.2	47.2	46.1	29.9	33.5	31.3	28.8	27.8	43.3	47.6	44.4	27	38.3	31.1
12	82	78.6	75.5	67.9	51.2	47.1	45.6	40.9	61.6	52.5	54.6	30.8	57.4	46.5
13	44.7	46.7	48.8	40.9	29.9	28	30	35.1	50.6	55.1	31.7	23.7	38.8	31.4
14	53.6	43.1	44	33.6	33.8	30	32.5	37.1	41.2	41.7	48.2	41.4	40.0	32.4
23	50.4	45.4	48.9	46.1	40.5	39.9	37	38.2	49	56.5	42.8	32	43.9	35.6
24	49.3	45.4	50.5	46.8	34.8	28	31.2	32.4	40.7	57.4	40.5	27.6	40.4	32.7
25	53.1	45.6	38.1	29.3	30	27.9	29.8	30	38.8	39.8	32.4	24.7	35.0	28.3
26	66.2	62.2	58.2	43.6	37.4	46.2	43	40.6	60.8	66.6	50.9	42	51.5	41.7
27	67.3	61.3	56.8	41.9	41.2	29	26.7	34.8	52.6	55.1	48.4	35.8	45.9	37.2
28	75.4	63.9	53.5	43.1	39.7	48	44	46.8	51.6	64	50	47.8	52.3	42.4
29	46.2	45.1	38.1	28.6	28.5	18.4	27.5	26.6	39.3	44.6	35.9	33.7	34.4	27.8
30	54.6	50.3	48.1	38.3	36.6	30.1	32.3	25.1	43	51.4	41.6	25.5	39.7	32.2
31	87.2	71.1	69	53	53.3	28.8	57.2	44.8	58.5	71.9	56.7	43.4	57.9	46.9
32	74.7	83.9	75.3	61.1	53.2	47.1	38.9	51.5	74.1	85.2	49.9	44.1	61.6	49.9
33	67.8	63	53.7	53	50.4	48.2	42.2	46.9	59.7	60.6	50.5	34.3	52.5	42.5
34	46.6	47.9	42.4	25.6	28.5	33.2	31.8	35.4	46.6	47.8	41	30.9	38.1	30.9
35	53.6	49.5	47	44.4	37.7	43.9	40.9	43.3	47.3	47.3	43.7	39.2	44.8	36.3
36	57.7	66.9	48.7	59.2	51	48.8	51.3	42.2	56.9	61.6	61.7	55.3	55.1	44.6
39	58.1	53.6	44	42.2	37.2	31.9	38.2	43.6	40.2	#	47.5	34.4	42.8	34.7

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
40	64.4	66.3	58.5	#0.1	#	34.1	35.6	43.9	60.1	80.8	42.9	35.9	52.3	42.3
41	57.6	44.8	59.7	47.7	34.7	35.3	42.7	32.9	51.7	56.9	50.4	41.7	46.3	37.5
42	61.8	57.3	44.6	42.1	41.9	41.6	37.3	38.8	45.6	42.6	49.4	47.2	45.9	37.1
43	31.6	44.9	#4.6	#	27	21.7	23.4	32.6	40.7	51.4	37.4	34.8	34.6	28.0
48	#	41.7	35.3	28.1	25.8	24.3	25.7	28.3	37.9	40	33.8	26.4	31.6	25.6
49	38	48.1	47.6	39.8	28.3	31.8	28.6	33.4	46	51.5	30.6	26.2	37.5	30.4
51	61	56.4	57.9	44	34.7	34.9	32.7	35.1	49.2	59.3	41.4	27.5	44.5	36.1
52	60.3	56	54.5	52.6	40.5	43.9	37.2	37.2	54.8	56.7	39.8	27.7	46.8	37.9
54	55.6	53.4	48.1	35.6	40.9	37.9	44.3	41	44.7	45.8	45.2	35.5	44.0	35.6
71	51.9	46.7	44.1	34.6	23.4	30.1	30.4	26.3	41.1	41.7	39.8	31.6	36.8	29.8
74	61.3	59.7	48	46.1	37.2	31.5	34.2	35.2	46	45.4	46.5	34.3	43.8	35.5
76	61.2	53.2	57.4	48.2	39.6	24.9	40.1	33.2	47.5	51.2	41.9	28.7	43.9	35.6
77	60.8	66.9	63.5	54.7	40.8	38.2	38.1	41.7	51.5	57.8	47.6	41.2	50.2	40.7
81	49.3	46.4	28.1	34	#	46.2	38.3	38.1	39.4	42.1	34.9	41.1	39.8	32.2
83	95.8	80	71.3	55.1	64.9	45.2	48.9	63.4	78.6	70.5	78.3	71.2	68.6	55.6
84	50.8	48.3	#	34	33.7	31.1	33.1	37.8	46.6	50.5	45.1	35.1	40.6	32.8
85	77.4	71.5	62.6	49.5	46.5	49.1	43.2	48.5	55	66.8	60.3	36.5	55.6	45.0
86	61.4	62.3	51.7	39.5	30.4	29.1	32.1	38.7	55.5	58.5	45.6	38.6	45.3	36.7
87	86.1	75.6	58.5	41.8	47.9	53	51	53.7	69.2	66.1	77.8	31.7	59.4	48.1
88	40.8	39.2	42.7	34.7	32	29.9	30.3	34.3	40.3	45.8	33.3	27.7	35.9	29.1
90	57.7	54	#	38.2	26	29.1	26.4	32.4	45.3	62.3	36.5	31.9	40.0	32.4
93	45	47.8	42.3	33.7	25.2	27.5	27.6	32.8	43.1	49.6	33.3	25.5	36.1	29.3
94	55.7	53.1	37.7	37.9	35.6	31.2	36.8	35.4	44.6	53.1	42.7	35	41.6	33.7
95	57.3	47.5	45.2	40.5	32.8	34	33.8	39.2	44.9	52.4	43.2	34.6	42.1	34.1

(1) See Appendix C for details on bias adjustment

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

Due to problems relating to the air conditioner at Bat and Ball less than a full years' worth of data was achieved. The data from this site has been annualised using the methodology within LAQM (TG16)

	Bat and Ball $\mu\text{g}/\text{m}^3$	Derived Bat and Ball $\mu\text{g}/\text{m}^3$	Greatness Background site $\mu\text{g}/\text{m}^3$	Greatness Ratio period to year	Maidstone Rural Background site. $\mu\text{g}/\text{m}^3$	Maidstone Ratio period to year	Mean ratio
Period 1	45	-	17	1.012	12	0.952	1.041
Period 2	-	30.65	15.1	0.900	9	0.714	0.807
Period 3	21.4	-	11.2	0.667	7.5	0.595	0.631
Period 4	-	28.05	12.4	0.738	9.3	0.738	0.738
Period 5	34	-	16.7	0.994	13.3	1.056	1.025
Annual average	38		16.8		12.6		
Adjusted annual average	31.8 $\mu\text{g}/\text{m}^3$						

The PM10 analyser at Sevenoaks quarry went live in July 2015 and therefore a full years' worth of data was not achieved. As this monitor is to monitor dust from one specific site annualisation has not been carried out. This data is to be used to produce a detailed assessment for this site.

Air Quality Monitoring Data QA/QC

Automatic Sites:

The District Council currently has three operating continuous automatic monitoring sites (CMS) both in the Sevenoaks town urban area. The Greatness background site has monitored 3 pollutants (NO_x, PM₁₀ & O₃) since 1997. The Bat & Ball roadside site has monitored NO_x and PM₁₀ since 2006. The Sevenoaks Quarry CMS commenced monitoring for PM₁₀ mid July 2015.

Local site operations and routine calibration/maintenance are carried out under contract by ERG Kings College London with service contract work by ESU1. The sites are audited twice a year by NPL and the data collected, validated and ratified by ERG. Annual reports are published and all data including current concentrations are available via the London Air Quality Network web site. The site is operated to the same standards as the rest of the London Air Quality Network.

2008 and earlier PM₁₀ Data measured by TEOM has been corrected by applying a 1.3 factor.

From 2009 data has been corrected by ERG using their volatile correction model.

Diffusion Tubes:

NO₂ diffusion tubes are supplied and analysed by ESG Scientifics (formerly Harwell Scientifics at Didcot). This laboratory is UKAS accredited.

The tubes were prepared by spiking acetone: triethanolamine (50:50) on to grids prior to the tubes being assembled.

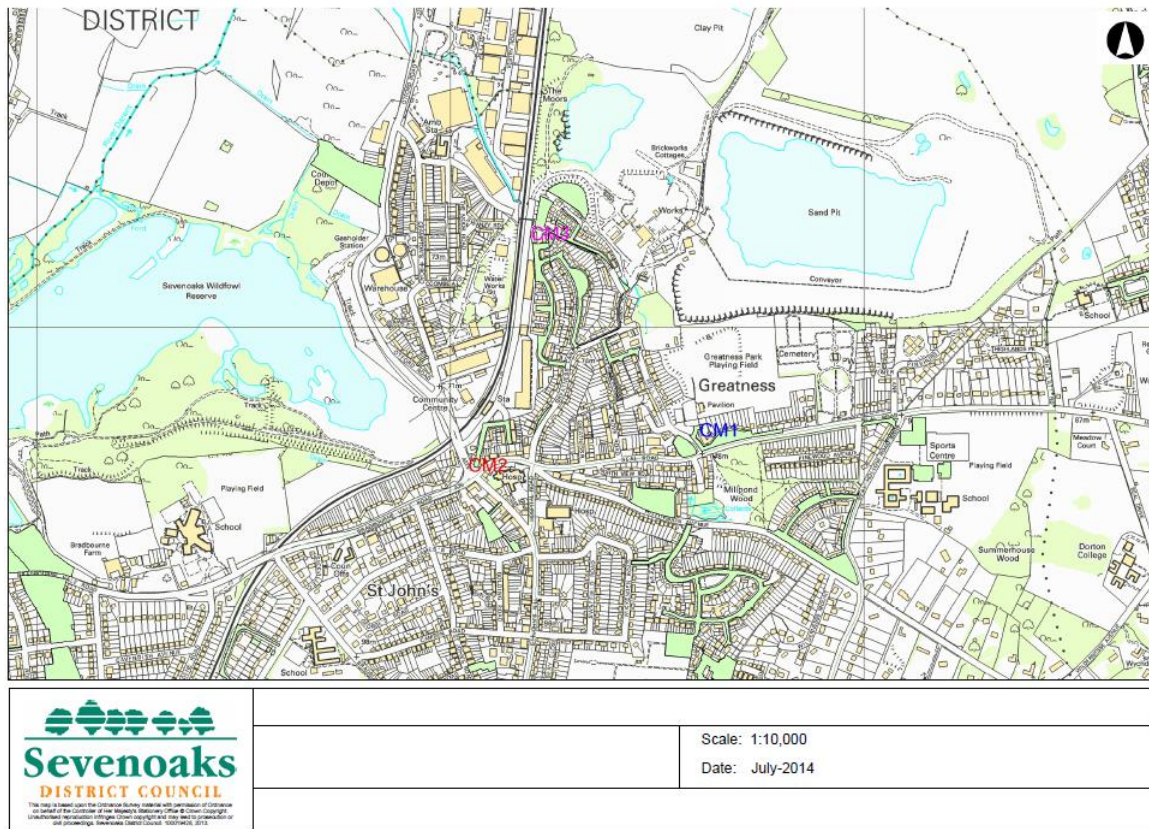
The laboratory confirms it follows the procedures set out in the Harmonisation Practical Guidance and that it is ranked 'Good' in the WASP inter-comparison scheme.

The tubes have been compared with the reference method by a triplicate co-location study with the chemiluminescent NO_x analysers at Greatness Park, Sevenoaks.

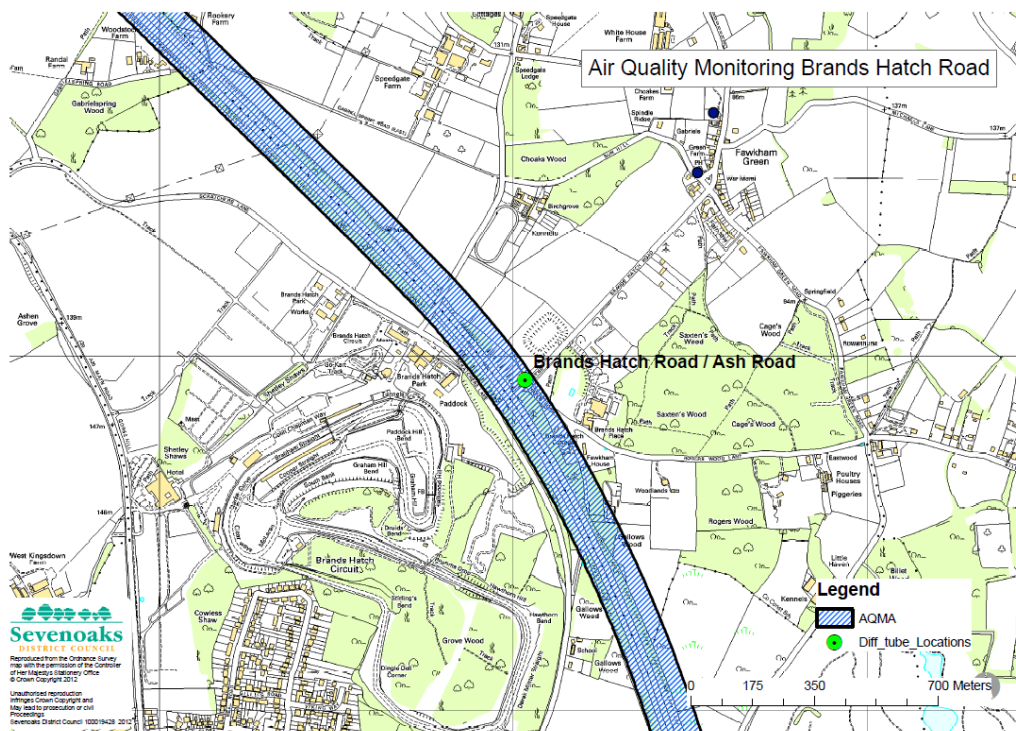
The locally derived Bias Factor from the above co-location study for 2015 was 0.81.

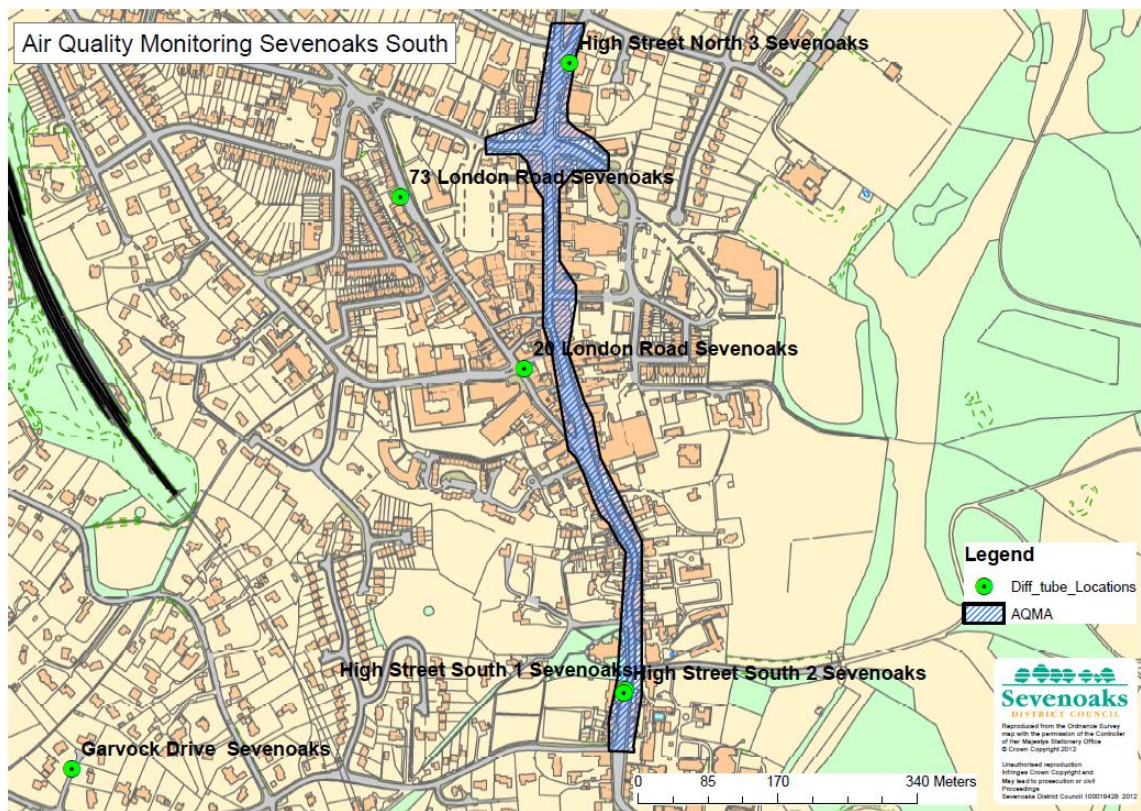
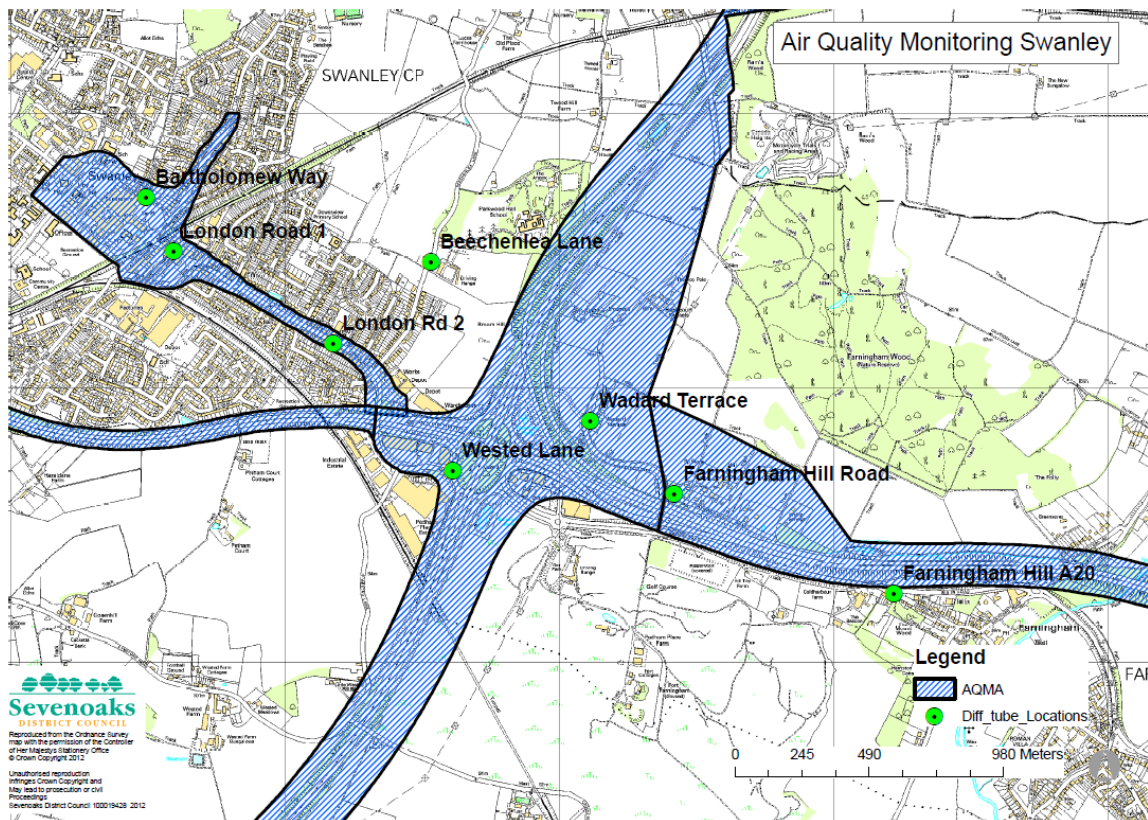
Appendix D: Map(s) of Monitoring Locations

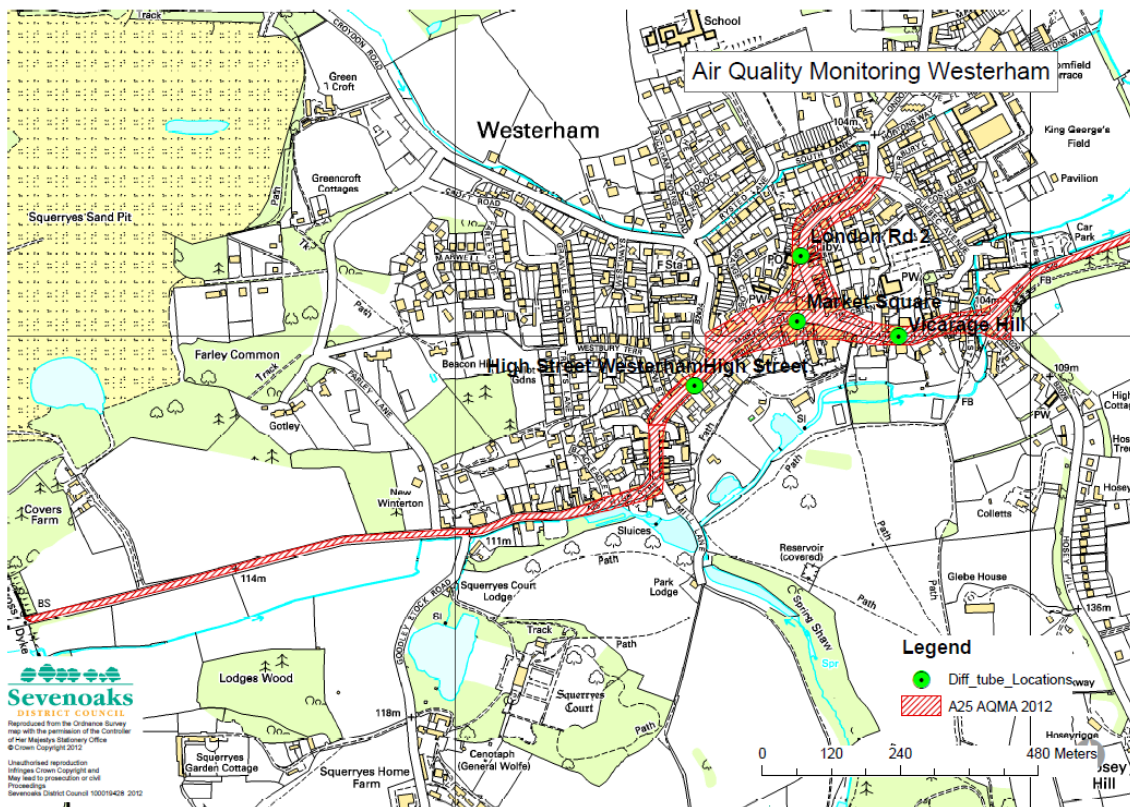
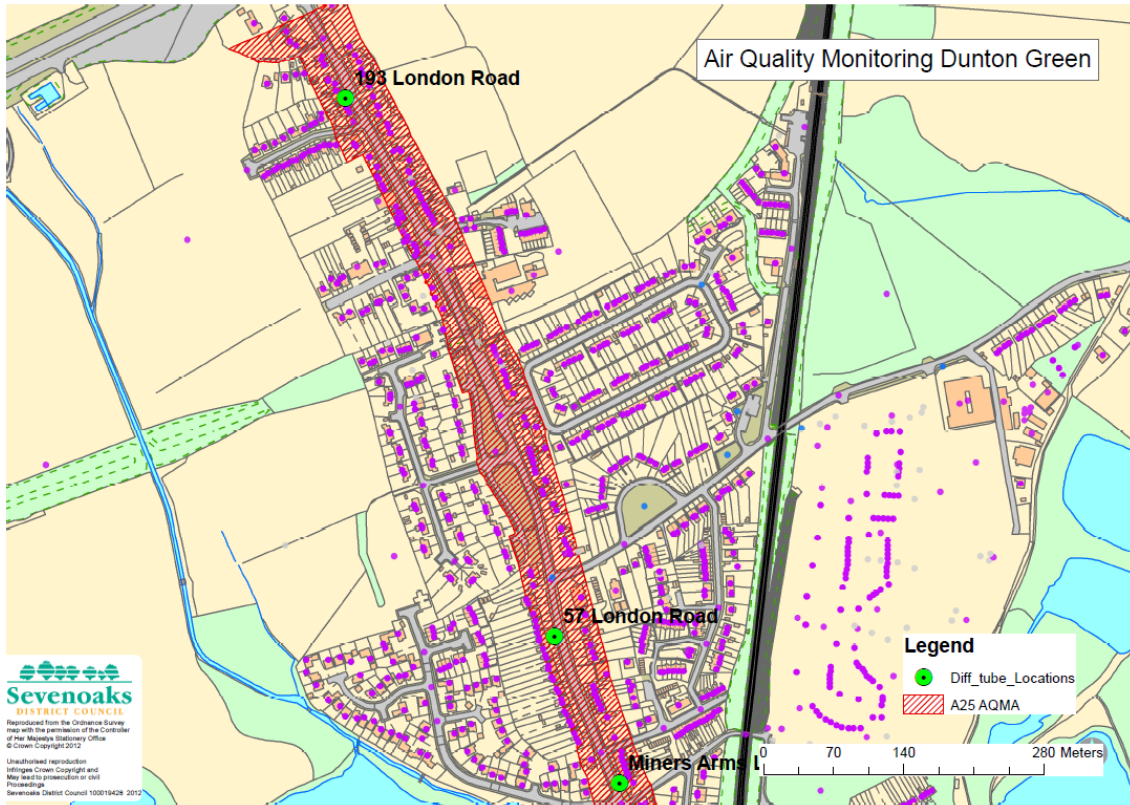
Automatic Monitoring Stations

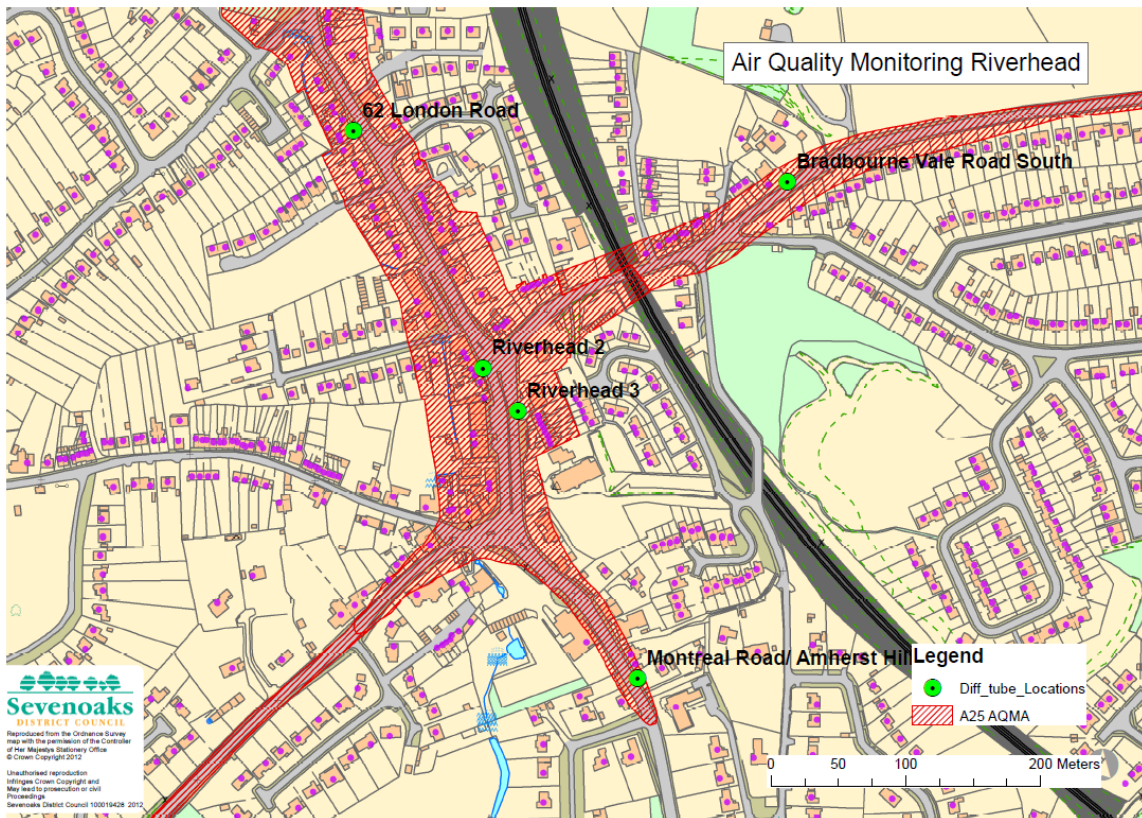
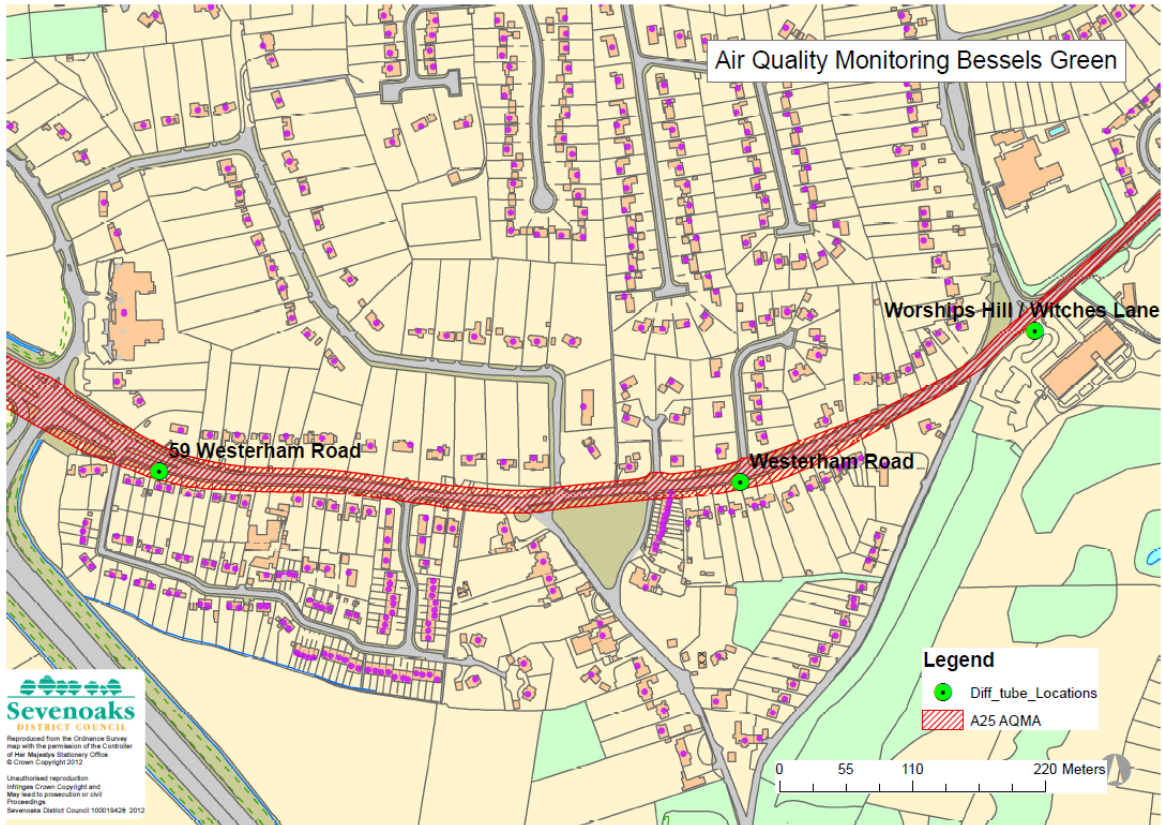


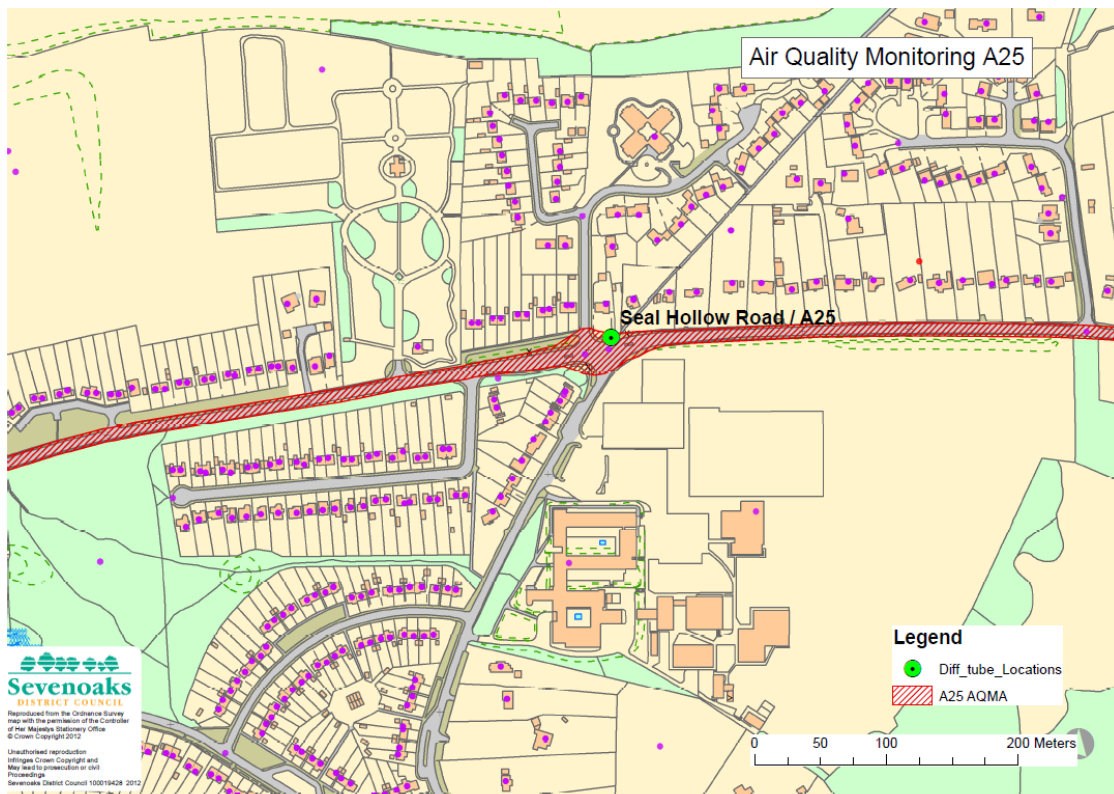
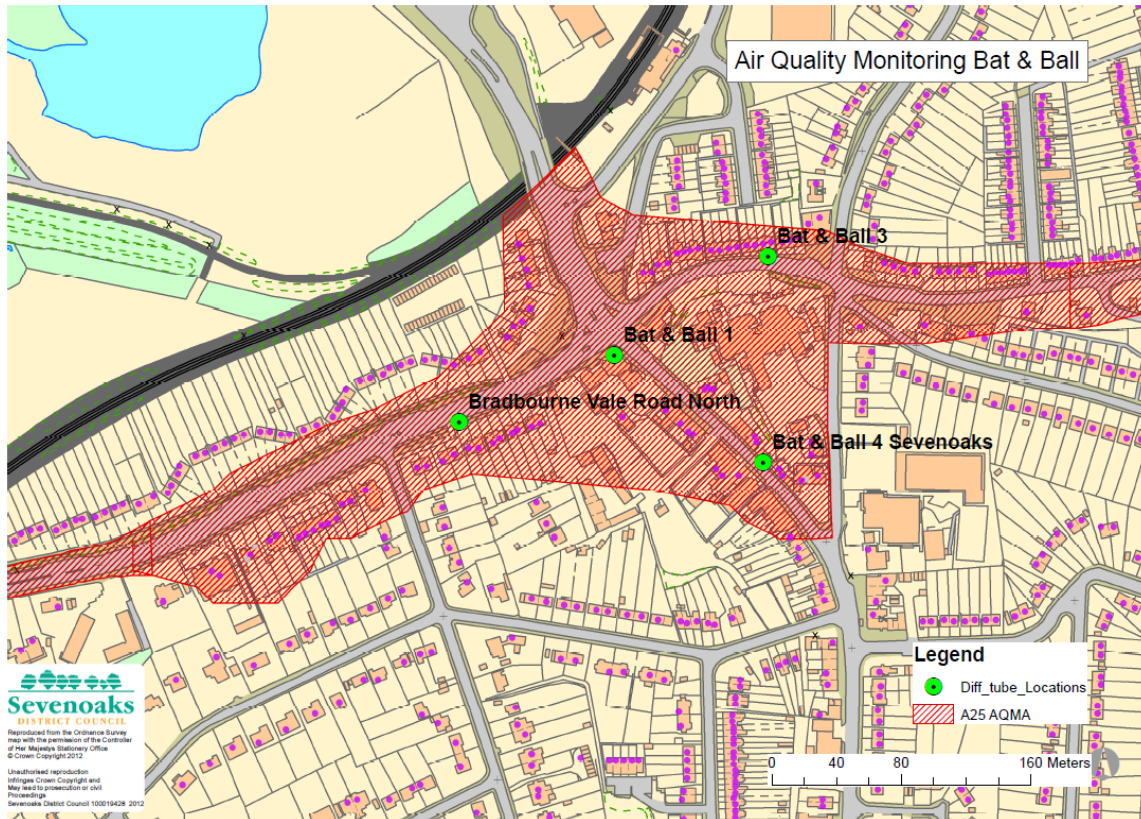
Diffusion Tube Locations

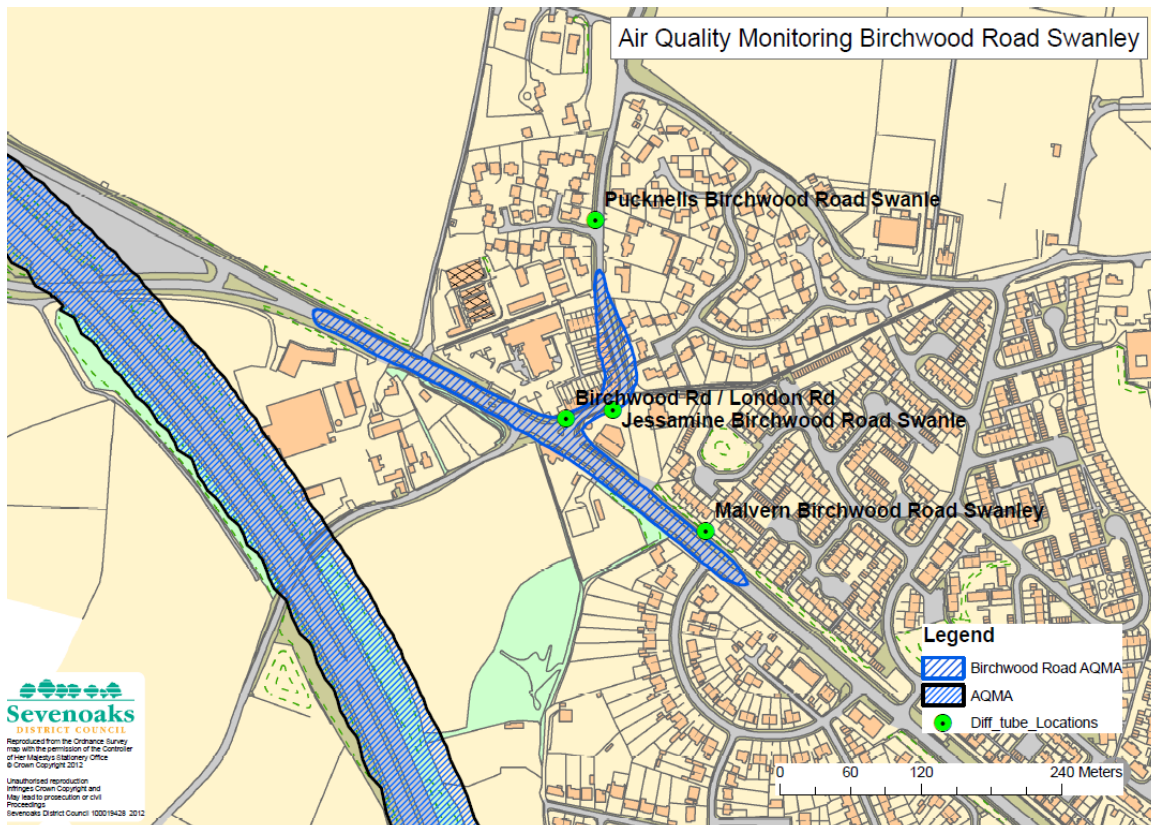
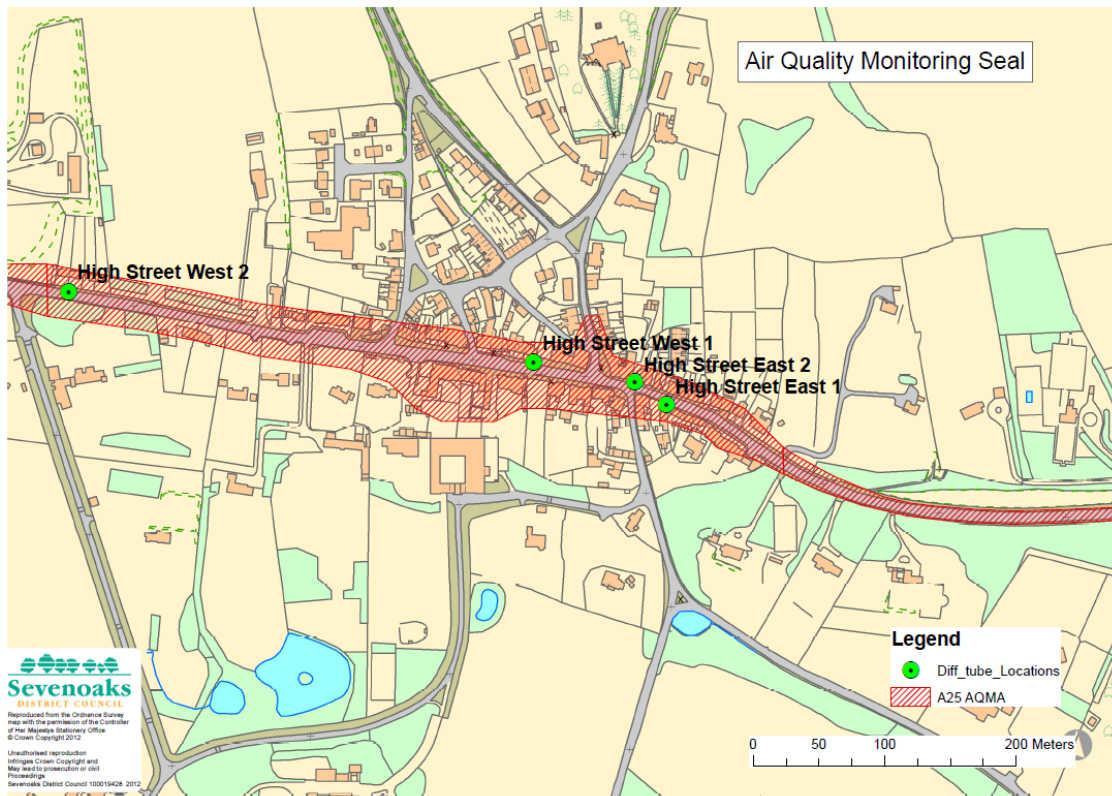


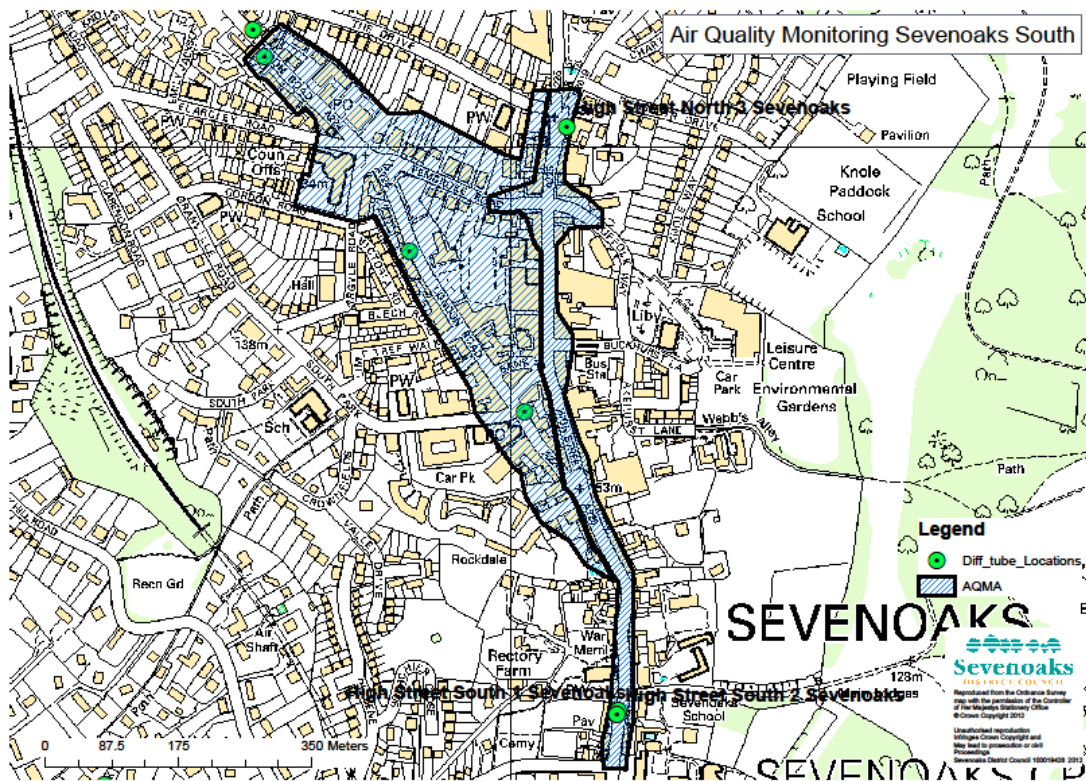












Appendix E: Summary of Air Quality Objectives in England

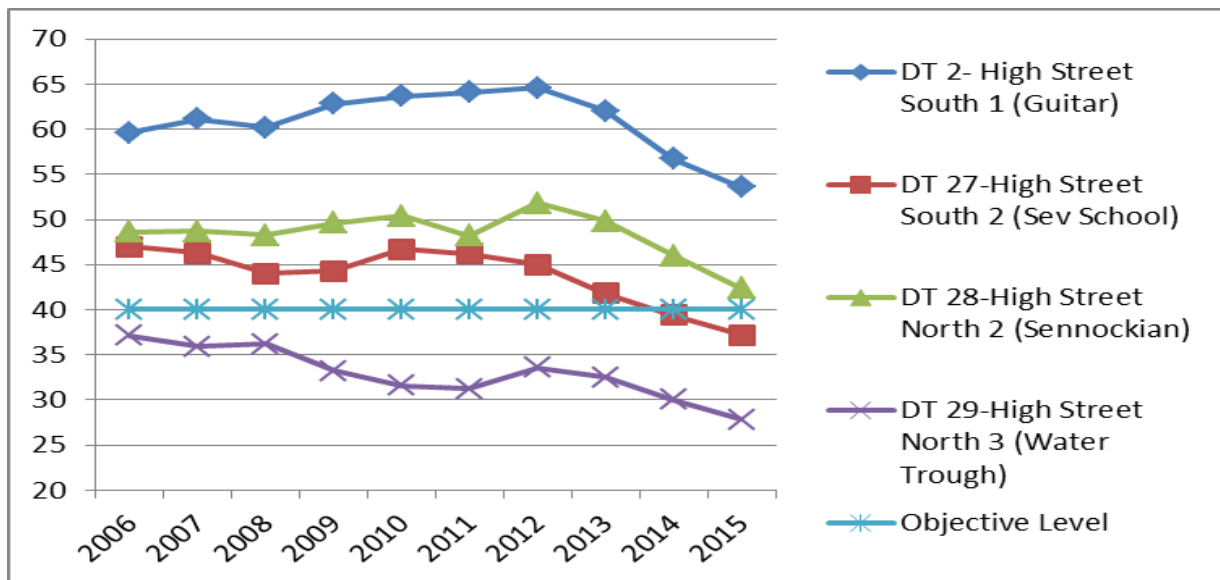
Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

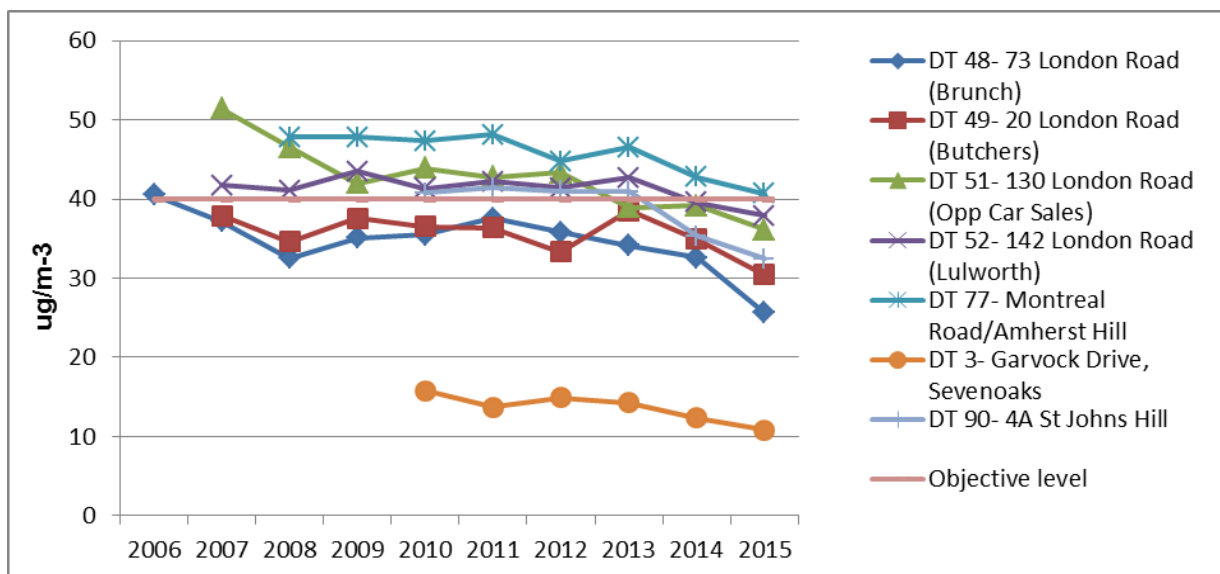
⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Trends from Diffusion Tube Data

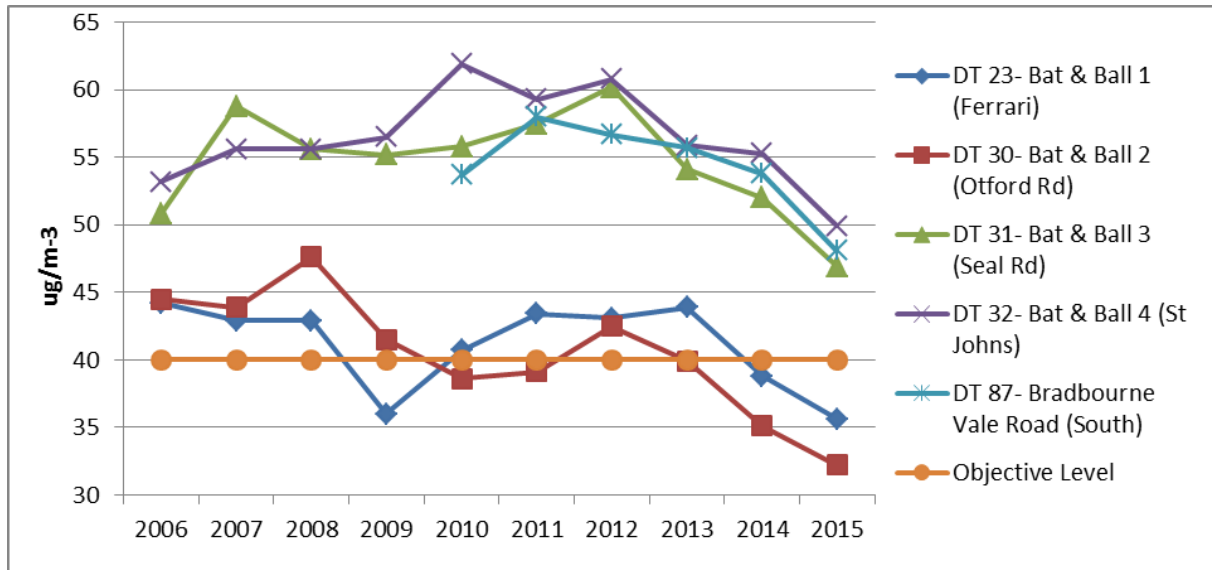
Sevenoaks High Street



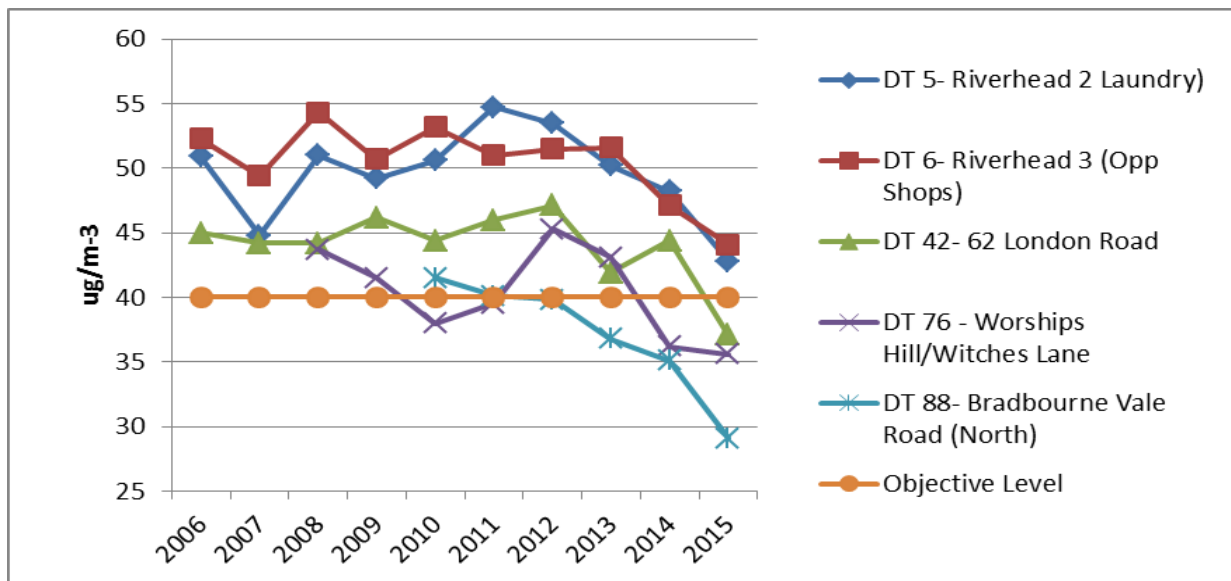
Sevenoaks



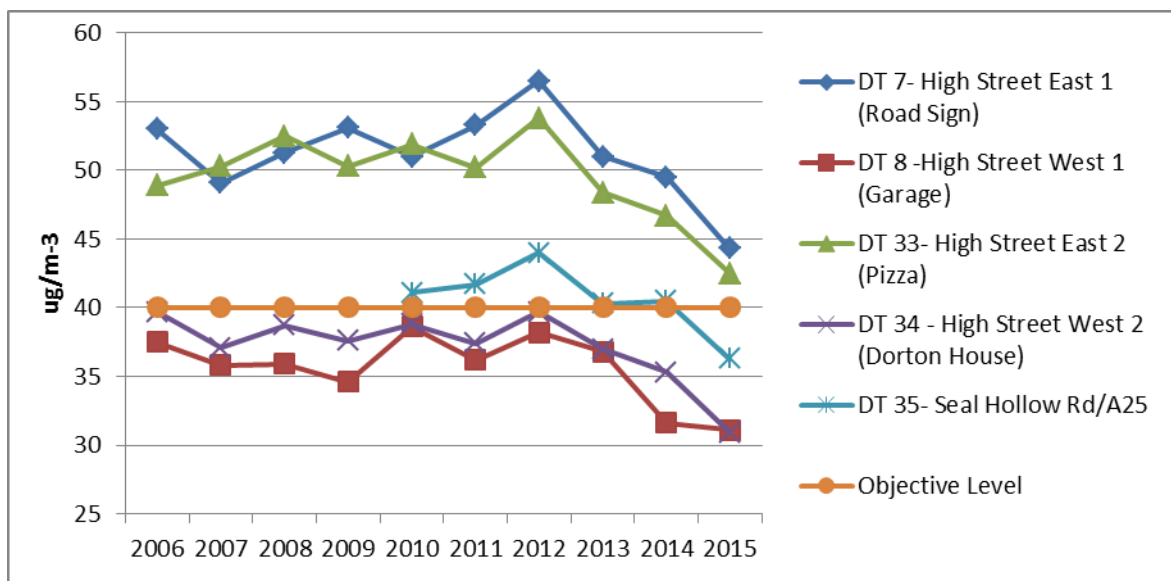
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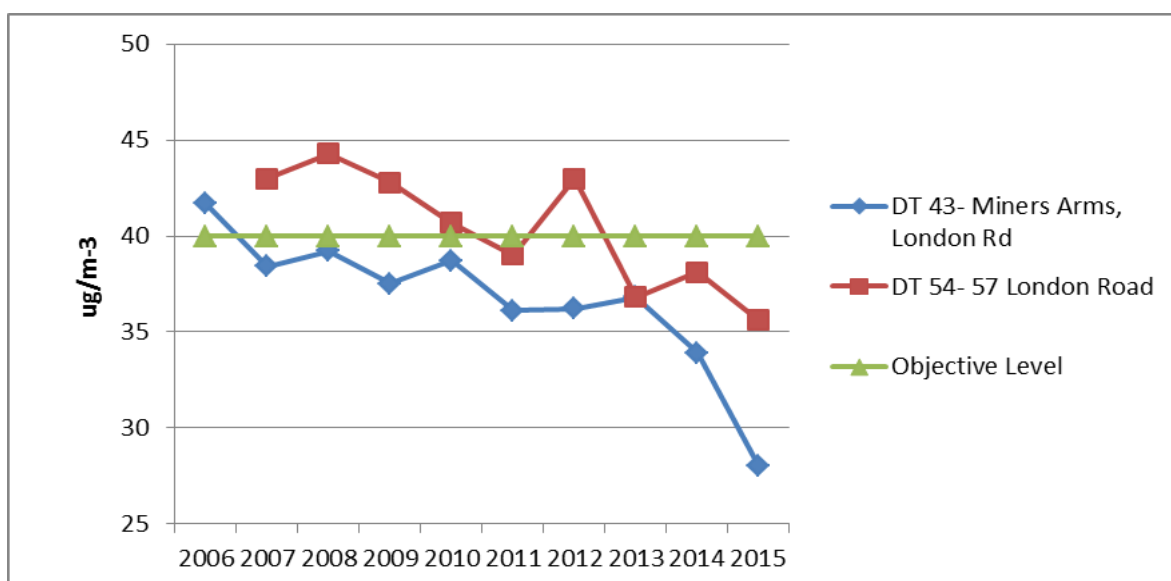
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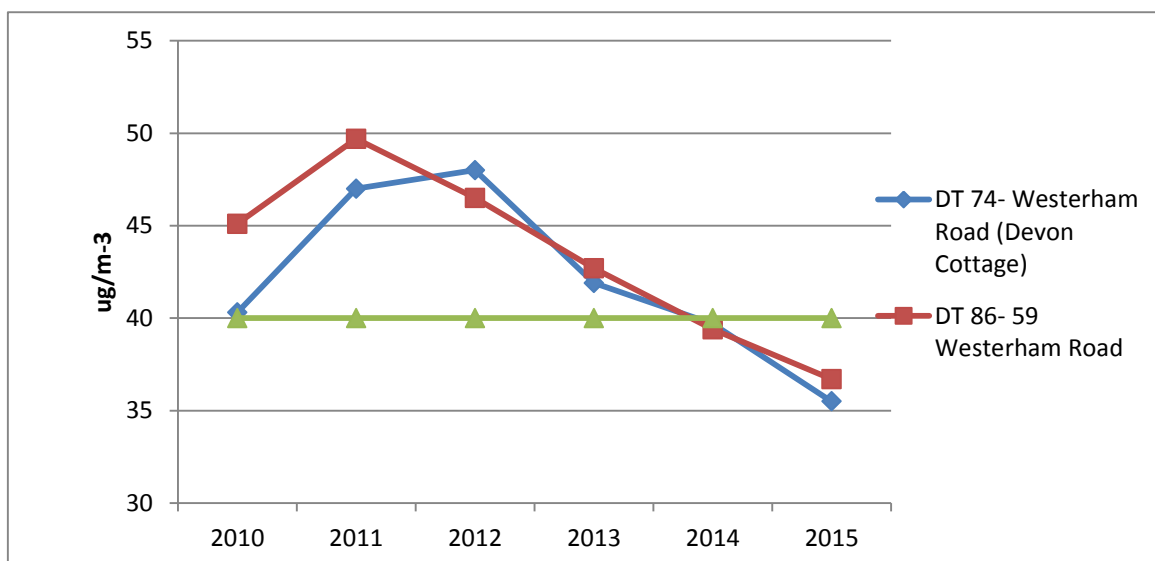
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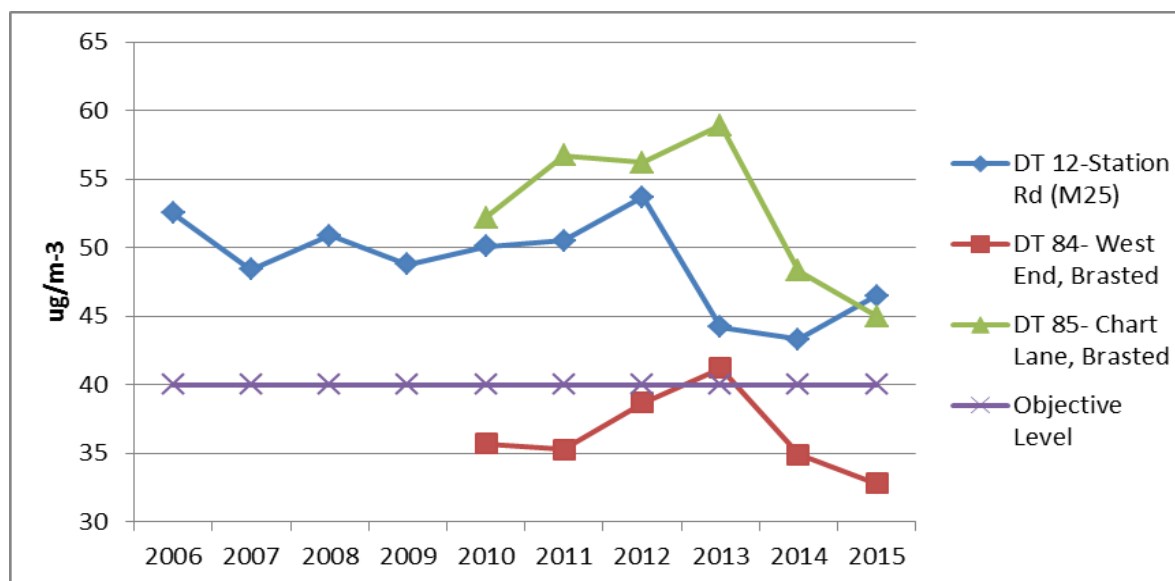
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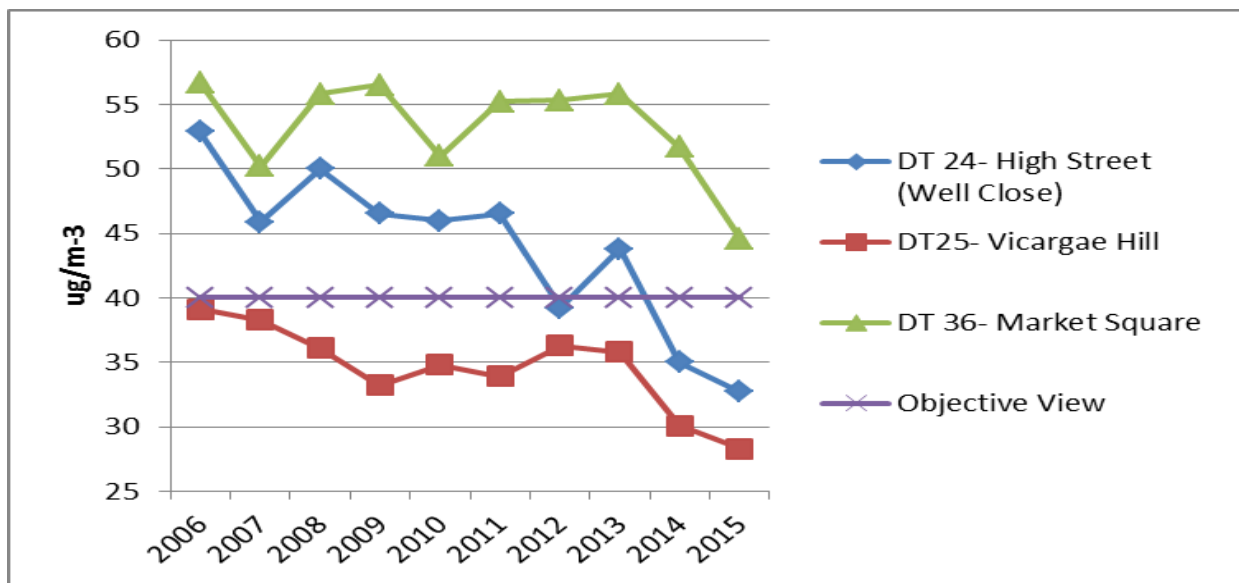
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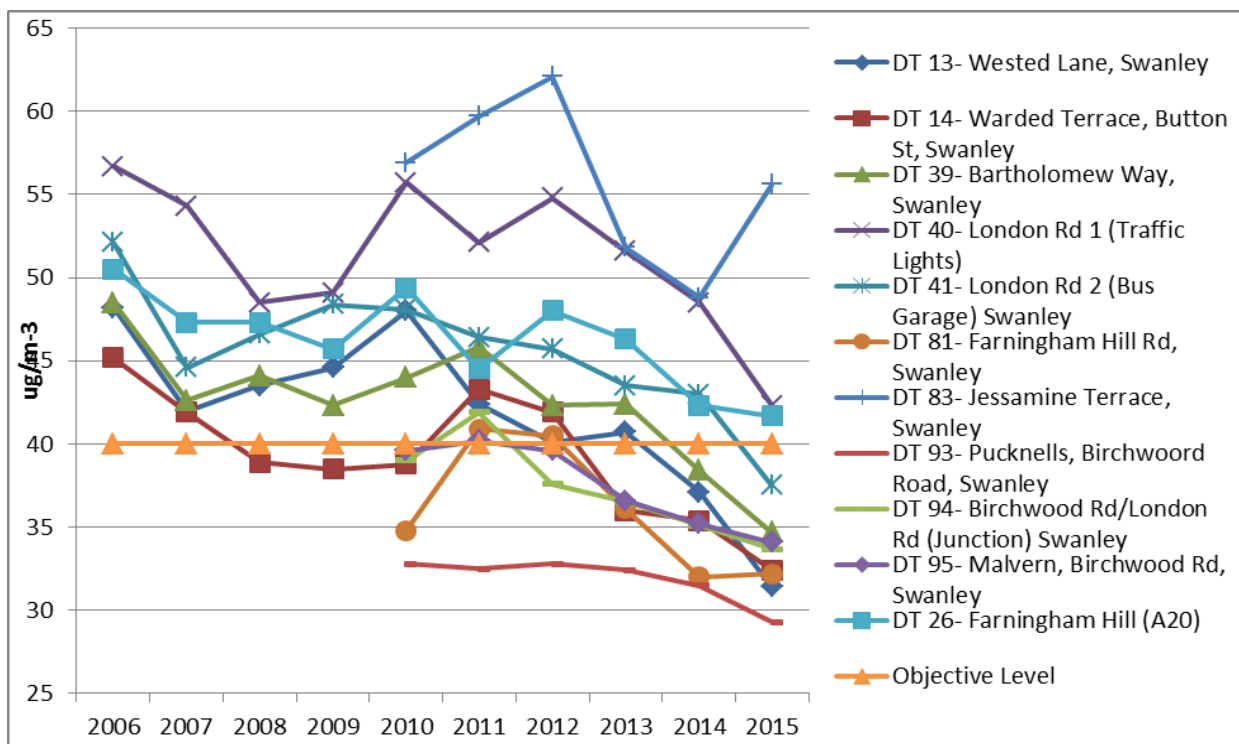
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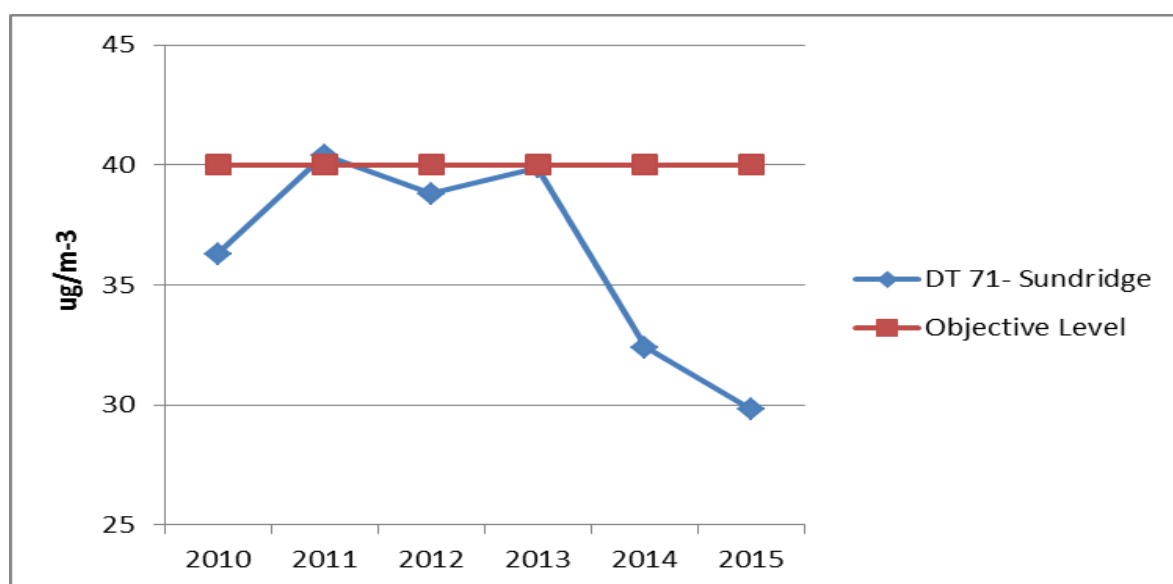
Westerham



Swanley



Sundridge



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
...	...

References

Defra - Local Air Quality Management Technical Guidance (TG16) (2016)

Defra - Local Air Quality Management Policy Guidance (PG16) (2016)

Kent County Council - Local Transport Plan: Delivering Growth without Gridlock (2016)

Sevenoaks District Council - Updating and Screening Assessment (2015)