



Northamptonshire County Council

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## **APPENDIX 6-3**

Scheme Specific Monitoring





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#### Scheme Specific Monitoring

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WSP

No 8 First Street

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WSP.com

## 6. SCHEME SPECIFIC MONITORING

### 6.1. MONITORING LOCATIONS

6.1.1. A project specific NO<sub>2</sub> passive diffusion tube monitoring programme was completed by WSP to supplement and extend local authority monitoring to establish baseline conditions within the vicinity of the Proposed Development. A three-month programme ran from November 2018 until February 2019 and consisted of eleven diffusion tube locations.

6.1.2. Details of the monitoring site locations are presented in Table 6-3-1 and each depicted on Figure 6.2. Where site conditions allowed, the monitoring locations were not located in proximity (within 10m) to the following localised sources or sinks of air pollutants and areas that could cause undue disturbance to free flow air flow around the diffusion tubes:

- § Heather Flues (particularly low level balanced flues);
- § Trees and other vegetation;
- § Extractor vents; and / or;
- § Underground ventilation shafts.

**Table 6-3-1 – Scheme Specific Monitoring Locations and Site Details**

Site ID	Coordinates		Location	Height (m)
	X	Y		
NRR1	474067.8	264238.3	Spring Recreation Ground, Welford Road	2.5
NRR2	473681.1	265252.1	Boughton Crossing	2.5
NRR3	472982	266313.2	Northampton Road/Pitsford Road Junction, Chapel Brampton	2.5
NRR4	472154.2	265951.6	Harlestone Road, Church Brampton	2.5
NRR5	471945.6	263335.8	Lodge Way	2.5
NRR6	471247.7	263450.7	Harlestone Road Roundabout	2.5

Site ID	Coordinates		Location	Height (m)
	X	Y		
NRR7	471640.7	262900.8	Harleston Road/Quarry Road	2.5
NRR8	473057	261938.6	St Andrews Church, Harlestone Road	2.5
NRR9	473969.5	262381.8	Park Drive/Mill Lane Roundabout	2.5
NRR10	471315.9	263387.3	Harleston Road/Whites Lane	2.5
NRR11	470358	264737	A428/Church Lane	2.5

## 6.2. NO<sub>2</sub> DIFFUSION TUBE MONITORING RESULTS

### BIAS ADJUSTED PERIOD MEAN CONCENTRATIONS

- 6.2.1. Diffusion tubes are affected by several sources of interference which can cause substantial under or over estimation of concentrations. This is often referred to as bias, when compared to concentrations measured by more accurate chemiluminescent analysers referred to as continuous monitors.
- 6.2.2. As a result, Defra advises applying an appropriate bias adjustment factor to measured diffusion tube concentrations. A bias adjustment factor is obtained from studies where diffusion tubes are co-located with a continuous monitor. The concentration sampled by the tubes are then compared against that sampled by the continuous monitor and a factor obtained based on the difference.
- 6.2.3. The monitoring survey included a co-location study with Northampton Spring Park. A local bias adjustment factor was derived of 0.84. To ensure a conservative assessment, a decision was made to use the bias adjustment factor from Defra's National Diffusion Tubes Adjustment Spreadsheet. Details of the National and Local Bias Adjustment monitoring results can be seen in Table 6-3-2.

### ANNUALISATION

- 6.2.4. The monitored NO<sub>2</sub> concentrations presented in Table 6-3-2 are representative of a period mean. However, period means are not directly comparable with the annual mean air quality Objective, and therefore all monitoring results were adjusted based upon the methodology contained within Box 7.9 of LAQM.TG16. In this procedure, data from nearby (within 50 miles) continuous monitoring sites with annual datasets are used to generate a factor to convert period data into annual data. The

conversion into annual mean concentrations then provides a concentration that is directly comparable with the annual mean air quality Objective for NO<sub>2</sub>.

6.2.5. Four AURN 'Urban' sites were used for annualisation. These included:

- § Northampton Spring Park;
- § Leamington Spa;
- § Coventry; and
- § Leicester University

6.2.6. The annualisation factor was applied to all bias adjusted period mean results, thus providing annualised NO<sub>2</sub> concentrations at each monitoring site for 2018. A summary of the annualised mean concentration data is displayed in Table 6-3-2.

**Table 6-3-2 – Bias Adjusted Annual Mean Diffusion Tube Monitoring Results 2018 (concentrations given as µg/m<sup>3</sup>)**

Site ID	Monthly Measurements				2018 Annualised Value <sup>1</sup>	2018 Final Value – Local Bias <sup>2</sup>	Final Value – National Bias <sup>3</sup>
	Nov - Dec	Dec - Jan	Jan - Feb	Average			
NRR1	27.3	28.7	31.7	29.2	20.6	17.3	19.2
NRR2	22.3	23.1	21.8	25.8	18.2	15.3	16.9
NRR3	27.1	-	21.1	29.6	20.9	17.6	19.4
NRR4	21.4	23.3	28.0	24.2	17.1	14.4	15.9
NRR5	26.1	22.7	27.9	25.6	18.1	15.2	16.8
NRR6	25.4	30.0	29.9	28.4	20.1	16.9	18.7
NRR7	28.0	26.8	27.0	27.3	19.3	16.2	17.9
NRR8	21.0	16.2	21.7	19.6	13.9	11.7	12.9
NRR9	23.4	30.3	31.0	28.2	20.0	16.8	18.5
NRR10	36.2	32.1	30.0	32.8	23.2	19.5	21.5
NRR11	30.8	19.7	22.6	24.3	17.2	14.4	16.0
Co-Location Diffusion Tubes							
NRR CoLo1	22.5	19.2	-	20.8	-	-	-
NRR CoLo2	22.9	18.4	23.1	21.5	-	-	-
NRR CoLo3	24.2	20.1	24.5	22.9	-	-	-

<sup>1</sup> Annualised factor 0.71 applied to adjusted mean. Factor based on period/annual mean at 4 AURN continuous monitoring sites in 2018



<sup>2</sup> Local bias factor 0.84 applied to 'unadjusted period mean'

<sup>3</sup> National bias factor 0.93 applied to 'unadjusted period mean'



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