Air Quality Note:
114 – 116 Charing Cross Road, Camden

July 2022

Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 This air quality note has been prepared in support of the planning application for the proposed development at 114-116 Charing Cross Road, in the London Borough of Camden (LBC).

1.2 The emerging proposals for the site comprise "*the comprehensive refurbishment and upward extension of the existing building by two storeys, along with the reconfiguration of the existing ground floor elevations. The proposals would provide a total of 1,811.1 sqm of Class E accommodation. The proposals would see an increase of 479 sqm GIA of Class E office accommodation. The proposals would see the building modernised and provide high quality office accommodation to meet the pressing demand and need for office accommodation, as set out within the Council's Local Plan".*

1.3 The existing site includes a five-storey commercial building. The ground floor is currently occupied by a Mexican restaurant and the four upper floors are office use. The proposed development does not include any car parking, and there will be no changes to vehicle flows on local roads as a result of the development. The proposed development will be provided with heat and hot water via air source heat pumps (ASHPs); the existing boilers will be removed. Thus, there will be no significant point sources of emissions associated with the provision of energy provision to the proposed development. Emergency back-up power will, however, be provided by a diesel generator, the emissions from which could impact on air quality at existing and proposed sensitive receptors.

1.4 LBC has declared a borough-wide Air Quality Management Area (AQMA) for exceedances of the annual mean nitrogen dioxide and 24-hour mean PM_{10} objectives, and the development lies within this area. The development also lies close to of the Focus Areas identified by the GLA for exceedances of the EU annual mean limit value for nitrogen dioxide coinciding with high levels of human exposure.

1.5 The location of the proposed development is shown in Figure 1, along with the nearby Focus Areas.

1.6 The Greater London Authority's (GLA's) London Plan (GLA, 2021a) requires new developments to be air quality neutral. The air quality neutrality of the proposed development has been assessed following the methodology provided in the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2021b), which is currently in consultation stage.

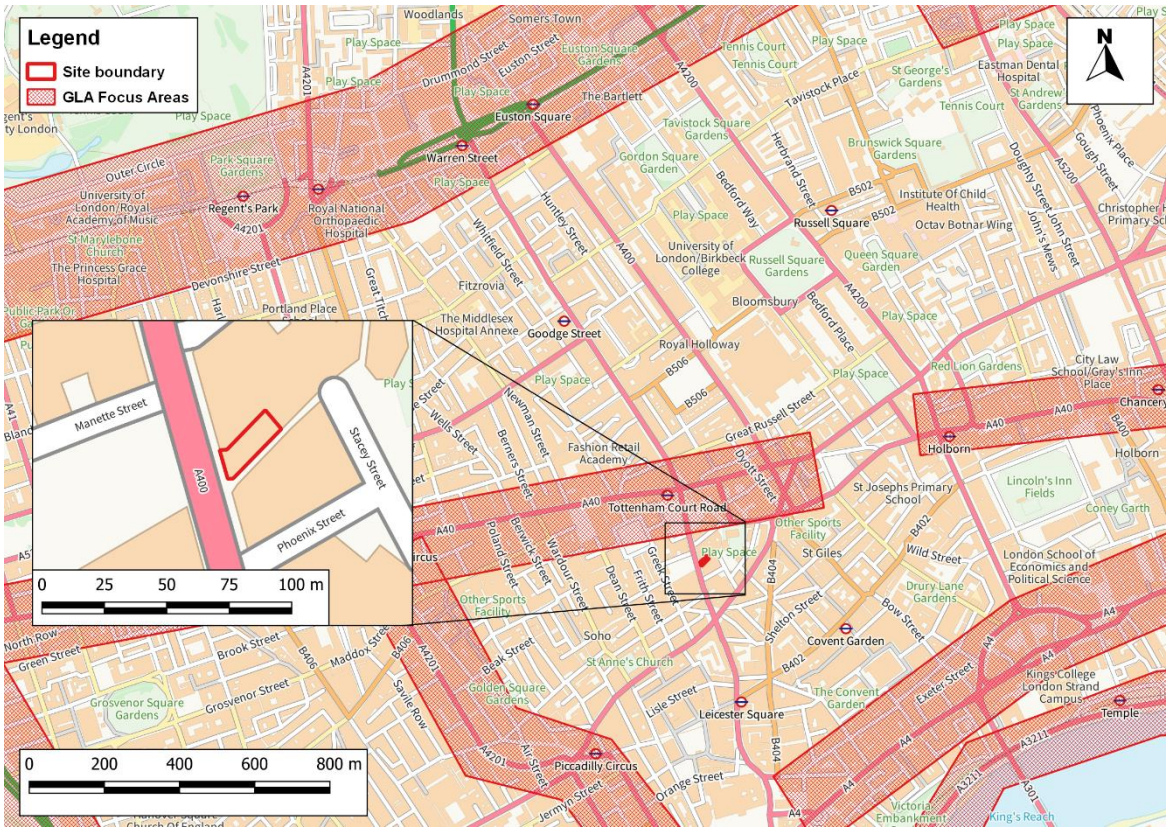

Figure 1: Proposed Development Location

1.7 The GLA has also released Supplementary Planning Guidance (SPG) on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014). The SPG outlines a risk assessment approach for construction dust assessment and helps determine the mitigation measures that will need to be applied. However, the SPG makes clear that only 'major' developments need to be assessed, which are defined in the London Plan as being developments of ten or more residential units / greater than 1,000 m^2 floor space. The proposed development comprises an additional 271.1 m^2 floor space and is not, therefore, a major development; a construction dust risk assessment is, therefore, not required.

1.8 This note is required to demonstrate that the development would be Air Quality Neutral to meet the requirements of policy SI 1 of the London Plan and, if not, the extent to which mitigation/off-setting is required. It sets out details of existing air quality conditions in the area, and provides a qualitative assessment of the suitability of the site for the proposed development in terms of air quality.

2 Assessment Criteria

2.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).

2.2 The UK-wide objectives for nitrogen dioxide and PM_{10} were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The $PM_{2.5}$ objective was to be achieved by 2020. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m^3 (Defra, 2021).

2.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019). The annual mean objectives for nitrogen dioxide and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

2.4 The restaurant use within the development is the only location at which the 1-hour mean nitrogen objective applies; the annual mean nitrogen dioxide and PM_{10} objectives, and 24-hour mean PM_{10} objective do not apply at any location within the development, given office[1] accommodation comprises the rest of the development. The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m^3 not to be exceeded more than 18 times a year

[1] Offices are not considered relevant exposure for the air quality objectives and will be covered separately by occupational workplace exposure limits detailed within the Health and Safety at Work Regulations.

3 Existing Conditions

3.1 The site is bound to the north by a seven-storey commercial building at 120 Charing Cross Road, to the east by a three-storey commercial building at 12 Flitcroft Street, to the south by Flitcroft Street, and to the west by Charing Cross Road. Charing Cross Road also forms the borough boundary with City of Westminster (CoW).

3.2 Information on existing air quality has been obtained by collating the results of monitoring carried out by LBC and CoW, as well as modelled annual mean nitrogen dioxide concentrations presented in the London Atmospheric Emissions Inventory (LAEI) database (GLA, 2021c).

Local Air Quality Monitoring

3.3 LBC operates four automatic monitoring stations within its area, and one of these is located 850 m to the northeast of the proposed development. The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko International (using the 50% TEA in acetone method). These include one adjacent to Tottenham Court Road (A400) and two others within approximately 1 km of the proposed development. Monitoring is also undertaken by CoW, including two automatic monitors located within 630 m of the proposed development. Measured annual mean and 1-hour mean concentrations for the years 2016 to 2020 for these monitoring sites are summarised in Table 2. The monitoring locations are shown in Figure 2. Data have been taken from the CoW 2020 Air Quality Annual Status Report (ASR) and the LBC 2020 ASRs (City of Westminster Council, 2021; London Borough of Camden, 2021).

3.4 While 2020 results have been presented for completeness, they are not relied upon in any way as they will not be representative of ‘typical’ air quality conditions due to the considerable impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.

Table 2: Summary of Nitrogen Dioxide (NO_2) Monitoring (2016-2020) [a]

Site No.	Local Authority	Site Type	Location	2016	2017	2018	2019	2020
Annual Mean (µg/m³)								
BL0	LBC	Urban Background (automatic)	London Bloomsbury	**42**	38	36	32	28
CA10		Urban Background	Tavistock Gardens	40	**46**	35	33	26
CA11		Kerbside	Tottenham Court Road	**84**	**74**	**66**	**61**	**42**
CA21		Kerbside	Bloomsbury Street	**72**	**71**	**59**	**48**	28
Covent Garden	CoW	Urban Background (automatic)	Covent Garden	-	37	39	39	21
Oxford Street East		Roadside (automatic)	Oxford Street East	-	-	**76**	**51**	35
Objective				**40**				
Automatic Monitors - No. of Hours > 200 µg/m³ (1-hour mean objective)								
BL0	LBC	Urban Background	London Bloomsbury	0	0	0	0	0
Covent Garden	CoW	Urban Background	Covent Garden	-	0	0	0	0
Oxford Street East		Roadside	Oxford Street East	-	-	11	5	0
Objective				**18**				

[a] Exceedances of the objectives are shown in **bold**. Exceedances of 60 µg/m³, which indicate the potential for an exceedance of the 1-hour mean objective are shown in **bold underline**.

3.5 There are clear downward trends in annual mean nitrogen dioxide concentrations between 2016 and 2019 at all of the monitors operated by LBC. There have been no measured exceedances of the annual mean objective at urban background sites since at least 2017. All kerbside and roadside sites have measured exceedances of the objective between 2016 and 2019. In several years the concentrations at these monitoring sites have exceeded 60 µg/m³, which indicates the potential for exceedance of the 1-hour mean objective at those locations (Paragraph 2.2). However, direct measurements of 1-hour mean concentrations show that the 1-hour mean objective has been met at all of the automatic monitoring sites.

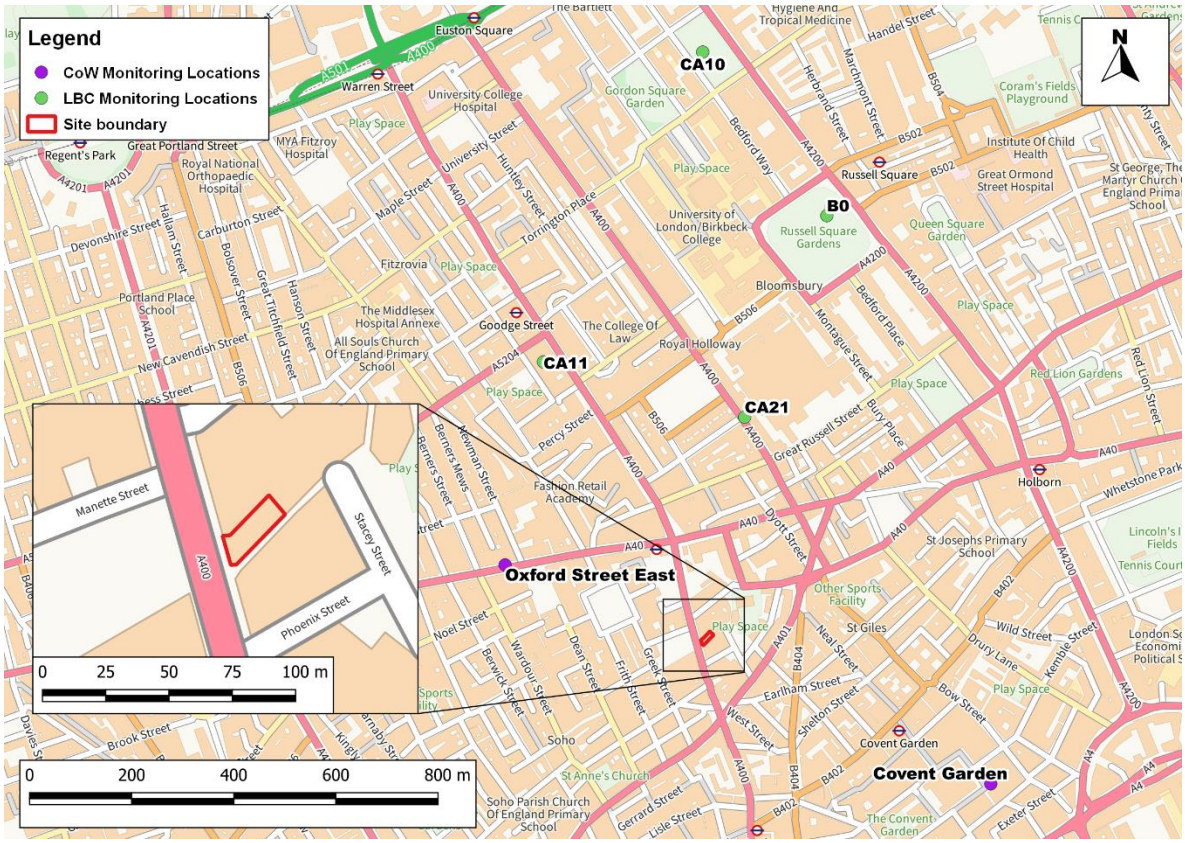

Figure 2: Monitoring Locations

3.6 Diffusion tube monitor CA11 is located less than 1 m from the kerb of Tottenham Court Road, approximately 610 m to the north of the development along the A400. It is considered to be the most representative monitoring site for the Charing Cross Road façade of the development. The façade of the development is approximately 4 m from the kerb of Charing Cross Road. It is thus considered that pollutant concentrations at the development will be lower than at monitor CA11.

LAEI Modelled Concentrations

3.7 Modelled nitrogen dioxide concentrations close to the site in 2019 are shown in Figure 3 (GLA, 2021c). Figure 3 shows that modelled annual mean nitrogen dioxide concentrations at the proposed development site in 2019 were between 40 µg/m^3 and 50 µg/m^3. As these predicted concentrations are well below 60 µg/m^3, it is unlikely that the 1-hour mean objective was exceeded at the proposed development site (Paragraph 2.2).

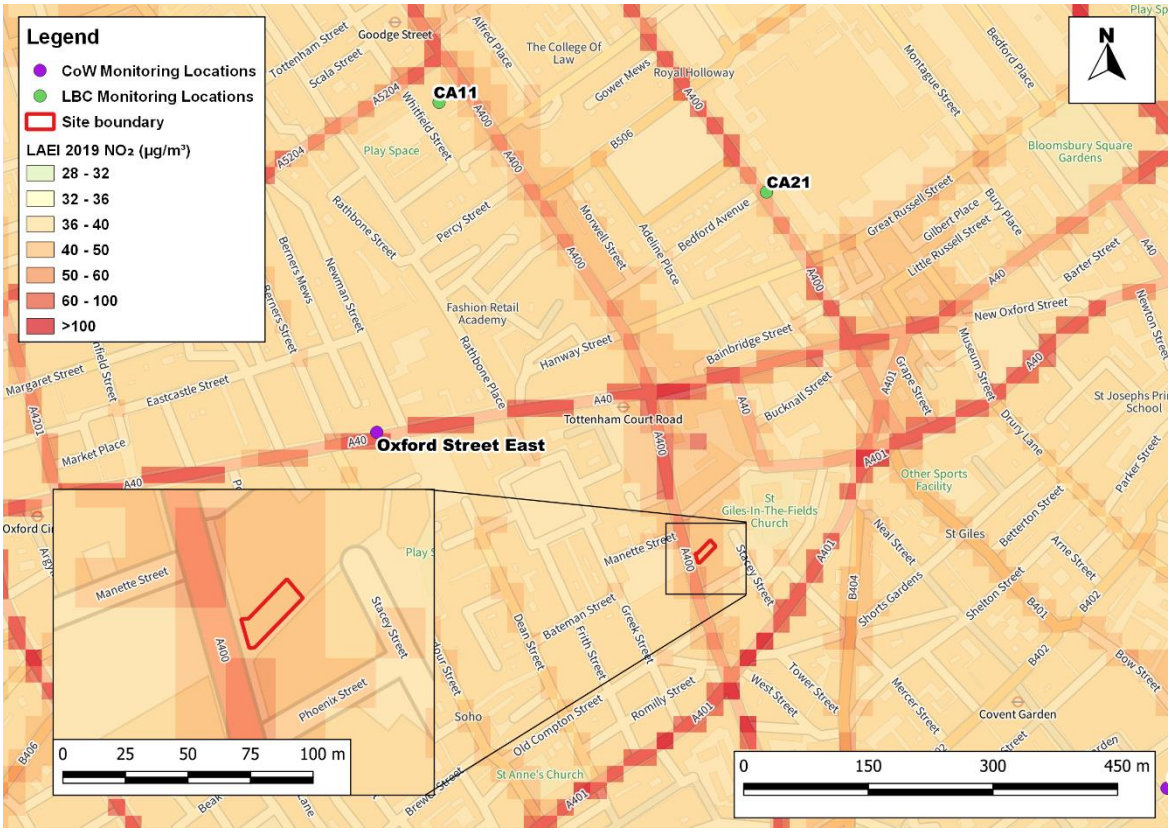

Figure 3: GLA LAEI 2019 Modelled NO_2 Concentrations (µg/m^3)

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4 Impact Assessment

Air Quality for Future Users of the Proposed Development

4.1 Measured 1-hour mean nitrogen dioxide data indicate that the 1-hour mean objective has not been exceeded in recent years (Table 2). Modelled annual mean nitrogen dioxide concentrations presented in the LAEI database (GLA, 2021c) show that the maximum annual mean concentration in 2019 within the application site was less than 50 µg/m^3. As this concentration is less than 60 µg/m^3, it is unlikely that the 1-hour mean objective was exceeded in 2019.

4.2 Concentrations are expected to continue to reduce in future years due to the improvements in emissions standards and the implementation of local and national measures, and therefore concentrations in the opening year are expected to be lower than those presented in this assessment.

Generator Impacts

4.3 The proposed emergency diesel generator will exhaust at 1 m above the parapet level, approximately 3.5 m above the accessible roof terrace, where dispersion will be favourable. As the emergency diesel generator will only be tested every six months, and taking account of measurements in the local area (maximum of 5 hours with measured concentrations greater than 200 µg/m^3 in 2019 at a roadside monitoring location adjacent to Oxford Street), it is very unlikely to cause an exceedance of the 1-hour mean nitrogen dioxide objective at any existing or proposed sensitive receptor. Based on the location of the flue and the testing schedule, it is judged that emissions from the emergency diesel generator will not lead to unacceptable air quality for users of the development.

5 ‘Air Quality Neutral’

5.1 The purpose of the London Plan’s requirement that development proposals be ‘air quality neutral’ is to prevent the gradual deterioration of air quality throughout Greater London. The GLA’s London Plan Guidance (Air Quality Neutral) (GLA, 2021b) sets out guidance on how an ‘air quality neutral’ assessment should be undertaken. It also provides a methodology for calculating an offsetting payment if a development is not ‘air quality neutral’ and it is not possible to identify or agree appropriate and adequate mitigation. The document is currently in consultation draft.

Building Emissions

5.2 The Air Quality Neutral guidance specifies that “*Backup plant installed for emergency and life safety power supply, such as diesel generators, may be excluded from the calculation of predicted building emissions*”. Heat and hot water will be provided by ASHPs; the proposed development does not, therefore, include any relevant combustion plant and will thus have no direct building emissions relevant to the air quality neutral assessment. It is, therefore, better than air quality neutral in terms of building emissions.

Road Transport Emissions

5.3 The proposed development does not provide any car parking spaces. According to Paragraph 4.1.1 of the GLA’s Air Quality Neutral guidance (GLA, 2021b), “*Where minor developments include new parking, they can be assumed to meet the TEB if the maximum parking standards set out in policies T6 and T6.1 to T6.5 of the London Plan are not exceeded*”. On this basis, the development is air quality neutral in terms of transport emissions.

Summary

5.4 The proposed development complies with the requirement that all new developments in London should be at least air quality neutral.

6 Conclusions

6.1 Future users of the development are expected to experience acceptable air quality, with nitrogen dioxide concentrations below the 1-hour mean objective.

6.2 The development will not generate any additional traffic, and emissions associated with the twice-yearly testing of the emergency diesel generator are unlikely to result in an exceedance of the 1-hour mean objective.

6.3 The proposed development complies with the requirement of Policy SI 1 of the London Plan that all new developments in London should be at least air quality neutral. No mitigation measures are required.

7 References

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8 Glossary

AQC	Air Quality Consultants
AQMA	Air Quality Management Area
ASHP	Air Source Heat Pump
AURN	Automatic Urban and Rural Network
CoW	City of Westminster
Defra	Department for Environment, Food and Rural Affairs
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the annual mean limit value for NO_2 but also has a high level of human exposure
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LBC	London Borough of Camden
µg/m^3	Microgrammes per cubic metre
NO_2	Nitrogen dioxide
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
$PM_{2.5}$	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide

A1 Professional Experience

Dr Denise Evans, BSc (Hons) PhD MIEnvSc MIAQM

Dr Evans is an Associate Director with AQC, with more than 22 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Dr Kate Wilkins, BSc (Hons) MSc PhD MIEnvSc MIAQM

Dr Wilkins is a Senior Consultant with AQC with over nine years' postgraduate and work experience in the field of Environmental and Earth Sciences. Since joining AQC in January 2018, she has undertaken numerous air quality impact assessments for road traffic, combustion plant and construction dust throughout the UK for both standalone assessments and for EIAs, and has also prepared local authority reports and literature reviews. She has contributed her technical skills in programming and specialist software to a range of large-scale projects, including the third runway at Heathrow airport. Previously, Kate completed a PhD at the University of Bristol, researching atmospheric dispersion modelling and satellite remote sensing of volcanic ash. Prior to her PhD she spent a year working at the Environment Agency in Flood Risk Management. She is a Member of both the Institute of Air Quality Management and the Institution of Environmental Sciences.

Will Wrench, BSc (Hons)

Mr Wrench is an Assistant Consultant with AQC, having joined the company in February 2022. Prior to joining, he completed a BSc degree with Honours in Ecological and Environmental Sciences at the University of Edinburgh, where he undertook air quality modelling projects, screening assessments and gained extensive experience of data processing and report writing. He is an Affiliate Member of both the Institute of Air Quality Management and Institution of Environmental Sciences and is now gaining experience in the field of air quality monitoring and assessment.