London Borough of Sutton Air Quality Annual Status Report for 2021

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This report provides a detailed overview of air quality in London Borough of Sutton during 2021. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process¹.

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¹ LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
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

Pollutant	Standard / 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
Nitrogen dioxide (NO ₂)	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
Particles (PM ₁₀)	40 µg m ⁻³	Annual mean	31 Dec 2004
Particles (PM _{2.5})	25 μg m ⁻³	Annual mean	2021
Particles (PM _{2.5})	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2021
Sulphur dioxide (SO ₂)	266 µg m ⁻³ not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO ₂)	350 μg m ⁻³ not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO ₂)	125 μg m ⁻³ mot to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

Table A. Summary of National Air Quality Standards and Objectives

Notes:

(1) Date by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2021

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQM A?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet heig ht (m)	Pollutant s monitor ed	Monitoring technique
ST4	Wallington	528925	163804	Kerbside	Y	5	0.8	1.5	NO ₂ , PM ₁₀	Chemiluminesce nt; FDMS
ST5	Beddington Lane North	529400	167224	Industrial	Y	6	4.5	1.5	NO ₂ , PM ₁₀ , PM _{2.5}	Chemiluminesce nt; FDMS
ST6	Worcester Park	522557	165787	Kerbside	Y	2	1.3	1.5	NO ₂ , PM ₁₀	Chemiluminesce nt; FDMS
ST8 ^[1]	Beddington Lane	529781	166597	Industrial	Y	330	N/A	1.5	NO ₂ , PM ₁₀	Chemiluminesce nt; FDMS
ST9 ^[2]	Beddington Village	530124	165323	Roadside	Y	15	5	1.9	NO ₂ , PM ₁₀	Chemiluminesce nt; FDMS

Notes:

[1] Monitor was decommissioned and relocated 16th October 2020

[2] Monitor was relocated and installed 16th October 2020

Automatic (continuous) monitoring was undertaken at four locations in 2021, representing kerbside, roadside and industrial exposures. All four locations monitor for NO_2 and PM_{10} , with one (ST5) also monitoring for $PM_{2.5}$

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQM A? If so, which AQM A?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet heig ht (m)	Pollutants monitore d	Tube co-located with an automatic monitor. (Y/N)
ST21	Glastonbury Road	525567	166291	Urban Background	Y	6	2	2	NO2	N
ST22	Dorset Road, Belmont	525063	162474	Roadside	Y	12	2	2	NO ₂	N
ST23	Sandy Lane South	529734	163868	Roadside	Y	5	2	2	NO_2	N
ST24	Derry Road	530130	165404	Roadside	Y	7	2	2	NO ₂	N
ST25	Staines Avenue	523874	165683	Roadside	Y	15	2	2	NO_2	N
ST26	West Street	527683	164663	Roadside	Y	2	2	2	NO ₂	N
ST07	Hackbridge Primary	528401	166038	Urban background	Y	0	56	2	NO ₂	Ν

Table C. Details of Non-Automatic Monitoring Sites for 2021

ST08	Victor Seymour	527786	165021	Urban background	Y	0	33	2	NO_2	Ν
ST29	Park Lane	528339	164615	Roadside	Y	2	6	2	NO_2	N
ST10	Muschamp Priory	527284	165778	Urban background	Y	0	20	2	NO ₂	Ν
ST11	Sherwood Park School	529835	165041	Urban background	Y	0	35	2	NO ₂	Ν
ST32	Alcorn Close	525184	165845	Urban background	Y	40	25	2	NO ₂	N
ST33	Carshalton Road	526021	164025	Roadside	Y	3	1	2	NO_2	N
ST34	Oakhill Road	525772	165118	Roadside	Y	10	1	2	NO_2	N
ST35	Gander Green Lane	524782	165167	Roadside	Y	10	1	2	NO ₂	N
ST36	Croydon Rd, Beddington	530645	164839	Roadside	Y	0	11	2	NO ₂	Ν
ST27	Haddon Road/St Nicholas Way	525691	164599	Roadside	Y	11	2	2	NO ₂	Ν

ST38	Brighton Road, Sutton	526046	163636	Roadside	Y	2	10	2	NO ₂	Ν
ST39	Rose Hill roundabout	526019	166469	Roadside	Y	6	2	2	NO ₂	Ν
ST40	38 High Street, Cheam	524357	163599	Roadside	Y	2	1	2	NO ₂	Ν
ST42	Royston Park	526605	165364	Urban background	Y	20	95	2	NO ₂	Ν
ST43	Chiltern Road	525883	162518	Roadside	Y	13	1	2	NO ₂	Ν
H1	Hackbridge Road	528359	166067	Roadside	Y	0.5	17	2	NO ₂	Ν
H2	Clover Way	528437	166275	Urban background	Y	0	25	2	NO ₂	Ν
H3	57 London Rd	528637	166021	Roadside	Y	0	5	2	NO ₂	Ν
BL	Beddington Lane	529400	167235	Roadside	Y	15	2	2	NO ₂	Ν



Figure 1A. Air Quality Monitoring Locations in the London Borough of Sutton

London Borough of Sutton declared a borough-wide Air Quality Management Area (AQMA) in 2013 for exceedances of the annual mean objective for NO₂, and the 24-hour mean objective for PM₁₀. This declaration superseded Sutton's original AQMA from 2001 which only comprised properties lining several of the main roads throughout the borough.



Figure 1B. Air Quality Focus Areas in the London Borough of Sutton

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 (if required), the details of which are described in Appendix A.

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ST4	Kerbside	N/A	99.5	<u>61.40 (c)</u>	63.00	53.00	47.00	45.86	40.76	43.29
ST5	Industrial	N/A	99	32.00	36.00	32.00	29.00	29.43	22.80	21.90
ST6	Kerbside	N/A	94.6	52.00	57.00	52.00	52.00	51.09	39.40 (34.9)	43.36
ST8 ^[1]	Industrial	-	-	27.00	30.00	25.00	25.00	25.10	19.14 (c)	-
ST9 ^[2]	Roadside	N/A	88.8	-	-	-	-	-	21.56 (*c)	24.31
ST21	Urban background	100	100	27.32	32.07	27.15	29.37	26.84	20.63	21.48
ST22	Roadside	92	92	37.30	37.24	38.54	36.10	33.51	26.72	24.04
ST23	Roadside	100	100	32.15	35.02	33.64	36.99	34.87	26.98	28.09

Table D. Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ST24	Roadside	100	100	26.68	30.6	26.26	28.87	25.67	19.16	21.86
ST25	Roadside	100	100	32.02	34.65	32.57	31.61	29.74	23.86	25.15
ST26	Roadside	100	100	36.64	41.27	38.54	38.38	35.95	25.61	29.60
ST07	Urban background	92	92	21.87	24.17	21.98	22.35	20.5	17.06	16.63
ST08	Urban background	75	75	23.55	28.52	26.26	24.03	23.21	17.39	12.00
ST29	Roadside	100	100	37.85	41.48	39.52	38.93	35.70	29.60	33.47
ST10	Urban background	100	100	21.12	24.29	21.81	22.72	20.13	14.62	16.17
ST11	Urban background	100	100	23.39	26.43	24.48	24.46	22.55	18.56	19.53
ST32	Urban background	100	100	22.36	27.00	22.43	24.34	20.01	16.67	19.28
ST33	Roadside	92	92	37.34	38.79	33.20	34.46	34.15	27.72	30.20
ST34	Roadside	100	100	39.43	42.78	42.28	38.85	40.67	32.89	33.29
ST35	Roadside	100	100	31.50	34.06	30.53	31.06	28.66	21.99	23.99

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ST36	Roadside	100	100	29.05	32.81	28.84	29.30	27.37	22.67	25.45
ST27	Roadside	83	83	36.78	39.56	36.05	35.59	34.66	28.11	29.06
ST38	Roadside	100	100	34.65	36.83	34.62	35.08	33.18	24.73	29.09
ST39	Roadside	100	100	37.07	39.32	38.89	40.71	41.80	49.51	41.13
ST40	Roadside	100	100	42.90	44.85	39.87	41.14	42.05	31.04	32.96
ST42	Urban background	100	100	20.98	21.82	23.05	19.86	17.35	14.06	17.12
ST43	Roadside	92	92	-	-	-	30.01	28.37	22.20	23.86
H1	Roadside	100	100	28.90	32.29	29.90	26.78	32.58	24.21	27.01
H2	Urban background	100	100	26.50	29.26	25.37	44.10	24.33	18.13	21.88
H3	Roadside	100	100	32.92	32.35	40.32	28.99	44.46	36.09	33.00
BL	Roadside	100	100	-	34.11	32.22	29.37	29.1	26.79	24.55

<u>Notes:</u>

The annual mean concentrations are presented as $\mu g m^{-3}$.

Exceedances of the NO₂ annual mean AQO of 40 μ g m⁻³ are shown in bold.

 NO_2 annual means in excess of 60 µg m⁻³, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

Means for diffusion tubes have been corrected for bias.

All means have been "annualised" in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Results have been distance corrected where applicable.

(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%).

[1] Monitor was decommissioned and relocated 16th October 2020

[2] Monitor was relocated and installed 16th October 2020

Non-automatic (passive) diffusion tube monitoring of NO2 was conducted at 26 locations in 2021, representing urban background and roadside locations. At diffusion tube monitoring locations, there was one exceedance of the annual mean NO2 objective, with site ST39 recording a concentration of 41.1 μ g/m3. Similar to the trends at continuous monitors, there was an increase in concentrations in 2020 at most monitoring locations, but an overall decreasing trend since 2015.





Figure 2. Trend in Annual Mean NO₂ Concentrations at Continuous Monitoring Sites

At automatic monitors, there were two exceedances of the annual mean NO₂ objective in 2021; annual mean NO₂ concentrations of 43.3 µg/m³ were monitored at both ST4 and ST6. Whilst this represents an increase in concentrations in 2020, there is an overall decreasing trend since 2015 and concentrations have not returned to pre-pandemic levels. There was one 1-hour mean greater than 200 µg/m³at ST4, but this is within the permitted 18 times per year.



Annual Mean NO2 Concentrations for DT at Roadside Location

Figure 3A. Trend in Annual Mean NO₂ Concentrations at Roadside Location



Annual Mean NO2 Concentrations for DT at Kerbside Location

Figure 3B. Trend in Annual Mean NO₂ Concentrations at Kerbside Location



Figure 3C. Trend in Annual Mean NO₂ Concentrations at Industrial Location



Figure 3D. Trend in Annual Mean NO₂ Concentrations at Urban Background Location

Site ID	Valid data capture for monitoring period %(ª)	Valid data capture 2021 %(ʰ)	2015	2016	2017	2018	2019	2020	2021
Wallington	N/A	99.5	9 (198.7)	22	1	0	0	0	1
Beddington Lane North	N/A	99	0 (99.8)	0	0	0	0	0	0
Worcester Park	N/A	94.6	11	24	11	7	9	0	0
Beddington Village	N/A	88.8	_	_	-	_	_	0 (72.1)	0

Table E. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m⁻³

<u>Notes</u>

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m⁻³ have been recorded.

Exceedance of the NO₂ short term AQO of 200 µg m⁻³ over the permitted 18 hours per year are shown in bold.

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

(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%)

The number of exceedances of the short term, 200 μ g m⁻³ NO₂ AQO, continue to remain at a very low threshold with only 1 occurrence of exceedance in 2021 at the Wallington site.

Site ID	Valid data capture for monitoring period %(ª)	Valid data capture 2021 %(ʰ)	2015	2016	2017	2018	2019	2020	2021
ST4 Wallington	N/A	99.5	16	23	25	23	21	18.7	18.0
ST5 Beddington Lane North	N/A	99	24	24	31	22	22	21.4	17.6
ST6 Worcester Park	N/A	94.6	23	20	20	20	21 (c)	15.3 (C)	14.8
ST8 Beddington Lane	N/A	-	19 (c)	23	23	22	17	14.5 (*c)	-
ST9 Beddington Village	N/A	80.2	-	-	-	-	-	14.5 (*c)	17.3

	Table F.	Annual Mean	PM ₁₀ Automatic	Monitoring	Results	(µg m <u>-3</u>)
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<u>Notes</u>

The annual mean concentrations are presented as μ g m⁻³.

Exceedances of the PM_{10} annual mean AQO of 40 µg m⁻³ are shown in bold.

All means have been "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 25%.

(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%).



Figure 4. Trend in Annual Mean PM10 Automatic Monitoring Results

There were no exceedances of the annual mean PM_{10} objective in 2021, with a maximum concentration of 18.0 µg/m³at ST4. Compliance was achieved against the 24-hour mean PM_{10} objective. ST5, which is the only site monitoring for $PM_{2.5}$, did not exceed the annual mean objective in 2021, recording an annual mean $PM_{2.5}$ concentration of 10 µg/m³.

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ST4 Wallington	N/A	99.5	0 (25.3)	5	6	4	7	1	0
ST5 Beddington Lane North	N/A	99	13	5 (34)	21	2	13	8	1
ST6 Worcester Park	N/A	94.6	3 (33)	8	2	7	10 (44)	1 (22.6)	0
ST8 Beddington Lane	N/A	0	8	8 (37)	5	2	4	0 (23.3)	-
ST9 Beddington Village	N/A	80.2	-	-	-	-	-	1 (26.2)	0 (28)

<u>Table G.</u> PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 μ g m⁻³

<u>Notes</u>

Exceedances of the PM₁₀ 24-hour mean objective (50 µg m⁻³ over the permitted 35 days per year) are shown in bold.

Where the period of valid data is less than 85% of a full year, the 90.4th percentile is provided in brackets.

(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%).

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ST5 Beddington Lane North	N/A	99	14.8	14.4	15.2 (c)	12	11.7	9.4	10

Table H.	Annual Mear	n PM ₂₅ Automat	ic Monitoring	Results (µ	a m <u>-3</u>)
		<u> </u>			<u>→</u> →

<u>Notes</u>

The annual mean concentrations are presented as $\mu g m^{-3}$.

Exceedances of the $PM_{2.5}$ annual mean AQO of 25 µg m⁻³ are shown in bold.

All means have been "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 25%.

(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%).

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of London Borough of Sutton progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2021 are shown at the bottom of the table.

Table J. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
1	Cleaner Transport	Discourage unnecessary engine idling	LBS is participating in the pan-London Anti-idling project funded by the MAQF. As part of this project, 4 schools have so far been visited. In 20201, numerous sites were identified for anti-idling signs. Suitable sites are under investigation on case-by-case basis.
2		Ensure that Transport and air quality policies and projects are integrated	10 permanent school streets introduced in November 2021 and started planning for four further schemes in 22/23 subject to

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			consultation. Neighbourhood placemaking in Butter Hill and Worcester Park will include highways and public realm improvements. LIP project planning for 22/23 included schemes related to improving modal choice, however TfL funding pressures is restricting delivery.
3		Implement measures to control speeds and smooth traffic flows in residential areas where pedestrians and cyclists are to be given greater priority	Deliver 2 x 20mph schemes. 10 permanent school streets introduced in November 2021 Completion of schemes on the St Helier section of the Morden to Sutton cycle ways scheme.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
4		Encourage car sharing by promoting Car Clubs in order to reduce vehicle ownership and increase the proportion of electric, hydrogen and ultra-low emission vehicles within Car Clubs	Draft STS consultation took place between 14 Jan and 25 March 2021. Responses being reviewed, with revised document due to be presented to Environment & Sustainable Transport Committee in autumn 2021
5		Support communities wishing to enact temporary road closures, encourage Play Streets and run campaigns to raise awareness of benefits of not using a private motor vehicle	No further Play Streets are scheduled to take place due to lockdown and social distancing measures
6		Offer residents free or discounted parking charges for zero emission vehicles (e.g. electric) within Council-run car parks and free or discounted parking permits for zero emission vehicles	Additional permit zones rolled out in 2021/22 in Carshalton, Carshaltoin Beeches, Worcester Park, St Helier and Cheam. Concessions in regards to electric vehicles in car park maintained. Traffic order

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			progressed to ensure electric charging bays in car parks are enforceable if vehicles utilise them without charging.
7		Use parking policies to help reduce pollution emissions	Additional permit zones rolled out in 2021/22 in Carshalton, Carshaltoin Beeches, Worcester Park, St Helier and Cheam. School Street Zones which limit car usage on school roads during peak times implemented across Carshalton, Cheam, Worcester Park, Wallington and Sutton.
8		Installation of ULEV infrastructure including both standard and rapid electric vehicle charging points	Sustainable Transport officers are working with Siemens and their partner Ubitricity to deliver 115 lamp column charging points for Sutton using funding from Government through the Go Ultra Low Cities (GULCS) Locations are being determined from the

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			2020, 2021 Citizen Space survey and from resident requests emailed to Sustainable Transport email address for on-street charging points. Some difficulties encountered in Sutton around suitability of lamp columns (many still concrete), narrow footways, 2-wheel pavement parking. More funding required to deliver more charging points, may however need alignment with lamp column replacement programme.
9		Review of road space allocation to identify opportunities for improving bus journey times, public transport options and the cycling experience while minimising impacts of emissions caused by congestion	LIP programme for 21/22 was significantly disrupted by TfL funding uncertainty, so many of the safety, walking and cycling schemes, which consider the use of road space are still to be progressed and have been carried forward into 22/23.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
10		Provision of infrastructure and support to encourage a modal switch to walking and cycling	10 permanent School Streets introduced in November 2021. Sutton is 28th out of 33 in the 2021Healthy Streets Scorecard, it has one of the lowest active travel rates in the whole of London: this is the proportion of adults regularly walking or cycling. Plans to complete the Beddington Cycleway major project.
12		Promote awareness of Low Emission Zones and creation of local Low Emission Zones	10 permanent school streets introduced in November 2021. Neighbourhood placemaking in Butter Hill and Worcester Park will include highways and public realm improvements
11		Work with Transport for London and other relevant providers to improve public	This work is ongoing.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
		transport connections, availability for passengers and a cleaner fleet mix	
12		Introduce a Dockless electric bike hire scheme to encourage mode-shift amongst residents & commuter's	E bike operator selected in April 2022 with the aim of launching scheme with 120 e-bikes in June 2022 at trains stations, urban centres, NHS sites & colleges. Scope to expand fleet as customer base grows. Ebikes bike batteries swapped/serviced etc using fleet of e-cargo bikes & electric vans.
13	Delivery servicing and freight	Encourage existing contractors providing Council services to be members of the Fleet Operator Recognition Scheme and obtain Gold accreditation	The procurement guidance includes mandatory instructions to follow the sustainability and social value strategies. This objective will be supported by this process on a case by case basis.
14		Update local authority procurement policies to encourage contractors with fleets of more	Policy not yet updated - will form a part of Environmental Strategy which is being

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
		than 10 vehicles providing Council services to reduce emissions from their fleets and reduce pollution from logistics and servicing	reviewed to respond to the climate emergency. It will be prioritised in 2022 when a policy officer is recruited. The Strategy will inform how tenders are assessed.
15		Retiming of freight deliveries to commercial centres	This action has been postponed due to the Covid-19 impact. With many of the premises not trading for much of the year we were unable to progress this. However our intention would be to explore further options to expand on the trial in 2022 and beyond.
16		Reduce emissions from deliveries through e.g. promotion of consolidation and/or Virtual Loading Bays with priority loading for ultra-low emission delivery vehicles	Suitable sites for freight consolidation are still being sought and discussions are ongoing. The procurement guidance includes mandatory instructions to follow the sustainability and social value strategies.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			This objective will be supported by this process on a case by case basis
17	Borough fleet actions	Procurement policies to be developed to encourage new contractors providing Council services to only use vehicles that meet Euro VI emissions standards	The procurement guidance includes mandatory instructions to follow the sustainability and social value strategies. This objective will be supported by this process on a case by case basis.
18		Increase the number of hydrogen, electric, hybrid, bio-methane and cleaner vehicles in the borough's fleet	To allow the Council to move to a fully electric fleet the current fleet lease contract is being extended to 31 March 2024. In the meantime the tender for the next fleet contract is being completed so that the contract can be let with a years notice to the successful bidder. This will allow the vehicles to be manufactured and delivered. The above is affected by the global

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			microprocessor shortage and these actions are aimed at mitigating its effects on delivery of a fully electric fleet. The council is also simultaneously working on a project to install the necessary electric charging infrastructure at Council sites to support these vehicles.
19	Emissions from developments and buildings	Ensure emissions from construction and/or demolition are minimised	Planning conditions relating to air quality are summarised in Table J. Officers apply relevant air quality conditions when consulted on planning applications. In addition, new guidance has been written for our website regarding controlling emissions through the planning approval process. This guidance clarifies to developers which sites will be reviewed for air quality, it stipulates compliance with the SPGs for Control of

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			Dust and Emissions during Construction and Demolition, and Sustainable Design and Construction Practice, it recommends the structure of a standard air quality assessment and recommends compliance with relevant IAQM guidance on assessment of risk. The procurement guidance includes mandatory instructions to follow the sustainability and social value strategies. This objective will be supported by this process on case by case basis.
20		Ensure enforcement of Non-Road Mobile Machinery (NRMM) air quality policies	The use of our standard NRMM planning condition during 2021 is summarised in Table K. Additionally, the Council is taking part in the pan-London NRMM project, funded by the MAQF. Construction Logistics

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			Plans also form part of the new draft Sustainable Transport Strategy, consulted on between January and March 2021
21		Reduce emissions from Combined Heat & Power (CHP) including through enforcement of air quality policies on energy sources in new developments	Zero planning applications for biomass boilers were received and zero were approved in 2019-20 or 2020-21. Zero planning applications for CHP plants over 500kW were received or approved in 2019-20 or 2020-21 Sutton's Authority Monitoring Report (AMR) currently reports on the capacity of energy supply systems implemented as part of completed developments within the borough (such as biomass and CHP) but it is intended to extend this monitoring to planning applications received and permissions from 2020-21 onwards.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
22		Enforce Air Quality Neutral policies	Quantitative assessment of the Council's performance against this action can be found in Table K of this report. Assessment of a developments performance against Air Quality Neutral policy is expected of any major development in the borough. Our air quality website clarifies this requirement for developers.
23		Ensure that Air Quality Positive and Healthy Streets approaches are incorporated within future master-planning and redevelopment areas	A number of the major applications have used the Healthy Streets Approach in recent times, and TfL usually require it for major development on their road network. Some TfL Healthy Streets Training a little while ago and team are generally familiar with the guidance and London Plan/MTS et

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
24		Ensure adequate, appropriate and well located green space and infrastructure is included in new developments	All eight major residential developments granted during 2020-21 have been supported by evidence in support of the planning application to demonstrate that the landscape strategy will achieve the minimum Green Space Factor (GSF) score of +0.2 required by Local Plan Policy 33 and in the Technical Guidance Note. LBS Urban Design Officer appointed in December 2021.
25		Ensure that Smoke Control Areas are appropriately identified and fully promoted and enforced	The consolidation of historic Smoke Control Orders has been agreed at a council level. The consultation is in progress due to implementation by Autumn 2022.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
26		Promote and deliver energy efficiency and energy supply retrofitting projects in workplaces and homes through retrofit programmes such as RE:NEW, RE:FIT and through borough carbon offset funds	In 2021 (completed in September 2021) 6 homes were completed using the Energisprong approach.
27	Public health and awareness raising	Director of Public Health to be fully briefed on air quality issues, to sign off Statutory Annual Status Reports and new Air Quality Action Plans and to support joint working across Council departments on tackling air pollution	Air Quality has been included in section 4 of the borough's JSNA. Air Quality Action Plan working group meetings are chaired by the director of public health and held every two months. Minutes are taken.
28		Work with Public Health Team on stakeholder engagement to raise awareness of health effects of air pollution and reducing exposure	In 2021, a number of bids were placed in order to receive funding that would be used in projects to raise air pollution awareness and reduce exposure. Two bids were submitted that are Defra funded - Driving

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			Training and London Wood Burning Project. The Idling Action project team continues to produce web-based workshops. These have been used as a standard response to complaints of idling made against specific businesses as well as being promoted more widely through the borough and its schools.
29		Engagement with businesses to reduce emissions from associated activities including employees travel to/from and within work	Opportunities limited in 2021, but CFD included Dr Bike Day.
30		Promotion of sources of information about air quality and health including LoveCLeanAir, AirTEXT and Walkit.com and ensuring people are advised when an air pollution episode is forecast	The Council website to promote the AirTEXT service as well as recommending ways in which residents can reduce their exposure to, and emissions of, air pollution. The Council has also shared pollution episode

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints
			alerts from the GLA forecasting service. During 2021, borough residents subscribing to AirTEXT increased by 34 to 217.
31		Encourage schools to join the TfL STARS accredited travel planning programme and supporting its implementation	Ongoing. In 2021 LBS benefited from the services of a Healthy Streets Officer which helped ensure we met this target. 33 schools are predicted to gain either bronze, silver or gold accreditation this year.
32		Raise awareness of air quality through education within schools	Schools were asked to run air quality and anti-idling events as STARS activities
33	Localised solutions	Increase use of vegetation and tree planting to help reduce exposure to air pollutants	2021-22 - 3978 planted and 680 recorded fells
34		Target areas for implementing package of measures aimed at reducing emissions: Low Emission Neighbourhoods (LENs)	10 permanent School Streets introduced in November 2021

Measure	LLAQM Action Matrix Theme	Action	 Progress Emissions/Concentration data Benefits Negative impacts / Complaints
35	Monitoring an other core statutory duties	Collect and publish air quality monitoring data	LBS air quality monitoring data is available on the Council's website. Our Annual Status Reports are also available via our website. In addition to our permanent monitoring network, further passive monitoring has been carried out in 2021 around specific highways improvements. in 2021 there has been an addition of 2 extra air quality monitoring nodes, these are part of breatheLondon project.
36		Continue working with Environment Agency on joint approach to regulation of waste management sites including regular inspections and reviewing of monitoring data	Representatives of the Borough's Pollution Control Team regularly attend the Beddington ERF Community Liason Group which the Environment Agency is invited to.

Measure	LLAQM Action Matrix Theme	Action	Progress Emissions/Concentration data Benefits Negative impacts / Complaints

3. Planning Update and Other New Sources of Emissions

Table K.Planning requirements met by planning applications in London Borough ofSutton in 2021

<u>Condition</u>	<u>Number</u>
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	9
Number of planning applications required to monitor for construction dust	32
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	0
Number of developments required to install Ultra-Low NO _x boilers	1
Number of developments where an AQ Neutral building and/or transport assessments undertaken	8
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	1
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)	
Number of conditions related to NRMM included.	10 conditions included
Number of developments registered and compliant.	12 registered and
Please include confirmation that you have checked that the development has been registered through the <u>NRMM webpage</u> and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	2 unregistered/uncompliant and being chased.

The London Borough of Sutton Planning Department consults the Environmental Protection Team on all major planning applications as well as some non-major applications that are likely to be of interest. Applications are reviewed by officers within the team in respect of contaminated land, noise and air quality. Typically, one

officer coordinates the team's response and records data such as the air quality conditions that were recommended.

The enforcement of air quality conditions is largely the responsibility of the Planning Enforcement Team unless environmental nuisance issues arise. However, NRMM enforcement is carried out by the LB Merton-led pan-London NRMM enforcement project, funded by the Mayor's Air Quality Fund.

3.1 New or significantly changed industrial or other sources

No new sources identified

4. Additional Activities to Improve Air Quality

4.1 London Borough of Sutton Fleet

There is currently no zero emission and zero emission capable vehicles there are within the borough's fleet.

4.2 NRMM Enforcement Project

London Borough of Sutton is continuing to support the NRMM Enforcement project in 2022 – 23.

4.2 Air Quality Alerts

The Council website to promote the AirTEXT service as well as recommending ways in which residents can reduce their exposure to, and emissions of, air pollution. The Council has also shared pollution episode alerts from the GLA forecasting service. During 2021, borough residents subscribing to AirTEXT increased by 34 to 217.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

The Council's monitoring stations form part of the London Air Quality Network and QA/QC standards are delivered accordingly. These are considered close, if not equivalent to, the AURN standards. QA/QC is carried out by contractors.

PM₁₀ Monitoring Adjustment

The monitoring stations in the London Borough of Sutton are part of the London Air Quality Network and the data is collected and managed (including ratification) by ERG (Environmental Research Group).

A.2 Diffusion Tubes

The diffusion tubes used by the London Borough of Sutton are supplied and analysed

by Gradko utilising the 20% triethanolamine (TEA) in water preparation method. A bias adjustment factor of 0.84 for the year 2020 has been derived from the national bias adjustment calculator dated March 2022.

London Borough of Sutton did not conduct any co-location studies in 2021, so it was not possible to calculate a local adjustment factor. As a result, the national bias adjustment factor of 0.84 is applied to diffusion tube monitoring results in this report.

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. Gradko previously participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis Page 38 and the Annual Field Inter Comparison Exercise. In April 2014, a new scheme, AIR PT13, was introduced. This is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

Laboratory performance in AIR PT is also assessed by the National Physical Laboratory (NPL) alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a 'z' score. A score of 2 or less indicates satisfactory laboratory performance.

Gradko International Ltd.'s performance for 2021 for 100% of samples submitted by Gradko were deemed satisfactory.

The laboratory has also achieved a "good" precision result for 2021. Tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%

Year	Local or National	lf National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93
2017	National	03/18	0.89
2016	National	04/17	0.94

National Diffusion Tube	Bias Adju	stment	Fac	ctor Spreadsheet			Spreadsh	ieet Vers	ion Numbe	er: 03/22				
Follow the steps below <u>in the correct order</u> Data only apply to tubes exposed monthly a Whenever presenting adjusted data, you sh This spreadhseet will be updated every few	to show the results nd are not suitable f ould state the adjus months: the factors	of <u>relevant</u> c or correcting i tment factor u may therefore	o-local ndividi Ised al e be si	tion studies ual short-term monitoring periods nd the version of the spreadsheet ubject to change. This should not disco	ourage their	immediate us	e.	This updat LAQ1	spreadshe ed at the er 2022 t Helpdesk	eet will be nd of June <u>(Website</u>				
The LAQM Helpdesk is operated on behalf of Def partners AECOM and the National Physical Labor	ra and the Devolved A atory.	dministrations b	y Bure	au Veritas, in conjunction with contract	Spreadshe compiled l	eet maintained by Air Quality Co	by the Nationa onsultants Ltd.	I Physica	I Laborato	ry. Original				
Step 1:	Step 1: Step 2: Step 3: Step 4:													
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop- Down List	Year Drop- List Where there is only one study for a chosen combination, you should use the adjustment factor shown with cautio Where there is more than one study, use the overall factor ³ shown in blue at the foot of the final column.											
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is net shown, we have no data or this method at this laboratory.	lf a year is not shown, we have no data ²	If you have your own co-location study then see footnote ⁴ . If uncertain what to do then contact the Local Air Quality Managem Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953											
Analysed By ¹	Method To + vda yourselection, choase All) from the pop-up list	Year ⁵ Taundayaur relection, chanro (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ^{\$})	Automatic Monitor Mean Conc. (Cm) (μg/m ^s)	Bias (B)	Tube Precision ®	Bias Adjustment Factor (A) (Cm/Dm)				
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	0.72				
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	0.74				
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	0.96				
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	0.95				
Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	0.68				
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	0.84				
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	0.95				
Gradko	20% TEA in water	2021		Overall Factor ³ (32 studies)				I	se	0.84				
	·	A 11 (-											

Figure 5. National Diffusion Tube Bias Adjustment Factor Spreadsheet

A.3 Adjustments to the Ratified Monitoring Data Short-term to Long-term Data Adjustment

Where data capture is less than 75% and greater than 25% of a full calendar year (between 3 and 9 months), the mean should be "annualised" – i.e. adjusted using the methodology outlined in LLAQM.TG(19) before being compared to annual mean objectives.

In 2021, all monitoring sites had data capture of 75% or more. No annualisation was required.

Distance Adjustment

The continuous NO₂ monitoring sites of ST4 and ST6 as well as the NO₂ diffusion tube monitoring site ST39 were exceeding the AQO of 40 μ g/m3. Annual mean NO₂ concentrations for these sites were calculated at relevant exposure receptors using the NO₂ fall-off with distance calculator.

ST4 and ST39 calculated annual mean concentrations are not within 10% of the NO_2 annual objective of 40µg/m3 (i.e. above 36µg/m3), which accounts for the inherent uncertainty in monitoring concentration data

Table N. NO2 Fall off With Distance Calculations

The results presented in the table below are after adjustments for bias adjustment, annualisation and distance to a location of relevant public exposure. To estimate the concentration at the nearest receptor, the procedure specified in LLAQM.TG(16) has been applied to all monitoring locations that record an annual mean concentration above the NO₂ annual mean objective of 40ug/m3.

The calculation has also been applied to monitoring locations that record an annual mean concentration that is within 10% of the NO₂ annual mean objective (i.e. above 36ug/m3), to account for the inherent uncertainty in diffusion tube monitoring data.

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted (µg m ⁻³)	Background Concentrati on (µg m ⁻³)	Concentrati on Predicted at Receptor (µg m ⁻³)	Comments
ST4	0.8	5.8	43.29	14.76	32.4	
ST6	1.3	3.3	43.36	16.16	38.0	Predicted concentration at Receptor within 10% of the AQO
ST39	2.0	8.0	41.13	17.53	33.5	

The calculations have been carried out in accordance with LLAQM Technical Guidance in order to provide information on the concentrations at which relevant exposure occurs. The data shows that there is just one exceedance of the annual mean objective at an area of relevant exposure and this is a location adjacent to a busy road. This site has been identified in the previous ASR's.

Appendix B Full Monthly Diffusion Tube Results for 2021

Table O. NO₂ Diffusion Tube Results

Site ID	Valid data captur e for monito ring period % ^(a)	Valid data capture 2021 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
			32.5													
ST21	100	100	0	31.49	33.49	26.14	21.70	17.87	19.20	15.58	27.70	25.91	29.36	25.95	25.57	21.48
			36.7													
ST22	92	92	7	31.87	30.27	26.14	30.55	28.54	27.37	-	30.18	34.77	38.10	28.93	28.62	24.04
			35.9													
ST23	100	100	2	37.73	21.29	40.65	31.59	35.73	31.20	27.09	39.62	30.84	39.58	29.97	33.44	28.09
			27.5													
ST24	100	100	2	36.14	35.21	28.58	19.16	22.73	23.70	18.57	29.22	21.38	27.09	22.93	26.02	21.86
			36.0													
ST25	100	100	0	43.04	38.13	27.99	25.10	24.36	22.70	21.54	29.32	27.94	37.06	26.08	29.94	25.15

ST26	100	100	41.0 2	40.32	49.48	31.04	30.96	31.20	28.00	28.23	35.50	34.43	42.49	30.11	35.23	29.60
ST07	02	02	25.0		26.22	22.57	15 44	15 50	15.20	10.16	20.99	19 57	24.02	20.19	10.90	16.62
3107	92	92	I	_	20.33	23.57	15.44	15.52	15.20	12.10	20.00	10.57	24.92	20.10	19.00	10.05
ST08	75	75	-	-	26.33	21.5	16.97	16.40	16.80	12.49	22.36	21.49	-	17.12	14.29	12.00
			41.1													
ST29	100	100	8	42.47	42.17	45.48	39.48	38.16	34.80	32.47	44.31	34.95	47.38	35.28	39.84	33.47
			25.4													
ST10	100	100	2	30.89	26.53	19.68	13.72	13.43	14.00	10.63	18.16	15.68	23.14	19.64	19.24	16.17
			28.6													
ST11	100	100	8	33.23	29.02	21.89	17.94	16.20	20.20	13.94	25.27	23.93	26.31	22.49	23.25	19.53
			24.8													
ST32	100	100	1	32.10	40.19	23.20	15.03	17.03	18.80	13.35	25.72	22.10	21.83	21.24	22.95	19.28
			37.6													
ST33	92	92	0	34.19	44.93	39.62	-	33.29	30.50	33.44	43.86	27.55	38.76	31.83	35.96	30.20
			44.3													
ST34	100	100	2	38.94	30.78	35.63	41.03	39.05	35.60	37.18	43.88	42.98	49.10	37.07	39.63	33.29

ST35	100	100	31.3 9	45.95	32.38	26.81	24.18	23.01	24.30	19.35	29.77	27.71	32.39	25.37	28.55	23.99
ST36	100	100	33.0 3	46.46	38.51	28.09	27.46	25.88	21.80	21.11	31.94	27.06	34.19	28.07	30.30	25.45
ST27	83	83	42.1 5	30.09	45.09	38.02	36.49	-	33.56	32.53	44.45	33.71	44.49	-	34.60	29.06
ST38	100	100	33.5 9	24.97	50.45	35.83	31.55	35.67	32.90	29.73	37.96	31.97	38.27	32.73	34.63	29.09
ST39	100	100	55.2 5	28.69	44.82	47.48	44.82	53.87	48.20	44.68	56.82	52.01	66.13	44.72	48.96	41.13
ST40	100	100	42.6 8	25.88	20.52	50.57	45.49	44.96	37.62	36.22	49.57	38.36	43.71	35.28	39.24	32.96
ST42	100	100	26.7 9	48.39	32.38	18.94	13.37	12.41	12.94	10.44	17.75	10.11	22.87	18.13	20.38	17.12
ST43	92	92	35.3 1	-	25.68	26.93	26.21	24.86	24.70	22.56	30.22	28.99	38.74	28.24	28.40	23.86
H1	100	100	36.5 1	35.86	37.42	31.80	32.25	17.96	25.20	28.52	39.21	33.48	41.71	25.93	32.15	27.01

H2	100	100	32.1 4	22.66	54.78	20.84	20.56	27.99	18.70	15.34	24.79	24.86	29.14	20.79	26.05	21.88
НЗ	100	100	53.8 5	27.54	21.47	38.41	44.23	38.08	36.60	35.75	42.40	45.09	51.00	37.07	39.29	33.00
BL	100	100	30.2 5	27.73	25.86	20.50	22.44	17.75	26.30	27.87	37.43	41.21	39.41	33.89	29.22	24.55

<u>Notes</u>

Concentrations are presented as µg m⁻³.

Exceedances of the NO₂ annual mean AQO of 40 µg m⁻³ are shown in bold.

 NO_2 annual means in excess of 60 µg m-³, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in bold and underlined.

All means have been "annualised" in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

(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%).