# London Air Quality Network

# Summary Report 2014

March 2016

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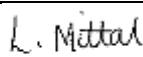| Title | London Air Quality Network – Summary Report 2014 |
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# Contents

# 1    Introduction

This report details the results of air pollution measurements made on the London Air Quality Network during 2014. Measurements have been presented with specific reference to the UK Air Quality Strategy (AQS) Objectives and the EU Limit Values.

The London Air Quality Network (LAQN) is a unique resource, providing robust air pollution measurements that are essential to underpin air quality management and health studies. The public face of the network, the LondonAir web site (www.londonair.org.uk), is visited by thousands of Londoners seeking hourly updated air pollution information.

The LAQN was formed in 1993 to coordinate and improve air pollution monitoring in London. The majority of London's 33 boroughs supply measurements to the network and in addition these data are increasingly being supplemented by measurements from local authorities surrounding London, thereby providing an overall perspective of air pollution in London and the Home Counties.

The LAQN is operated and managed by the Environmental Research Group (ERG) at King's College London. QA/QC audits are carried out by the National Physical Laboratory (NPL). Each borough funds air quality monitoring in its own area. The Department of Environment, Food and Rural Affairs (Defra) funds King's to operate the Marylebone Road site and to maintain several of the LAQN sites as affiliate sites to the UK Automatic Urban and Rural Network (AURN). This Defra support assists the operation of the overall LAQN. Analysis of LAQN measurements has been augmented by measurements from directly-funded Defra sites in London. Measurements from Defra sites were provided by Ricardo AEA from the National Air Quality Archive and were included within the LAQN database. Transport for London has also funded monitoring to help assess the air pollution impacts of the Congestion Charging Scheme and Low Emission Zone.

# 2  Air quality Strategy Objectives and EU Limit Values

There is ample evidence of the adverse health effects caused by air pollution (WHO, 2006). In response to these health impacts, the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (Defra, 2008) sets out the UK's  way forward on air quality issues, details objectives to be achieved, and proposes measures to help reach them. These UK objectives largely reflect EU Limit Values (EC, 2008). The GLA and the London boroughs and district councils outside the capital have responsibilities for the management of air quality and must work towards the attainment of AQS objectives. The AQS Objectives and EU Limit Values are detailed in Table 1. Monitoring progress towards the attainment of these Objectives and Limit Values forms a core activity for the LAQN.

| Pollutant | Air Quality Objective Concentration | Measured as | To be achieved by |
|---|---|---|---|
| Carbon Monoxide (CO) | 10.0 mg m$^{-3}$ | Maximum daily running 8-hour mean | 31 December 2003 |
| Nitrogen Dioxide (NO$_2$) | 200 µg m$^{-3}$ not to be exceeded more than 18 times a year | 1-hour mean | 31 December 2005 |
|  | 40 µg m$^{-3}$ | Annual mean | 31 December 2005 |
| Sulphur dioxide (SO$_2$) | 350 µg m$^{-3}$, not to be exceeded more than 24 times a year | 1-hour mean | 31 December 2004 |
|  | 125 µg m$^{-3}$, not to be exceeded more than 3 times a year | 24-hour mean | 31 December 2004 |
|  | 266 µg m$^{-3}$, not to be exceeded more than 35 times a year | 15-minute mean | 31 December 2005 |
| Ozone (O$_3$) | 100 µg m$^{-3}$ not to be exceeded more than 10 times a year | 8 hourly running or hourly mean | 31 December 2005 |
| Particles (PM$_{10}$) (gravimetric) | 50 µg m$^{-3}$, not to be exceeded more than 35 times a year | Daily mean | 31 December 2004 |
|  | 40 µg m$^{-3}$ | Annual mean | 31 December 2004 |
| Particles (PM$_{2.5}$) (gravimetric) | 25 µg m$^{-3}$ (target) | Annual mean | 2020 |
|  | 20% cut in urban background exposure | Annual mean | 2010 - 2020 |

**Table 1: AQS Objectives and EU Limit Values.**

# 3    Results

The AQS Objective results measured at LAQN sites during 2012 are detailed in Tables 2 to 8.

**Key to site types:**

RU    =    Rural
S    =    Suburban
U    =    Urban background
R    =    Roadside
K    =    Kerbside
I    =    Industrial

**Key to network status**

AA    =    Affiliated to UK AURN. Final data set published by DEFRA
A    =    AURN DEFRA funded. Final data set published by DEFRA

All other instruments are LAQN only

## 3.1    Carbon Monoxide

| Site Name | Type | Capture Rate (%) | No occurrences of rolling 8hr mean >=10mgm$^{-3}$ (8.6ppb) | Achieved? |
|---|---|---|---|---|
| Islington - Holloway Road | R | 32 | 0 | n/a |
| Kensington and Chelsea - North Ken [AA] | U | 98 | 0 | yes |
| Wandsworth - Wandsworth Town Hall | U | 97 | 0 | yes |
| Westminster - Marylebone Road [AA] | K | 97 | 0 | yes |

**Table 2: AQS Objective results for CO**

## Summary

- All sites with a data capture of 90% or above achieved the CO rolling 8 hourly mean objective.
- Large reductions in CO over last 20 years with the introduction of catalytic converters.
- Small number of sites still measuring CO.

## 3.2    Nitrogen Dioxide

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm⁻³ | Annual Mean Achieved? | No more than 18 occurrences of hourly mean > 200ugm⁻³ (104.7ppb) | Hourly Mean Achieved? |
|---|---|---|---|---|---|---|
| Barking and Dagenham – Rush Green | S | 87 | 25 | n/a | 1 | n/a |
| Barking and Dagenham – Scrattons Farm | S | 93 | 30 | yes | 0 | yes |
| Bexley – Belvedere | S | 98 | 27 | yes | 0 | yes |
| Bexley – Belvedere West | U | 97 | 23 | yes | 0 | yes |
| Bexley – Erith | I | 96 | 24 | yes | 0 | yes |
| Bexley – Slade Green ᴬ | S | 97 | 27 | yes | 0 | yes |
| Brent – Ikea | R | 31 | 80 | n/a | 10 | n/a |
| Brentwood – Brentwood Town Hall | U | 99 | 23 | yes | 0 | yes |
| Camden – Bloomsbury ᴬ | U | 73 | 50 | n/a | 0 | n/a |
| Camden – Euston Road | R | 92 | 104 | no | 220 | no |
| Camden – Holborn (inmidtown) | K | 83 | 94 | n/a | 202 | no |
| Camden – Shaftesbury Avenue | R | 42 | 71 | n/a | 1 | n/a |
| Camden – Swiss Cottage ᴬᴬ | K | 99 | 66 | no | 13 | yes |
| Castle Point – Hadleigh | R | 95 | 28 | yes | 0 | yes |
| City of London – Beech Street | R | 98 | 80 | no | 175 | no |
| City of London – Sir John Cass School | U | 98 | 45 | no | 0 | yes |
| City of London – Walbrook Wharf | R | 97 | 122 | no | 656 | no |
| Croydon – George Street | R | 93 | 45 | no | 0 | yes |
| Croydon – Norbury | K | 44 | 66 | n/a | 0 | n/a |
| Croydon – Purley Way A23 | R | 99 | 35 | yes | 0 | yes |
| Ealing – Hanger Lane Gyratory | R | 90 | 78 | no | 30 | no |
| Ealing – Horn Lane | I | 91 | 48 | no | 0 | yes |
| Ealing – Southall | U | 90 | 29 | yes | 0 | yes |
| Ealing – Western Avenue | R | 94 | 66 | no | 17 | yes |
| Enfield – Bowes Primary School | R | 15 | 42 | n/a | 0 | n/a |
| Enfield – Bush Hill Park | S | 83 | 34 | n/a | 0 | n/a |
| Enfield – Derby Road | R | 93 | 45 | no | 0 | yes |
| Enfield – Prince of Wales School | U | 80 | 24 | n/a | 0 | n/a |
| Greenwich – A206 Burrage Grove | R | 99 | 39 | yes | 0 | yes |
| Greenwich – Blackheath | R | 97 | 44 | no | 0 | yes |
| Greenwich – Eltham ᴬᴬ | S | 64 | 20 | n/a | 0 | n/a |
| Greenwich – Fiveways Sidcup Rd A20 | R | 97 | 54 | no | 2 | yes |
| Greenwich – Millennium Village | I | 79 | 37 | n/a | 0 | n/a |
| Greenwich – Plumstead High Street | R | 89 | 37 | n/a | 0 | n/a |
| Greenwich – Trafalgar Road | R | 98 | 38 | yes | 5 | yes |
| Greenwich – Westhorne Avenue | R | 96 | 43 | no | 2 | yes |
| Greenwich – Woolwich Flyover | R | 98 | 75 | no | 26 | no |
| Greenwich and Bexley – Falconwood | R | 87 | 47 | n/a | 11 | n/a |
| Hackney – Old Street | R | 99 | 67 | no | 2 | yes |
| Hammersmith and Fulham – Shepherds Bush | R | 21 | 81 | n/a | 0 | n/a |
| Haringey  - Priory Park South ᴬᴬ | U | 73 | 24 | n/a | 0 | n/a |

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm⁻³ | Annual Mean Achieved? | No more than 18 occurrences of hourly mean > 200ugm⁻³ (104.7ppb) | Hourly Mean Achieved? |
|---|---|---|---|---|---|---|
| Haringey – Haringey Town Hall AA | R | 65 | 48 | n/a | 0 | n/a |
| Harrow – Pinner Road | R | 93 | 48 | no | 2 | yes |
| Harrow – Stanmore | U | 99 | 25 | yes | 0 | yes |
| Havering – Rainham | R | 99 | 35 | yes | 0 | yes |
| Havering – Romford | R | 25 | 42 | n/a | 0 | n/a |
| Hounslow and Ealing – Gunnersbury Avenue | R | 99 | 61 | no | 36 | no |
| Islington – Arsenal | U | 83 | 35 | n/a | 0 | n/a |
| Islington – Holloway Road | R | 87 | 55 | n/a | 0 | n/a |
| Kensington and Chelsea – Cromwell Road | R | 57 | 56 | n/a | 0 | n/a |
| Kensington and Chelsea – Earls Court Rd | K | 91 | 93 | no | 212 | no |
| Kensington and Chelsea – Kings Road | R | 98 | 75 | no | 5 | yes |
| Kensington and Chelsea – Knightsbridge | R | 99 | 72 | no | 116 | no |
| Kensington and Chelsea – North Ken AA | U | 97 | 34 | yes | 0 | yes |
| Lambeth – Bondway Interchange | I | 98 | 72 | no | 3 | yes |
| Lambeth – Brixton Road | K | 90 | 153 | no | 2001 | no |
| Lambeth – Streatham Green | U | 97 | 31 | yes | 0 | yes |
| Lewisham – Catford | U | 99 | 54 | no | 0 | yes |
| Lewisham – Loampit Vale | R | 78 | 56 | n/a | 5 | n/a |
| Lewisham – New Cross | R | 99 | 42 | no | 0 | yes |
| Merton – Morden Civic Centre | R | 67 | 38 | n/a | 2 | n/a |
| Mole Valley – Dorking | U | 99 | 22 | yes | 0 | yes |
| Redbridge – Gardner Close | R | 37 | 52 | n/a | 0 | n/a |
| Redbridge – Ley Street | U | 42 | 36 | n/a | 0 | n/a |
| Redbridge – Perth Terrace | U | 35 | 35 | n/a | 0 | n/a |
| Reigate and Banstead – Horley AA | S | 88 | 20 | n/a | 0 | n/a |
| Reigate and Banstead – Horley South | S | 99 | 29 | yes | 0 | yes |
| Reigate and Banstead – Poles Lane | RU | 99 | 18 | yes | 0 | yes |
| Richmond Upon Thames – Barnes Wetlands | S | 91 | 25 | yes | 0 | yes |
| Richmond Upon Thames – Castlenau | R | 91 | 37 | yes | 0 | yes |
| Richmond Upon Thames – Hanworth Road | K | 98 | 42 | no | 0 | yes |
| Richmond Upon Thames – Hanworth Road (low level) | K | 97 | 43 | no | 0 | yes |
| Richmond Upon Thames – Ntl Physical Lab A | S | 98 | 27 | yes | 0 | yes |
| Sevenoaks – Bat and Ball | R | 95 | 29 | yes | 1 | yes |
| Sevenoaks – Greatness Park | U | 98 | 17 | yes | 0 | yes |
| Southwark – A2 Old Kent Road AA | R | 38 | 42 | n/a | 1 | n/a |
| Southwark – Elephant and Castle | U | 93 | 37 | yes | 0 | yes |
| Southwark – Heygate | U | 28 | 50 | n/a | 0 | n/a |
| Sutton – Beddington Lane | I | 75 | 31 | n/a | 0 | n/a |
| Sutton – Beddington Lane north | I | 42 | 37 | n/a | 0 | n/a |
| Sutton – Carshalton | S | 75 | 27 | n/a | 0 | n/a |
| Sutton – Wallington | K | 20 | 67 | n/a | 10 | n/a |

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm$^{-3}$ | Annual Mean Achieved? | No more than 18 occurrences of hourly mean > 200ugm$^{-3}$ (104.7ppb) | Hourly Mean Achieved? |
|---|---|---|---|---|---|---|
| Sutton – Worcester Park | K | 99 | 53 | no | 2 | yes |
| Thurrock – Calcutta Road Tilbury | R | 91 | 33 | yes | 0 | yes |
| Thurrock – London Road (Grays) [A] | U | 98 | 27 | yes | 0 | yes |
| Thurrock – London Road (Purfleet) | R | 98 | 62 | no | 5 | yes |
| Thurrock – Stanford-le-Hope [AA] | R | 98 | 26 | yes | 0 | yes |
| Tower Hamlets – Blackwall | R | 98 | 59 | no | 1 | yes |
| Tower Hamlets – Mile End Road [AA] | R | 99 | 62 | no | 1 | yes |
| Tower Hamlets – Victoria Park | U | 38 | 44 | n/a | 0 | n/a |
| Wandsworth – Battersea | R | 93 | 47 | no | 1 | yes |
| Wandsworth – Putney | U | 90 | 41 | no | 0 | yes |
| Wandsworth – Putney High Street | K | 95 | 123 | no | 1537 | no |
| Wandsworth – Putney High Street Facade | R | 99 | 95 | no | 505 | no |
| Wandsworth – Wandsworth Town Hall | U | 76 | 43 | n/a | 0 | n/a |
| Westminster – Horseferry Road [A] | U | 99 | 46 | no | 0 | yes |
| Westminster – Marylebone Road [AA] | K | 98 | 94 | no | 60 | no |
| Westminster – Oxford Street | K | 73 | 143 | n/a | 1532 | no |
| Westminster – Victoria | U | 95 | 54 | no | 3 | yes |
| Windsor and Maidenhead – Clarence Road | R | 99 | 43 | no | 1 | yes |
| Windsor and Maidenhead – Frascati Way | R | 98 | 47 | no | 0 | yes |

**Table 3: AQS Objective results for NO$_2$**


## Summary

- 28 sites out of the 67 which achieved the 90% data capture requirement achieved the annual mean objective for nitrogen dioxide (NO$_2$) less than 40 µgm$^{-3}$.
- 39 out of 67 sites did not achieve the annual mean objective.
- 8 sites recorded an annual mean of twice the legal limit or above.
- 55 sites achieved the hourly mean objective of no more than 18 occurrences of an hourly mean greater than 200 µgm$^{-3}$.
- 14 sites exceeded the hourly mean objective for NO$_2$.
- Three sites measured more than 1000 hours with mean NO$_2$ greater than 200 µgm$^{-3}$.
- The main source of NO$_2$ in London is traffic emissions.

## 3.3   Nitrogen Oxides

| Site Name | Type | Capture Rate (%) | Annual Mean NO$_X$ as NO$_2$ ugm$^{-3}$ |
|---|---|---|---|
| Barking and Dagenham – Rush Green | S | 87 | 38 |
| Barking and Dagenham – Scrattons Farm | S | 93 | 50 |
| Bexley – Belvedere | S | 98 | 41 |
| Bexley – Belvedere West | U | 97 | 36 |
| Bexley – Erith | I | 96 | 49 |
| Bexley – Slade Green [A] | S | 97 | 48 |
| Brent – Ikea | R | 31 | 221 |
| Brentwood – Brentwood Town Hall | U | 99 | 32 |
| Camden – Bloomsbury [A] | U | 73 | 72 |
| Camden – Euston Road | R | 92 | 362 |
| Camden – Holborn (inmidtown) | K | 83 | 292 |
| Camden – Shaftesbury Avenue | R | 42 | 152 |
| Camden – Swiss Cottage [AA] | K | 99 | 177 |
| Castle Point – Hadleigh | R | 95 | 44 |
| City of London – Beech Street | R | 98 | 264 |
| City of London – Sir John Cass School | U | 98 | 78 |
| City of London – Walbrook Wharf | R | 97 | 358 |
| Croydon – George Street | R | 93 | 97 |
| Croydon – Norbury | K | 44 | 189 |
| Croydon – Purley Way A23 | R | 99 | 84 |
| Ealing – Hanger Lane Gyratory | R | 90 | 285 |
| Ealing – Horn Lane | I | 91 | 120 |
| Ealing – Southall | U | 90 | 47 |
| Ealing – Western Avenue | R | 94 | 170 |
| Enfield – Bowes Primary School | R | 15 | 105 |
| Enfield – Bush Hill Park | S | 83 | 53 |
| Enfield – Derby Road | R | 93 | 96 |
| Enfield – Prince of Wales School | U | 80 | 50 |
| Greenwich – A206 Burrage Grove | R | 99 | 70 |
| Greenwich – Blackheath | R | 97 | 108 |
| Greenwich – Eltham [AA] | S | 64 | 30 |
| Greenwich – Fiveways Sidcup Rd A20 | R | 97 | 142 |
| Greenwich – Millennium Village | I | 79 | 64 |
| Greenwich – Plumstead High Street | R | 89 | 75 |
| Greenwich – Trafalgar Road | R | 98 | 70 |
| Greenwich – Westhorne Avenue | R | 96 | 101 |
| Greenwich – Woolwich Flyover | R | 98 | 214 |
| Greenwich and Bexley – Falconwood | R | 87 | 102 |
| Hackney – Old Street | R | 99 | 164 |
| Hammersmith and Fulham – Shepherds Bush | R | 21 | 253 |
| Haringey  - Priory Park South [AA] | U | 73 | 34 |
| Haringey – Haringey Town Hall [AA] | R | 65 | 113 |

| Site Name | Type | Capture Rate (%) | Annual Mean NO$_x$ as NO$_2$ ugm$^{-3}$ |
|---|---|---|---|
| Harrow – Pinner Road | R | 93 | 110 |
| Harrow – Stanmore | U | 99 | 36 |
| Havering – Rainham | R | 99 | 73 |
| Havering – Romford | R | 25 | 101 |
| Hounslow and Ealing – Gunnersbury Avenue | R | 99 | 177 |
| Islington – Arsenal | U | 83 | 52 |
| Islington – Holloway Road | R | 87 | 150 |
| Kensington and Chelsea – Cromwell Road | R | 57 | 127 |
| Kensington and Chelsea – Earls Court Rd | K | 91 | 268 |
| Kensington and Chelsea – Kings Road | R | 98 | 200 |
| Kensington and Chelsea – Knightsbridge | R | 99 | 179 |
| Kensington and Chelsea – North Ken $^{AA}$ | U | 97 | 53 |
| Lambeth – Bondway Interchange | I | 98 | 191 |
| Lambeth – Brixton Road | K | 90 | 484 |
| Lambeth – Streatham Green | U | 97 | 57 |
| Lewisham – Catford | U | 99 | 106 |
| Lewisham – Loampit Vale | R | 78 | 152 |
| Lewisham – New Cross | R | 99 | 111 |
| Merton – Morden Civic Centre | R | 67 | 92 |
| Mole Valley – Dorking | U | 99 | 35 |
| Redbridge – Gardner Close | R | 37 | 102 |
| Redbridge – Ley Street | U | 42 | 69 |
| Redbridge – Perth Terrace | U | 35 | 58 |
| Reigate and Banstead – Horley $^{AA}$ | S | 88 | 34 |
| Reigate and Banstead – Horley South | S | 99 | 49 |
| Reigate and Banstead – Poles Lane | RU | 99 | 28 |
| Richmond Upon Thames – Barnes Wetlands | S | 91 | 39 |
| Richmond Upon Thames – Castlenau | R | 91 | 77 |
| Richmond Upon Thames – Hanworth Road | K | 98 | 102 |
| Richmond Upon Thames – Hanworth Road (low level) | K | 97 | 97 |
| Richmond Upon Thames – Ntl Physical  Lab $^A$ | S | 98 | 38 |
| Sevenoaks – Bat and Ball | R | 95 | 64 |
| Sevenoaks – Greatness Park | U | 98 | 26 |
| Southwark – A2 Old Kent Road $^{AA}$ | R | 38 | 115 |
| Southwark – Elephant and Castle | U | 93 | 63 |
| Sutton – Beddington Lane | I | 75 | 57 |
| Sutton – Beddington Lane north | I | 42 | 85 |
| Sutton – Carshalton | S | 75 | 43 |
| Sutton – Wallington | K | 20 | 168 |
| Sutton – Worcester Park | K | 99 | 139 |
| Thurrock – Calcutta Road Tilbury | R | 91 | 63 |
| Thurrock – London Road (Grays) $^A$ | U | 98 | 46 |
| Thurrock – London Road (Purfleet) | R | 98 | 203 |
| Thurrock – Stanford-le-Hope $^{AA}$ | R | 98 | 49 |

| Site Name | Type | Capture Rate (%) | Annual Mean NO$_x$ as NO$_2$ ugm$^{-3}$ |
|---|---|---|---|
| Tower Hamlets – Blackwall | R | 98 | 145 |
| Tower Hamlets – Mile End Road [AA] | R | 99 | 118 |
| Tower Hamlets – Victoria Park | U | 38 | 62 |
| Wandsworth – Battersea | R | 93 | 95 |
| Wandsworth – Putney | U | 90 | 71 |
| Wandsworth – Putney High Street | K | 95 | 294 |
| Wandsworth – Putney High Street Facade | R | 99 | 227 |
| Wandsworth – Wandsworth Town Hall | U | 76 | 80 |
| Westminster – Horseferry Road [A] | U | 99 | 75 |
| Westminster – Marylebone Road [AA] | K | 98 | 330 |
| Westminster – Oxford Street | K | 73 | 447 |
| Westminster – Victoria | U | 95 | 115 |
| Windsor and Maidenhead – Clarence Road | R | 99 | 91 |
| Windsor and Maidenhead – Frascati Way | R | 98 | 107 |

**Table 4: Annual Mean values for Nox**

## 3.4 Ozone

| Site Name | Type | Capture Rate (%) | No more than 10 days where maximum rolling 8hr mean >= 100 ugm$^{-3}$ (50ppb) | Achieved? |
|---|---|---|---|---|
| Bexley – Belvedere West | U | 98 | 10 | yes |
| Bexley – Slade Green | S | 96 | 5 | yes |
| Brent – Ikea | R | 97 | 0 | yes |
| Camden – Bloomsbury [A] | U | 98 | 1 | yes |
| Ealing – Southall | U | 93 | 1 | yes |
| Greenwich – Eltham [AA] | S | 97 | 4 | yes |
| Greenwich – Plumstead High Street | R | 94 | 0 | yes |
| Greenwich – Westhorne Avenue | R | 93 | 0 | yes |
| Greenwich – Woolwich Flyover | R | 100 | 0 | yes |
| Greenwich and Bexley – Falconwood | R | 99 | 0 | yes |
| Hackney – Old Street | R | 99 | 0 | yes |
| Haringey  - Priory Park South [AA] | U | 97 | 16 | no |
| Kensington and Chelsea – North Ken [AA] | U | 95 | 9 | yes |
| Lewisham – Catford | U | 98 | 0 | yes |
| Redbridge – Ley Street | U | 62 | 6 | n/a |
| Redbridge – Perth Terrace | U | 13 | 1 | n/a |
| Reigate and Banstead – Poles Lane | RU | 98 | 8 | yes |
| Richmond Upon Thames – Barnes Wetlands | S | 99 | 17 | no |
| Richmond Upon Thames – Hanworth Road | K | 98 | 0 | yes |
| Richmond Upon Thames – Ntl Physical Lab [A] | S | 83 | 5 | n/a |
| Sevenoaks – Greatness Park | U | 99 | 25 | no |
| Southwark – Elephant and Castle | U | 94 | 2 | yes |
| Sutton – Carshalton | S | 84 | 6 | n/a |
| Thurrock – London Road (Grays) [A] | U | 99 | 3 | yes |
| Tower Hamlets – Blackwall | R | 92 | 0 | yes |
| Wandsworth – Wandsworth Town Hall | U | 95 | 4 | yes |
| Westminster – Horseferry Road [A] | U | 0 | 0 | n/a |
| Westminster – Marylebone Road [AA] | K | 95 | 0 | yes |

**Table 5:  AQS Objective results for O$_3$**

## Summary

- 23 sites out of 26 which achieved the 90% data capture requirement achieved the 8 hourly mean AQS objective for ozone of no more than ten days measuring a daily mean greater than or equal to 100μgm$^{-3}$.
- 3 sites in urban background locations did not achieve the objective.
- Ozone is a regional pollutant which is greater away from busy roads as it is scavenged by NO$_X$ from traffic.

## 3.5    Sulphur Dioxide

| Site Name | Type | Capture Rate (%) | No more than 35 occurrences of 15min mean >=350ugm$^{-3}$ (100ppb) | Achieved? |
|---|---|---|---|---|
| Barking and Dagenham – Rush Green | S | 84 | 0 | n/a |
| Bexley – Slade Green [A] | S | 92 | 0 | yes |
| Camden – Bloomsbury [A] | U | 93 | 0 | yes |
| Castle Point – Hadleigh | R | 59 | 0 | n/a |
| Enfield – Derby Road | R | 94 | 0 | yes |
| Greenwich – Eltham | S | 94 | 0 | yes |
| Kensington and Chelsea – North Ken [AA] | U | 94 | 0 | yes |
| Lambeth – Bondway Interchange | I | 98 | 0 | yes |
| Lambeth – Brixton Road | K | 62 | 0 | n/a |
| Lewisham – Catford | U | 97 | 0 | yes |
| Lewisham – New Cross | R | 99 | 0 | yes |
| Thurrock – Calcutta Road Tilbury | R | 89 | 0 | n/a |
| Thurrock – London Road (Grays) [A] | U | 90 | 0 | yes |
| Tower Hamlets – Victoria Park | U | 38 | 0 | n/a |
| Wandsworth – Wandsworth Town Hall | U | 81 | 0 | n/a |
| Westminster – Marylebone Road [A] | K | 96 | 0 | yes |

**Table 6: AQS Objective results for SO$_2$**

### Summary

- All 11 sites which achieved the 90% data capture requirement achieved the AQS objective of no more than 35 occurrences of 15 minute mean greater than 350 $\mu$gm$^{-3}$ for SO$_2$.
- No 15 minute mean SO$_2$ measurements greater than 350 $\mu$gm$^{-3}$ were recorded at any LAQN site.
- The 15 minute mean objective is the most stringent of the current AQS objectives for SO$_2$.
- The WHO Guidelines (WHO, 2006) recommended a significant reduction in the maximum daily mean concentration from the current 125 $\mu$gm$^{-3}$ to an eventual 20 $\mu$gm$^{-3}$.  Only one of the 10 sites achieving the data capture requirement of 90% met this target in 2014.

## 3.6 Particulate Matter PM$_{10}$

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm$^{-3}$ | Annual Mean Achieved? | No more than 35 occurrences of daily mean >= 50ugm$^{-3}$ | Daily Mean Achieved? |
|---|---|---|---|---|---|---|
| Barking and Dagenham - Scrattons Farm | S | 94 | 21 | yes | 10 | yes |
| Bexley - Belvedere | S | 98 | 19 | yes | 7 | yes |
| Bexley - Belvedere FDMS | S | 98 | 17 | yes | 8 | yes |
| Bexley - Belvedere West | U | 95 | 19 | yes | 6 | yes |
| Bexley - Belvedere West FDMS | U | 84 | 18 | n/a | 7 | n/a |
| Bexley - Erith | I | 92 | 27 | yes | 29 | yes |
| Bexley - Manor Road East Gravimetric | I | 78 | 28 | n/a | 27 | n/a |
| Bexley - Manor Road West Gravimetric | I | 79 | 29 | n/a | 35 | n/a |
| Bexley - Slade Green | S | 98 | 19 | yes | 6 | yes |
| Brent - Ikea | R | 97 | 29 | yes | 26 | yes |
| Brent - John Keble Primary School | R | 72 | 21 | n/a | 1 | n/a |
| Brent - Neasden Lane | I | 73 | 27 | n/a | 9 | n/a |
| Camden – Bloomsbury [A] | U | 95 | 20 | yes | 10 | yes |
| Camden - Euston Road | R | 24 | 29 | n/a | 5 | n/a |
| Camden - Shaftesbury Avenue | R | 79 | 27 | n/a | 15 | n/a |
| Camden - Swiss Cottage [AA] | K | 75 | 22 | n/a | 11 | n/a |
| City of London - Beech Street | R | 96 | 25 | yes | 19 | yes |
| City of London - Sir John Cass School | U | 97 | 20 | yes | 5 | yes |
| City of London - Upper Thames Street | R | 97 | 38 | yes | 54 | no |
| Croydon - George Street | R | 93 | 23 | yes | 9 | yes |
| Ealing - Hanger Lane Gyratory | R | 99 | 28 | yes | 15 | yes |
| Ealing - Horn Lane [AA] | I | 56 | 31 | n/a | 21 | n/a |
| Ealing - Horn Lane TEOM | I | 95 | 34 | yes | 55 | no |
| Ealing - Southall | U | 96 | 19 | yes | 4 | yes |
| Ealing - Western Avenue | R | 95 | 29 | yes | 28 | yes |
| Enfield - Bowes Primary School | R | 67 | 21 | n/a | 11 | n/a |
| Enfield - Derby Road | R | 85 | 31 | n/a | 21 | n/a |
| Greenwich - A206 Burrage Grove | R | 70 | 23 | n/a | 16 | n/a |
| Greenwich - Blackheath | R | 94 | 27 | yes | 18 | yes |
| Greenwich – Eltham | S | 91 | 19 | yes | 8 | yes |
| Greenwich - Fiveways Sidcup Rd A20 | R | 95 | 28 | yes | 25 | yes |
| Greenwich - Millennium Village | I | 75 | 26 | n/a | 17 | n/a |
| Greenwich - Plumstead High Street | R | 77 | 23 | n/a | 14 | n/a |
| Greenwich - Trafalgar Road | R | 97 | 21 | yes | 10 | yes |
| Greenwich - Westhorne Avenue | R | 93 | 25 | yes | 19 | yes |
| Greenwich - Woolwich Flyover | R | 82 | 30 | n/a | 24 | n/a |
| Greenwich and Bexley - Falconwood FDMS | R | 35 | 26 | n/a | 11 | n/a |
| Hackney - Old Street | R | 99 | 27 | yes | 13 | yes |
| Haringey - Haringey Town Hall [A] | R | 25 | 25 | n/a | 9 | n/a |
| Harrow - Pinner Road | R | 97 | 22 | yes | 5 | yes |
| Harrow - Stanmore | U | 98 | 16 | yes | 3 | yes |
| Havering - Rainham | R | 94 | 19 | yes | 3 | yes |

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm⁻³ | Annual Mean Achieved? | No more than 35 occurrences of daily mean >= 50ugm⁻³ | Daily Mean Achieved? |
|---|---|---|---|---|---|---|
| Havering - Romford | R | 80 | 26 | n/a | 12 | n/a |
| Hounslow and Ealing - Gunnersbury Avenue | R | 90 | 29 | yes | 17 | yes |
| Islington - Arsenal | U | 84 | 20 | n/a | 0 | n/a |
| Islington - Holloway Road | R | 70 | 26 | n/a | 7 | n/a |
| Kensington and Chelsea - Cromwell Road | R | 63 | 26 | n/a | 10 | n/a |
| Kensington and Chelsea - Earls Court Rd | K | 92 | 31 | yes | 25 | yes |
| Kensington and Chelsea - North Ken | U | 95 | 20 | yes | 0 | yes |
| Kensington and Chelsea - North Ken FDMS AA | U | 74 | 23 | n/a | 10 | n/a |
| Kensington and Chelsea - North Ken Partisol A | U | 99 | 18 | yes | 6 | yes |
| Lambeth - Bondway Interchange | I | 63 | 35 | n/a | 17 | n/a |
| Lambeth - Brixton Road | K | 74 | 30 | n/a | 14 | n/a |
| Lambeth - Streatham Green | U | 45 | 19 | n/a | 4 | n/a |
| Lewisham - Loampit Vale | R | 80 | 26 | n/a | 17 | n/a |
| Lewisham - Mercury Way | I | 99 | 24 | yes | 27 | yes |
| Lewisham - New Cross | R | 81 | 23 | n/a | 14 | n/a |
| Merton - Merton Road | R | 77 | 29 | n/a | 17 | n/a |
| Mole Valley - Dorking | U | 84 | 18 | n/a | 2 | n/a |
| Redbridge - Gardner Close | R | 36 | 31 | n/a | 9 | n/a |
| Redbridge - Ley Street | U | 60 | 21 | n/a | 6 | n/a |
| Redbridge - Perth Terrace | U | 35 | 19 | n/a | 5 | n/a |
| Reigate and Banstead - Horley | S | 99 | 19 | yes | 4 | yes |
| Reigate and Banstead - Horley FDMS | S | 96 | 19 | yes | 5 | yes |
| Richmond Upon Thames - Barnes Wetlands | S | 92 | 16 | yes | 3 | yes |
| Richmond Upon Thames - Bushy Park | S | 30 | 17 | n/a | 4 | n/a |
| Richmond Upon Thames - Castlenau | R | 91 | 19 | yes | 5 | yes |
| Richmond Upon Thames - Hanworth Road | K | 98 | 22 | yes | 6 | yes |
| Sevenoaks - Bat and Ball | R | 97 | 22 | yes | 8 | yes |
| Sevenoaks - Greatness Park | U | 98 | 19 | yes | 6 | yes |
| Southwark - A2 Old Kent Road AA | R | 39 | 24 | n/a | 10 | n/a |
| Southwark - Elephant and Castle | U | 92 | 23 | yes | 10 | yes |
| Sutton - Beddington Lane | I | 67 | 17 | n/a | 0 | n/a |
| Sutton - Beddington Lane north | I | 36 | 17 | n/a | 0 | n/a |
| Sutton - Wallington | K | 20 | 20 | n/a | 0 | n/a |
| Sutton - Worcester Park | K | 40 | 27 | n/a | 7 | n/a |
| Thurrock - London Road (Grays) | U | 95 | 19 | yes | 9 | yes |
| Thurrock - London Road (Purfleet) | R | 99 | 27 | yes | 21 | yes |
| Thurrock - Stanford-le-Hope AA | R | 94 | 19 | yes | 8 | yes |
| Tower Hamlets - Blackwall | R | 62 | 29 | n/a | 16 | n/a |
| Tower Hamlets - Victoria Park | U | 38 | 21 | n/a | 0 | n/a |
| Wandsworth - Battersea | R | 97 | 28 | yes | 28 | yes |
| Wandsworth - Putney | U | 33 | 20 | n/a | 2 | n/a |
| Wandsworth - Putney High Street | K | 98 | 28 | yes | 16 | yes |

| Site Name | Type | Capture Rate (%) | Annual Mean < 40 ugm$^{-3}$ | Annual Mean Achieved? | No more than 35 occurrences of daily mean >= 50ugm$^{-3}$ | Daily Mean Achieved? |
|---|---|---|---|---|---|---|
| Westminster - Horseferry Road [A] | U | 98 | 19 | yes | 8 | Yes |
| Westminster - Marylebone Road | K | 97 | 31 | yes | 22 | yes |
| Westminster - Marylebone Road FDMS [AA] | K | 93 | 26 | yes | 14 | yes |
| Westminster - Oxford Street | K | 28 | 32 | n/a | 7 | n/a |

**Table 7: AQS Objective results for PM$_{10}$.**

**All PM$_{10}$ measurements have been converted to reference equivalent by the methods recommended in Defra's Local Air Quality Management Technical Guidance (Defra, 2009), i.e. TEOM measurements have been corrected using the Volatile Correction Model (VCM) and unheated BAM measurements have been multiplied by 0.833. Results revised June 2018.**

## Summary

- All 47 sites achieving the 90% data capture requirement, met the annual mean AQS objective of 40 µgm$^{-3}$ for PM$_{10}$.
- Two sites did not meet the daily mean objective of no more than 35 days with a daily mean greater than or equal to 50 µgm$^{-3}$. This single site measured 55 days with a mean concentration greater than 50 µgm$^{-3}$.

## 3.7 Particulate Matter PM$_{2.5}$

| Site Name | Type | Instrument | Capture Rate (%) | Annual Mean ugm$^{-3}$ uncorrected |
|---|---|---|---|---|
| Bexley - Belvedere | S | TEOM* | 97 | 9 |
| Bexley - Belvedere West | U | TEOM* | 94 | 9 |
| Bexley - Erith | I | FDMS | 58 | 16 |
| Bexley - Slade Green FDMS [AA] | S | FDMS | 89 | 16 |
| Bexley - Thamesmead | S | TEOM* | 97 | 9 |
| Brent - Ikea | R | TEOM* | 96 | 13 |
| Camden – Bloomsbury [A] | U | FDMS | 94 | 15 |
| Camden - Euston Road | R | FDMS | 23 | 21 |
| Camden - Swiss Cottage [AA] | K | FDMS | 75 | 15 |
| City of London - Farringdon Street | K | BAM* | 92 | 26 |
| Ealing - Southall FDMS | U | FDMS | 85 | 15 |
| Greenwich - A206 Burrage Grove | R | FDMS | 71 | 17 |
| Greenwich – Eltham [AA] | S | FDMS | 83 | 12 |
| Greenwich - Millennium Village | I | FDMS | 82 | 15 |
| Greenwich - Plumstead High Street | R | FDMS | 90 | 16 |
| Greenwich - Westhorne Avenue | R | FDMS | 95 | 16 |
| Greenwich - Woolwich Flyover | R | TEOM* | 95 | 15 |
| Greenwich and Bexley - Falconwood FDMS | R | FDMS | 67 | 14 |
| Hackney - Old Street | R | TEOM* | 98 | 14 |
| Haringey - Haringey Town Hall [AA] | R | FDMS | 82 | 16 |
| Harrow – Stanmore [AA] | U | FDMS | 86 | 13 |
| Havering - Rainham | R | FDMS | 93 | 12 |
| Kensington and Chelsea - North Ken [AA] | U | FDMS | 76 | 16 |
| Lewisham - New Cross | R | FDMS | 95 | 17 |
| Redbridge - Gardner Close | R | BAM* | 32 | 17 |
| Richmond Upon Thames - Bushy Park | S | FDMS | 38 | 14 |
| Sutton - Beddington Lane north | I | BAM* | 27 | 11 |
| Thurrock - Stanford-le-Hope [AA] | R | FDMS | 91 | 14 |
| Tower Hamlets - Blackwall | R | FDMS | 90 | 16 |
| Westminster - Marylebone Road FDMS [AA] | K | FDMS | 96 | 18 |

**Table 8: Annual mean results for PM$_{2.5}$**

**n.b. instruments marked with a * are not considered a reference equivalent measurement method**

## Summary

- All 16 sites with data capture of 90% or more that used a reference equivalent measurement method achieved the EU target value of 25 µgm$^{-3}$ as an annual mean. This target value should be met by 2020.
- No sites using a reference equivalent measurement method achieved the WHO guideline value of 10 µgm$^{-3}$ (WHO, 2006).

# 4  References

European Commission (EC) 2008. Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe. Commission of the European Community, Brussels.

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