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High Speed Rail  
(London-West Midlands)

Air Quality and Dust Monitoring  
Monthly Report - September 2017

London Borough of Ealing

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October 2017





## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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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 Ealing (LBE).

The report presents data from six nitrogen dioxide (NO<sub>2</sub>) diffusion tube monitoring locations around highways within the borough during August 2017 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 2017 and running mean can be found in Appendix B.

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 LBE. Future LBE 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 on a monthly basis 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 Ealing (LBE) during August 2017.
- 1.1.4 There are no current worksites located within LBE. Therefore, no dust monitoring has been carried out.

# 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 (99.8th 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 (90.4th 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<sub>3</sub> (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 Air quality around highways**

- 3.1.1 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.

#### **Monitoring locations**

- 3.1.2 Table 2 lists the HS<sub>2</sub> diffusion tube locations in Ealing. Figure 1 in Appendix A shows the location of the diffusion tubes.

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

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

Monitoring site ID	Grid reference (x,y)	Location description
HS2-000020BN5	521443, 182477	Sign post on Victoria Road
HS2-000020BN7	520959, 181102	The Approach street sign
HS2-000020BP6	520430, 181950	Western Avenue
HS2-000020BP7	518537, 182708	Ealing Hanger Lane Gyrotory
HS2-000020BQF	520856, 181733	Conway Drive sign post
HS2-000020BQG	521312, 182033	Lamp post outside No 1. Wells House Road on Old Oak Common Lane

## 4 Monitoring results

### 4.1 Air quality around highways

#### Data summary

- 4.1.1 Table 3 below details the monitoring results from the NO<sub>2</sub> diffusion tube monitoring survey in LBE for the month of August. This data is two months in arrears due to the time required for lab analysis.
- 4.1.2 Table 4 in Appendix B details NO<sub>2</sub> concentrations from diffusion tube monitoring for all previous months in 2017 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 August 2017 (µg/m <sup>3</sup> )
HS2-000020BN5	Victoria Terrace sign post about 3m from kerb	45
HS2-000020BN7	The Approach street sign	67
HS2-000020BP6	Western Avenue	65
HS2-000020BP7	Ealing Hanger Lane Gyrotory	83
HS2-000020BQF	Conway Drive sign post	54
HS2-000020BQG	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	59

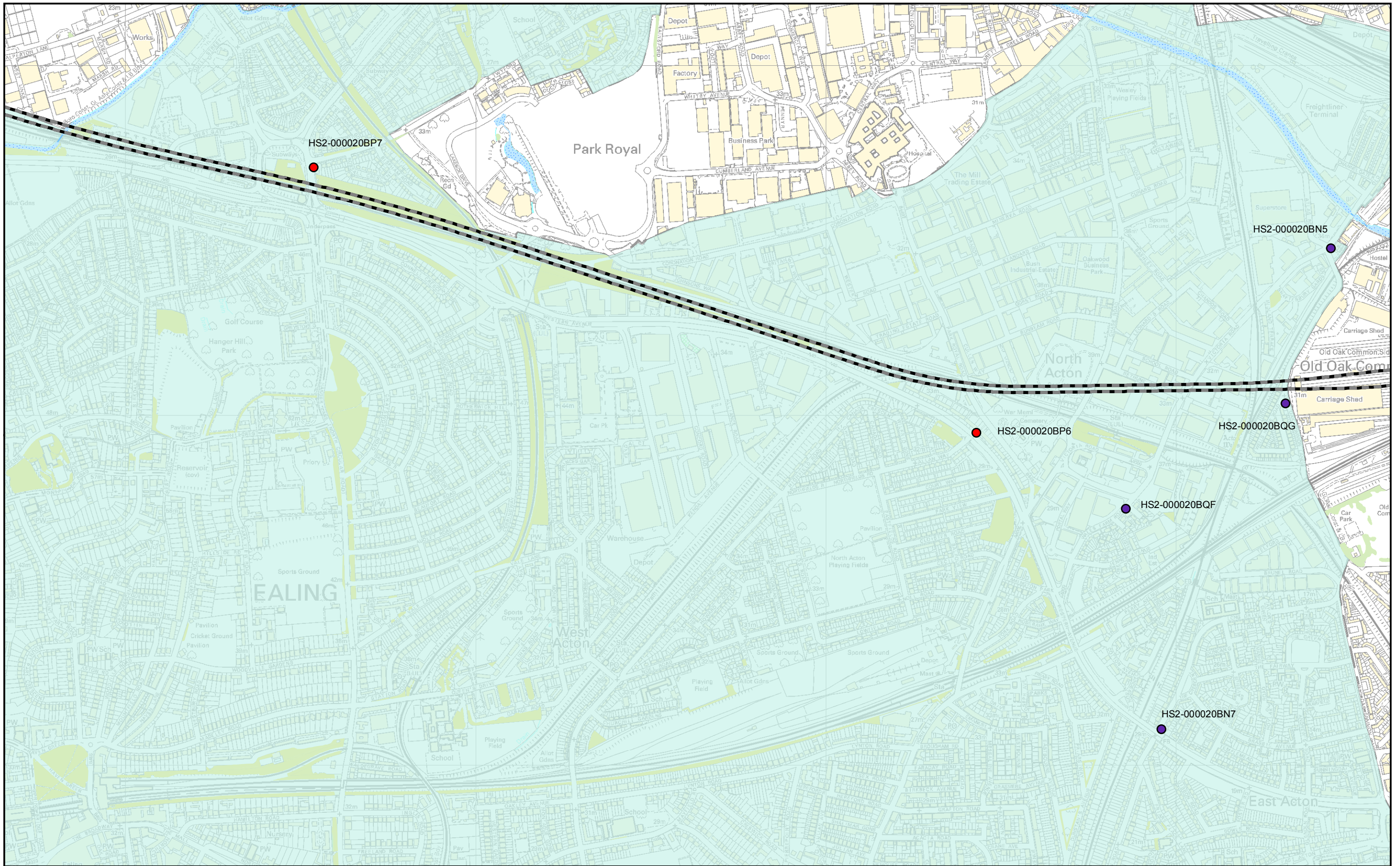
### 4.2 Complaints

- 4.2.1 In future reports this sub section will cover complaints relating to demolition/construction dust and/or air quality around highways. There are no complaints relating to dust or air quality.

# Appendix A – Monitoring locations

## Air quality around highways





- Legend**
- Route in tunnel
  - Route on surface
  - NO2 diffusion tube
  - NO2 diffusion tube (co-located)
  - Ealing Local Authority

Figure Number

Figure Name  
**Nitrogen dioxide tube monitoring site locations during August**

London Borough of Ealing

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## Appendix B – 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 Ealing

Monitoring Site ID	Location description	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	June 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Mean
HS2-000020BN5	Victoria Terrace sign post about 3m from kerb	81	No data	47	55	48	55	43	45					53
HS2-000020BN7	The Approach street sign	87	71	61	68	51	66	58	67					66
HS2-000020BP6	Western Avenue	90	69	58	64	47	58	42	65					62
HS2-000020BP7	Ealing Hanger Lane Gyratory	93	82 One tube missing	79	91	66	86	65	83					81
HS2-000020BQF	Conway Drive sign post	79	72	53	59	50	70	47	54					61
HS2-000020BQG	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	89	No data	73	61	65	82.02	tube damaged	59					65

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