8. Air Quality

Introduction

8.1 This Chapter of the ES sets out the methodology followed and provides a review of the baseline air quality in the vicinity of the proposed site and surrounding area and then presents the results of the assessment of air quality associated with the proposed development (both construction and occupational phases) in order to determine the anticipated magnitude and significance of impact.

8.2 Mitigation measures are presented and discussed to minimise the air quality impacts associated with the proposals during the construction and occupation phases of the development.

Table 8.1: Appendices

Appendices	Title
See Volume 2, Appendix 7	Air Quality Assessment

8.3 This chapter presents the approach and findings of the Air Quality assessment prepared by WYG.

Legislative framework

National Policy and Legislation

8.4 European air quality legislation is consolidated under Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates.

8.5 The Air Quality Standards Regulations (Amendments 2016) sought to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directives. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives.

8.6 The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the impacts of air pollution.

8.7 For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of

Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments.

8.8 The AQOs for pollutants included within the Air Quality Strategy are presented in Table 8.2 and Table 8.3 along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines.

Table 8.2 Human Health Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	50µg/m^3 (max 35 exceedances a year)	24-hour mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
PM_{10}	40µg/m^3 by end of 2004	Annual mean	1st January 2005	40µg/m^3	1st January 2005	Retain Existing
$PM_{2.5}$	25µg/m^3	Annual Mean	31st December 2010	25µg/m^3	1st January 2010	Retain Existing
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1 Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	Retain Existing

Table 8.3 Ecological Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Objective	Concentration Measured as[10]
NO_X	30µg/m^3	Annual Mean

8.9 The National Planning Policy Framework (NPPF), revised February 2019, principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The

NPPF broadly retains the principles of PPS:23: Planning and Pollution Control and states that:

'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas or Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic or travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan'

8.10 The Planning Practice Guidance (PPG) web-based resource was updated by the Ministry for Housing, Communities and Local Government (MHCLG) on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. A review of PPG: Air Quality identified the following guidance:

"The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that affect public health such as particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2).

The UK also has national emission reduction commitments for overall UK emissions of 5 damaging air pollutants:

- *fine particulate matter (PM2.5)*
- *ammonia (NH3)*
- *nitrogen oxides (NOx)*
- *sulphur dioxide (SO2)*
- *non-methane volatile organic compounds (NMVOCs)*

As well as having direct effects on public health, habitats and biodiversity, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems. Odour and dust can also be a planning concern, for example, because of the effect on local amenity".

Assessment methodology

Methodology

8.11 The construction phase assessment uses the IAQM Guidance on the Assessment of Dust from Demolition and Construction document.

8.12 As construction traffic is predicted be lower than the operational phase traffic, it is considered that the effect will not be greater than the operational phase assessment

and this has been assessed qualitatively in line with the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

8.13 The operational phase assessment consists of the quantified predictions of the change in NO_2, PM_{10} and $PM_{2.5}$ of the development due to changes in traffic movement. Predictions of air quality at the Proposed Development site have been undertaken for the operational phase of the development using Atmospheric Dispersion Modelling Software (ADMS) 4.1.1. ADMS software is used to model NO_2, PM_{10} and $PM_{2.5}$ traffic emissions under several different assessment scenarios as determined through the scoping discussions. These are detailed in the consultation section below.

8.14 An additional assessment has completed for if the development is to be used as a data centre using AERMOD dispersion modelling software to examine emissions from standby generators.

8.15 The significance of the effects during the operational phase of the development is based on the latest guidance produced by EPUK and IAQM in in January 2017 'Land-Use Planning & Development Control: Planning for Air Quality' and June 2019 'A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites'. The guidance lays a basis for a consistent approach that could be used by all parties associated with the planning process to professionally judge the overall significance of the air quality effects based on severity of air quality impacts.

Study area

8.16 The study area is shown in *Appendix 1* of **Appendix 7 of Volume 2** which covers the same geographical extent as the traffic assessment which has identified where there is likely to be a significant change in traffic.

Surveys

8.17 WYG has obtained baseline air quality information from a number of sources including a review of local authority monitoring and DEFRA online tools.

Consultation

8.18 WYG attended a meeting at Slough Borough Council with the Environmental Health Officer and Planners on 6th September 2019 to determine the scope of the air quality assessment. At this meeting it was agreed that:

- 'Sensitivity testing' of the traffic would be undertaken under different future baseline ('do minimum') scenarios including:
    - The 'existing consented scenario', i.e. inclusive of the fully occupied lawful development of the site
    - The future year with the current use of the site
- Include PM10 and PM2.5 in modelling results

- The extent of the traffic model
- Completion of a damage costs assessment
- The damage cost assessment output to be put towards appropriate mitigation measured including but not limited to:
    - electric vehicle charging
    - 20-30 car club spaces
    - Contribution to Slough Council Car Club sharing
- Ecological receptors to be considered

8.19 The report has also been updated following comments on the original draft submission of the assessment for review by the local planning authority.

Significance criteria

8.20 The level of significance of each likely effect is determined by combining the magnitude of change with the sensitivity of the receptor. Table 8.4 shows how the interaction of magnitude and sensitivity results in the significance of an environmental effect. If the scale of the impact magnitude is negative, then the resulting effect is adverse. If the scale of the impact magnitude is positive, then the resulting effect is beneficial.

Table 8.4 Significance Criteria

Significance criteria	Description of criteria	Examples
Large	Impact resulting in a considerable change in baseline environmental conditions with severe undesirable/desirable consequences on the receiving environment.	Air quality varies between the do minimum and do something by more than 10% of the air quality criterion (Emissions). Substantial risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Medium	Impact resulting in a discernible change in baseline environmental conditions with undesirable/desirable conditions	Air quality varies between the do minimum and do something by 5 - 10% of the air quality criterion (Emissions). Moderate risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Small	Impact resulting in a discernible	Air quality varies between the do

Significance criteria	Description of criteria	Examples
	change in baseline environmental conditions with undesirable/desirable conditions that can be tolerated.	minimum and do something by 2 - 5% of the air quality criterion (Emissions). Slight risk that emissions will generate statutory nuisance complaints, resulting in formal action (Construction).
Imperceptible	Very low discernible change in baseline environmental conditions.	Air quality varies between the do minimum and do something by less than 1-2% of the air quality criterion (Emissions). Little or no cause for nuisance complaints to be made (Construction).
Neutral	No change in baseline conditions	Air quality varies between the do minimum and do something by less than 0.5% of the air quality criterion (Emissions).

Baseline conditions

8.21 Baseline air quality in the vicinity of the proposed development site has been defined from a number of sources, as described in the following sections.

Air Quality Review and Assessment

8.22 As required under section 82 of the Environment Act 1995, Slough Borough Council (SBC) has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO_2 are above the relevant AQOs at a number of locations of relevant public exposure within the area administered by the Council; SBC has four designated Air Quality Management Areas (AQMAs) as outlined below;

- Slough AQMA No.1: An area encompassing land adjacent to the M4 motorway along the north carriageway between junctions 5 and 7, and along the south carriageway between junction 5 and Sutton Lane.
- Slough AQMA No.2: An area encompassing the A4 London Road east of junction 5 of the M4 Motorway as far as Sutton Lane.
- Slough AQMA No.3 Extension: The designated area incorporates stretch of road between Tuns Lane Junction known as the “Three Tuns” and 30 Bath Road and Quadrivium Point.

- Slough AQMA No.4: The Designated Area incorporates the A4 Bath Road from the junction with Ledgers Road/Stoke Poges Lane, in an easterly direction, along Wellington Street, up to Sussex Place junction.

8.23 The proposed development is located 220m north of the Slough AQMA No.4, therefore receptors within the AQMA have been included within the modelling assessment.

8.24 Background concentrations as used within the prediction calculations were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the development site. In May 2019, DEFRA issued revised 2017 based background maps for NO_X, NO_2, PM_{10} and $PM_{2.5}$ which incorporate updates to the input data used for modelling. 2018 background maps have been utilised for the model verification and baseline occupational phase assessment.

Air Quality Monitoring

Continuous Monitoring

8.25 SBC operated a network of 10 automatic monitoring stations in 2018. The closest automatic monitoring station (SLH10) is located approximately 350 m south from the site boundary.

8.26 The closest monitoring station results are presented in Table 8.5 below.

Table 8.5 Local Authority Nitrogen Dioxide Diffusion Tube Monitoring Results

Site ID	Location	Site Type	Distance to kerb of nearest road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)	Distance to site (m)
SLH10	Slough Town Centre, Wellington Street	Kerbside	5.0	1.5	36	350
SLH12	Slough Windmill, Bath Road	Kerbside	7.5	1.5	42	1,900

Nitrogen Dioxide Diffusion Tube Monitoring

8.27 SBC operated a network of passive diffusion tubes in 2018. The closest diffusion tube SLO 27 was located approximately 50 m south from the site boundary.

8.28 The closest NO_2 diffusion tube monitoring results from within SBC are presented in Table 8.6 below.

Table 8.6 Local Authority Nitrogen Dioxide Diffusion Tube Monitoring Results

Site ID	Location	Site Type	Distance to kerb of nearest road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)
SLO 5	Princess Street	Roadside	22.0	2	34.40
SLO 6	Sussex Place	Roadside	9.6	2	29.00
SLO 23*	Tuns Lane	Urban	17.5	2.5	29.50
SLO 24*	Spackmans Way	Other	60.5	2.5	32.70
SLO 25*	Paxton Avenue	Other	34.5	2	33.20
SLO 26	Yew Tree Rd (Uxbridge Rd) (B)	Roadside	9.5	2	31.50
SLO 27	India Road	Other (Railway)	13	2	26.90
SLO 29	Yew Tree Road (Uxbridge Rd)	Kerbside	1.5	2	**52.70**
SLO 33	Wellington Street - Stratfield	Roadside	12.0	2.5	28.70
SLO 37	Blair Road-Victoria Court	Roadside	11	2	39.90
SLO 38	Wellesley Road	Roadside	11.5	2.5	32.30

Site ID	Location	Site Type	Distance to kerb of nearest road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)
SLO 40	Wexham Road	Roadside	11.0	2	38.60
SLO 43	Windmill (Bath Rd)	Roadside	12	2	34.00
SLO 44	Goodman Park (Uxbridge Rd)	Roadside	9.7	2.5	31.90
SLO 46	Cornwall House, Bath Rd	Roadside	5	2	40.10
SLO 47	Princes House, Bath Road	Roadside	4.5	2	35.20
SLO 48*	Castle Street	Roadside	14	2	28.10
SLO 49	Windsor Road (B)	Roadside	1.5	2	**40.00**
SLO 50	Tuns Lane (B)	Kerbside	4	2	**45.80**

Traffic Emission Sources

8.29 Desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the site and its surroundings. The principal traffic derived pollutant likely to impact local receptors is nitrogen dioxide (NO_2).

Data Centre Emissions Sources

8.30 Emissions from the combustion of the emergency generators of any data centre use of the site would be primarily NO_2 concentrations. These have been modelled and assessed.

Meteorology

8.31 Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data. The 2018 meteorological data used in the assessment is derived from Middle Wallop Meteorological Station. This is the nearest meteorological station, which is considered representative of the development site, with all the complete parameters necessary for the ADMS model.

Sensitive Receptors for Air Quality Assessment

8.32 Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated along routes predicted to experience significant changes in traffic flow as a result of the Proposed Development. The sensitivity of receptors is considered to be high. These have been identified in the following sections. These have been included within the modelling assessment as described in *Table 8.7*.

8.33 With regards to the assessment of emissions from the data centre operations, proposed

residential receptors have been included.

Ecological Sensitive Receptors

8.34 The IAQM guidance on 'Air Quality Impacts on Designated Nature Conservation Sites' (2019) document outlines the types of designated nature sites within 2 km of the proposed development which require air quality assessment. These are inclusive of;

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and
- Areas of Ancient Woodland (AW).

8.35 The Conservation of Habitats and Species Regulations (2017) additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

8.36 A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations.

8.37 Following a search within a 2 km radius of the site boundary, ecological receptors were identified. It should also be noted that several sites were raised during the Scoping Response where it was requested the effects of Air Quality associated with vehicles should be assessment. All ecological sites identified are shown in *Table 1.8*.

Emission Sensitive Receptors

8.38 The AQOs only apply at locations where the public may be exposed to pollution for a sufficient period for there to be a measurable health impact. The averaging period and AQO involved will determine which locations are considered to be sensitive receptors. For annual mean NO_2 and particulate matter with mean hydraulic diameter of less than 10µm) AQOs, LAQM.TG(16) considers typical locations for sensitive receptors to include:

- Residential properties;

- Hospitals;
- Schools; and,
- Care homes.

8.39 **Appendix 7 of Volume 2** identifies high sensitivity roadside residential receptors that are representative of worst-case exposure locations and have been chosen as the closest residences to each road which may be affected by the traffic associated with the proposed development. The list of human health sensitive receptors identified are shown in *Table 8.7*. With the list of ecological sensitive receptors identified are shown in *Table 8.8*.

Table 8.7 Human Health Sensitive Receptor Locations

Discrete Sensitive Receptor		UK NGR (m) X	UK NGR (m) Y
R1	Princes Street	498552	179808
R2	Hazelmere Road	499037	180364
R3	Yew Tree Road	498499	179731
R4	Wexham Road	498394	179849
R5	Apsley House	498138	179920
R6	Cornwall House	497501	179974
R7	Claycoats School	496943	180043
R8	Windmill Care Centre	496506	180184
R9	Tuns Lane	496366	179928
R10	Paxton Avenue	496124	179253
R11	Spackmans Way	496237	179200
R12	Slough and Eton CoE Business and Enterprise College	496869	179191
R13	Windsor Road	497374	179439
R14	Saint Mary's Church of England Primary School	498281	179425
R15	16 John Taylor Court	496426	180162
R16	19 Farnham Road	496351	180331
R17	49 Stoke Road	497718	180412
R18	50 Stoke Road	497772	180431
R19	100 Wexham Road	498547	180361
R20	98 Broadmark Road	499099	180430
R21	25 Cannon Gate	499345	180876
R22	27 Clifton Road	498623	179672

Table 8.8 Ecological Receptors

Discrete Sensitive Receptor		UK NGR (m) X	UK NGR (m) Y
E1	Railway Triangle	497318	180155
E2	Eton Meadows	495473	178197
E3	St Marys Churchyard	497605	179519

Discrete Sensitive Receptor		UK NGR (m) X	Y
E4	Upton Court Park	498238	178838
E5	Langley Park	499367	180709
E6	Stoke Park	497244	181983
E7	Herschel Park	497830	178995
E8	Burnham Beeches	495487	187068

Predicted significant effects

Effect during construction phase: short to medium

8.40 The main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months), or from construction materials. In respect of fires on site it should be noted that suitable management strategies will be in place to prevent burning of any material during the construction phase. The main potential impacts of particulates/dust are:

- Visual – dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination; and,
- Health impacts due to inhalation e.g. asthma or irritation of the eyes.

8.41 A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

8.42 Construction activities can give rise to short term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

Particulate Matter

8.43 The UK Air Quality Standards seek to control the health implications of respirable particulate matter PM_{10} (less than 10 micrometers in diameter). However, the majority of particles released from construction will be greater than this in size.

8.44 However, construction works do on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

Dust

8.45 Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. There are no formal standards or criteria for

nuisance caused by deposited particles, however, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance, though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

8.46 Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures should be taken to minimise the emissions of dust as part of good site practice. Recommended mitigation measures proportionate to the risk associated with the development will be implemented as part of the construction management plan. Details in line with the IAQM construction guidance are included within **Appendix 7 of Volume 2**.

Methodology

8.47 WYG have adapted Guidance from the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' Document published in February 2014. In total four processes are considered, namely demolition, earthworks, construction and trackout. For each of these phases, the significance of the potential significant dust impacts is derived following the determination of a dust emission class and the distance of activities to the nearest sensitive receptor, therefore assessing worst case likely significant impacts.

Assessment Results

8.48 The potential significance of dust emissions associated with the construction phase is presented in *Table 8.9.* The assessment is based on the nearest sensitive receptors to each source activity.

8.49 It should be noted that all impacts have been assessed based on the distance between the planning application boundary and the receptor location. The majority of dust generating activities are unlikely to be undertaken at the development boundary and therefore the distance to the sensitive area would usually be greater than those used in the assessment. Predicted impacts are therefore based on a worst-case scenario.

Table 8.9 Summary Risk of Impacts Prior to Mitigation

Source	Dust Soiling	Health Impacts of PM_{10}	Ecological
Demolition	n/a	n/a	N/A
Earthworks	Medium	Low	N/A
Construction	Medium	Low	N/A
Trackout	Low	Negligible	N/A

8.50 All impacts presented within Table 8.9 are predicted with regard to the potential for dust nuisance complaints and surface soiling events due to deposition, as opposed to the risk of exceeding any AQOs.

8.51 All dust impacts are considered to be direct, temporary, short-term and reversible in nature. The impacts are determined to be direct as they occur as a result of activities associated with the development, temporary as they will only potentially occur during the construction phase, short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine, and reversible as conditions will return to baseline upon cessation of construction phase activities.

8.52 Following the implementation of mitigation measures, the air quality effects arising from the construction phase are considered **negligible**.

Effect during operational phase: Traffic emissions

8.53 Vehicle movements associated with the proposed development will generate additional exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$, on the local and regional road networks. In order to quantify potential impacts of these emissions in the vicinity of the site, a detailed dispersion modelling assessment has been undertaken using the ADMS-Roads software package.

8.54 This model is routinely used in the UK for environmental assessment work. The likely significant impacts of road vehicle exhaust emissions has been undertaken for the following assessment scenarios:

- 2018 Baseline = Existing baseline conditions;
- 2026 “Do Minimum 1” = The lawful use of the site – this scenario includes background traffic growth (from 2019), committed developments and 8,070sq.m Research and Development and 52,293sq m of B2 use on the site), (Scenario (DM1b)
- 2026 “Do Minimum 2” = The existing, underutilised, use of the site – this scenario includes background traffic growth (from 2019), committed developments and 8,070sq.m Research and Development use on the site. (Scenario (DM2b)
- 2026 “Do Something 1” = This scenario includes background traffic growth (from 2019), committed developments and development on the site including 1,000 dwellings, 8,361sq.m B2 use and 28,428sq.m B8 use.(Scenario DS1b)
- 2026 “Do Something 2” = This scenario includes background traffic growth (from 2019), committed developments and development on the site including 1,000 dwellings and 36,789sq.m B8 use (scenario DS2b)

8.55 The development opening years were considered with appropriate 'do-minimum' and 'do-something' scenarios. i-Transport LLP transport consultants provided the traffic data.

8.56 Reference should be made to the AQA Technical Report at **Appendix 7 of Volume 2** for the:

- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Method Statement;
- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Detailed Results Tables; and,
- Theoretical assessment assuming no improvement in emissions from baseline year to future year.

Effect during operational phase: Data Centre emissions

8.57 Modelling was completed of the traffic scenario with the data centre which would result in a reduction in traffic when compared to the DS2b use.

8.58 Four generator operation scenarios have been assessed as below:

- Scenario i – this is a generator testing scenario. The generators will be tested fortnightly, with a testing period of 30 minutes at 25% load for each engine. One generator will be tested at a time and the testing will be taking place only at day-time. The total net generator running time will be 28 hours fortnightly and approximately 728 hours per year. For the short-term impact assessment, it is assumed that (1) the testing starts at 8 am and finishes at 5pm; (2) 12 generators will be tested per day and (2) it will take 5 days (Monday to Friday) to compete the testing of 54 generators.
- Scenario ii – this is also a generator testing scenario. The generators will be tested twice a year with a testing period of 1.5 hour at 100% load for each engine/generator. One generator will be tested at a time and the testing will be taking place only at day-time. The total net generator running time will be 81 hours for one round test and approximately 162 hours per year in total. For the short-term impact assessment, it is assumed that (1) the testing starts at 8 am and finishes at 5pm; (2) 4 generators will be tested per day and (2) it will take approximately 14 days to compete one round of the testing of 54 generators. Testing will only take place on weekdays, for example, Monday to Friday.
- Scenario iii– this is emergency scenario. The all 54 generators will be in operation, among them 50 generators (including 2 generators for office building) at 100% load and all 4 Catchers generators at 25% load. All generators will be operating continuously for 6 hours for the emergency scenario.

- Scenario iv – Combined Scenario - The scenario considers the combined operations of scenario i fortnight testing, scenario ii twice-a-year testing and the emergency scenario iii operations. This is a theoretical worst-case scenario as the scenario i and scenario ii could not take place simultaneously.

8.59 The above scenarios have been modelled using AERMOD modelling software to determine the potential effects of a data centre installation.

Nitrogen Dioxide

8.60 Predicted annual mean NO_2 concentrations were assessed against the AQO of 40 µg/m^3. Reference should be made to the AQA Technical Report (*Appendix O1*) for detailed results tables of predicted annual mean NO_2 concentrations for all different modelled scenarios. The results presented below are the worst case modelled scenario from the assessments (a comparison of the existing use of the site DM2b in the future with the 'do something 2' scenario traffic DS2b) for the worse case pollutant (NO_2)

8.61 As indicated in the AQA Technical Report, the annual mean NO_2 concentration at surrounding existing receptors from the effects of traffic is predicted to be neutral at all identified receptors. The effects at these locations are considered to be **negligible**, in accordance with the stated assessment methodology and as such is not considered to be significant. All impacts are considered to be **direct**, **permanent**, **long-term** and **irreversible** in nature.

8.62 Confidence in these predictions is high given that a detailed dispersion modelling assessment has been undertaken using traffic data provided by i-Transport LLP and modelling results have been verified, which is considered to be a robust approach.

Table 8.10 Significance at the Identified Sensitive Receptors (NO_2)

		NO_2 (µg/m^3)					
ReceptorReceptor		Do Minimum 2025	Do Something 2025	Sensitivity	Development Contribution	Magnitude of Effect	Impact Description
R1	Princes Street	35.08	35.46	Negligible	0.38	Imperceptible	Negligible
R2	Hazelmere Road	27.88	27.90	Negligible	0.03	Neutral	Negligible
R3	Yew Tree Road	32.88	33.08	Negligible	0.19	Neutral	Negligible
R4	Wexham Road	32.28	32.59	Negligible	0.31	Imperceptible	Negligible
R5	Apsley House	30.56	30.77	Negligible	0.21	Imperceptible	Negligible
R6	Cornwall House	31.40	31.43	Negligible	0.03	Neutral	Negligible
R7	Claycoats	28.75	28.76	Negligible	0.01	Neutral	Negligible

	School						
R8	Windmill Care Centre	31.01	31.04	Negligible	0.03	Neutral	Negligible
R9	Tuns Lane	30.58	30.60	Negligible	0.02	Neutral	Negligible
R10	Paxton Avenue	36.51	36.55	Negligible	0.04	Neutral	Negligible
R11	Spackmans Way	35.93	35.97	Negligible	0.04	Neutral	Negligible
R12	Slough and Eton CoE Business and Enterprise College	30.01	30.03	Negligible	0.02	Neutral	Negligible
R13	Windsor Road	31.54	31.56	Negligible	0.02	Neutral	Negligible
R14	Saint Mary's Church of England Primary School	25.83	25.86	Negligible	0.03	Neutral	Negligible
E1	Railway Triangle	45.55	43.87	High	<0.01	Neutral	Negligible
E2	Eton Meadows	35.46	34.58	High	<0.01	Neutral	Negligible
E3	St Marys Churchyard	46.88	44.55	High	<0.01	Neutral	Negligible
E4	Upton Court Park	45.20	41.63	High	0.01	Neutral	Negligible
E5	Langley Park	39.77	38.12	High	0.04	Neutral	Negligible
E6	Stoke Park	31.35	31.04	High	<0.01	Neutral	Negligible
E7	Herschel Park	71.46	60.17	High	0.01	Neutral	Negligible
E8	Burnham Beeches	22.50	22.27	High	<0.01	Neutral	Negligible

8.63 All impacts are considered to be direct**, permanent, long-term** and **irreversible** in nature. The impacts are determined to be **direct** as they occur as a result of vehicles travelling to and from the Proposed Development, **permanent** as they will occur throughout the operational phase, **long-term** because these occur during the entire operational phase, and **irreversible** as conditions will not return to baseline conditions.

8.64 Confidence in these predictions is **high** given that a detailed dispersion modelling assessment has been undertaken using traffic data provided by i-Transport LLP

Transport Consultants and modelling results have been verified, which is considered to be a robust approach.

Particulate Matter (PM_{10} & $PM_{2.5}$)

8.65 Predicted annual mean ground level PM_{10} and $PM_{2.5}$ concentrations were assessed against the annual average AQOs of 40 µg/m^3 for PM_{10} and 25 µg/m^3 for $PM_{2.5}$ respectively. Reference should be made to the AQA Technical Report for detailed results tables of predicted annual mean ground level PM_{10} and $PM_{2.5}$ concentrations.

8.66 As indicated in the AQA Technical Report, the likely impacts on annual mean PM_{10} and $PM_{2.5}$ concentrations from the development traffic flows is predicted to be neutral at all identified receptors. The effects at these locations are considered to be **negligible** in accordance with the stated assessment methodology and as such is not considered to be significant.

8.67 Confidence in these predictions is high given that a detailed dispersion modelling assessment has been undertaken using traffic data provided by i-Transport LLP Transport Consultants and the DfT Database, and modelling results have been verified, which is considered to be a robust approach

Effect during operational phase: Data Centre Use

8.68 Should the development be used as a data centre, there will be the requirement for the installation of short-term emergency backup generators.

8.69 An assessment four different operating scenarios has been undertaken. A summary of the results for the worst-case scenario at surrounding residential receptors is included below.

Table 8.11: The Long-Term (Annual Mean) Concentrations of NO2 and Impact Description of Effects at Receptors – Scenario iii

Receptor		Predicted Annual Mean Concentration (µg/m^3) – 2017 Met Data, and NO_2 Impact Description at Receptors						
ID	Name	Process Contribution (PC)	PC as percentage of AQO (%)	Background from the Traffic assessment	PEC[(a)] (PC +Background)	PEC as percentage of AQO	PEC as percentage of AQO	Impact Descriptor
R1	Princes Street	0.03	0.01	39.95	39.98	99.95	95-102% of AQO	Negligible
R2	Hazelmere Road	0.26	0.10	26.96	27.22	68.04	≤ 75 of AQO	Negligible
R3	Yew Tree Road	0.02	0.01	37.88	37.91	94.77	76-94% of AQO	Negligible
R4	Wexham Road	0.03	0.01	36.86	36.89	92.23	76-94% of AQO	Negligible
R5	Apsley House	0.02	0.01	33.76	33.78	84.45	76-94% of AQO	Negligible
R6	Cornwall House	0.01	<0.01	35.26	35.27	88.18	76-94% of AQO	Negligible
R7	Claycoats School	0.01	<0.01	31.14	31.14	77.86	76-94% of AQO	Negligible
R8	Windmill Care Centre	<0.01	<0.01	34.95	34.95	87.38	76-94% of AQO	Negligible
R9	Tuns Lane	<0.01	<0.01	34.57	34.58	86.44	76-94% of AQO	Negligible

Receptor		Predicted Annual Mean Concentration (µg/m³) – 2017 Met Data, and NO_2 Impact Description at Receptors						
ID	Name	Process Contribution (PC)	PC as percentage of AQO (%)	Background from the Traffic assessment	PEC[(a)] (PC +Background)	PEC as percentage of AQO	PEC as percentage of AQO	Impact Descriptor
R10	Paxton Avenue	<0.01	<0.01	44.32	44.32	110.80	>110 of AQO	Negligible
R11	Spackmans Way	<0.01	<0.01	43.30	43.30	108.25	103-109% of AQO	Negligible
R12	Slough and Eton CoE Business and Enterprise College	<0.01	<0.01	33.72	33.73	84.32	76-94% of AQO	Negligible
R13	Windsor Road	0.01	<0.01	35.54	35.55	88.87	76-94% of AQO	Negligible
R14	Saint Mary's Church of England Primary School	0.01	0.01	28.00	28.02	70.04	≤ 75 of AQO	Negligible
R15	16 John Taylor Court	<0.01	<0.01	37.96	37.97	94.92	76 – 94% of AQ	Negligible
R16	19 Farnham Road	<0.01	<0.01	30.19	30.19	75.48	≤ 75 of AQO	Negligible
R17	49 Stoke Road	0.01	<0.01	31.66	31.67	79.17	76-94% of AQO	Negligible
R18	50 Stoke Road	0.01	<0.01	30.22	30.24	75.59	76-94% of AQO	Negligible
R19	100 Wexham Road	0.08	0.03	35.05	35.13	87.83	76 – 94% of AQ	Negligible
R20	98 Broadmark Road	0.18	0.07	29.84	30.02	75.06	≤ 75 of AQO	Negligible
R21	25 Cannon Gate	0.05	0.02	26.05	26.10	65.26	≤ 75 of AQO	Negligible
R22	27 Clifton Road	0.02	0.01	33.03	33.05	82.63	76 – 94% of AQ	Negligible
R23	PR 1	0.07	0.03	37.74	37.81	94.53	76-94% of AQO	Negligible
R24	PR 2	0.05	0.02	33.96	34.02	85.04	76-94% of AQO	Negligible
R25	PR 3	0.06	0.02	32.14	32.20	80.51	76-94% of AQO	Negligible
R26	PR 4	0.08	0.03	31.77	31.84	79.61	76-94% of AQO	Negligible
R27	PR 5	0.08	0.03	32.67	32.75	81.87	76-94% of AQO	Negligible
R28	PR 6	0.09	0.03	31.71	31.79	79.49	76-94% of AQO	Negligible
R29	PR 7	0.07	0.03	31.57	31.64	79.10	76-94% of AQO	Negligible
R30	PR 8	0.09	0.03	31.68	31.77	79.42	76-94% of AQO	Negligible
AQO		**40 µg/m³**						

8.70 As shown above, the long-term effects of long-term NO2 for the worst-case scenario, is **'negligible'**.

Scope of mitigation

Construction

8.71 Despite the favourable assessment, mitigation measures to reduce pollutant emission from the proposed development including the promotion of sustainable transport

options. During the construction and operational phases of the Proposed Development residual likely significant impacts are anticipated to be negligible.

Table 8.11 Highly Recommended Construction Phase Mitigation Measures

Highly Recommended Mitigation Measures
Construction
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
Display the head or regional office contact information
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period
Avoid site runoff of water or mud.
Keep site fencing, barriers and scaffolding clean using wet methods.
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
Cover, seed or fence stockpiles to prevent wind whipping.
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable
Ensure all vehicles switch off engines when stationary - no idling vehicles.
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

Highly Recommended Mitigation Measures
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
Avoid bonfires and burning of waste materials.
Construction
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
Record all inspections of haul routes and any subsequent action in a site logbook.
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
Access gates to be located at least 10m from receptors where possible.

Completed development – B2/B8 Use

8.72 Table 8.12 shows the significance of effect at the modelled receptors as a result of changes in NO_2 exposure in the worst case assessed scenario.

8.73 All receptors will receive a 'negligible' change in NO_2, PM_{10} and $PM_{2.5}$ levels.

8.74 Table 8.12 provides the summary of the assessment of Air Quality.

Completed development – Data Centre Use

8.75 This scenario would result in a reduction of vehicle trips within the AQMA compared to the existing B2 use, leading to some improvements within the Air Quality Management area.

8.76 An assessment of the data centre has shown that the predicted NO2 annual mean PECs are all below the relevant long-term AQS of 40 µg/m3 for the protection of human health for all 4 scenarios (generator testing/emergency operations). The effect of the proposed generator operations of all 4 scenarios on the local area is considered to be insignificant. The predicted long-term NO2 concentrations from the proposed development are considered acceptable for the protection of human health.

8.77 The predicted NO2 short-term PECs are all below the relevant short-term AQS of 200 µg/m3 for the protection of human health for all 4 scenarios.

Residual effects assessment

Construction

8.78 Provide a summary during construction. Despite the favourable assessment, mitigation measures to reduce pollutant emission from the proposed development including the promotion of sustainable transport options. During the construction and operational phases of the Proposed Development residual likely significant impacts are anticipated to be negligible.

Operation - B2/B8 Use

8.79 Table 8.10 shows the significance of effect at the modelled receptors as a result of changes in NO_2 exposure.

8.80 All receptors will receive a 'negligible' change in PM_{10} and $PM_{2.5}$ levels.

8.81 Table 8.12 provides the summary of the assessment of Air Quality.

Operation – Data Centre Use

8.82 An assessment of the data centre has shown that the predicted NO2 annual mean PECs are all below the relevant long-term AQS of 40 µg/m3 for the protection of human health for all 4 scenarios (generator testing/emergency operations). The effect of the proposed generator operations of all 4 scenarios on the local area is considered to be insignificant. The predicted long-term NO2 concentrations from the proposed development are considered acceptable for the protection of human health.

8.83 The predicted NO2 short-term PECs are all below the relevant short-term AQS of 200 µg/m3 for the protection of human health for all 4 scenarios.

Table 8.12 Summary Table (complete as per example for all residual effects identified)

Construction / Operational	Impact	Impact		Impact		Mitigation	Residual			
		Impact Significance	Adverse / Beneficial	Local, Regional, National	Direct/Indirect (D/I) Permanent/Temporary (P/T) Period (ST/MT/LT)		Impact Significance	Adverse / Beneficial	Local, Regional, National	Direct/Indirect (D/I) Permanent/Temporary (P/T) Period (ST/MT/LT)
Construction										
	Demolition	Negligible	Adverse	Local	D, T, ST	CEMP	Negligible	**Adverse**	Local	D, T, ST
	Earthworks	Negligible	Adverse	Local	D, T, ST	CEMP	Negligible	**Adverse**	Local	D, T, ST
	Construction	Negligible	Adverse	Local	D, T, ST	CEMP	Negligible	**Adverse**	Local	D, T, ST
	Trackout	Negligible	Adverse	Local	D, T, ST	CEMP	Negligible	**Adverse**	Local	D, T, ST
Operational – B2/B8 Use										
	Impact of NO_2 emissions generated by road vehicles movements during operational phase	Neutral to Imperceptible	Adverse	Local	D, P, LT	None Required	Neutral to Small	**Adverse**	Local	D, P, LT
	Impact of PM_{10} emissions generated by road vehicle movements during operational phase	Neutral	Adverse	Local	D, P, LT	None Required	Negligible	**Adverse**	Local	D, P, LT
	Impact of $PM_{2.5}$ emissions generated by road vehicle movements during operational phase	Neutral	Adverse	Local	D, P, LT	None Required	Negligible	**Adverse**	Local	D, P, LT
Operational – Data Centre Use										

	Impact of emissions emissions generated by road vehicles movements during operational phase within AQMA	Neutral	Beneficial	Local	D, P, LT	None Required	Negligible	**Beneficial**	Local	D, P, LT
	Impact of Long-term NO_2 emissions from emergency generators	Neutral	Adverse	Local	D, P, LT	None Required	Negligible	**Adverse**	Local	D, P, LT
	Impact of Short-term NO_2 emissions from emergency generators	Neutral	Adverse	Local	D, P, ST	None Required	Negligible	**Adverse**	Local	D, P, ST