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Stag Brewery

Briefing Note – Responses to GLA Air Quality Queries

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

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Introduction

1.1. Waterman Infrastructure and Environment (WIE) were commissioned by Reselton Properties Ltd to prepare an Environmental Statement (the '2018 ES') for the redevelopment of the former Stag Brewery Site in Mortlake (the 'Site'), which collectively covered three planning applications (refs. 18/0547/FUL ('Application A'), 18/0548/FUL ('Application B') and 18/0549/FUL ('Application C'). Following planning submission in February 2018 for the three applications (the 'Development'), the Greater London Authority's (GLA) internal air quality team reviewed the air quality assessment in the 2018 ES and provided comments on 24th August 2018. WIE provided a response to the GLA's comments in a note dated 6th September 2018. In addition, in May 2019, Reselton Properties Ltd (the 'Applicant') issued design amendments to the February 2018 applications, which resulted in the submission of substitution documents and an ES Addendum (the 'May 2019 ES Addendum'). As part of the May 2019 ES Addendum, the air quality assessment was revised to take into account the amendments to the Development and new baseline monitoring data collected between July 2018 and January 2019.

1.2. This briefing note presents a full response to the GLA's most recent comments (received on 22nd July 2019) to the Air Quality Assessment undertaken for the Development. It is intended that the information in this briefing note provides clarification on the GLA comments and assists with their decision that the Development is acceptable in terms of impact on local air quality.

1.3. This Briefing Note is accompanied by the following Annexes:

- Annex A: Air Quality Neutral Calculation;
- Annex B: Air Quality Modelling Results; and
- Annex C: Estimated Operational Profile Boilers and CHPs; and

- Annex D: Figures.

Model Verification

GLA Comment: The verification factor should be applied consistently to the model, and the overall conclusions reviewed following this.

1.4. Model verification is the process of comparing monitored and modelled pollutant concentrations and, if necessary, adjusting the modelled results to reflect actual measured concentrations, to improve the accuracy of the modelling results.

1.5. As part of the May 2019 ES Addendum, the dispersion model used for the 2018 ES was re-run to predict annual mean NO_x concentrations at the project specific kerbside and roadside diffusion tube monitoring locations (as presented in Table 7 of the May 2019 ES Addendum) to determine the accuracy of the 2018 ES model with new monitoring data collected between July 2018 and January 2019. The results of the results of the re-running of the dispersion model are presented in Appendix C of the May 2019 ES Addendum. The methodology used for this model verification is consistent with that presented in Appendix 10.2 of Chapter 10: Air Quality of the 2018 ES.

1.6. As identified in Appendix D of the May 2019 ES Addendum, on re-running, the model is performing well, and no adjustment factor needs to be applied to the modelled results. This is consistent with the process detailed in Appendix 10.2 of Chapter 10: Air Quality of the 2018 ES, whereby no adjustment factor was applied as the model was performing well.

1.7. Consequently, the results of the detailed dispersion modelling of the air quality assessment as presented in Chapter 10: Air Quality of the 2018 ES remain applicable and valid.

Stack Heights and Locations

GLA Comment: Stack heights and locations should be shown.

1.8. The plant stack parameters are presented in Table A9 of Appendix 10.1 of the 2018 ES and presents grid references to locate the flues, together with release heights. For completeness the locations are presented in Figure 1 in **Annex D** and plant stack parameters reiterated in **Annex A**.

Interim Assessment

GLA Comment: The applicant needs to justify the assumptions for the future scenarios and present an interim between the two unrealistic extremes to determine the potential impacts in an earlier year.

1.9. Following this comment raised by the GLA on the NO_2 sensitivity analysis presented in the 2018 ES, a further assessment has been undertaken using revised NO_x emissions data obtained from the Air Quality Consultants Ltd Calculator Using Realistic Emissions for Diesels (CURED) spreadsheet[1]. This spreadsheet has been designed to provide a reasonable worst-case assumption for future vehicle emissions.

1.10. All other input data used within this further assessment remains the same as that presented in the 2018 ES, in summary:

- Opening year of the Development (2027);
- Traffic data and road network;

1 Air Quality Consultants Ltd (2017) Calculator Using Realistic Emissions for Diesels (CURED) Spreadsheet. CURED V3A December 2017.

- Sensitive receptors; and
- Building services plant.

1.11. The results of the assessment using the CURED emissions factors in relation to NO_2 are presented in Table 1.

Table 1: Results of the Assessment using CURED emission factors

ID	Receptor Location	2027 Without Development	2027 With Development	µg/m^3 Change*	Significance
1	1 Varsity Flow	26.1	26.5	0.4	Negligible
2	6 Watney Cottages	29.0	29.5	0.5	Negligible
3	1 Watney Cottages	27.1	27.6	0.5	Negligible
4	1-3 Parliament Mews	24.6	25.1	0.5	Negligible
5	Ship Lane	24.5	25.2	0.7	Negligible
6	Lower Richmond Road	27.6	28.1	0.5	Negligible
7	Lower Richmond Road	27.7	28.3	0.6	Negligible
8	Lower Richmond Road	27.6	28.2	0.6	Negligible
9	13 Sheen Lane	27.1	27.6	0.5	Negligible
10	40 Mortlake High Street	28.3	28.8	0.5	Negligible
11	Boat Race Court	27.2	27.6	0.4	Negligible
12	Little Paradise Nursery	27.8	28.5	0.7	Negligible
13	Thomas House Primary School	26.5	27.0	0.5	Negligible
14	Richmond Training and Development Centre	26.8	27.2	0.4	Negligible
15	St Mary Magdalen's Catholic Primary School	24.5	24.7	0.2	Negligible
16	Proposed Residential Building 10 – Ground Floor Level	-	28.2	-	-
17	Proposed School – Ground Floor Level	-	26.1	-	-
18	Proposed Residential Building 3 – Floor Level 5	-	27.9	-	-
19	Proposed School Building – Floor Level 2	-	25.7	-	-
20	Chalkers Corner Junction - Receptor 57*	32.4	33.1	0.7	Slight Adverse
21	Chalkers Corner Junction - Receptor 21*	36.3	34.4	-1.9	Slight Beneficial

Note: For accuracy, the changes arising from the Development have been calculated using the exact output from the ADMS-Road and ADMS model rather than the rounded numbers within Table 1. This explains the slight difference in the calculated change in concentrations from the 'without' and 'with' Development scenarios.

* Results presented for the Receptor with the greatest adverse and beneficial impact of NO_2, as presented in Annex B

1.12. Although the overall predicted concentrations in Table 1 are higher than those presented in Table 10.14 of the 2018 ES, they are lower than the results of the sensitivity test presented in Table 10.15 due to revised NOx vehicle emission factors obtained from CURED. The results in Table 1 show that the annual mean concentrations of NO_2 are predicted to be below the annual mean NO_2 AQS objective value of 40 µg/m^3 'without' and 'with' the Development at all receptor locations presented in Table 1. This is consistent with the assessment presented in the 2018 ES.

1.13. The predicted annual mean NO_2 concentrations are below 60µg/m^3 at all receptor locations both 'without' and 'with' the Development and as such the 1-hour mean objective is likely to be met at these locations. This is consistent with the assessment (based on current guidance, i.e. with reduced emission rates and background concentration to the completion year of 2027) presented in the 2018 ES.

1.14. Table 1 presents the impact of the Development using the impact descriptors outlined in Table 10.7 of the 2018 ES. Consequently, the Development is predicted to result in:

- a 'slight adverse' impact at Receptors 20;
- a 'slight beneficial' impact at Receptor 21; and
- a 'negligible' impact at the other 15 existing receptors.

1.15. As indicated in Chapter 10: Air Quality of the 2018 ES, following the approach to assessing significance outlined in the EPUK / IAQM Guidance[2], the significance of likely residual effects of the completed Development on air quality has been established through professional judgement. Considering the results of this further assessment using the CURED emissions factors, the overall effect of the Development on local air quality remains **insignificant** as presented in the 2018 ES and May 2019 ES Addendum.

Point and Traffic Source Emissions

GLA Comment: The applicant needs to fully describe how point and traffic source emissions have been combined and assess short term impacts.

1.16. For assessment against the 1-hour short term Predicted Environmental Concentration (PEC) has been compared to the short-term objective level, set at no more than 18 hourly exceedences of 200µg/m^3, which corresponds to the 99.8th percentile of 1-hour mean concentrations. The short-term PEC has been calculated as the Process Contribution plus twice the long-term background.

Table 2: Results of the Assessment using CURED emission factors

ID	Receptor Location	2027 Without Development	2027 With Development	µg/m^3 Change*	Significance
1	1 Varsity Flow	59.2	60.3	1.1	Negligible
2	6 Watney Cottages	75.8	76.8	1.0	Negligible
3	1 Watney Cottages	67.7	68.5	0.8	Negligible

[2] Environmental Protection UK & Institute of Air Quality Management (2017); 'Land-Use Planning & Development Control: Planning for Air Quality', January 2017. IAQM, London.

ID	Receptor Location	2027 Without Development	2027 With Development	µg/m³ Change*	Significance
4	1-3 Parliament Mews	54.1	57.5	3.4	Negligible
5	Ship Lane	53.0	60.8	7.8	Negligible
6	Lower Richmond Road	66.7	71.9	5.2	Negligible
7	Lower Richmond Road	67.1	78.4	11.3	Negligible
8	Lower Richmond Road	68.4	72.7	4.3	Negligible
9	13 Sheen Lane	62.6	72.8	10.1	Negligible
10	40 Mortlake High Street	68.5	76.3	7.8	Negligible
11	Boat Race Court	66.3	67.1	0.8	Negligible
12	Little Paradise Nursery	68.3	77.7	9.3	Negligible
13	Thomas House Primary School	61.4	66.7	5.2	Negligible
14	Richmond Training and Development Centre	66.8	67.4	0.6	Negligible
15	St Mary Magdalen's Catholic Primary School	52.8	53.0	0.2	Negligible
16	Proposed Residential Building 10 – Ground Floor Level	-	99.3	-	-
17	Proposed School – Ground Floor Level	-	77.4	-	-
18	Proposed Residential Building 3 – Floor Level 5	-	78.8	-	-
19	Proposed School Building – Floor Level 2	-	78.7	-	-
20	Chalkers Corner Junction - Receptor 57	92.3	95.2	2.9	Negligible
21	Chalkers Corner Junction - Receptor 21	117.1	104.1	-13.0	Negligible

Note: For accuracy, the changes arising from the Development have been calculated using the exact output from the ADMS-Road and ADMS model rather than the rounded numbers within Table 1. This explains the slight difference in the calculated change in concentrations from the 'without' and 'with' Development scenarios.

* Results presented for the Receptor with the greatest adverse and beneficial impact of NO_2, as presented in **Annex B**.

1.17. The 1hour mean AQS objective for NO_2 is unlikely to be exceeded at a receptor location where the 99.8th percentile of NO_2 concentrations is less than 200µg/m^3. As shown in Table 2 the 99.8th percentile of NO_2 concentrations in 2027 is predicted to be below 200µg/m^3 at all receptor locations therefore the 1-hour mean objective is also predicted to be met at all receptor locations. This is consistent with the conclusions of the 2018 ES and May 2019 ES Addendum which concluded that the 1-hour mean objective was not exceeded.

Receptors

GLA Comment: The applicant needs to show all the receptors in the report (not just in the rebuttal document) and correctly position the ground level receptors. Impacts should also be classified for all receptors, not just a selection.

1.18. As per the footnote in Table 10.3 of the 2018 ES, the ground floor is assumed to be 0m to represent the worst-case assessment of exposure as this is the closest location to tailpipe vehicle emissions. By modelling 0m above ground sensitive groups (less than 1.5m in height) such as children and people in wheelchairs have been accounted for in the results. In order to make a direct comparison of the 2018 ES and the additional interim modelling described earlier in this note, ground level receptors have not been repositioned.

1.19. Full results of the modelling are presented in **Annex B**, and all receptor locations are presented in Figure 2 in **Annex D**.

Isopleth Map

GLA Comment: The results should also be presented as an overall isopleth map.

1.20. An isopleth map of the results is presented in Figure 3 of **Annex D**.

Energy Strategy

GLA Comment: Finally the applicant would need to either show that at least one configuration of the energy strategy could meet air quality neutral or propose offsetting measures.

1.21. The Applicant has undertaken consultation with the GLA in respect of the Development's proposed heating and energy strategy, as presented within the Energy Strategy supporting the three planning applications submitted in February 2018. In summary the strategy provides two Energy Centres to serve the eastern and western parts of Development, split by Ship Lane, and a separate heating and energy strategy would be provided for the school. This approach has been discussed with and agreed in principle with the GLA.

1.22. As indicated in Appendix 10.2 of the 2018 ES the total NO_x building emissions were above the benchmarks calculated for each land-use category and the Development is therefore not considered to be 'Air Quality Neutral', with respect to building emissions. However, this assessment assumed that the CHP is operating constantly, and boilers, responding to peaks in demand, would be operational for 50% of the year. The assessment did not take into account the estimated operating profiles provided by the project building services engineer, Hoare Lee, which are set out in **Annex C.**

1.23. Review of the operating profile for the CHP and boilers (**Annex C**) indicates that operational hours of the CHP and boilers are lower than the assumptions made within the 2018 ES. On re assessment based on the updated operating profile the Development is air quality neutral with respect to building emissions and no further mitigation measures are required.

1.24. For completeness the relevant plant information for the three energy centres within the Development, together with the benchmarked NO_x building emissions for each land-use category, and air quality neutral assessment are presented within **Annex A**.

Conclusion

1.25. This briefing note presents a full response to the GLA's most recent comments (received on 22nd July 2019) to the Air Quality Assessment undertaken for the Development. It is intended that the information in this briefing note provides clarification on the GLA comments and assists with their decision that the Development is acceptable in terms of impact on local air quality.

1.26. Clarification is provided in respect of:

- Model verification;
- Stack heights and locations;
- An interim assessment using CURED;
- Point Source and traffic source emissions;
- Receptors;
- Isopleth mapping; and
- The energy strategy and air quality neutral.

1.27. The information contained within this Briefing Note does not change the conclusions of the 2018 ES and the May 2019 ES Addendum.

References

[1] Greater London Authority (2017); 'Draft New London Plan', Draft for Public Consultation, GLA, London.
[2] Greater London Authority (2015); 'The London Plan -– The Spatial Development Strategy for London consolidated with alterations since 2011', GLA, London.

Annex A: Air Quality Neutral Assessment

Annex A: Air Quality Neutral Calculations

Introduction

1.1.1 This Appendix presents the calculations undertaken by Waterman Infrastructure and Environment (WIE) to demonstrate how the Development performs against relevant 'air quality neutral' benchmarks.

Description of the Development

1.1.2 The Development is located within the Outer London Activity Zone and would provide a mixed-use scheme (see **Table 1**).

1.1.3 The total amount of floorspace proposed by the Development, relevant to the Air Quality Neutral Assessment criteria is set out below in **Table 1**.

Table 1: 'Air Quality Neutral' Emissions Benchmarks for Buildings

Land Use (Use Class)	Proposed Floorspace Areas (GIA) (m^2)
Residential (Use Class C3, excluding assisted living)	75,079
Office (Use Class B1)	2,417
Cinema (Use Class D2)	2,120
Gym (Use Class D2)	740
Flexible Uses - Restaurant / bar / retail / community / leisure (Use Classes A1 / A2 / A3 / A4 / B1 / D1 / Boathouse)	4,686
Hotel (Use Class C1)	1,668
Assisted Living (Use Class C2)	14,738
Nursing and Care Home (Use Class C2)	9,472
School (Use Class D1)	9,319
Total	**120,239**

Note: Table 1 is not the Total Floor Space provided within the Development and excludes non-habitable uses such as plant and storage areas, play space, private amenity space, car park space, which are not used within the Air Quality Neutral Assessment calculations.

The AQNA assessment requires the comparison of Development against relevant benchmarks for each use class and therefore it is necessary for them to be included in Table 1.

1.1.4 It is noted the proposed land uses of Assisted Living are submitted as flexible use and have the potential to become residential. For the purposes of the Air Quality Neutral Assessment Assisted Living have been calculated separately as either Use Class C2 or Use Class C3.

Planning Policy

Draft New London Plan, 2017

1.1.5 Policy SI1 'Improving air quality' of the Draft London Plan[1] states that:

"…the development of large-scale redevelopment areas, such as Opportunity Areas and those subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development. All other developments should be at least Air Quality Neutral..."

The London Plan - The Spatial Development Strategy for Greater London; consolidated with alterations since 2011, March 2015

1.1.6 Policy 7.14 'Improving air quality' of the London Plan[2] states that development proposals should:

"…be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs);…"

The Mayor's Air Quality Strategy 'Clearing the Air' 2010

1.1.7 The Mayor's Air Quality Strategy states that:

"New developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions".

Sustainable Design and Construction - Supplementary Planning Guidance, 2014

1.1.8 To enable the implementation of the London Plan the GLA have produced a Sustainable Design and Construction Supplementary Planning Guidance (SPG). Section 4.3 focusses on air pollution and the effects from the operation of new developments to ensure that they are 'air quality neutral'.

1.1.9 Paragraph 4.3.17 and Appendix 5 of the SPG note that Building Emission Benchmarks (BEBs) have been defined for a series of land-use classes for both NO_x and PM_{10}. **Table 2** outlines the relevant emissions benchmarks for the Development. It is considered that where a Development does not exceed these benchmarks then they are considered to be 'air quality neutral' and would not increase NO_x and PM_{10} emissions across London as a whole.

Table 2: 'Air Quality Neutral' Emissions Benchmarks for Buildings

Land Use Class	NO_x (g/m^2)	PM_{10} (g/m^2)
Class A1	22.6	1.29
Class A3 - A5	75.2	4.32
Class A2 and Class B1	30.8	1.77
Class B2 – B7	36.6	2.95
Class B8	23.6	1.90
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
Class D1(a)	43.0	2.47
Class D1(b)	75.0	4.30
Class D1(c-h)	31.0	1.78
Class D2(a-d)	90.3	5.18
Class D2(e)	284	16.3

1.1.10 As well as defining a series of benchmarks for a buildings' operation, Appendix 6 of the SPG also defines benchmarks for the transport emissions related to the Development. **Table 3** details the emissions benchmarks for transport relevant to the Development. Section 4.3.18 of the SPG

notes that the design of a development should encourage and facilitate walking, cycling and the use of public transport, thereby minimising the generation of air pollutants.

Table 3: 'Air Quality Neutral' Emissions Benchmarks for Transport

Land Use	London Central Activity Zone	Inner	Outer
NO_x (g/m^2/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
NO_x (g/dwelling/annum)			
Residential (C3)	234	558	1553
PM_{10} (g/m^2/annum)			
Retail (A1)	29.3	39.3	42.9
Office (B1)	0.22	2.05	11.8
PM_{10} (g/dwelling/annum)			
Residential (C3, C4)	40.7	100	267

1.1.11 For both the Building and Transport Emissions Benchmarks, where a development does not exceed these benchmarks then the development is considered to be 'air quality neutral' and would not increase NO_x and PM_{10} emissions across London as a whole.

1.1.12 As well as providing benchmarks the SPG also recommends emission standards for combustion plant to comply with, in addition to meeting the overall 'air quality neutral' benchmark.

Air Quality Neutral Planning Support: GLA 80371, April 2014

1.1.13 In April 2014, the GLA published a report to provide support to the development of the Mayor's policy related to 'air quality neutral' developments. The report provides a method to enable a development to be assessed against the air quality neutral benchmarks set out in the Sustainable Design and Construction SPG.

1.1.14 The report provides a methodology required to apply the air quality neutral policy. It requires the transport and building emissions for the development to be identified and then compared to the benchmark emissions. The report notes that the building and transport emissions should be calculated separately and not combined.

Calculation of the Emissions Benchmarks

Building Emissions

1.1.15 The Development heating and energy strategy would provide two Energy Centres to serve the eastern and western parts of Development, split by Ship Lane. In addition, a separate heating and energy strategy would be provided for the school. The details of the Energy Centres are presented in **Table 4**. The operating profiles for each Energy Centre was provide by Hoare Lea and is presented in Annex C of the Briefing Note - Responses to GLA Air Quality Queries Ref WIE10667-103-BN-13-2-2-GLA_AQ.

Table 4: Calculation of the Total Building Emission

Energy Centre	Unit	Number	Release Rate (m/s)	Total NO_x Emissions (g/s)	Hours of Operation (hrs./annum)	Total NO_x (kg/annum)
Building 02	Boiler (2400kW)	5	15	0.1300	258	120.7
	CHP (560kW)	2	10	0.0204	6052	444.5
	CHP (610kW)	1	10	0.0111	6052	241.8
Building 17	Boiler (2500kW)	4	15	0.1027	242	89.5
	CHP (560kW)	2	10	0.0204	6052	444.5
	CHP (610kW)	1	10	0.0111	6052	241.8
School	Boiler (750kW)	2	15	0.0154	180	10.0
	CHP (226kW)	1	10	0.0041	6052	89.3
	Total Building NO_x Emission					**1682.1**

Note: For gas-fired plants PM_{10} emission factors are not provided because gas-fired plants do not emit any significant level of particulates

1.1.16 The Building Emission Benchmarks (BEB) for each land use category are presented in **Table 5** (as Assisted Living being Use Class C2) and **Table 6** (as Assisted Living being Use Class C3). These are calculated by multiplying the floor area for each land use category with the Building Emission Benchmark presented in **Table 2**.

Table 5: Calculation of the Benchmarked NO_x Building Emissions for each Land-Use Category (Assisted Living being Use Class C2)

Land Use	GIA	Building Emissions Benchmark (gNO_x/m^2/annum)	Benchmarked Emissions ($kgNO_x$/annum)
C3	75,079	26.2	1967.1
B1	2,417	30.8	74.4
D2*	2,880	187.15	535.2
A1	4,686	22.6	105.9
C1	1,668	70.9	118.3
D1*	9,319	49.7	463.2
C2	24,210	68.5	1658.4
Total Benchmarked Building Emissions			**4922.5**

Note: *The average benchmark of these use-class has been taken as presented in Table A2.

Table 6: Calculation of the Benchmarked NO_x Building Emissions for each Land-Use Category (Assisted Living Use Class C3)

Land Use	GIA	Building Emissions Benchmark (gNO_x/m^2/annum)	Benchmarked Emissions ($kgNO_x$/annum)
C3	89,817	26.2	2353.2
B1	2,417	30.8	74.4
D2*	2,860	187.15	5395.2
A1	4,686	22.6	105.9
C1	1,668	70.9	118.6
D1*	9,319	49.7	463.2
C2	9,472	68.5	648.8
Total Benchmarked Building Emissions			**4299.0**

Note: *The average benchmark of these use-class has been taken as presented in Table A2.

1.1.17 As shown in **Table 4**, the Total Building NOx Emission of 1,682.1kg/annum are below the benchmarks calculated in **Table 5** (Assisted Living Use Class C2) of 4,922.5.0kg/annum and **Table 6** (Assisted Living being Use Class C3) of 4,299.0kg/annum and the Development is therefore considered to be 'Air Quality Neutral', with respect to building emissions.

Transport Emissions

1.1.18 Details of the trip generation per day for each land-use class have been provided by Peter Brett Associates (the Applicant's transport consultant).

Assisted Living being Use Class C2

1.1.19 The calculation of the Transport Emission for each component of the Development, assuming Assisted Living and Care Home being Use Class C2 is presented in **Table 7**.

Table 7: Calculation of the Benchmarked Transport Emissions for each Land-Use Category (Assisted Living Use Class C2)

Land Use	Trips per annum	Average Distance per trip*	Distance travelled km/annum	Emission Factors (g/vehicle-km)	Transport Emission (kg/annum)	
					NO_x	PM_{10}
C3	442,782	11.4	5,047,715	NO_x: 0.353 PM_{10}: 0.0606	1781.8	108.0
B1	81,997	10.8	885,567.6		312.6	18.9
D2	87,928	10.8	949,622.4		335.2	20.3
A1	144,105	5.4	778,167		274.7	16.6
C1	4,885	10.8	52,758		18.6	1.1
D1	186,324	10.8	2,012,299.2		710.3	43.0
C2	61,758	10.8	666,986.4		235.4	14.3
Total Transport Emissions					**3,668.8**	**222.3**

Note: * Average distance travelled by car per trip for sites within Outer London Activity Zone

1.1.20 The Transport Benchmark for the Development, as shown in **Table 8**, can be calculated by multiplying the benchmark in **Table 3** by the number of properties within the Development.

Table 8: Calculation of the Benchmarked Transport Emissions for each Land-Use Category (Assisted Living Use Class C2)

Land Use	Units	GIA	Transport Emission Benchmark		Benchmarked Emissions	
			gNO_x/m^2/annum or gNO_x/dwelling/ annum	gPM_{10}/m^2/annum or gPM_{10}/dwelling/ annum	$kgNO_x$/ annum)	$kgPM_{10}$/ annum
C3	663	-	1553	267	1029.7	177.0
B1	-	2,417	68.5	11.8	165.6	28.5
D2	-	2,880	68.5	11.8	197.3	34.0
A1	-	4,686	249	42.9	1166.8	201.0
C1	-	1,668	68.5	11.8	114.3	19.7
D1	-	9,319	68.5	11.8	638.4	110.0
C2	-	24,210	68.5	11.8	1658.4	285.7
Total Transport Emissions					**4970.03**	**855.9**

1.1.21 Assuming the Assisted Living is Use Class C2, the Total Transport NOx Emission of 3,668.8kg/annum (as shown in **Table 7**) is below the benchmark of 4,970.03kg/annum (as shown in **Table 8**) and the Total Transport PM_{10} Emission of 222.3kg/annum (as shown in **Table 7**) is below the benchmark of 855.9kg/annum (as shown in **Table 8**).

1.1.22 The Development is therefore considered to be 'Air Quality Neutral', with respect to transport emissions and no further mitigation measures are required.

Assisted Living being Use Class C3

1.1.23 The calculation of the Transport Emission for each component of the Development, assuming Assisted Living being Use Class C3 is presented in **Table 9**.

Table 9: Calculation of the Benchmarked Transport Emissions for each Land-Use Category (Assisted Living being Use Class C3)

Land Use	Trips per annum	Average Distance per trip*	Distance travelled km/annum	Emission Factors (g/vehicle-km)	Transport Emission (kg/annum)	
					NO_x	PM_{10}
C3	454,645	11.4	5,182,953	NO_x: 0.353 PM_{10}: 0.0606	1829.6	110.9
B1	81,997	10.8	885,567.6		312.6	18.9
D2	87,928	10.8	949,622.4		335.2	20.3
A1	144,105	5.4	778,167		274.7	16.6
C1	4,885	10.8	52,758		18.6	1.1
D1	186,324	10.8	2,012,299.2		710.3	43.0
C2	49,895	10.8	538,866		190.2	11.5
Total Transport Emissions					**3671.3**	**222.5**

Note: * Average distance travelled by car per trip for sites within Outer London Activity Zone

1.1.24 The Transport Benchmark for the Development, as shown in **Table 10**, can be calculated by multiplying the benchmark in **Table 3** by the number of properties within the Development.

Table 10: Calculation of the Benchmarked Transport Emissions for each Land-Use Category (Assisted Living Use Class C3)

Land Use	Units	GIA	Transport Emission Benchmark		Benchmarked Emissions	
			gNO_x/m^2/annum or gNO_x/dwelling/ annum	gPM_{10}/m^2/annum or gPM_{10}/dwelling/ annum	$kgNO_x$/ annum)	$kgPM_{10}$/ annum
C3	813	-	1553	267	1262.6	217.1
B1	-	2,417	68.5	11.8	165.6	28.5
D2	-	2,880	68.5	11.8	197.3	34.0
A1	-	4,686	249	42.9	1166.8	201.0
C1	-	1,668	68.5	11.8	114.3	19.7
D1	-	9,319	68.5	11.8	638.4	110.0
C2	-	9,472	68.5	11.8	648.8	111.8
Total Transport Emissions					**4193.7**	**722.0**

1.1.25 Assuming the Assisted Living and Care Home elements are Use Class C3, the Total Transport NOx Emission of 3,671.3kg/annum (as shown in **Table 9**) is below the benchmark of 4,193.7kg/annum (as shown in **Table 10**) and the Total Transport PM_{10} Emission of 222.5kg/annum (as shown in **Table 9**) is below the benchmark of 722.0kg/annum (as shown in **Table 10**).

1.1.26 The Development is therefore considered to be 'Air Quality Neutral', with respect to transport emissions and no further mitigation measures are required.

Annex B: Air Quality Modelling Results

Annex B: Air Quality Modelling Results

This Annex presents the results for all receptors considered within the air quality assessment.

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J1	179 Lower Richmond Road	37.0	37.1	0.2	115.8	116.5	0.7
J2	179 Lower Richmond Road	35.3	35.4	0.1	106.5	106.7	0.2
J3	179 Lower Richmond Road	31.9	32.0	0.1	91.3	91.5	0.2
J4	179 Lower Richmond Road	29.1	29.2	0.1	78.0	81.2	3.2
J5	189 Lower Richmond Road	34.9	35.1	0.1	103.5	111.5	8.0
J6	2 South Circular	36.6	36.6	0.1	118.3	122.1	3.7
J7	2a South Circular	34.6	34.7	0.1	107.7	117.9	10.2
J8	4 South Circular	36.6	36.7	0.1	118.8	121.8	3.0
J9	4a South Circular	34.4	34.5	0.1	106.8	115.8	9.0
J10	6 South Circular	34.9	34.9	0.1	110.1	116.9	6.8
J11	8 South Circular	34.8	34.9	0.1	109.8	109.7	0.0
J12	67 Shalstone Road	36.9	37.0	0.1	108.8	117.4	8.6
J13	1 Lower Richmond Road	42.7	42.7	0.0	141.3	146.4	5.0
J14	2 Lower Richmond Road	41.8	41.7	-0.1	140.1	140.8	0.8
J15	3 Lower Richmond Road	39.5	39.2	-0.3	127.0	127.2	0.2
J16	4 Lower Richmond Road	37.9	37.5	-0.4	118.8	117.0	-1.8
J17	5 Lower Richmond Road	36.9	36.4	-0.5	113.7	110.5	-3.2
J18	6 Lower Richmond Road	36.3	35.4	-0.9	110.7	104.0	-6.7
J19	7 Lower Richmond Road	35.7	34.5	-1.2	109.2	100.0	-9.1

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J20	8 Lower Richmond Road	36.0	34.3	-1.7	113.2	100.8	-12.4
J21	9 Lower Richmond Road	36.3	34.4	-1.9	117.1	104.1	-13.0
J22	10 Lower Richmond Road	36.8	34.9	-1.9	121.1	109.2	-11.9
J23	11 Lower Richmond Road	37.1	35.5	-1.6	121.8	114.0	-7.8
J24	12 Lower Richmond Road	37.8	36.3	-1.5	125.1	118.9	-6.2
J25	13 Lower Richmond Road	36.9	35.9	-1.0	120.4	116.8	-3.6
J26	14 Lower Richmond Road	37.5	36.6	-0.9	122.9	120.1	-2.8
J27	15 Lower Richmond Road	37.3	36.7	-0.7	121.4	120.2	-1.3
J28	16 Lower Richmond Road	37.1	36.7	-0.5	120.2	119.6	-0.6
J29	17 Lower Richmond Road	36.9	36.6	-0.3	118.8	118.7	-0.1
J30	18 Lower Richmond Road	36.6	36.4	-0.2	117.3	117.9	0.6
J31	19 Lower Richmond Road	36.3	36.2	-0.1	115.8	117.1	1.3
J32	20 Lower Richmond Road	36.0	36.0	0.1	114.1	116.2	2.2
J33	21 Lower Richmond Road	35.5	35.7	0.2	112.8	115.1	2.3
J34	22 Lower Richmond Road	35.7	36.1	0.4	114.4	117.6	3.2
J35	23 Lower Richmond Road	34.7	35.2	0.5	111.1	114.9	3.8
J36	24 Lower Richmond Road	33.5	34.0	0.5	102.8	106.9	4.2
J37	25 Lower Richmond Road	32.7	33.2	0.5	97.5	101.0	3.5
J38	26 Lower Richmond Road	32.2	32.7	0.5	94.1	97.0	2.9
J39	27 Lower Richmond Road	31.8	32.2	0.5	91.6	94.1	2.5
J40	28 Lower Richmond Road	31.1	31.5	0.4	88.2	90.4	2.2
J41	29 Lower Richmond Road	31.2	31.6	0.4	87.9	90.0	2.0

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J42	30 Lower Richmond Road	30.6	31.0	0.4	85.2	87.1	1.9
J43	31 Lower Richmond Road	30.4	30.8	0.4	83.9	85.8	1.9
J44	32 Lower Richmond Road	30.2	30.6	0.4	82.8	84.5	1.8
J45	33 Lower Richmond Road	30.4	30.8	0.4	83.1	84.9	1.8
J46	34 Lower Richmond Road	30.3	30.7	0.4	82.3	84.0	1.8
J47	35 Lower Richmond Road	29.8	30.2	0.4	80.2	81.8	1.6
J48	36 Lower Richmond Road	30.0	30.4	0.4	80.7	82.4	1.7
J49	1 Chertsey Court	29.1	29.4	0.3	77.3	78.5	1.2
J50	2 Chertsey Court	29.2	29.5	0.3	78.2	79.4	1.3
J51	3 Chertsey Court	29.6	29.9	0.4	80.4	81.8	1.5
J52	4 Chertsey Court	30.0	30.4	0.4	82.9	84.4	1.6
J53	5 Chertsey Court	30.7	31.2	0.5	86.1	88.1	2.0
J54	6 Chertsey Court	31.0	31.5	0.5	87.2	89.2	2.0
J55	7 Chertsey Court	31.6	32.1	0.5	88.8	90.9	2.1
J56	8 Chertsey Court	31.9	32.5	0.6	90.0	92.3	2.3
J57	9 Chertsey Court	32.4	33.1	0.7	92.3	95.2	2.9
J58	10 Chertsey Court	31.9	32.5	0.6	90.6	93.4	2.8
J59	11 Chertsey Court	31.7	32.2	0.6	89.6	92.1	2.5
J60	12 Chertsey Court	32.6	33.2	0.6	92.8	96.3	3.4
J61	13 Chertsey Court	32.7	33.1	0.5	92.6	94.9	2.2
J62	14 Chertsey Court	32.1	32.5	0.3	89.9	91.4	1.4
J63	15 Chertsey Court	31.8	32.1	0.3	88.2	89.4	1.2

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J64	16 Chertsey Court	31.5	31.8	0.3	86.9	87.9	1.0
J65	17 Chertsey Court	31.3	31.6	0.3	86.0	86.8	0.9
J66	18 Chertsey Court	31.2	31.5	0.2	85.3	86.1	0.8
J67	19 Chertsey Court	31.1	31.3	0.2	84.3	85.1	0.7
J68	20 Chertsey Court	31.0	31.2	0.2	83.8	84.5	0.7
J69	21 Chertsey Court	28.9	29.3	0.3	76.2	77.3	1.1
J70	22 Chertsey Court	28.7	29.0	0.3	74.6	75.6	1.0
J71	23 Chertsey Court	28.4	28.7	0.4	73.1	73.9	0.8
J72	1 Chertsey Court	28.6	28.9	0.3	75.7	76.8	1.1
J73	2 Chertsey Court	28.7	29.0	0.3	76.5	77.7	1.2
J74	3 Chertsey Court	29.1	29.4	0.3	78.5	79.8	1.3
J75	4 Chertsey Court	29.5	29.8	0.3	80.6	81.9	1.3
J76	5 Chertsey Court	30.1	30.5	0.4	83.2	84.9	1.7
J77	6 Chertsey Court	30.4	30.8	0.4	84.1	85.8	1.7
J78	7 Chertsey Court	30.8	31.3	0.5	85.5	87.4	1.9
J79	8 Chertsey Court	31.2	31.7	0.5	86.7	88.8	2.1
J80	9 Chertsey Court	31.7	32.3	0.6	88.9	91.4	2.5
J81	10 Chertsey Court	31.3	31.9	0.6	87.8	90.3	2.5
J82	11 Chertsey Court	31.2	31.7	0.5	87.7	90.2	2.5
J83	12 Chertsey Court	32.0	32.5	0.6	90.7	93.4	2.7
J84	13 Chertsey Court	32.0	32.4	0.4	89.6	91.6	2.0
J85	14 Chertsey Court	31.5	31.8	0.3	87.1	88.5	1.4

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J86	15 Chertsey Court	31.2	31.5	0.3	85.6	86.8	1.2
J87	16 Chertsey Court	30.9	31.2	0.3	84.2	85.1	0.9
J88	17 Chertsey Court	30.7	31.0	0.2	83.3	84.1	0.9
J89	18 Chertsey Court	30.6	30.9	0.2	82.6	83.3	0.8
J90	19 Chertsey Court	30.5	30.7	0.2	81.6	82.3	0.7
J91	20 Chertsey Court	30.4	30.6	0.2	81.1	81.7	0.6
J92	21 Chertsey Court	28.4	28.7	0.3	74.7	75.7	1.0
J93	22 Chertsey Court	28.2	28.5	0.3	73.3	74.1	0.8
J94	23 Chertsey Court	27.9	28.2	0.3	71.9	72.6	0.8
J95	1 Chertsey Court	27.6	27.9	0.3	71.4	72.2	0.7
J96	2 Chertsey Court	27.7	28.0	0.2	72.1	72.9	0.8
J97	3 Chertsey Court	28.0	28.3	0.3	73.8	74.8	1.0
J98	4 Chertsey Court	28.3	28.6	0.3	75.3	76.4	1.1
J99	5 Chertsey Court	28.8	29.1	0.3	77.0	78.0	1.0
J100	6 Chertsey Court	29.0	29.3	0.3	77.5	78.5	1.0
J101	7 Chertsey Court	29.3	29.6	0.3	78.4	79.5	1.1
J102	8 Chertsey Court	29.6	29.9	0.3	79.3	80.7	1.4
J103	9 Chertsey Court	30.0	30.4	0.4	81.0	82.5	1.5
J104	10 Chertsey Court	30.0	30.4	0.4	81.7	83.2	1.5
J105	11 Chertsey Court	30.0	30.4	0.4	81.4	83.2	1.8
J106	12 Chertsey Court	30.5	30.9	0.4	83.2	84.9	1.8
J107	13 Chertsey Court	30.4	30.8	0.3	81.5	82.9	1.4

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J108	14 Chertsey Court	30.0	30.3	0.3	79.6	80.8	1.2
J109	15 Chertsey Court	29.8	30.0	0.3	78.6	79.5	0.9
J110	16 Chertsey Court	29.6	29.8	0.2	77.4	78.1	0.8
J111	17 Chertsey Court	29.4	29.6	0.2	76.6	77.3	0.7
J112	18 Chertsey Court	29.3	29.5	0.2	75.8	76.4	0.6
J113	19 Chertsey Court	29.1	29.3	0.2	74.9	75.4	0.5
J114	20 Chertsey Court	29.1	29.2	0.2	74.0	74.5	0.5
J115	21 Chertsey Court	27.4	27.7	0.2	70.3	71.0	0.7
J116	22 Chertsey Court	27.2	27.4	0.3	69.0	69.6	0.6
J117	23 Chertsey Court	27.0	27.2	0.3	67.8	68.4	0.6
J118	1 Chertsey Court	26.7	26.9	0.2	67.1	67.5	0.5
J119	2 Chertsey Court	26.8	27.0	0.2	67.4	68.0	0.6
J120	3 Chertsey Court	27.0	27.2	0.2	68.5	69.2	0.7
J121	4 Chertsey Court	27.2	27.4	0.2	69.4	69.9	0.5
J122	5 Chertsey Court	27.5	27.7	0.2	70.2	70.6	0.4
J123	6 Chertsey Court	27.6	27.8	0.2	70.5	71.0	0.4
J124	7 Chertsey Court	27.8	28.0	0.2	71.0	71.7	0.6
J125	8 Chertsey Court	28.0	28.3	0.2	71.6	72.5	0.9
J126	9 Chertsey Court	28.3	28.6	0.2	72.8	73.8	1.0
J127	10 Chertsey Court	28.5	28.8	0.2	72.6	73.7	1.1
J128	11 Chertsey Court	28.6	28.9	0.2	72.8	73.4	0.6
J129	12 Chertsey Court	28.9	29.1	0.3	73.9	74.5	0.6

ID	Receptor Name	Annual Mean NO_2 Concentrations			1-Hour Mean NO_2 Concentrations		
		2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)	2027 Base	2027 With Development (with Junction Amendments	Change: Baseline - With Development (with Junction Amendment)
J130	13 Chertsey Court	28.7	28.9	0.2	73.3	74.1	0.8
J131	14 Chertsey Court	28.4	28.6	0.2	72.3	72.9	0.6
J132	15 Chertsey Court	28.3	28.5	0.2	71.5	72.2	0.6
J133	16 Chertsey Court	28.1	28.3	0.2	70.7	71.3	0.6
J134	17 Chertsey Court	28.0	28.2	0.2	70.1	70.6	0.5
J135	18 Chertsey Court	27.9	28.0	0.2	69.5	70.0	0.5
J136	19 Chertsey Court	27.8	27.9	0.2	69.0	69.4	0.4
J137	20 Chertsey Court	27.7	27.8	0.2	68.4	68.8	0.4
J138	21 Chertsey Court	26.5	26.7	0.2	66.2	66.6	0.4
J139	22 Chertsey Court	26.3	26.5	0.2	65.2	65.6	0.4
J140	23 Chertsey Court	26.2	26.4	0.2	64.3	64.7	0.4

Note: For accuracy, the changes have been calculated using the exact output from the ADMS-Roads model rather than the rounded numbers within Table A1. This explains where there may a slight difference in the calculated change in concentrations between the different scenarios

Table A2: Predicted Annual Mean NO_2 Concentrations (µg/m^3) for Floors Levels within the Development

Floor	Building																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	School	Playing field
G	27.5	28.2	28.2	25.5	31.4	27.6	25.7	25.6	27.7	28.2	25.4	25.6		26.8	25.8	25.9	27.4	25.6	25.2	25.2	54.3	26.1	26.1
1	26.8	28.2	28.2	25.5	29.3	27.0	25.7	25.5	26.8	27.2	25.3	25.5	25.8	26.5	25.8	25.8	27.3	25.5	25.2	25.2	25.7	25.9	
2	25.9	28.1	28.1	25.5	26.5	26.0	25.6	25.4	25.6	25.8	25.2	25.3	25.6	25.9	25.8	25.8	27.2	25.5	25.2	25.2	25.6	25.7	
3	25.6	28.0	28.0	25.5		25.4	25.4	25.2	25.0	25.2	25.1	25.0	25.5	25.5	25.7	25.8	27.2	25.5	25.1	25.1	25.6		
4		28.0	28.0	25.5			25.3	25.1	24.8	24.9	24.9	24.9	25.3	25.3	25.7	25.8	27.1	25.5					
5		27.9	27.9	25.5			25.2	25.0			24.9	24.8	25.2	25.2	25.7	25.7	27.0	25.5					
6		27.8		25.5			25.1	24.9			24.8	24.7			25.7		27.0	25.6					
7		26.7		25.5			25.1	24.9									26.9						
8				25.4																			
9				25.4																			

Table A3: Predicted 1-Hour Mean NO_2 Concentrations (µg/m^3) for Floors Levels within the Development

Floor	Building																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	School	Playing field
G	66.2	59.3	79.1	78.2	113.0	99.5	99.5	72.8	124.3	99.3	83.7	105.1		60.6	56.0	55.5	74.7	59.3	57.5	56.9	54.3	77.4	79.1
1	63.8	59.4	78.9	78.4	109.0	98.8	75.3	104.2	124.2	100.3	83.5	104.8	75.4	59.2	55.9	55.5	55.0	58.9	57.4	56.8	54.2	77.2	
2	61.7	59.8	78.7	78.5	103.0	97.7	101.5	105.4	123.9	100.8	83.3	104.3	76.0	57.3	55.7	55.3	54.9	58.1	56.6	56.1	54.1	76.9	
3	61.5	67.3	78.8	81.2		96.6	103.5	74.4	123.5	75.8	82.8	103.4	76.9	56.3	55.3	54.9	54.6	57.3	55.9	55.6	53.9		
4		72.0	81.6	84.0			103.4	73.4	122.7	74.2	102.5	102.8	80.3	55.4	54.9	54.7	54.3	56.1					
5		71.5	84.1	86.5			103.1	72.8			101.9	89.2	81.9	54.7	54.5	54.1	60.8	55.1					
6		70.9		75.9			102.8	72.3			101.3	121.6			53.7		61.3	54.2					
7		68.2		67.2			102.4	71.9									71.4						
8				66.8																			
9				66.7																			

Annex C: Estimated Operational Profile Boilers and CHPs

Stag Brewery - estimated boiler/CHP operating profile - Phase A

	CHP(1)			CHP(2)			CHP(3)			Boilers 01			Boiler02			Boiler03			Boiler04			Boiler05			Boiler06		
	CHP_Winter	CHP_Mid	CHP_Summer	CHP_Winter	CHP_Mid	CHP_Summer	CHP_Winter	CHP_Mid	CHP_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winte	Boiler_Mid	Boiler_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winte	Boiler_Mid	Boiler_Summer
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	0	0
8	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0	0	0
9	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0.25	0	0
10	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0.25	0	0
11	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	1	0
12	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	0	0
17	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	0	0
18	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0.25	0	0
19	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0.25	0	0
20	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0.25	0	0	0	0	0
21	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	1	1	0	1	0.5	0	1	0	0	0.5	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

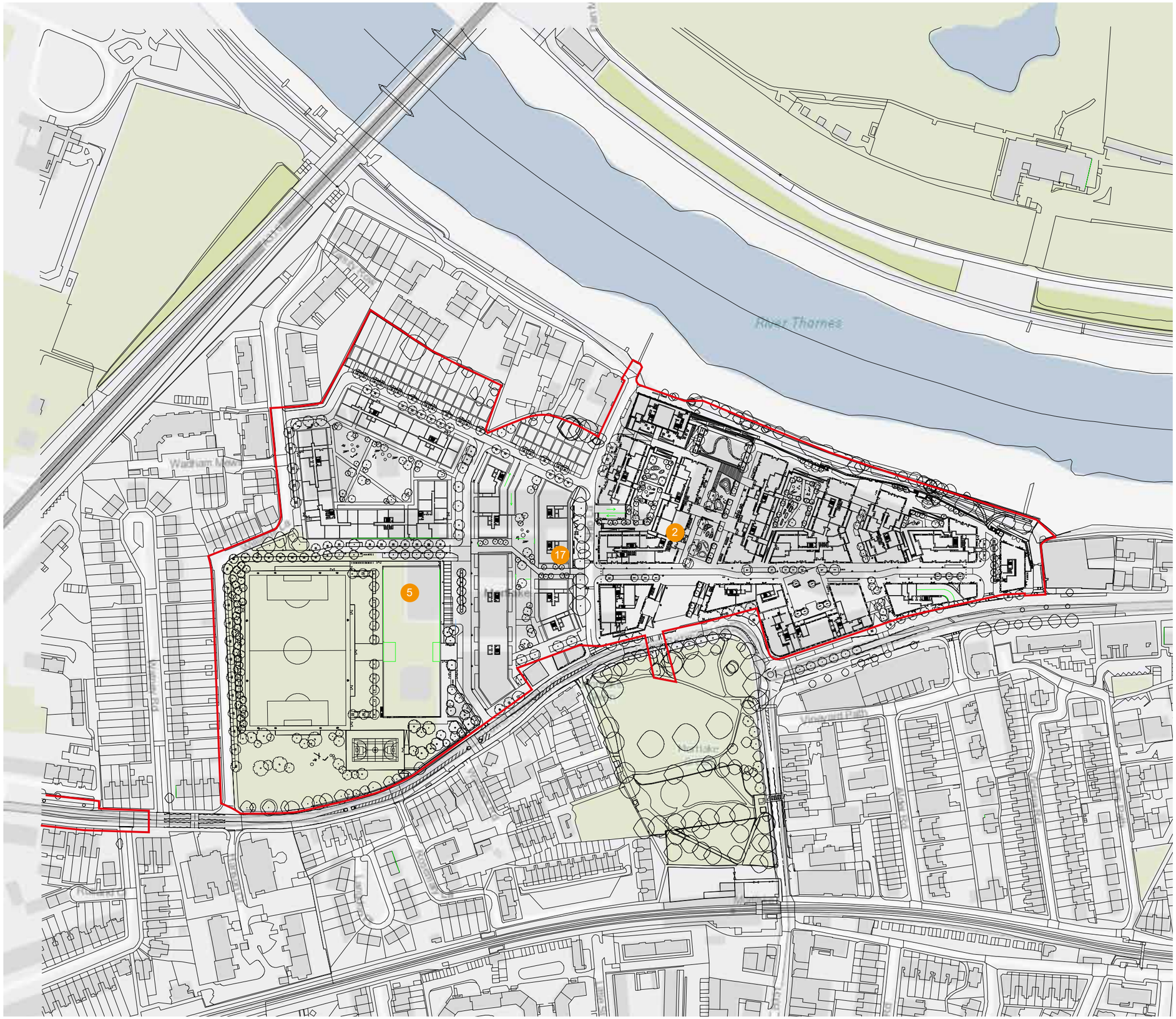
Stag Brewery - estimated boiler/CHP operating profile - Phase B

	CHP(1)			CHP(2)			CHP(3)			Boilers 01			Boiler02			Boiler03			Boiler04		
	CHP_Winter	CHP_Mid	CHP_Summer	CHP_Winter	CHP_Mid	CHP_Summer	CHP_Winter	CHP_Mid	CHP_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winte	Boiler_Mid	Boiler_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
7	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
8	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0
9	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0
10	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
11	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
12	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
13	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
14	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
16	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
17	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
18	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0
19	1	1	1	1	1	1	1	1	1	1	1	0.75	1	0.5	0	1	0	0	0.5	0	0
20	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
21	1	1	1	1	1	1	1	1	1	1	1	0	1	0.5	0	1	0	0	0.5	0	0
22	0	0	0	0	0	0	0	0	0	1	1	0	1	0.5	0	1	0	0	0.5	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Stag Brewery - estimated boiler/CHP operating profile - School

	CHP(3)			Boiler05		
	CHP_Winter	CHP_Mid	CHP_Summer	Boiler_Winter	Boiler_Mid	Boiler_Summer
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	1	1	1	0	0	0
6	1	1	1	0	0	0
7	1	1	1	1	0.5	0
8	1	1	1	1	0.5	0
9	1	1	1	1	0.5	0
10	1	1	1	1	0.5	0
11	1	1	1	1	0.5	0
12	1	1	1	1	0.5	0
13	1	1	1	1	0.5	0
14	1	1	1	0	0	0
15	1	1	1	0	0	0
16	1	1	1	0	0	0
17	1	1	1	0	0	0
18	1	1	1	0	0	0
19	1	1	0	0	0	0
20	1	1	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24	0	0	0	0	0	0

Annex D: Figures



- Site Boundary
- 2 Building 2 Flue Location
- 5 School Flue Location
- 17 Building 17 Flue Location

N

Project Details	WIE10677-104: Stag Brewery
Figure Title	Figure 1: Flue Locations within the Proposed Development
Figure Ref	WIE10677-104_GR_AQTN_1A
Date	August 2019
File Location	\\s-lncs\wiel\projects\wie10677\104\graphics\aqtn\issued figures

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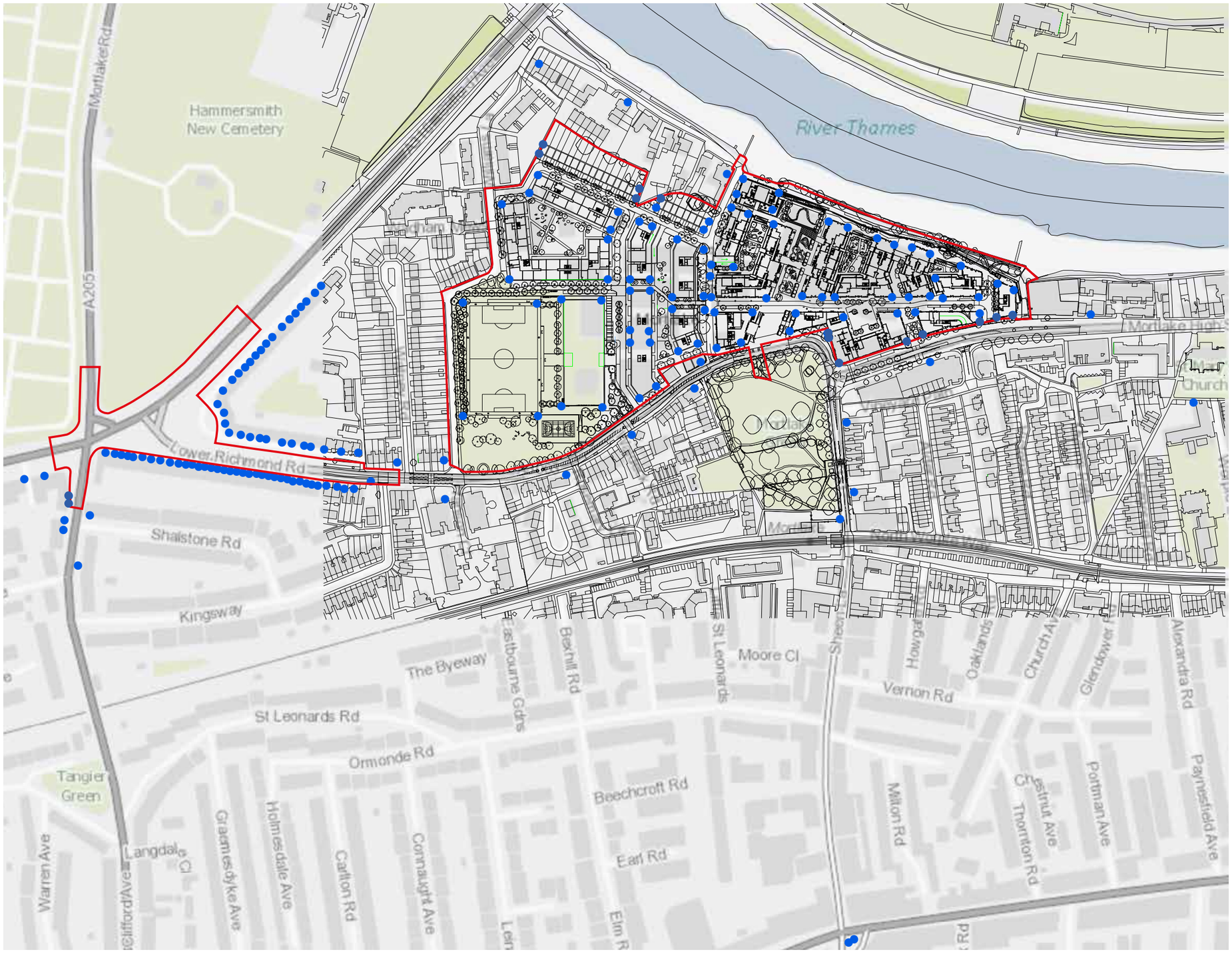

Site Boundary

Modelled Receptors

Project Details	WIE10677-104: Stag Brewery
Figure Title	Figure 2: Modelled On and Off Site Air Quality Receptor Locations
Figure Ref	WIE10677-104_GR_AQTN_2A
Date	August 2019
File Location	\\s-lncs\wiel\projects\wie10677\104\graphics\aqtn\issued figures

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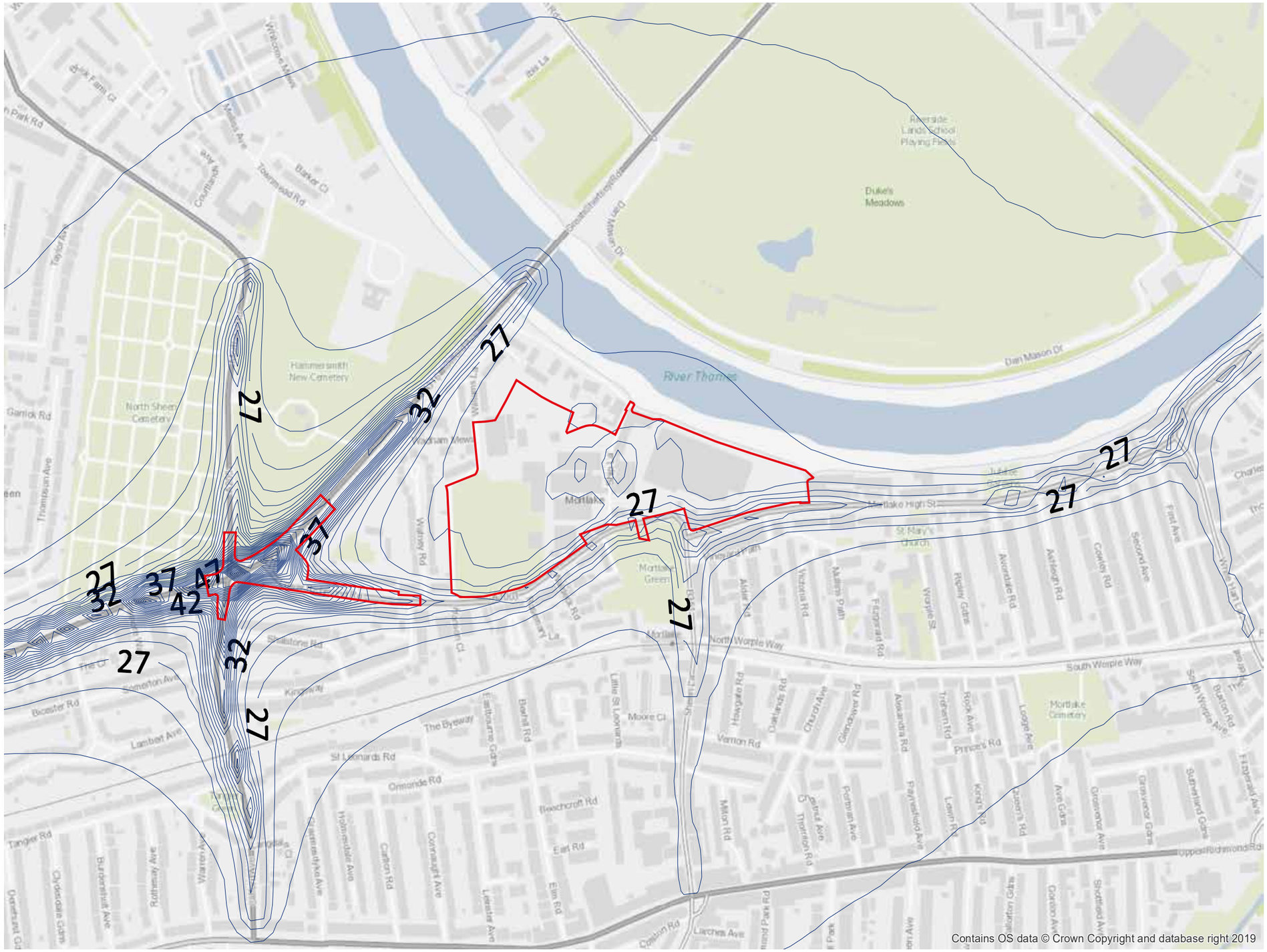

Site Boundary

Annual Mean NO2 Concentrations (µg/m3)

Project Details	WIE10677-104: Stag Brewery
Figure Title	Figure 3: Ground Level 2027 Annual Mean NO2 Concentrations
Figure Ref	WIE10677-104_GR_AQTN_3A
Date	August 2019
File Location	\\s-lncs\wiel\projects\wie10677\104\graphics\aqtn\issued figures

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