Population Exposure Comparison: 2007 and 2017

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Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 Air Quality Consultants Ltd (AQC) has carried out dispersion modelling to determine annual mean nitrogen dioxide concentrations across Waltham Forest, and the level of population exposure to exceedances of the annual mean objective (in terms of properties at which the objective applies), detailed in two reports. The first, "Detailed Modelling of Nitrogen Dioxide in the London Borough of Waltham Forest" (report number J3223A/1/F1, dated 25th May 2018) detailed areas where modelling indicated that the nitrogen dioxide annual mean air quality objective (40 µg/m^3) was currently being exceeded (AQC, 2018). This was followed up with an Addendum Report, "Addendum to Waltham Forest Detailed Modelling" (report number J3223B/1/F1, dated 12th July 2018) (AQC, 2018a), which presented the locations of population exposure within three nitrogen dioxide (NO_2) concentration contours (36 – 38 µg/m^3, 38 – 40 µg/m^3 and ≥40 µg/m^3) based on the original dispersion modelling for 2017.

1.2 The London Borough of Waltham Forest has provided AQC with similar contours of annual mean nitrogen dioxide concentrations based on dispersion modelling carried out for the year 2007. The contours were originally created by Bureau Veritas, and presented in Appendix 3 of the North London Cluster Group Air Quality Monitoring 2009 report (Bureau Veritas, 2009). AQC has used these contours alongside the AddressBase data to determine the level of population exposure to objective exceedances in 2007, in order that this can be compared to that in 2017, to demonstrate how local air quality has improved throughout the Borough over the last 10 years.

1.3 Section 2 presents the population exposure maps, whilst Section 3 presents density plots ("heat maps") for 2007 and 2017.

2 Population Exposure

2.1 The number of properties representative of relevant exposure within the 40 µg/m^3 annual mean nitrogen dioxide contour has been calculated using AddressBase data provided by the Council. Figure 1 shows relevant properties where the annual mean objective (40 µg/m^3) was exceeded in 2007, whilst Figure 2 shows those where the annual mean objective was exceeded in 2017. Individual points presented in Figure 1 and Figure 2 may represent a number of addresses, such as in an apartment block. Some of these properties will be at height, where concentrations will be lower than at ground-floor level (where the predictions have been made). It is not possible to disaggregate properties at height within the AddressBase data, thus the prediction of population exposure within areas of exceedance should be considered a conservative estimate in both cases.

2.2 Table 1 sets out the number of properties representative of relevant exposure in terms of the annual mean nitrogen dioxide objective in both 2007 and 2017, based on the points presented in Figure 1 and Figure 2. As identified in Paragraph 2.1, the prediction of population exposure within areas of exceedance should be considered a conservative estimate in both cases.

Table 1: Relevant Exposure

Relevant Exposure Code	Relevant Exposure Description	Count	
		2007	2017
CE	Commercial Education	111	6
CM	Commercial Medical	5	0
RD	Residential Dwelling	60,152	6,353
RH	Residential House in Multiple Occupation	987	7
RI	Residential Institution	61	11
Total		**61,316**	**6,377**

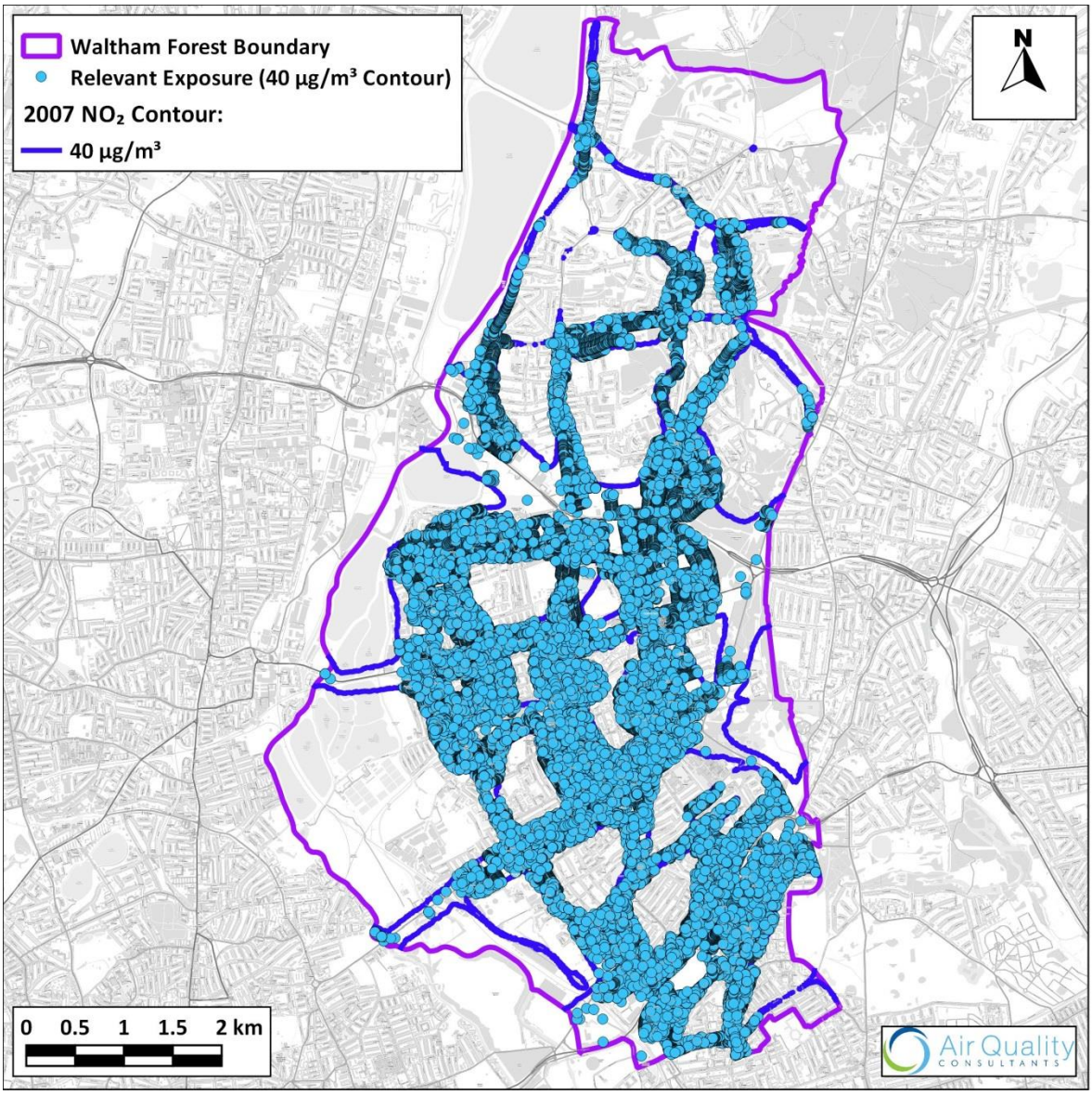

Figure 1: Locations of Relevant Exposure in 2007

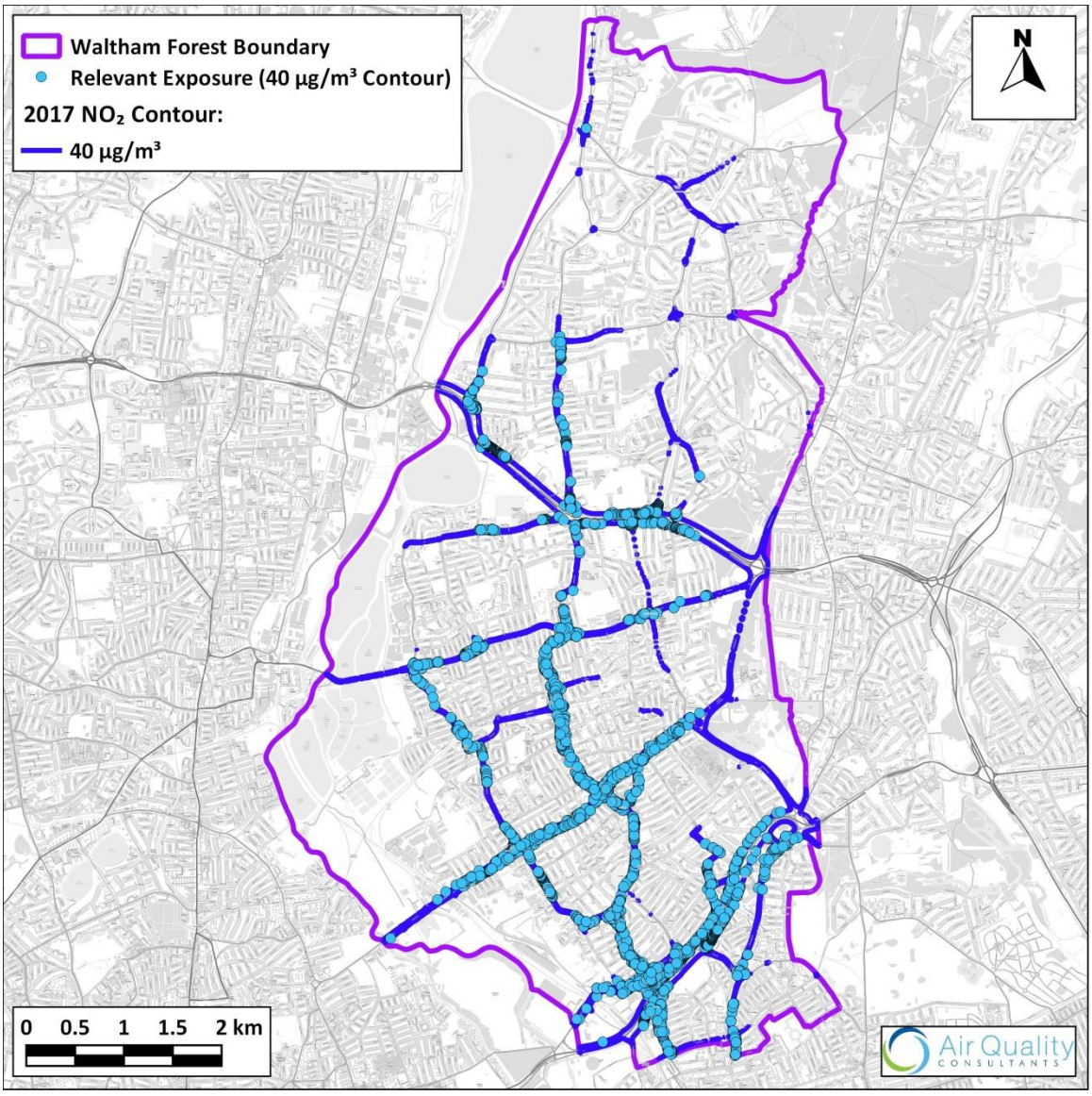

Figure 2: Locations of Relevant Exposure in 2017

3 Heat Maps

3.1 At some locations, individual points presented in the contour maps may represent a number of properties, such as an apartment block. Figure 3 and Figure 4 presents the same exposure data from Figure 1 and Figure 2, but displayed as density plots ("heat maps"), where the darker colour indicates a concentrated area of relevant exposure.

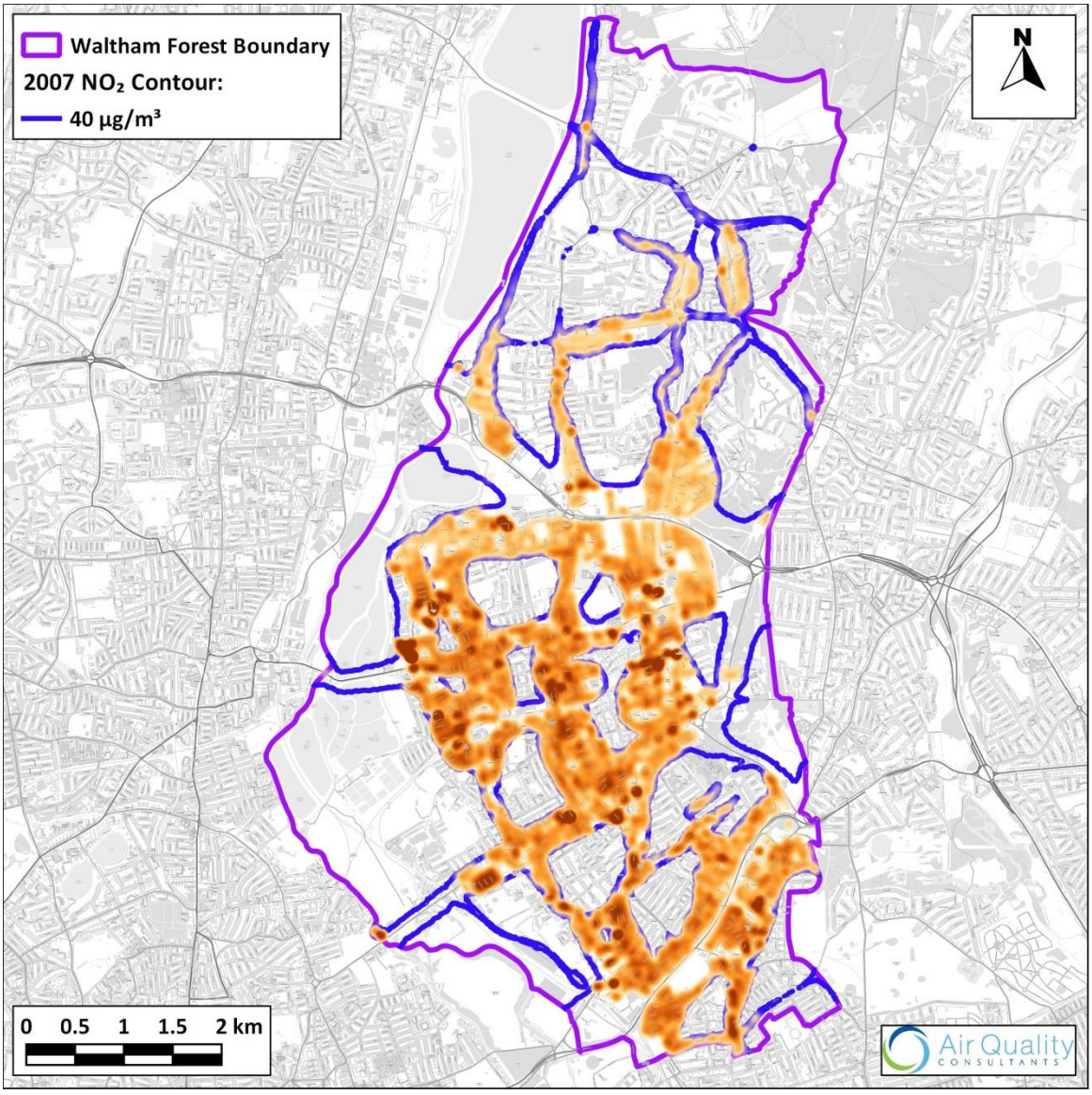

Figure 3: Heat Map of Relevant Exposure in 2007

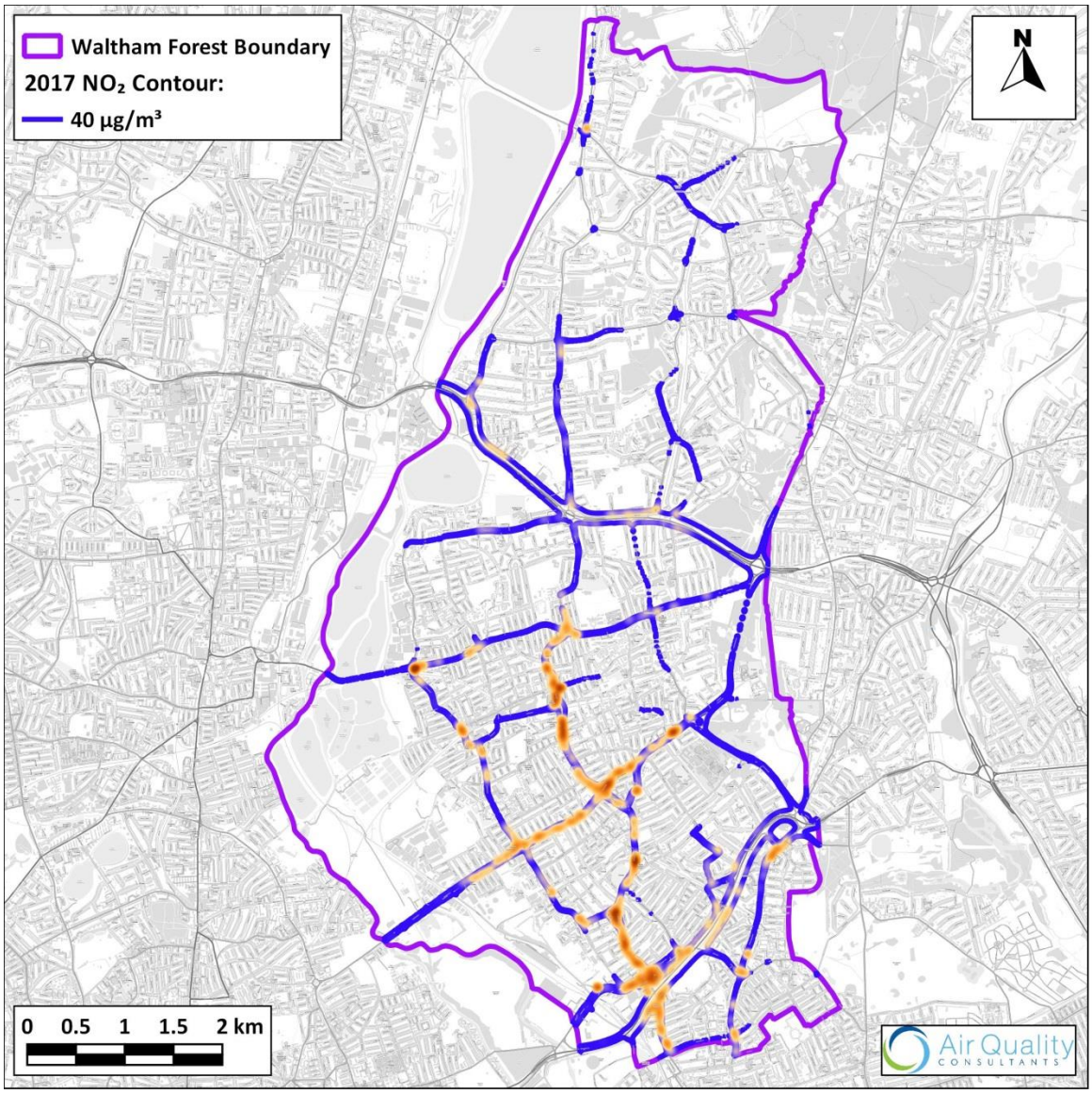

Figure 4: Heat Map of Relevant Exposure in 2017

4 References

AQC (2018) 'Detailed Modelling of Nitrogen Dioxide in the London Borough of Waltham FOrest'.

AQC (2018a) 'Addendum to Waltham Forest Detailed Modelling'.

Bureau Veritas (2009) 'North London Cluster Group Air Quality Monitoring: London Borough of Waltham Forest'.