

Air Quality Annual Report 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

The High Speed Two project (HS2) is the Government's proposal for a new, high speed, north-south railway. HS2 Phase One will connect London with Birmingham and the West Midlands; Phase Two will extend the route to Manchester, Leeds and beyond.

In November 2013, HS2 Ltd. deposited a Hybrid Bill with Parliament to seek powers for the construction and operation of Phase One of HS2 (referred to as 'the Proposed Scheme'). The results of the Environmental Impact Assessment were reported in an Environmental Statement which was submitted alongside the Bill.

The HS2 Air Quality Strategy and HS2 Phase One Information Paper E31: Air Quality summarises the air quality effects identified in the Environmental Statement, as amended, and set out HS2 Ltd.'s approach for managing air quality, which includes the publication of an annual review of air quality.

On 3 January 2018, the first of HS2 Ltd.'s annual reviews of air quality was published. The first annual report focused on reporting monitoring data for air quality around highways and covered the 2016 period based on 6 months of monitoring data.

This, second annual report, is focused on reporting monitoring data for air quality around highways, covering the 2017 period. The report makes reference to the air pollutants and areas where significant effects were identified within the Environmental Statement. These significant effects are confined to a limited number of roads in the Greater London area and the significant effects are for the pollutants nitrogen dioxide and particulate matter. Therefore, the monitoring data discussed in this report only covers the Greater London area and the pollutants nitrogen dioxide and particulate matter.

HS2 Ltd. commenced a baseline air quality survey at the end of June 2016. This survey uses diffusion tubes to monitor nitrogen dioxide. The monitoring and reporting of this survey has been undertaken following the Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management best practice guidance. The results from this survey for 2017 are presented in table format in Appendix B and shown on maps, with monitoring sites colour coded based on the measured concentration, in Appendix F. Particulate matter monitoring around highways is available from sites operated by Defra or local authorities and a reference to the relevant reports, where this data is available, is provided. There was not identified to be a need for HS2 to undertake additional supplementary monitoring for particulate matter around highways. However, HS2 Ltd. is undertaking monitoring of indicative particulate matter for the purposes of management of dust emissions at high and medium risk construction sites.

The HS2 Ltd. air quality monitoring survey is intended to supplement air quality monitoring that is being undertaken by other parties such as Defra, local authorities and in some areas

communities and academic institutions. Data from air quality monitoring surveys undertaken by other parties is not reproduced within this report.

This report provides a summary of the significant effects identified in the Environmental Statement, as amended, and a comparison of 2017 monitoring data with the predictions from the air quality modelling undertaken for the Environmental Statement.

The Proposed Scheme is currently in the early stages of the construction period. The year 2017 is considered a baseline period, due to the limited construction activities occurring during the year, but HS2 Ltd. have already made commitments for measures to reduce emissions generated by construction activities. The measures include:

- Construction vehicle emission standards requirements and methods to manage their use via traffic management plans;
- Non-road mobile machinery emission standard requirements; and
- Dust mitigation measures.

The Phase One Information Paper E31: Air Quality sets out the HS2 emission standards for construction vehicles and Non-Road Mobile Machinery (NRMM). The construction vehicle standards came into effect on 14 September 2017 with the commencement of early works, including ground investigation surveys, land preparation works, ecological surveys, etc.

Progress and impact of measures to improve air quality during 2017 are set out in Section 4.2 and will therefore be reported in future annual reports. HS2 Ltd. continues to monitor air quality in line with the Local Air Quality Management requirements as set out in the HS2 Phase One Code of Construction Practice, and in consideration of clean air zones, HS2 Ltd. has also been liaising with relevant local authorities. Furthermore, HS2 will be publishing an Air Quality Action Plan to outline commitments made, and progress thereof in the management of the significant effects identified in the Environmental Statement.

This report is a revision of that published in October 2018 following a review of all diffusion tube monitoring location categories (i.e. kerbside, roadside, urban background).

1 Introduction

1.1.1 The High Speed Two project (HS2) is the Government's proposal for a new, high speed, north-south railway. HS2 Phase One will connect London with Birmingham and the West Midlands; Phase Two will extend the route to Manchester, Leeds and beyond.

1.1.2 The high speed railway project is in 3 phases:

- Phase 1 London to the West Midlands;
- Phase 2A West Midlands to Crewe; and
- Phase 2B West Midlands to Leeds, Crewe to Manchester.

1.1.3 In November 2013, HS2 Ltd. deposited a Hybrid Bill¹ with Parliament to seek powers for the construction and operation of Phase One of HS2 (referred to as 'the Proposed Scheme'). The results of the Environmental Impact Assessment (EIA) were reported in an Environmental Statement (ES) which was submitted alongside the Bill. The Secretary of State also published Environmental Minimum Requirements (EMRs), which set out the environmental and sustainability commitments that will be observed in the construction of the Proposed Scheme.

1.1.4 The ES prepared as part of the Bill included an assessment of the impacts of the Proposed Scheme on air quality during construction and operation. The HS2 Air Quality Strategy and HS2 Phase One Information Paper E31: Air Quality summarises the impacts identified in the ES.

1.1.5 The key area of impacts identified was highway construction traffic and highway interventions which will cause temporary significant effects for local air quality. These significant effects are confined to a limited number of roads in the Greater London area. These effects are mostly from changes in nitrogen dioxide (NO₂) concentrations, and to a much less extent from changes in PM₁₀. This is largely due to the existing concentrations of air pollutants already being above government air quality standards in London.

1.2 Management of air quality

1.2.1 The HS2 Air Quality Strategy and HS2 Phase One Information Paper E31: Air Quality set out HS2 Ltd.'s approach for managing air quality.

1.2.2 In order to manage significant impacts related to highway traffic changes and interventions, HS2 Ltd. committed to putting in place a process to manage those impacts through measurement and regular assessments of air quality during the

¹ The High Speed Rail (London – West Midlands) Bill, hereafter 'the Bill'.

construction of the Proposed Scheme. Where significant effects are predicted, action plans will be put in place with the objective of removing those significant effects.

- 1.2.3 The management process is modelled on Defra's Local Air Quality Management (for which the statutory duties of local authorities and London boroughs are set out in Part IV of the Environment Act 1995), and the periodic reviews and action plans are envisaged as being similar to those produced in that process.
- 1.2.4 The management process comprises of: measure – review – action plan. Baseline (pre-works) air quality monitoring is being undertaken in locations where potential significant effects have been predicted. Forecast baseline and 'with HS2 construction' traffic numbers used in the air quality modelling for the ES will be reviewed and updated in these locations, if necessary.
- 1.2.5 The baseline measurements will be reviewed and an air quality assessment produced at appropriate stages of construction to determine whether significant effects are still predicted. Where significant effects are still predicted, the air quality monitoring will be continued, and an air quality action plan be developed, with the objective of removing the significant effects as soon and as far as practicable.

1.3 Purpose of this report

- 1.3.1 On 3 January 2018, the first of HS2 Ltd.'s annual reviews of air quality was published. The first report covered the 2016 calendar year, which is considered to be a baseline year, prior to the start of the enabling works and main works². This report is an update to the first annual report based on the availability of additional NO₂ monitoring data, covering the 12-month period between January and December 2017. This report also provides a comparison with the information previously presented in the first annual 2016 air quality report.
- 1.3.2 This annual report is focused on reporting monitoring data for air quality around highways. The air pollutants considered in this report are nitrogen dioxide (NO₂) and particulate matter. The area of focus is where significant effects were identified within the ES. These areas were within Greater London and as such the reporting of monitoring data is for Greater London only. For other areas along the Phase One route, data from Defra and local authority monitoring surveys provides an indication of baseline. This data is not reproduced in this report and reference should be made to the relevant Defra and local authority publications and websites.

² In some areas, survey work and ground investigation works were undertaken during 2016. In addition, in the London Borough of Camden construction of housing to replace that which will be lost due to land required by HS2 was under construction during 2016.

1.4 Summary of significant effects identified in the environmental statement

- 1.4.1 For the ES, calculations of changes in concentrations of nitrogen dioxide (NO₂) and particulate matter (PM₁₀) were calculated. PM_{2.5} concentrations were considered but not calculated or reported in the ES. The ES predicted that changes in traffic emissions during construction of the Proposed Scheme would give rise to significant effects from changes in annual mean NO₂ concentrations around certain construction traffic routes in the Greater London area. Significant effects from changes in the 24-hour daily mean PM₁₀ concentrations were also predicted, but this was limited to the area in the immediate vicinity of Euston Road.
- 1.4.2 For the ES, best practice guidance published by the Institute of Air Quality Management (IAQM) was used to determine if there were significant impacts anticipated for air quality. This guidance determines the significant effect based on the change in pollutant concentration due to the Proposed Scheme relative to pollutant concentration for the existing situation. Where the existing air quality is already above government air quality standards, a relatively smaller change in pollution concentration is considered to be a significant effect, than where existing air quality is below government air quality standards.
- 1.4.3 Where an effect on air quality is described as significant at a particular location, with respect to the air quality legislation, this does not denote a significant effect on human health. Much larger changes in air quality than what is predicted as a consequence of the Proposed Scheme would be needed to cause significant impacts on health at the level of an individual person.
- 1.4.4 A summary of the number of receptors with significant effects predicted in the ES is presented in Appendix A.

2 Air Quality monitoring data and comparison with air quality objectives and national compliance

2.1 Pollutants

2.1.1 The pollutants NO₂ and particulate matter are considered in this annual report. Further details of each of these pollutants is given below.

Nitrogen dioxide (NO₂)

2.1.2 Nitrogen dioxide (NO₂) is a secondary pollutant produced by the oxidation of nitric oxide (NO). NO and NO₂ are collectively termed nitrogen oxides (NO_x). Almost a third of the UK NO_x emissions are from road transport. The majority of NO_x emitted from vehicles is in the form of NO, which oxidises rapidly in the presence of ozone (O₃) to form NO₂. In high concentrations, NO₂ can affect the respiratory system and can also enhance the response to allergens in sensitive individuals, whereas NO does not have any observable effect on human health at the range of concentrations found in ambient air. Elevated concentrations of oxides of nitrogen can have an adverse effect on vegetation, including leaf or needle damage and reduced growth. Deposition of pollutants derived from oxides of nitrogen emission contribute to acidification and/or eutrophication of sensitive habitats.

Particulate Matter

2.1.3 The principal sources of particles in the UK are combustion processes, which include traffic and industry. Particulate matter in vehicle exhaust gases consists of carbon nuclei onto which a wide range of compounds are absorbed. These particles have an effective aerodynamic diameter of less than 10 micrometres (µm). Particles in this size range are referred to as PM₁₀. Finer size fractions are referred to as PM_{2.5}. These particles have an effective aerodynamic diameter of less than 2.5µm. Diesel engines produce the majority of particulate emissions from the vehicle fleets. Approximately a fifth of primary PM₁₀ emissions in the UK are derived from road transport. Particulate matter are associated with a range of symptoms of ill health including effects on the respiratory and cardiovascular systems, on asthma and on mortality.

2.2 Summary of relevant legislation

2.2.1 Air quality monitoring data has been compared against limit values and objectives set out in the following legislation:

- The Air Quality (England) Regulations 2000³, Air Quality (England) (Amendment) Regulations 2002⁴, the Air Quality Standards Regulations 2010⁵ and the Air Quality Standards (Amendment) Regulations 2016⁶; and
- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe⁷.

2.2.2 Air quality limit values and objectives are quality standards that have been set for clean air and to protect human health. Some pollutants have standards expressed as annual average concentrations and others have standards expressed as 24-hour, 1-hour or 15-minute average concentrations. Some pollutants have standards expressed in terms of both long-term and short-term concentrations.

2.2.3 Table 1 sets out the EU air quality limit values and UK national air quality objectives for the pollutants NO₂ and PM₁₀ for which significant effects were identified. PM_{2.5} is also included for completeness. Within this report, the term ‘air quality standards’ refers to both the English air quality objectives and the air quality limit values introduced in the UK based on EU Directives.

Table 1 – Relevant air quality standards

Pollutant	Averaging Period	Air Quality Standards
Nitrogen dioxide (NO ₂)	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual mean	40 µg/m ³
PM ₁₀	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual mean	40 µg/m ³
PM _{2.5}	Annual mean	25 µg/m ³ to be achieved by 2020
	3-year mean	Target of 15% reduction in concentration at urban background locations to be achieved between 2010 and 2020.

³ Department for Environment, Food and Rural Affairs, 2000, The Air Quality (England) Regulations 2000, The Stationery Office

⁴ Department for Environment, Food and Rural Affairs, 2002, The Air Quality (England) (Amendment) Regulations 2002, The Stationery Office

⁵ Department for Environment, Food and Rural Affairs, 2010, The Air Quality Standards Regulations 2010, The Stationery Office
 Department for Environment, Food and Rural Affairs, 2016, The Air Quality Standards (Amendment) Regulations 2016, The Stationery Office

⁶ Department for Environment, Food and Rural Affairs, 2016, The Air Quality Standards (Amendment) Regulations 2016, The Stationery Office

⁷ Official Journal of the European Union, 2008, Directive 2008/50/EC of the European Parliament and of the Council of the 21 May 2008 on ambient air quality and cleaner air for Europe, EU

2.3 Summary of monitoring undertaken by HS2

- 2.3.1 All HS2 Ltd. air quality monitoring surveys are intended to supplement air quality monitoring that is being undertaken by other parties such as Defra, local authorities and in some areas communities and academic institutions. Data from surveys undertaken by other parties is not reproduced within this report.
- 2.3.2 HS2 Ltd. commenced a baseline air quality survey at the end of June 2016 in locations where there were predicted to be significant effects on air quality around highways. This baseline air quality survey measures annual mean NO₂, for which potential significant effects were predicted around certain construction traffic routes in the Greater London area.
- 2.3.3 In relation to where significant effects were identified for PM₁₀ for air quality around highways, supplementary surveys are not being undertaken as existing monitoring sites operated by Defra and/or local authorities are considered to give sufficient coverage⁸.

2.4 Summary of NO₂ monitoring methodology

- 2.4.1 A survey of NO₂ concentrations using diffusion tubes commenced at the end of June 2016 for locations within Greater London. The survey was planned, installed and operated in accordance with Defra Local Air Quality Management Technical Guidance 2016 (LAQM.TG(16))⁹.
- 2.4.2 The sites selected for inclusion in the survey comprise of:
- Locations where the ES predicted significant effects;
 - Co-located locations at pre-existing long term continuous monitoring sites, operated to European Union reference method standards for bias adjustment; and
 - Background and roadside sites where significant effects were not predicted to provide control locations not expected to be affected by the Proposed Scheme.
- 2.4.3 Diffusion tubes are a passive monitoring method, that has the benefit of not requiring mains power and can be deployed over a large number of locations. In accordance with Defra LAQM.TG(16) guidance, diffusion tubes are exposed for a 4 or 5 week period depending on the length of the month. The diffusion tubes are then collected and returned to the laboratory for analysis at the end of each month and new diffusion tubes are deployed for the next month.

⁸ HS2 will be undertaking surveys of indicative PM₁₀ for the purposes of management of construction dust.

⁹ Department for Environment, Food and Rural Affairs, 2016, Local Air Quality Management Technical guidance. Available at: <https://laqm.defra.gov.uk/technical-guidance/>

- 2.4.4 In accordance with Defra LAQM.TG(16) guidance, NO₂ diffusion tube surveys aim for a minimum data capture of 75% for each site for each year of the survey (i.e. there needs to be 9 out of 12 months with valid data at each site). This gives some allowance for the diffusion tube at a site to go missing or be damaged for a given month.
- 2.4.5 Where data capture over the year is less than 75% a process of annualisation can be applied in accordance with Defra LAQM.TG(16) guidance to calculate an annual mean equivalent for the site based on the comparison of the months with available data against a full dataset for a long term fixed continuous monitoring site operated by Defra or local authorities.
- 2.4.6 A process of bias adjustment is also undertaken each year. Triplicate sets of diffusion tubes are co-located at long term fixed continuous monitoring sites operated by Defra or local authorities. The average concentration from the triplicate diffusion tubes is compared to the concentrations measured at the long term fixed continuous monitoring site and a correction factor is applied to all sites in the survey to bring these into line with the long term fixed continuous monitoring site.
- 2.4.7 Where diffusion tube surveys include co-location with continuous monitors operated to EU reference method standards, Defra LAQM.TG(16) guidance considers diffusion tube monitoring to be a robust method for measurement of annual mean NO₂.
- 2.4.8 Details of the diffusion tube locations included in the HS2 Ltd. air quality monitoring survey are given in the table in Appendix B and maps in Appendix F.
- 2.4.9 The diffusion tubes used for the survey period between January and December 2017 were supplied by Gradko Environmental. The diffusion tube preparation used was 20% triethanolamine (TEA) in de-ionised water¹⁰.

Calculation of the annual mean NO₂ Concentrations

- 2.4.10 Data collected with the diffusion tubes for the January to December 2017 period were annualised and bias adjusted in accordance with Defra LAQM.TG(16) guidance.
- 2.4.11 Continuous monitoring data, used to annualise and bias adjust diffusion tube data, were downloaded from www.londonair.org.uk.
- 2.4.12 Diffusion tube data for January to December 2017 were annualised in line with Defra LAQM.TG(16) guidance. The background¹¹ continuous monitoring sites

¹⁰ The Gradko 20% TEA in water diffusion tubes have a grey cap.

¹¹ Site location type are defined in Defra LAQM.TG(16):

- Kerbside sites are within one metre of the kerb of a busy road.

Camden – Bloomsbury and Kensington and Chelsea – North Kensington were used to derive an annualisation factor for the data set.

- 2.4.13 Bias adjustment factors for background, roadside and kerbside¹¹ locations were derived using Defra's local bias adjustment factors spreadsheet¹². Bias adjustment factors were derived using the data from diffusion tubes co-located with automatic monitoring sites. The background sites used were Camden – Bloomsbury and Kensington and Chelsea – North Kensington. The roadside sites used were, Camden – Euston Road, Ealing – Hanger Lane, and Ealing – Western Avenue. The kerbside sites used were Camden – Swiss Cottage and Westminster – Marylebone Road. Further details on the continuous monitoring sites is available at www.londonair.org.uk. The precision of the tubes (the difference between the triplicate tubes at each location) was represented by calculating the coefficient of variation. It is considered that if the average coefficient of variation is below 10 percent, the survey is of good precision. All sites were found to have good precision and therefore all sites were used for bias adjustment.
- 2.4.14 Full details of the annualisation and bias adjustment factors calculated are presented in Appendix C.

2.5 HS2 NO₂ survey monitoring results

- 2.5.1 Full monitoring results for the air quality NO₂ diffusion tube survey are presented in the tables in Appendix D and maps in Appendix F.

2.6 Particulate matter monitoring results

- 2.6.1 HS2 has not undertaken supplementary surveys for particulate matter around highways, as existing monitoring sites operated by Defra and/or local authorities are considered to give sufficient coverage for the areas over which significant effects were identified. Monitoring data from relevant Defra and local authority monitoring sites is presented in the London Air Quality Network Summary Report 2016¹³, available at www.londonair.org.uk. The relevant monitoring sites are Camden – Bloomsbury, Camden – Euston Road, Camden – Swiss Cottage, Ealing – Hanger Lane, Ealing – Western Avenue, Kensington and Chelsea – North Kensington and Westminster – Marylebone Road.

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- Roadside sites are typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases).
 - Background sites in urban areas are distanced from sources and therefore broadly representative of city-wide background conditions, such as urban residential areas.

¹² Department of Environment, Food and Rural Affairs, 2011, local bias adjustment factors spreadsheet version 04. Available at: <https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html>

¹³ Kings College London, 2017, London Air Quality Network Summary Report 2016, June 2017.

3 Comparison to predictions in the environmental statement

- 3.1.1 Appendix E presents a comparison between the calculated 2017 results, and the modelled prediction for 2017 NO₂ annual mean concentrations from the ES for the scenario without the Proposed Scheme in place¹⁴. The year 2017 was modelled for the ES as this was the earliest expected year in which construction for the Proposed Scheme would start.
- 3.1.2 This is an indicative comparison rather than an absolute one. There may be differences in the characteristics of the individual diffusion tube locations and the nearest receptor location assessed in the ES. For instance, receptor locations assessed in the ES were typically at the facades of properties adjacent to roads affected by the Proposed Scheme. However, due to the need to be able to access the sites to mount the diffusion tubes on a monthly basis they have typically been located on publicly accessible street furniture such as lampposts and signposts. The diffusion tube locations are intended to be representative of exposure locations along roads where significant effects were predicted during construction. In some instances, they are closer to roads than the locations where the public would typically be exposed.
- 3.1.3 Where comparisons of monitoring data and modelling prediction results are undertaken, Defra LAQM.TG(16) guidance suggests that if the difference is less than $\pm 25\%$ then the comparison can be considered acceptable.
- 3.1.4 The comparison indicates that:
- Of the 106 locations where monitoring was undertaken in 2017, monitored concentrations from 84 tubes were within $\pm 25\%$ of the modelled concentrations.
 - Where the comparison has a difference of more than $\pm 25\%$:
 - Modelled concentrations were higher than the monitored concentrations for 21 sites (20% of the overall sites), which were typically associated with locations away from major roads on side streets away from major roads (however with two exceptions along the A40);
 - Monitored concentrations were higher than the modelled concentrations for 3 sites (3% of the overall sites), which occurred at locations adjacent to relatively high traffic roads for the area, specifically Hendon Way / Finchley Road, Camden High Street and Old Oak Common Lane respectively.
 - A further 19 tubes are not located in proximity to modelled receptors and thus have not undergone a comparison.

¹⁴ Modelled annual mean NO₂ results are from the SES2 and AP3 Environmental Statement for locations east of the Edgware Road and from the SES and AP2 Environmental Statement for all other sites (predictions without Proposed Scheme concentrations are identical for the SES and AP2 and the SES3 and AP4 Environmental Statements).

3.1.5 The key reasons for differences in 2017 monitored annual mean NO₂ concentrations and the modelled annual mean NO₂ concentrations are as follows:

- For the ES modelling there was a more limited number of air quality monitoring sites available for model verification at the time the air quality modelling for the ES was undertaken;
- These sites were typically adjacent to high traffic roads recording concentrations well in excess of air quality standards;
- Monitoring sites representative of areas away from high traffic roads were limited so model performance in these areas could not be determined;
- This resulted in over adjustment of the air quality model for the locations away from high traffic roads and therefore higher predicted concentrations; and
- For areas adjacent to high traffic flow roads and subject to congestion, the air quality modelling undertaken for the ES, was not able to fully reflect the impacts of congestion¹⁵.

3.1.6 The ES determined significance of the air quality impacts based on the change in concentration relative to the modelled without Proposed Scheme concentrations. This approach and the relevant parameters to apply are set out in the Institute of Air Quality Management guidance, Planning for Air Quality (2017).

3.1.7 For the locations away from major roads where the modelled concentrations are higher than those monitored, then the modelling required a smaller change in concentrations due to the Proposed Scheme to give a significant effect. On this basis the modelling for the ES gave a worst-case view of the significant effects due to the Proposed Scheme.

3.1.8 For locations adjacent to high traffic flow roads, where the monitored concentrations were higher than the modelled concentrations, the modelled concentrations were higher than air quality standards so the changes in concentrations required for a significant effect is already small. On this basis the modelling or the ES did not underestimate the significant effects due to the Proposed Scheme for these locations.

¹⁵ Where there is congestion the real-world speeds of traffic are typically lower than those that are used in the air quality model. A very detailed level of modelling is required to reflect congestion in an air quality model, which was not possible for the ES due to the large geographic area over which the air quality assessment was undertaken.

4 Actions to improve air quality

4.1 Proposed actions

4.1.1 In preparation for developing an air quality action plan for the Proposed Scheme HS2 Ltd. have already made commitments to measures to reduce emissions generated by construction activities. These measures are set out in the HS2 Phase One Code of Construction Practice (CoCP) and HS2 Phase One Information Paper E31: Air Quality.

4.1.2 The measures include:

- Construction vehicle emission standards requirements¹⁶ and methods to manage their use via traffic management plans;
- NRMM emission standard requirements; and
- Dust mitigation measures as set out in the CoCP.

4.2 Progress and impact of measures to address air quality

4.2.1 The Proposed Scheme is currently in the early stages of the construction period. The year 2016 is considered a baseline period. The year 2017 also provides further baseline data due to the limited number of construction activities occurring during the year.

4.2.2 Phase One Information Paper E31: Air Quality sets out the HS2 emission standards. For construction vehicle emissions, NRMM and dust management. The construction vehicle standards came into effect on 14 September 2017 with the commencement of early works, including ground investigation surveys, land preparation works, ecological surveys, etc.

4.2.3 HS2 Phase One Area North begins south of Long Itchington Wood tunnel (south of Warwick) and proceeds to the Birmingham Interchange and Curzon Street Stations, to Handsacre where it connects with the West Coast Main Line at Lichfield. During 2017, there was 99.5% Euro 6 HGV use and 100% use of Stage IIIB NRMM recorded.

4.2.4 HS2 Phase One Area Central extends from the Colne valley viaduct and Chiltern Tunnels, through to the North Portal Chiltern tunnels to Brackley, to the Itchington Green Tunnel, south portal area. During 2017, there were a very low number of vehicle movements, two Euro 5 HGVs were recorded and no recorded NRMM.

4.2.5 Area South covers the Greater London Area. During 2017, there was 95% Euro 6 Heavy Goods Vehicles (HGV) use recorded (with the inclusion of approved

¹⁶ The HS2 emission standards are set out HS2 Phase One Information Paper E31: Air Quality

exemption requests on the grounds of specialist equipment, triviality or unforeseen circumstances). Further to this, there was 100% use of Stage IV NRMM within the Central Activity Zone, and 95% use of Stage IIIB NRMM within the Greater London areas.

- 4.2.6 HS2 will continue to monitor air quality in line with the LAQM requirements as set out in the CoCP. In consideration of potential future local authority designated Clean Air Zones, HS2 has also been liaising with relevant local authorities and will consider these in future annual air quality reports. Furthermore, HS2 will be publishing an Air Quality Action Plan to outline commitments made, and progress thereof in the management of the significant effects identified in the ES.

Appendix A – Summary of receptors with significant effects predicted in the ES

The number of receptors with significant effects is presented in Table 2. This has been calculated from the annual mean NO₂ modelling results presented in the ES, as amended. These calculations are a combination of results from the Supplementary Environmental Statement (SES) and Additional Provision (AP) 2, SES2 and AP3, SES3 and AP4. Air quality modelling was not undertaken for the SES4 and AP5 ES. The calculations use the latest reported modelling result for each receptor.

Table 2 – Summary of number of receptors modelled in the ES with adverse and beneficial significant effects for Greater London area

Significant effect	Air quality impact descriptor	Number of receptors
Significant adverse	Substantial adverse	227
Significant adverse	Moderate adverse	199
Not significant	Slight adverse	10
Not significant	Negligible	241
Not significant	Slight beneficial	10
Significant beneficial	Moderate beneficial	39
Significant beneficial	Substantial beneficial	31
Total number of receptors		757

Appendix B – HS2 Ltd. air quality monitoring survey locations

Table 3 gives details of the locations included in the HS2 Ltd. NO₂ diffusion tube survey during 2017. Appendix F presents maps of the locations, labelled with the site ID, colour coded based on the measured concentration.

Table 3 – Details of HS2 Ltd. air quality NO₂ diffusion tube monitoring survey locations

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	530436	182929	2.3	Predicted significant effect
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	530321	182268	2.5	Predicted significant effect
HS2-000020BM7	Camden Council	Chalton Street	Roadside	529894	182702	2.3	Predicted significant effect
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	529737	182641	2.3	Predicted significant effect
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	529785	182529	2.4	Predicted significant effect
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	529429	182375	2.5	Predicted significant effect
HS2-000020BMB	Camden Council	Whitfield Street	Background	529273	182114	2.5	Predicted significant effect
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	529232	182511	2.3	Predicted significant effect
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	528776	182170	2.3	Predicted significant effect
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	528901	182180	2.3	Predicted significant effect
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	529715	183123	2.5	Predicted significant effect
HS2-000020BMH	Camden Council	Nash Street	Background	528861	182717	2.5	Predicted significant effect
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	529080	182698	2.5	Predicted significant effect
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	529196	183546	2.5	Predicted significant effect
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	529093	183356	2.5	Predicted significant effect

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	529084	183722	2.5	Predicted significant effect
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	528850	183573	2.5	Predicted significant effect
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	528662	183604	2.5	Predicted significant effect
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	528548	183967	2.5	Predicted significant effect
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	528685	184188	2.5	Predicted significant effect
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	529079	184043	2.3	Predicted significant effect
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	527783	185407	2.5	Predicted significant effect
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	527538	184250	2.5	Predicted significant effect
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	526619	184081	2.3	Predicted significant effect
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	527206	182887	2.3	Predicted significant effect
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	526549	182226	2.3	Predicted significant effect
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	525102	186042	2.3	Predicted significant effect
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	523869	182465	2.3	Predicted significant effect
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	523998	180160	2.5	Predicted significant effect
HS2-000020BN2	Hammersmith and Fulham Council	Lamp post on Du Cane Road	Roadside	523092	181264	2.5	Predicted significant effect
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	522335	182955	2.5	Predicted significant effect
HS2-000020BN4	Hammersmith and Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	521625	180871	2.3	Predicted significant effect
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	521443	182477	2.3	Predicted significant effect

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	520959	181102	2.3	Predicted significant effect
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	527884	183980	2.5	Predicted significant effect
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	528639	183518	2.5	Predicted significant effect
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	528528	183443	2.5	Predicted significant effect
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	528276	182185	2.5	Predicted significant effect
HS2-000020BNF	Kensington and Chelsea Council	Unsuitable for long vehicles sign on St Ann's Villas	Roadside	523849	180620	2.5	Predicted significant effect
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	523110	184055	2.5	Predicted significant effect
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	528763	183720	2.5	Predicted significant effect
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	527359	182633	2.3	Predicted significant effect
HS2-000020BNK	Westminster City Council	London Underground sign outside Edgware Rd Station	Roadside	527048	181731	2.3	Predicted significant effect
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	526914	182077	2.3	Background not affected by scheme
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	530744	181308	2.5	Background not affected by scheme
HS2-000020BNQ	Camden Council	Camley Street	Background	529735	183737	2.3	Background not affected by scheme
HS2-000020BNR	Hammersmith and Fulham Council	Lamp posts in Shepherd's Bush Common	Background	523481	179871	2.5	Background not affected by scheme
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	522196	184448	2.5	Background not affected by scheme
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	509678	187214	2.5	Background not affected by scheme
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	505492	183926	2.5	Roadside not affected by scheme
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	509439	187117	2.3	Roadside not affected by scheme

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	507365	182687	2.5	Roadside not affected by scheme
HS2-000020BNX	Hammersmith and Fulham Council	Signpost on A402 Goldhawk Road	Roadside	522035	179199	2.5	Roadside not affected by scheme
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	524839	185136	2.5	Roadside not affected by scheme
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	528050	185508	2.5	Roadside not affected by scheme
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	529708	184871	2.3	Roadside not affected by scheme
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	528597	180942	2.3	Roadside not affected by scheme
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	531149	181616	2.5	Roadside not affected by scheme
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	528125	182016	2.5	Colocation kerbside
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	526633	184392	3.0	Colocation kerbside
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	529895	182657	2.5	Colocation roadside
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	520430	181950	2.0	Colocation roadside
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Roadside	518537	182708	2.0	Colocation roadside
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	530120	182034	2.5	Colocation background
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	524045	181752	2.5	Colocation background

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BPB	Camden Council	Camden High Street	Roadside	528966	183735	2.3	Predicted significant effect
HS2-000020BPC	Camden Council	Castlehaven Road	Background	528788	184591	2.5	Predicted significant effect
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	528571	184683	2.5	Predicted significant effect
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	527710	184749	2.5	Predicted significant effect
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	527549	184640	2.5	Predicted significant effect
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	527019	182748	2.3	Predicted significant effect
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	526818	183164	2.3	Predicted significant effect
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	525222	183309	2.5	Background not affected by scheme
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	523792	181066	2.5	Predicted significant effect
HS2-000020BPP	Hammersmith and Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	522378	182877	2.5	Predicted significant effect
HS2-000020BPQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Roadside	524038	182028	2.5	Predicted significant effect
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	523763	181172	2.5	Predicted significant effect
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	523886	182358	2.5	Predicted significant effect
HS2-000020BPT	Hammersmith and Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	522478	182517	2.5	Predicted significant effect
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	529476	182267	2.5	Predicted significant effect
HS2-000020BPV	Camden Council	Phoenix Road	Background	529653	182958	2.5	Predicted significant effect

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	528939	183637	2.5	Predicted significant effect
HS2-000020BPX	Camden Council	Netley Street	Background	529177	182625	2.5	Predicted significant effect
HS2-000020BPY	Camden Council	Stanhope Street	Background	529060	182947	2.5	Predicted significant effect
HS2-000020BPZ	Camden Council	Albany Street	Roadside	528790	182923	2.5	Predicted significant effect
HS2-000020BQ0	Camden Council	Werrington Street	Background	529493	183113	2.3	Predicted significant effect
HS2-000020BQ1	Camden Council	Polygon Road	Background	529574	183045	2.5	Predicted significant effect
HS2-000020BQ2	Camden Council	Alexandra Place	Background	526320	183980	2.5	Predicted significant effect
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	529228	183172	2.5	Predicted significant effect
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	529290	182572	2.5	Predicted significant effect
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	527713	184392	2.7	Predicted significant effect
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	528836	183474	2.5	Predicted significant effect
HS2-000020BQ7	Camden Council	Arlington Road	Background	529009	183479	2.5	Predicted significant effect
HS2-000020BQ8	Camden Council	Clarkson Row	Background	529024	183213	2.5	Predicted significant effect
HS2-000020BQ9	Camden Council	Park Village East	Background	528923	183121	2.5	Predicted significant effect
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	529386	183132	2.5	Predicted significant effect
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	529147	182816	2.5	Predicted significant effect
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	529199	182704	2.5	Predicted significant effect
HS2-000020BQD	Camden Council	Drummond Crescent	Background	529648	182856	2.5	Predicted significant effect

Site ID	Local authority	Site location	Site location type	X coordinate	Y coordinate	Height (metres)	Site purpose
HS2-000020BQE	Hammersmith and Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	521996	181118	2.5	Predicted significant effect
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	520856	181733	2.5	Predicted significant effect
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	521312	182033	2.5	Predicted significant effect
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	508451	186879	2.4	Predicted significant effect
HS2-000020BQJ	Camden Council	Grafton Way	Background	529380	182225	2.5	Predicted significant effect
HS2-000020BQK	Camden Council	Junction of Drummond Street and Cobourg Street	Background	529398	182593	2.4	Predicted significant effect
HS2-000020BQL	Camden Council	Delancey Street	Roadside	528768	183581	2.4	Predicted significant effect

Appendix C – Annualisation and bias adjustment of NO₂ diffusion tubes

Table 4 – Annualisation and bias adjustment factors applied to each monitoring site

Site ID	Local authority	Site location	Site location type	2017 annualisation factor ¹⁷	2017 bias adjustment factor
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	Not annualised	0.901
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	Not annualised	0.901
HS2-000020BM7	Camden Council	Chalton Street	Roadside	Not annualised	0.901
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	Not annualised	0.901
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	Not annualised	0.901
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	Not annualised	0.901
HS2-000020BMB	Camden Council	Whitfield Street	Background	Not annualised	0.909
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	Not annualised	0.901
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	Not annualised	0.901
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	Not annualised	0.901
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	Not annualised	0.909
HS2-000020BMH	Camden Council	Nash Street	Background	Not annualised	0.909
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	Not annualised	0.909
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	Not annualised	0.901
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	Not annualised	0.909
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	Not annualised	0.901
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	Not annualised	0.901
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	Not annualised	0.901
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	Not annualised	0.909
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	Not annualised	0.901
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	Not annualised	0.873
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	Not annualised	0.901
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	Not annualised	0.901
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	Not annualised	0.901

¹⁷ Sites have not been annualised where there is greater than 75% or less than 25% data capture

Site ID	Local authority	Site location	Site location type	2017 annualisation factor ¹⁷	2017 bias adjustment factor
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	Not annualised	0.901
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	Not annualised	0.901
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	Not annualised	0.901
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	Not annualised	0.901
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	Not annualised	0.901
HS2-000020BN2	Hammersmith and Fulham Council	Lamp post on Du Cane Road	Roadside	Not annualised	0.901
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	Not annualised	0.901
HS2-000020BN4	Hammersmith and Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	Not annualised	0.901
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	Not annualised	0.901
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	Not annualised	0.901
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	Not annualised	0.901
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	Not annualised	0.901
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	0.912	0.909
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	Not annualised	0.873
HS2-000020BNF	Kensington and Chelsea Council	Unsuitable for long vehicles sign on St Ann's Villas	Roadside	1.096	0.901
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	Not annualised	0.901
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	Not annualised	0.873
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	Not annualised	0.901
HS2-000020BNK	Westminster City Council	London Underground sign outside Edgware Rd Station	Roadside	Not annualised	0.901
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	Not annualised	0.909
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	Not annualised	0.909
HS2-000020BNQ	Camden Council	Camley Street	Background	Not annualised	0.909
HS2-000020BNR	Hammersmith and Fulham Council	Lamp posts in Shepherd's Bush Common	Background	Not annualised	0.909
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	Not annualised	0.909
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	1.081	0.909
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	1.087	0.901
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	1.082	0.901
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	1.087	0.901
HS2-000020BNX	Hammersmith and Fulham Council	Signpost on A402 Goldhawk Road	Roadside	Not annualised	0.901

Site ID	Local authority	Site location	Site location type	2017 annualisation factor ¹⁷	2017 bias adjustment factor
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	Not annualised	0.901
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	Not annualised	0.901
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	Not annualised	0.901
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	Not annualised	0.901
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	Not annualised	0.901
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	Not annualised	0.873
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	1.058	0.873
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	Not annualised	0.901
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	Not annualised	0.901
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Roadside	Not annualised	0.901
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	Not annualised	0.909
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	Not annualised	0.909
HS2-000020BPB	Camden Council	Camden High Street	Roadside	Not annualised	0.901
HS2-000020BPC	Camden Council	Castlehaven Road	Background	Not annualised	0.909
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	Not annualised	0.901
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	Not annualised	0.901
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	Not annualised	0.909
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	Not annualised	0.901
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	Not annualised	0.901
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	Not annualised	0.909
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	Not annualised	0.901
HS2-000020BPP	Hammersmith and Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	Not annualised	0.901
HS2-000020BPQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus	Roadside	Not annualised	0.901

Site ID	Local authority	Site location	Site location type	2017 annualisation factor ¹⁷	2017 bias adjustment factor
		stop at Trevorton Road junction			
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	Not annualised	0.901
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	Not annualised	0.901
HS2-000020BPT	Hammersmith and Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	Not annualised	0.901
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	Not annualised	0.901
HS2-000020BPV	Camden Council	Phoenix Road	Background	Not annualised	0.909
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	Not annualised	0.901
HS2-000020BPX	Camden Council	Netley Street	Background	Not annualised	0.909
HS2-000020BPY	Camden Council	Stanhope Street	Background	Not annualised	0.909
HS2-000020BPZ	Camden Council	Albany Street	Roadside	Not annualised	0.901
HS2-000020BQ0	Camden Council	Werrington Street	Background	Not annualised	0.909
HS2-000020BQ1	Camden Council	Polygon Road	Background	Not annualised	0.909
HS2-000020BQ2	Camden Council	Alexandra Place	Background	Not annualised	0.909
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	Not annualised	0.873
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	Not annualised	0.909
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	Not annualised	0.901
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	Not annualised	0.909
HS2-000020BQ7	Camden Council	Arlington Road	Background	Not annualised	0.909
HS2-000020BQ8	Camden Council	Clarkson Row	Background	Not annualised	0.909
HS2-000020BQ9	Camden Council	Park Village East	Background	Not annualised	0.909
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	Not annualised	0.873
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	Not annualised	0.909
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	Not annualised	0.873
HS2-000020BQD	Camden Council	Drummond Crescent	Background	Not annualised	0.909
HS2-000020BQE	Hammersmith and Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	Not annualised	0.909
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	Not annualised	0.901
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	Not annualised	0.901
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	1.022	0.901
HS2-000020BQJ	Camden Council	Grafton Way	Background	0.948	0.909
HS2-000020BQK	Camden Council	Junction of Drummond Street and Cobourg Street	Background	0.948	0.909
HS2-000020BQL	Camden Council	Delancey Street	Roadside	0.948	0.901

Appendix D – Air quality monitoring results

HS2 NO₂ diffusion tube results

Table 5 – Annual mean NO₂ monitoring results for 2017

Site	Local authority	Site location	Site location type	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	50.4
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	47.4
HS2-000020BM7	Camden Council	Chalton Street	Roadside	58.4
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	58.0
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	52.4
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	60.3
HS2-000020BMB	Camden Council	Whitfield Street	Background	45.0
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	59.1
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	67.4
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	81.6
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	35.8
HS2-000020BMH	Camden Council	Nash Street	Background	39.5
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	39.1
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	51.4
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	38.2
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	67.3
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	41.9
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	48.6
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	40.1
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	50.6
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	62.4
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	37.3
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	39.3
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	55.5

Site	Local authority	Site location	Site location type	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	51.7
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	57.4
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	83.9
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	45.8
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	43.1
HS2-000020BN2	Hammersmith and Fulham Council	Lamp post on Du Cane Road	Roadside	57.8
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	52.5
HS2-000020BN4	Hammersmith and Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	52.6
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	50.5
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	61.0
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	38.5
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	42.4
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	28.8
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	40.1
HS2-000020BNF	Kensington and Chelsea Council	Unsuitable for long vehicles sign on St Ann's Villas	Roadside	41.5
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	38.6
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	39.8
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	54.1
HS2-000020BNK	Westminster City Council	London Underground sign outside Edgware Rd Station	Roadside	70.4
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	43.8
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	36.9
HS2-000020BNQ	Camden Council	Camley Street	Background	41.1
HS2-000020BNR	Hammersmith and Fulham Council	Lamp posts in Shepherd's Bush Common	Background	39.6
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	30.6
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	30.6
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	47.0
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	37.0
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	43.3
HS2-000020BNX	Hammersmith and Fulham Council	Signpost on A402 Goldhawk Road	Roadside	38.6
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	42.7
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	37.4

Site	Local authority	Site location	Site location type	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	55.0
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	58.7
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	46.8
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	74.3
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	62.1
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	76.2
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	57.3
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotary roadside automatic monitoring station	Roadside	71.9
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	38.7
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	30.7
HS2-000020BPB	Camden Council	Camden High Street	Roadside	66.0
HS2-000020BPC	Camden Council	Castlehaven Road	Background	36.6
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	34.4
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	44.3
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	37.2
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	43.2
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	45.7
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	32.1
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	38.5
HS2-000020BPP	Hammersmith and Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	46.3
HS2-000020BPQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Roadside	38.4
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	43.0
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	44.5
HS2-000020BPT	Hammersmith and Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	45.5

Site	Local authority	Site location	Site location type	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	51.5
HS2-000020BPV	Camden Council	Phoenix Road	Background	36.4
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	42.9
HS2-000020BPX	Camden Council	Netley Street	Background	36.0
HS2-000020BPY	Camden Council	Stanhope Street	Background	32.4
HS2-000020BPZ	Camden Council	Albany Street	Roadside	39.5
HS2-000020BQ0	Camden Council	Werrington Street	Background	33.9
HS2-000020BQ1	Camden Council	Polygon Road	Background	35.0
HS2-000020BQ2	Camden Council	Alexandra Place	Background	31.6
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	45.5
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	39.2
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	43.0
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	35.2
HS2-000020BQ7	Camden Council	Arlington Road	Background	34.9
HS2-000020BQ8	Camden Council	Clarkson Row	Background	35.3
HS2-000020BQ9	Camden Council	Park Village East	Background	32.7
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	53.6
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	33.4
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	39.7
HS2-000020BQD	Camden Council	Drummond Crescent	Background	41.2
HS2-000020BQE	Hammersmith and Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	36.8
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	57.0
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	64.0
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	37.2
HS2-000020BQJ	Camden Council	Grafton Way	Background	54.2
HS2-000020BQK	Camden Council	Junction of Drummond Street and Cobourg Street	Background	37.5
HS2-000020BQL	Camden Council	Delancey Street	Roadside	49.3

Notes:

Exceedances of the NO₂ annual mean air quality standard of 40 µg/m³ are shown in bold.

Table 6 – Full monthly raw NO₂ monitoring results for 2017 (prior to annualisation and bias adjustment)

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	72.6	57.0	55.6	No data	53.2	53.5	48.9	48.2	55.6	53.1	60.9	56.8	55.9	11
HS2-000020 BM6	Camden Council	Brunswick Square	Roadside	61.3	52.6	55.2	49.7	50.9	53.3	40.0	45.5	44.5	54.0	66.3	58.0	52.6	12
HS2-000020 BM7	Camden Council	Chalton Street	Roadside	85.8	70.0	68.7	55.4	57.5	No data	48.5	64.6	55.1	70.9	64.9	71.8	64.8	11
HS2-000020 BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	77.6	59.7	56.7	60.6	63.7	66.3	56.9	65.8	81.7	65.1	61.8	57.0	64.4	12
HS2-000020 BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	72.3	61.2	50.9	56.3	60.2	64.4	47.7	54.4	55.0	55.9	63.3	56.5	58.2	12
HS2-000020 BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	No data	No data	67.9	67.3	68.5	64.9	No data	66.3	64.0	64.7	77.7	60.9	66.9	9
HS2-000020 BMB	Camden Council	Whitfield Street	Background	72.6	54.6	53.3	45.2	49.0	44.9	29.6	45.1	41.7	44.9	57.5	55.0	49.5	12
HS2-000020 BMC	Camden Council	Hampstead Road	Roadside	76.8	71.4	68.3	65.2	71.0	62.5	46.4	65.4	65.8	67.5	67.9	58.8	65.6	12
HS2-000020 BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	81.4	84.4	77.5	79.8	79.8	92.2	60.9	68.9	72.3	67.2	72.2	60.7	74.8	12
HS2-000020 BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	106.4	89.5	93.3	98.0	77.0	85.9	82.8	87.2	87.4	100.4	94.0	84.7	90.5	12
HS2-000020 BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	63.1	52.9	42.2	34.1	35.1	34.6	29.8	31.4	37.7	32.6	39.5	39.2	39.3	12

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BMH	Camden Council	Nash Street	Background	58.5	51.4	42.9	39.2	40.2	36.1	31.4	No data	39.2	38.9	54.2	46.4	43.5	11
HS2-000020 BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	63.5	46.5	42.0	39.2	39.5	38.2	31.9	40.3	39.5	39.5	50.9	45.3	43.0	12
HS2-000020 BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	71.2	83.3	53.7	48.2	51.0	51.9	41.4	53.8	52.3	52.1	64.0	61.4	57.0	12
HS2-000020 BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	63.2	47.8	42.8	39.2	38.0	35.2	27.3	33.6	39.3	44.2	47.4	46.6	42.0	12
HS2-000020 BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	78.9	69.1	79.5	73.0	58.6	68.2	61.8	65.4	83.1	87.7	91.1	79.6	74.7	12
HS2-000020 BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	63.7	47.6	48.3	45.5	42.9	38.9	35.0	45.3	45.7	45.1	53.7	46.9	46.5	12
HS2-000020 BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	72.4	59.0	53.2	49.2	62.2	51.6	38.9	49.0	53.0	47.3	58.0	No data	54.0	11
HS2-000020 BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	63.2	49.5	44.1	44.6	44.4	38.7	29.5	37.1	35.3	41.8	56.3	44.9	44.1	12
HS2-000020 BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	77.8	60.0	68.4	19.1	64.1	57.1	49.2	53.6	51.1	56.4	60.2	57.4	56.2	12
HS2-000020 BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	99.9	78.4	68.2	88.0	81.6	84.7	No data	55.8	49.4	57.5	63.8	58.4	71.4	11
HS2-000020 BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	No data	No data	48.2	35.2	41.4	37.1	27.7	45.1	39.1	44.6	47.8	47.9	41.4	10
HS2-000020 BMV	Camden Council	Primrose Hill Road	Roadside	62.4	No data	44.4	No data	38.5	38.3	27.2	36.9	39.0	42.2	58.1	49.6	43.7	10

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	81.4	55.2	61.1	56.7	56.3	54.5	47.5	66.2	60.7	66.2	68.8	65.3	61.6	12
HS2-000020 BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	76.7	62.1	69.1	56.1	56.3	46.2	40.1	50.3	52.0	59.1	65.4	55.0	57.4	12
HS2-000020 BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	82.2	63.0	54.1	63.2	No data	74.1	46.8	56.5	61.8	61.4	73.4	64.1	63.7	11
HS2-000020 BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	147.1	94.4	93.2	101.7	90.5	94.0	80.1	76.5	76.2	83.8	92.8	88.0	93.2	12
HS2-000020 BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	67.7	58.4	47.0	No data	No data	54.0	38.2	41.6	No data	47.4	53.8	49.6	50.9	9
HS2-000020 BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	63.2	59.4	49.5	53.2	34.4	45.1	30.9	45.8	42.3	50.4	47.5	52.5	47.9	12
HS2-000020 BN2	Hammersmith and Fulham Council	Lamp post on Du Cane Road	Roadside	111.7	66.3	51.9	60.4	57.1	72.0	44.3	56.0	55.9	62.8	70.7	61.0	64.2	12
HS2-000020 BN3	Brent Council	Sign post on High Street Harlesden	Roadside	80.3	60.5	51.9	59.0	51.6	No data	48.7	57.9	45.9	55.9	67.1	61.9	58.2	11
HS2-000020 BN4	Hammersmith and Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	98.2	66.2	50.1	64.8	62.1	56.6	48.0	53.5	50.6	46.6	54.3	49.9	58.4	12
HS2-000020 BN5	Ealing Council	Sign post on Victoria Road	Roadside	81.3	No data	46.6	55.1	47.6	54.8	43.1	45.3	53.9	60.7	66.2	61.7	56.0	11
HS2-000020 BN7	Ealing Council	The Approach street sign	Roadside	87.1	71.3	60.9	67.9	51.4	66.4	58.3	67.4	57.1	72.5	74.4	78.4	67.7	12

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	65.5	43.2	47.6	37.4	37.3	37.3	28.3	36.6	39.9	43.1	46.2	49.9	42.7	12
HS2-000020 BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	67.1	49.9	45.3	46.0	42.7	44.3	30.6	40.8	44.6	46.4	56.8	49.6	47.0	12
HS2-000020 BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	48.2	38.6	34.1	25.2	No data	No data	No data	25.4	No data	32.8	37.3	36.0	34.7	8
HS2-000020 BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	58.4	55.3	50.0	43.0	35.0	40.7	27.0	No data	39.1	50.0	55.0	51.4	45.9	11
HS2-000020 BNF	Kensington and Chelsea Council	Unsuitable for long vehicles sign on St Ann's Villas	Roadside	No data	53.0	42.0	No data	No data	41.9	30.3	36.2	No data	41.0	No data	49.7	42.0	7
HS2-000020 BNG	Brent Council	Lamp post on Donnington Road	Roadside	33.4	55.3	47.3	48.8	41.8	39.6	31.8	38.0	20.6	46.0	59.2	51.9	42.8	12
HS2-000020 BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	57.4	45.6	49.2	46.6	43.1	43.6	30.7	39.0	42.5	45.4	52.0	52.4	45.6	12
HS2-000020 BNJ	Westminster City Council	Light post on Park Road	Roadside	73.9	No data	69.6	51.2	63.1	59.4	43.2	53.6	54.9	57.9	65.1	68.5	60.0	11
HS2-000020 BNK	Westminster City Council	London Underground sign outside Edgware Rd Station	Roadside	86.1	78.7	72.7	72.6	86.1	79.9	67.6	No data	79.0	73.8	84.8	78.8	78.2	11
HS2-000020 BNL	Westminster City Council	Lamp post on Penfold Street	Background	69.4	57.1	47.8	45.3	44.3	43.0	28.8	38.8	46.9	47.8	56.4	52.2	48.1	12
HS2-000020 BNN	Camden Council	Lincoln's Inn Fields	Background	54.0	48.1	45.0	40.0	34.1	39.1	23.6	38.0	34.4	No data	No data	49.3	40.6	10
HS2-000020 BNQ	Camden Council	Camley Street	Background	70.4	No data	43.2	34.2	38.1	35.8	No data	No data	39.7	44.2	54.2	47.1	45.2	9

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BNR	Hammersmith and Fulham Council	Lamp posts in Shepherd's Bush Common	Background	54.4	No data	43.6	44.0	42.3	40.7	29.2	39.7	36.9	41.9	55.4	50.7	43.5	11
HS2-000020 BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	52.6	39.4	31.2	29.1	27.0	27.4	21.2	26.2	31.2	32.5	46.4	39.4	33.6	12
HS2-000020 BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	Monitoring did not commence until May 2017				24.9	24.9	20.3	35.0	26.4	No data	51.7	34.8	31.1	7
HS2-000020 BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	Monitoring did not commence until May 2017				43.1	48.2	37.5	43.0	42.4	58.7	57.5	53.4	48.0	8
HS2-000020 BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	Monitoring did not commence until May 2017				No data	37.4	27.8	23.3	38.7	38.6	51.6	48.0	37.9	7
HS2-000020 BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	Monitoring did not commence until May 2017				51.4	44.6	40.3	39.8	37.9	44.2	53.7	41.7	44.2	8
HS2-000020 BNX	Hammersmith and Fulham Council	Signpost on A402 Goldhawk Road	Roadside	57.9	55.5	40.2	37.0	39.1	40.6	29.8	34.0	36.7	41.6	53.4	48.1	42.8	12
HS2-000020 BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	62.6	53.6	49.1	43.2	41.6	43.1	33.5	37.3	40.2	43.0	66.7	55.0	47.4	12
HS2-000020 BNZ	Camden Council	Mansfield Road	Roadside	55.2	43.1	46.6	44.2	32.4	34.6	24.8	36.6	35.0	43.5	54.7	47.4	41.5	12
HS2-000020 BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	81.1	62.4	58.1	57.3	63.1	54.8	62.2	54.3	35.3	72.0	70.6	No data	61.0	11
HS2-000020 BP1	Westminster City Council	Lamp post on Brook Street	Roadside	77.4	74.2	66.9	59.7	56.7	67.8	50.5	50.9	56.0	69.1	73.0	80.2	65.2	12

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	68.7	50.8	49.1	48.5	51.1	46.0	37.7	47.7	46.0	60.5	60.2	57.4	52.0	12
HS2-000020 BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	108.7	83.6	92.6	81.0	81.0	92.8	63.5	69.7	75.8	89.9	91.9	90.6	85.1	12
HS2-000020 BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	97.8	no data	64.6	71.3	63.6	56.8	49.0	65.3	no data	69.6	no data	no data	67.3	8
HS2-000020 BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	107.3	88.6	83.6	75.0	78.8	98.7	70.8	83.4	83.5	81.1	80.9	83.8	84.6	12
HS2-000020 BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	90.6	68.9	58.3	63.6	47.4	57.6	42.3	65.1	60.0	64.3	75.7	69.0	63.6	12
HS2-000020 BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Roadside	93.2	81.8	78.9	90.9	66.3	85.6	65.1	82.7	77.4	77.6	76.3	82.2	79.8	12
HS2-000020 BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	62.3	48.8	40.7	36.5	39.1	36.8	27.8	38.4	37.4	36.5	52.5	53.5	42.5	12
HS2-000020 BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	52.0	40.5	30.5	27.6	31.1	28.5	19.8	27.1	31.7	31.0	45.2	40.7	33.8	12

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BPB	Camden Council	Camden High Street	Roadside	79.4	74.3	70.9	76.2	No data	66.8	59.2	70.5	77.0	No data	81.4	77.3	73.3	10
HS2-000020 BPC	Camden Council	Castlehaven Road	Background	51.6	45.6	41.5	36.7	36.3	37.1	22.8	35.8	38.2	40.1	51.9	45.6	40.3	12
HS2-000020 BPD	Camden Council	Prince of Wales Road	Roadside	59.1	42.8	42.9	35.8	34.9	33.7	22.7	33.3	36.4	35.3	41.1	40.3	38.2	12
HS2-000020 BPE	Camden Council	Haverstock Hill	Roadside	63.0	48.3	48.0	No data	44.9	51.6	34.9	46.9	44.7	50.2	54.4	53.8	49.2	11
HS2-000020 BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	56.9	47.5	41.3	35.3	37.3	36.6	19.4	33.1	37.8	39.9	60.1	46.1	40.9	12
HS2-000020 BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	73.4	54.8	49.5	44.9	44.7	42.5	33.5	41.3	42.9	42.6	54.7	51.1	48.0	12
HS2-000020 BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	71.5	57.6	51.4	48.3	43.9	48.8	29.3	47.3	43.4	49.5	63.3	54.6	50.7	12
HS2-000020 BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	51.0	40.2	35.7	31.2	32.0	30.6	19.9	29.9	36.8	31.2	43.0	42.5	35.3	12
HS2-000020 BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	62.2	46.7	42.5	41.6	42.6	32.9	35.2	34.9	No data	40.6	45.9	45.2	42.7	11
HS2-000020 BPP	Hammersmith and Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	77.2	54.3	45.1	46.3	39.0	47.5	35.4	43.0	59.2	54.9	67.0	47.8	51.4	12
HS2-000020 BPQ	Kensington and Chelsea Council	Lamp post along Ladbrooke Grove, near shops and bus stop at Trevorton Road junction	Roadside	57.7	44.7	43.1	No data	42.8	41.6	28.7	39.7	40.2	40.1	No data	48.2	42.7	10

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	64.6	46.9	46.6	No data	48.1	48.2	29.0	42.1	45.5	49.2	56.6	47.7	47.7	11
HS2-000020 BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	65.0	50.0	46.9	47.1	58.6	47.4	33.0	41.7	48.3	44.5	57.2	53.6	49.4	12
HS2-000020 BPT	Hammersmith and Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	80.6	55.1	40.9	46.1	49.2	50.1	37.2	47.9	48.9	46.0	55.3	48.9	50.5	12
HS2-000020 BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	74.0	59.3	56.7	65.5	58.7	57.7	40.7	50.0	43.1	56.7	68.8	54.9	57.2	12
HS2-000020 BPV	Camden Council	Phoenix Road	Background	54.6	48.5	43.1	34.4	35.6	34.7	28.2	33.5	39.2	42.3	No data	45.9	40.0	11
HS2-000020 BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	58.4	50.3	47.9	45.7	47.9	49.1	35.1	42.3	46.3	45.4	54.4	48.2	47.6	12
HS2-000020 BPX	Camden Council	Netley Street	Background	53.0	45.8	40.9	36.3	39.4	37.3	30.0	33.8	36.4	38.5	41.5	42.7	39.6	12
HS2-000020 BPY	Camden Council	Stanhope Street	Background	55.9	44.2	28.2	34.0	22.0	29.6	20.9	30.4	37.3	39.7	44.0	40.9	35.6	12
HS2-000020 BPZ	Camden Council	Albany Street	Roadside	57.1	49.6	46.3	39.9	44.3	41.9	29.5	35.9	42.3	45.8	46.4	47.7	43.9	12
HS2-000020 BQ0	Camden Council	Werrington Street	Background	55.0	44.9	37.9	34.5	34.2	32.4	23.2	30.3	31.4	36.7	42.9	43.5	37.3	12
HS2-000020 BQ1	Camden Council	Polygon Road	Background	No data	45.6	39.2	36.1	33.2	35.2	22.9	No data	39.7	41.3	52.7	No data	38.5	9

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BQ2	Camden Council	Alexandra Place	Background	54.5	37.4	38.5	30.9	28.7	27.1	18.9	30.9	35.5	33.3	41.1	40.0	34.7	12
HS2-000020 BQ3	Camden Council	Harrington Square	Kerbside	68.7	54.5	49.2	48.9	48.1	52.9	38.1	41.9	50.4	55.2	60.9	56.8	52.1	12
HS2-000020 BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	60.2	54.3	46.3	38.8	42.6	39.0	32.1	34.7	30.9	44.3	50.9	44.1	43.2	12
HS2-000020 BQ5	Camden Council	Adelaide Road	Roadside	67.5	54.1	53.1	41.5	44.0	52.3	24.1	39.1	44.8	44.4	55.2	52.9	47.7	12
HS2-000020 BQ6	Camden Council	Mornington Terrace	Background	53.7	41.7	40.3	35.7	36.2	30.5	25.8	34.7	34.7	39.6	44.7	47.1	38.7	12
HS2-000020 BQ7	Camden Council	Arlington Road	Background	58.5	44.0	38.7	36.7	33.7	31.0	25.4	33.1	39.3	39.1	42.5	38.2	38.3	12
HS2-000020 BQ8	Camden Council	Clarkson Row	Background	50.3	45.3	35.3	34.6	38.9	31.9	27.2	36.3	36.7	No data	47.5	42.8	38.8	11
HS2-000020 BQ9	Camden Council	Park Village East	Background	44.7	41.6	37.1	30.1	32.0	31.2	21.5	31.1	35.5	40.2	42.6	43.7	35.9	12
HS2-000020 BQA	Camden Council	Eversholt Street	Kerbside	75.0	59.0	50.5	64.2	57.5	74.6	50.0	No data	41.9	63.9	67.6	70.4	61.3	11
HS2-000020 BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	56.3	44.7	31.4	32.5	32.5	31.1	26.9	29.8	33.9	39.9	No data	45.6	36.8	11
HS2-000020 BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	61.1	47.5	46.7	40.2	44.8	45.0	27.5	38.6	42.5	47.9	53.2	49.8	45.4	12
HS2-000020 BQD	Camden Council	Drummond Crescent	Background	65.9	58.5	47.9	44.3	38.8	42.1	34.5	38.1	42.7	48.3	39.5	43.4	45.3	12

Site ID	Local authority	Site location	Site location type	NO ₂ concentration (µg/m ³)													Number of months of data
				Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Mean	
HS2-000020 BQE	Hammersmith and Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	58.9	46.5	37.3	35.4	31.9	40.8	21.2	35.9	40.6	43.1	50.8	43.5	40.5	12
HS2-000020 BQF	Ealing Council	Conway Drive sign post	Roadside	78.6	72.2	53.4	58.5	50.4	70.3	46.9	54.2	53.3	64.9	83.8	72.2	63.2	12
HS2-000020 BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	89.0	No data	72.7	60.6	64.7	82.0	No data	58.7	51.6	75.8	80.2	74.9	71.0	10
HS2-000020 BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	Monitoring did not commence until May 2017				35.2	41.1	No data	No data	37.2	40.4	41.5	47.3	40.4	6
HS2-000020 BQJ	Camden Council	Grafton Way	Background	Monitoring did not commence until September 2017								52.4	65.2	67.5	66.7	63.0	4
HS2-000020 BQK	Camden Council	Junction of Drummond Street and Cobourg Street	Background	Monitoring did not commence until September 2017								32.9	42.2	51.4	47.4	43.5	4
HS2-000020 BQL	Camden Council	Delancey Street	Roadside	Monitoring did not commence until September 2017								50.6	59.4	68.0	52.8	57.7	4

Notes:

Table contains raw data as presented in laboratory reports. Mean concentrations have not been annualised or bias corrected and are not directly comparable to the NO₂ annual mean air quality standard of 40µg/m³.

Appendix E – Comparison of 2017 annual mean NO₂ diffusion tube results and the predicted NO₂ annual mean concentrations from the ES

Table 7 presents a comparison of the 2017 annual mean NO₂ diffusion tube results and the predicted 2012 and 2017 NO₂ annual mean concentrations from the ES for the scenario without the Proposed Scheme in place.

Table 7 – Comparison of the 2017 annual mean NO₂ diffusion tube results and the predicted 2012 and 2017 NO₂ annual mean concentrations from the ES

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Predicted significant effect	50.4	1-204	86.4	75.6	5	-25.2	-33%
HS2-000020BM6	Camden Council	Brunswick Square	Predicted significant effect	47.4	1-7	61.1	52.5	67	-5.1	-10%
HS2-000020BM7	Camden Council	Chalton Street	Predicted significant effect	58.4	1-1	104.8	90.1	14	-31.7	-35%
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Predicted significant effect	58.0	1-178	91.7	81	29	-23	-28%
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Predicted significant effect	52.4	1-47	93.6	82.3	16	-29.9	-36%
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Predicted significant effect	60.3	1-170	99.3	80	0	-19.7	-25%
HS2-000020BMB	Camden Council	Whitfield Street	Predicted significant effect	45.0	1-287	63.6	53.4	11	-8.4	-16%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BMC	Camden Council	Hampstead Road	Predicted significant effect	59.1	1-165	83.1	66.6	9	-7.5	-11%
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Predicted significant effect	67.4	1-42	89.6	75.7	49	-8.3	-11%
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Predicted significant effect	81.6	1-279	86.1	72.8	17	8.8	12%
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Predicted significant effect	35.8	1-79	50.4	43.4	0	-7.6	-18%
HS2-000020BMH	Camden Council	Nash Street	Predicted significant effect	39.5	1-261	54.5	46.4	7	-6.9	-15%
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Predicted significant effect	39.1	1-257	58.6	50.1	24	-11	-22%
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Predicted significant effect	51.4	1-298	61.4	53.5	9	-2.1	-4%
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Predicted significant effect	38.2	1-9	52	45.8	2	-7.6	-17%
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Predicted significant effect	67.3	2-72	69.4	57.2	6	10.1	18%
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Predicted significant effect	41.9	1-246	55.8	46.7	4	-4.8	-10%
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Predicted significant effect	48.6	2-103	70.5	58.4	22	-9.8	-17%
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Predicted significant effect	40.1	2-98	45.5	39.1	7	1	3%
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Predicted significant effect	50.6	2-8	64.3	53.2	5	-2.6	-5%
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Predicted significant effect	62.4	2-38	79.3	63.4	21	-1	-2%
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Predicted significant effect	37.3	3-153	52.4	46.3	14	-9	-19%
HS2-000020BMV	Camden Council	Primrose Hill Road	Predicted significant effect	39.3	3-213	55.2	46.7	32	-7.4	-16%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Predicted significant effect	55.5	3-60	64.9	53.6	8	1.9	4%
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Predicted significant effect	51.7	1-141	65.1	55.7	24	-4	-7%
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Predicted significant effect	57.4	4-65	64.2	54.1	13	3.3	6%
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Predicted significant effect	83.9	3-96	70.4	56.4	8	27.5	49%
HS2-000020BNO	Westminster City Council	Lamp post on Ladbroke Grove	Predicted significant effect	45.8	4-225	77.1	66.2	14	-20.4	-31%
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Predicted significant effect	43.1	4-193	62.3	53.2	4	-10.1	-19%
HS2-000020BN2	Hammersmith and Fulham Council	Lamp post on Du Cane Road	Predicted significant effect	57.8	4-204	72.1	61.1	12	-3.3	-5%
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Predicted significant effect	52.5	4-209	68.7	58.5	47	-6	-10%
HS2-000020BN4	Hammersmith and Fulham Council	End of cycle lane sign on Old Oak Road	Predicted significant effect	52.6	4-155	88.7	76	18	-23.4	-31%
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Predicted significant effect	50.5	4-12	64.6	52.6	3	-2.1	-4%
HS2-000020BN7	Ealing Council	The Approach street sign	Predicted significant effect	61.0	4-152	83.3	69.6	20	-8.6	-12%
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Predicted significant effect	38.5	3-193	47.4	39.4	2	-0.9	-2%
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Predicted significant effect	42.4	1-284	53.4	45.5	19	-3.1	-7%
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Predicted significant effect	28.8	1-70	49.4	42.7	22	-13.9	-33%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Predicted significant effect	40.1	1-281	61.1	52	15	-11.9	-23%
HS2-000020BNF	Kensington and Chelsea Council	Unsuitable for long vehicles sign on St Ann's Villas	Predicted significant effect	41.5	4-182	59.5	50.8	1	-9.3	-18%
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Predicted significant effect	38.6	4-120	53.7	46	14	-7.4	-16%
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Predicted significant effect	39.8	2-85	61.6	51.3	18	-11.5	-22%
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Predicted significant effect	54.1	1-242	69.7	57.4	10	-3.3	-6%
HS2-000020BNK	Westminster City Council	London Underground sign outside Edgware Rd Station	Predicted significant effect	70.4	1-25	100.3	86.8	2	-16.4	-19%
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background not affected by scheme	43.8	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background not affected by scheme	36.9	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNQ	Camden Council	Camley Street	Background not affected by scheme	41.1	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNR	Hammersmith and Fulham Council	Lamp posts in Shepherd's Bush Common	Background not affected by scheme	39.6	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background not affected by scheme	30.6	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background not affected by scheme	30.6	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside not affected by scheme	47.0	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside not affected by scheme	37.0	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside not affected by scheme	43.3	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BNX	Hammersmith and Fulham Council	Signpost on A402 Goldhawk Road	Roadside not affected by scheme	38.6	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside not affected by scheme	42.7	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside not affected by scheme	37.4	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside not affected by scheme	55.0	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside not affected by scheme	58.7	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside not affected by scheme	46.8	n/a	n/a	n/a	n/a	n/a	n/a

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Colocation kerbside	74.3	1-293	92	77.3	33	-3	-4%
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Colocation kerbside	62.1	3-64	76.8	60.2	9	1.9	3%
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Colocation roadside	76.2	1-1	104.8	90.1	32	-13.9	-15%
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Colocation roadside	57.3	5-35	74.3	63.4	14	-6.1	-10%
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Colocation roadside	71.9	5-49	89	76	102	-4.1	-5%
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Colocation background	38.7	1-276	66.1	58.6	90	-19.9	-34%
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Colocation background	30.7	4-121	59.6	50.8	84	-20.1	-40%
HS2-000020BPB	Camden Council	Camden High Street	Predicted significant effect	66.0	2-63	62.1	50.7	68	15.3	30%

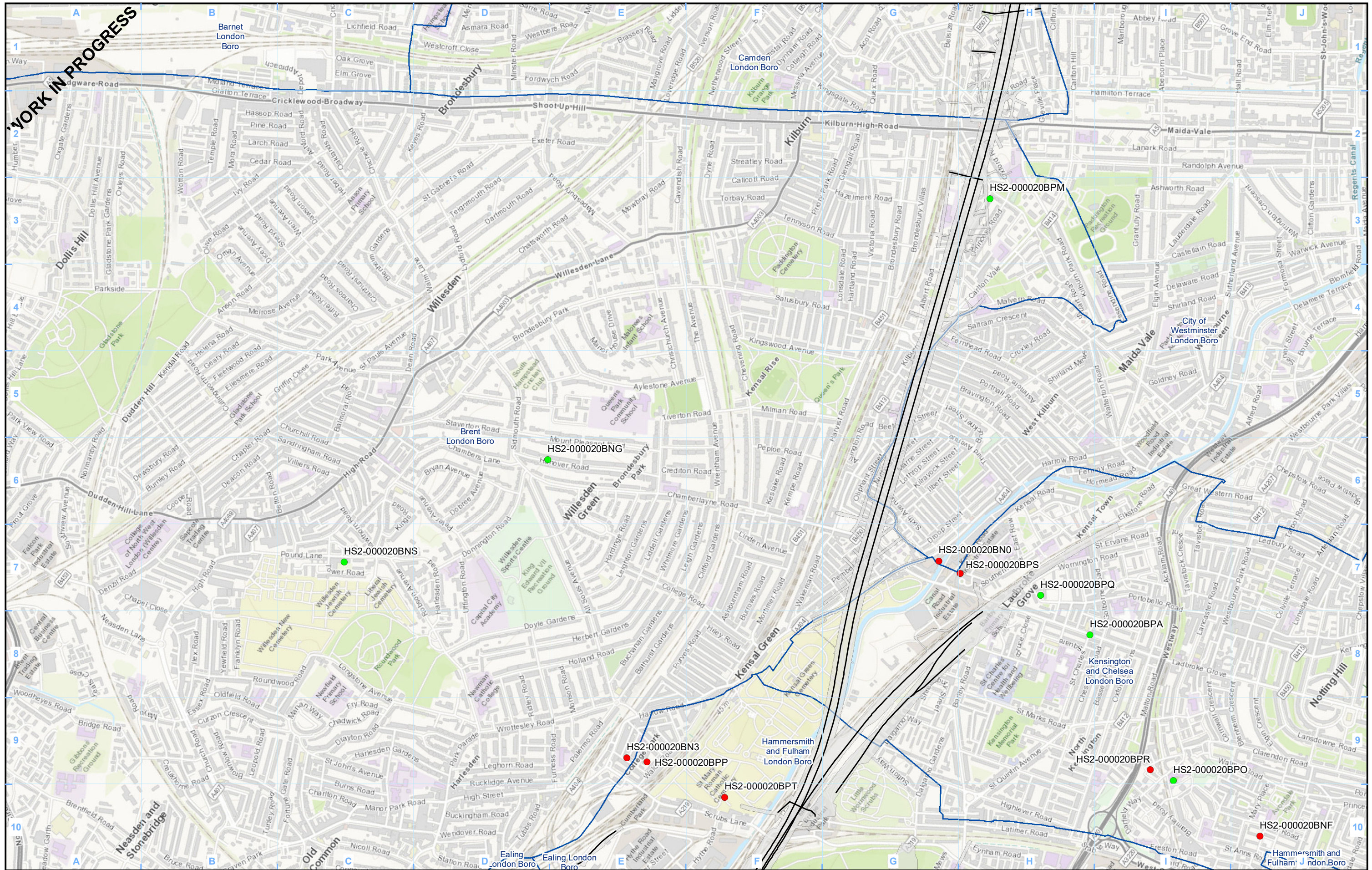
Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BPC	Camden Council	Castlehaven Road	Predicted significant effect	36.6	2-93	48.8	42.3	29	-5.7	-13%
HS2-000020BPD	Camden Council	Prince of Wales Road	Predicted significant effect	34.4	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BPE	Camden Council	Haverstock Hill	Predicted significant effect	44.3	3-41	50.5	42.7	25	1.6	4%
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Predicted significant effect	37.2	3-130	46.3	40.7	8	-3.5	-9%
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Predicted significant effect	43.2	1-48	60.7	53	66	-9.8	-18%
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Predicted significant effect	45.7	1-62	61.5	51.5	8	-5.8	-11%
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background not affected by scheme	32.1	n/a	n/a	n/a	n/a	n/a	n/a
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Predicted significant effect	38.5	4-104	70.2	60.2	19	-21.7	-36%
HS2-000020BPP	Hammersmith and Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Predicted significant effect	46.3	4-209	68.7	58.5	57	-12.2	-21%
HS2-000020BPQ	Kensington and Chelsea Council	Lamp post along Ladbrooke Grove, near shops and bus stop at Trevorton Road junction	Predicted significant effect	38.4	4-217	61.5	51.7	9	-13.3	-26%
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Predicted significant effect	43.0	4-173	75.2	63.8	33	-20.8	-33%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Predicted significant effect	44.5	4-223	50.5	43.1	13	1.4	3%
HS2-000020BPT	Hammersmith and Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Predicted significant effect	45.5	4-206	64.8	55.3	59	-9.8	-18%
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Predicted significant effect	51.5	1-4	76.1	62.1	4	-10.6	-17%
HS2-000020BPV	Camden Council	Phoenix Road	Predicted significant effect	36.4	1-269	57.4	51.3	51	-14.9	-29%
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Predicted significant effect	42.9	1-58	56.1	46.9	27	-4	-9%
HS2-000020BPX	Camden Council	Netley Street	Predicted significant effect	36.0	1-292	83.2	66.6	87	-30.6	-46%
HS2-000020BPY	Camden Council	Stanhope Street	Predicted significant effect	32.4	1-254	51.5	43.5	97	-11.1	-26%
HS2-000020BPZ	Camden Council	Albany Street	Predicted significant effect	39.5	1-283	54.1	46.3	32	-6.8	-15%
HS2-000020BQ0	Camden Council	Werrington Street	Predicted significant effect	33.9	1-191	56.7	50.1	82	-16.2	-32%
HS2-000020BQ1	Camden Council	Polygon Road	Predicted significant effect	35.0	1-208	50.2	43.1	57	-8.1	-19%
HS2-000020BQ2	Camden Council	Alexandra Place	Predicted significant effect	31.6	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BQ3	Camden Council	Harrington Square	Predicted significant effect	45.5	1-134	61.5	52.2	38	-6.7	-13%
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Predicted significant effect	39.2	1-166	65.4	54.4	39	-15.2	-28%
HS2-000020BQ5	Camden Council	Adelaide Road	Predicted significant effect	43.0	3-211	46.2	39.3	109	3.7	9%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BQ6	Camden Council	Mornington Terrace	Predicted significant effect	35.2	1-246	55.8	46.7	100	-11.5	-25%
HS2-000020BQ7	Camden Council	Arlington Road	Predicted significant effect	34.9	1-198	51.9	44.1	23	-9.2	-21%
HS2-000020BQ8	Camden Council	Clarkson Row	Predicted significant effect	35.3	1-253	50.9	43.8	56	-8.5	-19%
HS2-000020BQ9	Camden Council	Park Village East	Predicted significant effect	32.7	No assessed receptor location nearby	n/a	n/a	n/a	n/a	n/a
HS2-000020BQA	Camden Council	Eversholt Street	Predicted significant effect	53.6	1-192	57.7	51.2	13	2.4	5%
HS2-000020BQB	Camden Council	Junction of Harrington Street and Vardell Street	Predicted significant effect	33.4	1-322	63.6	50	5	-16.6	-33%
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Predicted significant effect	39.7	1-71	63.1	53.5	32	-13.8	-26%
HS2-000020BQD	Camden Council	Drummond Crescent	Predicted significant effect	41.2	1-186	66.7	56.8	58	-15.6	-27%
HS2-000020BQE	Hammersmith and Fulham Council	Lamp post next to No 11 Wulfstan Street	Predicted significant effect	36.8	4-262	48.1	40.8	8	-4	-10%
HS2-000020BQF	Ealing Council	Conway Drive sign post	Predicted significant effect	57.0	4-55	63.7	55.2	36	1.8	3%
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Predicted significant effect	64.0	4-143	52.6	45.2	6	18.8	42%
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Predicted significant effect	37.2	6-73	45.6	39	59	-1.8	-5%
HS2-000020BQJ	Camden Council	Grafton Way	Predicted significant effect	54.2	1-4	76.1	62.1	109	-7.9	-13%
HS2-000020BQK	Camden Council	Junction of Drummond Street and Cobourg Street	Predicted significant effect	37.5	1-169	64	52.6	7	-15.1	-29%

Site ID	Local authority	Site location	Site purpose	2017 annual mean NO ₂ concentration, annualised and bias adjusted (µg/m ³)	Nearest ES assessed receptor ID	Modelled annual mean NO ₂ 2012 (µg/m ³)	Modelled annual mean NO ₂ 2017 (without scheme, µg/m ³)	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored vs 2017 modelled	% diff 2017
HS2-000020BQL	Camden Council	Delancey Street	Predicted significant effect	49.3	2-87	62.5	51.4	19	-2.1	-4%

Appendix F – Maps of HS2 Ltd. monitoring survey locations and 2017 monitored results



Legend

NO₂ Monitoring Positions

2017 Results

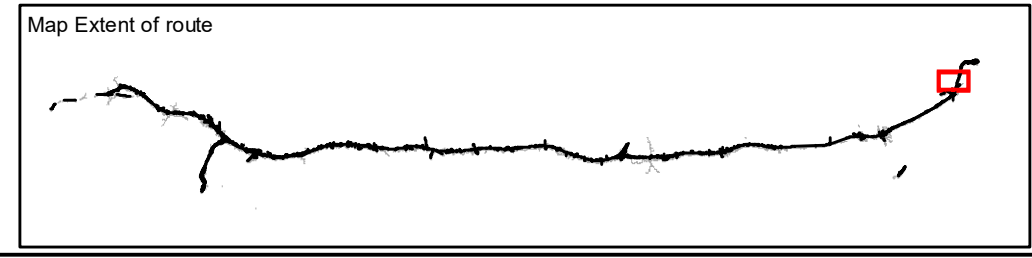
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— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries

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Map Number
HS2-EV-REP-000-000030

Map Name
NO₂ Monitoring Positions
London Borough of Brent

(1 of 6)

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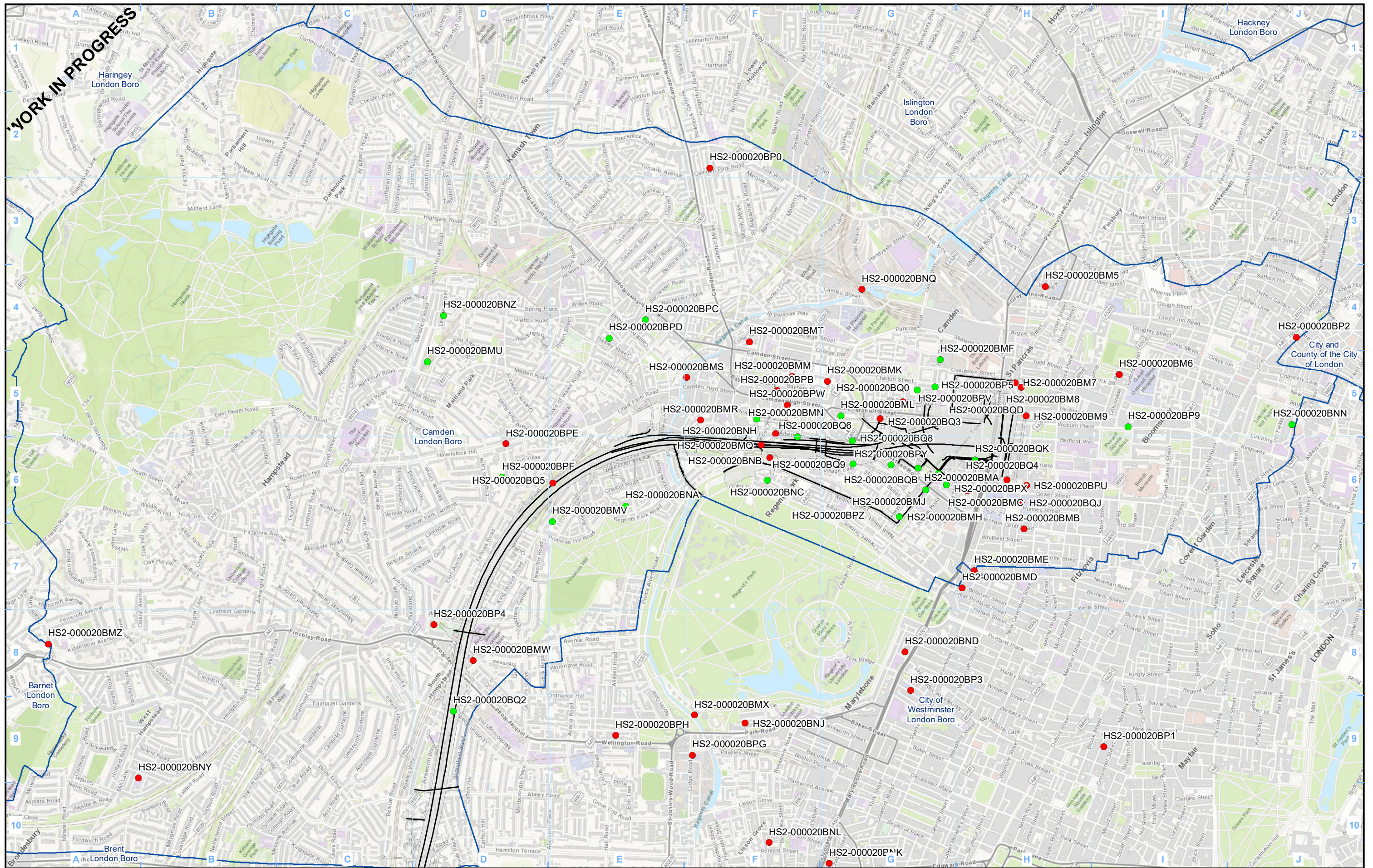
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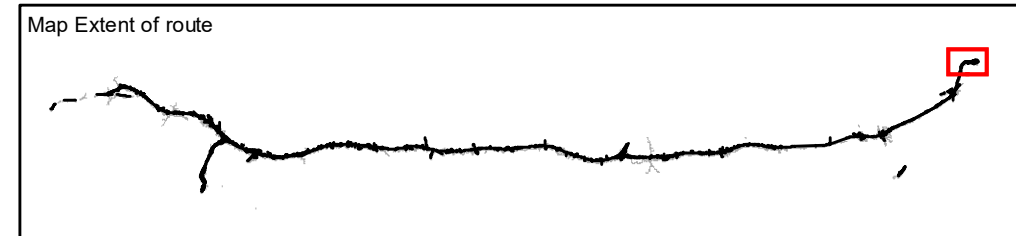
Legend

NO₂ Monitoring Positions

- < 40 µg/m³ (below AQS)
- ≥ 40 µg/m³ (above AQS)

Work Sections Centreline

- Consolidated Land Boundary
- ▭ District Borough Unitary Boundaries



Map Number
HS2-EV-REP-000-000030

Map Name
NO₂ Monitoring Positions
London Borough of Camden

(2 of 6)

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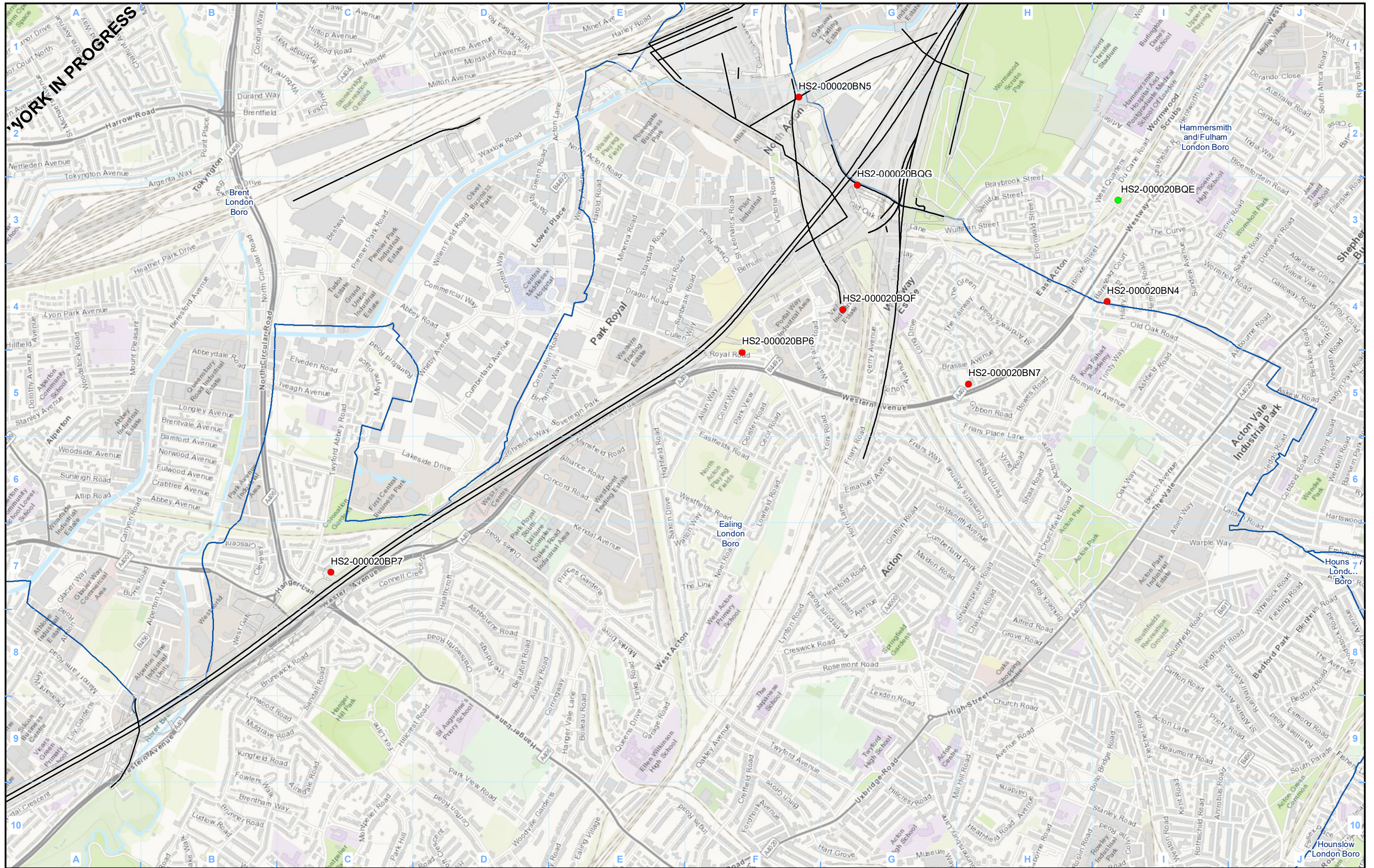
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Legend

NO₂ Monitoring Positions

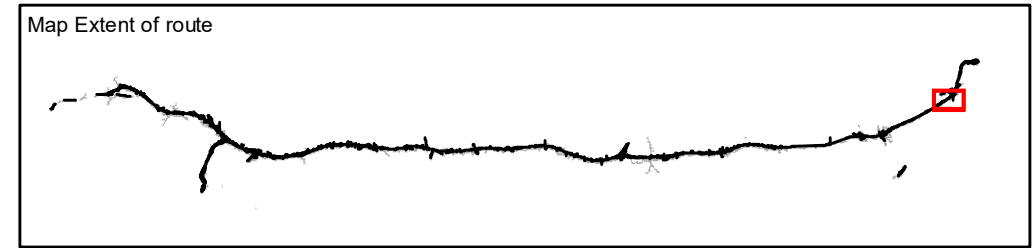
2017 Results

- < 40 µg/m³ (below AQS)
- ≥ 40 µg/m³ (above AQS)

— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries



Map Number
HS2-EV-REP-000-000030

Map Name
**NO₂ Monitoring Positions
London Borough of Ealing**

(3 of 6)

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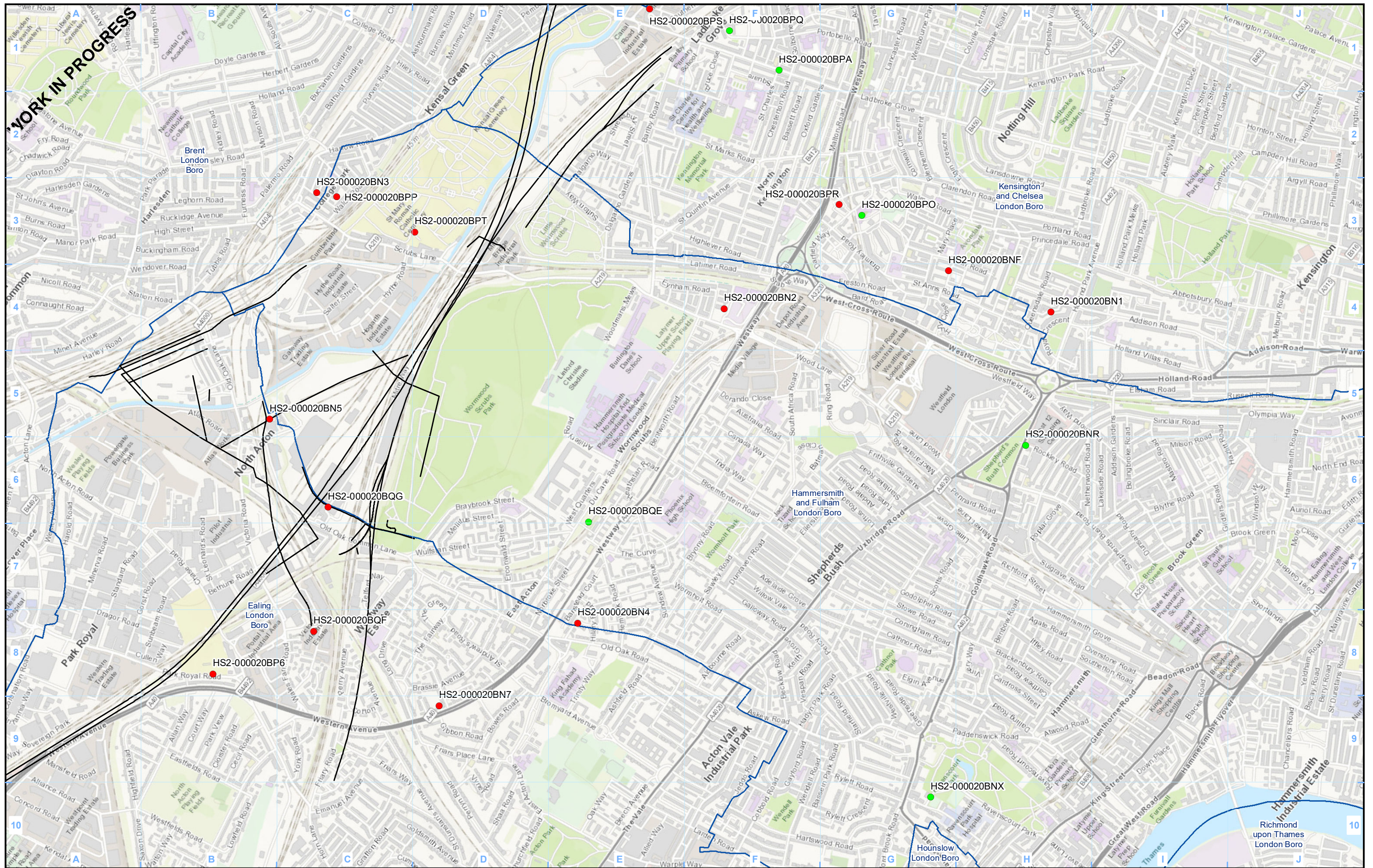
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NO₂ Monitoring Positions

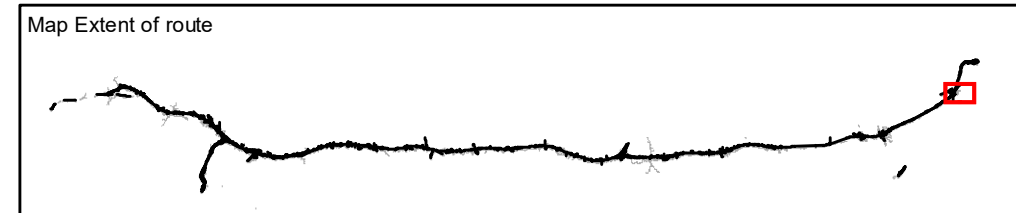
2017 Results

- < 40 µg/m³ (below AQS)
- ≥ 40 µg/m³ (above AQS)

— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries



Map Number
HS2-EV-REP-000-000030

Map Name
**NO₂ Monitoring Positions
London Borough of Hammersmith
and Fulham**

(4 of 6)

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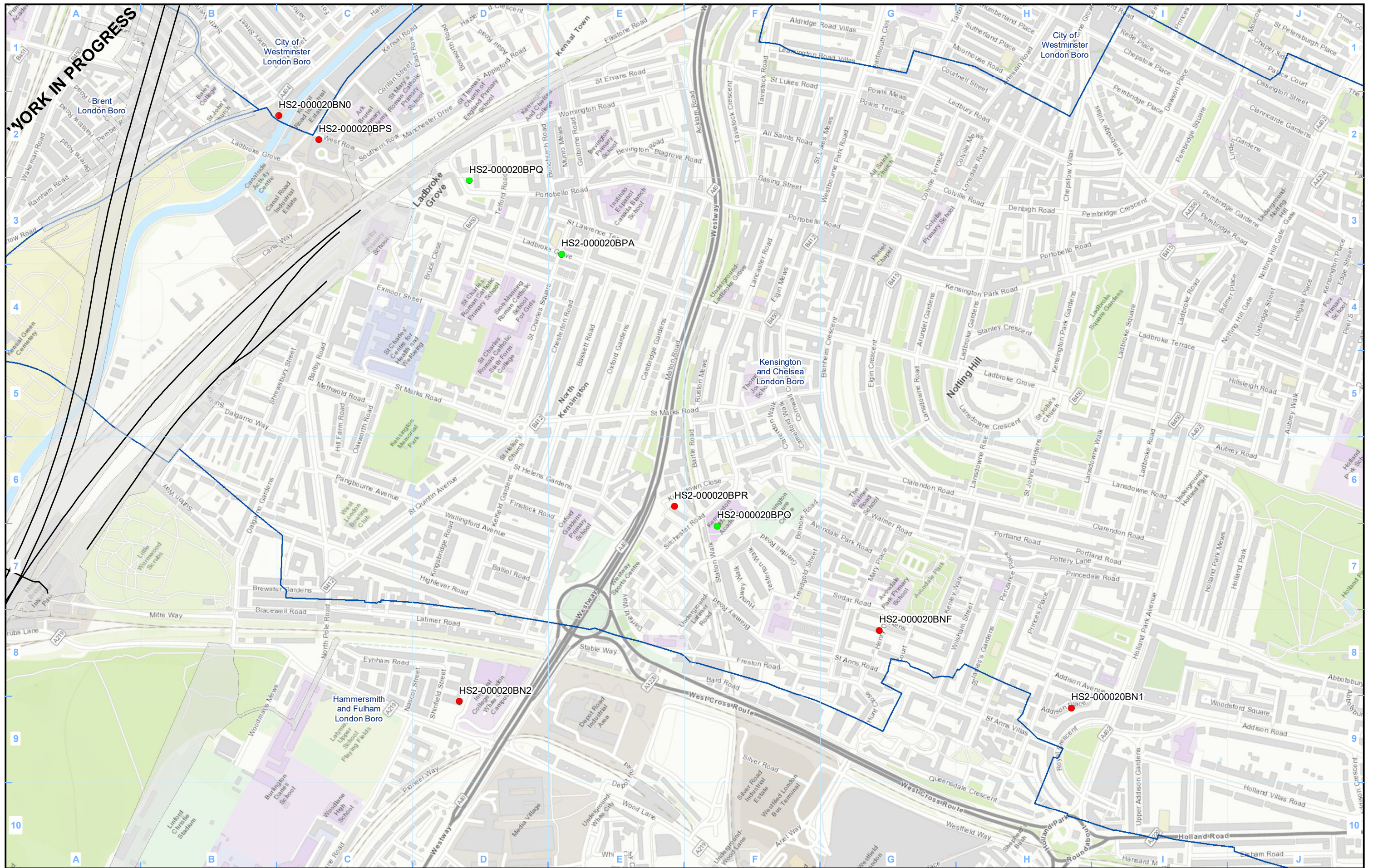
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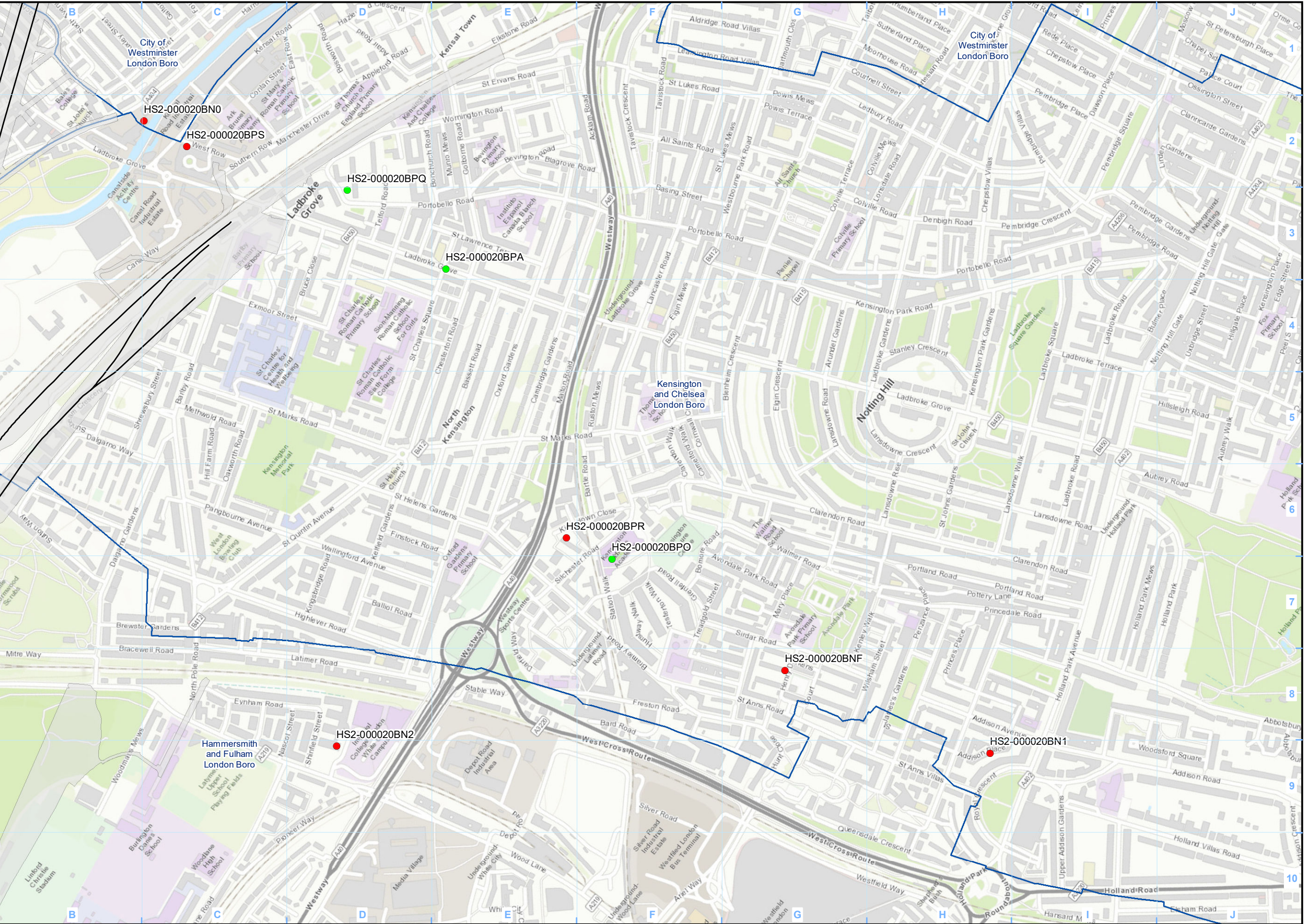
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WORK IN PROGRESS

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City of Westminster London Boro

Brent London Boro

City of Westminster London Boro

Kensington and Chelsea London Boro

Hammersmith and Fulham London Boro

HS2-000020BN0

HS2-000020BPS

HS2-000020BPQ

HS2-000020BPA

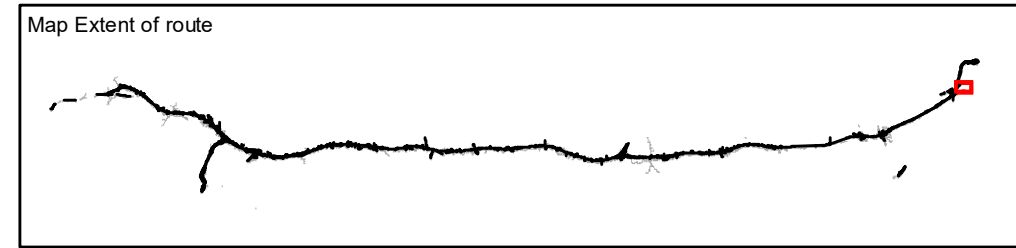
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HS2-000020BPO

HS2-000020BNF

HS2-000020BN2

HS2-000020BN1



Map Number
HS2-EV-REP-000-000030

Map Name
NO₂ Monitoring Positions
Royal Borough of Kensington and
Chelsea

(5 of 6)

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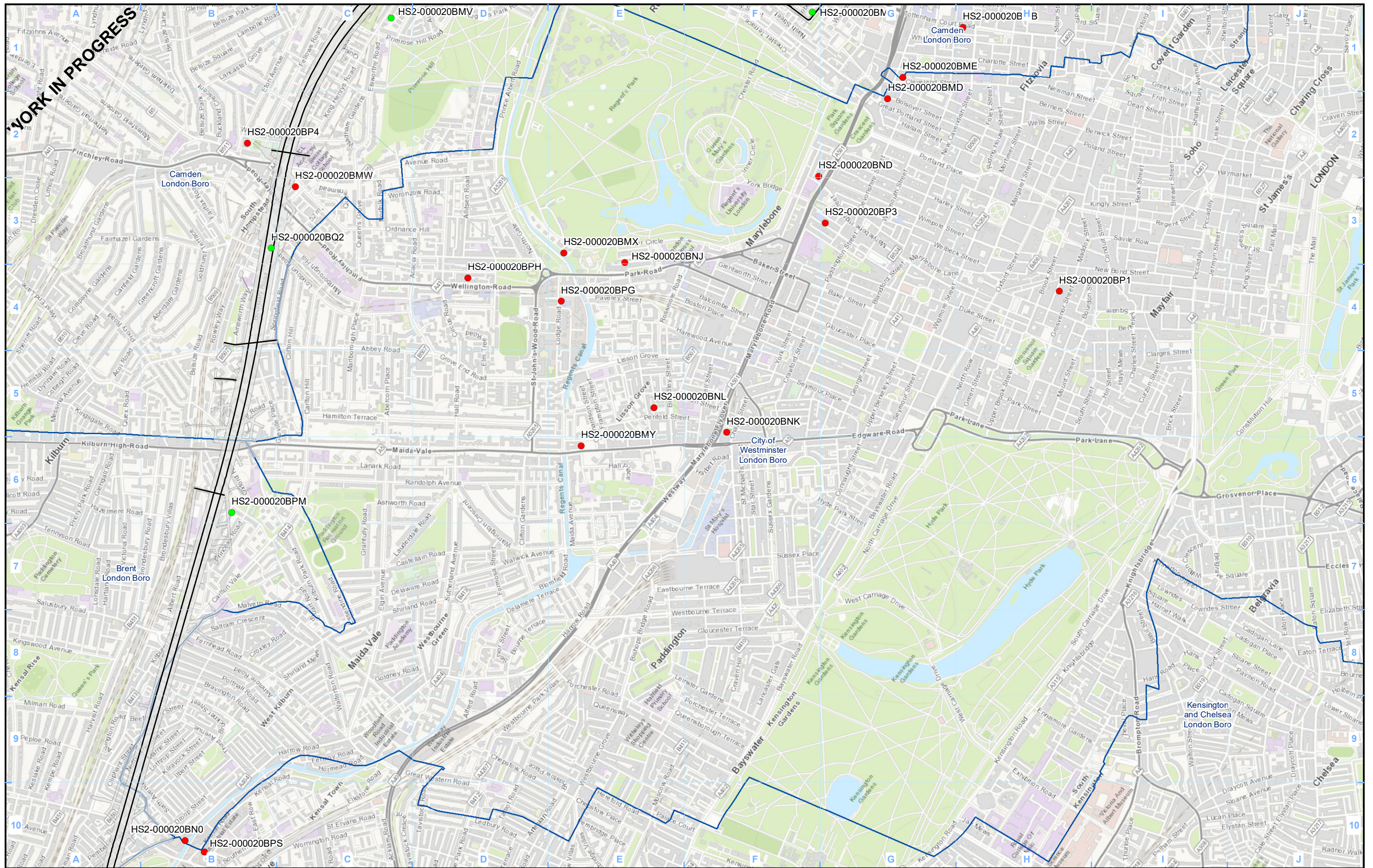
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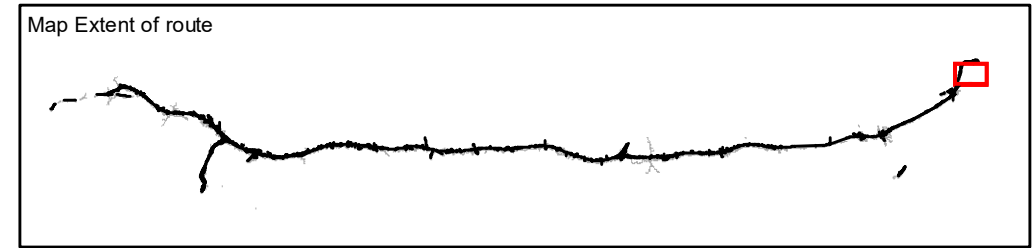
Legend

NO₂ Monitoring Positions

- < 40 µg/m³ (below AQ5)
- ≥ 40 µg/m³ (above AQ5)

Work Sections Centrelines

- Work Sections Centrelines
- ▭ Consolidated Land Boundary
- ▭ District Borough Unitary Boundaries



Map Number
HS2-EV-REP-000-000030

Map Name
NO₂ Monitoring Positions
City of Westminster

(6 of 6)

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