

# London Borough of Hounslow Air Quality Annual Status Report for 2020

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This report provides a detailed overview of air quality in the London Borough of Hounslow during 2020. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process<sup>1</sup>.

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<sup>1</sup> LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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## Abbreviations

<b>Abbreviation</b>	<b>Description</b>
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 <sub>10</sub>	Particulate matter less than 10 micron in diameter
PM <sub>2.5</sub>	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**

<b>Pollutant</b>	<b>Standard / Objective (UK)</b>	<b>Averaging Period</b>	<b>Date<sup>(1)</sup></b>
Nitrogen dioxide (NO <sub>2</sub> )	200 µg m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
Nitrogen dioxide (NO <sub>2</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2005
Particles (PM <sub>10</sub> )	50 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
Particles (PM <sub>10</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2004
Particles (PM <sub>2.5</sub> )	25 µg m <sup>-3</sup>	Annual mean	2020
Particles (PM <sub>2.5</sub> )	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2020
Sulphur dioxide (SO <sub>2</sub> )	266 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO <sub>2</sub> )	350 µg m <sup>-3</sup> not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO <sub>2</sub> )	125 µg m <sup>-3</sup> not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

**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 2020**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
HS2	Cranford	510373	177199	Background	Hounslow	20	N/A	3	NO <sub>2</sub> , PM <sub>10</sub> , O <sub>3</sub> , SO <sub>2</sub>	Chemiluminescent; TEOM
HS4	Chiswick	521084	178499	Roadside	Hounslow	1	2	3	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Chemiluminescent; TEOM; Spirant BAM
HS5	Brentford	517425	178071	Roadside	Hounslow	1	4	3	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Chemiluminescent; TEOM; Spirant BAM
HS6	Heston	513655	176842	Roadside	Hounslow	1	3	1.5	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; TEOM
HS7	Hatton Cross	509334	174997	Background	Hounslow	10	11.5	2	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; Met One BAM 1020
HS9	Feltham	510691	173247	Roadside	Hounslow	1	1.5	1.5	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; TEOM
HS8	Gunnorsbury	519180	179369	Roadside	Hounslow	4	4	2	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; Met One BAM 1020

**Table C. Details of Non-Automatic Monitoring Sites for 2020**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
BREN A	Brentford, Great West Road	517425	178071	Roadside	Hounslow	1	4	3	NO <sub>2</sub>	Y
BREN B	Brentford, Great West Road	517425	178071	Roadside	Hounslow	1	4	3	NO <sub>2</sub>	Y
BREN C	Brentford, Great West Road	517425	178071	Roadside	Hounslow	1	4	3	NO <sub>2</sub>	Y
CHIS A	Chiswick High Road	521084	178499	Roadside	Hounslow	1	2	3	NO <sub>2</sub>	Y
CHIS B	Chiswick High Road	521084	178499	Roadside	Hounslow	1	2	3	NO <sub>2</sub>	Y
CHIS C	Chiswick High Road	521084	178499	Roadside	Hounslow	1	2	3	NO <sub>2</sub>	Y
CRAN A	Cranford Avenue Park	510373	177199	Background	Hounslow	20	N/A	3	NO <sub>2</sub>	Y
CRAN B	Cranford Avenue Park	510373	177199	Background	Hounslow	20	N/A	3	NO <sub>2</sub>	Y
CRAN C	Cranford Avenue Park	510373	177199	Background	Hounslow	20	N/A	3	NO <sub>2</sub>	Y
FELT A	Feltham High St / Hanworth Rd Jct	510691	173247	Roadside	Hounslow	1	1.5	1.5	NO <sub>2</sub>	Y
FELT B	Feltham High St / Hanworth Rd Jct	510691	173247	Roadside	Hounslow	1	1.5	1.5	NO <sub>2</sub>	Y
FELT C	Feltham High St / Hanworth Rd Jct	510691	173247	Roadside	Hounslow	1	1.5	1.5	NO <sub>2</sub>	Y
HAT A	Myrtle Avenue	509334	174997	Background	Hounslow	10	11.5	2	NO <sub>2</sub>	Y
HAT B	Myrtle Avenue	509334	174997	Background	Hounslow	10	11.5	2	NO <sub>2</sub>	Y
HAT C	Myrtle Avenue	509334	174997	Background	Hounslow	10	11.5	2	NO <sub>2</sub>	Y
HEST A	Heston Road	513655	176842	Roadside	Hounslow	1	3	1.5	NO <sub>2</sub>	Y
HEST B	Heston Road	513655	176842	Roadside	Hounslow	1	3	1.5	NO <sub>2</sub>	Y
HEST C	Heston Road	513655	176842	Roadside	Hounslow	1	3	1.5	NO <sub>2</sub>	Y
HS32	24 Adelaide Terrace	517551	178186	Roadside	Hounslow	1	10	3	NO <sub>2</sub>	N

HS33	30 Surrey Crescent	519452	178314	Roadside	Hounslow	3	7	2	NO <sub>2</sub>	N
HS34	Chiswick School	520876	177164	Intermediate	Hounslow	3	15	2.5	NO <sub>2</sub>	N
HS35	Wood Street	521220	178069	Roadside	Hounslow	1	2	4	NO <sub>2</sub>	N
HS41	Hanworth Library	512103	172506	Roadside	Hounslow	2.5	5	2	NO <sub>2</sub>	N
HS42	High Street, Hounslow	514090	175812	Background	Hounslow	2	14	3	NO <sub>2</sub>	N
HS43	Glenhurst Road	517436	178044	Roadside	Hounslow	1	0.5	2	NO <sub>2</sub>	N
HS51	Bedfont Sports Club	509249	174683	Intermediate	Hounslow	3	28	2	NO <sub>2</sub>	N
HS52	Bedfont Library	508868	173720	Roadside	Hounslow	2	6	3	NO <sub>2</sub>	N
HS53	Church of the Good Shepherd	510986	176031	Intermediate	Hounslow	4	25	2.5	NO <sub>2</sub>	N
HS54	Cranford Lane / Cranford High Street Jct.	510784	177460	Roadside	Hounslow	2	2	2	NO <sub>2</sub>	N
HS55	Cranford Library	510750	176684	Roadside	Hounslow	3	6	3	NO <sub>2</sub>	N
HS61	Twickenham Road	516208	175793	Roadside	Hounslow	0	18	3	NO <sub>2</sub>	N
HS62	Sutton Road	513619	176924	Roadside	Hounslow	1	1	4	NO <sub>2</sub>	N
HS63	Lampton Road	513528	175868	Roadside	Hounslow	1	1	2.5	NO <sub>2</sub>	N
HS64	Junction of Roseheath Road	512860	175013	Roadside	Hounslow	2	2	5	NO <sub>2</sub>	N
HS65	Eastbourne Road, Uxbridge Rd Jct	511840	172745	Roadside	Hounslow	2	3	2	NO <sub>2</sub>	N
HS66	Brainton Avenue	510957	173642	Roadside	Hounslow	1	5	2	NO <sub>2</sub>	N
HS67	Busch Corner	516590	176888	Roadside	Hounslow	0	1	2.5	NO <sub>2</sub>	N
HS68	Junction of Commerce Road	517278	177298	Roadside	Hounslow	0	2	2	NO <sub>2</sub>	N
HS69	Kew Bridge	519015	178018	Roadside	Hounslow	0	0	2	NO <sub>2</sub>	N
HS70	Eastbury Grove (Chiswick Lane)	521442	177980	Roadside	Hounslow	1	1	2.5	NO <sub>2</sub>	N
HS71	Gunnersbury Avenue	519178	179375	Roadside	Hounslow	2	9	2	NO <sub>2</sub>	N
HS72	Heston Crossroads	513064	177552	Roadside	Hounslow	1	2.5	3	NO <sub>2</sub>	N
HS73	Browells Lane, Feltham	510567	172857	Roadside	Hounslow	2	4	2	NO <sub>2</sub>	N
HS74	Swift Road, Hanworth	511989	171797	Roadside	Hounslow	2	13.5	2	NO <sub>2</sub>	N

HS76	Clements Court, Hounslow	511572	175015	Background	Hounslow	3	N/A	4	NO <sub>2</sub>	N
HS77	Beaversfield Park	512000	175970	Background	Hounslow	5	N/A	2.5	NO <sub>2</sub>	N
HS78	Staines / Wellington Road	512763	175312	Roadside	Hounslow	1	3	4	NO <sub>2</sub>	N
HS79	Whitton Road	513839	175316	Roadside	Hounslow	2	1	3	NO <sub>2</sub>	N
HS80	Hounslow East	514433	175950	Roadside	Hounslow	0	3	3	NO <sub>2</sub>	N
HS81	Woodlands	515035	175907	Intermediate	Hounslow	10	2	2.5	NO <sub>2</sub>	N
HS82	Church Street	516669	175998	Roadside	Hounslow	0	1	2	NO <sub>2</sub>	N
HS83	Osterley Park	514848	178068	Background	Hounslow	2	N/A	1	NO <sub>2</sub>	N
HS84	Apex Corner (York Way)	512709	172155	Roadside	Hounslow	1	2	3	NO <sub>2</sub>	N
HS85	Hospital Road	513213	175655	Roadside	Hounslow	1	1	4	NO <sub>2</sub>	N
HS86	Jolly Waggoners	510947	176564	Roadside	Hounslow	2	1	4	NO <sub>2</sub>	N
HS87A	Henlys Roundabout	511542	176426	Roadside	Hounslow	2	1.5	4	NO <sub>2</sub>	N
HS88	Thames Path, Duke's Meadows	521483	176692	Background	Hounslow	2	N/A	2	NO <sub>2</sub>	N
HS89	Mogden Sewage Works Gate	515424	174719	Roadside	Hounslow	3	3	2	NO <sub>2</sub>	N
HS90	The Butts	517585	177606	Intermediate	Hounslow	2	3	2	NO <sub>2</sub>	N
HS91	Hogarth Ln / Dukes Av	521041	177973	Roadside	Hounslow	3	8	6	NO <sub>2</sub>	N
HS92	St Mary's School	521110	177970	Intermediate	Hounslow	2	13	5	NO <sub>2</sub>	N
HS93	William Hogarth School	521110	177970	Intermediate	Hounslow	2	13	5	NO <sub>2</sub>	N
HSVF1	Vicarage Farm Road (S)	512367	176683	Roadside	Hounslow	1	1	3	NO <sub>2</sub>	N
HSVF2	Vicarage Farm Road	512422	176817	Roadside	Hounslow	1	1	3	NO <sub>2</sub>	N
HSVF3	Vicarage Farm Road (N)	512462	177051	Roadside	Hounslow	1	1	3	NO <sub>2</sub>	N
HSVF4	Westbrook Road, The Warren Jct	512752	177400	Roadside	Hounslow	1	1	3	NO <sub>2</sub>	N
HSVF5	Westbrook Road	512974	177160	Roadside	Hounslow	1	1	3	NO <sub>2</sub>	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 (if required), the details of which are described in Appendix A.

**Table D. Annual Mean NO<sub>2</sub> Ratified and Bias-adjusted Monitoring Results**

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
Brentford	Automatic	91.8	91.8	<b>52.6</b>	<b>53.3</b>	<b>56.9</b>	<b>54</b>	<b>48</b>	<b>43.9</b>	33
Chiswick	Automatic	97.2	97.2	<b>51.7</b>	<b>44.8</b>	<b>49.8</b>	<b>53</b>	<b>47</b>	<b>41.7</b>	32
<i>Cranford</i>	<i>Automatic</i>	<i>98.7</i>	<i>26.64</i>	31.4	30.2	30.8	30	26	27.2	25
Feltham	Automatic	95.5	95.5	<b>43.3</b>	39.7	38.4	34	27	27.7	26
Gunnersbury	Automatic	98	98	<b>58.4</b>	<b>53</b>	<b>59.1</b>	<b>53</b>	<b>45</b>	<b>45</b>	37
Hatton Cross	Automatic	96.5	96.5	31.1	29.7	31.6	33	28	27.3	17
Heston	Automatic	88.6	88.6	<b>47.7</b>	<b>40.7</b>	<b>42.2</b>	<b>44</b>	<b>40</b>	37.7	31
BREN	Diffusion tube	91.7%	91.7%	<b><u>66.3</u></b>	<b><u>64.2</u></b>	<b><u>64.8</u></b>	<b>58.3</b>	<b>48.3</b>	<b>44.1</b>	33.6
CHIS	Diffusion tube	91.7%	91.7%	<b><u>68.0</u></b>	<b><u>60.1</u></b>	<b>49.0</b>	<b>52.4</b>	<b>43.9</b>	<b>41.8</b>	31.9
CRAN	Diffusion tube	91.7%	91.7%	29.7	27.7	28.4	25.0	24.1	26.6	16.0
FELT	Diffusion tube	86.1%	86.1%	<b>45.3</b>	<b>43.1</b>	<b>46.0</b>	38.6	25.8	27.8	24.6
MYR	Diffusion tube	91.7%	91.7%	38.1	36.4	37.7	33.9	29.9	27.2	17.5
HEST	Diffusion tube	91.7%	91.7%	<b>56.3</b>	<b>50.9</b>	<b>56.9</b>	<b>50.1</b>	<b>43.6</b>	38.2	29.7
HS32	Diffusion tube	91.7%	91.7%	<b><u>63.6</u></b>	<b>58.8</b>	<b>59.5</b>	<b>50.2</b>	<b>43.2</b>	<b>42.5</b>	35.5
HS33	Diffusion tube	91.7%	91.7%	<b><u>61.5</u></b>	<b>59.4</b>	<b>57.8</b>	<b>54.8</b>	<b>42.5</b>	38.9	30.2
HS34	Diffusion tube	83.3%	83.3%	39.1	32.8	34.1	28.7	25.9	25.9	20.0

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HS35	Diffusion tube	83.3%	83.3%	37.0	34.6	37.3	32.2	27.3	26.4	19.9
HS41	Diffusion tube	50.0%	50.0%	37.9	35.6	<b>55.7</b>	<b>51.4</b>	<b>41.8</b>	<b>40.2</b>	33.9
HS42	Diffusion tube	83.3%	83.3%	34.9	30.1	36.6	33.1	28.4	29.9	22.8
HS43	Diffusion tube	75.0%	75.0%	<b>43.7</b>	<b>41.2</b>	<b>43.2</b>	35.4	33.3	30.6	22.8
HS51	Diffusion tube	66.7%	66.7%	31.3	26.9	31.9	28.2	25.6	24.1	16.3
HS52	Diffusion tube	91.7%	91.7%	29.6	27.4	29.7	25.1	23.3	23.0	16.9
HS53	Diffusion tube	91.7%	91.7%	33.5	34.1	34.0	33.4	25.6	28.0	18.7
HS54	Diffusion tube	75.0%	75.0%	<b>44.3</b>	<b>48.4</b>	<b>46.0</b>	<b>40.8</b>	35.0	38.4	28.5
HS55	Diffusion tube	91.7%	91.7%	<b>49.3</b>	<b>44.5</b>	<b>50.8</b>	<b>43.7</b>	33.8	33.9	23.7
HS61	Diffusion tube	75.0%	75.0%	<b>41.4</b>	<b>42.4</b>	<b>40.9</b>	34.8	32.1	31.4	21.4
HS62	Diffusion tube	91.7%	91.7%	<b>43.4</b>	38.9	<b>43.7</b>	37.5	33.6	33.6	23.0
HS63	Diffusion tube	91.7%	91.7%	<b>51.9</b>	<b>48.3</b>	<b>48.4</b>	37.3	34.1	30.9	24.6
HS64	Diffusion tube	91.7%	91.7%	35.6	33.3	35.4	33.1	28.7	27.1	20.1
HS65	Diffusion tube	91.7%	91.7%	36.7	33.5	35.4	28.3	25.1	25.1	18.7
HS66	Diffusion tube	83.3%	83.3%	<b>48.5</b>	<b>43.3</b>	<b>46.7</b>	<b>44.0</b>	37.9	34.3	26.0
HS67	Diffusion tube	83.3%	83.3%	<b><u>75.2</u></b>	<b><u>74.2</u></b>	<b><u>68.0</u></b>	<b>59.5</b>	<b>48.5</b>	<b>50.0</b>	<b>40.5</b>
HS68	Diffusion tube	83.3%	83.3%	<b>51.5</b>	<b>52.1</b>	<b>52.3</b>	<b>43.7</b>	36.6	36.6	30.8
HS69	Diffusion tube	83.3%	83.3%	<b>59.6</b>	<b><u>60.1</u></b>	<b>55.5</b>	<b>47.9</b>	39.0	36.0	26.5
HS70	Diffusion tube	83.3%	83.3%	<b><u>62.9</u></b>	<b><u>61.9</u></b>	<b><u>65.1</u></b>	<b>59.7</b>	<b>47.2</b>	<b>44.1</b>	30.5
HS71	Diffusion tube	91.7%	91.7%	<b>58.9</b>	<b>57.3</b>	<b>54.2</b>	<b>48.3</b>	37.9	36.6	29.1
HS72	Diffusion tube	91.7%	91.7%	<b>47.1</b>	<b>46.6</b>	<b>51.8</b>	<b>48.6</b>	36.2	35.0	26.1

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HS73	Diffusion tube	75.0%	75.0%	37.2	33.0	33.3	29.7	25.3	29.1	21.4
HS74	Diffusion tube	83.3%	83.3%	37.6	37.3	<b>41.9</b>	38.4	31.0	29.2	21.7
HS76	Diffusion tube	75.0%	75.0%	36.4	35.7	<b>40.7</b>	26.8	27.0	29.0	21.7
HS77	Diffusion tube	91.7%	91.7%	32.5	26.9	33.8	27.9	21.8	21.6	14.8
HS78	Diffusion tube	91.7%	91.7%	<b>57.9</b>	<b>56.1</b>	<b>57.8</b>	<b>47.4</b>	<b>42.7</b>	<b>40.7</b>	32.7
HS79	Diffusion tube	83.3%	83.3%	<b>42.2</b>	35.7	<b>42.4</b>	33.1	30.1	30.5	22.0
HS80	Diffusion tube	75.0%	75.0%	<b>65.0</b>	<b>63.2</b>	<b>79.2</b>	<b>59.6</b>	<b>58.8</b>	<b>46.4</b>	36.7
HS81	Diffusion tube	91.7%	91.7%	26.6	24.8	26.9	23.0	22.0	20.2	15.4
HS82	Diffusion tube	91.7%	91.7%	34.9	32.5	31.3	26.2	22.2	20.2	15.6
HS83	Diffusion tube	75.0%	75.0%	22.3	24.2	27.0	19.9	19.9	18.4	14.0
HS84	Diffusion tube	91.7%	91.7%	<b>47.5</b>	<b>43.7</b>	<b>45.4</b>	39.7	31.6	33.4	24.6
HS85	Diffusion tube	91.7%	91.7%	<b>51.1</b>	<b>49.3</b>	<b>50.5</b>	<b>47.6</b>	38.0	37.5	30.4
HS86	Diffusion tube	83.3%	83.3%	<b>54.1</b>	<b>50.8</b>	<b>54.9</b>	<b>53.4</b>	<b>41.4</b>	<b>43.5</b>	30.1
HS87A	Diffusion tube	75.0%	75.0%	<b>59.0</b>	<b>56.0</b>	<b>66.2</b>	<b>65.7</b>	<b>44.8</b>	<b>47.3</b>	31.5
HS88	Diffusion tube	83.3%	83.3%	27.0	25.4	26.9	23.3	20.7	22.0	16.1
HS89	Diffusion tube	91.7%	91.7%	39.5	<b>41.3</b>	<b>42.1</b>	32.1	28.9	27.4	22.5
HS90	Diffusion tube	83.3%	83.3%	32.5	30.1	33.8	26.5	25.3	24.7	20.4
HS91	Diffusion tube	66.7%	66.7%	-	-	-	<b>62.0</b>	<b>49.1</b>	<b>43.7</b>	30.5
HS92	Diffusion tube	75.0%	75.0%	-	-	-	-	-	34.8	26.1
HS93	Diffusion tube	75.0%	75.0%	-	-	-	-	<b>56.3</b>	36.2	25.5
HSVF1	Diffusion tube	75.0%	50.0%	-	-	-	-	-	39.4	27.7

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HSVF2	Diffusion tube	62.5%	41.7%	-	-	-	-	-	37.2	31.3
HSVF3	Diffusion tube	75.0%	50.0%	-	-	-	-	-	38.5	26.9
HSVF4	Diffusion tube	75.0%	50.0%	-	-	-	-	-	29.0	17.8
HSVF5	Diffusion tube	75.0%	50.0%	-	-	-	-	-	28.0	18.6

**Notes:**

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

Exceedances of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> 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 33%.

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%).

## Automatic Monitoring Stations

Automatic monitoring data from the six automatic monitoring stations which were active throughout 2020 all show a decrease, with roadside sites at Brentford, Chiswick and Gunnersbury all dipping beneath the 40-microgram annual limit for the first time. This is the first year that all of Hounslow's automatic monitoring stations have measured an annual mean below the annual limit. Additionally, none of the sites recorded any exceedances of the short term mean limit of 200-microgram (1-hour). This is the third consecutive year that this has been achieved in Hounslow.

The most significant reduction year-on-year was 37.7% at Hatton Cross, an urban background site on the eastern perimeter of Heathrow Airport. This is likely due in part to a reduction in both air traffic and airport-related traffic as a result of the Covid-19 pandemic and national lockdowns.

Two roadside sites also saw large reductions, 24.8% at Brentford and 23.3% at Chiswick High Road.

**Diffusion Tubes** – Tubes HS41, HS51 & HS91 annualised in accordance with LLAQM Technical Guidance. Temporary tubes HSVF1-5 were also annualised. See appendix A.3

Hounslow had permanent 49 diffusion tube sites in 2020, including six triplicate colocation studies at automatic monitoring stations. Additionally, there were five short term sites which were used for 2019 and part of 2020. No new diffusion tube sites were added in 2020.

In Hounslow, one diffusion tube site registered an annual mean value in exceedance of the 40  $\mu\text{g m}^{-3}$  limit in 2020 – HS67 Busch Corner with a bias adjusted annual mean of 40.5  $\mu\text{g m}^{-3}$ . This is down from 11 sites with a mean over 40  $\mu\text{g m}^{-3}$  in 2019.

Much of the reduction seen in nitrogen dioxide was seen in the early part of the year, in the wake of the UK's first national lockdown. Following an initial dip, NO<sub>2</sub> levels rose in the latter part of the year to levels similar to those seen at the same time in 2019.

**Table E. NO<sub>2</sub> Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
Brentford	91.8	91.8	4	0	7	12	0	0	0
Chiswick	97.2	97.2	0	0	6	12	0	0	0
<i>Cranford</i>	<i>98.7</i>	<i>26.64</i>	0	0	2	10	0	0	0
Feltham	95.5	95.5	0	0	0	0	0	0	0
Gunnersbury	98	98	<b>36</b>	0	<b>39</b>	<b>46</b>	0	0	0
Hatton Cross	96.5	96.5	0	0	0	0	0	0	0
Heston	88.6	88.6	4	0	1	6	0	0	0

**Notes**

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

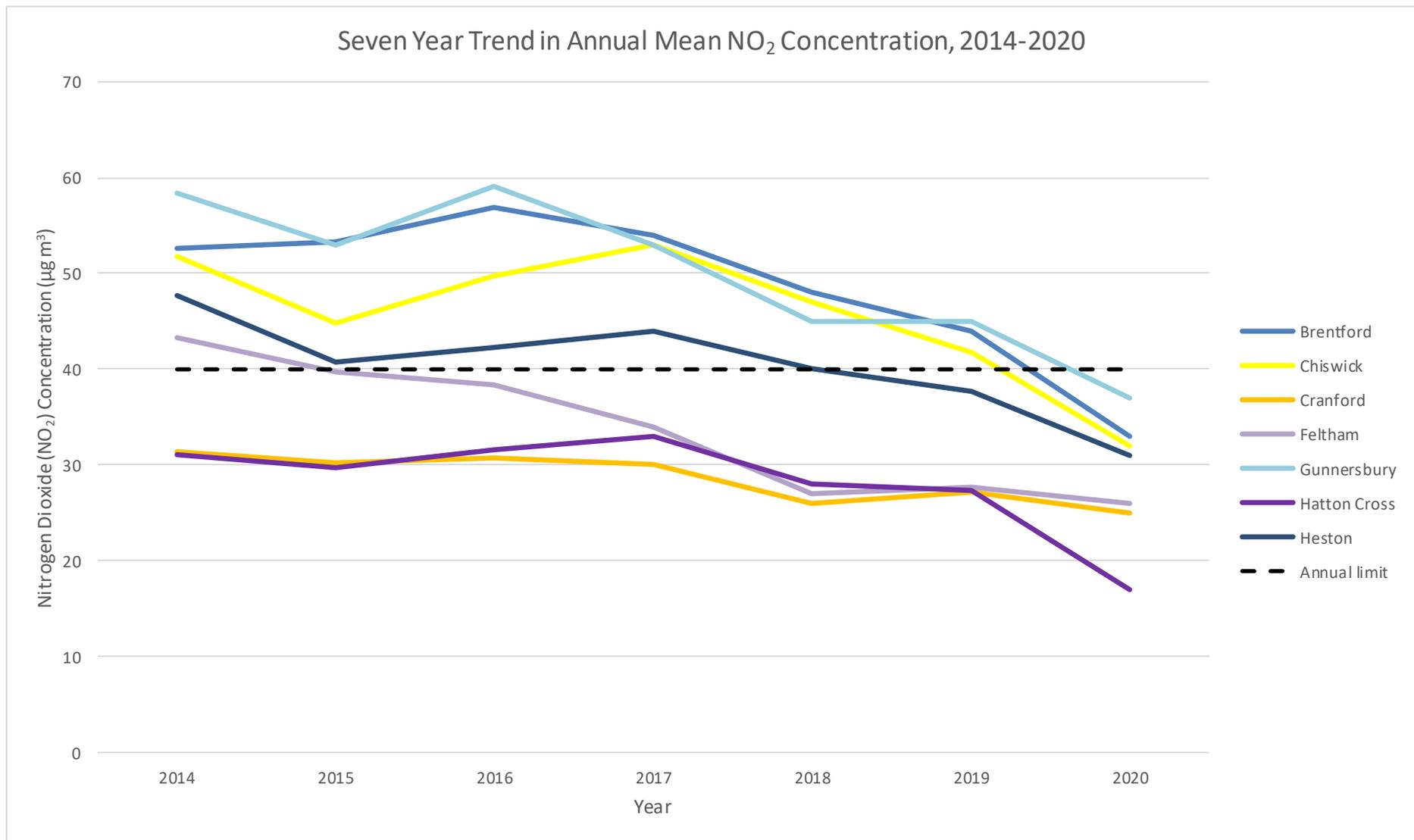
Exceedance of the NO<sub>2</sub> short term AQO of 200 µg m<sup>-3</sup> over the permitted 18 hours per year are shown in **bold**.

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%)

**Graph 1. Seven Year Trend in Annual Mean NO<sub>2</sub> Concentration, 2014-2020**



**Nitrogen Dioxide:**

Annual mean NO<sub>2</sub> levels measured at Hounslow's automatic monitoring stations continue to show a declining trend over the past 7 years. Following minimal change in annual readings between 2014-2017, the past three years (2018 – 2020) have shown a far more significant trend. Reductions in pollution levels at all sites were the largest seen in several years. 2020 was the first year that all sites, most notably roadside sites at Brentford, Chiswick and Gunnersbury, registered an annual mean value of less than 40 micrograms. This is likely to be due in large part to reduced volumes of traffic due to the pandemic, as well as a gradual shift towards cleaner vehicles with the upcoming expansion of London's ULEZ. This follows two years where NO<sub>2</sub> levels at these sites remained between 40-50 µg m<sup>-3</sup>.

**Table F. Annual Mean PM<sub>10</sub> Automatic Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
Brentford	96.2	96.2	31	31	30	28	26	22	25
Chiswick	95.6	95.6	25	22	22	20	20	20	21
<i>Cranford</i>	97.2	26.2	18	17	17	18	15	18	18
Feltham	98.8	98.8	20	18	19	19	20	20	21
Gunnersbury	92.4	92.4	28	25	27	27	22	20	22
Hatton Cross	90.9	90.9	20	18	19	18	21	20	18
Heston	94	94	24	24	25	23	22	24	23

**Notes**

The annual mean concentrations are presented as µg m<sup>-3</sup>.

Exceedances of the PM<sub>10</sub> annual mean AQO of 40 µg m<sup>-3</sup> 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 33%.

(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%).

**Table G. PM<sub>10</sub> Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM<sub>10</sub> 24-Hour Means > 50 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
Brentford	96.2	96.2	42	30	28	24	4	8	9
Chiswick	95.6	95.6	15	5	9	6	1	3	3
<i>Cranford</i>	<i>97.2</i>	<i>26.2</i>	5	4	8	5	0 (23)	7	0
Feltham	98.8	98.8	17	4	7	4	4	7	2
Gunnersbury	92.4	92.4	7	15	15	15	1	5	2
Hatton Cross	90.9	90.9	6	4	6	3	2	7	4
Heston	94	94	18	10	17 (42)	9	2	5	4

**Notes**

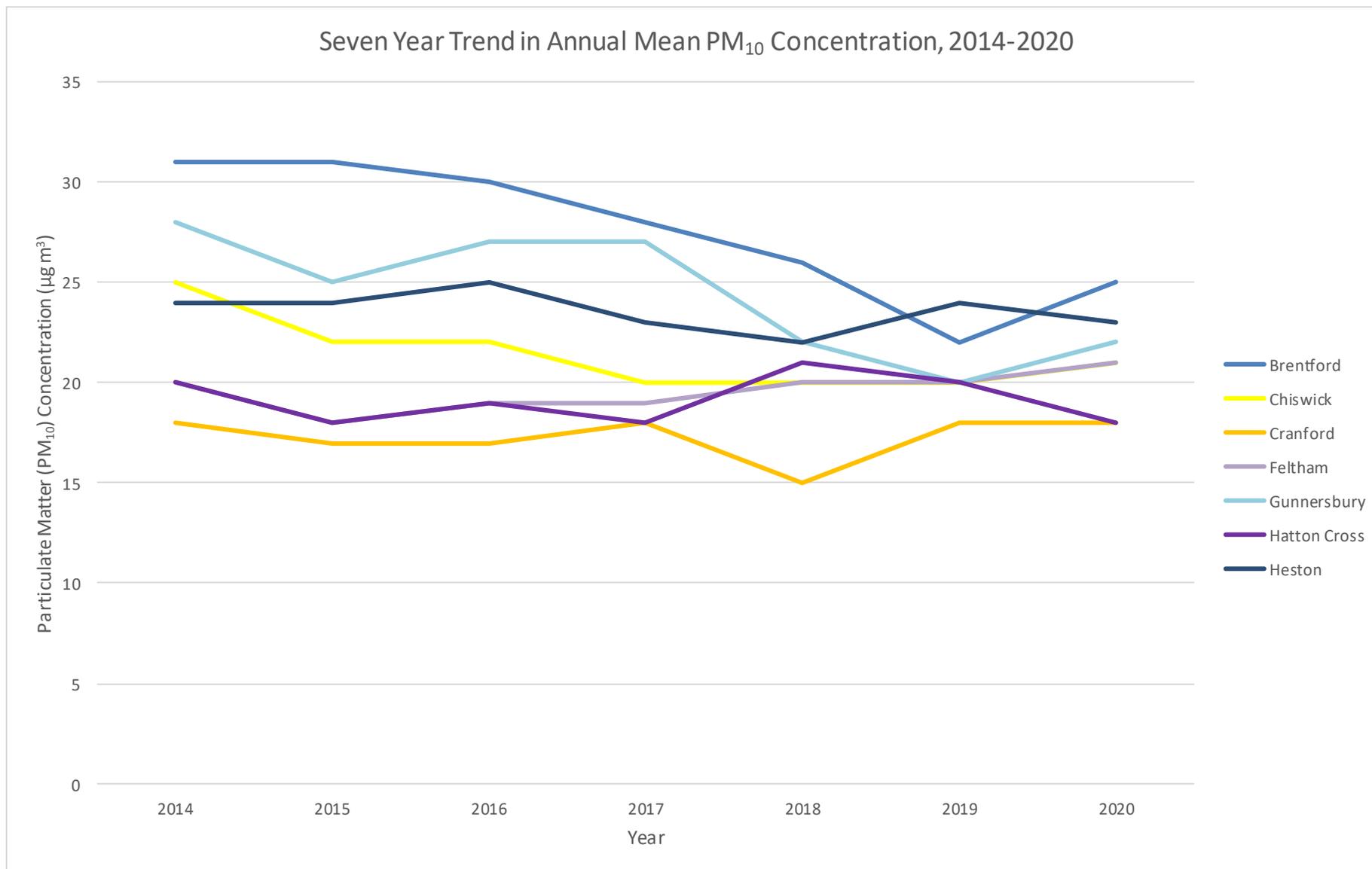
Exceedances of the PM<sub>10</sub> 24-hour mean objective (50 µg m<sup>-3</sup> over the permitted 35 days per year) are shown in **bold**.

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%).

**Graph 2. Seven Year Trend in Annual Mean PM<sub>10</sub> Concentration, 2014-2020**



### **Particulate Matter:**

In contrast to the NO<sub>2</sub> pollution levels in Hounslow, PM<sub>10</sub> data has been more static over the past seven years. All sites remain at or below 25 micrograms, annual average, although three sites saw an increase from 2019. This is well below the UK limit value of 40 µg m<sup>-3</sup> but still in exceedance of the WHO's guideline value of 20 µg m<sup>-3</sup>.

In 2020, the total number of PM<sub>10</sub> means that were greater than 50 micrograms was 26. This is 16 fewer than 2019 and fewer than the per-site limit of 35 per year despite being across six sites. This shows an improvement in short term exceedances year-on-year which, while not mirrored in the annual mean figures and trend presented above (graph 2) is a notable positive for particulate matter exposure in Hounslow.

Excluding Cranford, four sites showed a decrease from 2019, one remained the same (Chiswick, 3) and just Brentford increased from eight to nine exceedances of the short term limit year-on-year.

PM<sub>2.5</sub> is currently monitored at two Hounslow roadside sites: Brentford and Chiswick. This monitoring has been conducted alongside NO<sub>2</sub> and PM<sub>10</sub> since 2017. In the past four years PM<sub>2.5</sub> pollution monitored at these sites has decreased by 3-4 µg m<sup>-3</sup>. These levels are well within the UK limit value of 25 µg m<sup>-3</sup> but exceed the WHO guideline of 10 µg m<sup>-3</sup>.

**Table H. Annual Mean PM<sub>2.5</sub> Automatic Monitoring Results ( $\mu\text{g m}^{-3}$ )**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
Brentford			-	-	-	15	15	13	12
Chiswick			-	-	-	14	14	13	10

**Notes**

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

Exceedances of the PM<sub>2.5</sub> annual mean AQO of  $25 \mu\text{g m}^{-3}$  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 33%.

(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. Impact of COVID-19 upon LAQM**

The first national lockdown which came into force on 20<sup>th</sup> March 2020 prevented us from being able to visit our monitoring locations in April to change the diffusion tubes or calibrate the automatic monitors. This is reflected the in monthly data included in Appendix B.

Some sites were inaccessible for periods throughout 2020 due to sites being closed as a result of the lockdown restrictions, this prevented access to diffusion tubes in some cases. This was the case for sites at some sports clubs and schools.

The automatic monitoring station at Cranford was without power for much of the year due to the theft of the power cable and the pandemic has made restoring power to the site considerably more difficult given restrictions on the various parties (including utility providers and site managers and the need to adhere to the social distancing guidelines.

The impact of lockdown enabled Hounslow to introduce a range of new Streetspace schemes and a temporary Cycleway 9 in Chiswick to help make walking and cycling, as well as social distancing, easier.

### 3. Action to Improve Air Quality

#### 3.1 Air Quality Action Plan Progress

Table J provides a brief summary of Hounslow's progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2020 are shown at the bottom of the table.

**Table J. Delivery of Air Quality Action Plan Measures**

Measure	LLAQM Action Matrix Theme	Action	<b>Progress</b> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
2	Emissions from developments and buildings	The council will ensure appropriate enforcement of Non-Road Mobile Machinery (NRMM) air quality policies. Borough is currently being assisted by GLA in implementing this to 2019. After funding expires in March 2019, the council will either submit another bid for MAQF and/or seek alternative funds or methods to continue this activity. Success may be measured by monitoring the proportion of construction sites that are compliant with NRMM, relative to the total number of sites monitored. Report to AQAP Steering Group in Q1 21/22	Merton provided NRMM monitoring for Hounslow during 2020. Due to the Covid-19 pandemic fewer sites were engaged 'on the ground'. Total 20 audits undertaken by Cleaner Construction for London: 2 achieved self-compliance 7 achieved compliance 2 sites recorded non-compliant 3 had no NRMM 6 sites were complete
5	Emissions from developments and buildings	The council will seek to secure adequate, appropriate, and well-located green space and infrastructure is included in new developments. Report on this to be provided to AQAP Steering Group in Q1 2021/22 to provide detail on the number of schemes where green infrastructure is used or enhanced to provide low exposure walking and cycling routes	Hounslow's green spaces were awarded a Borough-record 16 Green Flags in October 2020, recognising the well managed parks and spaces in Hounslow which provide important green infrastructure for people in the borough.  Hounslow is currently producing the boroughs Green Infrastructure Strategy, Tree Management Policy and Nature Recovery Action Plan which will be adopted in Autumn 2021 following public consultation in Summer 2021.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
			<p>Facilities wise, 3 bike hangars were installed in 2020. We also installed 21 Sheffield stands (one was sheltered). A bike hangar accommodates for 6 CP spaces, whereas a Sheffield stand accommodates for 2</p>
6.1	Emissions from developments and buildings	<p>The Council will raise awareness of the impact of illicit wood burning and fires in Smoke Control Areas (SCA). This will be done through the provision of one article in Hounslow Matters magazine in 2019/20 and an annual campaign using the council's social media outlets. We will also distribute a leaflet direct to residents in all air quality focus areas.</p>	<p>Hounslow publicise the importance of the Clean Air Act and the potential for enforcement. Information about alternatives - waste disposal sites and the garden waste collection scheme - is published on the LBH website. Council is an active member of the GLA Wood Burning Working Group.</p>
7	Emissions from developments and buildings	<p>The council will promote and deliver energy efficiency retrofitting projects in workplaces and homes using the GLA RE:NEW and RE:FIT programmes to replace old boilers /top-up loft insulation in combination with other energy conservation measures; Hounslow Housing is continuing to invest in measures including: Domestic boilers replacement scheme with high efficiency boilers across social housing: circa £6.5m between 18/19 and 21/22; District and communal heating network upgrades across social housing: circa £5.5m between 18/19 and 21/22; Insulation upgrades across social housing: circa £4m primarily for EWI programmes between 18/19 and 21/22; LED street lighting upgrades: circa 1200 lamps to be upgraded to LED. Update presented to Air Quality Action Plan Steering Group in Q1 2022/23</p>	<p>A Public Sector Decarbonisation Scheme application was submitted for energy improvements on 30 Corporate Buildings on the 12th November 2020 totalling £11.2M. In March 2021, the Council was awarded the funding. A mini-competition utilising the RE:FIT Framework has been completed selecting 'Asset Plus as our Energy Saving Company [ESCo] to carry out site surveys and installation of works. All works must be installed and commissioned by March 2022</p> <p>Lighting upgrades in all social housing estates managed by Hounslow Housing were completed in 2019/20.</p> <p>All the Project Network streetlights have been converted to LED with the exception of an additional 157 non LED columns identified during the Borough wide survey which are to be replaced (15,799 total lights).</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
			<p>There are also a number of Project Network streetlights on the additional highway network which are to be programmed for replacement, these are not included in the 15,799 figure above.</p>
7.1	Emissions from developments and buildings	<p>The Council has identified over 30 schools to identify suitable measures for energy efficiency &amp; emissions reduction. 70 schools responsible for 70% CO2 emissions targeted under GLA's RE-FIT programme; 11 schools have now completed the Investment Grade Proposal (IGP) that provides 320kWp of Solar PV (Phases 1 &amp; 2); Further 13 schools have signed-up (agreed works to commence) to IGP and agreement is in pipeline with further 10 schools – these 23 schools are projected to save ~£230k/ann. (with &lt; 8yr. payback), which accounts for ~ 23% of CO2 emission reductions and similar order of magnitude of NOx emissions. High Level Appraisal survey completed (for energy savings under RE-FIT) in 42 schools in the past 18 months: 10 schools have taken up this initiative;</p>	<p>A Public Sector Decarbonisation Scheme application was submitted for energy improvements on 33 School Buildings on the 12th October 2020 totalling £7.65M. This bid was successfully secured. All surveys have been completed with works due to commencing March 2021. All works will be installed and commissioned by Sept 2021.</p>
8	Public health and awareness raising	<p>The council will ensure that the Director of Public Health (DPH) is fully briefed on current Air Quality issues. 1x briefing per year provided to DPH plus DPH (or representative) invited to Air Quality Steering Group.</p>	<p>The Public Health team have been included in environment-focused meetings. At a PH team meeting the results of the ASR were presented, along with information about the state of AQ in Hounslow during lockdown.</p> <p>LBH Environmental Strategy regularly share air quality data with colleagues in the public health team to support their work. This information is shared with Public Health partners and stakeholders.</p>
9	Public health and awareness raising	<p>The council's Public Health Team will support engagement with local stakeholders (businesses, schools, community groups and healthcare providers) by helping raise awareness about air quality issues and</p>	<p>Work by PH has been curtailed by dedicating resources to the Covid-19 response in 2020. We hope to pick up this work again in 2021</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
		<p>what can be done to reduce emissions. They will be asked for their support via the DsPH when projects are being developed. The Public Health team engage with stakeholders via the Health &amp; Wellbeing Board and regular meetings with CCG. Working with DPH, the council will do two presentations on air quality issues, during lifetime of this action plan.</p>	<p>That being said, we are hoping to begin some more work around assessing the levels of air pollution across the borough and the association and correlation with air-pollution / air quality related hospital admissions, i.e. severe asthma and other respiratory conditions that may have been triggered by air pollution.</p>
13	Public health and awareness raising	<p>The council will ensure that the Head of Transport has been fully briefed on the Public Health duties and the fact that all directors (not just Director of Public Health) are responsible for delivering them, as well as on air quality opportunities and risks related to transport in the borough. Provide a briefing covering impacts of transport on air quality and potential techniques/solutions for mitigating impact to be disseminated amongst the Transport team. 2 x 'lunch and learn' training sessions on Air Quality to be held with transport team during lifetime of this action plan.</p>	<p>We are developing a working relationship across departments including public health and transport with air quality at the core to ensure that it's a focus in all projects.</p>
14	Public health and awareness raising	<p>The Council will take action to raise awareness of Air Quality amongst the business community with 1x briefing to the Hounslow Economic Business Forum. This is made up of the 30 largest businesses in the borough and also the local chambers of commerce who together disseminate information to circ. 12,000 local contacts. The briefing will look to promote the Mayor's new Cleaner Vehicle Checker</p>	<p>LBH and Hounslow Business Forum hosted a business engagement webinar on Clean Air Day 2020 (8th October) to highlight the work currently being done on AQ in the borough by the council and businesses. This is attended by a wide range of SMEs from Hounslow.</p>
15	Public health and awareness raising	<p>The Council will raise awareness about air quality by promoting AirText through articles on Air Quality in local magazine, 'Hounslow Matters' once a year, using social media and by distributing leaflets, with an aim to increase subscription of AirText in Hounslow by 10% on 2017 level (178).</p>	<p>Hounslow continue to publicise the AirText scheme across social channels and in the borough magazine, particularly in the wake of the Covid-19 pandemic.</p> <p>We were unable to get signup figures for 2020 due to a cessation in the meeting of the AirText group in the past year and limited engagement with Public Health and</p>

Measure	LLAQM Action Matrix Theme	Action	<b>Progress</b> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
			GPs to promote the scheme. This was due to the Covid19 Pandemic which meant resources were diverted and there was limited capacity to promote the scheme.
16	Public health and awareness raising	The council will encourage schools to join the TfL STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme. With the aim of having 50% Schools accredited by end of 2018/19, 55% by end 2019/20 60% by end 2020/21, 65% by end 2021/22.	<p>Cycle training has been continuing in 2020 in conjunction with LBH partners cyclehub, although this has been disrupted by the impacts of Covid-19.</p> <p>Cycle training, community 'Dr Bike' sessions and inclusive/adapted cycling sessions were run on Clean Air Day (Thursday 8th October)</p> <p>Due to school closures in response to Covid-19, TfL made the decision to roll over STARS accreditation from 2019 to 2020 and there are plans to do this again for the current academic year. Schools are engaging with the programme where possible but there is no pressure to do so given the circumstances.</p>
17	Public health and awareness raising	The council will raise the issue of air quality with school pupils and communities through STARS accreditation, and also via a dedicated Theatre in Education intervention run in 2019/20 for all primary schools on the subject of air quality (target 60% of eligible schools to take up). Letters home to all parents of primary age pupils in 2019/20 on actions they can take to reduce pollution outside school gates and generally (note action 27.1)	Schools took part in Clean Air Day in October 2020, this involved activities such as designing posters, watching Global Action Plan's webinar and putting messages in their parent bulletins. Participation was dictated by the schools interest/capacity.
17.1	Public health and awareness raising	The council will work with schools to implement proposals contained in GLA/TfL air quality audit reports for schools in poor air quality areas. Key recommendations implemented at audited schools by April 2020	Further audits have not been taken but progress has been made with the 3 schools previously audited by the GLA. Cavendish Primary, The William Hogarth School and St Mary's Catholic Primary have all benefitted from School Streets schemes introduced in 2020.

Measure	LLAQM Action Matrix Theme	Action	<p><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
			<p>Hounslow will be working with the GLA, Global Action Plan and the new London Schools Pollution Helpdesk to undertake air quality audits in schools in 2021.</p> <p>The Chiswick Oasis project at St Mary's Catholic Primary school, Chiswick, was fitted with a classroom air purifier to contribute to pollution reduction measures.</p>
21	Delivery servicing and freight	The Council will consider best practice from schemes to incentivise low emission freight delivery options implemented elsewhere. This will be progressed via a liveable neighbourhoods bid to TfL in 2019/20.	Hounslow Council trialled the cargo bike scheme in 2020. As a result, 21 businesses made a total of 244 deliveries by cargo bike, covering almost 500 miles, during a five-month trial which saved a total of 127kg of CO2 vs using cars for collection or vans for delivery. 100% of customers said they were 'very likely to use the scheme again'
23	Borough fleet actions	The council will look to increase the number of hydrogen, electric, hybrid, bio-methane and cleaner vehicles in the boroughs' fleet. The council will explore opportunities to introduce EVs and make future vehicle fleet as clean as possible in future, however noting that the in-house fleet is now quite small. Action to procure 4x electric vehicles (EV) for use by Pest Control & Animal Wardens. Future report to AQAP Steering Group Q1 20/21.	<p>A Green Fleet review programme has been set up within the council with a view to measuring the existing fleet emissions, setting a framework for a move towards alternative fuel vehicles, and ultimately reducing overall council emissions from fleet in 2021 and going forward.</p> <p>Hounslow Highways will continue to increase the electrification of its fleet and plant, and on the 12th October 2020 the Hounslow Highways Tree Surgery Team began taking delivery of the first Electric Chipper in the country.</p> <p>This means that all the tools and equipment used by the Tree Team, will be electric and will therefore have a positive impact on the boroughs carbon footprint and will contribute more to Clean Air on a daily basis.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
			<p>In addition, seven electric supervisor vans will be added to the fleet over the coming months, bringing further benefits to the borough.</p> <p>Early in 2021 Hounslow Highways will also be introducing a fully electric 7.2 Tonne cleansing vehicle into the fleet and this will be a first for the UK Group. This will be joined by other vehicles that have been completing trails, including a new 3.5 tonne tipper range, which is 100% electric.</p> <p>To support these significant developments, Hounslow Highways has also just received approval to spend over £30,000 on the installation of 16 Electric Vehicle Charging points around the Jubilee House depot yard. This is an important investment for the long-term carbon-reduction of the organisation and the further planning for the electrification of the fleet which will also bring added co benefits for reducing air pollution..</p>
24	Borough fleet actions	The council will look to accelerate uptake of new Euro VI vehicles in borough fleet	£750,000 allocated in 2020/21 procurement plan for the Replacement of council vehicles in line with ULEZ and aging fleet of vehicles to replacing high emission vehicles with cleaner emission vehicles.
26	Localised solutions	The council will submit an application for a 'Low Emission Neighbourhood' if funding becomes available.	<p>The South Chiswick Liveable Neighbourhood project has been combined with a range of new Streetspace and traffic measures in response to Covid-19 with the aim of improving road safety and enabling social distancing. Trial proposals for the Liveable Neighbourhood project have been brought forward to turn the area into a low traffic neighbourhood, reducing the number of 'rat runs' through residential areas.</p> <p>Low Emission Neighbourhoods have largely been replaced by Liveable Neighbourhoods, part of the wider Streetspace schemes.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
26.1	Localised solutions	The council will explore options to increase the number of street and parks trees from the 2017/18 base, including making a bid to GLAs greener city fund and other such opportunities as identified in 2018/19.	<p>In 2020, Hounslow Council adopted the Greener Borough Framework which sets out a proposal to move towards planting one carbon capturing tree or large hedge specimen for every child born in the borough over the next 10 years and we are committed to working with our partners to fulfil this ambition.</p> <p>Heathrow Airport Limited funded corporate volunteer day and planted 64 trees in Hanworth Air Park, Grantley Road, Bedfont Green and Heston Green in 2020.</p> <p>Hounslow Highways have planted over 200 trees in 2019/20 under the Mayor of London's Tree Planting initiative. That was additional to the 144 trees planted in 2020, one for each team member.</p>
27	Localised solutions	The council will discourage unnecessary idling by taxis, coaches and other vehicles through the implementation of an anti-idling Traffic Management Order in 2019 and undertake targeted enforcement activity at host spot areas such as taxi ranks, coach parking and outside schools. Enforcement activity will take place bimonthly and reported to AQAP Steering Group in Q1 21/22	<p>New anti-idling signage, along schools-based campaign days, are driving the idling agenda in Hounslow. Two workshops were held in Hounslow prior to March 2020. Idling Action has since produced online materials which have been shared with schools. Some business engagement took place with Osterley Tesco on idling and a webinar was held with Hounslow Chamber and local businesses for Clean Air Day. Hounslow is actively promoting the new 'Engines Off, Every Stop' campaign through social media, billboards press release, etc (Feb 2021).</p> <p>The Council has not installed any signage as it requires DfT approval and they request evidence of an AQ issue before granting permission.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
31	Localised solutions	The council will complete a feasibility study for implementing free or discounted parking charges for on street parking for zero emission cars by end 2019.	Hounslow Council has approved the introduction of emissions-based parking charges for Pay and Display parking and business permits. Due to the current Covid-19 pandemic these changes were introduced on 1 January 2021. This allowed time for trade to recover in the borough's high streets following easing of the lockdown, as well as testing and setting up the necessary technology to differentiate between vehicles of different emissions bandings.
34	Localised solutions	The Council will continue to support installation of residential electric charge points to cater for EV charging solution for those without off-street parking. The council aims to double the number of public EV charging points by end 2020 (from 27 to 54) and double the number of lamp column charging (from 47 to 100) by end 2020.	Hounslow has installed 47 new charge points in 2020. This is a mix of lamp column and floor-mounted charge points. Over 250 total lamp column and Source London charging points will have been installed across Hounslow, with a goal to increase this to 400 by the end of 2021.
35	Localised solutions	The council will help facilitate the installation of 10 rapid chargers in the borough to help enable the take up of electric taxis etc by 2020.	Hounslow has 8 Rapid chargers in the borough to date. The aim is to double this in 2021.
36	Localised solutions	The Council, in line with GLA strategies, will continue to explore ways to reduce dominance of vehicular traffic on residential streets through road closures & banned entries, where such measures are supported by residents; Town Centre development will continue to provide low or no level of car parking, and in many cases this will take place where existing parking stock will not be renewed; The council will work in partnership with TfL to improve bus journey times through active or passive bus priority measures, work will be monitored as part of new LIP. Report to Air Quality Action Plan Steering Group Q2 2021/22	<p>Street-space schemes have been implemented throughout the summer of 2020 and the Council are looking at options to assess the success of these schemes in terms of air quality by installing diffusion tubes at sites prior to the scheme being phased in.</p> <p>Existing Streetspace schemes are currently subject to an independent review. As a result, new Streetspace schemes are on hold.</p>
37	Localised solutions	As part of the new LIP, the Council will continue to improve provision of its infrastructure to support walking	A temporary version of C9 was implemented in Dec 2020. The Chiswick Liveable Neighbourhood project

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
		<p>&amp; cycling. Emerging proposals would be consulted upon in Oct. 2018, including: (1) Provision of legible wayfinding at all town centres by 2020; (2) Improved accessibility for pedestrians (junction entry treatment, dropped curbs, tactile paving etc.), particularly for those with mobility impairments, through our 'better streets' programme; (3) Pedestrian countdown at all town centre located controlled crossings by 2020 (subject to relevant controller upgrades being progressed by TfL); (4) Improvements to cycling facilities, Priority projects include, (i) Partnership working with TfL to deliver a substantially segregated facility between Chiswick, Brentford and Hounslow Town Centre (CS9) in place by 2022; (ii) Substantially segregated cycle facility between Hounslow and Feltham town centre via Staines, expected to be in place by 2022/23; (iii) Completion of west area greenways network, including appropriate wayfinding to promote the network, by 2019/20; (iv) Completion of a quietway between Brentford &amp; Twickenham, via Church St, by 2020/21; (v) Further specifications for priority cycle routes linking borough town centres with neighbouring metropolitan town centres and Heathrow, by 2020/21; (vi) Continue roll out of 20MPH limit on residential roads and other busy roads with high footfall, by 2020 (see action 28 also); AQAP would be reviewed &amp; updated to reflect approved LIP.</p>	<p>began delivery in May 2020, starting with the closure of Dan Mason Drive to motor traffic. Other elements of the project include an access only zone on Thames Road, a northbound access restriction on Hartington Road and restrictions at Harvard Hill and Staveley Rd / Park Rd</p> <p>Furthermore, the council has implemented 23 School Streets across the borough to reduce congestion, improve road safety and encourage active travel to school (June-November 2020). A wide range of Streetspace measures are also being trialled following government guidance to reallocate road space and enable increased levels of walking and cycling. Details for each of these measures is available here.</p>
40	Additional measures	<p>The council will continue to work in partnership with Highways England (HE), seeking clear strategy and framework to: (i) reducing current (and future – Smart Motorway) exceedances of NO2/PM AQO and mitigate adverse effects, including health impacts of harmful emissions associated with road/routes within their</p>	<p>Highways England have requested that LBH undertake some diffusion tube monitoring on their behalf along the M4/A4 corridor in the borough.</p> <p>As a result meetings were held with Highways England on Dec 9<sup>th</sup> 2020 to discuss the possible schemes for</p>

Measure	LLAQM Action Matrix Theme	Action	<b>Progress</b> <ul style="list-style-type: none"> <li>• Emissions/Concentration data <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
		jurisdiction; (ii) ) Seek contributions for implementing mitigation measures locally, aimed at reducing exposure to harmful emissions NO2/PM (all sensitive receptors), resulting from their roads/routes; and improving air quality in nearby areas.	reducing NO2 levels at the elevated M4 in Brentford. HE have considered a number of options but ruled them out. They are open to working with LBH, using their designated funds for environment work, to deliver schemes in this area which will lead to an improvement in air quality.

#### 4. Planning Update and Other New Sources of Emissions

**Table K. Planning requirements met by planning applications in Hounslow in 2020**

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	36
Number of planning applications required to monitor for construction dust	13
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	Unknown
Number of developments required to install Ultra-Low NO <sub>x</sub> boilers	Unknown
Number of developments where an AQ Neutral building and/or transport assessments undertaken	6
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0
Number of planning applications with S106 agreements including other requirements to improve air quality	Unknown
Number of planning applications with CIL payments that include a contribution to improve air quality	0
<p><b>NRMM: Central Activity Zone and Canary Wharf</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant <a href="#">NRMM website</a> and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	N/A
<p><b>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at <a href="http://www.nrmm.london">www.nrmm.london</a> and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.</p>	<p>Total 20 audits undertaken by Cleaner Construction for London</p> <p>2 achieved self-compliance</p> <p>7 achieved compliance</p> <p>2 sites recorded non-compliant</p> <p>3 had no NRMM</p> <p>6 sites were complete</p>

Please note that all major planning applications with issues of air quality or noise, including environmental statements and CEMPs, are reviewed on Hounslow's behalf by an external consultant, Tetra Tech Ltd (formerly WYG).

#### **4.1 New or significantly changed industrial or other sources**

No new sources identified

## Appendix A Details of Monitoring Site Quality QA/QC

### A.1 Automatic Monitoring Sites

- Routine calibrations carried out monthly by LSO from Hounslow Council
- Biannual audits completed by Ricardo
- Ad hoc servicing provided by Matts Monitors
- Loss of power at Cranford monitoring station prevented this site being used as a colocation study in 2020.

#### PM<sub>10</sub> Monitoring Adjustment

N/A

### A.2 Diffusion Tube Quality Assurance / Quality Control

- Gradko International supplied and analysed the diffusion tubes used by the London Borough of Hounslow in 2020
- The preparation method used was 20% TEA in water
- Gradko is a UKAS accredited laboratory (2187) with ISO 17025
- Laboratory precision results:
  - o Precision: Good (<http://laqm.defra.gov.uk/diffusion-tubes/precision.html>)
  - o AIR-PT: 100% (<http://laqm.defra.gov.uk/diffusion-tubes/ga-qc-framework.html>)
- National bias adjustment factor from database v03/21: **0.81**
- Local bias adjustment factor from five co-location studies: **0.83**
- As in previous years, the bias adjustment factor being used in the analysis of 2020 diffusion tube data is the local BAF of **0.83**

#### Factor from Local Co-location Studies

Site ID	Site Name	Site Type	Annual mean	Site adjustment factor (A)	Bias adjusted mean
BREN	Brentford, Great West Road	Roadside	41.601	0.81	33.602
CHIS	Chiswick High Road	Roadside	37.150	0.86	31.891
FELT	Feltham High St / Hanworth Rd Jct	Roadside	28.012	0.88	24.602
HAT	Myrtle Avenue	Urban Background	24.955	0.73	17.475
HEST	Heston Road	Roadside	32.385	0.9	29.743

# Brentford – 0.81

## Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{gm}^{-3}$	Tube 2 $\mu\text{gm}^{-3}$	Tube 3 $\mu\text{gm}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2020	04/02/2020	45.986	46.134	45.583	46	0.3	1	0.7
2	04/02/2020	04/03/2020	46.437	44.822	46.122	46	0.9	2	2.1
3	04/03/2020	01/05/2020	36.898	38.799	36.858	38	1.1	3	2.8
4									
5	01/05/2020	02/06/2020	33.345	34.043	34.347	34	0.5	2	1.3
6	02/06/2020	03/07/2020	38.955	37.101	38.677	38	1.0	3	2.5
7	03/07/2020	04/08/2020	35.760	34.953	33.842	35	1.0	3	2.4
8	04/08/2020	01/09/2020	42.717	43.855	42.981	43	0.6	1	1.5
9	01/09/2020	14/10/2020	44.245	42.165	46.726	44	2.3	5	5.7
10	14/10/2020	05/11/2020	46.559	42.638	45.754	45	2.1	5	5.1
11	05/11/2020	02/12/2020	46.213	48.894	44.362	46	2.3	5	5.7
12	02/12/2020	08/01/2021	40.501	40.265	42.416	41	1.2	3	2.9
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
42.078	99.538	Good	Good
35.535	100.000	Good	Good
31.018	97.410	Good	Good
26.684	49.155	Good	or Data Capture
26.397	71.159	Good	or Data Capture
27.303	90.352	Good	Good
31.735	99.853	Good	Good
35.064	99.805	Good	Good
33.459	100.000	Good	Good
41.120	99.536	Good	Good
34.461	100.000	Good	Good

Overall survey → Good precision Good Overall DC  
(Check average CV & DC from Accuracy calculations)

**Site Name/ ID:** Hounslow Brentford

<b>Accuracy</b> (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 9 periods of data Bias factor A <b>0.81</b> (0.77 - 0.86) Bias B <b>23%</b> (16% - 30%)
Diffusion Tubes Mean: <b>43</b> $\mu\text{gm}^{-3}$
Mean CV (Precision): <b>3</b>
Automatic Mean: <b>35</b> $\mu\text{gm}^{-3}$
Data Capture for periods used: <b>98%</b>
Adjusted Tubes Mean: <b>35</b> (33 - 37) $\mu\text{gm}^{-3}$

**Precision** 11 out of 11 periods have a CV smaller than 20%

<b>Accuracy</b> (with 95% confidence interval) <b>WITH ALL DATA</b>
Bias calculated using 9 periods of data Bias factor A <b>0.81</b> (0.77 - 0.86) Bias B <b>23%</b> (16% - 30%)
Diffusion Tubes Mean: <b>43</b> $\mu\text{gm}^{-3}$
Mean CV (Precision): <b>3</b>
Automatic Mean: <b>35</b> $\mu\text{gm}^{-3}$
Data Capture for periods used: <b>98%</b>
Adjusted Tubes Mean: <b>35</b> (33 - 37) $\mu\text{gm}^{-3}$

Diffusion Tube Bias

Jaume Targa, for AEA  
Version 04 - February 2011

# Chiswick – 0.86

## Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{gm}^{-3}$	Tube 2 $\mu\text{gm}^{-3}$	Tube 3 $\mu\text{gm}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2020	05/02/2020	45.690	41.855	45.078	44	2.1	5	5.1
2	05/02/2020	04/03/2020	40.566	40.933	38.629	40	1.2	3	3.1
3	04/03/2020	01/05/2020	32.958	34.235	29.761	32	2.3	7	5.7
4									
5	01/05/2020	02/06/2020	27.791	26.250	27.522	27	0.8	3	2.0
6	02/06/2020	03/07/2020	34.181	33.959	36.184	35	1.2	4	3.0
7	03/07/2020	04/08/2020	26.713	28.109	27.017	27	0.7	3	1.8
8	04/08/2020	04/09/2020	37.885	38.144	40.349	39	1.4	3	3.4
9	03/09/2020	14/10/2020	38.507	36.015	36.785	37	1.3	3	3.2
10	14/10/2020	05/11/2020	41.687	39.999	43.272	42	1.6	4	4.1
11	05/11/2020	02/12/2020	45.803	43.378	47.186	45	1.9	4	4.8
12	02/12/2020	08/01/2021	36.873	39.638	40.756	39	2.0	5	5.0
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
45.201	97.626	Good	Good
31.107	100.000	Good	Good
28.884	95.827	Good	Good
23.473	87.370	Good	Good
27.660	99.865	Good	Good
22.425	99.740	Good	Good
31.355	98.923	Good	Good
30.275	99.491	Good	Good
34.810	100.000	Good	Good
40.834	90.881	Good	Good
35.824	100.000	Good	Good

Overall survey → Good precision Good Overall DC  
(Check average CV & DC from Accuracy calculations)

**Site Name/ ID:** Hounslow Chiswick

<b>Accuracy</b> (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 11 periods of data Bias factor A <b>0.86</b> (0.82 - 0.91) Bias B <b>16%</b> (10% - 22%)
Diffusion Tubes Mean: <b>37</b> $\mu\text{gm}^{-3}$
Mean CV (Precision): <b>4</b>
Automatic Mean: <b>32</b> $\mu\text{gm}^{-3}$
Data Capture for periods used: <b>97%</b>
Adjusted Tubes Mean: <b>32</b> (30 - 34) $\mu\text{gm}^{-3}$

**Precision** 11 out of 11 periods have a CV smaller than 20%

<b>Accuracy</b> (with 95% confidence interval) <b>WITH ALL DATA</b>
Bias calculated using 11 periods of data Bias factor A <b>0.86</b> (0.82 - 0.91) Bias B <b>16%</b> (10% - 22%)
Diffusion Tubes Mean: <b>37</b> $\mu\text{gm}^{-3}$
Mean CV (Precision): <b>4</b>
Automatic Mean: <b>32</b> $\mu\text{gm}^{-3}$
Data Capture for periods used: <b>97%</b>
Adjusted Tubes Mean: <b>32</b> (30 - 34) $\mu\text{gm}^{-3}$

Diffusion Tube Bias

Jaume Targa, for AEA  
Version 04 - February 2011

# Feltham – 0.88

## Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{g m}^{-3}$	Tube 2 $\mu\text{g m}^{-3}$	Tube 3 $\mu\text{g m}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	07/01/2020	03/02/2020	39.174	36.405	41.283	39	2.4	6	6.1
2	03/02/2020	02/03/2020	30.653	36.738	35.350	34	3.2	9	7.9
3	02/03/2020	27/04/2020	25.784	25.365	26.173	26	0.4	2	1.0
4									
5	27/04/2020	01/06/2020	17.374	19.880	15.622	18	2.1	12	5.3
6	01/06/2020	02/07/2020	21.270	20.322	17.554	20	1.9	10	4.8
7	02/07/2020	03/08/2020	20.417	18.612	18.434	19	1.1	6	2.7
8	03/08/2020	02/09/2020	26.825	34.475	27.860	30	4.2	14	10.3
9	02/09/2020	12/10/2020	31.407	33.542	31.364	32	1.2	4	3.1
10	12/10/2020	03/11/2020			14.484				
11	03/11/2020	01/12/2020	36.073	35.023	33.665	35	1.2	3	3.0
12	01/12/2020	06/01/2021	31.144	31.065	32.082	31	0.6	2	1.4
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
47.753	67.028	Good	pr Data Capture
26.891	95.104	Good	Good
25.050	99.703	Good	Good
16.128	99.881	Good	Good
16.818	94.197	Good	Good
14.141	90.130	Good	Good
21.625	97.214	Good	Good
22.951	99.584	Good	Good
25.948	100.000		Good
37.221	99.552	Good	Good
35.386	100.000	Good	Good
Overall survey -->		Good precision	Good Overall DC

(Check average CV & DC from Accuracy calculations)

**Site Name/ ID:** Hounslow Feltham

Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 9 periods of data	
Bias factor A	0.88 (0.78 - 1.02)
Bias B	13% (-2% - 28%)
Diffusion Tubes Mean:	27 $\mu\text{g m}^{-3}$
Mean CV (Precision):	7
Automatic Mean:	24 $\mu\text{g m}^{-3}$
Data Capture for periods used:	97%
Adjusted Tubes Mean:	24 (21 - 28) $\mu\text{g m}^{-3}$

**Precision** 10 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 9 periods of data	
Bias factor A	0.88 (0.78 - 1.02)
Bias B	13% (-2% - 28%)
Diffusion Tubes Mean:	27 $\mu\text{g m}^{-3}$
Mean CV (Precision):	7
Automatic Mean:	24 $\mu\text{g m}^{-3}$
Data Capture for periods used:	97%
Adjusted Tubes Mean:	24 (21 - 28) $\mu\text{g m}^{-3}$

Jaume Targa, for AEA  
Version 04 - February 2011

# Hatton Cross – 0.73

## Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{g m}^{-3}$	Tube 2 $\mu\text{g m}^{-3}$	Tube 3 $\mu\text{g m}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	07/01/2020	03/02/2020	31.745	31.448	32.913	32	0.8	2	1.9
2	03/02/2020	03/03/2020	39.424	29.513	30.465	33	5.5	17	13.6
3	03/03/2020	27/04/2020	23.750	25.723	20.695	23	2.5	11	6.3
4									
5	27/04/2020	01/06/2020	14.869	15.425	14.672	15	0.4	3	1.0
6	01/06/2020	02/07/2020	15.014	16.796	16.666	16	1.0	6	2.5
7	02/07/2020	03/08/2020	16.558	15.877	14.820	16	0.9	6	2.2
8	03/08/2020	02/09/2020	19.297	20.273	21.076	20	0.9	4	2.2
9	02/09/2020	12/10/2020	27.098	23.831	21.567	24	2.8	12	6.9
10	12/10/2020	03/11/2020	23.168	20.418	22.727	22	1.5	7	3.7
11	03/11/2020	01/12/2020	34.458	31.123	30.361	32	2.2	7	5.4
12	01/12/2020	06/01/2021	29.127	30.048	29.031	29	0.6	2	1.4
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
25.261	95.833	Good	Good
21.501	95.245	Good	Good
18.927	83.849	Good	Good
11.970	100.000	Good	Good
10.757	99.190	Good	Good
9.848	100.000	Good	Good
15.066	99.583	Good	Good
16.951	99.376	Good	Good
14.800	98.491	Good	Good
25.883	99.851	Good	Good
21.104	99.654	Good	Good
Overall survey -->		Good precision	Good Overall DC

(Check average CV & DC from Accuracy calculations)

**Site Name/ ID:** Hounslow Hatton Cross

Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.73 (0.68 - 0.78)
Bias B	37% (28% - 46%)
Diffusion Tubes Mean:	24 $\mu\text{g m}^{-3}$
Mean CV (Precision):	7
Automatic Mean:	17 $\mu\text{g m}^{-3}$
Data Capture for periods used:	97%
Adjusted Tubes Mean:	17 (16 - 19) $\mu\text{g m}^{-3}$

**Precision** 11 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	0.73 (0.68 - 0.78)
Bias B	37% (28% - 46%)
Diffusion Tubes Mean:	24 $\mu\text{g m}^{-3}$
Mean CV (Precision):	7
Automatic Mean:	17 $\mu\text{g m}^{-3}$
Data Capture for periods used:	97%
Adjusted Tubes Mean:	17 (16 - 19) $\mu\text{g m}^{-3}$

Jaume Targa, for AEA  
Version 04 - February 2011

# Heston – 0.9

## Checking Precision and Accuracy of Triplicate Tubes

From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 $\mu\text{gm}^{-3}$	Tube 2 $\mu\text{gm}^{-3}$	Tube 3 $\mu\text{gm}^{-3}$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	07/01/2020	04/02/2020	41.972	43.980	39.965	42	2.0	5	5.0
2	04/02/2020	03/03/2020	35.033	37.883	36.539	36	1.4	4	3.5
3	03/03/2020	01/05/2020	28.742	31.498	31.897	31	1.7	6	4.3
4									
5	01/05/2020	02/06/2020	22.364	20.970	24.060	22	1.5	7	3.8
6	02/06/2020	03/07/2020	27.270	28.679	28.698	28	0.8	3	2.0
7	03/07/2020	03/08/2020	23.464	24.462	23.427	24	0.6	2	1.5
8	03/08/2020	01/09/2020	33.077	34.827	33.785	34	0.9	3	2.2
9	01/09/2020	13/10/2020	32.911	35.352	32.595	34	1.5	4	3.7
10	13/10/2020	04/11/2020	31.578	34.330	30.331	32	2.0	6	5.1
11	04/11/2020	01/12/2020	44.066	41.072	45.234	43	2.1	5	5.3
12	01/12/2020	07/01/2021	35.760	37.835	36.921	37	1.0	3	2.6
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check		
Period	Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	36.804	99.851	Good	Good
2	29.951	99.852	Good	Good
3	35.571	70.347	Good	or Data Capture
4				
5	26.960	84.955	Good	Good
6	25.131	97.439	Good	Good
7	22.050	81.074	Good	Good
8	27.975	64.143	Good	or Data Capture
9	27.821	95.916	Good	Good
10	28.820	100.000	Good	Good
11	37.274	97.531	Good	Good
12	34.953	100.000	Good	Good
13				

Overall survey --> Good precision Good Overall DC

(Check average CV & DC from Accuracy calculations)

<b>Site Name/ ID:</b> Hounslow Heston	<b>Precision</b> 11 out of 11 periods have a CV smaller than 20%
---------------------------------------	--

Accuracy (with 95% confidence interval)

without periods with CV larger than 20%

Bias calculated using 9 periods of data

Bias factor A 0.9 (0.84 - 0.98)

Bias B 11% (2% - 20%)

Diffusion Tubes Mean: 33  $\mu\text{gm}^{-3}$

Mean CV (Precision): 4

Automatic Mean: 30  $\mu\text{gm}^{-3}$

Data Capture for periods used: 95%

Adjusted Tubes Mean: 30 (28 - 33)  $\mu\text{gm}^{-3}$

Accuracy (with 95% confidence interval)

WITH ALL DATA

Bias calculated using 9 periods of data

Bias factor A 0.9 (0.84 - 0.98)

Bias B 11% (2% - 20%)

Diffusion Tubes Mean: 33  $\mu\text{gm}^{-3}$

Mean CV (Precision): 4

Automatic Mean: 30  $\mu\text{gm}^{-3}$

Data Capture for periods used: 95%

Adjusted Tubes Mean: 30 (28 - 33)  $\mu\text{gm}^{-3}$

Diffusion Tube Bias

Without CV>20%    With all data

## Discussion of Choice of Factor to Use

Per section 7.193 of LAQM TG.16:

*“If there is more than one local collocation study, then the A factors should not be averaged. Instead, a reasonable approximation can be derived by averaging the B values. For example, if there were 2 studies of 22% and 28%, then the average would be 25%. This is then expressed as a factor, e.g. 25% is 0.25. Next add 1 to this value, e.g.  $0.25 + 1.00 = 1.25$ . Finally, take the inverse to give the bias adjustment factor, e.g.  $1/1.25 = 0.80$ .”*

The local bias adjustment factor was calculated at five co-location studies at automatic monitoring stations across Hounslow. The average bias adjustment factor of these six studies (from B factor) was 0.83. Details of each co-location study are listed below. The local bias adjustment factor of 0.83 was applied to all single diffusion tube sites, as is consistent with analysis in previous years. The national BAF for 20% TEA in water tubes analysed by Gradko in 2019 is 0.81 (Database v03/21).

Site	BA A	BA B	Factor	Plus 1	Inverse
Brentford	0.81	23%			
Chiswick	0.86	16%			
Cranford					
Feltham	0.88	13%			
Hatton Cross	0.73	37%			
Heston	0.9	11%			
<b>AVERAGE</b>	<b>0.836</b>	<b>20%</b>	0.2	1.2	<b>0.83</b>

**Table L. Bias Adjustment Factor**

Year	Local or National	If Local, Version of National Spreadsheet	Adjustment Factor
2020	Local	03/21 (0.81)	0.83
2019	Local	03/20 (0.93)	0.89
2018	Local	Unknown	0.87
2017	Local	Unknown	0.89
2016	Local	Unknown	0.87
2015	Local	Unknown	0.91
2014	Local	Unknown	0.91

### A.3 Adjustments to the Ratified Monitoring Data

#### Short-term to Long-term Data Adjustment

Data from three diffusion tube sites in Hounslow have been annualised.

Annualisation has been completed using the [LAQM Annualisation Tool](#) in line with the methodology outlined in LLAQM.TG(19).

Site ID	Site Type	Valid data capture 2020 (%)	Bias Adjustment Factor	Annualised, bias adjusted mean
HS41	Diffusion tube	50%	0.83	33.94
HS51	Diffusion tube	66.67%	0.83	16.31
HS91	Diffusion tube	66.67%	0.83	30.50
HSVF1	Diffusion tube	50.00%	0.83	27.71
HSVF2	Diffusion tube	41.67%	0.83	31.28
HSVF3	Diffusion tube	50.00%	0.83	26.86
HSVF4	Diffusion tube	50.00%	0.83	17.76
HSVF5	Diffusion tube	50.00%	0.83	18.58

## Distance Adjustment

### Brentford

			
<b>Enter data into the red cells</b>			
<b>Step 1</b>	How far from the KERB was your measurement made (in metres)?	<input type="text" value="3"/>	metres
<b>Step 2</b>	How far from the KERB is your receptor (in metres)?	<input type="text" value="10"/>	metres
<b>Step 3</b>	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	<input type="text" value="27.4"/>	µg/m <sup>3</sup>
<b>Step 4</b>	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	<input type="text" value="33"/>	µg/m <sup>3</sup>
<b>Result</b>	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	<input type="text" value="31.3"/>	µg/m <sup>3</sup>

### Chiswick

			
<b>Enter data into the red cells</b>			
<b>Step 1</b>	How far from the KERB was your measurement made (in metres)?	<input type="text" value="4"/>	metres
<b>Step 2</b>	How far from the KERB is your receptor (in metres)?	<input type="text" value="10"/>	metres
<b>Step 3</b>	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	<input type="text" value="26"/>	µg/m <sup>3</sup>
<b>Step 4</b>	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	<input type="text" value="32"/>	µg/m <sup>3</sup>
<b>Result</b>	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	<input type="text" value="30.5"/>	µg/m <sup>3</sup>

## Gunnersbury

			
<b>Enter data into the red cells</b>			
Step 1	How far from the KERB was your measurement made (in metres)?	4	metres
Step 2	How far from the KERB is your receptor (in metres)?	5	metres
Step 3	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	28.6	µg/m <sup>3</sup>
Step 4	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	37	µg/m <sup>3</sup>
Result	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	36.5	µg/m <sup>3</sup>

## Heston

			
<b>Enter data into the red cells</b>			
Step 1	How far from the KERB was your measurement made (in metres)?	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	4	metres
Step 3	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	26	µg/m <sup>3</sup>
Step 4	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	31	µg/m <sup>3</sup>
Result	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	29.6	µg/m <sup>3</sup>

**Table M. Short-Term to Long-Term Monitoring Data Adjustment**

Site ID	Annualisation Factor Brentford	Annualisation Factor Chiswick	Annualisation Factor Heston	Annualisation Factor Hatton Cross	Average Annualisation Factor	Raw Data Annual Mean ( $\mu\text{g m}^{-3}$ )	Annualised Annual Mean ( $\mu\text{g m}^{-3}$ )	Comments
HS41	0.959	0.971	1.015	0.950	0.974	41.985	40.903	
HS51	0.945	0.941	0.986	0.928	0.950	20.647	19.651	
HS91	1.035	1.037	1.049	1.105	1.056	34.771	36.752	
HSVF1	1.028	1.022	0.996	1.012	1.015	32.888	33.385	
HSVF2	1.095	1.122	1.040	1.116	1.093	34.456	31.685	
HSVF3	1.028	1.022	0.996	1.012	1.015	31.885	32.367	
HSVF4	1.028	1.022	0.996	1.012	1.015	21.077	21.396	
HSVF5	1.028	1.022	0.996	1.012	1.015	22.057	22.390	

## Appendix B Full Monthly Diffusion Tube Results for 2020

Table O. NO<sub>2</sub> Diffusion Tube Results

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
BREN A	91.7%	91.7%	45.99	46.44	36.90	*	33.35	38.95	35.76	42.72	44.24	46.56	46.21	40.50	41.60	34.53
BREN B	91.7%	91.7%	46.13	44.82	38.80	*	34.04	37.10	34.95	43.85	42.17	42.64	48.89	40.28	41.24	34.23
BREN C	91.7%	91.7%	45.58	46.12	36.86	*	34.35	38.68	33.84	42.98	46.73	45.75	44.36	42.42	41.61	34.53
CHIS A	91.7%	91.7%	45.69	40.57	32.96	*	27.79	34.18	26.71	37.88	38.51	41.69	45.80	36.87	37.15	30.83
CHIS B	91.7%	91.7%	41.86	40.93	34.23	*	26.25	33.96	28.11	38.14	36.02	40.00	43.38	39.64	36.59	30.37
CHIS C	91.7%	91.7%	45.08	38.63	29.76	*	27.52	36.18	27.02	40.35	36.79	43.27	47.19	40.76	37.50	31.13
CRAN A	91.7%	91.7%	25.74	26.43	19.15	*	12.74	13.42	11.60	17.92	18.17	22.07	27.31	21.21	19.62	16.28
CRAN B	91.7%	91.7%	23.48	27.11	19.34	*	12.13	14.66	12.77	16.64	17.95	19.06	24.57	21.98	19.06	15.82
CRAN C	91.7%	91.7%	30.41	26.18	18.02	*	12.07	13.14	12.35	17.41	18.83	19.34	23.96	19.74	19.22	15.95
FELTA	83.3%	83.3%	39.17	30.65	25.78	*	17.37	21.27	20.42	26.82	31.41		36.07	31.14	28.01	23.25
FELTB	83.3%	83.3%	36.41	36.74	25.37	*	19.88	20.32	18.61	34.47	33.54		35.02	31.06	29.14	24.19
FELTC	91.7%	91.7%	41.28	35.35	26.17	*	15.62	17.55	18.43	27.86	31.36	14.48	33.67	32.08	26.72	22.17
HATA	91.7%	91.7%	31.75	39.42	23.75	*	14.87	15.01	16.56	19.30	27.10	23.17	34.46	29.13	24.96	20.71
HATB	91.7%	91.7%	31.45	29.51	25.72	*	15.43	16.80	15.88	20.27	23.83	20.42	31.12	30.05	23.68	19.65
HATC	91.7%	91.7%	32.91	30.46	20.70	*	14.67	16.67	14.82	21.08	21.57	22.73	30.36	29.03	23.18	19.24
HESTA	91.7%	91.7%	41.97	35.03	28.74	*	22.36	27.27	23.46	33.08	32.91	31.58	44.07	35.76	32.39	26.88
HESTB	91.7%	91.7%	43.98	37.88	31.50	*	20.97	28.68	24.46	34.83	35.35	34.33	41.07	37.83	33.72	27.99
HESTC	91.7%	91.7%	39.96	36.54	31.90	*	24.06	28.70	23.43	33.78	32.60	30.33	45.23	36.92	33.04	27.42

HS32	91.7%	91.7%	55.43	51.71	36.82	*	34.01	41.97	29.32	35.39	40.27	45.19	51.55	48.56	42.75	35.48
HS33	91.7%	91.7%	46.59	41.87	27.14	*	29.46	31.11	31.01	38.17	36.97	37.74	43.35	36.97	36.40	30.21
HS34	83.3%	83.3%	33.11	26.88	22.33	*	16.85	18.79	16.82	22.47	25.41		26.60	31.39	24.06	19.97
HS35	83.3%	83.3%	35.68	29.08	21.73	*	15.66		13.53	19.85	21.63	23.35	31.51	28.31	24.03	19.95
HS41	50.0%	50.0%	50.52	43.83		*		33.05	33.44		38.88		52.19		41.98	33.95
HS42	83.3%	83.3%	32.75	25.03	24.55	*	13.95	19.39	32.99		29.66	30.00	35.85	31.05	27.52	22.84
HS43	75.0%	75.0%	34.70			*	20.93	20.69	21.10	26.12	28.01	31.40	36.21	28.13	27.47	22.80
HS51	66.7%	66.7%	27.20	27.27		*			13.14	19.98	17.21	16.97	21.47	22.17	20.67	16.31
HS52	91.7%	91.7%	25.88	21.61	20.47	*	13.79	13.59	13.93	18.08	21.69	21.10	30.99	23.25	20.40	16.93
HS53	91.7%	91.7%	33.44	31.81	21.74	*	14.46	16.13	16.19	13.72	22.53	23.11	32.29	22.91	22.57	18.74
HS54	75.0%	75.0%	44.69	45.99	28.30	*	22.12		23.93	31.80	32.25		43.90	35.64	34.29	28.46
HS55	91.7%	91.7%	39.00	35.38	30.88	*	20.34	21.94	19.44	25.37	25.80	27.39	39.76	28.88	28.56	23.71
HS61	75.0%	75.0%		32.36	24.50	*	17.96	19.44	18.06	26.68	27.19	29.07	37.12		25.82	21.43
HS62	91.7%	91.7%	38.03	31.21	24.43	*	17.02	21.61	18.52	25.32	28.11	30.43	37.07	32.81	27.69	22.98
HS63	91.7%	91.7%	32.83	27.79	25.51	*	19.06	25.86	21.42	30.45	32.31	34.35	43.40	32.49	29.59	24.56
HS64	91.7%	91.7%	31.07	24.95	21.16	*	15.62	19.67	16.42	23.12	24.07	25.86	31.63	32.97	24.23	20.11
HS65	91.7%	91.7%	32.14	21.37	21.99	*	14.42	15.18	15.59	21.54	21.12	23.37	34.57	27.07	22.58	18.74
HS66	83.3%	83.3%		38.82	27.84	*	20.99	25.17	25.25	36.42	32.85	30.27	39.76	36.33	31.37	26.04
HS67	83.3%	83.3%	57.83		37.21	*	34.89	42.04	41.51	53.82	53.82	54.08	59.46	53.32	48.80	40.50
HS68	83.3%	83.3%	48.71	35.93		*	21.89	28.86	30.93	32.44	35.96	42.95	49.21	44.14	37.10	30.80
HS69	83.3%	83.3%	37.73	37.37		*	22.77	24.35	27.64	30.07	33.99	33.77	39.29	32.17	31.91	26.49
HS70	83.3%	83.3%	48.43		31.03	*	26.45	32.08	24.75	37.13	38.32	41.25	46.18	41.51	36.71	30.47
HS71	91.7%	91.7%	43.30	42.88	30.19	*	25.71	29.79	29.57	33.93	39.47	33.55	38.91	38.62	35.08	29.12
HS72	91.7%	91.7%	49.77	41.98	24.16	*	17.91	24.31	23.65	24.05	29.92	36.61	39.32	34.46	31.47	26.12
HS73	75.0%	75.0%		29.65	23.06	*		17.37	19.74	22.06	25.92	28.16	36.10	30.25	25.81	21.42

HS74	83.3%	83.3%	34.70	28.34	23.03	*	18.17	21.77	18.37	26.07		26.86	35.77	27.82	26.09	21.66
HS76	75.0%	75.0%	30.74	30.67	24.76	*		16.68	18.94		26.33	26.53	32.91	27.58	26.13	21.68
HS77	91.7%	91.7%	24.14	20.93	17.29	*	11.96	11.60	11.17	14.39	18.43	19.50	24.47	22.86	17.89	14.84
HS78	91.7%	91.7%	46.95	39.18	34.85	*	25.69	32.73	29.19	43.12	40.21	43.34	54.00	44.08	39.40	32.70
HS79	83.3%	83.3%	38.73	29.14	21.77	*		17.48	15.22	22.56	26.44	29.30	32.70	31.28	26.46	21.96
HS80	75.0%	75.0%	40.01	43.54		*	28.52	32.74	40.86		48.58	34.05	70.43	59.30	44.23	36.71
HS81	91.7%	91.7%	24.31	20.45	24.31	*	10.93	11.68	11.99	14.74	16.91	17.53	27.17	23.92	18.54	15.39
HS82	91.7%	91.7%	24.62	23.47	18.78	*	11.24	13.20	12.55	15.98	18.54	21.43	26.40	20.47	18.79	15.60
HS83	75.0%	75.0%	21.55	17.02		*		12.12	8.18	15.68	15.32	17.43	24.18	19.90	16.82	13.96
HS84	91.7%	91.7%	42.44	35.85	23.72	*	20.37	27.79	20.58	31.53	33.93	19.01	38.61	31.63	29.59	24.56
HS85	91.7%	91.7%	45.41	42.04	26.88	*	24.18	29.99	30.16	35.59	40.03	37.33	50.83	40.54	36.64	30.41
HS86	83.3%	83.3%	41.27	50.48	32.92	*	23.83	28.67	27.11		37.36	35.96	47.51	37.70	36.28	30.11
HS87A	75.0%	75.0%	57.70			*	24.45	30.20	28.04	36.14	38.37	41.52	46.79	38.71	37.99	31.53
HS88	83.3%	83.3%	27.48	20.68	18.40	*	11.57	13.22	10.91	15.74	19.95		29.55	25.92	19.34	16.05
HS89	91.7%	91.7%	33.83	27.82	26.95	*	22.64	24.14	16.80	23.91	25.70	28.86	35.99	32.12	27.16	22.54
HS90	83.3%	83.3%	29.35	25.52	23.77	*	14.42		15.54	21.75	20.11	28.72	36.13	30.49	24.58	20.40
HS91	66.7%	66.7%				*	26.40	29.36	28.96	35.03	35.93	39.25	44.08	39.17	34.77	30.50
HS92	75.0%	75.0%	43.97	36.37		*		22.55	18.05	25.58	28.23	32.36	42.84	33.44	31.49	26.14
HS93	75.0%	75.0%	35.55	38.89		*		20.88	18.19	30.71	28.77	31.56	37.29	34.14	30.67	25.45
HSVF1	75.0%	50.0%	48.90	40.26	32.28	*	22.24	30.08		23.57					32.89	27.71
HSVF2	62.5%	41.7%		55.12	36.50	*	23.91	28.06		28.69					34.46	31.28
HSVF3	75.0%	50.0%	47.38	36.45	32.66	*	23.40	26.26		25.16					31.88	26.86
HSVF4	75.0%	50.0%	34.50	27.53	19.35	*	13.87	14.98		16.24					21.08	17.76
HSVF5	75.0%	50.0%	37.59	28.54	20.87	*	12.74	16.35		16.24					22.06	18.58

## Notes

Concentrations are presented as  $\mu\text{g m}^{-3}$ .

Exceedances of the NO<sub>2</sub> annual mean AQO of  $40 \mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of  $60 \mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> 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 33%.

(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%).

\*Due to the first national lockdown in March/April 2020, the tubes put up at the start of March were not changed in April and were therefore exposed for two months, until the start of May.