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## High Speed Rail (London-West Midlands)

Air Quality and Dust Monitoring  
Monthly Report - March 2018

London Borough of Hillingdon

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April 2018





## Department for Transport

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## Non-technical summary

This Air Quality and Dust Monitoring Report is published in fulfilment of commitments detailed in the High Speed Rail (London-West Midlands) Environmental Minimum Requirements (EMRs), Annex 1: Code of Construction Practice, for the nominated undertaker to present the results of air quality and dust monitoring carried out within the London Borough of Hillingdon (LBH).

The report presents data from eleven nitrogen dioxide (NO<sub>2</sub>) diffusion tube monitoring locations around highways within the borough during February 2018 as part of the management of air quality where significant effects may occur due to the scheme.

NO<sub>2</sub> monitoring results can be found in Section 4 of the report. NO<sub>2</sub> concentrations from diffusion tube monitoring over the course of 2018 and running mean can be found in Appendix C.

Whilst this report is limited to data informing pre-construction conditions, future reports will present this and data collected from monitoring around active work sites as they are established within LBH. Future LBH monthly reports will include a summary of the construction activities occurring; any complaints received; the data recorded over the monitoring period; any periods in exceedance of the agreed trigger levels; the results of any investigations; and, where the works have been found to be the source, any action taken to immediately resolve the issue and to prevent a recurrence.

## Abbreviations and descriptions

AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BPM	Best practicable means
CFA	Community Forum Area
CoCP	Code of Construction Practice
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EA	Environment Agency
EPUK	Environmental Protection UK
ES	Environmental Statement
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IPPC	Integrated Pollution Prevention and Control
LAPPC	Local Authority Pollution Prevention and Control
LDV	Light Duty Vehicle
LEMP	Local Environmental Management Plan
LGV	Light Goods Vehicle
NO <sub>x</sub>	Oxides of nitrogen
NO <sub>2</sub>	Nitrogen dioxide
PM <sub>10</sub>	Particulate matter with an average aerodynamic diameter not exceeding 10 micrometres
SPG	Supplementary Planning Guidance
ULEV	Ultra Low Emission Vehicle

# 1 Introduction

1.1.1 The nominated undertaker is required to undertake air quality and dust monitoring as necessary to comply with the requirements of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements, including specifically Annex 1: Code of Construction Practice. Monitoring will fulfil the following aims:

- monitoring the effectiveness of mitigation measures;
- monitoring the impact of construction works; and
- inform taking other actions as may be necessary to enable compliance.

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority monthly and shall include a summary of the construction activities occurring, any complaints received, the data recorded over the monitoring period, any periods in exceedance of agreed trigger levels, the results of any investigations; and where the works have been found to be the source, any action taken to immediately resolve the issue and to prevent a recurrence.

1.1.3 The report presents data from Nitrogen Dioxide (NO<sub>2</sub>) Diffusion Tube monitoring carried out around highway locations within the London Borough of Hillingdon (LBH) during February 2018.

1.1.4 Current worksites located within LBH are detailed in Figure 1, Appendix A and include.

- Copthall Cutting where site establishment and vegetation clearance works are currently underway. Given the nature of the works at Copthall Cutting the level of risk of dust being generated by the works is not considered sufficient to require monitoring.

# 2 Applicable standards and guidance

## 2.1 Relevant legislation

### *High Speed Rail (London - West Midlands) Act 2017*

2.1.1 On 23 February 2017, Royal Assent was granted for Phase One of HS2. The High Speed Two Bill is now an Act of Parliament (law) i.e. High Speed Rail (London - West Midlands) Act 2017.

2.1.2 The Act is accompanied by the Environmental Minimum Requirements (EMRs). The EMRs set out the high level environmental and sustainability commitments and are contained in the EMR General Principles document supported by a series of annexes:

- Annex 1: Code of Construction Practice;
- Annex 2: Planning Memorandum;
- Annex 3: Heritage Memorandum; and

- Annex 4: Environmental Memorandum.

### *Environmental Minimum Requirements: General Principles*

- 2.1.3 The EMR - General Principles require that the controls to be implemented in delivering the scheme (including the EMRs, powers contained in the Act and Undertakings) will ensure that impacts which have been assessed in the ES will not be exceeded. If the significant adverse impacts identified in the ES are likely to be exceeded, all reasonable steps will be taken to minimise or eliminate those additional impacts.
- 2.1.4 The EMRs also require compliance with the undertakings and assurances.
- 2.1.5 Annex 1 to the EMRs comprises a Code of Construction Practice (CoCP), which shall be adopted and implemented by the nominated undertaker in delivering the works, the high level requirements of which are set out below.

### *Code of Construction Practice (CoCP)*

- 2.1.6 The CoCP details a range of control measures and the standards to be implemented during construction works across Area South (and all of Phase 1 Areas) to protect communities and the environment.
- 2.1.7 Section 7 of the CoCP stipulates the air quality management controls including monitoring to be implemented. The key requirement is for BPM to be employed to limit dust, odour, and exhaust emissions during construction work.

## **Construction dust**

### *Environmental Protection Act 1990*

- 2.1.8 Under Part III of the Environmental Protection Act 1990 (EPA), a local authority has a duty to inspect its area from time to time to detect any statutory nuisances and to take such steps as are reasonably practicable to investigate any complaint of a statutory nuisance made by a person living within its area. Relevant statutory nuisances (under relevant conditions) include dust, odour, smoke, and fumes or gases which are prejudicial to health or a nuisance.
- 2.1.9 Work sites have the potential to give rise to dust, fumes, and odour during demolition and construction works and need to be managed in accordance with Best Practicable Means (BPM). BPM is defined in Section 79 of the Environmental Protection Act 1990 as those measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.

### *Pollution Prevention and Control Act 1999*

- 2.1.10 The Pollution Prevention & Control Act 1999 and Environmental Permitting (England and Wales Regulations) 2010 which together govern the Environment Agency (EA) Integrated Pollution Prevention and Control (IPPC) and Local Authority Pollution Prevention and Control (LAPPC).



- 2.1.11 Future air quality related construction operations that may fall within the environmental permitting regime include crushing operations, batching plant and on site waste operations.
- 2.1.12 Operations such as these will have stringent dust control requirements including monitoring and inspections as conditions of their permit.

## **Air quality around highways**

### *EU and UK Air Quality Management Legislation*

- 2.1.13 In 1996 the European Commission published the Air Quality Framework Directive on ambient air quality assessment and management (96/62/EC). This directive defined the policy framework for 12 air pollutants known to have harmful effects on human health and the environment. Limit values (pollutant concentrations not to be exceeded by a certain date) for each specified pollutant were set through a series of Daughter Directives. Directive 1999/30/EC (the 1st Daughter Directive) sets limit values for NO<sub>2</sub> and PM<sub>10</sub> (amongst other pollutants) in ambient air.
- 2.1.14 In May 2008 the Directive 2008/50/EC on ambient air quality and cleaner air for Europe came into force. This Directive consolidates the above (apart from the 4th Daughter Directive), makes provision for extended compliance deadlines and sets new limit values for fine particulate matter (PM<sub>2.5</sub>).
- 2.1.15 The Directive 2008/50/EC was transposed into national legislation in England by the Air Quality Standards Regulations 2010 (as amended). The Secretary of State for the Environment has the duty of ensuring the air quality limit values are complied with.
- 2.1.16 The air quality limit values and objectives for England for the pollutants relevant to this project are detailed in Table 1 below.

Table 1 – UK air quality objectives relevant to construction dust and highways

Pollutant	Averaging period	Limit value / objective
<i>Human health</i>		
Nitrogen dioxide (NO <sub>2</sub> )	Annual mean	40 µg/m <sup>3</sup>
	1-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year (99.8 <sup>th</sup> percentile)
Particulate matter (PM <sub>10</sub> )	Annual mean	40 µg/m <sup>3</sup>
	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year (90.4 <sup>th</sup> percentile)
Fine particulate matter (PM <sub>2.5</sub> )	Annual mean	25 µg/m <sup>3</sup>
<i>Vegetation</i>		
Oxides of nitrogen (NO <sub>x</sub> )	Annual mean	30 µg/m <sup>3</sup>

## 2.2 Relevant guidance

### Construction dust

#### *IAQM Guidance*

- 2.2.1 The Institute of Air Quality Management (IAQM) has published guidance on air quality monitoring in the vicinity of demolition and construction sites, which sets up to date monitoring protocols and techniques (*IAQM (2012) Guidance on air quality monitoring in the vicinity of demolition and construction sites*). The approach to monitoring is based on the risk rating for the demolition / construction site, derived from an assessment of construction dust emissions as described in the *IAQM (2014) Guidance on the assessment of dust from demolition and construction*.
- 2.2.2 The IAQM guidance proposes that visual inspections for dust emissions are undertaken at least once on each working day and the results clearly recorded in the site log for all construction / demolition sites (regardless of the risk rating).
- 2.2.3 The IAQM guidance also suggests where dust monitoring is required based on the level of risk of dust emissions.
- 2.2.4 In the Area South priority will be given to using near real time measurements of airborne dust, to provide information for active dust management.
- 2.2.5 The guidance recommends the use of a real-time measurement site action level of 250 µg/m<sup>3</sup> (15min) unless other information becomes available, when more appropriate level can be set.

#### *GLA Guidance*

- 2.2.6 The Mayor's Supplementary Planning Guidance (SPG) on the control of dust and emissions during construction and demolition includes site monitoring protocols depending on the risk

category of the site. The GLA guidance replicates the IAQM 2014 risk assessment matrix and associated control measures and monitoring requirements based on the level of risk of dust emissions.

## Air quality around highways

### *Local Air Quality Management: Technical Guidance LAQM.TG(16)*

- 2.2.7 Defra's *Technical Guidance (TG16)*<sup>1</sup> sets the requirements and considerations to be taken when monitoring concentrations of NO<sub>2</sub> associated with highways. It provides recommendations for the selection of appropriate locations and the duration of the monitoring surveys and it specifies minimum requirements for quality assurance and quality control, laboratory performance, precision and bias.

## 3 Monitoring methodology

### 3.1 Construction dust

- 3.1.1 Monitoring of dust during construction of the project will be undertaken in accordance with Section 7 of the CoCP. The CoCP refers to the best practice in the IAQM and the GLA guidance documents as detailed in section 2.
- 3.1.2 Future visual inspections for dust emissions will be undertaken at least once on each working day and the results recorded in the site log for all construction / demolition sites (regardless of the risk rating).
- 3.1.3 Dust will be measured at appropriate locations at the site boundary and/or at sensitive receptors using instruments that provide continuous measurements of particulate matter as PM<sub>10</sub>. As a minimum standard of measurement uncertainty, these instruments shall be certified through MCERTS as being indicative ambient particulate monitors.

### Risk rating

- 3.1.4 The risk rating for future demolition / construction work sites will be based on IAQM 2014 construction dust assessment guidance. Each detailed assessment will follow the methodology provided in the aforementioned IAQM guidance. The risk assessment for each demolition/construction work site will assess:
- Potential magnitude of dust emissions.
  - Sensitivity of the area.
  - Risk of dust impacts.

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<sup>1</sup> See also: London Local Air Quality Management Technical Guidance LLAQM(TG.16)

- Assessment of cumulative effects.
- Mitigation measures to be considered.
- Monitoring requirements.

3.1.5 Given the nature of the site establishment and vegetation clearance works at Copthall Cutting the level of risk of dust being generated by the works is not considered sufficient to require monitoring.

## 3.2 Air quality around highways

3.2.1 The locations, duration and standard of air quality monitoring around highways is being undertaken in accordance with Defra's TG16 guidance and any future revisions of it.

### Monitoring locations

3.2.2 Table 2 lists the HS2 diffusion tube locations in Hillingdon. Figure 2 in Appendix B shows the location of the diffusion tubes.

Table 2 - Monitoring locations for Hillingdon – air quality around highways

Monitoring site ID	Grid reference (x,y)	Location description
HS2-000020BNT	509678, 187214	Lamp post on Pembroke Road
HS2-000020BNU	505492, 183926	Cowley Road sign post at junction with Hillingdon Road
HS2-000020BNV	509439, 187117	High Street sign post at junction with Pembroke Road
HS2-000020BNW	507365, 182687	Signpost on A4020 Uxbridge Road at junction with Long Lane
HS2-000020BPK	506542, 186037	Lamp post in crescent off Swakeleys Road (installed at end of January)
HS2-000020BPL	506240, 185660	Warren Road sign post on corner of Swakeleys Road and Warren Road (installed at end of January)
HS2-000020BPN	506767, 186224	Lamp post on B467 (installed at end of January)
HS2-000020BQH	508451, 186879	Lamp post on High Road Ickenham
HS2-000020BQN	506176, 185444	Lamp post on Park Road (installed at end of January)
HS2-000020BQP	507614, 184663	Sign post on Long Lane (installed at end of January)
HS2-000020BP8	510858, 184916	Triplicate site at South Ruislip roadside automatic monitoring station (installed at end of January)

## 4 Monitoring results

### 4.1 Air quality around highways

4.1.1 The locations, duration and standard of air quality monitoring around highways is being undertaken in accordance with Defra's TG16 guidance and any future revisions of it.

#### Data summary

4.1.2 Table 3 below details the monitoring results from the NO<sub>2</sub> diffusion tube monitoring survey in LBH for the month of February 2018. This data is two months in arrears due to the time required for lab analysis.

4.1.3 Table 4 in Appendix C details NO<sub>2</sub> concentrations from diffusion tube monitoring for all previous months in 2018 and running mean (µg/m<sup>3</sup>).

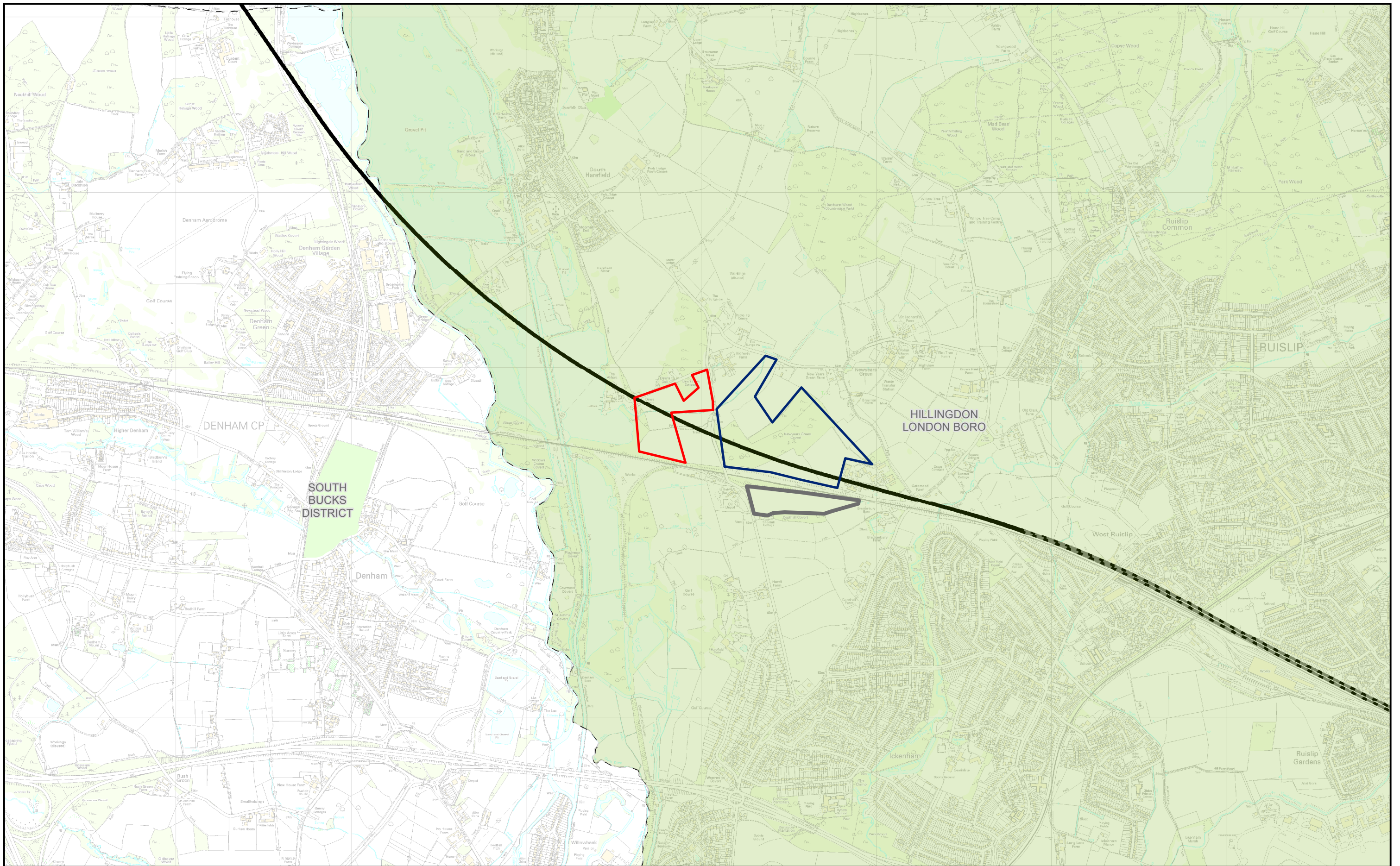
Table 3 - Monitoring results - air quality around highways

Monitoring Site ID	Location description	Provisional NO <sub>2</sub> concentration for February 2018 (µg/m <sup>3</sup> )
HS2-000020BNT	Lamp post on Pembroke Road	35
HS2-000020BNU	Cowley Road sign post at junction with Hillingdon Road	52
HS2-000020BNV	High Street sign post at junction with Pembroke Road	51
HS2-000020BNW	Signpost on A4020 Uxbridge Road at junction with Long Lane	56
HS2-000020BPK	Lamp post in crescent off Swakeleys Road (installed at end of January)	42
HS2-000020BPL	Warren Road sign post on corner of Swakeleys Road and Warren Road (installed at end of January)	48
HS2-000020BPN	Lamp post on B467 (installed at end of January)	Tube missing
HS2-000020BQH	Lamp post on High Road Ickenham	49
HS2-000020BQN	Lamp post on Park Road (installed at end of January)	52
HS2-000020BQP	Sign post on Long Lane (installed at end of January)	45
HS2-000020BP8	Triplicate site at South Ruislip roadside automatic monitoring station (installed at end of January)	37

### 4.2 Complaints

4.2.1 There are no complaints relating to dust or air quality in this period.

## Appendix A – Site locations



**Legend**

- Route in tunnel
- Route on surface
- Hillingdon Local Authority
- Cophall North
- Cophall South
- Cophall 18'

Figure Number	
Figure Name	<b>Construction site locations</b>
	London Borough of Hillingdon

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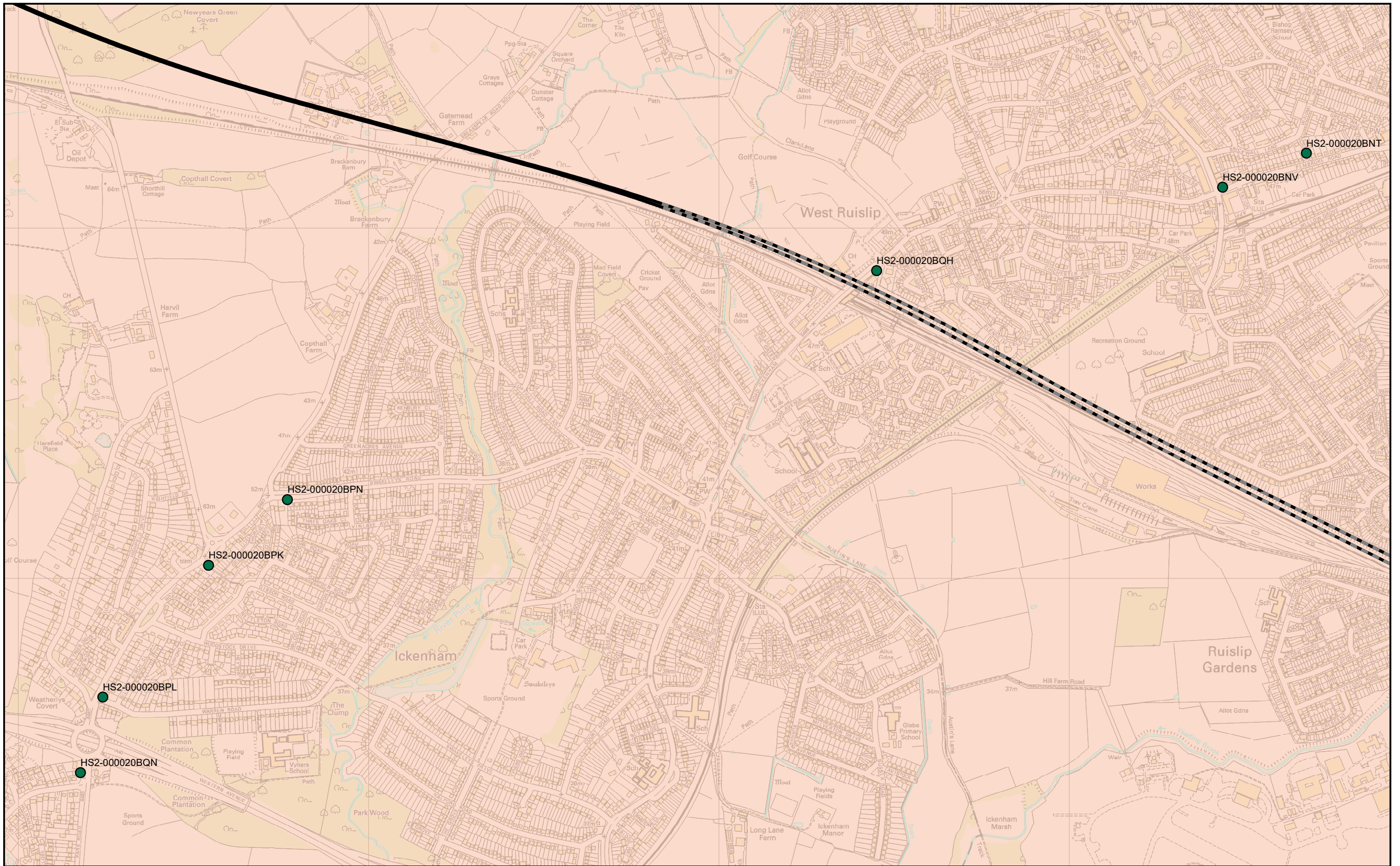
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Map Number: 1EW02-CSJ-EV-REP-S000-000017\_appA\_fig1.pdf **Date: 11/12/17**

## Appendix B – Monitoring locations

### Air quality around highways





- Legend**
- Route in tunnel
  - Route on surface
  - Hillingdon Local Authority
  - Diffusion tubes

Figure Number

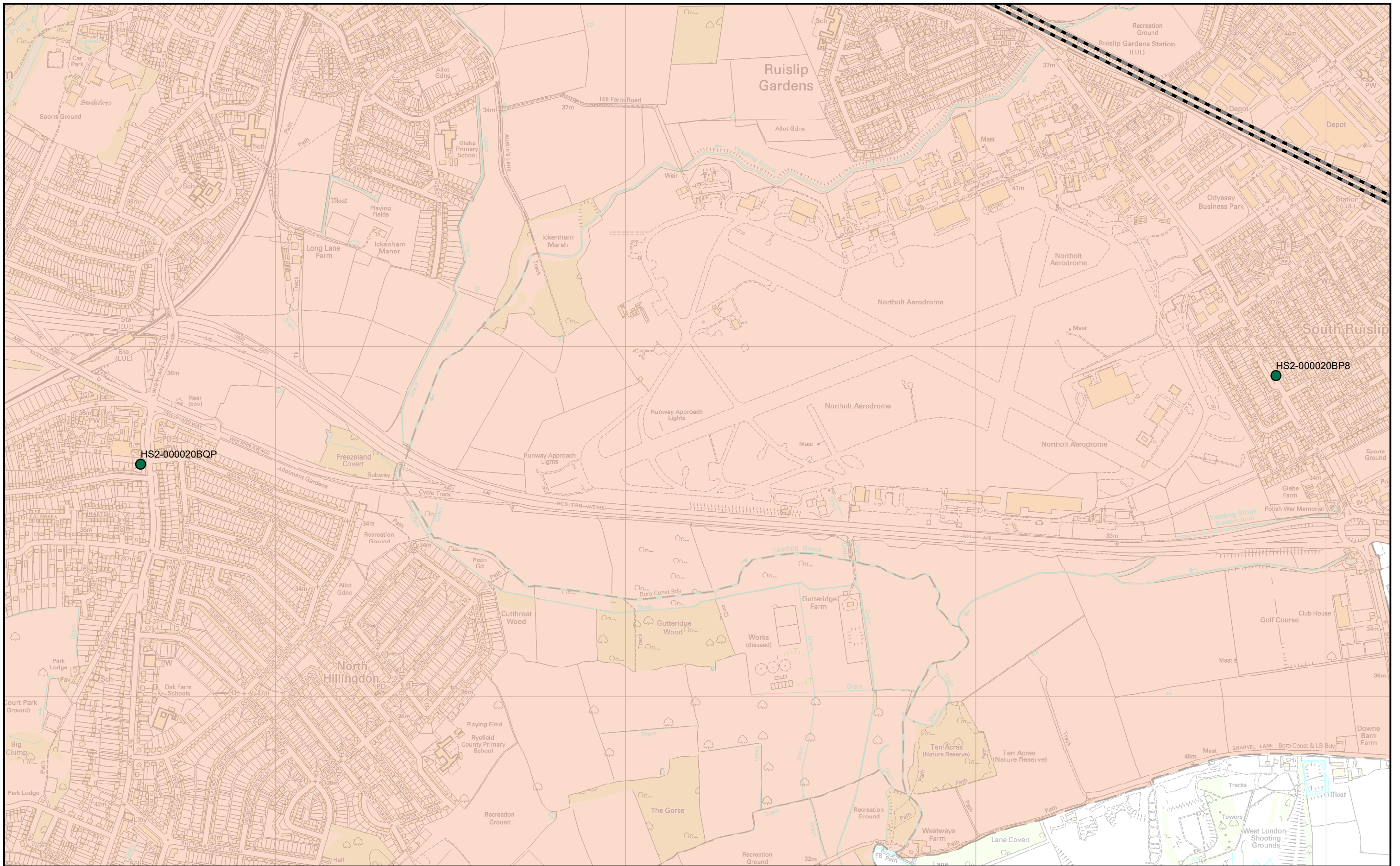
Figure Name  
**Nitrogen dioxide tube monitoring site locations during April (sheet 1)**

London Borough of Hillingdon

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- Legend**
- Route in tunnel
  - Route on surface
  - Hillingdon Local Authority
  - Diffusion tubes

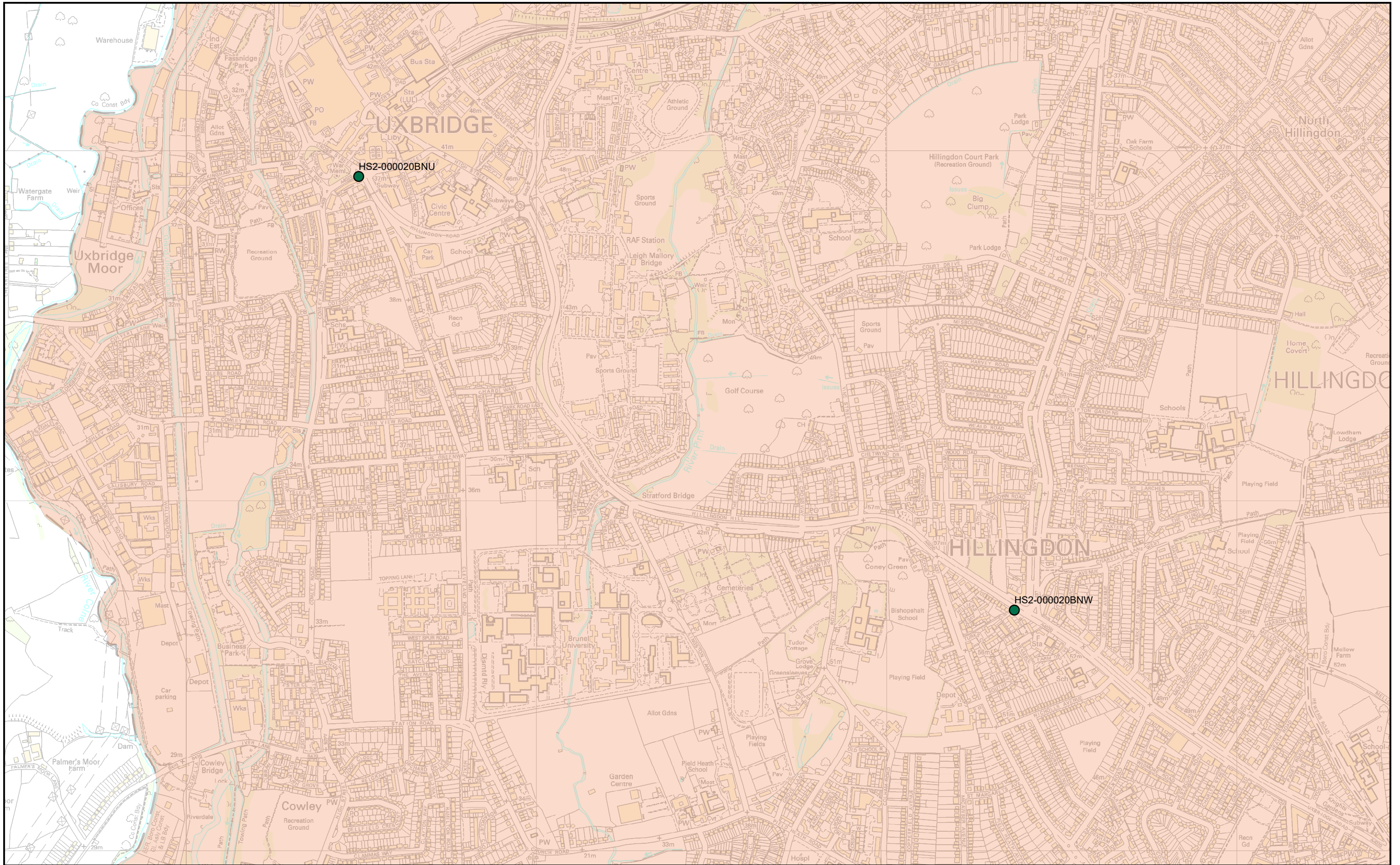
Figure Number  
 Figure Name  
**Nitrogen dioxide tube monitoring site locations during April (sheet 2)**

London Borough of Hillingdon

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- Legend**
-  Route in tunnel
  -  Route on surface
  -  Hillingdon Local Authority
  -  Diffusion tubes

Figure Number


Figure Name  
**Nitrogen dioxide tube monitoring site locations during April (sheet 3)**

London Borough of Hillingdon

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## Appendix C – Monitoring data

### Air quality around highways

Table 4 - Air quality around highways NO<sub>2</sub> concentrations from diffusion tube monitoring all months and running mean (µg/m<sup>3</sup>) within LB Hillingdon

Monitoring Site ID	Location description	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	Mean <sup>2</sup>
HS2-000020BNT	Lamp post on Pembroke Road	39	35											37
HS2-000020BNU	Cowley Road sign post at junction with Hillingdon Road	58	52											55
HS2-000020BNV	High Street sign post at junction with Pembroke Road	48	51											50
HS2-000020BNW	Signpost on A4020 Uxbridge Road at junction with Long Lane	50	56											53
HS2-000020BPK	Lamp post in crescent off Swakeleys Road (installed at end of January)	No data	42											42
HS2-000020BPL	Warren Road sign post on corner of Swakeleys Road and Warren Road (installed at end of January)	No data	48											48

<sup>2</sup> Note: to aid interpretation and conform with best practice, the monthly measurements in this table are reported rounded to the nearest whole number. The annual mean presented here is calculated based on laboratory data to 4 significant figures, rounded to a whole number, and therefore may differ slightly to a mean derived from averaging the rounded monthly measurements in the table.

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Monitoring Site ID	Location description	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	Mean <sup>2</sup>
HS2-000020BPN	Lamp post on B467 (installed at end of January)	No data	Tube Missing											No data
HS2-000020BQH	Lamp post on High Road Ickenham	49	49											49
HS2-000020BQN	Lamp post on Park Road (installed at end of January)	No data	52											52
HS2-000020BQP	Sign post on Long Lane (installed at end of January)	No data	45											45
HS2-000020BP8	Triplicate site at South Ruislip roadside automatic monitoring station (installed at end of January)	No data	37											37

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