Redbridge Air Quality Annual Status Report for 2019
Date of publication: September 2020

This report provides a detailed overview of air quality in London Borough of Redbridge during 2019. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

Table A.   Summary of National Air Quality Standards and Objectives

Pollutant	Objective (UK)	Averaging Period	Date[1]
Nitrogen dioxide - NO_2	200 µg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 µg m^{-3}	Annual mean	31 Dec 2005
Particles - PM_{10}	50 µg m^{-3} not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 µg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 µg m^{-3}	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 µg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 µg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg m^{-3} mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1] by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

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1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2019

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
CM7	Redbridge 7 Ley Street	544454.8	187681.9	Urban background	Y	70	50m	2.7	NO_2,PM_{10}, $PM_{2.5}$, O_3	Chemiluminescent; BAM
CM4	Redbridge 4 Gardner Close	540828.3	188367.9	Urban traffic	Y	12	12m	2.	NO_2,PM_{10}, $PM_{2.5}$,	Chemiluminescent; BAM

Table C. Details of Non-Automatic Monitoring Sites for 2019

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Site height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
DT A	Mayfield School	547022.3	187232.3	Urban Background	Y	<5m	>100	1.5	NO_2	N
DT B	Ilford Lane	543688.0	186139.6	Roadside	Y	<5m	2.3	3.1	NO_2	N

DT C	Ilford Lane BP	544132.4	184945.6	Roadside	Y	<5m	3.0	2.7	NO_2	N
DT D	Ley Street	544454.8	187681.9	Urban Background	Y	>5m	50m	2.7	NO_2	Y
DT E	Gardner Close	540828.3	188367.9	Roadside	Y	<5m	4.2	2.6	NO_2	Y
DT F	Fullwell Cross	544560.7	190400.8	Roadside	Y	<5m	1.2	1.7	NO_2	N
DT G	Perth Road	543421.7	188322.6	Roadside	Y	<5m	1.5	2.8	NO_2	N
DT H	Westbound Eastern Ave	543450.6	188371.1	Roadside	Y	<5m	1.3	2.4	NO_2	N
DT I	CentralRes Eastern Ave	543453.7	188384.4	Roadside	Y	<5m	2.0	2.5	NO_2	N
DT J	Eastbound Eastern Ave	543442.0	1888400.2	Kerbside	Y	<5m	0.9	2.7	NO_2	N
DT K	Parham Dr	543498.3	188427.6	Near Road	Y	<5m	40m from Eastern Ave	2.6	NO_2	N
DT L	North Circ. Rd, Northbound Royston Gd	541816.3	188161.3	Roadside	Y	<5m	2.1	2.8	NO_2	N
DT M	North Circ. Rd, Southbound Wanstead Pk	541887.8	188136.2	Roadside	Y	<5m	3.0	3.0	NO_2	N
DT N	Ethel Davis School	546675.6	188886.1	Near Road	Y	<5m	15	2.8	NO_2	N
DT O	Grove Road	540025.7	190494.3	Roadside	Y	<5m	8.0 horizontal	2.7	NO_2	N
DT P	High Road Woodford	540076.0	190682.6	Roadside	Y	<5m	2.7	2.6	NO_2	N
DT Q	M11	541992.1	191799.9	Near Road	Y	>10m	35	2.4	NO_2	N
DT R	Winston Way Primary Sch.	544364.1	186597.4	Roadside	Y	<5m	3.2	2.8	NO_2	N
DT S	Winston Way Gyratory	544360.4	186615.3	Kerbside	Y	>10m	0.9	2.6	NO_2	N
DT T	Chadwell Heath	547158.3	187699.4	Kerbside	Y	<5m	0.6	2.8	NO_2	N

DT U	Goodmayes Primary School	546665.3	187046.3	Roadside	Y	<5m	9.0	2.6	NO_2	N
	Primary School									
DT U	*Goodmayes Primary School*	*546665.3*	*187046.3*	*Roadside*	*Y*	*<5m*	*9.0*	*2.6*	NO_2	*N*
DT V	*Isaac Newton Academy*	*545030.2*	*186919.8*	*Near Road*	*Y*	*<5m*	*15*	*2.6*	NO_2	*N*
DT W	*Inside Winston Way Prim.Sch*	*544332.3*	*186571.3*	*Near Road*	*Y*	*<5m*	*17*	*3.0*	NO_2	*N*

1.2   Comparison of Monitoring Results with AQOs

The results presented are after adjustments for "annualisation" and for distance to a location of relevant public exposure, the details of which are described in Appendix A.

Table D.   Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results (μg m⁻³) (Non-automatic co-located tube date included for data trend comparisons) (DT D Perth Terrace was relocated to DT D Ley Street in 2014 with CM7)

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (μg m⁻³)						
				2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
CM1	*Automatic Background (Perth Terrace)*			35.4	32.8					
CM7	*Automatic Background (Ley Street)*	*99*	*99*		34.6	33.1	33	30.4	30.6	30
CM3	*Urban Traffic*									
CM4	*Urban Traffic (Gardner Close)*	*97*	*97*	**45.0**	**48.3**	**41.0**	**42.3**	38.8	37.4	37
CM5	*Urban Traffic*									

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration ($\mu g\ m^{-3}$)						
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
DT D	Non-Automatic Background (Ley Street)						29.6	30.4	28.4	25
DT D	Non-Automatic Background (Perth Terrace)			37.2	33.7	31.7				
DT E	Non-Automatic Background (Gardner Close)			**48.6**	**46.8**	**48.6**	**42.9**	**42.3**	**42.4**	35.7

Notes: Exceedance of the NO₂ annual mean AQO of 40 $\mu g\ m^{-3}$ are shown in **bold**.

NO₂ annual means in excess of 60 $\mu g\ m^{-3}$, indicating a potential exceedance of the NO₂ hourly mean AQS 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 six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table D2: Results of Non-Automatic Nitrogen Dioxide Diffusion Tubes (2012 to 2019)

Year	2012	2013	2014	2015	2016	2017	2018	2019
Bias adjustment factor	0.86	0.80	0.76	0.95	1.03	0.97	0.92	0.89

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m³) - Adjusted for bias [a]							
DT A	Background	Y	28.7	24.1	24.2	25.8	28.8	27.4	24.9	25.1
DT B	Roadside	Y	**60.8**	**52.5**	**51.7**	**52.0**	**55.9**	**52.8**	**45.6**	**43.0**
DT C	Roadside	Y	**57.8**	**47.5**	**49.2**	**53.1**	**57.0**	**52.6**	**46.9**	**43.2**
DT D	Background	Y	37.2	33.7	31.7	29.6	29.0	28.4	25.2	25.0
DT E	Roadside	Y	**48.6**	**46.8**	**48.6**	**42.9**	**43.4**	**42.4**	34.5	35.7
DT F	Roadside	Y	**52.5**	**44.0**	**42.3**	**44.7**	**46.0**	**43.2**	37.6	37.4
DT G	Roadside	Y	**45.4**	**43.9**	39.2	**46.9**	**59.1**	**55.0**	**51.5**	**42.2**
DT H	Roadside	Y	**65.0**	**58.1**	**64.6**	**53.1**	**50.3**	**52.7**	**46.8**	**41.3**
DT I	Roadside	Y	**82.3**	**56.7**	**64.3**	**51.8**	**54.4**	**52.5**	**47.2**	**47.5**
DT J	Kerbside	Y	**50.5**	**45.1**	**45.6**	**48.0**	**55.3**	**50.3**	**43.4**	**41.4**
DT K	Near Road	Y	38.3	**43.1**	36.8	**44.8**	**52.9**	**55.3**	**45.9**	**43.4**
DT L	Roadside	Y	**48.4**	**46.2**	**42.4**	**45.7**	**47.6**	**42.6**	**42.2**	36.7
DT M	Roadside	Y	**77.3**	**66.7**	**71.6**	**73.0**	**80.5**	**78.9**	**68.4**	**61.4**
DT N	Near Road	Y	31.9	32.9	25.8	25.8	28.1	26.8	26.3	23.5

DT O	Roadside	Y	**58.2**	**45.2**	**52**	**45.7**	**49.5**	**47.4**	**44.7**	**41.3**
DT P	Roadside	Y	**45.6**	**40.7**	39.8	38.0	38.8	37.6	34.8	32.0
DT Q	Near Road	Y	**49.5**	**41.4**	**42.6**	**46.8**	**42.1**	**43.9**	36.7	34.7
DT R	Roadside	Y		**53.6**	**50.3**	**50.2**	**57.3**	**54.5**	**53.4**	**47.5**
DT S	Kerbside	Y		**53.2**	**49.4**	**52.6**	**58.3**	**55.5**	**54.2**	**45.7**
DT T	Kerbside	Y		**47.2**	**41.4**	**42.0**	**47.8**	**43.3**	**44.8**	39.4
DT U	Roadside	Y		35.6	34.3	34.8	37.6	36.1	36.5	32.6
DT V	Near Road	Y		34.7	36	31.4	34.0	32.8	31.1	29.2
DT W	Near Road	Y			36.4	34.8	38.1	35.8	37.1	30.4

Trends in Annual Mean NO$_2$ Concentrations

The data above shows the annual mean NO$_2$ concentrations 8 year trend from 2012 to 2019. The results indicate that the annual mean objective was exceeded for all years monitored at the CM3 (Fullwell Cross) and CM5 (Grove Road) roadside monitoring sites until their closure in 2012. The annual mean objective was also exceeded for 6 years at the roadside site CM4 (Gardner Close) with the exceptions of 2017, 2018 and 2019 where CM4 recorded an annual mean concentrations of 38.8, 37.4 and 37 respectively. The results at CM4 show a downward trend over the 8 period. The background site CM1 at Perth Terrace has shown steady concentrations until its closure in 2014. Similarly the background site CM7 at Ley Street has shown steady concentrations since opening in 2014. Both background sites CM1 and CM7 have continually met the annual mean objective concentration. 8 years of non-automatic data at monitoring site DT E (Gardner Close) has been included for data trend comparisons. Similarly data from background sites DT D (Perth Terrace) and DT D (Ley Street) have been included for trend comparison purposes. Site DT D (Perth Terrace) was relocated to DT D Ley Street in 2014 therefore the 8 years of data is split between the two sites. Site DT E in comparison to CM4 shows a similar unsteady concentration decrease and increase trend in the data over the 8 year period. However it is notable that in 2019 CM4 has recorded an annual average just below the Air Quality Objective for the third time over the 8 year period in comparison to DT E which also recorded an annual average concentration just below the objective. It is possible that air quality concentration trends around CM4 and DTE are consistently decreasing. We will observe the concentration trend at CM4 and DT E in future years to see how it progresses. The comparison of site DT D to sites CM1 and CM7 show that background concentration trends have remained relatively steady over the 8 year period.

Table D2 shows a significant number of non-automatic diffusion tube sites still showing pollution levels above the level of 40 μgm^{-3},as prescribed in the Air Quality Objectives. There is a small downward trend across Redbridge's diffusion tube sites, and roadside sites although for the most part above levels set in the Air Quality Objectives, there is an evident downward trend showing in the 2019 concentrations. We attribute this to effective local and regional air quality policies/projects that encourage drivers to switch to using less polluting modes of transport

Table E.   NO₂ Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Hourly Means > 200 $\mu g\ m^{-3}$						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
CM1(Background)			1	0					
CM7(Background)			0	0	0	0	0	0	1
CM4(Roadside)							0	0	0

Notes: Exceedance of the NO₂ short term AQO of 200 $\mu g\ m^{-3}$ over the permitted 18 days per 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 six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table F.   Annual Mean PM₁₀ Automatic Monitoring Results ($\mu g\ m^{-3}$)

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration ($\mu g\ m^{-3}$)						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
CM1(Background)			17.7	16.9					
CM7(Background)		90		22.9	18.8	16.9	15.7	18	16
CM3(Roadside)									
CM4(Roadside)		94	30.3	25.4	17.0	18.8	17.3	18	19
CM5(Roadside)									

Notes: Exceedance of the PM$_{10}$ annual mean AQO of 40 µg m^{-3} 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 six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Option to include some narrative on the 7 year trend here

Table G.   PM$_{10}$ Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]
CM1(Background)			2	5(35)					
CM7(Background)		90		7(36)	3(30)	3(28)	2	1	2
CM3(Roadside)									
CM4(Roadside)		94	23	9(43)	1	6	2	1	2

Notes: Exceedance of the PM$_{10}$ short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**.
Where the period of valid data is less than 85% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.
[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 six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table H.   Annual Mean PM$_{2.5}$ Automatic Monitoring Results (μg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (μg m^{-3})						
			2013[c]	2014 [c]	2015[c]	2016 [c]	2017[c]	2018[c]	2019 [c]
CM7(Background)	39	39					13.6	12	11

Notes: Exceedance of the PM$_{2.5}$ annual mean AQO of 25 μg m^{-3} 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 six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

*KCL ERG advised us that they had to exclude most of 2019 PM2.5 for RB7. This is because of repeated leaks as a result of tape debris build up on the nozzle. Therefore we have no reliable PM2.5 data to report for 2019.

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2.   Action to Improve Air Quality

2.1   Air Quality Action Plan Progress

Table J provides a brief summary of Redbridge Council's new Air Quality Action Plan 2020-2025. This Action Plan is based on the new LLAQM Matrix template. We are focussing our actions on reducing emissions in our air quality focus areas and pollution hotspots. Some actions are currently progressing. The actions have been grouped into seven categories: Monitoring, Emissions from developments and buildings; Public health and awareness raising; Delivery servicing and freight; Borough fleet actions; Localised solutions; and Cleaner transport.

The link to the full document can be found here:

https://www.redbridge.gov.uk/media/7646/aqap-2020-to-2025.pdf

An AQAP Steering Group will be set up to ensure clear governance and ownership of this plan. The Steering Group will consist of representatives from Environmental Health, Public Health, Planning, Transport and other relevant teams. This group will subsequently report on the progress of the actions documented below.

Key for reading the Action Plan:

Responsibility: name of council department responsible for this action	Environmental Health: Planning: Estate Management: Public Health: Smarter Travel Team Procurement Engineering Services
Ease of delivery (**EOD**)	Straightforward **1-2** Medium **3-4** Most difficult **5**

Magnitude of emissions/air quality benefits	High **1** Medium **2** Low **3**
Priority level (**PL**)	High **1-5** (*actions marked **selected** are key priority actions for the council for effective emissions and exposure reductions) Medium **6-10** Low **11-15**
Timescale	The year (or month) this action will be implemented or completed or if this is an ongoing commitment

Table J. Delivery of Air Quality Action Plan Measures (From Redbridge Air Quality Action Plan 2020-2025)

Action category	Action ID	Action description	Responsibility	Cost	Expected emissions/ concentrations benefit	Timescale	Outputs, Targets and KPIs	Further information
Monitoring and Core Statutory Duties	**1**	Maintain the borough's 2 automatic and 26 diffusion tube monitoring sites.	Air Quality Officer	£25K per annum	No. Data from monitoring will assist in identifying the impact of action taken	Ongoing for maintenance of monitors, and target to install new monitors subject to available funding.	All monitors maintained and over 90% data capture	Details of our monitoring can be found here: https://www.redbridge.gov.uk/media/5495/asr_london_2018_final-report.pdf
Reducing Emissions from Developments & Buildings								
Emissions from developments and buildings	**2**	Ensuring emissions from construction and operation of new developments are	Planning	Within existing resource.	**2**	2019 - ongoing	Number of planning applications conditioned	This information is reported on in our ASR

		minimised by requiring developers to adhere to current and any superseding best practice guidance and supplementary planning guidance. Ensuring major sites have a dust management plan (DMP) and construction management plan (CMP) and appropriate real-time monitoring in accordance with the identified risk of the site.					for dust management best practice and automatic air quality monitoring in line with SPG guidance. **EOD** = 2 **PL** = 4 (High)	which can be found here: https://www.redbridge.gov.uk/media/5495/asr_london_2018_final-report.pdf

Emissions from developments and buildings	3	Adoption of a Planning Obligations SPD and securing additional funding from developers through s.106 agreements to manage and enforce construction impacts	Planning		2	2019	Reduction in complaints relating to construction projects.. Amount of money generated for AQ from s.106 agreements **EOD** = 2 **PL** = 4	
Emissions from developments and buildings	4	Educate, raise awareness and enforce Non Road Mobile Machinery (NRMM) air quality policies.	Planning	£4000 match funding requirement for participation in the Pan-London NRMM project	2	Immediately	Number of eligible planning applications conditioned for NRMM in line with SPG Guidance. Number of sites visited by NRMM	This information is reported on in our ASR which can be found here: https://www.redbridge.gov.uk/media/5495/asr_london_2018_final-report.pdf

						enforcement project. Number of sites compliant after follow visit. **EOD** = 2 **PL** = 4 (High & Selected)	Further NRMM information can be found here http://nrmm.london/

Emissions from developments and buildings	5	Enforcing CHP and biomass air quality policies for new developments	Planning	Normal Business	1	Immediately	Annual reporting on number of planning applications conditioned for CHP or biomass in line with SPG Guidance. **EOD** = 4 **PL** = 4 (High)	This information is reported on in our ASR which can be found here: https://www.redbridge.gov.uk/media/5495/asr_london_2018_final-report.pdf
Emissions from developments and buildings	6	Enforcing Air Quality Neutral and Air Quality Positive policies for new developments and require Air Quality Assessments where necessary	Planning	Normal Business	2	Immediately	Number of air quality neutral assessments completed in accordance with GLA	This information is reported on in our ASR which can be found here:

							commissioned guidance. **EOD** = 2 **PL** = 4 (High)	https://www.redbridge.gov.uk/media/5495/asr_london_2018_final-report.pdf
Emissions from developments and buildings	**7**	Ensuring adequate, appropriate, and well located green space and infrastructure is included in new developments	Planning	Normal Business	**3**	Immediately	Local Planning Policy is in place to adequately cover this measure. **EOD** = 2 **PL** = 6 Medium	The Redbridge Local Plan is available to view at: https://www.redbridge.gov.uk/planning-and-building/planning-policy/local-plan/ has a number of Borough wide policies

							on green space and infrastructure:
							Section 1.22-23
							Quality of Environment
							Section 4: Promoting a Green Environment Policy LP19 Climate Change Mitigation. Policy LP24 Pollution.
							Policy LP 32 Sustainable Design and Construction. Policy LP37 Green

							Infrastructure
							Policy LP38 Protecting Trees and enhancing landscape
							Policy 39 Nature Conservation

| Emissions from developments and buildings | 8 | Ensuring the Borough Smoke Control Zone requirements are fully enforced and that information about the requirements are readily available to the public. Awareness will be raised with residents and fuel suppliers through direct engagement. | Environmental Health | Normal Business | 1 | Immediately | Annual reporting on number of smoke control complaints received and enforced. Report on engagement with suppliers and residents **EOD** = 2 **PL** = 2 (High & Selected) | Further information provided to residents and on the council website can be found here: https://www.redbridge.gov.uk/business-and-regeneration/environmental-health/pollution/ |

Emissions from developments and buildings	9	Promoting and delivering in the Council's own stock energy efficiency retrofitting projects in workplaces and homes (Including using the GLA RE:NEW and RE:FIT programmes) to replace	Estate Management	Normal business and support from GLA funding streams	1	Immediately	Number of eligible buildings to benefit from these programmes and delivery date. **EOD** = 3 **PL**= 3 High and selected	The council has signed up to take part in Re-fit for the corporate estate (more information on

		old polluting heat and energy plant with new low emission plant (e.g. old boilers with new ultra-low-NOx boilers); in combination with other energy conservation measures.					RE:FIT is available at https://www.london.gov.uk/what-we-do/environment/energy/energy-buildings/refit

Public health and awareness raising							
Public health and awareness raising	10	Director of Public Health (DsPHs) have been fully briefed on the AQ problem in Redbridge; on what is being done, and what is needed.	Public Health and Environmental Health	Normal business	2	Immediately	Director has been fully briefed and will be re-briefed annually and at interim AQ meetings/projects that require public health

| | | | | | | input. AQ problems are in the council JSNA and amongst Health and Well Being Board priorities.

New Draft Air Quality Action Plan is to be reported to the Health and Well Being Board in March 2019 and periodically thereafter. This is to shape local strategy to effectively tackle local AQ issues. The Public | |
|---|---|---|---|---|---|---|---|

							Health team contributes to all MAQF school projects in Redbridge through awareness raising through local GP surgeries and local schools. **EOD**: 1 **PL**: 2	
Public health and awareness raising	**11**	Public Health and Environmental Health Teams are supporting engagement with local stakeholders (businesses, schools, community groups and healthcare providers).	Public Health and Environmental Health	Normal business and MAQF	**2**	Immediately	Annual reporting summarising engagement progress. **EOD**: 3 **PL**: 6	

Public health and awareness raising	**12**	Joint Strategic Needs Assessment (JSNA) has up to date information on air quality impacts on the population. Revised Health & Well Being Strategy to integrate air quality objectives.	Public Health and Environmental Health	Normal business	1	2019	Annual reporting summarising progress	
Public health and awareness raising	**13**	Strengthening co-ordination with Public Health by ensuring that at least one Consultant-grade public health specialist within the borough has air quality responsibilities outlined in their job profile	Public Health	Normal business	1	Immediately	Annual reporting summarising progress	
Public health and awareness raising	**14**	Engagement with businesses: disseminate information to Redbridge's GP surgeries and pharmacies on how to help improve air quality and reduce	Public Health and Environmental Health	Normal business and MAQF	1	Immediately	Number of GP surgeries/ph armacies to receive information by Dec 2020	

		exposure for patients and employees. Disseminate information to other businesses					Number of businesses engaged with by June 2021	
Public health and awareness raising	15	Promotion of availability of airTEXT and the Mayor of London's air pollution forecasts	Public Health and Environmental Health	£1000	2	Immediately	Increase in number of Redbridge users annually. Continue to support dissemination of airTEXT **EOD** = 2 **PL**= 4 High and selected	Air Text information can be found here: https://www.airtext.info/ Mayor of London forecasts can be found here: https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/monit

								[oring-and-predicting-air-pollution](#)
Public health and awareness raising	**16**	Encourage schools to join the TfL STARS accredited travel planning programme and retain/improve STARS rating through the MAQF school projects. Promoting sustainable travel and cleaner walking routes with supported mapping.	Transport	Normal business and MAQF	. 2	Immediately	Annual reporting summarising STARS progress: Target number of schools to be signed up to STARS and level at sign up. STARS awarded	

							level progress and targets per school **EOD** = 2 **PL**= 4 High	
Public health and awareness raising	17	Reducing pollution in and around schools to improve local air quality at schools. MAQF Project to implement anti-idling and road closure measures around targeted schools. Extending Mayor's school audits to all polluted schools.	Transport	Normal business and pending MAQF funding.	1	2019 to 2023	Report on number of polluted schools using Mayor's school audit toolkit to undertake their own audit **EOD** = 4 **PL**= 4 High & Selected	Develop audit toolkit using guidance from the Mayor and support from TfL STARS programme and issue to schools between 2019-2020.

Delivery servicing and freight

| Delivery servicing and freight | 18 | Update Redbridge procurement policies to reduce pollution from logistics/servicing and to include a requirement for suppliers with large fleets to have attained Bronze Fleet Operator Recognition Scheme (FORS) accreditation | Procurement | Normal business | **3** | 2019 | Annual reporting summarising FORS accreditation and improvements procured service vehicle standards

EOD = 2

PL= 6 Medium | |

Delivery servicing and freight	**19**	Update Redbridge procurement policies to preferentially score bidders delivering goods and services with zero or low emission vehicles.	Procurement	Normal business	**3**	2019	Annual reporting summarising number procured services delivering to Redbridge using low emission/zero emission vehicles. **EOD** = 2 **PL**= 6 Medium	
Delivery servicing and freight	**20**	Reducing emissions from deliveries to local businesses and residents. Evaluate transport being used services such as Age UK Redbridge (Daisy	Procurement and Transport	Normal business	**2**	2019 -2023	Annual reporting summarising comparative delivery numbers, frequency	

		Fresh) for potential emission reductions.					and emission standards of vehicles used **EOD** = 3 **PL**= 6 Medium	
Borough fleet actions								
Borough fleet actions	21	Redbridge's own fleet is a member of the Freight Transport Association with Truck Excellence accreditation; equivalent to bronze (FORS) accreditation. The council will explore the possibility of obtaining (FORS) Gold accreditation for its own fleet.	Waste and Fleet	Normal business	2	2019-2021	Annual report summarising FORS accreditation progress Obtain Silver by 2022 Obtain Gold by 2024 **EOD** = 2	

							PL= 2 High and selected	
Borough fleet actions	22	Increasing the number of electric, hybrid and cleaner vehicles in the boroughs' fleet. Redbridge are seeking to comply with the ULEZ standard.	Waste and Fleet	Normal business with support from Defra and GLA funding streams.	1	2019-2021	Annual report summarising progress Number ULEV by Dec 2021 **EOD** = 2 **PL**= 2 High and selected	
Borough fleet actions	23	Increase the uptake of new Euro VI vehicles in borough fleet.	Waste and Fleet	Normal business	1	2019-2021	Annual report summarising progress Number of Euro VI by Dec 2021 **EOD** = 2	

							PL= 2 High and selected	
Borough fleet actions	24	Smarter Driver Training for drivers of vehicles in Borough Own Fleet i.e. through training of fuel efficient driving and providing regular re-training of staff	Waste and Fleet	Normal business	2	Immediately	Annual report summarising progress **EOD** = 2 **PL**= 4 High	
Localised solutions								
Localised solutions	25	Green Infrastructure	Environmental Health, Transportation and Planning	Normal business and	3	Immediately	Annual report summarising number of	

				MAQF funding			green infrastructure projects implemented by the council. **EOD** = 2 **PL**= 6 Medium	
Localised solutions	**26**	Low Emission Neighbourhoods (LENs) Ilford Garden Junction and pending bid for Ley Street LEN	Transportation	GLA LEN funding and council match funding	**1**	Immediately	Report summarising LEN progress and emission reductions achieved by completion date March 2020. **EOD** = 4 **PL**= 4 High	

Cleaner transport

| **Cleaner transport** | **27** | Discouraging unnecessary idling by taxis, coaches and other vehicles through participation in the Pan London anti-idling campaign and through targeted education and enforcement activity | Environmental Health | Normal Business and MAQF funding for Pan London anti-idling work | 3 | 2019-2024 | Annual report summarising informal and formal enforcement action and response to anti-idling |

		around schools in the borough.					education initiatives. **EOD** = 1 **PL**= 3 High	
Cleaner transport	28	Promote and deliver projects with Car Free Days and Road Closures.	Transportation and Environmental Health	Normal business and pending MAQF	1	2019-2023	Annual report summarising number of car free days held and road closures implemented and their effect on the targeted area/community. **EOD** = 3 **PL**= 3 High and selected	

Cleaner transport	29	Promote the existing free residential parking permit scheme for electric vehicles (EV) to encourage increased uptake	Parking Services	Normal business	1	Immediately	Annual report summarising number of permits issued for EV **EOD** = 3 **PL**= 3 High and selected	

Cleaner transport	30	Installation of (EV) residential electric charge points	Transportation and Planning	LIP, GULCS and OLEV funding support	1	2019-2020	Annual report summarising progress/ number of chargers installed per year **EOD** = 3 **PL**= 3 High and selected	10 EVCPs in South Woodford, Wanstead Village and Wanstead Park March 2019 5-10 EVCPs within the A406 detailed in the MAQF Ley Street LEN bid.
Cleaner transport	31	Installation of rapid chargers to help enable the take up of electric	Transportation	LIP and GULCS funding	1	2020	Annual report	2 EV rapid charging points to be

		taxis, cabs and commercial vehicles (in partnership with TfL and/or OLEV)					summarising progress number of chargers installed per year **EOD** = 3 **PL**= 3 High and selected	installed in the Council's Ley Street Depot detailed in the MAQF Ley Street Bid 1 TfL rapid charger in Cranbrook Road car park, Gants Hill. 6 Fast Chargers to be installed at Lynton House as part of the Workplace Travel Project

Cleaner transport	32	Provision of infrastructure to support walking and cycling	Transportation	LIP and LEN Funding	1	2019-2024	Annual report summarising progress in key schemes implemented from the LIP **EOD** = 4 **PL**= 4 High and selected	
Cleaner transport	33	Introduce parking surcharge on diesel vehicles below Euro 6 standards for Resident and Controlled Parking Zone permits	Parking Services	Normal business	1	2021	Annual report summarising impact of the policy **EOD** = 3 **PL**= 3 High	

Cleaner transport	34	Reallocation or restriction of road space around schools located in areas of high pollution.	Transportation	Normal business and MAQF	1	2019-2023	Annual report summarising progress **EOD** = 3 **PL**= 3 High	A significant amount of road space restriction around schools have been proposed and detailed in the current MAQF and LEN bids.

3. Planning Update and Other New Sources of Emissions

Table K.   Planning requirements met by planning applications in Redbridge in 2019

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	*61*
Number of planning applications required to monitor for construction dust	36
Number of CHPs/Biomass boilers refused on air quality grounds	0
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	4
Number of developments required to install Ultra-Low NO$_x$ boilers	14
Number of developments where an AQ Neutral building and/or transport assessments undertaken	14
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	6
Number of planning applications with S106 agreements including other requirements to improve air quality	2
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Central Activity Zone and Canary Wharf Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	*0*
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	*0*

3.1 New or significantly changed industrial or other sources

London Borough of Redbridge confirms that there are no new or significantly changed industrial or other sources identified.

Appendix A   Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

Air quality monitoring data provides a measure of actual concentrations and therefore exceedences of air quality objectives. Data also provides information on trends in air pollution and can provide the basis for verifying the various models used to predict future pollution levels.

In 2018 London Borough of Redbridge undertook automatic monitoring at the following two sites:

• **CM7 - Redbridge 7** (Ley Street) located northeast of Ilford – an urban background site within the Ley Street Depot that is sited on Ley Street. The site monitored nitrogen dioxide, PM10 (by BAM), and ozone. Since 2016 this site began monitoring PM2.5 (by BAM). Redbridge 7 (Ley Street) was set up in 2014, and is also identified in this report as CM7.

• **CM4 - Redbridge 4** (Wanstead) – an urban traffic site close to the A12 towards the southwest of the Borough. The site started operating in November 1999. The site monitors nitrogen dioxide, PM10 and PM2.5 (both by BAM). Until March 2012 it also monitored carbon monoxide and sulphur dioxide.

The sites represent relevant exposure within the Borough. The sites are part of the London Air Quality Network and therefore the standards of QA/QC are similar to those of the government's AURN sites. Fortnightly local site operator (LSO) zero/span calibrations of the gas analysers are carried out by the local authority, with subsequent data collection, validation and ratification undertaken by the ERG at King's College London. In all cases the data are fully ratified unless reported otherwise. Details of the sites can be found at www.londonair.org.uk

UKCAS accredited independent site audits are carried out every 6 months by the National Physics Laboratory (NPL). Additional six monthly equipment service visits by Enviro Technology Services Plc.

The Council previously operated three other automatic monitoring stations in the Borough: **Redbridge 2** - a roadside site on Ilford Broadway closed in 2003, **Redbridge 3** – a kerbside site at Fulwell Cross closed in 2012, and **Redbridge 5** – a roadside site in South Woodford closed in 2012.

PM$_{10}$ Monitoring Adjustment

The LLAQM.TG16 guidance highlights that Met-One PM$_{10}$ Unheated BAM 1020 instruments conform to the equivalence criteria relating to the gravimetric European reference method. A correction using a factor of 1.2 is automatically applied to adjust for slope..

A.2   Diffusion Tube Quality Assurance / Quality Control

- Diffusion Tubes are prepared and analysed by UKAS accredited Gradko International Ltd
- Diffusion Tubes are prepared using 50% triethanolamine with acetone method and analysed using UV spectrophotometry
- The lab follows the procedures set out in the Defra Technical Guidance for LAQM TG(16).
- For details attaining to 'results' – precision, bias adjustment factors; and reference methods are as follows:

  Results of laboratory precision (tube precision and WASP results):

  The LAQM website gives the following precision results for Gradko 50% TEA in acetone:

  2019 Good (29 studies)

  The laboratory performance of Gradko International was tested in April to November 2018 under AIR NO2 PT Rounds AR024, AR025, AR027 and AR028. The performance was 100% in all rounds.

  The version of the bias adjustment factor database used is: 09/20

Factor from Local Co-location Studies (if available)

The local co-location studies at the Redbridge 7, Ley Street, CMT = DT D and Redbridge 4, Gardner Close, CM4 = DT E gave an average local bias factor for 2019 of 1.006. This was derived by averaging the B Values from the Local Bias Adjustment Tool in accordance with the method in paragraph 7.192 of LAQM TG16. The average is then expressed as factor. 1 is added to the value. Finally an inverse is taken to give the bias adjustment factor.

2019	Bias adjustment factor
Background Redbridge local: CM7=DT D Bias A value = 1.07 Bias B value = -6%	
Roadside Redbridge local: CM4=DT E Bias A value = 0.95 Bias B value = 5%	
Average local: CM7=DT D and CM4=DT E As in method in paragraph 7.192 of LAQM (TG16) = **1.006**	
National Default used – (29 studies)	**0.89**

<u>Discussion of Choice of Factor to Use</u>

For each of the two local sites there were 11 months of "Good Precision" diffusion tube data.

Overall automatic data capture at CM7 and CM4 was good with 12 months of "Good data capture",. The diffusion tubes are in similar exposure positions to the sampler inlets of the chemiluminescent analysers at the continuous sites. In deciding upon the choice of factor to use, we have applied the National Default of 0.89 in our calculations in preference to the local factor of 1.006 since the former derives from good precision data and 29 sites.

<u>Bias adjustment factors for previous years:</u>

2018: A national bias factor of 0.92 used (Lab: ESG Glasgow)
2017: A national bias factor of 0.97 used (Lab: ESG Glasgow)

A.3 Adjustments to the Ratified Monitoring Data

<u>Short-term to Long-term Data Adjustment</u>

No short to long term adjustments required this year to the ratified monitoring data.

Appendix B   Full Monthly Diffusion Tube Results for 2019

Table M.   **NO$_2$ Diffusion Tube Results**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO$_2$ (Bias Adj Factor =0.89)												Annual mean – raw data [c]	Annual mean – bias adjusted [c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
DT A			37.8	37.9	28.8	23.8	20.4	22.0	19.5	21.6	26.7	23.6	38.2	38.7	28.2	25.1
DT B			58.6	57.7	54.3	44.7	45.5	41.6	44.2	41.0	48.8	43.1	41.1	59.0	48.3	43.0
DT C			54.8	63.0	51.1	41.7	45.7	40.5	42.2	45.8	47.8	45.4	46.4	57.7	48.5	43.2
DT D			33.6	35.6	30.1	20.5	22.5	19.2	21.2	21.5	26.4	24.4	50.1	32.2	28.1	25.0
DT E			46.9	57.7	39.2	33.3	34.4	34.5	28.2	41.2	37.7	35.3	37.7	55.1	40.1	35.7
DT F			53.6	55.7	41.1	34.7	37.4	38.1	39.6	36.8	36.1	42.8	43.8	45.3	42.1	37.4
DT G			51.8	74.1	52.9	42.0	36.2	43.7	49.2	30.3	35.8	48.7	58.9	44.9	47.4	42.2
DT H			57.3	61.4	30.3	54.7	36.0	50.0	32.3	33.6	41.1	42.8	61.9	55.2	46.4	41.3
DT I			78.4	72.8	47.6	38.3	41.3	42.5	57.8	50.6	59.3	39.6	64.7	48.0	53.4	47.5
DT J			56.3	66.0	16.5	45.4	35.9	34.5	47.3	34.2	48.4	64.2	53.3	55.8	46.5	41.4
DT K			45.0	50.4	43.1	30.7	44.5	44.7	61.9	49.2	48.2	53.2	55.1	59.7	48.8	43.4

Site ID	Valid data capture for monitoring period %[a]	Valid data capture 2019 %[b]	Annual Mean NO$_2$ (Bias Adj Factor =0.89)												Annual mean – raw data[c]	Annual mean – bias adjusted[c]
			Jan	Feb	March	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec		
DT L			47.8	48.8	44.5	49.4	40.6	40.6	29.5	30.7	39.0	31.8	55.0	37.0	**41.2**	36.7
DT M			78.1	76.5	79.3	57.9	66.7	70.7	61.7	65.3	68.4	52.8	73.9	77.3	**69.0**	**61.4**
DT N			34.1	41.8	30.1	19.3	20.5	19.8	19.8	20.5	25.6	22.5	27.0	35.8	26.4	23.5
DT O			52.6	65.5	48.0	33.1	39.4	38.5	40.4	38.0	47.8	41.1	52.3	59.9	**46.4**	**41.3**
DT P			44.8	48.9	34.9	28.4	31.0	28.6	28.8	27.4	37.0	29.3	43.4	48.5	35.9	32.0
DT Q			47.4	56.7	32.7	28.2	35.8	35.7	37.1	35.9	36.1	38.7	32.4	51.2	39.0	34.7
DT R			53.8	60.0	55.8	58.1	45.9	50.6	45.8	43.1	63.1	50.3	50.5	63.8	**53.4**	**47.5**
DT S			53.4	59.5	57.8	52.6	53.3	49.7	39.4	46.0	45.9	48.5	52.4	58.1	**51.4**	**45.7**
DT T			51.0	59.4	48.5	39.4	38.2	39.3	35.1	35.2	48.5	34.8	52.2	49.8	**44.3**	39.4
DT U			40.8	49.8	41.5	31.4	29.3	31.5	29.0	26.0	38.6	28.3	45.0	48.1	36.6	32.6
DT V			37.7	43.1	36.9	30.2	28.5	25.7	23.3	24.8	34.4	27.1	42.4	39.1	32.8	29.2
DT W			39.9	53.5	36.5	34.6	30.4	25.9	26.9	41.9	29.4	31.3	30.7	29.4	34.2	30.4

Exceedance of the NO$_2$ annual mean AQO of 40 µg m^{-3} 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 six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Distance Adjustment

The bias-adjusted NO_2 annual mean diffusion tube concentration exceedances reported at the sites listed in table N (above) have been distance corrected for the nearest location relevant for exposure. These predictions have been done using the NO_2 fall-off with distance calculator available on the LAQM Support website.

The following factors are have been used to predict the annual mean NO2 concentration (in $\mu g/m^3$) at the the receptor/relevant exposure :

- How far from the KERB is the location where the measurement was made (in meters)
- How far from the KERB is the receptor/relevant exposure (in meters)
- The local annual mean background NO2 concentration (in $\mu g/m^3$)
- The measured annual mean NO2 concentration (in $\mu g/m^3$)

The measurement and background concentrations must be for the same year. The background concentration could come from the national maps published at (http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html) or from a nearby monitor in a background location. 2018 National map background concentrations have been in this report. Use of a measured result from nearby background monitor for background concentration will be denoted by *****

Data for the distance of the kerb to the measurement location has been taken from table B in this report.

The calculator follows the procedure set out in paragraphs 7.77 to 7.79 of LAQM TG(16) and Box 2.3 of LAQM TG(09). The results will have greater uncertainty than measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large. Each distance should be greater than 0.1m and less than 50m. The NO_2 fall off with distance correction has only been applied to sites with relevant exposure that exceed the AQ objectives and that also meet the distance requirement.

Table O.   NO$_2$ Distance Corrected Diffusion Tube Results

Site ID	Annual mean – raw data [c]	Annual mean – bias adjusted [c]	Local Annual mean – background	Distance of measurement from kerb of nearest road (m)	Distance of receptor from kerb (m)	Annual mean – distance corrected
DT A	28.2	25.1				
DT B	48.3	43.0	31.1	2.3	2	**43.4**
DT C	48.5	43.2	24.75	3.0	4.9	**40.9**
DT D	28.1	25.0				
DT E	40.1	35.7	29.1	4.2	11.3	33.8
DT F	42.1	37.4	20.4	1.2	8.7	30.4
DT G	47.4	42.2	25.01	1.5	6.4	36.7
DT H	46.4	41.3	25.01	1.3	4.3	37.2
DT I	53.4	47.5				
DT J	46.5	41.4	25.01	0.9	7.5	34.5
DT K	48.8	43.4	25.01	40	43.9	**42.1**
DT L	41.2	36.7	31.8	2.1	26.2	33.8
DT M	69.0	61.4	31.8	3.0	4.8	**57.8**
DT N	26.4	23.5				
DT O	46.4	41.3	32.4	8.0	12.8	39.7
DT P	35.9	32.0				
DT Q	39.0	34.7				

Site ID	Annual mean – raw data [c]	Annual mean – bias adjusted [c]	Local Annual mean – background	Distance of measurement from kerb of nearest road (m)	Distance of receptor from kerb (m)	Annual mean – distance corrected
DT R	53.4	47.5	25.75	3.2	16.8	38
DT S	51.4	45.7				
DT T	44.3	39.4	21.43	0.6	6.6	31.5
DT U	36.6	32.6				
DT V	32.8	29.2				
DT W	34.2	30.4				