# Sandycombe Road (Scheme P03)

## Air Quality Neutral Calculation

## Sandycombe Road, North Sheen, Richmond

## For Goldcrest Land Plc.






# Quality Management

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|---|---|---|---|---|
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## Tables

# 1 Introduction

1.1 This Air Quality Neutral assessment of the emissions from proposed development scheme P03 at Sandycombe Road in the London Borough of Richmond upon Thames (LBR), complements RPS` air quality impact report *'Air Quality Assessment':* Sandycombe Road (Scheme P03)' report dated 21 December 2016. That air quality assessment report considered the impacts of the development on ambient air quality at the point of exposure (i.e. at sensitive receptor locations) by comparing predicted levels with Air Quality Strategy objectives and EU Limit Values. In contrast, this supplementary Air Quality Neutral report quantifies the emissions of atmospheric pollutants from the development at source (i.e. from vehicles and building plant) and compares the emissions with official benchmark levels that define neutrality.

1.2 The requirement for this Air Quality Neutral report is driven by:

- Policy 7.14 in the London Plan [1], entitled *'Improving Air Quality'*, which 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 Air Quality Management Areas (AQMAs))"*; and
- The Mayor's Air Quality Strategy (MAQS) [2], which 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."*

1.3 The 'air quality neutral' policy is designed to address the problem of multiple new developments that individually add only a small increment to pollution at the point of human exposure (i.e. to ambient concentrations), but cumulatively lead to baseline pollution levels creeping up. The policy requires Developers to design their schemes so that they are at least Air Quality Neutral in terms of emissions at source.

1.4 The Greater London Authority (GLA) Sustainable Design and Construction Supplementary Planning Guidance (SPG), published in April 2014, provides a formal definition for the term 'air quality neutral' and allows a transparent and consistent approach to demonstrating whether a development is 'air quality neutral'. This Air Quality Neutral report determines whether the proposed development is air quality neutral using the GLA SPG calculation method that separately quantifies building emissions (from heating and power plant) and transport emissions.

# 2 Methodology - Air Quality Neutral Calculation

## Building Emissions

2.1 The SPG requires a comparison of the 'Total Development Building Emissions' with the 'Total Building Emissions Benchmark' (Total BEB).

2.2 For this development, the heat and power demands are likely to be met by a gas-fired Combined Heat and Power (CHP) plant with a scrubber system. The key pollutants emitted from gas-fired appliances are nitrogen oxides ($NO_X$).

2.3 The SPG sets out limits against which $NO_X$ emissions from gas-fired boilers and CHPs must be compared. The first step in the calculation requires the applicant to confirm that the maximum $NO_X$ emissions from the proposed appliances meet the SPG standards. However, at this stage, a decision on the thermal capacity of the CHP has not been made.

2.4 The applicant acknowledges this, and wishes to be bound by the requirements of the GLA's SPG which state:

*"4.3.25 It is acknowledged that developers may not procure plant until planning permission has been obtained. Developers will therefore be required to provide a written statement of their commitment and ability to meet the emission standards within their Air Quality Assessments. When securing these emissions standards, it is best to agree maximum emissions as opposed to the technology. Technology may improve between the time planning permission is granted and the equipment is procured."*

## Transport Emissions

2.5 The SPG requires a comparison of the 'Total Development Transport Emissions' with the 'Total Transport Emissions Benchmark' (Total TEB).

2.6 For each land-use class, the number of vehicle movements generated by the operation of the development has been provided by the project's transport consultants. The average trip length (km) for each land-use class could not be provided; however, consistent with the examples provided in the Air Quality Neutral Planning Support Update [3], the average London distances driven per annum for the different development categories have been obtained. The number of vehicle movements has been multiplied by the average distances driven for each land use class to derive the vehicle.km term. The total vehicle.km for the development has then been multiplied by the $NO_X$ and $PM_{10}$ emission factors (in kg/annum) provided in the SPG to determine the 'Total Development Transport Emissions'.

2.7 The SPG provides TEB factors for $NO_X$ and $PM_{10}$ as mass emissions per dwelling per annum for residential properties and mass emissions per floor space per annum for all other land- use classes. A separate TEB for each pollutant ($NO_X$ and $PM_{10}$) has been calculated for each land-

use class. A ‘Total TEB’ has been calculated as the total of the individual TEBs for each land-use class and for each pollutant.

2.8 For each pollutant, the ‘Total Development Transport Emissions’ have been compared with the ‘Total TEB’. Where the ‘Total Development Transport Emissions’ exceeds the ‘Total TEB’, the need for on or off-site mitigation has been identified.

# 3 Results of Air Quality Neutral Calculation

## Transport Emissions

3.1 Table 3.1 and Table 3.2 set out the annual mass of $NO_X$ and $PM_{10}$ emitted by the proposed development per annum, respectively.

**Table 3.1: NOx - Total Development Transport Emissions (kgNOx/annum)**

| Land Use Class | Development trip rate (vehicle/day) | Average Trip Length (km) | Vehicle.km/ annum | Development Emissions ($kgNO_x$/ annum) |
|---|---|---|---|---|
| Offices | 10 | 10.8 | 39,420 | 14 |
| Residential dwellings | 29 | 11.4 | 120,669 | 43 |
| **Total Development Transport Emissions (kgNOx/annum)** | | | | **57** |

Emissions factor for outer London = 0.353 g/vehicle.km

**Table 3.2: $PM_{10}$ - Total Development Transport Emissions ($kgPM_{10}$/annum)**

| Land Use Class | Development trip rate (vehicle/day) | Average Trip Length (km) | Vehicle.km/ annum | Development Emissions ($kgPM_{10}$/ annum) |
|---|---|---|---|---|
| Offices | 10 | 10.8 | 39,420 | 2 |
| Residential dwellings | 29 | 11.4 | 120,669 | 8 |
| **Total Development Transport Emissions ($kgPM_{10}$/annum)** | | | | **10** |

Emissions factor for outer London = 0.0606 g/vehicle.km

3.2 It can be seen that the residential dwellings make the largest contribution to the total transport emissions. For both $NO_X$ and $PM_{10}$, the residential transport emissions account for more than 50% of the total transport emissions.

3.3 Table 3.3 and Table 3.4 set out the benchmark mass emissions of $NO_X$ and $PM_{10}$ against which the transport emissions from the development have been compared.

**Table 3.3: $NO_X$ - Total Benchmarked Transport Emissions ($kgNO_x$/annum)**

| Land Use Class | Gross Floor Area ($m^2$) | Number of Dwellings | NOx TEB ($g/m^2$/annum) or (g/dwelling/annum) | Benchmarked Emissions (kgNOx/annum) |
|---|---|---|---|---|
| Offices | 535 | - | 68.5 | 37 |
| Residential dwellings | 1651 | 20 | 1553 | 31 |
| **Total Benchmarked Transport Emissions (kgNOx/annum)** | | | | **68** |

**Table 3.4: $PM_{10}$ - Total Benchmarked Transport Emissions (kg$PM_{10}$/annum)**

| Land Use Class | Gross Floor Area ($m^2$) | Number of Dwellings | $PM_{10}$ TEB ($g/m^2$/annum) or (g/dwelling/annum) | Emissions Benchmark (kg$PM_{10}$/annum) |
|---|---|---|---|---|
| Offices | 535 | - | 11.8 | 6 |
| Residential dwellings | 1651 | 20 | 267 | 5 |
| **Total Benchmarked Transport Emissions (kg$PM_{10}$/annum)** | | | | **11** |

3.4 Table 3.5 provides a comparison of the development transport emissions with the benchmark.

**Table 3.5: Summary of Transport Results**

| | Total Development Transport Emissions | Total Transport Emissions Benchmark | Difference: Total Development – Transport Emissions Benchmark |
|---|---|---|---|
| $NO_X$ (kg/annum) | 57 | 68 | -11 |
| $PM_{10}$ (kg/annum) | 10 | 11 | -1 |

3.5 For $NO_X$ and $PM_{10}$, the Total Development Transport Emissions do not exceed the Total Benchmarked Transport Emissions.

3.6 In accordance with the SPG, no further action such as on-site mitigation measures or off-setting is required.

# 4 Mitigation

4.1 The development's transport emissions do not exceed the benchmarks and no mitigation measures need to be considered. The applicant has nonetheless already committed to providing cycle storage facilities as part of the proposed development.

# 5 Conclusions

5.1 The total transport emissions do not exceed the relevant benchmarks during the operational phase of the proposed development. No mitigation measures need to be considered.

# Glossary

| | |
|---|---|
| AQMA | Air Quality Management Area |
| BEB | Building Emissions Benchmark |
| CHP | Combined Heat and Power |
| GLA | Greater London Authority |
| Impact | The change in atmospheric pollutant concentration and/or dust deposition. A scheme can have an 'impact' on atmospheric pollutant concentration but no effect, for instance if there are no receptors to experience the impact. |
| LBWF | London Borough of Waltham Forest |
| MAQS | Mayor's Air Quality Strategy |
| SPG | Supplementary Planning Guidance |
| TEB | Transport Emissions Benchmark |

# References

1 GLA, March 2015, The London Plan – Spatial Development Strategy for London Consolidated with Alterations since 2011.

2 GLA, December 2010, The Mayor's Air Quality Strategy.

3 AQC, April 2014, Air Quality Neutral Planning Support Update: GLA 80371

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