



Air Quality Addendum:
Institute of Neurology and
Dementia Research
Institute, 256 Gray's Inn
Road

February 2022



Experts in air quality
management & assessment

Document Control

Client	Arcadis	Principal Contact	Piers Currell
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Report Prepared By:	Frances Marshall
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Air Quality Consultants Ltd
23 Coldharbour Road, Bristol BS6 7JT Tel: 0117 974 1086
24 Greville Street, Farringdon, London, EC1N 8SS Tel: 020 3873 4780
aqc@aqconsultants.co.uk

Registered Office: 23 Coldharbour Road, Bristol BS6 7JT
Companies House Registration No: 2814570

Introduction

- 1.1 This addendum has been prepared to consider the amendments to the consented commercial development at the site of the Eastman Dental Hospital, 256 Gray's Inn Road in Camden, and the implications in terms of air quality.
- 1.2 Planning permission was granted in 2019 for the partial redevelopment of the site to create approximately 24,000 m² of medical research, outpatient facility and academic floorspace (planning application reference 2019/2879/P), hereafter referred to as the "Proposed Development". The application was accompanied by an Environmental Impact Assessment (EIA), within which Chapter 7: Air Quality assessed the air quality impact of the Proposed Development on the local area, as well as the suitability of the proposals with respect to air quality conditions for future occupants.
- 1.3 Chapter 7: Air Quality, completed by Air Quality Consultants (AQC) Limited, detailed an assessment of the impact of additional road traffic and the operation of centralised energy plant on existing and proposed high sensitivity receptors, assuming an opening year of 2024. The assessment described in Chapter 7 of the ES is hereafter referred to as the "Original Assessment". The Original Assessment concluded that the Proposed Development would lead to an insignificant effect on local air quality, and that future occupants would be exposed to acceptable air quality conditions.
- 1.4 Since the Proposed Development was granted planning permission, the rooftop plant layout has undergone further technical review, resulting in a series of minor amendments to the flue arrangement for the energy plant. This addendum outlines the proposed changes to the energy plant flue arrangement and demonstrates that the proposed amendments will not materially affect the outcomes of the Original Assessment.

Energy Plant

Original Assessment

- 1.5 The Original Assessment assessed the impacts of four steam boilers and five Low Temperature Hot Water (LTHW) boilers which exhausted at roof level on Plot 1. In each case, there was also an additional standby boiler in case of failure. In addition, the Proposed Development included a single emergency diesel generator, with the flue routed to roof level of Plot 1. The amendments described within this addendum do not affect the plant themselves, and there have been no changes to the gross fuel input or emission parameters for any of the plant.
- 1.6 The Original Assessment assessed a five-flue configuration¹, based on two flues servicing a total of six LTHW boilers (three per flue), two flues servicing five steam boilers (two via one flue and three

¹ The air quality assessment assumed the sixth flue was redundant.

via another flue), and a dedicated flue for the emergency diesel generator. The flues were modelled at a height of 37.7 m above ground level, equivalent to 13.7 m above roof level.

- 1.7 Table 1 summarises the relevant release conditions for the flues modelled as part of the Original Assessment.

Table 1: Original Assessment Release Conditions

Parameter	Value				
	Steam Boilers		LTHW Boilers		Flue 5 (Diesel Generator)
	Flue 1 (Two Boilers)	Flue 2 (Three Boilers) ^a	Flue 3 (Three Boilers)	Flue 4 (Three Boilers) ^a	
Flue Diameter (m)	0.4	0.5	0.5	0.5	0.5
Actual Exhaust Volume Flow Rate (m ³ /s)	0.61	0.61	0.86	0.57	2.75
Exit Velocity (m/s)	4.8	3.1	4.4	2.9	14.0
Temperature (°C)	60		80		520

^a This includes the standby boiler so only two boilers are assumed to be concurrently operational.

Proposed Amendments

- 1.8 The proposed amendments to the flues are described as follows:
- an increase in flue height by approximately 550 mm;
 - a reduction to the number of operational flues from five¹ to four; and
 - a change to the exhaust velocity to 7 m/s, calculated from flue dispersion analysis on the revised configuration completed by Hoare Lea.
- 1.9 The consolidation of the flues does not materially affect the flue diameter and there will be no effect on the temperature of the exhaust gases. As stated in Paragraph 1.5, there are no changes to the plant serviced by the flues (i.e. the technical specifications of the steam boilers, LTHW boilers and emergency diesel generator remain unchanged).

Impact Assessment

- 1.10 Since the number and technical specifications of energy plant within the Proposed Development has not changed, the reduction in the number of flues leads to an increase in the plume buoyancy of the exhaust gases, as there are more energy plant serviced by each flue than in the Original Assessment. When multiple plant are discharged via a common flue, the overall volume of the

exhaust plume is greater, the total surface area of the plume is lower (which results in less rapid cooling) and the buoyancy flux (upward momentum) of the plume is greater, resulting in better dispersion. Additionally, there has been a marginal increase in the height of the flues and an increased exhaust gas velocity than was assumed in the Original Assessment; the exception to this is for the generator flue, where there will be a reduction in velocity². This favourable combination of factors leads to a better dispersion environment. The enhanced dispersion environment will lead to a greater dispersion of emissions, thus lower concentrations at ground floor level and lower air quality impacts.

- 1.11 It can be concluded that the changes to the flue configuration will not materially affect the outcomes of the Original Assessment. Based on the improved dispersion conditions, it is likely that the contribution to total concentrations from the operation of the energy plant within the Proposed Development will be lower than those presented in the Original Assessment.

Statement of Conformity

- 1.12 In summary, the proposed amendments will have no significant effect on air quality. Therefore, the residual effects and conclusions of Chapter 7: Air Quality, submitted in 2019 are unchanged and remain valid.

² Whilst the velocity of the diesel generator emissions will reduce, since it was only operating for a very small number of hours (12 in total, for testing and maintenance), its contribution was a small proportion of the total emissions, thus the reduced velocity will be more than cancelled out by the increase in flue height and improved dispersion for the other plant.