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Camden Goods Yard - Technical Note to Discharge Condition 58 – 'Air Quality Monitoring'

Prepared by Gordon Allison

Introduction

Condition 58 for 'Air Quality Monitoring' has been requested to be discharged by Camden Borough Council prior to the commencement of each building envelope.

The condition is as follows:

Air Quality Monitoring – prior to the commencement of the building envelope of each building and of the supermarket basement, details of the mechanical ventilation system for the structure shall be submitted to and approved in writing by the local planning authority. The building details shall include the air inlet locations. The basement carpark details shall include outlets and expected pollutant concentrations. The development shall thereafter be constructed and maintained in accordance with the approved details. Development of the temporary store shall be constructed and maintained in accordance with the details approved on 30/09/2020 under reference 2020/2099/P unless otherwise agreed in writing by a further approval pursuant to this condition.

Planning Condition 56 is related, and requests 'details of the mechanical ventilation system for the structure'. This is understood to amount to some one thousand drawings.

Since the development was consented, SGWL has developed the design to include an emergency life safety generator, which will cause additional emissions to air, adjacent to the carpark vents. An Environmental Permit for this has been issued by the Environment Agency, under the Medium Combustion Plan Directive. The permit is sent as a separate file.

Development Description

The development is mixed use and contains a supermarket served by a two-storey carpark, with residential accommodation above and around it. Due to the carpark being enclosed, ventilation fans will help to vent vehicle emissions to via the western façade of the carpark. The fans will be controlled dynamically in response to carbon monoxide monitors on the two carpark floors, which will detect the extent to which indoor air quality is affected by level of vehicle emissions. In the event of smoke detection from a fire, the ventilation fans will ramp up to clear smoke from the car park floors.

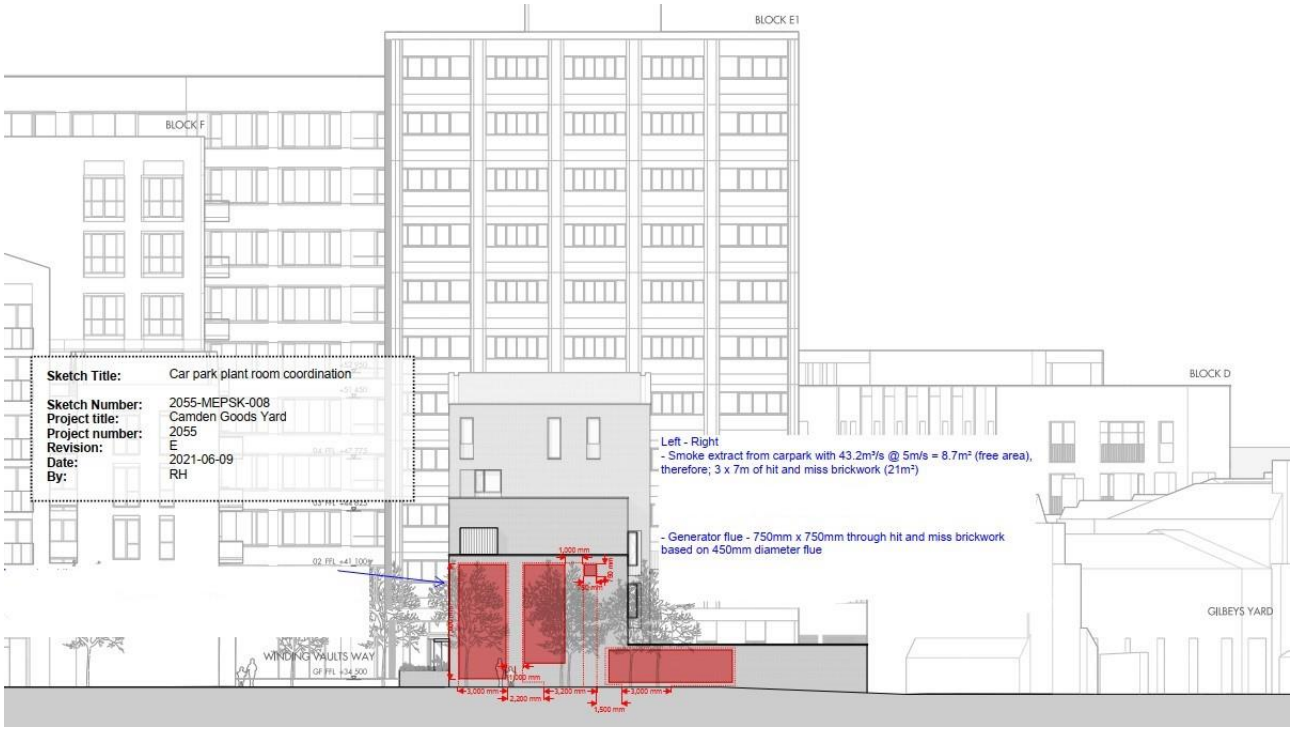

Figure 1: Car Park Vent Layout

Vehicle emissions will mainly be naturally vented from the entrance and exit to the carpark which is on its north-western corner. The planning condition is understood to be directed to ensuring that the emissions from the development itself do not significantly affect the air quality for the residents, by requiring the expected air pollutant concentrations to be presented for consideration by the Local Planning Authority.

The supermarket and carpark are currently planned to open in February 2025.

Future Emissions Affecting Air Quality in the Development

The majority of vehicles using the car park at the time of opening will emit exhaust pollutants from internal combustion engines powered by petrol and diesel; the key pollutants are NO_x and $PM_{2.5}$. Since the UK is set to stop the sale of new petrol and diesel cars from 2030[1], the exhaust emissions of NO_x and $PM_{2.5}$ from the vehicle fleet using the car park are expected to fall continuously from the year of opening, until NO_x emissions fall to zero. PM emissions will continue from the vehicle

[1] GOV (2021)., Outcome and response to ending the sale of new petrol, diesel and hybrid cars and vans, (Available at: https://www.gov.uk/government/consultations/consulting-on-ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans/outcome/ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans-government-response)

movements from brake dust and tyre wear even after exhaust emissions have ceased, so these emissions will not fall to zero, but will still decrease significantly.

Air Inlet Locations

The residential accommodation in the apartments in Block F, which is nearest to the car park vent, will be served by Mechanical Ventilation Heat Recovery, with the air intakes in louvres above the apartment windows.

Illustrations of the ventilation layout for the apartments is shown in document CGYB0-MTT-RES-ZZ-DR-M-4210 and the design strategy in document CGY00-MTT-XXX-XX-RP-MEP-1807 - Residential Extract & Ventilation (appended).

The location of the receptors in the model in 3D is illustrated in the figure below.

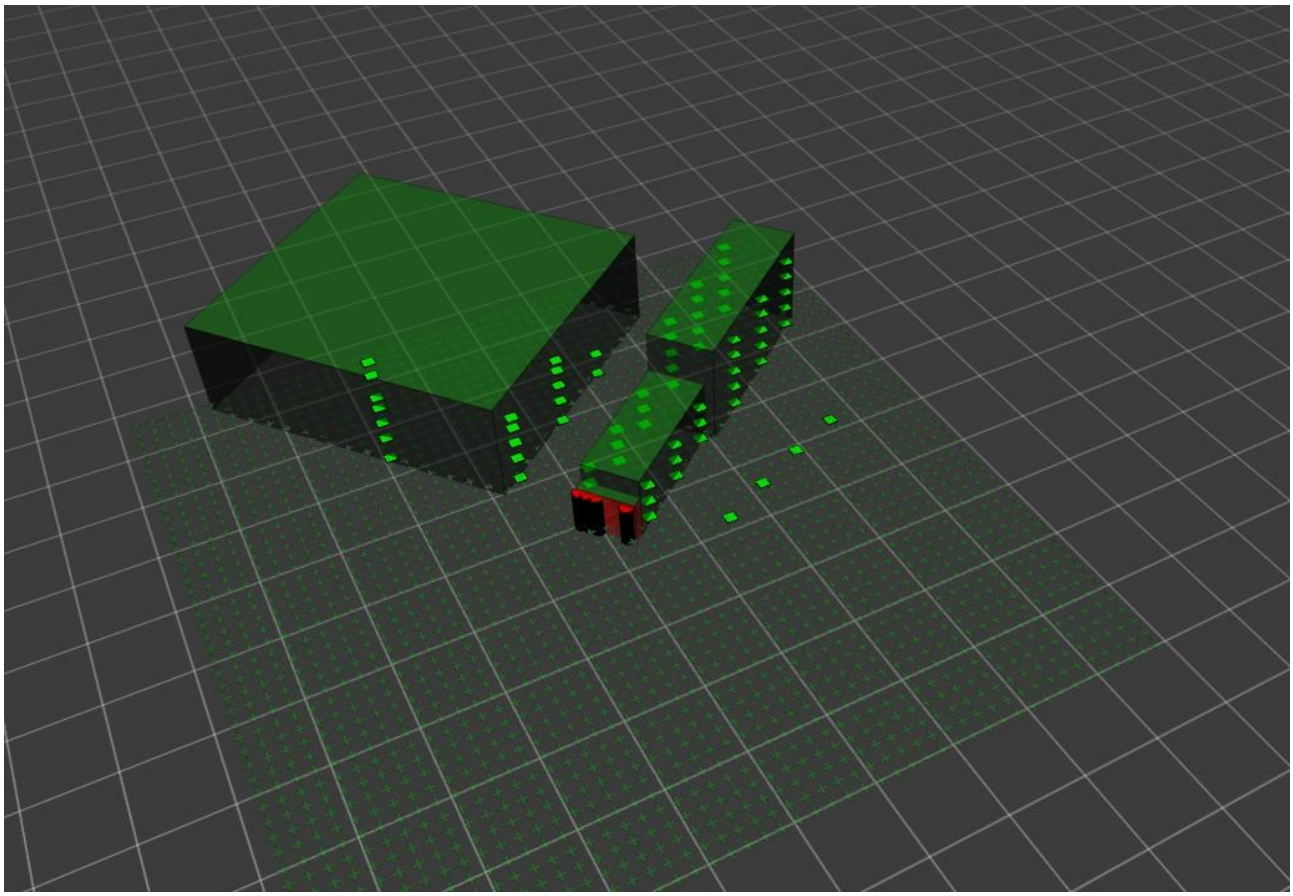

Figure 2: Receptor Locations in the model (shown green). Emission points shown in red.

Expected Pollutant Concentrations

The expected pollutant concentrations at the receptors are presented in Table 1 below.

The predictions are based on an opening year of 2025 and the conservative assumption that all vehicles (3134 AADT) drive the full distance around both floors of the car park, and that 50% of the emissions exit through the ventilation extract system, which has a free area of 8.7m^2. In most meteorological conditions, the bulk of the air exchange is anticipated to take place via the vehicle entrance and exit, which is approximately 7 x 4 m i.e. 28 m^2 in area. Further detail on the modelling set up can be found in the model report appended for the environmental permit application.

Table 1: Expected Pollutant Concentrations

Receptor ID	With proposed development (2025)			
	Annual Mean ($\mu g/m^3$)			No. of exceedances of 24-hour mean PM_{10} AQO
	NO_2	PM_{10}	$PM_{2.5}$	
R1_GF	31.5	19.1	12.1	2
R1_1F	31.6	19.2	12.1	2
R1_2F	24.5	17.5	11.2	1
R2_GF	29.3	18.6	11.8	2
R2_1F	29.4	18.6	11.8	2
R2_2F	24.6	17.5	11.2	1
R3_GF	28.1	18.3	11.6	2
R3_1F	28.1	18.3	11.6	2
R3_2F	24.5	17.5	11.2	1
R4_GF	27.3	18.1	11.5	1
R4_1F	27.3	18.1	11.5	1
R4_2F	24.5	17.5	11.2	1
R4_3F	24.4	17.4	11.2	1
R4_4F	24.4	17.4	11.2	1
R5_GF	26.7	18.0	11.4	1
R5_1F	26.7	18.0	11.4	1
R5_2F	24.5	17.5	11.2	1
R5_3F	24.4	17.4	11.2	1
R5_4F	24.4	17.4	11.2	1
R6_GF	26.4	17.9	11.4	1
R6_1F	26.4	17.9	11.4	1
R6_2F	24.4	17.4	11.2	1
R6_3F	24.4	17.4	11.2	1
R6_4F	24.4	17.4	11.2	1
R7_GF	32.9	19.5	12.2	3
R7_1F	32.9	19.5	12.2	3
R7_2F	25.0	17.6	11.2	1
R8_GF	31.5	19.1	12.1	2
R8_1F	31.5	19.1	12.1	2
R8_2F	24.6	17.5	11.2	1
R9_GF	28.8	18.5	11.7	2
R9_1F	28.8	18.5	11.7	2
R9_2F	24.5	17.5	11.2	1
R10_GF	27.1	18.1	11.5	1
R10_1F	27.1	18.1	11.5	1
R10_2F	24.5	17.5	11.2	1
R10_3F	24.4	17.4	11.2	1
R10_4F	24.4	17.4	11.2	1
R11_GF	26.4	17.9	11.4	1
R11_1F	26.4	17.9	11.4	1
R11_2F	24.4	17.5	11.2	1
R11_3F	24.4	17.4	11.2	1

R11_4F	24.4	17.4	11.2	1
R12_GF	26.0	17.8	11.3	1
R12_1F	26.0	17.8	11.3	1
R12_2F	24.4	17.4	11.2	1
R12_3F	24.4	17.4	11.2	1
R12_4F	24.4	17.4	11.2	1
R13_GF	27.7	18.2	11.6	2
R13_1F	27.7	18.2	11.6	2
R13_2F	24.5	17.5	11.2	1
R13_3F	24.4	17.4	11.2	1
R13_4F	24.4	17.4	11.2	1
R14_GF	27.1	18.1	11.5	1
R14_1F	27.0	18.0	11.5	1
R14_2F	24.5	17.5	11.2	1
R14_3F	24.4	17.4	11.2	1
R14_4F	24.4	17.4	11.2	1
R15_GF	26.2	17.9	11.4	1
R15_1F	26.2	17.8	11.4	1
R16_GF	24.6	17.5	11.2	1
R16_1F	24.5	17.5	11.2	1
R16_2F	24.5	17.5	11.2	1
R16_3F	24.4	17.4	11.2	1
R16_4F	24.4	17.4	11.2	1
R16_5F	24.4	17.4	11.2	1
R16_6F	24.4	17.4	11.2	1

The predicted pollutant concentrations are well within the annual mean Air Quality Objectives. The greatest predicted concentration of nitrogen dioxide at a residential receptor is predicted to be 32.9 $\mu g/m^3$. This concentration is well below the annual mean Air Quality Objective for nitrogen dioxide.

Appendix 1: Air Quality Assessment Report for Environmental Permit Application

Camden Goods Yard

Air Quality Assessment

March, 2022

St Georges West London Ltd

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Document Control Sheet

Project Information

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St George West London Limited	Patrick Gavin	10th Mar 2022	01

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Glossary of terms

Term	Definition
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Standard
AEL	Associated Emission Levels
ASR	Annual Status Report
BAT	Best Available Technology
CERC	Cambridge Environmental Research Consultants
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EAL	Environmental Assessment Level
EPUK	Environmental Protection UK
EQS	Environmental Quality Standard
EU	European Union
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
MCPD	Medium Combustion Plant Directive
MMOL	Minimum Monin-Obukhov Length
NAQS	National Air Quality Strategy
NNR	National Nature Reserve
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM	Particulate Matter
WHO	World Health Organisation

1 Introduction

1.1 Overview

St George West London (SGWL) are developing a mixed-use site including residential, a supermarket and integrated multi-storey carpark at Camden Goods Yard on Chalk Farm Road, Chalk Farm, Camden, London, NW1 8EH. The site will incorporate an emergency diesel generator to provide back-up electricity power for life-saving equipment such as lights and firewater pumps. It is currently expected to be commissioned by 2nd March 2024. The normal operation of the emergency generator will be its testing regime for ten minutes per month off load, and for 4 hours every six months with load. In an emergency, it will run for up to two hours. The testing regime is restricted to occur in no more than 18 hours per year, so that the 1 hour objective for nitrogen dioxide cannot be breached.

DustScanAQ were instructed by SGWL to provide an air quality assessment to support the design and consenting of the exhaust emission arrangements.

The potential local air quality effects of the power plant have been assessed using the latest guidance from the government website, Environment Agency (EA), Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)[1] and the Department for Environment, Food and Rural Affairs (Defra)[2].

1.2 Purpose of Study

This report provides an assessment on the following key impacts associated with the operation of the plant:

- The significance of the impacts from the operation of the plant on human health receptors as a result of pollutant concentrations associated with stack emissions.

1.3 Site Description

The site generator will be located on the west side of the Camden Goods Yard development, Chalk Farm Road, Chalk Farm, Camden, London. The location of the site is shown in Figure 1.1.

[1] IAQM (2017): 'Land Use Planning and Development Control: Planning for Air Quality v1.2'.
[2] Defra (2016): 'Local Air Quality Management – Technical Guidance (TG16)'.

Figure 1.1: Site location

2 Emissions and Environmental Standards

2.1 Medium Combustion Plant Directive and Emission Limit Values

As a new installation of medium combustion plant, the plant is regulated under the Environmental Permitting (England and Wales) (Amendment) Regulations 2018, which transposes requirements set in the EU Medium Combustion Plant Directive (MCPD).

By thermal capacity, the generator is above the 1 MWth threshold for regulation under the MCPD. By intended operational duty, running less than 50 hours per year, the generator is not required to meet the MCPD Emission Limit Values. The nearest relevant MCPD emission limit value for NO_2 is 190 mg/Nm^3, at 15% O_2. Whilst this limit value does not apply, it is a point of reference. There is no PM limit value.

2.2 Modelled Emissions

Burning gas oil (diesel) emits carbon dioxide and water vapour, with relatively trace quantities of particulate matter and nitrogen oxides. All of the particulate matter emitted can be considered to smaller than 1 µm in diameter i.e. within the $PM_{2.5}$ and PM_{10} size range. The concentrations of these size fractions of particulate matter are regulated by air quality standards discussed below.

NO_2 and nitric oxide (NO) are collectively referred to as oxides of nitrogen (NO_x). During fuel combustion, atmospheric nitrogen combines with oxygen to form NO, which is not considered harmful. Through a chemical reaction with ozone (O_3), NO further combines with oxygen to create NO_2 which can be harmful to human health and vegetation.

The foremost sources of NO_2 in the UK are combustion activities, mainly road transport and power generation. According to the National Atmospheric Emissions Inventory (NAEI), road transport is now the largest single UK source of NO_x, accounting for almost one third of UK emissions.

2.3 Relevant Air Quality Standards

A summary of the relevant Air Quality Objectives (AQO) for human health are presented in Table 2.1. On the government website[3], definitions are given for air quality standards, objectives and exceedances.

- Air Quality Standards are concentrations recorded over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to indicate whether air pollution is getting better or worse.
- An exceedance is a period of time (defined for each standard) where the concentration is higher than that set out in the Standard. In order to make useful comparisons between pollutants, (the Standards may be expressed in terms of

[3] https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits accessed 04/03/2022

different averaging times), the number of days on which an exceedance has been recorded is often reported.

- An objective is the target date on which exceedances of a Standard must not exceed a specified number.

An objective also defines the number of exceedances which are allowed per year after the target.

A summary of where standards referred to in Table 2.1 are applicable is presented in Table 2.2.

Table 2.1: Air Quality Standards

Pollutant	Averaging Period	AQS (µg/m^3)	Exceedance Allowance	Percentile Equivalent
Nitrogen Dioxide (NO_2)	Annual	40	-	-
	1-hour	200	18 per annum	99.79th
Particulate Matter (as PM_{10})	Annual	40	-	-
	24-hour	50	35 per annum	90.41th
Particulate Matter (as PM2.5)	Annual	20	-	-

AQS = Air Quality Standard; EAL = Environmental Assessment Level.

Table 2.2: Examples of where the AQO should apply

Averaging period	Objectives should apply at	Objectives should not apply at
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24 Hour	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties[(a)].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1 Hour	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not	Kerbside sites where the public would not be expected to have regular access.

Averaging period	Objectives should apply at	Objectives should not apply at
	fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably have expected to spend one hour or longer.	

Note:

(a) "*Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.*"

Source:

Department for Environment Food and Rural Affairs (2016): 'Local Air Quality Management Technical Guidance' (TG.16).

2.4 World Health Organisation Guidelines adopted by LBC

Camden Council adopted the World Health Organization air quality standards in 2018, becoming the first local authority to do so, and Camden's Clean Air Action Plan 2019-2022 is intended to deliver on LAQM statutory obligations in achieving the National Air Quality Standards and Objectives as well as the Council's own objective of achieving WHO compliance by 2030.

Table 2.3: LB Camden's WHO - aligned objectives for particulate matter

Pollutant	Averaging Period AQS/ EAL (µg/m^3)	Averaging Period	Date
Particulate Matter (as PM_{10})	20 µg m^{-3} Interim target of 17.1 µg m^{-3} by 2022 Interim target of 14.8 µg m^{-3} by 2026	Annual Mean	2030
Particulate Matter (as $PM_{2.5}$)	10 µg m^{-3} Interim target of 13.7 µg m^{-3} in 2022 Interim target of 11.8 µg m^{-3} in 2026	Annual Mean	2030

AQS = Air Quality Standard; EAL = Environmental Assessment Level.

3 Ambient and Background Conditions

The following section sets out the baseline conditions in relation to air quality at the site. For the purpose of this assessment, data has been obtained from the LBC 2020 Air Quality Annual Status Report (ASR)[4] and the Defra air quality resource website[5].

The 2020 ASR is prepared by LBC in accordance with the requirements of LAQM as set out in Part IV of the Environment Act (1995).

Defra provides background pollution concentration estimates to assist local authorities with undertaking their 'Review and Assessment' work. This data is available to download from the Defra air quality resource website for NO_x, NO_2, PM_{10} and $PM_{2.5}$ for every 1 km x 1 km grid square for all local authorities. The current dataset is based on 2017 background data and the future year projections are available for 2017 to 2030.

3.1 Air Quality Management Areas (AQMAs)

LBC declared the whole borough an AQMA on 20/09/2002 for the:

- Annual mean nitrogen dioxide objective
- 24 hour PM_{10} objective

3.2 NO_2

The annual mean 2024 NO_2 concentrations have been obtained from the latest Defra background map. The average Defra background NO_2 annual mean concentrations for the modelled grid extent is 24.9 µg/m^3, comfortably below the relevant AQO. This is considered a reasonable baseline given that the site is away from road traffic emission sources.

3.3 PM_{10}

Background PM_{10} concentrations have been taken from 2024 Defra background mapping which is deemed representative of background concentrations for the modelled area. The average PM_{10} concentration for 2024 is 17.7 µg/m^3.

3.4 Baseline Summary

A summary of the annual mean and short-term mean background concentrations used for the purpose of this assessment are presented below in Table 3.1.

Table 3.1: Backgrounds assigned to modelled grid receptors

Pollutant	Averaging Period	Background Concentration (µg/m^3)
NO_2	Annual mean	24.9

[4] London Borough of Camden. (2020), '2020 Air Quality Annual Status Report (ASR)'.
[5] Department for Environmental Food and Rural Affairs. Accessible at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017

Pollutant	Averaging Period	Background Concentration (µg/m^3)
	1-hour mean	49.9
PM_{10}	Annual mean	17.7
	24-hour mean	20.8
	1-hour mean	20.8

4 Dispersion Model

4.1 Modelling Software

Dispersion modelling was undertaken using ADMS-5.2 (v5.2.2.0), which is developed by Cambridge Environmental Research Consultants (CERC) Ltd. ADMS-5 is a PC based dispersion modelling software package that simulates a wide range of buoyant and passive releases to atmosphere from either single or multiple sources. The model utilises hourly meteorological data to define conditions for plume rise, transport and diffusion. It estimates the concentration for each source and receptor combination for each hour of input meteorology and calculates user-selected long-term and short-term averages.

4.2 Source and Emission Parameters

The source parameters and emissions data derived from representative supplier datasheets and included in the model are summarised in Table 4.1 and Table 4.2 respectively. The emissions are based on the Mitsubishi S12H-PTA engine, with 95% NOx reduction by Selective Catalytic reduction, and 93% PM reduction by Diesel Oxidation Catalyst/Diesel Particulate Filter. Further details can be found in Appendix B and Appendix E.

The PM emissions are treated as being abated by the same percentage in both test scenarios, the monthly 10 minute test and the 6 monthly 4 hour load test.

The NOx emissions are treated as being completely unabated in the 10 minute monthly tests, since SCR does not work fully until the catalyst is up to temperature (10 minutes is allowed for this in the MCPD testing guidance). This is considered a conservative assumption, as the abatement is expected to become gradually more effective during the first 10 minutes after start-up. The NOx emissions are treated as being abated by 95% in the 6 monthly load tests.

The emissions were constrained in the model to be on weekdays, between 9am and 5pm, when the generator testing would take place. On the advice of the model developer, to take account of the building effect, the horizontal point source was modelled as a vertical point source with a low exit velocity. For completeness, the relatively very trivial emissions from the nearby carpark vents were also included in the model, and details of this are appended.

Table 4.1: Source Parameters

Parameter	Generator Emission Point
Effective Stack Diameter (m)	0.75
Effective Stack Height (m)	7.15[a]
Stack area (m^2)	1.77
Stack Position (m)	528399.8, 184051.7
Temperature of release (^oC)	515
Emission Velocity at Stack Exit (m/s)	0.1[b]

a) above ground level
b) velocity reduced to model horizontal release

Table 4.2: Emissions Data

Pollutant	Emission Rate (g/s)	
	10 minute test (monthly)[a]	4 hour load test (6 monthly)[b]
NO_x	0.379	0.114
PM_{10}	0.00687	0.00687

a) Selective catalytic reduction not effective
b) Selective catalytic reduction effective

The design of the vent arrangement is shown in the figure below.

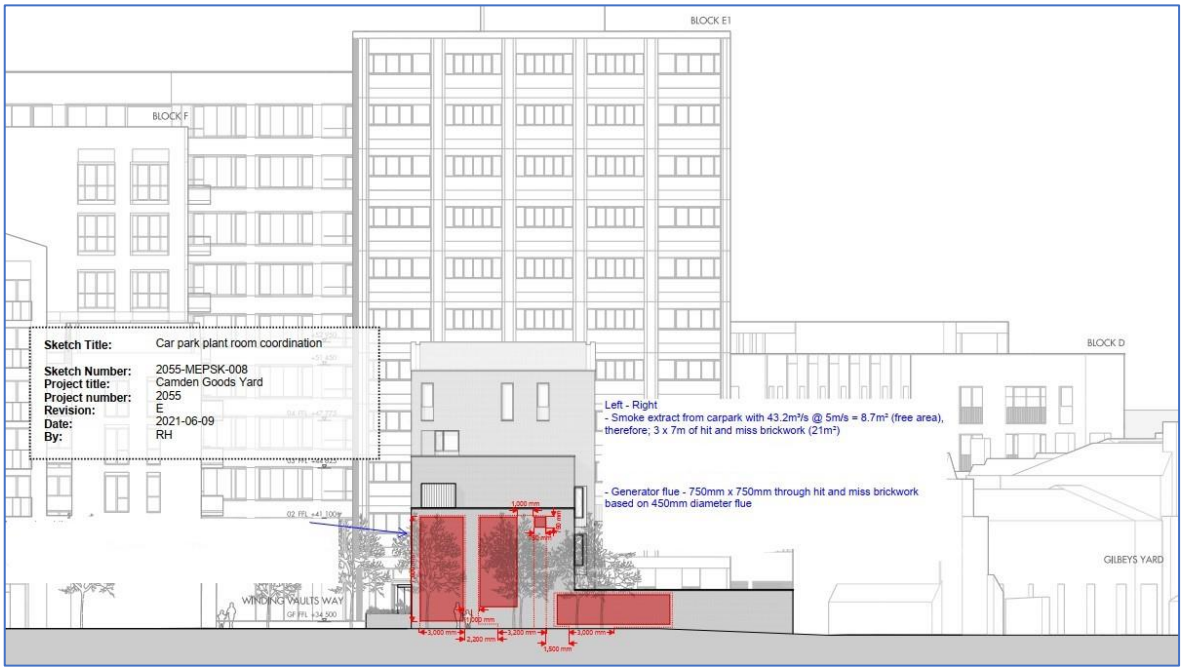


Figure 4.1: Vent arrangement – 0.75m square vent in west building facade

4.3 Modelled Domain and Receptors

The assessment area was defined based upon the source location, anticipated pollutant dispersion patterns and the positioning of sensitive receptors. The modelled grid parameters are defined in Table 4.3 below with respect to the British National Grid, and the spatial extent visualised in Figure 4.2.

Table 4.3: Modelled Grid Parameters

Parameter	Min	Max
X (m)	528337.16	528457.16
Y (m)	183994.74	184114.74
Z (m)	1.5	
Resolution (m)	2.5	

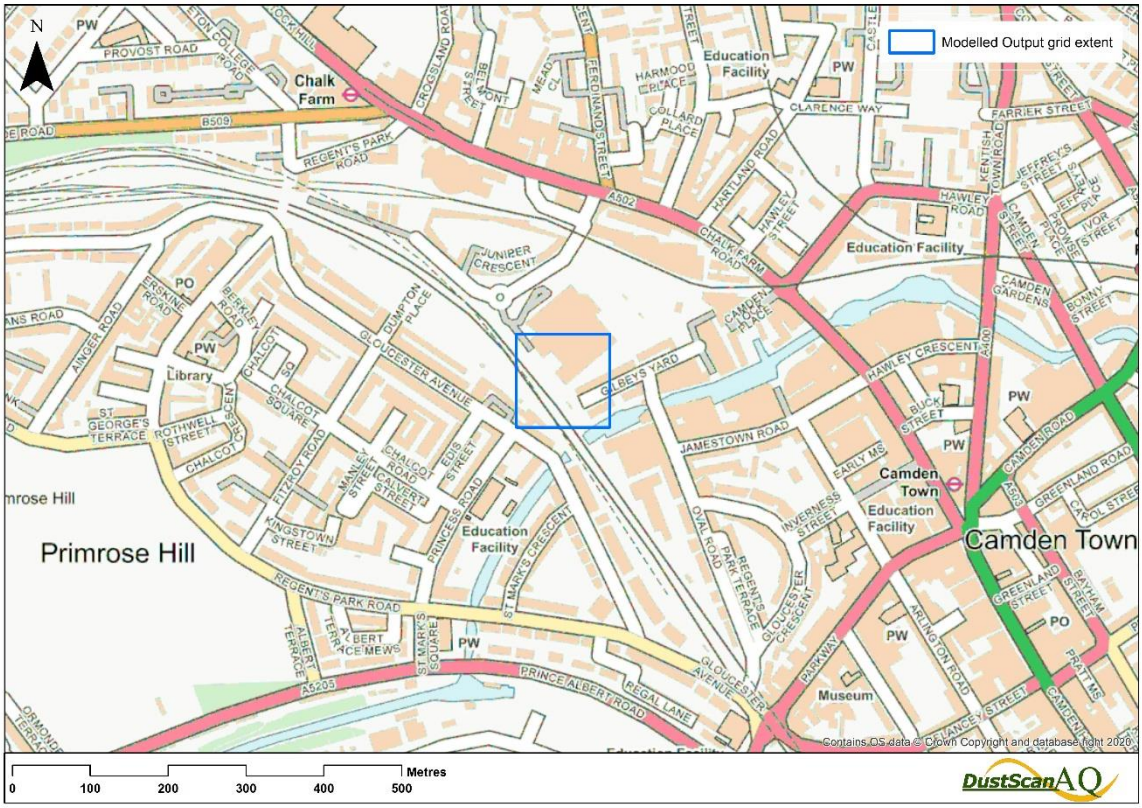


Figure 4.2: Modelled Grid Extent

71 specified receptors have been selected at nearby locations to represent short term exposure appropriately. The receptors are shown in Table 4.4 below, and in Figure 4.3.

Table 4.4: Specified receptors

Receptor ID	X	Y	Z
R1_GF	528404.37	184053.50	1.50
R1_1F	528404.37	184053.50	5.00
R1_2F	528404.37	184053.50	8.38
R2_GF	528412.28	184059.86	1.50
R2_1F	528412.28	184059.86	5.00
R2_2F	528412.28	184059.86	8.38
R3_GF	528419.98	184065.98	1.50
R3_1F	528419.98	184065.98	5.00
R3_2F	528419.98	184065.98	8.38
R4_GF	528429.40	184071.43	1.50
R4_1F	528429.40	184071.43	5.15
R4_2F	528429.40	184071.43	8.60

Receptor ID	X	Y	Z
R4_3F	528429.40	184071.43	12.13
R4_4F	528429.40	184071.43	15.28
R5_GF	528439.03	184079.15	1.50
R5_1F	528439.03	184079.15	5.15
R5_2F	528439.03	184079.15	8.60
R5_3F	528439.03	184079.15	12.13
R5_4F	528439.03	184079.15	15.28
R6_GF	528448.43	184086.83	1.50
R6_1F	528448.43	184086.83	5.15
R6_2F	528448.43	184086.83	8.60
R6_3F	528448.43	184086.83	12.13
R6_4F	528448.43	184086.83	15.28
R7_GF	528398.01	184061.62	1.50
R7_1F	528398.01	184061.62	5.00
R7_2F	528398.01	184061.62	8.38
R8_GF	528405.62	184067.64	1.50
R8_1F	528405.62	184067.64	5.00
R8_2F	528405.62	184067.64	8.38
R9_GF	528413.28	184073.81	1.50
R9_1F	528413.28	184073.81	5.00
R9_2F	528413.28	184073.81	8.38
R10_GF	528422.26	184081.05	1.50
R10_1F	528422.26	184081.05	5.15
R10_2F	528422.26	184081.05	8.60
R10_3F	528422.26	184081.05	12.13
R10_4F	528422.26	184081.05	15.28
R11_GF	528431.21	184088.41	1.50
R11_1F	528431.21	184088.41	5.15
R11_2F	528431.21	184088.41	8.60
R11_3F	528431.21	184088.41	12.13
R11_4F	528431.21	184088.41	15.28
R12_GF	528440.81	184096.28	1.50
R12_1F	528440.81	184096.28	5.15
R12_2F	528440.81	184096.28	8.60
R12_3F	528440.81	184096.28	12.13
R12_4F	528440.81	184096.28	15.28
R13_GF	528389.72	184071.68	1.50

Receptor ID	X	Y	Z
R13_1F	528389.72	184071.68	5.83
R13_2F	528389.72	184071.68	9.20
R13_3F	528389.72	184071.68	12.35
R13_4F	528389.72	184071.68	14.50
R14_GF	528401.43	184081.54	1.50
R14_1F	528401.43	184081.54	5.83
R14_2F	528401.43	184081.54	9.20
R14_3F	528401.43	184081.54	12.35
R13_4F	528401.43	184081.54	14.50
R14_GF	528411.88	184090.27	1.50
R14_1F	528411.88	184090.27	5.83
R14_2F	528372.65	184086.57	1.50
R14_3F	528372.65	184086.57	5.83
R14_4F	528372.65	184086.57	9.20
R15_GF	528372.65	184086.57	12.35
R15_1F	528372.65	184086.57	14.50
R16_GF	528372.65	184086.57	19.03
R16_1F	528372.65	184086.57	21.73
R16_2F	528415.46	184047.13	1.50
R16_3F	528423.84	184051.50	1.50
R16_4F	528432.56	184055.69	1.50
R16_5F	528441.61	184059.55	1.50
R16_6F	528404.37	184053.50	1.50
R17	528404.37	184053.50	5.00
R18	528404.37	184053.50	8.38
R19	528412.28	184059.86	1.50
R20	528412.28	184059.86	5.00

Figure 4.3: Modelled Receptors

4.4 Meteorological Data and Surface Characteristics

The key meteorological parameters for dispersion modelling are wind speed and wind direction. Meteorological parameters such as cloud cover, surface temperature, precipitation rate and relative humidity are also taken into account.

For dispersion modelling, hourly-resolved data are required and often it is difficult to find a local site that can provide reliable data for all the meteorological parameters at this resolution.

Based upon the above, the most representative meteorological monitoring station identified is Heathrow meteorological station, which is located approximately 20 km southwest of Camden Goods Yard.

To account for variation in meteorological conditions, the qualitative assessment and dispersion modelling have been carried out with five years of meteorological data from the period 2016 to 2020. Figure 4.4 below presents the wind rose for each modelled year.

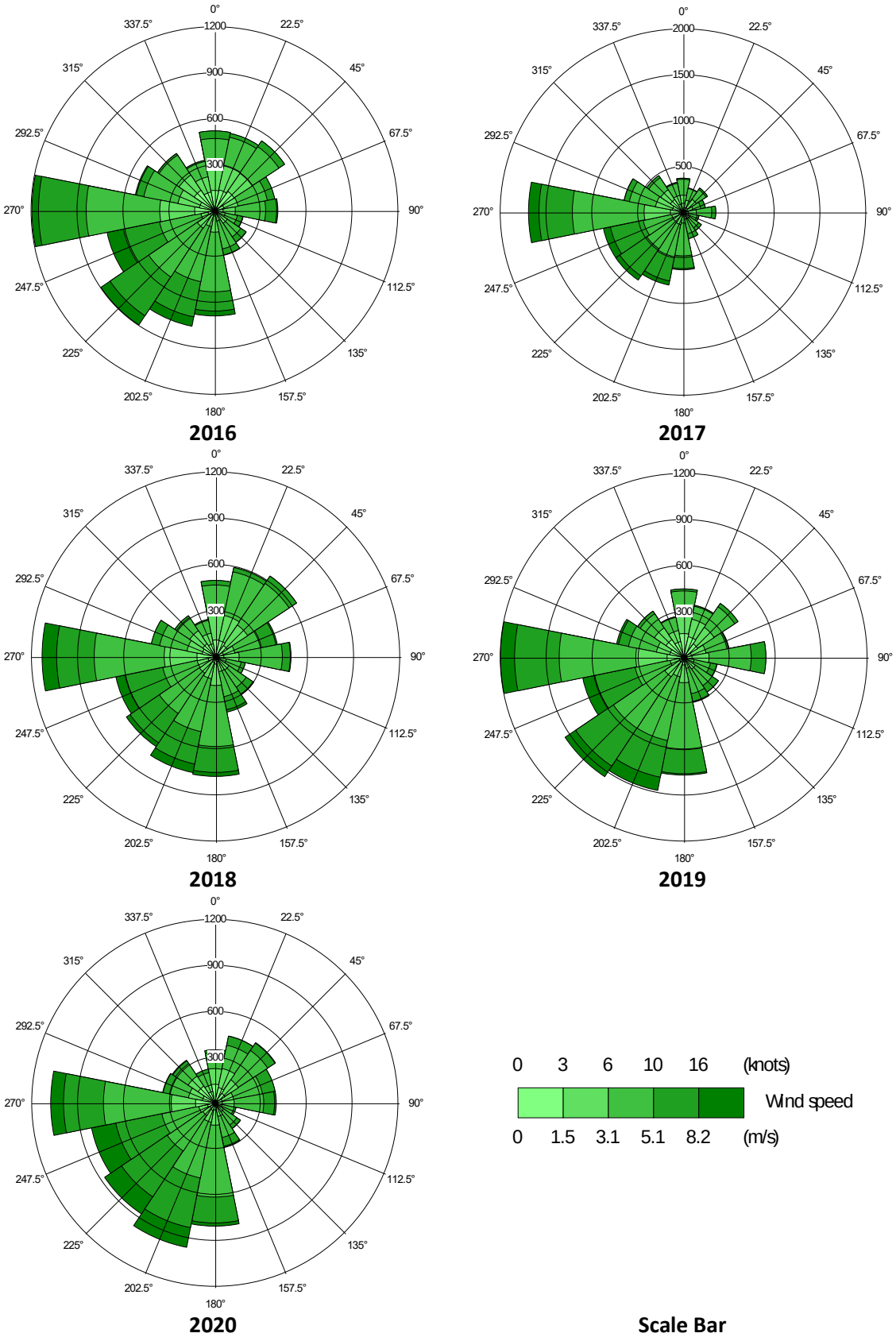


Figure 4.4: Heathrow meteorological station Windrose Plots: 2016 - 2020

The dispersion site surface roughness length (z0) was set to 1 m (cities) and the meteorological site surface roughness length was set to 0.5 m (parkland, open suburbia).

The Minimum Monin-Obukhov Length (MMOL) provides a measure of the stability of the atmosphere. A MMOL value of 100 m (large conurbations > 1 million) was used to describe both the dispersion site and meteorological station location.

These values are considered representative of the respective surrounding areas.

4.5 Building and Structural Effects

The dispersion of substances released from elevated sources can be influenced by the presence of buildings close to the emission point. Structures that are in excess of one third of the height of the stack can have a significant effect on dispersion by interrupting wind flows and causing significantly higher ground-level concentrations close to the source than would arise.

The grid references and the size dimensions of all buildings included in the dispersion model are set out below in Table 4.5. The positions of the modelled buildings are illustrated in Figure 4.5.

The building depiction in the model is shown in the figure below.

Table 4.5: Modelled Building Dimensions

Name	Shape	X (m)	Y (m)	Height (m)	Length (m)	Width (m)	Angle (°)
Vent	Rectangular	528398.3	184055.2	8.00	10.12	1.97	141.14
E2 (Short)	Rectangular	528408.8	184063.6	11.45	10.11	24.87	141.15
E2 (Tall)	Rectangular	528433.3	184082.3	18.95	11.87	36.80	141.02
F	Rectangular	528388.0	184109.2	18.25	51.79	57.78	50.41

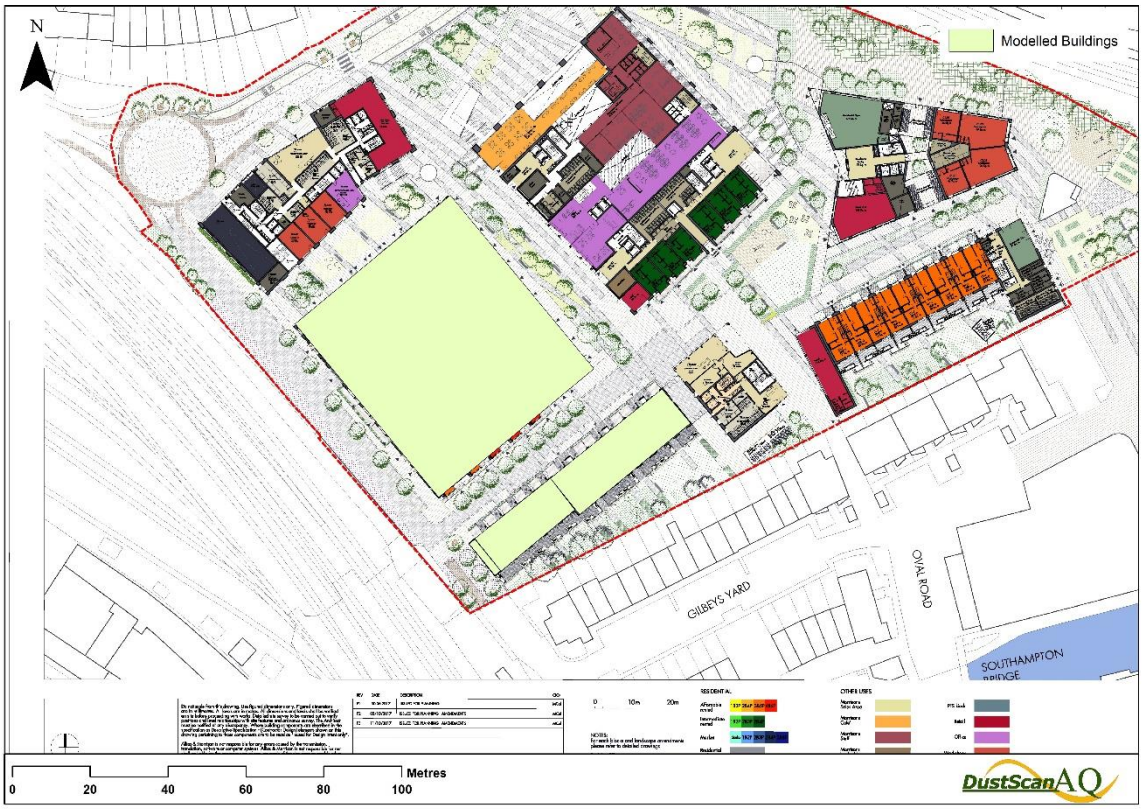


Figure 4.5: Modelled Buildings

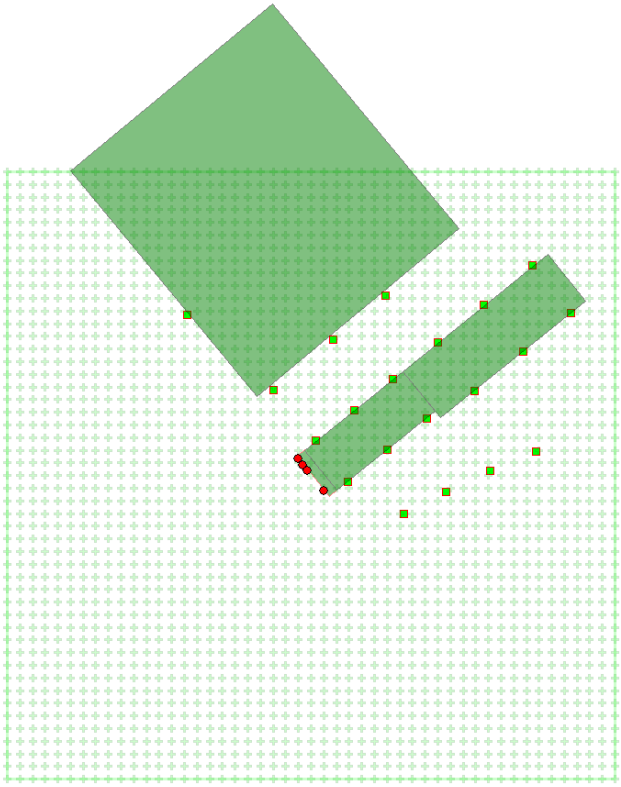


Figure 4.6: Source – Building – Receptor Model

4.6 Statistical Outputs

Annual mean outputs for the subject air pollutants are not informative in describing a situation when the proposed duty is only 9 hours 40 minutes duration in eighteen individual hours out of a year of 8760 hours. The ADMS user manual guidance has been used to derive percentiles considered to illustrate the probability of receptors being exposed to certain air pollution concentrations. The typically used statistical outputs of the dispersion modelling for the short term AQOs are the 99.79th percentile for nitrogen dioxide and 90.41th percentile for daily PM_{10}.

Constrained to operating between 9am and 5pm on weekdays, the percentiles derived are the 88.49th for hourly concentrations, and 84.52th for daily percentiles. Using the approach, the 88.49th percentile is the median between the highest hourly concentration result for all weekday hours of the year, and the lowest of the 2016 weekday hours. The median is one form of average, and in probability terms a concentration is no more likely to be higher than lower than the median.

Post-processing of these percentile outputs is described in Appendix B.

Table 4.6: Derivation of Hourly Percentiles

Number of hours possible to operate per day	Days per week	Weeks per year	Bank holidays	Hours per year	Hours Minimum percentile	Hours Median percentile
8	5	52	8	2016	76.99%	88.49%

Table 4.7: Derivation of Daily Percentiles

Number of hours possible to operate per day	Days per week	Weeks per year	Bank holidays	Hours per year	Days per year	Days Minimum percentile	Days median percentile
8	5	52	8	2016	252	69.04%	84.52%

4.7 Estimating Model Uncertainty

In addition to the parameters outlined above, some assumptions have been made for the modelling, including:

- The power plant will operate during 18 individual hours during the year; and
- Emission data and source parameters have been obtained from the datasheets of the original equipment manufacturer; and

Uncertainty in dispersion modelling predictions can be associated with a variety of factors, including:

- Model limitations;
- Data uncertainty due to errors in input data, emission estimates, operational procedures, land use characteristics and meteorology; and
- Variability - randomness of measurements used.

Potential uncertainties in the model results were minimised as far as practicable and conservative inputs used in order to provide a robust assessment. This included the following:

- Choice of model - ADMS-5 is a widely used atmospheric dispersion model and results have been verified through a number of studies to ensure predictions are as accurate as possible;
- Emission rates - Emission rates were provided by the client, based upon original equipment manufacturer datasheets. As such, they are considered to be representative of potential releases during normal operation;
- Receptor locations - A Cartesian Grid was included in the model in order to provide suitable data for contour plotting;
- Variability - Where site specific input parameters were not available, assumptions were made with consideration of conservative conditions as necessary in order to ensure a robust assessment of potential pollutant concentrations.

4.8 Sensitivity Analyses

Sensitivity analyses are appended. The sensitivity analyses include testing of:

- Meteorological characteristics: Other Met Sites, different surface characteristics
- Emissions characteristics – temperature of emission at 265 °C
- Buildings – not including building effects

Sensitivity analysis has not been carried out on a finer resolution grid, since the grid resolution of 2.5m is already fine.

5 Impact Assessment

5.1 Post-processing

As discussed above, emissions of NO_x will comprise contributions from both NO and NO_2. Air quality assessments are made against the concentrations of NO_2 as it is the regulated pollutant. However, combustion flue gases comprise 90-95% NO which, in time, will oxidise in the atmosphere into NO_2.

As NO_2 emissions from the plant are only one constituent of the total NO_x emissions, an allowance of the NO_2 proportion of NO_x needs to be made. The exact proportion of NO_2 in NO_x emissions from the plant is unknown.

Empirical estimates have been made by Janssen et al [6], which are based on a comprehensive study of observations within power station plumes. This method, which is considered to be more realistic, suggests that the conversion would be in the order of 10 – 20% within 1 – 2km of the release point.

In accordance with guidance provided by the Environment Agency Air Quality Modelling and Assessment Unit[7], it is assumed that 35% of the of the total NO_x emissions from the plant will be converted into NO_2 over the short-term period. This is a reasonably pessimistic approach when compared to other research and has been used in this assessment.

The post-processing of car park emissions described in the Appendix B.

5.2 Significance

The EA risk assessment guidance[8] provides criteria for assessing the significance of emissions with respect to the background air quality and air quality standards.

Stage 1: Criteria for screening out insignificant Process Contributions (PCs)

PCs can be screened out from detailed dispersion modelling if both of the below criteria are met:

- PC long-term < 1% of the long-term air quality standard; and
- PC short-term < 10% of the short-term air quality standard.

If both of these criteria are met, no further assessment of the pollutant in question is required. If one or both of the criteria are not met then further screening criteria are applied, outlined below in stage 2.

[6] L.H.J.M. Janssen, J.H.A. Van Wakeren, H. Van Duuren and A.J. Elshout, A Classification of NO Oxidation Rates in Power Plant Plumes Based on Atmospheric Conditions, Atmospheric Environment Vol. 22, No. 1, pp. 43 – 53. 1988.
[7] Environment Agency: Air Quality Modelling and Assessment Unit, Conversion rates for NO_x and NO_2. http://webarchive.nationalarchives.gov.uk/20140328232919/http:/www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf
[8] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

Stage 2: Criteria for screening out insignificant Predicted Environmental Concentrations (PECs)

The PEC is the combination of the PC and the background concentration of the pollutant. Detailed dispersion modelling can be screened out if both of the below criteria are met:

- PEC long-term < 70% of the long-term air quality standard; and
- PC short-term < 20% of the short-term air quality standard minus twice the long-term background concentration.

Any emissions which don't meet the screening criteria for stage 2 require further detailed modelling.

Detailed modelling is presented here because it is also required if:

- Emissions affect an AQMA; or
- Restrictions apply for any substance emitted in this area.

5.3 Contour Plots

Below are presented contour plots for each pollutant assessed against AQO.

5.3.1 NO_2

Contour plots showing the PC and PEC for the annual mean and 88.49th percentile are presented below for the 4 hour load tests and 10 minute tests.

The annual mean NO_2 is shown in Figure 5.1 and is well within the AQO.

Figure 5.2 shows the contour plot for the 6 monthly 4 hour load test. The AQS is not exceeded. The highest concentrations occur to the northeast of the vent point are below the value of the relevant AQS, which is 200 µg/m^3.

Figure 5.3 shows the contour plot for the 10 monthly 10 minute tests. It is conservatively estimated that the Air Quality Standard will be exceeded 10 times a year within a few metres of Building E1 during the 10 minute tests. It should be noted that these are the maximum concentrations from a 5-year modelling period, so represent a conservative depiction of the probable concentrations.

The short term AQO for hourly NO_2 is not exceeded, because the AQS is only predicted to be breached in 10 hours per year, and 18 hours are allowed in the Objective.

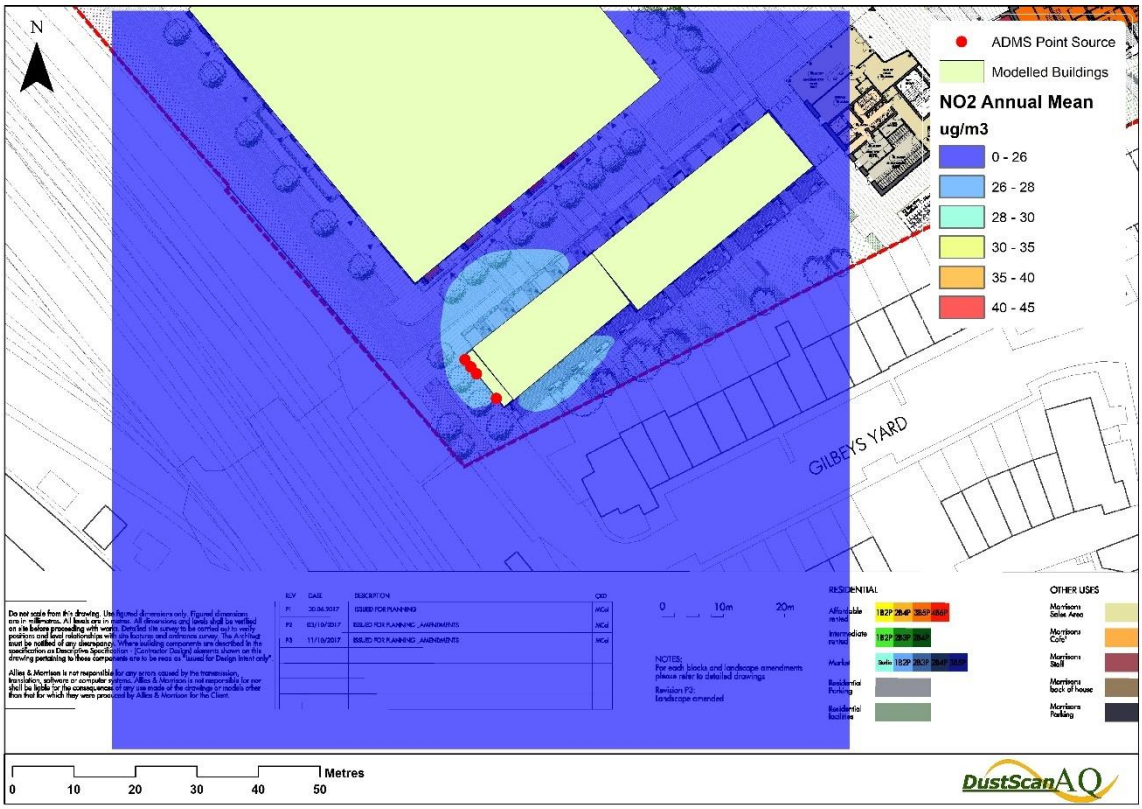


Figure 5.1: NO_2 Annual Mean

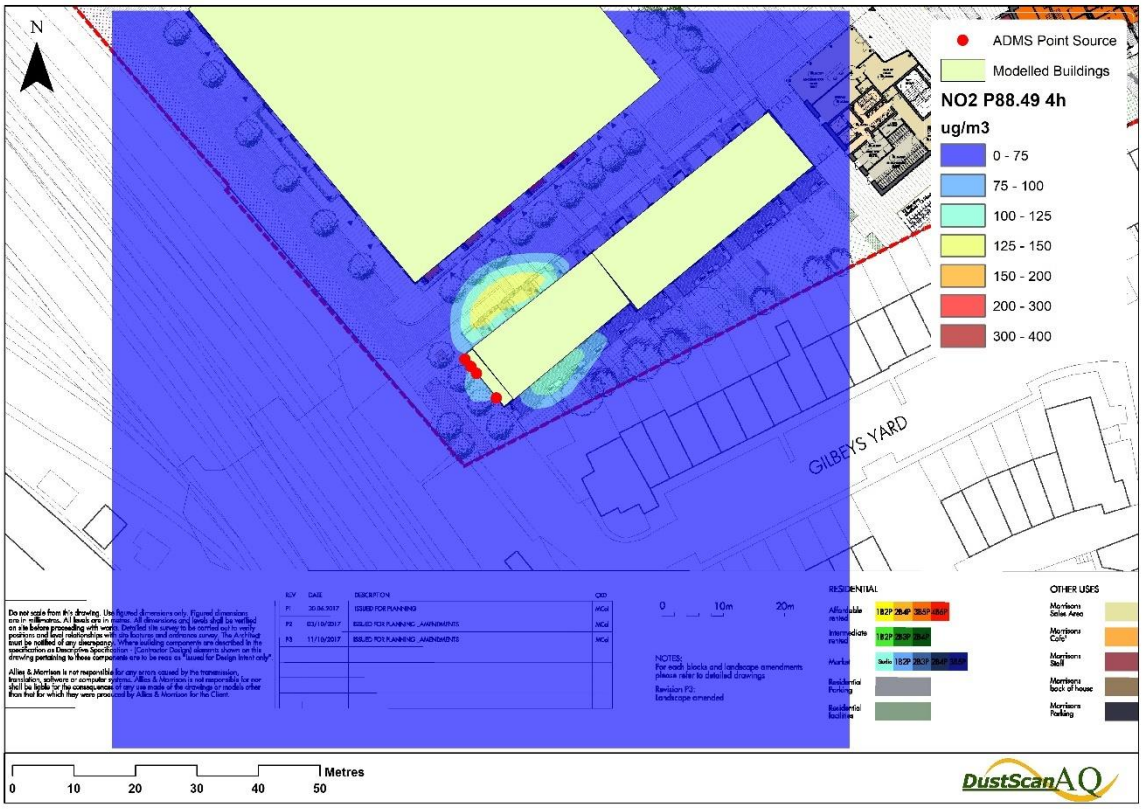


Figure 5.2: NO_2 88.49th percentile of hourly PEC (µg/m^3) – 4 hour load test

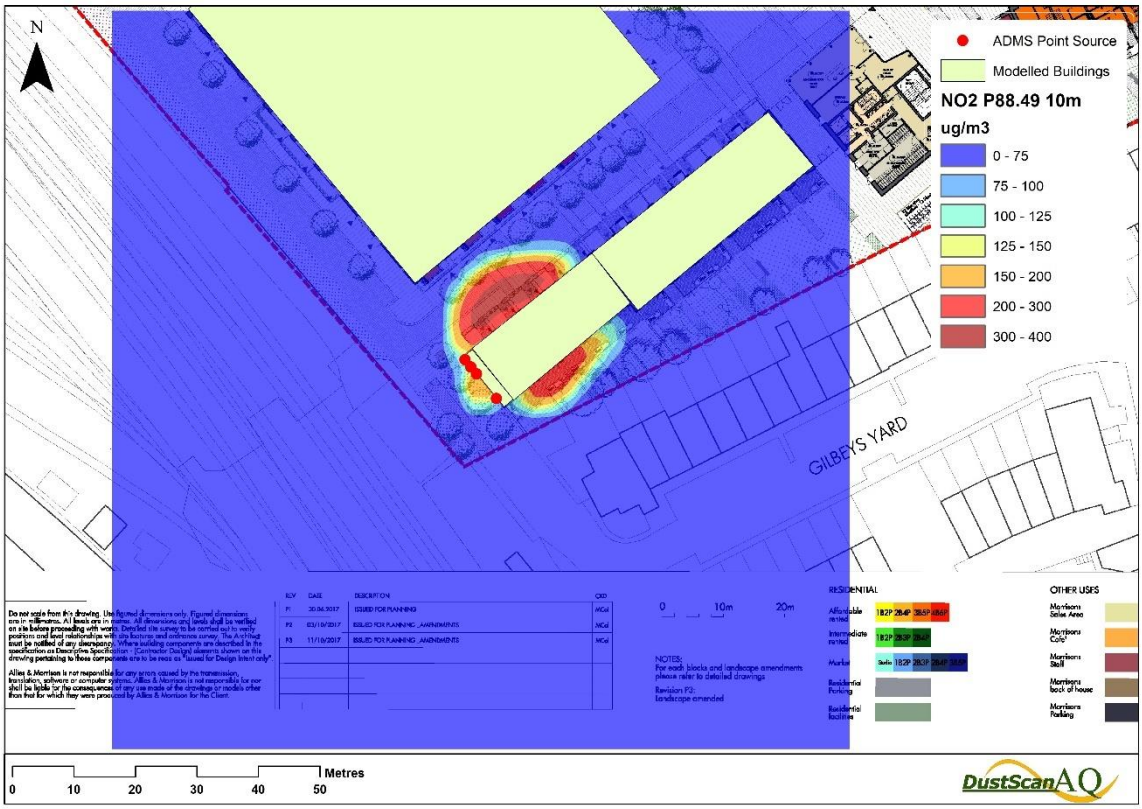


Figure 5.3: NO_2 88.49th percentile of hourly PEC (µg/m^3) – 10 minute test

5.3.2 PM_{10}

A contour plot of the annual mean PM_{10} concentration is shown in Figure 5.4 below. There is very little impact on the annual mean.

A contour plot showing the PEC for the 84.59th percentile of 24 hour PM_{10} concentration is presented below in Figure 5.5 for the 4 hour tests. The AQS of 50 µg/m^3 is not exceeded.

A contour plot showing the PEC for the 84.59th percentile of 24 hour PM_{10} concentration is presented below in Figure 5.6 for the 10 minutes tests. The AQS of 50 µg/m^3 is not exceeded.

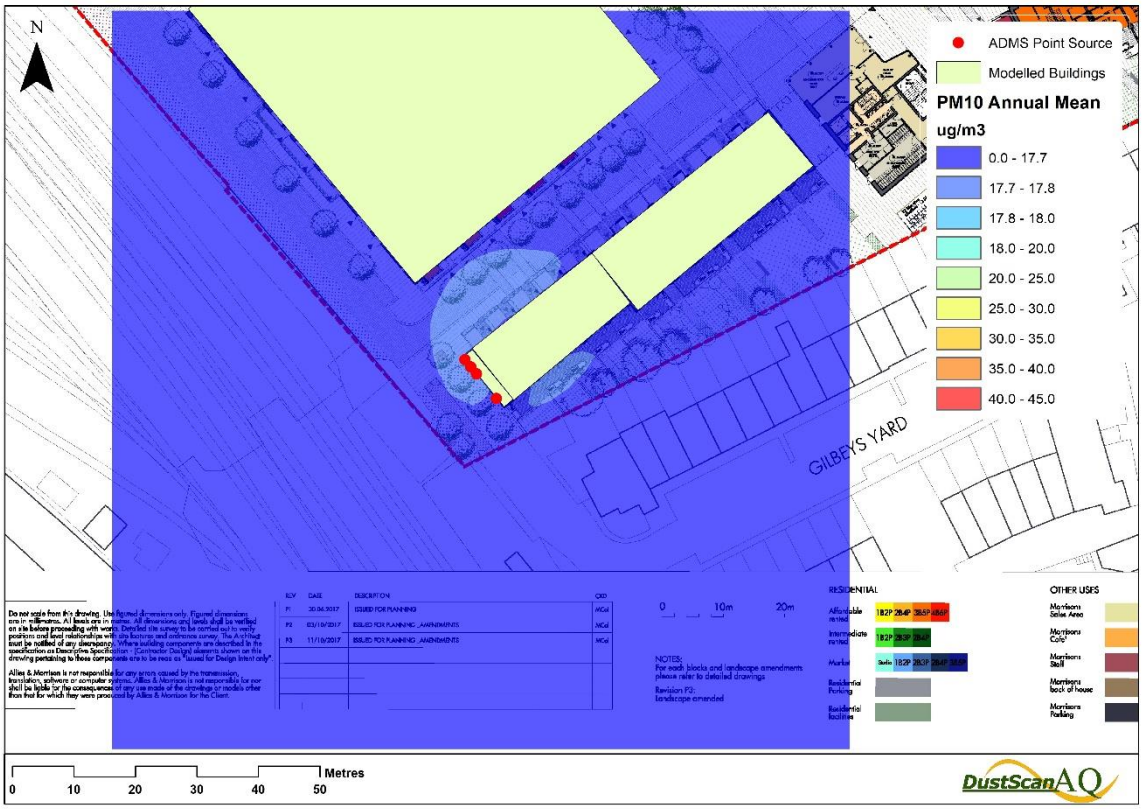


Figure 5.4: PM_{10} Annual Mean

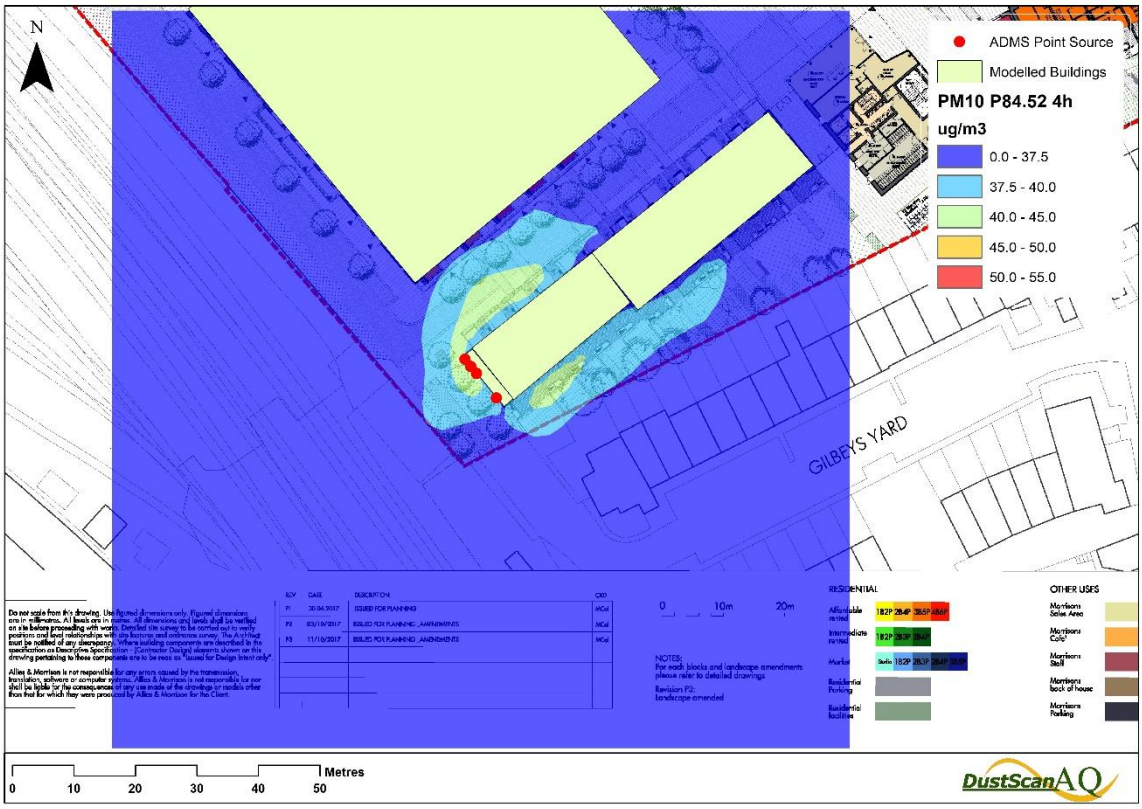


Figure 5.5: 84.52nd percentile of 24 hour PM_{10} PEC (µg/m^3) – 4 hour test

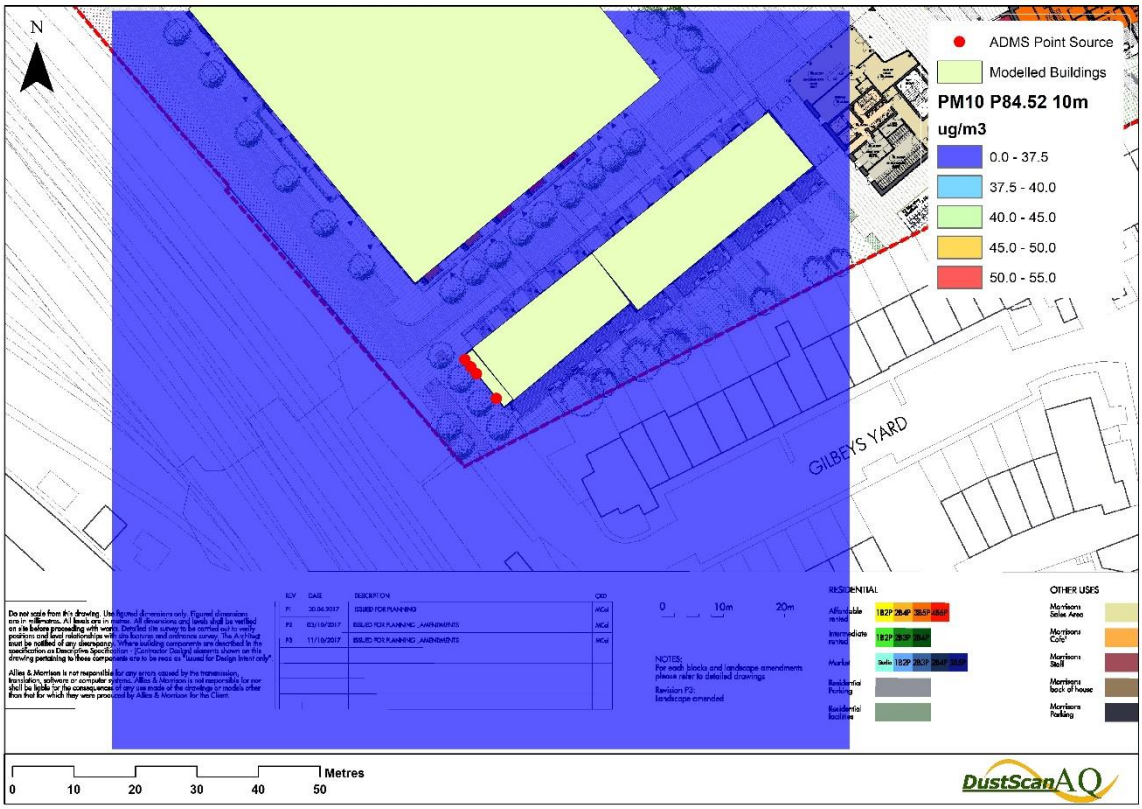


Figure 5.6: 84.52nd percentile of 24 hour PM_{10} PEC (µg/m^3) – 10 minute test

5.3.3 $PM_{2.5}$

A contour plot showing the $PM_{2.5}$ annual mean PEC is shown below in Figure 5.7.

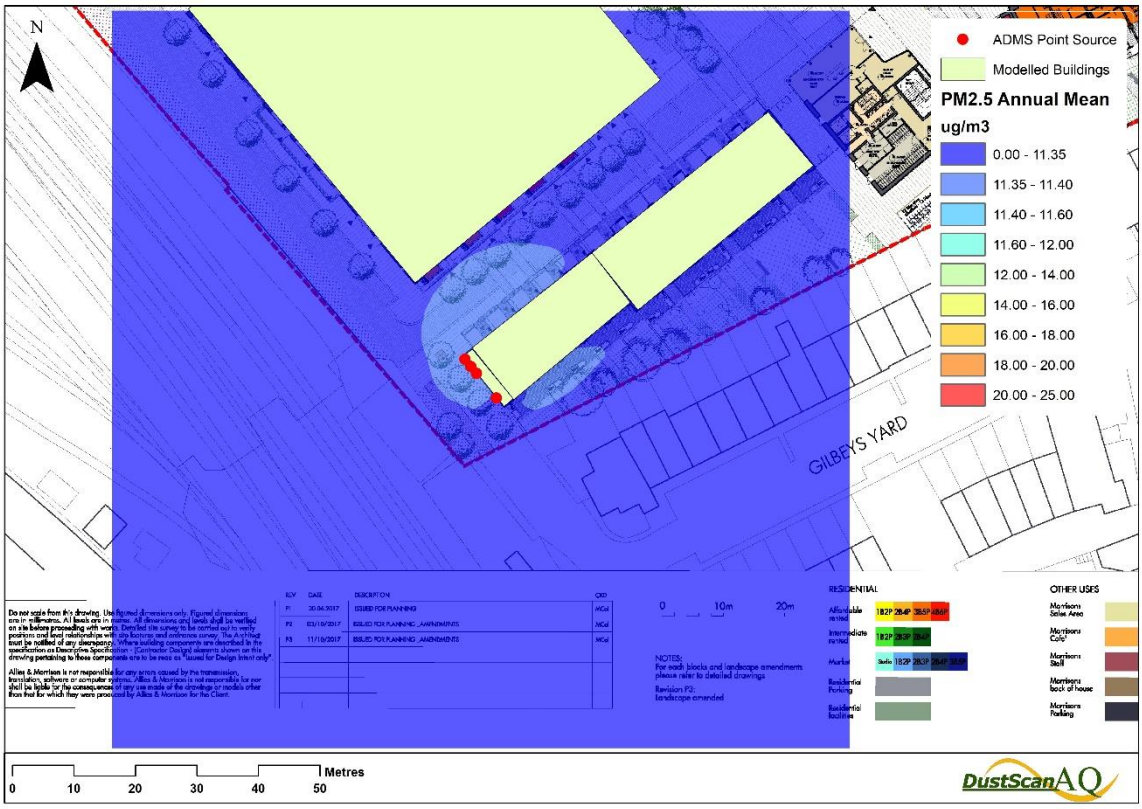


Figure 5.7: $PM_{2.5}$ Annual Mean

5.4 Impact at receptors

As discussed in above, there are potential impacts on local air quality that could arise from the operation of the plant at Camden Goods Yard. The potential impact of air quality is discussed below.

The impact on air quality from the assessed plant for all modelled pollutants and averaging periods are detailed in the tables in Appendix A. In order to investigate the impact at nearby dwellings, a large number of receptors were specified

From the tables, it can be seen that the PEC for NO_2 for some of the nearest modelled receptors is above the AQS. The highest PEC occurs at R1_GF and is 541.61 µg/m^3, which exceeds the AQS. The receptors where the NO_2 is breached are restricted to the very closest to the exhaust vent, specifically R1, R2, R7, R8 and R9.

6 Conclusion

This report provides an assessment of the impacts associated with the operation of a proposed emergency generator at the Camden Goods Yard development, Chalk Farm Road, Camden, London.

This report has:

- Assessed the impacts from the operational phase of the emergency generator on human health receptors as a result of pollutant concentrations associated with vent emissions, with respect to the Air Quality Objectives

An air quality assessment of the operational air quality effects was undertaken for the emergency plant.

Modelling was undertaken using the datasheet emissions for the proposed plant, corrected for the best achievable reduction using abatement equipment.

The results of the dispersion modelling show that at all modelled human health receptors and locations where the relevant air quality standards are applicable, no exceedances are likely to be caused by the proposed plant, except during the 10 minute monthly tests. Exceedances of the 1 hour nitrogen dioxide standard may occur at nearby dwellings and relevant outdoor areas, but the objective will not be breached, since there can only be 10 exceedances per year.

Since no air quality objectives will be breached, the proposed plant is not considered to have a significant impact with respect to meeting the relevant air quality legislation.

Appendix A: Results

Table A.1: NO_2 annual mean

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R1_GF	25.53	2.12	5.29	27.65	69.12
R1_1F	25.53	2.12	5.29	27.65	69.12
R1_2F	25.53	0.01	0.03	25.54	63.86
R2_GF	25.53	1.58	3.94	27.11	67.77
R2_1F	25.53	1.58	3.94	27.11	67.77
R2_2F	25.53	0.02	0.05	25.55	63.88
R3_GF	25.53	0.46	1.15	25.99	64.98
R3_1F	25.53	0.46	1.15	25.99	64.98
R3_2F	25.53	0.01	0.03	25.54	63.86
R4_GF	25.53	0.37	0.92	25.90	64.75
R4_1F	25.53	0.36	0.91	25.90	64.74
R4_2F	25.53	0.01	0.03	25.54	63.86
R4_3F	25.53	0.00	0.00	25.53	63.83
R4_4F	25.53	0.00	0.00	25.53	63.83
R5_GF	25.53	0.29	0.73	25.83	64.57
R5_1F	25.53	0.29	0.72	25.82	64.55
R5_2F	25.53	0.01	0.03	25.54	63.86
R5_3F	25.53	0.00	0.00	25.53	63.83
R5_4F	25.53	0.00	0.00	25.53	63.83
R6_GF	25.53	0.26	0.65	25.79	64.49
R6_1F	25.53	0.26	0.65	25.79	64.48
R6_2F	25.53	0.00	0.00	25.53	63.83
R6_3F	25.53	0.00	0.00	25.53	63.83
R6_4F	25.53	0.00	0.00	25.53	63.83
R7_GF	25.53	2.00	4.99	27.53	68.82
R7_1F	25.53	2.01	5.02	27.54	68.85
R7_2F	25.53	0.05	0.13	25.58	63.96
R8_GF	25.53	1.86	4.65	27.39	68.48
R8_1F	25.53	1.86	4.65	27.39	68.48
R8_2F	25.53	0.03	0.08	25.56	63.91
R9_GF	25.53	1.21	3.03	26.75	66.86
R9_1F	25.53	1.21	3.03	26.75	66.86
R9_2F	25.53	0.01	0.03	25.54	63.86
R10_GF	25.53	0.34	0.84	25.87	64.67
R10_1F	25.53	0.32	0.81	25.86	64.64
R10_2F	25.53	0.01	0.03	25.54	63.86
R10_3F	25.53	0.00	0.00	25.53	63.83
R10_4F	25.53	0.00	0.00	25.53	63.83
R11_GF	25.53	0.23	0.57	25.76	64.40
R11_1F	25.53	0.22	0.56	25.76	64.39
R11_2F	25.53	0.00	0.00	25.53	63.83
R11_3F	25.53	0.00	0.00	25.53	63.83

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R11_4F	25.53	0.00	0.00	25.53	63.83
R12_GF	25.53	0.18	0.45	25.71	64.28
R12_1F	25.53	0.18	0.45	25.71	64.28
R12_2F	25.53	0.00	0.00	25.53	63.83
R12_3F	25.53	0.00	0.00	25.53	63.83
R12_4F	25.53	0.00	0.00	25.53	63.83
R13_GF	25.53	0.31	0.78	25.84	64.61
R13_1F	25.53	0.31	0.78	25.84	64.61
R13_2F	25.53	0.01	0.03	25.54	63.86
R13_3F	25.53	0.00	0.00	25.53	63.83
R13_4F	25.53	0.00	0.00	25.53	63.83
R14_GF	25.53	0.25	0.63	25.78	64.46
R14_1F	25.53	0.25	0.63	25.78	64.46
R14_2F	25.53	0.00	0.00	25.53	63.83
R14_3F	25.53	0.00	0.00	25.53	63.83
R14_4F	25.53	0.00	0.00	25.53	63.83
R15_GF	25.53	0.17	0.43	25.70	64.26
R15_1F	25.53	0.17	0.43	25.70	64.26
R16_GF	25.53	0.01	0.03	25.54	63.86
R16_1F	25.53	0.01	0.03	25.54	63.86
R16_2F	25.53	0.00	0.00	25.53	63.83
R16_3F	25.53	0.00	0.00	25.53	63.83
R16_4F	25.53	0.00	0.00	25.53	63.83
R16_5F	25.53	0.00	0.00	25.53	63.83
R16_6F	25.53	0.00	0.00	25.53	63.83
R17	25.53	0.17	0.43	25.70	64.26
R18	25.53	0.22	0.55	25.75	64.38
R19	25.53	0.21	0.53	25.75	64.37
R20	25.53	0.07	0.18	25.60	64.01

Table A.2: NO_2 P88.49 abated – 4 hour tests – twice per year

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R1_GF	51.07	147.83	73.54	198.15	99.08
R1_1F	51.07	147.83	73.54	198.15	99.08
R1_2F	51.07	0.01	0.00	51.07	25.53
R2_GF	51.07	112.21	55.84	162.75	81.37
R2_1F	51.07	112.21	55.84	162.75	81.37
R2_2F	51.07	0.02	0.00	51.07	25.53
R3_GF	51.07	7.82	3.71	58.49	29.25
R3_1F	51.07	7.87	3.74	58.55	29.28
R3_2F	51.07	0.01	0.00	51.07	25.53
R4_GF	51.07	7.48	3.59	58.25	29.12
R4_1F	51.07	7.18	3.44	57.95	28.97

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R4_2F	51.07	0.01	0.00	51.07	25.53
R4_3F	51.07	0.00	0.00	51.07	25.53
R4_4F	51.07	0.00	0.00	51.07	25.53
R5_GF	51.07	5.95	2.85	56.77	28.39
R5_1F	51.07	5.38	2.57	56.21	28.10
R5_2F	51.07	0.01	0.00	51.07	25.53
R5_3F	51.07	0.00	0.00	51.07	25.53
R5_4F	51.07	0.00	0.00	51.07	25.53
R6_GF	51.07	4.67	2.22	55.51	27.76
R6_1F	51.07	4.34	2.06	55.19	27.59
R6_2F	51.07	0.00	0.00	51.07	25.53
R6_3F	51.07	0.00	0.00	51.07	25.53
R6_4F	51.07	0.00	0.00	51.07	25.53
R7_GF	51.07	123.41	61.28	173.62	86.81
R7_1F	51.07	124.37	61.76	174.59	87.29
R7_2F	51.07	0.05	0.00	51.07	25.53
R8_GF	51.07	120.32	59.79	170.65	85.32
R8_1F	51.07	120.32	59.79	170.65	85.32
R8_2F	51.07	0.03	0.00	51.07	25.53
R9_GF	51.07	80.85	40.19	131.45	65.73
R9_1F	51.07	80.85	40.19	131.45	65.73
R9_2F	51.07	0.01	0.00	51.07	25.53
R10_GF	51.07	4.21	1.96	54.98	27.49
R10_1F	51.07	2.88	1.29	53.64	26.82
R10_2F	51.07	0.01	0.00	51.07	25.53
R10_3F	51.07	0.00	0.00	51.07	25.53
R10_4F	51.07	0.00	0.00	51.07	25.53
R11_GF	51.07	0.97	0.37	51.81	25.91
R11_1F	51.07	0.67	0.22	51.51	25.76
R11_2F	51.07	0.00	0.00	51.07	25.53
R11_3F	51.07	0.00	0.00	51.07	25.53
R11_4F	51.07	0.00	0.00	51.07	25.53
R12_GF	51.07	0.19	0.01	51.08	25.54
R12_1F	51.07	0.19	0.00	51.07	25.54
R12_2F	51.07	0.00	0.00	51.07	25.53
R12_3F	51.07	0.00	0.00	51.07	25.53
R12_4F	51.07	0.00	0.00	51.07	25.53
R13_GF	51.07	0.31	0.00	51.07	25.53
R13_1F	51.07	0.31	0.00	51.07	25.53
R13_2F	51.07	0.01	0.00	51.07	25.53
R13_3F	51.07	0.00	0.00	51.07	25.53
R13_4F	51.07	0.00	0.00	51.07	25.53
R14_GF	51.07	0.25	0.00	51.07	25.53
R14_1F	51.07	0.25	0.00	51.07	25.53
R14_2F	51.07	0.00	0.00	51.07	25.53

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R14_3F	51.07	0.00	0.00	51.07	25.53
R14_4F	51.07	0.00	0.00	51.07	25.53
R15_GF	51.07	0.17	0.00	51.07	25.53
R15_1F	51.07	0.17	0.00	51.07	25.53
R16_GF	51.07	0.01	0.00	51.07	25.53
R16_1F	51.07	0.01	0.00	51.07	25.53
R16_2F	51.07	0.00	0.00	51.07	25.53
R16_3F	51.07	0.00	0.00	51.07	25.53
R16_4F	51.07	0.00	0.00	51.07	25.53
R16_5F	51.07	0.00	0.00	51.07	25.53
R16_6F	51.07	0.00	0.00	51.07	25.53
R17	51.07	0.17	0.00	51.07	25.53
R18	51.07	0.23	0.01	51.08	25.54
R19	51.07	0.58	0.18	51.43	25.72
R20	51.07	0.17	0.05	51.16	25.58

Table A.3: NO_2 P88.49 unabated – 10 minute tests – 10 times per year

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R1_GF	51.07	490.55	245.27	541.61	270.81
R1_1F	51.07	490.55	245.27	541.61	270.81
R1_2F	51.07	0.01	0.01	51.08	25.54
R2_GF	51.07	372.44	186.22	423.50	211.75
R2_1F	51.07	372.44	186.22	423.50	211.75
R2_2F	51.07	0.02	0.01	51.09	25.54
R3_GF	51.07	25.12	12.56	76.18	38.09
R3_1F	51.07	25.31	12.66	76.38	38.19
R3_2F	51.07	0.01	0.01	51.08	25.54
R4_GF	51.07	24.22	12.11	75.29	37.64
R4_1F	51.07	23.23	11.61	74.29	37.15
R4_2F	51.07	0.01	0.01	51.08	25.54
R4_3F	51.07	0.00	0.00	51.07	25.53
R4_4F	51.07	0.00	0.00	51.07	25.53
R5_GF	51.07	19.25	9.62	70.31	35.16
R5_1F	51.07	17.36	8.68	68.43	34.21
R5_2F	51.07	0.01	0.01	51.08	25.54
R5_3F	51.07	0.00	0.00	51.07	25.53
R5_4F	51.07	0.00	0.00	51.07	25.53
R6_GF	51.07	15.03	7.52	66.10	33.05
R6_1F	51.07	13.94	6.97	65.01	32.50
R6_2F	51.07	0.00	0.00	51.07	25.53
R6_3F	51.07	0.00	0.00	51.07	25.53
R6_4F	51.07	0.00	0.00	51.07	25.53
R7_GF	51.07	408.96	204.48	460.03	230.01

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R7_1F	51.07	412.17	206.09	463.24	231.62
R7_2F	51.07	0.05	0.03	51.12	25.56
R8_GF	51.07	398.95	199.48	450.02	225.01
R8_1F	51.07	398.95	199.48	450.02	225.01
R8_2F	51.07	0.03	0.02	51.10	25.55
R9_GF	51.07	268.14	134.07	319.21	159.60
R9_1F	51.07	268.14	134.07	319.21	159.60
R9_2F	51.07	0.01	0.01	51.08	25.54
R10_GF	51.07	13.33	6.66	64.39	32.20
R10_1F	51.07	8.89	4.44	59.95	29.98
R10_2F	51.07	0.01	0.01	51.08	25.54
R10_3F	51.07	0.00	0.00	51.07	25.53
R10_4F	51.07	0.00	0.00	51.07	25.53
R11_GF	51.07	2.71	1.35	53.77	26.89
R11_1F	51.07	1.71	0.85	52.77	26.39
R11_2F	51.07	0.00	0.00	51.07	25.53
R11_3F	51.07	0.00	0.00	51.07	25.53
R11_4F	51.07	0.00	0.00	51.07	25.53
R12_GF	51.07	0.23	0.11	51.29	25.65
R12_1F	51.07	0.21	0.11	51.28	25.64
R12_2F	51.07	0.00	0.00	51.07	25.53
R12_3F	51.07	0.00	0.00	51.07	25.53
R12_4F	51.07	0.00	0.00	51.07	25.53
R13_GF	51.07	0.31	0.16	51.38	25.69
R13_1F	51.07	0.31	0.16	51.38	25.69
R13_2F	51.07	0.01	0.01	51.08	25.54
R13_3F	51.07	0.00	0.00	51.07	25.53
R13_4F	51.07	0.00	0.00	51.07	25.53
R14_GF	51.07	0.25	0.13	51.32	25.66
R14_1F	51.07	0.25	0.13	51.32	25.66
R14_2F	51.07	0.00	0.00	51.07	25.53
R14_3F	51.07	0.00	0.00	51.07	25.53
R14_4F	51.07	0.00	0.00	51.07	25.53
R15_GF	51.07	0.17	0.09	51.24	25.62
R15_1F	51.07	0.17	0.09	51.24	25.62
R16_GF	51.07	0.01	0.01	51.08	25.54
R16_1F	51.07	0.01	0.01	51.08	25.54
R16_2F	51.07	0.00	0.00	51.07	25.53
R16_3F	51.07	0.00	0.00	51.07	25.53
R16_4F	51.07	0.00	0.00	51.07	25.53
R16_5F	51.07	0.00	0.00	51.07	25.53
R16_6F	51.07	0.00	0.00	51.07	25.53
R17	51.07	0.17	0.09	51.24	25.62
R18	51.07	0.26	0.13	51.32	25.66
R19	51.07	1.43	0.71	52.49	26.25

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R20	51.07	0.39	0.19	51.45	25.73

Table A.4: PM_{10} annual mean

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R1_GF	17.65	0.12	0.06	17.77	8.89
R1_1F	17.65	0.12	0.06	17.77	8.89
R1_2F	17.65	0.00	0.00	17.65	8.83
R2_GF	17.65	0.09	0.04	17.74	8.87
R2_1F	17.65	0.09	0.04	17.74	8.87
R2_2F	17.65	0.00	0.00	17.66	8.83
R3_GF	17.65	0.05	0.02	17.70	8.85
R3_1F	17.65	0.05	0.02	17.70	8.85
R3_2F	17.65	0.00	0.00	17.65	8.83
R4_GF	17.65	0.04	0.02	17.69	8.85
R4_1F	17.65	0.04	0.02	17.69	8.85
R4_2F	17.65	0.00	0.00	17.65	8.83
R4_3F	17.65	0.00	0.00	17.65	8.83
R4_4F	17.65	0.00	0.00	17.65	8.83
R5_GF	17.65	0.03	0.02	17.68	8.84
R5_1F	17.65	0.03	0.02	17.68	8.84
R5_2F	17.65	0.00	0.00	17.65	8.83
R5_3F	17.65	0.00	0.00	17.65	8.83
R5_4F	17.65	0.00	0.00	17.65	8.83
R6_GF	17.65	0.03	0.01	17.68	8.84
R6_1F	17.65	0.03	0.01	17.68	8.84
R6_2F	17.65	0.00	0.00	17.65	8.83
R6_3F	17.65	0.00	0.00	17.65	8.83
R6_4F	17.65	0.00	0.00	17.65	8.83
R7_GF	17.65	0.13	0.06	17.78	8.89
R7_1F	17.65	0.13	0.06	17.78	8.89
R7_2F	17.65	0.01	0.00	17.66	8.83
R8_GF	17.65	0.11	0.06	17.77	8.88
R8_1F	17.65	0.11	0.06	17.77	8.88
R8_2F	17.65	0.00	0.00	17.66	8.83
R9_GF	17.65	0.07	0.04	17.72	8.86
R9_1F	17.65	0.07	0.04	17.73	8.86
R9_2F	17.65	0.00	0.00	17.65	8.83
R10_GF	17.65	0.04	0.02	17.69	8.85
R10_1F	17.65	0.04	0.02	17.69	8.85
R10_2F	17.65	0.00	0.00	17.65	8.83
R10_3F	17.65	0.00	0.00	17.65	8.83
R10_4F	17.65	0.00	0.00	17.65	8.83
R11_GF	17.65	0.03	0.01	17.68	8.84

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R11_1F	17.65	0.03	0.01	17.68	8.84
R11_2F	17.65	0.00	0.00	17.65	8.83
R11_3F	17.65	0.00	0.00	17.65	8.83
R11_4F	17.65	0.00	0.00	17.65	8.83
R12_GF	17.65	0.02	0.01	17.68	8.84
R12_1F	17.65	0.02	0.01	17.68	8.84
R12_2F	17.65	0.00	0.00	17.65	8.83
R12_3F	17.65	0.00	0.00	17.65	8.83
R12_4F	17.65	0.00	0.00	17.65	8.83
R13_GF	17.65	0.04	0.02	17.69	8.85
R13_1F	17.65	0.04	0.02	17.69	8.85
R13_2F	17.65	0.00	0.00	17.65	8.83
R13_3F	17.65	0.00	0.00	17.65	8.83
R13_4F	17.65	0.00	0.00	17.65	8.83
R14_GF	17.65	0.03	0.02	17.68	8.84
R14_1F	17.65	0.03	0.02	17.68	8.84
R14_2F	17.65	0.00	0.00	17.65	8.83
R14_3F	17.65	0.00	0.00	17.65	8.83
R14_4F	17.65	0.00	0.00	17.65	8.83
R15_GF	17.65	0.02	0.01	17.67	8.84
R15_1F	17.65	0.02	0.01	17.67	8.84
R16_GF	17.65	0.00	0.00	17.66	8.83
R16_1F	17.65	0.00	0.00	17.65	8.83
R16_2F	17.65	0.00	0.00	17.65	8.83
R16_3F	17.65	0.00	0.00	17.65	8.83
R16_4F	17.65	0.00	0.00	17.65	8.83
R16_5F	17.65	0.00	0.00	17.65	8.83
R16_6F	17.65	0.00	0.00	17.65	8.83
R17	17.65	0.02	0.01	17.67	8.84
R18	17.65	0.03	0.01	17.68	8.84
R19	17.65	0.03	0.01	17.68	8.84
R20	17.65	0.01	0.00	17.66	8.83

Table A.5: PM_{10} P84.52 (4hr) – 2 times per year

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R1_GF	35.31	10.69	5.35	46.00	91.99
R1_1F	35.31	10.69	5.35	46.00	91.99
R1_2F	35.31	0.89	0.44	36.19	72.38
R2_GF	35.31	6.79	3.40	42.10	84.19
R2_1F	35.31	6.79	3.40	42.10	84.19
R2_2F	35.31	0.52	0.26	35.83	71.66
R3_GF	35.31	5.73	2.87	41.04	82.08
R3_1F	35.31	5.74	2.87	41.04	82.08

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R3_2F	35.31	0.28	0.14	35.58	71.17
R4_GF	35.31	4.95	2.47	40.26	80.51
R4_1F	35.31	4.95	2.47	40.26	80.51
R4_2F	35.31	0.27	0.13	35.57	71.15
R4_3F	35.31	0.11	0.06	35.42	70.84
R4_4F	35.31	0.06	0.03	35.36	70.72
R5_GF	35.31	3.41	1.71	38.72	77.44
R5_1F	35.31	3.41	1.71	38.72	77.44
R5_2F	35.31	0.22	0.11	35.53	71.05
R5_3F	35.31	0.12	0.06	35.42	70.85
R5_4F	35.31	0.06	0.03	35.37	70.73
R6_GF	35.31	3.33	1.67	38.64	77.28
R6_1F	35.31	3.29	1.64	38.60	77.19
R6_2F	35.31	0.15	0.07	35.45	70.91
R6_3F	35.31	0.10	0.05	35.41	70.81
R6_4F	35.31	0.06	0.03	35.37	70.74
R7_GF	35.31	7.25	3.62	42.56	85.11
R7_1F	35.31	7.25	3.62	42.56	85.11
R7_2F	35.31	0.30	0.15	35.60	71.21
R8_GF	35.31	7.03	3.51	42.33	84.66
R8_1F	35.31	7.03	3.51	42.33	84.67
R8_2F	35.31	0.53	0.27	35.84	71.68
R9_GF	35.31	5.92	2.96	41.23	82.46
R9_1F	35.31	5.92	2.96	41.23	82.46
R9_2F	35.31	0.32	0.16	35.62	71.25
R10_GF	35.31	3.35	1.68	38.66	77.32
R10_1F	35.31	3.35	1.68	38.66	77.32
R10_2F	35.31	0.18	0.09	35.49	70.98
R10_3F	35.31	0.13	0.06	35.43	70.86
R10_4F	35.31	0.07	0.03	35.38	70.75
R11_GF	35.31	3.11	1.56	38.42	76.84
R11_1F	35.31	3.11	1.55	38.42	76.83
R11_2F	35.31	0.13	0.07	35.44	70.87
R11_3F	35.31	0.10	0.05	35.40	70.81
R11_4F	35.31	0.06	0.03	35.37	70.74
R12_GF	35.31	2.16	1.08	37.47	74.93
R12_1F	35.31	2.15	1.08	37.46	74.92
R12_2F	35.31	0.10	0.05	35.41	70.81
R12_3F	35.31	0.07	0.04	35.38	70.76
R12_4F	35.31	0.05	0.03	35.36	70.72
R13_GF	35.31	2.66	1.33	37.96	75.93
R13_1F	35.31	2.63	1.31	37.93	75.86
R13_2F	35.31	0.08	0.04	35.39	70.77
R13_3F	35.31	0.02	0.01	35.33	70.66
R13_4F	35.31	0.01	0.00	35.31	70.63

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R14_GF	35.31	2.19	1.10	37.50	74.99
R14_1F	35.31	2.19	1.10	37.50	74.99
R14_2F	35.31	0.17	0.08	35.47	70.95
R14_3F	35.31	0.09	0.04	35.39	70.79
R14_4F	35.31	0.05	0.03	35.36	70.71
R15_GF	35.31	1.30	0.65	36.60	73.20
R15_1F	35.31	1.30	0.65	36.60	73.20
R16_GF	35.31	0.10	0.05	35.41	70.82
R16_1F	35.31	0.08	0.04	35.38	70.77
R16_2F	35.31	0.05	0.02	35.36	70.71
R16_3F	35.31	0.03	0.01	35.34	70.67
R16_4F	35.31	0.02	0.01	35.33	70.65
R16_5F	35.31	0.01	0.00	35.31	70.63
R16_6F	35.31	0.00	0.00	35.31	70.62
R17	35.31	1.66	0.83	36.97	73.94
R18	35.31	1.49	0.75	36.80	73.59
R19	35.31	1.62	0.81	36.92	73.85
R20	35.31	0.78	0.39	36.08	72.17

Table A.6: PM_{10} P84.52 (10 min) – 10 times per year

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R1_GF	35.31	0.54	0.27	35.84	71.68
R1_1F	35.31	0.54	0.27	35.84	71.68
R1_2F	35.31	0.04	0.02	35.34	70.69
R2_GF	35.31	0.35	0.17	35.65	71.31
R2_1F	35.31	0.35	0.17	35.65	71.31
R2_2F	35.31	0.02	0.01	35.33	70.66
R3_GF	35.31	0.29	0.14	35.59	71.18
R3_1F	35.31	0.29	0.14	35.59	71.18
R3_2F	35.31	0.01	0.01	35.32	70.64
R4_GF	35.31	0.24	0.12	35.55	71.10
R4_1F	35.31	0.24	0.12	35.55	71.10
R4_2F	35.31	0.01	0.01	35.32	70.64
R4_3F	35.31	0.01	0.00	35.31	70.62
R4_4F	35.31	0.00	0.00	35.31	70.62
R5_GF	35.31	0.17	0.09	35.48	70.95
R5_1F	35.31	0.17	0.09	35.48	70.95
R5_2F	35.31	0.01	0.00	35.32	70.63
R5_3F	35.31	0.01	0.00	35.31	70.62
R5_4F	35.31	0.00	0.00	35.31	70.62
R6_GF	35.31	0.16	0.08	35.47	70.94
R6_1F	35.31	0.16	0.08	35.47	70.94
R6_2F	35.31	0.01	0.00	35.31	70.63

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R6_3F	35.31	0.00	0.00	35.31	70.62
R6_4F	35.31	0.00	0.00	35.31	70.62
R7_GF	35.31	0.41	0.20	35.71	71.42
R7_1F	35.31	0.41	0.20	35.71	71.42
R7_2F	35.31	0.02	0.01	35.33	70.65
R8_GF	35.31	0.38	0.19	35.69	71.38
R8_1F	35.31	0.38	0.19	35.69	71.38
R8_2F	35.31	0.03	0.01	35.33	70.66
R9_GF	35.31	0.30	0.15	35.61	71.22
R9_1F	35.31	0.30	0.15	35.61	71.22
R9_2F	35.31	0.01	0.01	35.32	70.64
R10_GF	35.31	0.18	0.09	35.48	70.96
R10_1F	35.31	0.18	0.09	35.48	70.96
R10_2F	35.31	0.01	0.00	35.31	70.63
R10_3F	35.31	0.01	0.00	35.31	70.62
R10_4F	35.31	0.00	0.00	35.31	70.62
R11_GF	35.31	0.16	0.08	35.46	70.93
R11_1F	35.31	0.16	0.08	35.46	70.92
R11_2F	35.31	0.01	0.00	35.31	70.62
R11_3F	35.31	0.00	0.00	35.31	70.62
R11_4F	35.31	0.00	0.00	35.31	70.62
R12_GF	35.31	0.11	0.06	35.42	70.84
R12_1F	35.31	0.11	0.06	35.42	70.83
R12_2F	35.31	0.00	0.00	35.31	70.62
R12_3F	35.31	0.00	0.00	35.31	70.62
R12_4F	35.31	0.00	0.00	35.31	70.62
R13_GF	35.31	0.15	0.07	35.45	70.91
R13_1F	35.31	0.15	0.07	35.45	70.91
R13_2F	35.31	0.00	0.00	35.31	70.62
R13_3F	35.31	0.00	0.00	35.31	70.62
R13_4F	35.31	0.00	0.00	35.31	70.61
R14_GF	35.31	0.12	0.06	35.43	70.86
R14_1F	35.31	0.12	0.06	35.43	70.85
R14_2F	35.31	0.01	0.00	35.31	70.63
R14_3F	35.31	0.00	0.00	35.31	70.62
R14_4F	35.31	0.00	0.00	35.31	70.62
R15_GF	35.31	0.08	0.04	35.38	70.76
R15_1F	35.31	0.07	0.04	35.38	70.76
R16_GF	35.31	0.01	0.00	35.31	70.62
R16_1F	35.31	0.00	0.00	35.31	70.62
R16_2F	35.31	0.00	0.00	35.31	70.62
R16_3F	35.31	0.00	0.00	35.31	70.62
R16_4F	35.31	0.00	0.00	35.31	70.61
R16_5F	35.31	0.00	0.00	35.31	70.61
R16_6F	35.31	0.00	0.00	35.31	70.61

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R17	35.31	0.09	0.04	35.40	70.79
R18	35.31	0.09	0.04	35.39	70.79
R19	35.31	0.09	0.05	35.40	70.80
R20	35.31	0.04	0.02	35.35	70.70

Table A.7: $PM_{2.5}$ annual mean

Receptor ID	AC[(a)(b)] (µg/m³)	Max PC (µg/m³)	Max PC as % of AQS	Max PEC (µg/m³)	Max PEC as % of AQS
R1_GF	11.31	0.12	0.60	11.43	57.14
R1_1F	11.31	0.12	0.60	11.43	57.14
R1_2F	11.31	0.00	0.01	11.31	56.55
R2_GF	11.31	0.09	0.44	11.40	56.98
R2_1F	11.31	0.09	0.44	11.40	56.98
R2_2F	11.31	0.00	0.01	11.31	56.55
R3_GF	11.31	0.05	0.25	11.36	56.79
R3_1F	11.31	0.05	0.25	11.36	56.79
R3_2F	11.31	0.00	0.01	11.31	56.55
R4_GF	11.31	0.04	0.19	11.35	56.73
R4_1F	11.31	0.04	0.19	11.35	56.73
R4_2F	11.31	0.00	0.01	11.31	56.55
R4_3F	11.31	0.00	0.00	11.31	56.54
R4_4F	11.31	0.00	0.00	11.31	56.54
R5_GF	11.31	0.03	0.15	11.34	56.69
R5_1F	11.31	0.03	0.15	11.34	56.69
R5_2F	11.31	0.00	0.00	11.31	56.54
R5_3F	11.31	0.00	0.00	11.31	56.54
R5_4F	11.31	0.00	0.00	11.31	56.54
R6_GF	11.31	0.03	0.14	11.34	56.68
R6_1F	11.31	0.03	0.14	11.34	56.68
R6_2F	11.31	0.00	0.00	11.31	56.54
R6_3F	11.31	0.00	0.00	11.31	56.54
R6_4F	11.31	0.00	0.00	11.31	56.54
R7_GF	11.31	0.13	0.65	11.44	57.19
R7_1F	11.31	0.13	0.65	11.44	57.19
R7_2F	11.31	0.01	0.03	11.31	56.57
R8_GF	11.31	0.11	0.57	11.42	57.11
R8_1F	11.31	0.11	0.57	11.42	57.11
R8_2F	11.31	0.00	0.02	11.31	56.56
R9_GF	11.31	0.07	0.36	11.38	56.90
R9_1F	11.31	0.07	0.36	11.38	56.90
R9_2F	11.31	0.00	0.01	11.31	56.55
R10_GF	11.31	0.04	0.19	11.35	56.73
R10_1F	11.31	0.04	0.19	11.35	56.73
R10_2F	11.31	0.00	0.00	11.31	56.54

Receptor ID	AC[(a)(b)] (µg/m^3)	Max PC (µg/m^3)	Max PC as % of AQS	Max PEC (µg/m^3)	Max PEC as % of AQS
R10_3F	11.31	0.00	0.00	11.31	56.54
R10_4F	11.31	0.00	0.00	11.31	56.54
R11_GF	11.31	0.03	0.14	11.34	56.68
R11_1F	11.31	0.03	0.14	11.34	56.68
R11_2F	11.31	0.00	0.00	11.31	56.54
R11_3F	11.31	0.00	0.00	11.31	56.54
R11_4F	11.31	0.00	0.00	11.31	56.54
R12_GF	11.31	0.02	0.11	11.33	56.65
R12_1F	11.31	0.02	0.11	11.33	56.65
R12_2F	11.31	0.00	0.00	11.31	56.54
R12_3F	11.31	0.00	0.00	11.31	56.54
R12_4F	11.31	0.00	0.00	11.31	56.54
R13_GF	11.31	0.04	0.19	11.35	56.73
R13_1F	11.31	0.04	0.19	11.35	56.73
R13_2F	11.31	0.00	0.01	11.31	56.55
R13_3F	11.31	0.00	0.00	11.31	56.54
R13_4F	11.31	0.00	0.00	11.31	56.54
R14_GF	11.31	0.03	0.15	11.34	56.69
R14_1F	11.31	0.03	0.15	11.34	56.69
R14_2F	11.31	0.00	0.00	11.31	56.54
R14_3F	11.31	0.00	0.00	11.31	56.54
R14_4F	11.31	0.00	0.00	11.31	56.54
R15_GF	11.31	0.02	0.11	11.33	56.65
R15_1F	11.31	0.02	0.11	11.33	56.65
R16_GF	11.31	0.00	0.01	11.31	56.55
R16_1F	11.31	0.00	0.01	11.31	56.55
R16_2F	11.31	0.00	0.00	11.31	56.54
R16_3F	11.31	0.00	0.00	11.31	56.54
R16_4F	11.31	0.00	0.00	11.31	56.54
R16_5F	11.31	0.00	0.00	11.31	56.54
R16_6F	11.31	0.00	0.00	11.31	56.54
R17	11.31	0.02	0.10	11.33	56.64
R18	11.31	0.03	0.13	11.33	56.67
R19	11.31	0.03	0.13	11.33	56.67
R20	11.31	0.01	0.05	11.32	56.59

Appendix B: Modelling and Emissions

B.1 Generator

The generator emissions were based on a Mitsubishi S12HPTA

The emissions datasheet is appended in Appendix E.

B.2 Carpark

The consented development includes a basement level car park over two levels with parking provision for 250 vehicles. The basement carpark will be vented out of hit and miss brickwork located at the western end of block E2, shown in Figure 4.1. The Revised Framework Travel Plan, produced by Ardent Consulting Engineers to support planning application 2017/3847/P, states that the vast majority of vehicle movements will be associated with the proposed new superstore. The weekday am and pm peak hour traffic numbers are presented below in a reproduction of Table 4.4 of Ardent's report.

Replacement Foodstore	Weekday am peak hour			Weekday pm peak hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*
Vehicle Driver (67.5%)	110	51	161	162	189	351
Walk (22.8%)	37	17	54	55	64	119
Pedal Cycle (0.5%)	1	1	2	1	1	2
Public Transport* (9.2%)	15	7	22	22	26	48

*data does not define specific public transport types so 50/50 split of bus/underground is assumed

Table 4.4: Trips Associated with replacement foodstore - Weekday peak hour multi-modal trips

Figure B.1: Reproduction of Table 4.4 from the Revised Framework Travel Plan

Source Arrangement and Parameters

As stated above, the basement level carpark will be vented out of hit and miss brickwork in a wall. To represent this, an array of nine point sources have been modelled. Source parameters area presented below in Table B.1.

Table B.1: Carpark Modelled Source Parameters

Parameter	Generator Emission Point
Effective Stack Diameter (m)	0.50
Effective Stack Heights (m)	0.5, 4.0, 7.5
Stack area (m^2)	0.20
Stack Positions (m)	528394.61,184058.00

Parameter	Generator Emission Point
	528395.58,184056.84 528396.51,184055.71
Temperature of release (°C)	11
Emission Velocity at Stack Exit (m/s)	0.1[b]

a) above ground level
b) velocity reduced to model horizontal release

Emissions

Total carpark emissions have been estimated from data present form transport data provided by Ardent. In Appendix E of the Environmental Statement in support of plication 2017/3847/P, a table is presented showing TRICS -based traffic generation for a temporary supermarket, this is presented below. Though for a temporary food store, it is considered that the temporal pattern in traffic generation will be representative of the permanent supermarket once opened allowing the data to be used to create a time varying emissions file, shown in Table B.2 below.

Table B.2: Time Varying Emissions Factors for the Carpark Emissions

Hour	Factor
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0.004502
9	0.018571
10	0.078222
11	0.074845
12	0.089477
13	0.090039
14	0.111986
15	0.101857
16	0.07991
17	0.081035
18	0.088914
19	0.083849
20	0.046145
21	0.026449

Hour	Factor
22	0.014069
23	0.007316
24	0.002814

To estimate the AADT associated with the basement carpark, the hourly figures associated with the temporary supermarket were factored up by comparing the peak pm hour figures of the temporary supermarket (199) with the permanent supermarket (351), producing a factor of 1.76. Applied to all hours, this gave an AADT estimate of 3134.

The calculated transport movements were put through the latest version (v11.0) of the Emissions Factor Toolkit to calculate NO_x, PM_{10} and $PM_{2.5}$ emissions in g/km/s. The inputs into the EFT are summarised below in Table B.3. The outputted emissions are summarised in Table B.4.

Table B.3: EFT inputs

Road Type	London – Inner
AADT	3134
%HDV	0
Speed (kph)	10
No of Hours	24

Table B.4: EDT Output

Pollutant Name	Emission rate (g/km/s)
NOx	0.01188
PM_{10}	0.00071
$PM_{2.5}$	0.00120

For input into ADMS-5, the emissions rates were converted from g/km/s to g/s. From site plans, it was calculated that a vehicle would travel 0.5 km if it followed the one-way system over both storeys of the basement carpark. Therefore, conservatively, all emissions were multiplied by 0.5 to produce g/s emission rates.

As described in section above, the hit and miss brickwork has been represented in the model as an array of nine point sources. Therefore, each emission rate was divided by 9 before being inputted for each carpark source in the model.

The resultant emission rates applied to each of the carpark sources within the array are presented below in Table B.5.

Table B.5: Modelled Emission Rates

Pollutant Name	Emission rate (g/s)
NO_x	0.000894459
PM_{10}	4.30285E-05
$PM_{2.5}$	7.03857E-05

Post-processing

Emissions of NO_x will comprise contributions from both NO and NO_2. This assessment uses the latest NO_x to NO_2 conversion factor toolkit (Version 8.1 released August 2020), provided by Defra as a Microsoft Excel based calculation tool which is available from Defra's website[9]. This method is considered the most appropriate technique of determining NO_2 concentrations from road NO_x contributions.

B.3 Post processing (percentiles)

Due to the nature of the operational profile of the generator, the annual mean concentrations outputted by the model are not representative of the real-world impact on nearby receptors. The below details how the annual mean and other presented percentiles were calculated.

NO_2 – Annual Mean

As detailed in section 4.6, the 88.49th percentile of model results pertaining to the generator represents the median of the hour for which the generator has been modelled. Therefore, it is considered representative to use this value as the basis for the annual mean concentration calculations. The NO_2 annual mean was calculated with the following equation, taking into account the carpark emissions and generator emissions for both the 4 hour and 10 minute tests.

(GenP88.49 NO_2*(8/8760)) + (GenP88.49 NO_2*3.3*(10/8760)) + Carpark NO_2 AM

NO_2 - 88.49th Percentile

The following calculation were used to calculated the 88.49th percentiles for the 4 hour abated emissions and 10 minutes unabated emissions.

Abated: GenP88.49 NO_2 + Carpark NO_2 AM

Unabated: (GenP88.49 NO_2*3.3) + Carpark NO_2 AM

PM_{10} – Annual Mean

The PM_{10} annual mean as called in the same way as the NO_2 annual mean. An explanation of this method is provided above.

(GenP88.49 PM_{10}*(8/8760)) + (GenP88.49 PM_{10}*3.3*(10/8760)) + Carpark PM_{10} AM

[9] Department for Environment Food and Rural Affairs. NO_x to NO_2 Calculator, available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/

PM_{10} - 84.52nd percentile

As detailed in section 4.6, the 84.52nd percentile of PM_{10} 24 hour means represents the median of days where the generator is modelled as operational. In each modelled weekday, the generator operated for 8 hours, therefore modelled outputs are not representative of the 4 hour and 10 minute tests and results have been factored to reflect this. The below calculations have been used in data processing.

4 Hour test: (GenP84.52 PM_{10}/2) + Carpark PM_{10} AM

10 Minute test: (GenP84.52 PM_{10}*(1/48)) + Carpark PM_{10} AM

$PM_{2.5}$ – Annual Mean

For comparison against the $PM_{2.5}$ AQO, process contributions of PM_{10} and $PM_{2.5}$ have been assumed identical, i.e., all particulate matter is $PM_{2.5}$. Therefore, the process contribution calculation for the $PM_{2.5}$ annual mean is the same as that for PM_{10} annual mean outlined above.

Appendix C: Sensitivity Testing

NO2			Max PEC (µg/m3)			+/- original		
Receptor ID	Averaging Period	Original (Heathr	Gatwick	Gravesend	London City	Gatwick	Gravesend	London Cit
R1_GF	Annual Mean	27.53	27.41	27.61	27.52	-0.11	0.09	0.00
R1_1F	Annual Mean	27.54	27.41	27.63	27.52	-0.13	0.08	-0.02
R1_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R2_GF	Annual Mean	27.00	26.82	27.12	27.00	-0.19	0.11	-0.01
R2_1F	Annual Mean	27.01	26.82	27.13	27.01	-0.20	0.11	-0.01
R2_2F	Annual Mean	25.55	25.55	25.55	25.55	0.00	0.00	0.00
R3_GF	Annual Mean	25.98	26.00	26.01	25.89	0.02	0.03	-0.09
R3_1F	Annual Mean	25.98	26.00	26.03	25.90	0.02	0.05	-0.08
R3_2F	Annual Mean	25.54	25.55	25.55	25.55	0.01	0.01	0.01
R4_GF	Annual Mean	25.85	25.90	25.93	25.79	0.05	0.08	-0.06
R4_1F	Annual Mean	25.85	25.90	25.92	25.78	0.06	0.08	-0.06
R4_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R4_3F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R4_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R5_GF	Annual Mean	25.77	25.86	25.86	25.74	0.09	0.09	-0.03
R5_1F	Annual Mean	25.77	25.85	25.86	25.74	0.09	0.09	-0.03
R5_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R5_3F	Annual Mean	25.53	25.54	25.54	25.53	0.01	0.01	0.00
R5_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R6_GF	Annual Mean	25.73	25.83	25.82	25.69	0.10	0.09	-0.04
R6_1F	Annual Mean	25.72	25.82	25.81	25.69	0.10	0.09	-0.04
R6_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R6_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R6_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R7_GF	Annual Mean	27.40	27.35	27.55	27.26	-0.06	0.15	-0.14
R7_1F	Annual Mean	27.42	27.35	27.57	27.26	-0.06	0.15	-0.15
R7_2F	Annual Mean	25.58	25.59	25.60	25.55	0.01	0.02	-0.03
R8_GF	Annual Mean	27.23	27.05	27.33	27.12	-0.18	0.10	-0.11
R8_1F	Annual Mean	27.23	27.05	27.33	27.12	-0.18	0.10	-0.11
R8_2F	Annual Mean	25.55	25.57	25.57	25.55	0.02	0.02	0.00
R9_GF	Annual Mean	26.16	26.10	26.68	26.61	-0.06	0.52	0.46
R9_1F	Annual Mean	26.15	26.11	26.68	26.61	-0.04	0.53	0.46
R9_2F	Annual Mean	25.54	25.55	25.55	25.54	0.01	0.01	0.00
R10_GF	Annual Mean	25.78	25.90	25.85	25.72	0.13	0.07	-0.06
R10_1F	Annual Mean	25.77	25.90	25.84	25.71	0.13	0.07	-0.06
R10_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R10_3F	Annual Mean	25.53	25.54	25.54	25.53	0.01	0.01	0.00
R10_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R11_GF	Annual Mean	25.70	25.82	25.75	25.66	0.11	0.04	-0.04
R11_1F	Annual Mean	25.70	25.81	25.74	25.66	0.11	0.04	-0.04
R11_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R11_3F	Annual Mean	25.53	25.54	25.53	25.53	0.01	0.00	0.00
R11_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R12_GF	Annual Mean	25.67	25.74	25.69	25.63	0.07	0.02	-0.04
R12_1F	Annual Mean	25.67	25.74	25.68	25.63	0.07	0.01	-0.04
R12_2F	Annual Mean	25.53	25.54	25.54	25.54	0.01	0.01	0.01
R12_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R12_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R13_GF	Annual Mean	25.75	25.80	25.82	25.72	0.05	0.07	-0.03
R13_1F	Annual Mean	25.75	25.80	25.81	25.72	0.05	0.06	-0.03
R13_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R13_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R13_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R14_GF	Annual Mean	25.75	25.79	25.77	25.66	0.04	0.02	-0.09
R14_1F	Annual Mean	25.74	25.78	25.76	25.66	0.04	0.02	-0.08
R14_2F	Annual Mean	25.54	25.54	25.54	25.53	0.00	0.00	-0.01
R14_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R14_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R15_GF	Annual Mean	25.68	25.73	25.70	25.63	0.05	0.02	-0.05
R15_1F	Annual Mean	25.67	25.72	25.69	25.63	0.05	0.02	-0.04
R16_GF	Annual Mean	25.54	25.55	25.54	25.54	0.01	0.00	0.00
R16_1F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R16_2F	Annual Mean	25.54	25.54	25.54	25.53	0.00	0.00	-0.01
R16_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_5F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_6F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R17	Annual Mean	25.70	25.67	25.64	25.65	-0.03	-0.06	-0.05
R18	Annual Mean	25.75	25.70	25.68	25.68	-0.05	-0.07	-0.07
R19	Annual Mean	25.75	25.70	25.69	25.69	-0.05	-0.05	-0.05
R20	Annual Mean	25.60	25.59	25.60	25.59	-0.01	0.00	-0.01

Abated NO2

Receptor ID	Averaging Period	Max PEC (µg/m	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	88.49 %'ile of hourly	192.45	172.82	200.78	209.10	-19.63	8.33	16.65
R1_1F	88.49 %'ile of hourly	193.01	172.82	200.94	209.10	-20.20	7.93	16.09
R1_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R2_GF	88.49 %'ile of hourly	155.99	130.76	168.02	164.77	-25.23	12.03	8.77
R2_1F	88.49 %'ile of hourly	155.99	130.76	168.02	164.77	-25.23	12.03	8.77
R2_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R3_GF	88.49 %'ile of hourly	58.34	59.32	63.02	58.26	0.99	4.68	-0.07
R3_1F	88.49 %'ile of hourly	58.44	59.36	63.77	58.34	0.92	5.34	-0.10
R3_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R4_GF	88.49 %'ile of hourly	58.25	59.84	62.51	58.11	1.59	4.26	-0.14
R4_1F	88.49 %'ile of hourly	57.95	59.76	61.73	57.66	1.81	3.78	-0.29
R4_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R4_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R4_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R5_GF	88.49 %'ile of hourly	56.21	59.07	59.80	56.17	2.86	3.59	-0.04
R5_1F	88.49 %'ile of hourly	55.71	58.57	59.10	55.82	2.86	3.39	0.11
R5_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R5_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R5_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R6_GF	88.49 %'ile of hourly	54.92	57.87	57.92	55.33	2.95	2.99	0.40
R6_1F	88.49 %'ile of hourly	54.44	57.29	57.39	54.96	2.85	2.96	0.52
R6_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R6_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R6_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R7_GF	88.49 %'ile of hourly	166.36	147.61	178.13	172.52	-18.75	11.77	6.16
R7_1F	88.49 %'ile of hourly	167.88	149.53	178.82	172.93	-18.35	10.95	5.05
R7_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R8_GF	88.49 %'ile of hourly	160.98	133.15	169.52	166.41	-27.83	8.54	5.43
R8_1F	88.49 %'ile of hourly	160.98	133.15	169.52	166.41	-27.83	8.54	5.43
R8_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R9_GF	88.49 %'ile of hourly	78.32	62.11	127.44	135.52	-16.21	49.12	57.20
R9_1F	88.49 %'ile of hourly	77.33	62.13	127.44	135.52	-15.21	50.11	58.19
R9_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R10_GF	88.49 %'ile of hourly	52.76	56.59	56.07	53.24	3.83	3.31	0.48
R10_1F	88.49 %'ile of hourly	52.08	56.26	55.35	52.33	4.18	3.27	0.25
R10_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R10_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R10_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R11_GF	88.49 %'ile of hourly	51.22	52.41	52.80	51.19	1.19	1.58	-0.03
R11_1F	88.49 %'ile of hourly	51.15	51.87	52.22	51.14	0.72	1.06	-0.02
R11_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R11_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R11_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R12_GF	88.49 %'ile of hourly	51.07	51.08	51.19	51.07	0.02	0.12	0.00
R12_1F	88.49 %'ile of hourly	51.07	51.08	51.17	51.07	0.01	0.11	0.00
R12_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R12_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R12_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R15_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R15_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_5F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_6F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R17	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R18	88.49 %'ile of hourly	51.08	51.29	51.07	51.07	0.21	-0.01	-0.01
R19	88.49 %'ile of hourly	51.43	51.60	51.11	51.12	0.17	-0.32	-0.31
R20	88.49 %'ile of hourly	51.16	51.19	51.08	51.07	0.03	-0.08	-0.09

Unabated NO2

Receptor ID	Averaging Period	Max PEC (µg/m	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	88.49 %'ile of hourly	522.54	457.23	550.30	577.83	-65.31	27.75	55.29
R1_1F	88.49 %'ile of hourly	524.42	457.23	550.84	577.83	-67.19	26.41	53.41
R1_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R2_GF	88.49 %'ile of hourly	400.97	316.99	441.02	430.09	-83.98	40.05	29.13
R2_1F	88.49 %'ile of hourly	400.98	316.99	441.03	430.10	-83.99	40.05	29.13
R2_2F	88.49 %'ile of hourly	51.09	51.09	51.09	51.09	0.00	0.00	0.00
R3_GF	88.49 %'ile of hourly	75.66	78.95	91.24	75.33	3.29	15.58	-0.34
R3_1F	88.49 %'ile of hourly	76.00	79.07	93.76	75.60	3.08	17.77	-0.40
R3_2F	88.49 %'ile of hourly	51.08	51.09	51.09	51.09	0.01	0.01	0.01
R4_GF	88.49 %'ile of hourly	75.24	80.57	89.46	74.71	5.33	14.23	-0.53
R4_1F	88.49 %'ile of hourly	74.24	80.30	86.86	73.23	6.06	12.62	-1.01
R4_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R4_3F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R4_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R5_GF	88.49 %'ile of hourly	68.39	77.96	80.39	68.22	9.57	12.00	-0.16
R5_1F	88.49 %'ile of hourly	66.73	76.31	78.07	67.06	9.57	11.34	0.32
R5_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R5_3F	88.49 %'ile of hourly	51.07	51.08	51.08	51.07	0.01	0.01	0.00
R5_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R6_GF	88.49 %'ile of hourly	64.07	73.96	74.10	65.37	9.89	10.03	1.31
R6_1F	88.49 %'ile of hourly	62.45	72.02	72.36	64.16	9.56	9.91	1.70
R6_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R6_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R6_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R7_GF	88.49 %'ile of hourly	435.79	373.47	475.02	456.10	-62.32	39.23	20.31
R7_1F	88.49 %'ile of hourly	440.85	379.84	477.34	457.46	-61.01	36.50	16.61
R7_2F	88.49 %'ile of hourly	51.12	51.13	51.14	51.09	0.01	0.02	-0.03
R8_GF	88.49 %'ile of hourly	417.76	325.16	446.22	435.68	-92.59	28.47	17.92
R8_1F	88.49 %'ile of hourly	417.76	325.16	446.22	435.68	-92.59	28.47	17.92
R8_2F	88.49 %'ile of hourly	51.09	51.11	51.11	51.09	0.02	0.02	0.00
R9_GF	88.49 %'ile of hourly	142.21	88.32	305.83	332.60	-53.89	163.62	190.40
R9_1F	88.49 %'ile of hourly	138.91	88.37	305.83	332.60	-50.54	166.92	193.70
R9_2F	88.49 %'ile of hourly	51.08	51.09	51.09	51.08	0.01	0.01	0.00
R10_GF	88.49 %'ile of hourly	56.94	69.79	68.02	58.48	12.86	11.08	1.55
R10_1F	88.49 %'ile of hourly	54.67	68.69	65.59	55.44	14.02	10.93	0.77
R10_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R10_3F	88.49 %'ile of hourly	51.07	51.08	51.08	51.07	0.01	0.01	0.00
R10_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R11_GF	88.49 %'ile of hourly	51.76	55.82	57.05	51.62	4.07	5.29	-0.14
R11_1F	88.49 %'ile of hourly	51.53	54.02	55.10	51.44	2.49	3.57	-0.10
R11_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R11_3F	88.49 %'ile of hourly	51.07	51.08	51.07	51.07	0.01	0.00	0.00
R11_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R12_GF	88.49 %'ile of hourly	51.21	51.34	51.64	51.17	0.13	0.44	-0.04
R12_1F	88.49 %'ile of hourly	51.21	51.32	51.57	51.17	0.12	0.36	-0.04
R12_2F	88.49 %'ile of hourly	51.07	51.08	51.08	51.08	0.01	0.01	0.01
R12_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R12_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_GF	88.49 %'ile of hourly	51.29	51.34	51.36	51.26	0.05	0.07	-0.03
R13_1F	88.49 %'ile of hourly	51.29	51.34	51.35	51.26	0.05	0.06	-0.03
R13_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R13_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_GF	88.49 %'ile of hourly	51.29	51.33	51.31	51.20	0.04	0.02	-0.09
R14_1F	88.49 %'ile of hourly	51.28	51.32	51.30	51.20	0.04	0.02	-0.08
R14_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.07	0.00	0.00	-0.01
R14_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R15_GF	88.49 %'ile of hourly	51.22	51.27	51.24	51.17	0.05	0.02	-0.05
R15_1F	88.49 %'ile of hourly	51.21	51.26	51.23	51.17	0.05	0.02	-0.04
R16_GF	88.49 %'ile of hourly	51.08	51.09	51.08	51.08	0.01	0.00	0.00
R16_1F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R16_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.07	0.00	0.00	-0.01
R16_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_5F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_6F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R17	88.49 %'ile of hourly	51.24	51.21	51.18	51.19	-0.03	-0.06	-0.05
R18	88.49 %'ile of hourly	51.32	51.97	51.22	51.22	0.65	-0.11	-0.11
R19	88.49 %'ile of hourly	52.49	53.00	51.37	51.42	0.51	-1.12	-1.08
R20	88.49 %'ile of hourly	51.45	51.53	51.17	51.14	0.08	-0.28	-0.32

PM10 Annual Mean

Receptor ID	Averaging Period	Max PEC (µg/m3)	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	Annual Mean	17.76	17.77	17.77	17.75	0.00	0.00	-0.02
R1_1F	Annual Mean	17.76	17.77	17.77	17.75	0.00	0.00	-0.02
R1_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R2_GF	Annual Mean	17.73	17.73	17.74	17.72	0.00	0.00	-0.01
R2_1F	Annual Mean	17.73	17.74	17.74	17.73	0.00	0.00	-0.01
R2_2F	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00
R3_GF	Annual Mean	17.70	17.70	17.70	17.69	0.00	0.00	-0.01
R3_1F	Annual Mean	17.70	17.70	17.70	17.69	0.00	0.00	-0.01
R3_2F	Annual Mean	17.65	17.66	17.66	17.66	0.00	0.00	0.00
R4_GF	Annual Mean	17.69	17.69	17.69	17.68	0.00	0.01	-0.01
R4_1F	Annual Mean	17.69	17.69	17.69	17.68	0.00	0.01	-0.01
R4_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R4_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R4_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_GF	Annual Mean	17.68	17.69	17.69	17.67	0.01	0.01	0.00
R5_1F	Annual Mean	17.68	17.69	17.69	17.67	0.01	0.01	0.00
R5_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_GF	Annual Mean	17.67	17.68	17.68	17.67	0.01	0.01	0.00
R6_1F	Annual Mean	17.67	17.68	17.68	17.67	0.01	0.01	0.00
R6_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R7_GF	Annual Mean	17.77	17.78	17.78	17.75	0.01	0.01	-0.02
R7_1F	Annual Mean	17.77	17.78	17.78	17.75	0.01	0.01	-0.02
R7_2F	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00
R8_GF	Annual Mean	17.76	17.76	17.76	17.74	0.00	0.00	-0.02
R8_1F	Annual Mean	17.76	17.76	17.76	17.74	0.00	0.00	-0.02
R8_2F	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00
R9_GF	Annual Mean	17.70	17.71	17.72	17.70	0.01	0.02	0.00
R9_1F	Annual Mean	17.70	17.71	17.72	17.71	0.01	0.02	0.00
R9_2F	Annual Mean	17.65	17.66	17.66	17.65	0.00	0.00	0.00
R10_GF	Annual Mean	17.68	17.69	17.69	17.67	0.01	0.01	-0.01
R10_1F	Annual Mean	17.68	17.69	17.69	17.67	0.01	0.01	-0.01
R10_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R10_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R10_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_GF	Annual Mean	17.67	17.69	17.68	17.67	0.01	0.00	-0.01
R11_1F	Annual Mean	17.67	17.69	17.68	17.67	0.01	0.00	-0.01
R11_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_GF	Annual Mean	17.67	17.68	17.67	17.67	0.01	0.00	0.00
R12_1F	Annual Mean	17.67	17.68	17.67	17.67	0.01	0.00	0.00
R12_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R13_GF	Annual Mean	17.68	17.69	17.69	17.68	0.01	0.01	0.00
R13_1F	Annual Mean	17.68	17.69	17.69	17.68	0.01	0.01	0.00
R13_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R13_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R13_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R14_GF	Annual Mean	17.68	17.68	17.68	17.67	0.01	0.00	-0.01
R14_1F	Annual Mean	17.68	17.68	17.68	17.67	0.00	0.00	-0.01
R14_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R14_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R14_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R15_GF	Annual Mean	17.67	17.68	17.67	17.67	0.01	0.00	-0.01
R15_1F	Annual Mean	17.67	17.68	17.67	17.66	0.01	0.00	-0.01
R16_GF	Annual Mean	17.65	17.66	17.65	17.65	0.00	0.00	0.00
R16_1F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_5F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_6F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R17	Annual Mean	17.67	17.67	17.67	17.67	0.00	-0.01	-0.01
R18	Annual Mean	17.68	17.67	17.67	17.67	-0.01	-0.01	-0.01
R19	Annual Mean	17.68	17.67	17.67	17.67	-0.01	-0.01	-0.01
R20	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00

PM10 Short term (4hr)

Receptor ID	Averaging Period	Max PEC (µg/m3)	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	84.52 %'ile of 24 ho	45.99	46.41	46.19	45.54	0.42	0.20	-0.45
R1_1F	84.52 %'ile of 24 ho	45.99	46.36	46.18	45.40	0.37	0.19	-0.59
R1_2F	84.52 %'ile of 24 ho	36.19	36.33	36.43	35.63	0.14	0.24	-0.57
R2_GF	84.52 %'ile of 24 ho	41.46	41.37	42.08	41.54	-0.09	0.62	0.08
R2_1F	84.52 %'ile of 24 ho	41.46	41.37	42.08	41.54	-0.09	0.62	0.08
R2_2F	84.52 %'ile of 24 ho	35.78	36.32	35.99	35.69	0.54	0.21	-0.09
R3_GF	84.52 %'ile of 24 ho	40.50	39.80	40.90	40.86	-0.71	0.40	0.36
R3_1F	84.52 %'ile of 24 ho	40.50	39.80	40.90	40.86	-0.71	0.40	0.36
R3_2F	84.52 %'ile of 24 ho	35.54	35.81	35.65	35.51	0.26	0.11	-0.03
R4_GF	84.52 %'ile of 24 ho	40.25	39.38	40.48	40.66	-0.87	0.23	0.41
R4_1F	84.52 %'ile of 24 ho	40.25	39.37	40.48	40.66	-0.88	0.23	0.41
R4_2F	84.52 %'ile of 24 ho	35.57	35.63	35.58	35.49	0.05	0.00	-0.09
R4_3F	84.52 %'ile of 24 ho	35.41	35.49	35.44	35.39	0.09	0.03	-0.02
R4_4F	84.52 %'ile of 24 ho	35.36	35.41	35.38	35.34	0.06	0.02	-0.01
R5_GF	84.52 %'ile of 24 ho	37.83	38.57	39.33	38.78	0.74	1.50	0.95
R5_1F	84.52 %'ile of 24 ho	37.62	38.47	39.33	38.77	0.84	1.70	1.15
R5_2F	84.52 %'ile of 24 ho	35.53	35.54	35.51	35.45	0.02	-0.02	-0.07
R5_3F	84.52 %'ile of 24 ho	35.42	35.46	35.43	35.39	0.04	0.01	-0.03
R5_4F	84.52 %'ile of 24 ho	35.36	35.40	35.38	35.35	0.04	0.02	-0.01
R6_GF	84.52 %'ile of 24 ho	37.53	38.46	39.26	38.73	0.93	1.73	1.20
R6_1F	84.52 %'ile of 24 ho	37.53	38.46	39.26	38.73	0.93	1.72	1.19
R6_2F	84.52 %'ile of 24 ho	35.45	35.48	35.45	35.40	0.03	-0.01	-0.05
R6_3F	84.52 %'ile of 24 ho	35.41	35.43	35.41	35.37	0.03	0.00	-0.03
R6_4F	84.52 %'ile of 24 ho	35.37	35.39	35.38	35.35	0.02	0.01	-0.02
R7_GF	84.52 %'ile of 24 ho	42.34	42.17	43.05	41.99	-0.16	0.71	-0.35
R7_1F	84.52 %'ile of 24 ho	42.34	42.17	43.05	42.07	-0.17	0.71	-0.27
R7_2F	84.52 %'ile of 24 ho	35.48	35.62	35.59	35.38	0.14	0.11	-0.10
R8_GF	84.52 %'ile of 24 ho	42.08	41.74	42.66	41.57	-0.34	0.59	-0.51
R8_1F	84.52 %'ile of 24 ho	42.08	41.74	42.66	41.57	-0.34	0.59	-0.51
R8_2F	84.52 %'ile of 24 ho	35.70	36.16	35.92	35.61	0.46	0.22	-0.09
R9_GF	84.52 %'ile of 24 ho	40.75	40.43	41.55	41.38	-0.33	0.79	0.62
R9_1F	84.52 %'ile of 24 ho	40.75	40.42	41.55	41.38	-0.33	0.79	0.62
R9_2F	84.52 %'ile of 24 ho	35.54	35.79	35.69	35.51	0.25	0.15	-0.03
R10_GF	84.52 %'ile of 24 ho	37.80	38.63	39.32	38.74	0.83	1.52	0.95
R10_1F	84.52 %'ile of 24 ho	37.79	38.63	39.32	38.74	0.84	1.53	0.95
R10_2F	84.52 %'ile of 24 ho	35.46	35.60	35.54	35.43	0.14	0.09	-0.03
R10_3F	84.52 %'ile of 24 ho	35.40	35.52	35.46	35.39	0.12	0.06	-0.01
R10_4F	84.52 %'ile of 24 ho	35.36	35.44	35.40	35.35	0.08	0.04	-0.01
R11_GF	84.52 %'ile of 24 ho	37.49	38.39	39.17	38.56	0.90	1.68	1.07
R11_1F	84.52 %'ile of 24 ho	37.49	38.39	39.17	38.56	0.90	1.68	1.07
R11_2F	84.52 %'ile of 24 ho	35.41	35.52	35.47	35.39	0.11	0.06	-0.01
R11_3F	84.52 %'ile of 24 ho	35.38	35.46	35.42	35.37	0.09	0.05	-0.01
R11_4F	84.52 %'ile of 24 ho	35.35	35.42	35.38	35.35	0.06	0.03	-0.01
R12_GF	84.52 %'ile of 24 ho	36.82	37.51	37.79	36.92	0.69	0.97	0.10
R12_1F	84.52 %'ile of 24 ho	36.82	37.50	37.78	36.92	0.69	0.97	0.10
R12_2F	84.52 %'ile of 24 ho	35.39	35.48	35.43	35.38	0.09	0.04	-0.01
R12_3F	84.52 %'ile of 24 ho	35.37	35.43	35.40	35.36	0.07	0.03	-0.01
R12_4F	84.52 %'ile of 24 ho	35.35	35.40	35.37	35.34	0.05	0.02	0.00
R13_GF	84.52 %'ile of 24 ho	37.00	37.04	37.45	37.50	0.04	0.45	0.50
R13_1F	84.52 %'ile of 24 ho	36.98	37.04	37.43	37.50	0.06	0.45	0.52
R13_2F	84.52 %'ile of 24 ho	35.35	35.37	35.36	35.34	0.02	0.01	0.00
R13_3F	84.52 %'ile of 24 ho	35.32	35.33	35.32	35.32	0.01	0.01	0.00
R13_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R14_GF	84.52 %'ile of 24 ho	36.91	36.51	36.30	35.98	-0.39	-0.61	-0.92
R14_1F	84.52 %'ile of 24 ho	36.90	36.51	36.27	35.98	-0.39	-0.63	-0.91
R14_2F	84.52 %'ile of 24 ho	35.44	35.50	35.50	35.39	0.05	0.05	-0.05
R14_3F	84.52 %'ile of 24 ho	35.37	35.41	35.40	35.34	0.04	0.03	-0.03
R14_4F	84.52 %'ile of 24 ho	35.34	35.36	35.36	35.32	0.02	0.02	-0.02
R15_GF	84.52 %'ile of 24 ho	36.05	35.79	35.72	35.53	-0.26	-0.33	-0.52
R15_1F	84.52 %'ile of 24 ho	36.05	35.76	35.72	35.51	-0.29	-0.33	-0.54
R16_GF	84.52 %'ile of 24 ho	35.35	35.33	35.34	35.34	-0.02	-0.01	-0.01
R16_1F	84.52 %'ile of 24 ho	35.34	35.33	35.34	35.33	-0.02	0.00	-0.01
R16_2F	84.52 %'ile of 24 ho	35.33	35.32	35.33	35.32	-0.01	0.00	-0.01
R16_3F	84.52 %'ile of 24 ho	35.32	35.31	35.32	35.31	-0.01	0.00	0.00
R16_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_5F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_6F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R17	84.52 %'ile of 24 ho	36.97	37.08	36.17	36.37	0.11	-0.80	-0.60
R18	84.52 %'ile of 24 ho	36.80	36.34	36.37	36.36	-0.46	-0.43	-0.44
R19	84.52 %'ile of 24 ho	36.92	36.03	36.55	36.24	-0.90	-0.38	-0.69
R20	84.52 %'ile of 24 ho	36.08	35.85	35.91	35.72	-0.24	-0.18	-0.37

PM10 Short term (10 min)

Receptor ID	Averaging Period	Max PEC (µg/m	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	84.52 %'ile of 24 ho	35.83	35.86	35.84	35.80	0.03	0.01	-0.04
R1_1F	84.52 %'ile of 24 ho	35.83	35.86	35.84	35.79	0.03	0.01	-0.04
R1_2F	84.52 %'ile of 24 ho	35.34	35.35	35.35	35.32	0.01	0.01	-0.02
R2_GF	84.52 %'ile of 24 ho	35.62	35.63	35.65	35.62	0.00	0.03	-0.01
R2_1F	84.52 %'ile of 24 ho	35.62	35.63	35.65	35.62	0.00	0.03	-0.01
R2_2F	84.52 %'ile of 24 ho	35.33	35.35	35.34	35.32	0.02	0.01	0.00
R3_GF	84.52 %'ile of 24 ho	35.57	35.54	35.58	35.57	-0.03	0.02	0.01
R3_1F	84.52 %'ile of 24 ho	35.57	35.54	35.58	35.57	-0.03	0.02	0.01
R3_2F	84.52 %'ile of 24 ho	35.32	35.33	35.32	35.32	0.01	0.00	0.00
R4_GF	84.52 %'ile of 24 ho	35.54	35.51	35.56	35.55	-0.03	0.01	0.01
R4_1F	84.52 %'ile of 24 ho	35.54	35.51	35.56	35.55	-0.03	0.01	0.01
R4_2F	84.52 %'ile of 24 ho	35.32	35.32	35.32	35.32	0.00	0.00	0.00
R4_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R4_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R5_GF	84.52 %'ile of 24 ho	35.43	35.47	35.50	35.47	0.04	0.07	0.04
R5_1F	84.52 %'ile of 24 ho	35.43	35.47	35.50	35.47	0.04	0.08	0.04
R5_2F	84.52 %'ile of 24 ho	35.32	35.32	35.32	35.31	0.00	0.00	0.00
R5_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R5_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_GF	84.52 %'ile of 24 ho	35.42	35.47	35.50	35.46	0.05	0.08	0.05
R6_1F	84.52 %'ile of 24 ho	35.42	35.47	35.50	35.46	0.05	0.08	0.05
R6_2F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R7_GF	84.52 %'ile of 24 ho	35.69	35.71	35.73	35.66	0.01	0.03	-0.04
R7_1F	84.52 %'ile of 24 ho	35.70	35.70	35.73	35.66	0.01	0.03	-0.03
R7_2F	84.52 %'ile of 24 ho	35.32	35.33	35.33	35.31	0.01	0.01	-0.01
R8_GF	84.52 %'ile of 24 ho	35.67	35.67	35.70	35.63	0.00	0.03	-0.04
R8_1F	84.52 %'ile of 24 ho	35.67	35.67	35.70	35.63	0.00	0.03	-0.04
R8_2F	84.52 %'ile of 24 ho	35.33	35.35	35.34	35.32	0.02	0.01	0.00
R9_GF	84.52 %'ile of 24 ho	35.58	35.58	35.62	35.60	0.00	0.04	0.02
R9_1F	84.52 %'ile of 24 ho	35.58	35.58	35.62	35.60	0.00	0.04	0.02
R9_2F	84.52 %'ile of 24 ho	35.32	35.33	35.32	35.32	0.01	0.01	0.00
R10_GF	84.52 %'ile of 24 ho	35.44	35.48	35.51	35.47	0.05	0.07	0.03
R10_1F	84.52 %'ile of 24 ho	35.44	35.48	35.51	35.47	0.05	0.07	0.03
R10_2F	84.52 %'ile of 24 ho	35.31	35.32	35.32	35.31	0.01	0.00	0.00
R10_3F	84.52 %'ile of 24 ho	35.31	35.32	35.31	35.31	0.01	0.00	0.00
R10_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R11_GF	84.52 %'ile of 24 ho	35.42	35.47	35.49	35.46	0.05	0.07	0.04
R11_1F	84.52 %'ile of 24 ho	35.42	35.47	35.49	35.46	0.05	0.07	0.04
R11_2F	84.52 %'ile of 24 ho	35.31	35.32	35.31	35.31	0.01	0.00	0.00
R11_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R11_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_GF	84.52 %'ile of 24 ho	35.39	35.42	35.43	35.39	0.04	0.04	0.00
R12_1F	84.52 %'ile of 24 ho	35.39	35.42	35.43	35.39	0.04	0.04	0.00
R12_2F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R13_GF	84.52 %'ile of 24 ho	35.40	35.41	35.43	35.42	0.01	0.03	0.02
R13_1F	84.52 %'ile of 24 ho	35.40	35.41	35.43	35.42	0.01	0.03	0.02
R13_2F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R13_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R13_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R14_GF	84.52 %'ile of 24 ho	35.40	35.39	35.38	35.35	-0.01	-0.02	-0.05
R14_1F	84.52 %'ile of 24 ho	35.40	35.39	35.37	35.35	-0.01	-0.02	-0.05
R14_2F	84.52 %'ile of 24 ho	35.31	35.32	35.32	35.31	0.00	0.00	0.00
R14_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R14_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R15_GF	84.52 %'ile of 24 ho	35.36	35.35	35.34	35.33	-0.01	-0.01	-0.03
R15_1F	84.52 %'ile of 24 ho	35.35	35.35	35.34	35.33	-0.01	-0.01	-0.03
R16_GF	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_1F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_2F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_3F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_4F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_5F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_6F	84.52 %'ile of 24 ho	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R17	84.52 %'ile of 24 ho	35.40	35.40	35.36	35.36	0.00	-0.04	-0.03
R18	84.52 %'ile of 24 ho	35.39	35.37	35.37	35.37	-0.02	-0.03	-0.03
R19	84.52 %'ile of 24 ho	35.40	35.36	35.38	35.36	-0.04	-0.02	-0.03
R20	84.52 %'ile of 24 ho	35.35	35.34	35.34	35.33	-0.01	-0.01	-0.02

PM2.5 Annual Mean

Receptor ID	Averaging Period	Max PEC (µg/m3)	Max PEC (	Max PEC (µg	Max PEC (µg/m3)			
R1_GF	Annual Mean	11.42	11.42	11.42	11.40	0.00	0.00	-0.02
R1_1F	Annual Mean	11.42	11.42	11.42	11.40	0.00	0.00	-0.02
R1_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R2_GF	Annual Mean	11.39	11.39	11.39	11.38	0.00	0.00	-0.01
R2_1F	Annual Mean	11.39	11.39	11.39	11.38	0.00	0.00	-0.01
R2_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R3_GF	Annual Mean	11.36	11.36	11.36	11.35	0.00	0.00	-0.01
R3_1F	Annual Mean	11.36	11.36	11.36	11.35	0.00	0.00	-0.01
R3_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_GF	Annual Mean	11.34	11.35	11.35	11.33	0.00	0.01	-0.01
R4_1F	Annual Mean	11.34	11.35	11.35	11.33	0.00	0.01	-0.01
R4_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_GF	Annual Mean	11.33	11.34	11.34	11.33	0.01	0.01	0.00
R5_1F	Annual Mean	11.33	11.34	11.34	11.33	0.01	0.01	0.00
R5_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_GF	Annual Mean	11.33	11.34	11.34	11.32	0.01	0.01	0.00
R6_1F	Annual Mean	11.33	11.34	11.34	11.32	0.01	0.01	0.00
R6_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R7_GF	Annual Mean	11.43	11.44	11.44	11.40	0.01	0.01	-0.02
R7_1F	Annual Mean	11.43	11.44	11.44	11.40	0.01	0.01	-0.02
R7_2F	Annual Mean	11.31	11.32	11.32	11.31	0.00	0.00	0.00
R8_GF	Annual Mean	11.41	11.42	11.42	11.39	0.00	0.00	-0.02
R8_1F	Annual Mean	11.41	11.42	11.42	11.39	0.00	0.00	-0.02
R8_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R9_GF	Annual Mean	11.36	11.37	11.38	11.36	0.01	0.02	0.00
R9_1F	Annual Mean	11.36	11.37	11.38	11.36	0.01	0.02	0.00
R9_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_GF	Annual Mean	11.34	11.35	11.34	11.33	0.01	0.01	-0.01
R10_1F	Annual Mean	11.34	11.35	11.34	11.33	0.01	0.01	-0.01
R10_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_GF	Annual Mean	11.33	11.34	11.33	11.32	0.01	0.00	-0.01
R11_1F	Annual Mean	11.33	11.34	11.33	11.32	0.01	0.00	-0.01
R11_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_GF	Annual Mean	11.33	11.33	11.33	11.32	0.01	0.00	0.00
R12_1F	Annual Mean	11.33	11.33	11.33	11.32	0.01	0.00	0.00
R12_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_GF	Annual Mean	11.34	11.34	11.34	11.33	0.01	0.01	0.00
R13_1F	Annual Mean	11.33	11.34	11.34	11.33	0.01	0.01	0.00
R13_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_GF	Annual Mean	11.33	11.34	11.34	11.32	0.01	0.00	-0.01
R14_1F	Annual Mean	11.33	11.34	11.34	11.32	0.00	0.00	-0.01
R14_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R15_GF	Annual Mean	11.33	11.33	11.33	11.32	0.01	0.00	-0.01
R15_1F	Annual Mean	11.33	11.33	11.33	11.32	0.01	0.00	-0.01
R16_GF	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_1F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_5F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_6F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R17	Annual Mean	11.33	11.33	11.32	11.32	0.00	-0.01	-0.01
R18	Annual Mean	11.33	11.33	11.33	11.33	-0.01	-0.01	-0.01
R19	Annual Mean	11.33	11.33	11.33	11.33	-0.01	-0.01	-0.01
R20	Annual Mean	11.32	11.32	11.32	11.32	0.00	0.00	0.00

Max diff			
Gatwick		Gravesen	London City
	14.02	166.92	193.70

NO2		Max PEC (µg/m3)				+/- original		
Receptor ID	Averaging Period	Original	SR1.5	WO Bld	T265	SR1.5	WO Bld	T265
R1_GF	Annual Mean	27.47	27.45	25.73	27.47	-0.02	-1.74	0.00
R1_1F	Annual Mean	27.47	27.46	26.34	27.47	-0.01	-1.14	0.00
R1_2F	Annual Mean	25.54	25.54	25.58	25.54	0.00	0.03	0.00
R2_GF	Annual Mean	26.91	26.87	25.65	26.91	-0.04	-1.25	0.00
R2_1F	Annual Mean	26.92	26.87	25.69	26.92	-0.05	-1.23	0.00
R2_2F	Annual Mean	25.54	25.55	25.61	25.54	0.01	0.07	0.00
R3_GF	Annual Mean	25.94	25.95	25.61	25.94	0.02	-0.33	0.00
R3_1F	Annual Mean	25.94	25.96	25.61	25.94	0.03	-0.33	0.00
R3_2F	Annual Mean	25.54	25.54	25.58	25.54	0.00	0.04	0.00
R4_GF	Annual Mean	25.84	25.86	25.58	25.85	0.02	-0.27	0.00
R4_1F	Annual Mean	25.84	25.86	25.57	25.84	0.01	-0.27	0.00
R4_2F	Annual Mean	25.54	25.54	25.56	25.54	0.00	0.01	0.00
R4_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R4_4F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.00	0.00
R5_GF	Annual Mean	25.75	25.79	25.56	25.75	0.03	-0.19	0.00
R5_1F	Annual Mean	25.75	25.78	25.56	25.75	0.04	-0.18	0.00
R5_2F	Annual Mean	25.54	25.54	25.55	25.54	0.00	0.01	0.00
R5_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.01	0.00
R5_4F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.00	0.00
R6_GF	Annual Mean	25.71	25.74	25.55	25.71	0.02	-0.16	0.00
R6_1F	Annual Mean	25.71	25.73	25.55	25.71	0.02	-0.16	0.00
R6_2F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R6_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.01	0.00
R6_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R7_GF	Annual Mean	27.43	27.45	25.97	27.43	0.02	-1.45	0.00
R7_1F	Annual Mean	27.44	27.46	25.75	27.44	0.02	-1.69	0.00
R7_2F	Annual Mean	25.58	25.59	25.57	25.58	0.01	-0.01	0.00
R8_GF	Annual Mean	27.22	27.25	25.66	27.22	0.03	-1.56	0.00
R8_1F	Annual Mean	27.22	27.25	25.63	27.22	0.03	-1.59	0.00
R8_2F	Annual Mean	25.55	25.55	25.57	25.55	0.00	0.02	0.00
R9_GF	Annual Mean	26.05	26.08	25.61	26.05	0.04	-0.43	0.00
R9_1F	Annual Mean	26.05	26.08	25.60	26.05	0.04	-0.45	0.00
R9_2F	Annual Mean	25.54	25.54	25.57	25.54	0.00	0.03	0.00
R10_GF	Annual Mean	25.79	25.81	25.58	25.79	0.02	-0.21	0.00
R10_1F	Annual Mean	25.78	25.80	25.57	25.78	0.02	-0.21	0.00
R10_2F	Annual Mean	25.54	25.54	25.57	25.54	0.00	0.02	0.00
R10_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R10_4F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.00	0.00
R11_GF	Annual Mean	25.71	25.72	25.57	25.71	0.01	-0.15	0.00
R11_1F	Annual Mean	25.71	25.72	25.56	25.71	0.01	-0.15	0.00
R11_2F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R11_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R11_4F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.00	0.00
R12_GF	Annual Mean	25.67	25.68	25.55	25.67	0.01	-0.12	0.00
R12_1F	Annual Mean	25.67	25.68	25.55	25.67	0.01	-0.12	0.00
R12_2F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.02	0.00
R12_3F	Annual Mean	25.53	25.53	25.55	25.53	0.00	0.01	0.00
R12_4F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.00	0.00
R13_GF	Annual Mean	25.83	25.88	25.60	25.83	0.05	-0.23	0.00
R13_1F	Annual Mean	25.82	25.87	25.57	25.82	0.05	-0.25	0.00
R13_2F	Annual Mean	25.54	25.54	25.55	25.54	0.00	0.01	0.00
R13_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R13_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R14_GF	Annual Mean	25.78	25.82	25.58	25.78	0.04	-0.20	0.00
R14_1F	Annual Mean	25.77	25.82	25.56	25.77	0.05	-0.21	0.00
R14_2F	Annual Mean	25.54	25.54	25.55	25.54	0.00	0.01	0.00
R14_3F	Annual Mean	25.53	25.53	25.54	25.53	0.00	0.01	0.00
R14_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R15_GF	Annual Mean	25.69	25.72	25.56	25.69	0.03	-0.13	0.00
R15_1F	Annual Mean	25.69	25.72	25.55	25.69	0.03	-0.14	0.00
R16_GF	Annual Mean	25.54	25.55	25.55	25.54	0.01	0.01	0.00
R16_1F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R16_2F	Annual Mean	25.54	25.54	25.54	25.54	0.00	0.00	0.00
R16_3F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_4F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_5F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R16_6F	Annual Mean	25.53	25.53	25.53	25.53	0.00	0.00	0.00
R17	Annual Mean	25.65	25.67	25.59	25.65	0.02	-0.06	0.00
R18	Annual Mean	25.69	25.71	25.57	25.69	0.02	-0.12	0.00
R19	Annual Mean	25.70	25.71	25.57	25.70	0.01	-0.14	0.00
R20	Annual Mean	25.60	25.61	25.56	25.60	0.01	-0.05	0.00

Abated NO2

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	88.49 %'ile of hourly	184.29	173.59	51.08	183.95	-10.70	-133.21	-0.34
R1_1F	88.49 %'ile of hourly	184.68	173.80	123.21	184.40	-10.88	-61.47	-0.28
R1_2F	88.49 %'ile of hourly	51.07	51.07	51.59	51.07	0.00	0.52	0.00
R2_GF	88.49 %'ile of hourly	146.70	137.58	53.42	146.42	-9.12	-93.27	-0.28
R2_1F	88.49 %'ile of hourly	146.70	137.58	60.56	146.42	-9.12	-86.13	-0.28
R2_2F	88.49 %'ile of hourly	51.07	51.07	56.09	51.07	0.00	5.03	0.00
R3_GF	88.49 %'ile of hourly	56.79	56.59	53.48	56.79	-0.20	-3.31	0.00
R3_1F	88.49 %'ile of hourly	56.84	56.60	54.79	56.85	-0.24	-2.05	0.02
R3_2F	88.49 %'ile of hourly	51.07	51.07	53.78	51.07	0.00	2.71	0.00
R4_GF	88.49 %'ile of hourly	56.58	57.32	52.79	56.70	0.74	-3.79	0.12
R4_1F	88.49 %'ile of hourly	56.52	57.05	52.85	56.59	0.53	-3.67	0.07
R4_2F	88.49 %'ile of hourly	51.07	51.07	52.54	51.07	0.00	1.47	0.00
R4_3F	88.49 %'ile of hourly	51.07	51.07	51.79	51.07	0.00	0.73	0.00
R4_4F	88.49 %'ile of hourly	51.07	51.07	51.34	51.07	0.00	0.27	0.00
R5_GF	88.49 %'ile of hourly	53.14	55.80	52.26	53.29	2.66	-0.88	0.15
R5_1F	88.49 %'ile of hourly	52.45	55.33	52.16	52.51	2.88	-0.29	0.06
R5_2F	88.49 %'ile of hourly	51.07	51.07	51.91	51.07	0.00	0.84	0.00
R5_3F	88.49 %'ile of hourly	51.07	51.07	51.59	51.07	0.00	0.52	0.00
R5_4F	88.49 %'ile of hourly	51.07	51.07	51.34	51.07	0.00	0.27	0.00
R6_GF	88.49 %'ile of hourly	52.21	54.53	51.85	52.36	2.31	-0.37	0.15
R6_1F	88.49 %'ile of hourly	51.98	54.08	51.76	52.21	2.09	-0.22	0.23
R6_2F	88.49 %'ile of hourly	51.07	51.07	51.65	51.07	0.00	0.59	0.00
R6_3F	88.49 %'ile of hourly	51.07	51.07	51.46	51.07	0.00	0.40	0.00
R6_4F	88.49 %'ile of hourly	51.07	51.07	51.30	51.07	0.00	0.24	0.00
R7_GF	88.49 %'ile of hourly	163.58	157.24	51.07	163.58	-6.35	-112.52	0.00
R7_1F	88.49 %'ile of hourly	165.45	157.91	51.07	165.45	-7.54	-114.38	0.00
R7_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R8_GF	88.49 %'ile of hourly	157.80	152.31	51.55	157.47	-5.50	-106.26	-0.34
R8_1F	88.49 %'ile of hourly	157.80	152.31	53.01	157.47	-5.50	-104.79	-0.34
R8_2F	88.49 %'ile of hourly	51.07	51.07	51.99	51.07	0.00	0.93	0.00
R9_GF	88.49 %'ile of hourly	63.15	61.57	53.21	63.21	-1.59	-9.94	0.06
R9_1F	88.49 %'ile of hourly	63.15	61.62	53.93	63.21	-1.53	-9.22	0.06
R9_2F	88.49 %'ile of hourly	51.07	51.07	53.09	51.07	0.00	2.03	0.00
R10_GF	88.49 %'ile of hourly	52.64	53.64	53.07	52.66	1.00	0.44	0.02
R10_1F	88.49 %'ile of hourly	51.96	52.54	53.04	51.97	0.58	1.08	0.01
R10_2F	88.49 %'ile of hourly	51.07	51.07	52.57	51.07	0.00	1.50	0.00
R10_3F	88.49 %'ile of hourly	51.07	51.07	51.82	51.07	0.00	0.76	0.00
R10_4F	88.49 %'ile of hourly	51.07	51.07	51.36	51.07	0.00	0.30	0.00
R11_GF	88.49 %'ile of hourly	51.12	51.09	52.47	51.12	-0.03	1.35	0.00
R11_1F	88.49 %'ile of hourly	51.10	51.08	52.30	51.09	-0.02	1.20	0.00
R11_2F	88.49 %'ile of hourly	51.07	51.07	52.05	51.07	0.00	0.99	0.00
R11_3F	88.49 %'ile of hourly	51.07	51.07	51.69	51.07	0.00	0.62	0.00
R11_4F	88.49 %'ile of hourly	51.07	51.07	51.39	51.07	0.00	0.32	0.00
R12_GF	88.49 %'ile of hourly	51.07	51.07	52.04	51.07	0.00	0.97	0.00
R12_1F	88.49 %'ile of hourly	51.07	51.07	51.93	51.07	0.00	0.86	0.00
R12_2F	88.49 %'ile of hourly	51.07	51.07	51.74	51.07	0.00	0.68	0.00
R12_3F	88.49 %'ile of hourly	51.07	51.07	51.51	51.07	0.00	0.45	0.00
R12_4F	88.49 %'ile of hourly	51.07	51.07	51.34	51.07	0.00	0.28	0.00
R13_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R15_GF	88.49 %'ile of hourly	51.07	51.07	51.27	51.07	0.00	0.21	0.00
R15_1F	88.49 %'ile of hourly	51.07	51.07	51.27	51.07	0.00	0.20	0.00
R16_GF	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_1F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_2F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_5F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_6F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R17	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R18	88.49 %'ile of hourly	51.07	51.07	51.20	51.07	0.00	0.14	0.00
R19	88.49 %'ile of hourly	51.07	51.07	51.53	51.07	0.00	0.46	0.00
R20	88.49 %'ile of hourly	51.07	51.07	51.57	51.07	0.00	0.51	0.00

Unabated NO2

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	88.49 %'ile of hourly	495.40	459.85	51.31	494.28	-35.55	-444.09	-1.13
R1_1F	88.49 %'ile of hourly	496.69	460.56	291.45	495.75	-36.13	-205.24	-0.93
R1_2F	88.49 %'ile of hourly	51.08	51.08	52.84	51.08	0.00	1.76	0.00
R2_GF	88.49 %'ile of hourly	370.00	339.69	59.01	369.08	-30.31	-310.99	-0.92
R2_1F	88.49 %'ile of hourly	370.01	339.69	82.76	369.09	-30.32	-287.25	-0.92
R2_2F	88.49 %'ile of hourly	51.08	51.09	67.84	51.08	0.01	16.77	0.00
R3_GF	88.49 %'ile of hourly	70.48	69.84	59.15	70.49	-0.65	-11.33	0.01
R3_1F	88.49 %'ile of hourly	70.63	69.86	63.50	70.69	-0.77	-7.13	0.06
R3_2F	88.49 %'ile of hourly	51.08	51.08	60.11	51.08	0.00	9.04	0.00
R4_GF	88.49 %'ile of hourly	69.68	72.15	56.83	70.09	2.47	-12.85	0.41
R4_1F	88.49 %'ile of hourly	69.50	71.27	57.03	69.73	1.77	-12.47	0.24
R4_2F	88.49 %'ile of hourly	51.08	51.08	55.98	51.08	0.00	4.90	0.00
R4_3F	88.49 %'ile of hourly	51.07	51.07	53.50	51.07	0.00	2.44	0.00
R4_4F	88.49 %'ile of hourly	51.07	51.07	51.98	51.07	0.00	0.91	0.00
R5_GF	88.49 %'ile of hourly	58.17	67.05	55.07	58.66	8.88	-3.10	0.49
R5_1F	88.49 %'ile of hourly	55.89	65.49	54.73	56.08	9.60	-1.16	0.19
R5_2F	88.49 %'ile of hourly	51.08	51.08	53.88	51.08	0.00	2.81	0.00
R5_3F	88.49 %'ile of hourly	51.07	51.07	52.81	51.07	0.00	1.74	0.00
R5_4F	88.49 %'ile of hourly	51.07	51.07	51.98	51.07	0.00	0.91	0.00
R6_GF	88.49 %'ile of hourly	55.06	62.77	53.68	55.55	7.71	-1.38	0.48
R6_1F	88.49 %'ile of hourly	54.30	61.27	53.39	55.06	6.97	-0.91	0.76
R6_2F	88.49 %'ile of hourly	51.07	51.07	53.03	51.07	0.00	1.96	0.00
R6_3F	88.49 %'ile of hourly	51.07	51.07	52.39	51.07	0.00	1.33	0.00
R6_4F	88.49 %'ile of hourly	51.07	51.07	51.85	51.07	0.00	0.78	0.00
R7_GF	88.49 %'ile of hourly	426.58	405.54	51.51	426.58	-21.05	-375.08	0.00
R7_1F	88.49 %'ile of hourly	432.80	407.79	51.29	432.80	-25.01	-381.51	0.00
R7_2F	88.49 %'ile of hourly	51.12	51.13	51.11	51.12	0.01	-0.01	0.00
R8_GF	88.49 %'ile of hourly	407.20	388.97	52.79	406.08	-18.23	-354.41	-1.12
R8_1F	88.49 %'ile of hourly	407.20	388.97	57.62	406.08	-18.23	-349.58	-1.12
R8_2F	88.49 %'ile of hourly	51.09	51.09	54.18	51.09	0.00	3.10	0.00
R9_GF	88.49 %'ile of hourly	91.71	86.48	58.28	91.92	-5.23	-33.43	0.21
R9_1F	88.49 %'ile of hourly	91.71	86.66	60.63	91.92	-5.05	-31.08	0.21
R9_2F	88.49 %'ile of hourly	51.08	51.08	57.84	51.08	0.00	6.76	0.00
R10_GF	88.49 %'ile of hourly	56.53	59.89	57.79	56.60	3.35	1.25	0.07
R10_1F	88.49 %'ile of hourly	54.28	56.22	57.66	54.30	1.94	3.37	0.02
R10_2F	88.49 %'ile of hourly	51.08	51.08	56.10	51.08	0.00	5.02	0.00
R10_3F	88.49 %'ile of hourly	51.07	51.07	53.60	51.07	0.00	2.53	0.00
R10_4F	88.49 %'ile of hourly	51.07	51.07	52.05	51.07	0.00	0.99	0.00
R11_GF	88.49 %'ile of hourly	51.43	51.35	55.76	51.42	-0.08	4.33	-0.01
R11_1F	88.49 %'ile of hourly	51.35	51.31	55.18	51.34	-0.04	3.83	-0.01
R11_2F	88.49 %'ile of hourly	51.07	51.07	54.36	51.07	0.00	3.30	0.00
R11_3F	88.49 %'ile of hourly	51.07	51.07	53.14	51.07	0.00	2.07	0.00
R11_4F	88.49 %'ile of hourly	51.07	51.07	52.13	51.07	0.00	1.07	0.00
R12_GF	88.49 %'ile of hourly	51.21	51.22	54.31	51.21	0.01	3.11	0.00
R12_1F	88.49 %'ile of hourly	51.21	51.22	53.94	51.21	0.01	2.74	0.00
R12_2F	88.49 %'ile of hourly	51.07	51.07	53.33	51.07	0.00	2.26	0.00
R12_3F	88.49 %'ile of hourly	51.07	51.07	52.57	51.07	0.00	1.51	0.00
R12_4F	88.49 %'ile of hourly	51.07	51.07	51.98	51.07	0.00	0.92	0.00
R13_GF	88.49 %'ile of hourly	51.37	51.42	51.14	51.37	0.05	-0.23	0.00
R13_1F	88.49 %'ile of hourly	51.36	51.41	51.11	51.36	0.05	-0.25	0.00
R13_2F	88.49 %'ile of hourly	51.08	51.08	51.09	51.08	0.00	0.01	0.00
R13_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R13_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R14_GF	88.49 %'ile of hourly	51.32	51.36	51.12	51.32	0.04	-0.19	0.00
R14_1F	88.49 %'ile of hourly	51.31	51.36	51.11	51.31	0.05	-0.20	0.00
R14_2F	88.49 %'ile of hourly	51.08	51.08	51.09	51.08	0.00	0.01	0.00
R14_3F	88.49 %'ile of hourly	51.07	51.07	51.08	51.07	0.00	0.01	0.00
R14_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R15_GF	88.49 %'ile of hourly	51.23	51.26	51.79	51.23	0.03	0.56	0.00
R15_1F	88.49 %'ile of hourly	51.23	51.26	51.76	51.23	0.03	0.54	0.00
R16_GF	88.49 %'ile of hourly	51.08	51.09	51.09	51.08	0.01	0.01	0.00
R16_1F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R16_2F	88.49 %'ile of hourly	51.08	51.08	51.08	51.08	0.00	0.00	0.00
R16_3F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_4F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_5F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R16_6F	88.49 %'ile of hourly	51.07	51.07	51.07	51.07	0.00	0.00	0.00
R17	88.49 %'ile of hourly	51.19	51.21	51.13	51.19	0.02	-0.06	0.00
R18	88.49 %'ile of hourly	51.23	51.25	51.56	51.23	0.02	0.33	0.00
R19	88.49 %'ile of hourly	51.24	51.25	52.63	51.24	0.01	1.39	0.00
R20	88.49 %'ile of hourly	51.14	51.15	52.78	51.14	0.01	1.64	0.00

PM10 Annual Mean

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	Annual Mean	17.76	17.77	17.68	17.76	0.01	-0.09	0.00
R1_1F	Annual Mean	17.76	17.77	17.68	17.76	0.01	-0.08	0.00
R1_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R2_GF	Annual Mean	17.73	17.73	17.67	17.73	0.00	-0.07	0.00
R2_1F	Annual Mean	17.73	17.74	17.66	17.73	0.00	-0.07	0.00
R2_2F	Annual Mean	17.65	17.66	17.66	17.65	0.00	0.00	0.00
R3_GF	Annual Mean	17.70	17.70	17.66	17.70	0.00	-0.04	0.00
R3_1F	Annual Mean	17.70	17.70	17.66	17.70	0.00	-0.04	0.00
R3_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R4_GF	Annual Mean	17.69	17.69	17.66	17.69	0.00	-0.03	0.00
R4_1F	Annual Mean	17.69	17.69	17.66	17.69	0.00	-0.03	0.00
R4_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R4_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R4_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_GF	Annual Mean	17.68	17.68	17.66	17.68	0.00	-0.02	0.00
R5_1F	Annual Mean	17.68	17.68	17.66	17.68	0.00	-0.02	0.00
R5_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R5_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_GF	Annual Mean	17.67	17.67	17.65	17.67	0.00	-0.02	0.00
R6_1F	Annual Mean	17.67	17.67	17.65	17.67	0.00	-0.02	0.00
R6_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R6_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R7_GF	Annual Mean	17.78	17.79	17.71	17.78	0.01	-0.07	0.00
R7_1F	Annual Mean	17.78	17.79	17.68	17.78	0.01	-0.10	0.00
R7_2F	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00
R8_GF	Annual Mean	17.76	17.77	17.67	17.76	0.01	-0.09	0.00
R8_1F	Annual Mean	17.76	17.77	17.66	17.76	0.01	-0.10	0.00
R8_2F	Annual Mean	17.66	17.66	17.66	17.66	0.00	0.00	0.00
R9_GF	Annual Mean	17.71	17.71	17.66	17.71	0.01	-0.04	0.00
R9_1F	Annual Mean	17.71	17.71	17.66	17.71	0.01	-0.05	0.00
R9_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R10_GF	Annual Mean	17.68	17.68	17.66	17.68	0.00	-0.03	0.00
R10_1F	Annual Mean	17.68	17.68	17.66	17.68	0.00	-0.03	0.00
R10_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R10_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R10_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_GF	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R11_1F	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R11_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R11_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_GF	Annual Mean	17.67	17.67	17.65	17.67	0.00	-0.02	0.00
R12_1F	Annual Mean	17.67	17.67	17.65	17.67	0.00	-0.02	0.00
R12_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R12_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R13_GF	Annual Mean	17.69	17.70	17.66	17.69	0.01	-0.03	0.00
R13_1F	Annual Mean	17.69	17.70	17.66	17.69	0.01	-0.03	0.00
R13_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R13_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R13_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R14_GF	Annual Mean	17.68	17.69	17.66	17.68	0.01	-0.02	0.00
R14_1F	Annual Mean	17.68	17.69	17.66	17.68	0.01	-0.03	0.00
R14_2F	Annual Mean	17.65	17.65	17.66	17.65	0.00	0.00	0.00
R14_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R14_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R15_GF	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R15_1F	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R16_GF	Annual Mean	17.65	17.66	17.66	17.65	0.00	0.00	0.00
R16_1F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_2F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_3F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_4F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_5F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R16_6F	Annual Mean	17.65	17.65	17.65	17.65	0.00	0.00	0.00
R17	Annual Mean	17.67	17.67	17.66	17.67	0.00	-0.01	0.00
R18	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R19	Annual Mean	17.67	17.68	17.66	17.67	0.00	-0.02	0.00
R20	Annual Mean	17.66	17.66	17.66	17.66	0.00	-0.01	0.00

PM10 Short term (4hr)

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	84.52 %'ile of 24 hou	44.88	44.99	35.51	44.88	0.12	-9.37	0.00
R1_1F	84.52 %'ile of 24 hou	44.88	44.99	47.35	44.88	0.12	2.48	0.00
R1_2F	84.52 %'ile of 24 hou	35.72	36.12	36.40	35.72	0.40	0.69	0.00
R2_GF	84.52 %'ile of 24 hou	41.43	41.48	36.29	41.43	0.04	-5.15	0.00
R2_1F	84.52 %'ile of 24 hou	41.43	41.48	36.94	41.43	0.04	-4.49	0.00
R2_2F	84.52 %'ile of 24 hou	35.83	35.88	36.37	35.82	0.05	0.54	-0.01
R3_GF	84.52 %'ile of 24 hou	40.64	40.61	36.02	40.63	-0.03	-4.61	0.00
R3_1F	84.52 %'ile of 24 hou	40.65	40.61	36.01	40.64	-0.04	-4.64	0.00
R3_2F	84.52 %'ile of 24 hou	35.58	35.59	35.83	35.57	0.02	0.26	0.00
R4_GF	84.52 %'ile of 24 hou	40.01	40.05	35.78	40.01	0.04	-4.23	0.00
R4_1F	84.52 %'ile of 24 hou	40.01	40.04	35.72	40.01	0.03	-4.29	0.00
R4_2F	84.52 %'ile of 24 hou	35.55	35.55	35.62	35.55	0.00	0.07	0.00
R4_3F	84.52 %'ile of 24 hou	35.42	35.43	35.50	35.42	0.01	0.09	0.00
R4_4F	84.52 %'ile of 24 hou	35.36	35.38	35.41	35.36	0.01	0.05	0.00
R5_GF	84.52 %'ile of 24 hou	38.27	38.57	35.61	38.26	0.30	-2.66	-0.01
R5_1F	84.52 %'ile of 24 hou	38.11	38.57	35.57	38.11	0.46	-2.53	0.00
R5_2F	84.52 %'ile of 24 hou	35.50	35.50	35.52	35.50	0.00	0.02	0.00
R5_3F	84.52 %'ile of 24 hou	35.42	35.41	35.45	35.42	0.00	0.04	0.00
R5_4F	84.52 %'ile of 24 hou	35.36	35.37	35.40	35.36	0.01	0.04	0.00
R6_GF	84.52 %'ile of 24 hou	37.84	38.48	35.52	37.84	0.64	-2.32	0.00
R6_1F	84.52 %'ile of 24 hou	37.79	38.44	35.50	37.79	0.66	-2.29	0.00
R6_2F	84.52 %'ile of 24 hou	35.44	35.44	35.46	35.44	0.00	0.02	0.00
R6_3F	84.52 %'ile of 24 hou	35.40	35.40	35.42	35.40	0.00	0.02	0.00
R6_4F	84.52 %'ile of 24 hou	35.37	35.37	35.39	35.37	0.00	0.02	0.00
R7_GF	84.52 %'ile of 24 hou	42.27	42.45	35.87	42.27	0.18	-6.41	0.00
R7_1F	84.52 %'ile of 24 hou	42.30	42.45	37.65	42.30	0.15	-4.66	-0.01
R7_2F	84.52 %'ile of 24 hou	35.58	35.84	36.54	35.57	0.27	0.96	-0.01
R8_GF	84.52 %'ile of 24 hou	41.97	42.41	36.12	41.97	0.44	-5.84	0.00
R8_1F	84.52 %'ile of 24 hou	41.97	42.41	36.46	41.97	0.44	-5.51	0.00
R8_2F	84.52 %'ile of 24 hou	35.82	35.83	36.10	35.81	0.01	0.29	-0.01
R9_GF	84.52 %'ile of 24 hou	40.98	40.99	35.91	40.98	0.01	-5.07	0.00
R9_1F	84.52 %'ile of 24 hou	40.98	40.99	35.92	40.98	0.01	-5.06	0.00
R9_2F	84.52 %'ile of 24 hou	35.62	35.61	35.78	35.62	-0.01	0.15	0.00
R10_GF	84.52 %'ile of 24 hou	38.23	38.53	35.72	38.23	0.30	-2.51	0.00
R10_1F	84.52 %'ile of 24 hou	38.23	38.52	35.66	38.23	0.29	-2.57	0.00
R10_2F	84.52 %'ile of 24 hou	35.48	35.49	35.59	35.48	0.01	0.11	0.00
R10_3F	84.52 %'ile of 24 hou	35.43	35.43	35.49	35.42	0.01	0.06	0.00
R10_4F	84.52 %'ile of 24 hou	35.38	35.39	35.41	35.37	0.01	0.03	0.00
R11_GF	84.52 %'ile of 24 hou	38.02	37.95	35.58	38.02	-0.06	-2.43	0.00
R11_1F	84.52 %'ile of 24 hou	38.02	37.95	35.55	38.02	-0.07	-2.47	0.00
R11_2F	84.52 %'ile of 24 hou	35.43	35.43	35.50	35.43	0.01	0.07	0.00
R11_3F	84.52 %'ile of 24 hou	35.39	35.40	35.45	35.39	0.00	0.05	0.00
R11_4F	84.52 %'ile of 24 hou	35.37	35.37	35.40	35.37	0.01	0.03	0.00
R12_GF	84.52 %'ile of 24 hou	36.89	36.90	35.51	36.89	0.01	-1.38	0.00
R12_1F	84.52 %'ile of 24 hou	36.89	36.90	35.48	36.89	0.01	-1.40	0.00
R12_2F	84.52 %'ile of 24 hou	35.41	35.41	35.45	35.41	0.00	0.05	0.00
R12_3F	84.52 %'ile of 24 hou	35.38	35.38	35.41	35.38	0.01	0.04	0.00
R12_4F	84.52 %'ile of 24 hou	35.36	35.36	35.38	35.36	0.00	0.02	0.00
R13_GF	84.52 %'ile of 24 hou	37.96	37.86	35.66	37.99	-0.10	-2.30	0.03
R13_1F	84.52 %'ile of 24 hou	37.93	37.76	35.70	37.93	-0.17	-2.23	0.00
R13_2F	84.52 %'ile of 24 hou	35.39	35.43	35.60	35.39	0.04	0.21	0.00
R13_3F	84.52 %'ile of 24 hou	35.33	35.36	35.44	35.33	0.03	0.11	0.00
R13_4F	84.52 %'ile of 24 hou	35.31	35.33	35.37	35.31	0.02	0.05	0.00
R14_GF	84.52 %'ile of 24 hou	37.50	37.24	35.74	37.50	-0.25	-1.76	0.00
R14_1F	84.52 %'ile of 24 hou	37.49	37.24	35.71	37.49	-0.25	-1.78	0.00
R14_2F	84.52 %'ile of 24 hou	35.46	35.51	35.62	35.46	0.05	0.16	0.00
R14_3F	84.52 %'ile of 24 hou	35.39	35.42	35.49	35.39	0.03	0.10	0.00
R14_4F	84.52 %'ile of 24 hou	35.36	35.38	35.41	35.36	0.03	0.06	0.00
R15_GF	84.52 %'ile of 24 hou	36.09	36.00	35.64	36.08	-0.09	-0.45	-0.01
R15_1F	84.52 %'ile of 24 hou	36.06	36.00	35.59	36.06	-0.06	-0.47	0.00
R16_GF	84.52 %'ile of 24 hou	35.41	35.43	35.45	35.41	0.02	0.05	0.00
R16_1F	84.52 %'ile of 24 hou	35.38	35.40	35.43	35.39	0.02	0.05	0.00
R16_2F	84.52 %'ile of 24 hou	35.36	35.38	35.40	35.36	0.02	0.04	0.00
R16_3F	84.52 %'ile of 24 hou	35.34	35.35	35.37	35.34	0.02	0.03	0.00
R16_4F	84.52 %'ile of 24 hou	35.33	35.34	35.36	35.33	0.02	0.03	0.00
R16_5F	84.52 %'ile of 24 hou	35.31	35.32	35.33	35.31	0.01	0.02	0.00
R16_6F	84.52 %'ile of 24 hou	35.31	35.31	35.32	35.31	0.00	0.01	0.00
R17	84.52 %'ile of 24 hou	36.38	36.14	35.94	36.41	-0.24	-0.44	0.03
R18	84.52 %'ile of 24 hou	36.49	36.44	35.92	36.49	-0.05	-0.57	0.00
R19	84.52 %'ile of 24 hou	36.20	35.98	35.76	36.20	-0.22	-0.44	0.00
R20	84.52 %'ile of 24 hou	35.80	35.82	35.65	35.80	0.02	-0.14	0.01

PM10 Short term (10 min)

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	84.52 %'ile of 24 hou	35.79	35.80	35.34	35.79	0.01	-0.45	0.00
R1_1F	84.52 %'ile of 24 hou	35.79	35.80	35.82	35.79	0.02	0.04	0.00
R1_2F	84.52 %'ile of 24 hou	35.32	35.34	35.36	35.32	0.02	0.03	0.00
R2_GF	84.52 %'ile of 24 hou	35.62	35.63	35.36	35.62	0.01	-0.26	0.00
R2_1F	84.52 %'ile of 24 hou	35.62	35.63	35.38	35.62	0.01	-0.24	0.00
R2_2F	84.52 %'ile of 24 hou	35.33	35.33	35.35	35.33	0.00	0.02	0.00
R3_GF	84.52 %'ile of 24 hou	35.57	35.57	35.34	35.57	0.00	-0.23	0.00
R3_1F	84.52 %'ile of 24 hou	35.57	35.57	35.34	35.57	0.00	-0.23	0.00
R3_2F	84.52 %'ile of 24 hou	35.32	35.32	35.33	35.32	0.00	0.01	0.00
R4_GF	84.52 %'ile of 24 hou	35.53	35.54	35.33	35.53	0.00	-0.20	0.00
R4_1F	84.52 %'ile of 24 hou	35.53	35.54	35.33	35.53	0.00	-0.21	0.00
R4_2F	84.52 %'ile of 24 hou	35.32	35.32	35.32	35.32	0.00	0.00	0.00
R4_3F	84.52 %'ile of 24 hou	35.31	35.31	35.32	35.31	0.00	0.00	0.00
R4_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R5_GF	84.52 %'ile of 24 hou	35.45	35.47	35.32	35.45	0.01	-0.13	0.00
R5_1F	84.52 %'ile of 24 hou	35.45	35.47	35.32	35.45	0.02	-0.13	0.00
R5_2F	84.52 %'ile of 24 hou	35.32	35.32	35.32	35.32	0.00	0.00	0.00
R5_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R5_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_GF	84.52 %'ile of 24 hou	35.43	35.46	35.32	35.43	0.03	-0.12	0.00
R6_1F	84.52 %'ile of 24 hou	35.43	35.46	35.32	35.43	0.03	-0.11	0.00
R6_2F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R6_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R7_GF	84.52 %'ile of 24 hou	35.70	35.71	35.38	35.70	0.02	-0.32	0.00
R7_1F	84.52 %'ile of 24 hou	35.70	35.72	35.43	35.70	0.02	-0.27	0.00
R7_2F	84.52 %'ile of 24 hou	35.32	35.34	35.36	35.32	0.01	0.04	0.00
R8_GF	84.52 %'ile of 24 hou	35.67	35.69	35.35	35.67	0.03	-0.31	0.00
R8_1F	84.52 %'ile of 24 hou	35.67	35.69	35.36	35.67	0.03	-0.30	0.00
R8_2F	84.52 %'ile of 24 hou	35.33	35.33	35.34	35.33	0.00	0.01	0.00
R9_GF	84.52 %'ile of 24 hou	35.59	35.60	35.34	35.59	0.01	-0.25	0.00
R9_1F	84.52 %'ile of 24 hou	35.59	35.60	35.34	35.59	0.01	-0.25	0.00
R9_2F	84.52 %'ile of 24 hou	35.32	35.32	35.33	35.32	0.00	0.01	0.00
R10_GF	84.52 %'ile of 24 hou	35.46	35.47	35.33	35.46	0.01	-0.13	0.00
R10_1F	84.52 %'ile of 24 hou	35.46	35.47	35.32	35.46	0.01	-0.13	0.00
R10_2F	84.52 %'ile of 24 hou	35.31	35.31	35.32	35.31	0.00	0.01	0.00
R10_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R10_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R11_GF	84.52 %'ile of 24 hou	35.44	35.44	35.32	35.44	0.00	-0.12	0.00
R11_1F	84.52 %'ile of 24 hou	35.44	35.44	35.32	35.44	0.00	-0.12	0.00
R11_2F	84.52 %'ile of 24 hou	35.31	35.31	35.32	35.31	0.00	0.00	0.00
R11_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R11_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_GF	84.52 %'ile of 24 hou	35.39	35.39	35.32	35.39	0.00	-0.07	0.00
R12_1F	84.52 %'ile of 24 hou	35.39	35.39	35.31	35.39	0.00	-0.07	0.00
R12_2F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R12_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R13_GF	84.52 %'ile of 24 hou	35.45	35.45	35.33	35.45	0.00	-0.12	0.00
R13_1F	84.52 %'ile of 24 hou	35.45	35.45	35.33	35.45	0.00	-0.12	0.00
R13_2F	84.52 %'ile of 24 hou	35.31	35.31	35.32	35.31	0.00	0.01	0.00
R13_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R13_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R14_GF	84.52 %'ile of 24 hou	35.43	35.42	35.33	35.43	0.00	-0.10	0.00
R14_1F	84.52 %'ile of 24 hou	35.43	35.42	35.33	35.43	0.00	-0.10	0.00
R14_2F	84.52 %'ile of 24 hou	35.31	35.32	35.32	35.31	0.00	0.01	0.00
R14_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R14_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R15_GF	84.52 %'ile of 24 hou	35.36	35.36	35.32	35.36	0.00	-0.03	0.00
R15_1F	84.52 %'ile of 24 hou	35.36	35.36	35.32	35.36	0.00	-0.04	0.00
R16_GF	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_1F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_2F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_3F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_4F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_5F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R16_6F	84.52 %'ile of 24 hou	35.31	35.31	35.31	35.31	0.00	0.00	0.00
R17	84.52 %'ile of 24 hou	35.37	35.36	35.34	35.37	-0.01	-0.03	0.00
R18	84.52 %'ile of 24 hou	35.38	35.38	35.34	35.38	0.00	-0.04	0.00
R19	84.52 %'ile of 24 hou	35.36	35.36	35.33	35.36	-0.01	-0.04	0.00
R20	84.52 %'ile of 24 hou	35.33	35.34	35.32	35.34	0.00	-0.01	0.00

PM2.5 Annual Mean

Receptor ID	Averaging Period	Max PEC	Max PEC (	Max PEC (	Max PEC (µg/m3)			
R1_GF	Annual Mean	11.42	11.43	11.33	11.42	0.01	-0.09	0.00
R1_1F	Annual Mean	11.42	11.43	11.34	11.42	0.01	-0.08	0.00
R1_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R2_GF	Annual Mean	11.39	11.39	11.32	11.39	0.00	-0.07	0.00
R2_1F	Annual Mean	11.39	11.39	11.32	11.39	0.00	-0.07	0.00
R2_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R3_GF	Annual Mean	11.35	11.36	11.31	11.35	0.00	-0.04	0.00
R3_1F	Annual Mean	11.35	11.36	11.31	11.35	0.00	-0.04	0.00
R3_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_GF	Annual Mean	11.34	11.34	11.31	11.34	0.00	-0.03	0.00
R4_1F	Annual Mean	11.34	11.34	11.31	11.34	0.00	-0.03	0.00
R4_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R4_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_GF	Annual Mean	11.33	11.34	11.31	11.33	0.00	-0.02	0.00
R5_1F	Annual Mean	11.33	11.34	11.31	11.33	0.00	-0.02	0.00
R5_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R5_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_GF	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R6_1F	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R6_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R6_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R7_GF	Annual Mean	11.43	11.44	11.36	11.43	0.01	-0.07	0.00
R7_1F	Annual Mean	11.43	11.44	11.34	11.43	0.01	-0.10	0.00
R7_2F	Annual Mean	11.31	11.32	11.31	11.31	0.00	0.00	0.00
R8_GF	Annual Mean	11.41	11.42	11.32	11.41	0.01	-0.09	0.00
R8_1F	Annual Mean	11.41	11.42	11.32	11.41	0.01	-0.10	0.00
R8_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R9_GF	Annual Mean	11.36	11.37	11.32	11.36	0.01	-0.04	0.00
R9_1F	Annual Mean	11.36	11.37	11.31	11.36	0.01	-0.05	0.00
R9_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_GF	Annual Mean	11.34	11.34	11.31	11.34	0.00	-0.03	0.00
R10_1F	Annual Mean	11.34	11.34	11.31	11.34	0.00	-0.03	0.00
R10_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R10_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_GF	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R11_1F	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R11_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R11_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_GF	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R12_1F	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R12_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R12_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_GF	Annual Mean	11.35	11.35	11.32	11.35	0.01	-0.03	0.00
R13_1F	Annual Mean	11.34	11.35	11.31	11.34	0.01	-0.03	0.00
R13_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R13_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_GF	Annual Mean	11.34	11.34	11.31	11.34	0.01	-0.02	0.00
R14_1F	Annual Mean	11.34	11.34	11.31	11.34	0.01	-0.03	0.00
R14_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R14_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R15_GF	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R15_1F	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R16_GF	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_1F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_2F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_3F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_4F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_5F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R16_6F	Annual Mean	11.31	11.31	11.31	11.31	0.00	0.00	0.00
R17	Annual Mean	11.32	11.33	11.32	11.32	0.00	-0.01	0.00
R18	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R19	Annual Mean	11.33	11.33	11.31	11.33	0.00	-0.02	0.00
R20	Annual Mean	11.32	11.32	11.31	11.32	0.00	-0.01	0.00

Max diff

SR1.5	WO Bld	T265
9.60	16.77	0.76

Appendix D: List of Model Files

ADMS 5.2.2.0

London Heathrow Met Data – 2016 – 2020

Table D.1: Models used for assessment

File Name	Model Outputs
CGY_4h_v7_16_NOx.APL	NOx outputs, 2016 met
CGY_4h_v7_16_PM10_1.APL	PM10 output for annual mean, 2016 met
CGY_4h_v7_16_PM10_24.APL	PM10 output for 24h objective, 2016 met
CGY_4h_v7_17_NOx.APL	NOx outputs, 2017 met
CGY_4h_v7_17_PM10_1.APL	PM10 output for annual mean, 2017 met
CGY_4h_v7_17_.PM10_24.APL	PM10 output for 24h objective, 2017 met
CGY_4h_v7_18_NOx.APL	NOx outputs, 2018 met
CGY_4h_v7_18_PM10_1.APL	PM10 output for annual mean, 2018 met
CGY_4h_v7_18_PM10_24.APL	PM10 output for 24h objective, 2018 met
CGY_4h_v7_19_NOx.APL	NOx outputs, 2019 met
CGY_4h_v7_19_PM10_1.APL	PM10 output for annual mean, 2019 met
CGY_4h_v7_19_PM10_24.APL	PM10 output for 24h objective, 2019 met
CGY_4h_v7_20_NOx.APL	NOx outputs, 2020 met
CGY_4h_v7_20_PM10_1.APL	PM10 output for annual mean, 2020 met
CGY_4h_v7_20_PM10_24.APL	PM10 output for 24h objective, 2020 met

Table D.2: Models used for sensitivity testing

File Name	Model Outputs
CGY_4h_v7_17_Gatwick_Met_NOx.APL	Gatwick met
CGY_4h_v7_17_Gatwick_Met_PM10_1.APL	Gatwick met
CGY_4h_v7_17_Gatwick_Met_PM10_24.APL	Gatwick met
CGY_4h_v7_17_Gravesend_Met_NOx.APL	Gravesend met
CGY_4h_v7_17_Gravesend_Met_PM10_1.APL	Gravesend met
CGY_4h_v7_17_Gravesend_Met_PM10_24.APL	Gravesend met
CGY_4h_v7_17_London_City_Met_NOx.APL	London City met
CGY_4h_v7_17_London_City_Met_PM10_1.APL	London City met
CGY_4h_v7_17_London_City_Met_PM10_24.APL	London City met
CGY_4h_v7_19_265_NOx.APL	265°C generator exit temp
CGY_4h_v7_19_265_PM10_1.APL	265°C generator exit temp
CGY_4h_v7_19_265_PM10_24.APL	265°C generator exit temp
CGY_4h_v7_19_Grid_Res_1.25m_NOx.APL	1.25m grid resolution
CGY_4h_v7_19_Grid_Res_1.25m_PM10_1.APL	1.25m grid resolution
CGY_4h_v7_19_Grid_Res_1.25m_PM10_24.APL	1.25m grid resolution
CGY_4h_v7_19_SR1.5_NOx.APL	Surface roughness of 1.5
CGY_4h_v7_19_SR1.5_PM10_1.APL	Surface roughness of 1.5
CGY_4h_v7_19_SR1.5_PM10_24.APL	Surface roughness of 1.5

File Name	Model Outputs
CGY_4h_v7_19_WO_Buildings_NOx.APL	Without modelled buildings
CGY_4h_v7_19_WO_Buildings_PM10_1.APL	Without modelled buildings
CGY_4h_v7_19_WO_Buildings_PM10_24.APL	Without modelled buildings

Appendix E: Generator emissions datasheet

MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM No.	T0402-0001E Rev.4 (1/7)
	DATE	January, 2017

Exhaust Gas Emission Data

Exhaust Gas Emission Data is enclosed herein.

The specifications are subject to change without notice.

Revision				
	First Edition : May, 2008	Engine Engineering Department		
	Rev.1: February, 2013	High Speed Engine Designing Section		
	Rev.2: April, 2016	Approved by	Checked by	Drawn by
	Rev.3: October, 2016	M.NAKAMURA	S.MADAAN	S.M.
	Rev.4: January, 2017			

MITSUBISHI HEAVY INDUSTRIES ENGINE & TURBOCHARGER, LTD.

EXHAUST GAS EMISSION DATA OF DIESEL ENGINE FOR GENERATOR
For Reference

MODEL		S6A3-PTA		S12A2-PTA		S12H-PTA		S6R-PTA		S12R-PTA		S12R-PTA2		S12R-PTAA2 (W/FAN)		S16R-PTA		S16R-PTA2		S16R-PTAA2 (W/FAN)		S16R2-PTAW	S16R2-PTAW-E
Prime Rating kW/min^{-1} (without fan)		400/1500	460/1800	679/1500	761/1800	930/1500	1020/1800	515/1500	595/1800	1110/1500	1190/1800	1195/1500	1340/1800	1277/1500	1387/1800	1480/1500	1590/1800	1630/1500	1775/1800	1684/1500	1895/1800	2167/1500 *1	2275/1500 *1
NOx	PPM	900	890	852	825	935	877	901	940	852	940	950	852	940	779	925	852	950	852	828	754	659	549
	g/Nm^3	3.7	3.7	3.5	3.4	3.8	3.6	3.7	3.5	3.7	3.5	3.9	3.7	3.5	3.2	3.8	3.7	3.9	3.7	3.4	3.1	3.6	3.5
	g/kW・h	8.6	8.6	7.7	7.7	8.8	8.2	8.4	8.4	7.7	8.4	8.8	7.7	8.4	7.3	8.7	7.7	8.8	7.7	7.7	7.1	5.8	5.7
CO	PPM	(220)	(210)	(220)	(210)	(310)	(210)	310	210	(310)	(210)	(310)	(210)	(320)	(200)	(310)	(210)	(310)	(210)	(320)	(200)	119	94
	g/Nm^3	(0.44)	(0.45)	(0.44)	(0.45)	(0.59)	(0.43)	0.52	0.39	(0.59)	(0.43)	(0.59)	(0.43)	(0.55)	(0.42)	(0.56)	(0.43)	(0.59)	(0.43)	(0.55)	(0.42)	0.38	0.33
	g/kW・h	(1.2)	1.4	(1.2)	1.4	(1.8)	(1.4)	1.5	1.2	(1.8)	(1.4)	(1.8)	(1.2)	(1.5)	(1.2)	(1.6)	(1.4)	(1.8)	(1.2)	(1.5)	(1.2)	0.5	0.5
HC	PPM	(50)	(50)	(50)	(50)	(110)	(120)	110	120	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	35	45
	g/Nm^3	(0.05)	(0.06)	(0.05)	(0.06)	(0.11)	(0.13)	0.09	0.11	(0.11)	(0.13)	(0.11)	(0.13)	(0.10)	(0.13)	(0.10)	(0.13)	(0.11)	(0.13)	(0.10)	(0.13)	0.06	0.09
	g/kW・h	(0.15)	(0.18)	(0.15)	(0.18)	(0.31)	(0.38)	0.27	0.34	(0.31)	(0.38)	(0.31)	(0.35)	(0.29)	(0.38)	(0.29)	(0.38)	(0.31)	(0.35)	(0.29)	(0.38)	0.10	0.14
CO_2	%	6.7	6.2	6.7	6.2	6.9	6.5	8.0	7.1	6.9	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.7	6.5	8.0	7.2
	g/kW・h	619	646	619	646	619	625	598	619	619	625	620	613	619	612	619	612	620	613	619	612	643	643
PM	g/Nm^3	0.12	0.12	0.12	0.11	0.12	0.11	0.10	0.12	0.12	0.11	0.10	0.09	0.09	0.08	0.11	0.12	0.11	0.12	0.09	0.07	0.03	-
	g/kW・h	0.37	0.37	0.38	0.37	0.38	0.37	0.34	0.35	0.35	0.37	0.34	0.33	0.33	0.31	0.33	0.39	0.33	0.39	0.33	0.31	0.04	-

Notes
1.Allowance: +25%
2.Condition: 100kPa(750mmHg) barometric pressure, 298K(25℃) ambient temprature and 30% relative humidity.
3.NOx, CO, HC[PPM] : with 13% O_2 Level.
NOx, CO, HC, Particulates[g/Nm^3]: with 5% O_2 Level.
NOx, CO, HC, Particulates[g/PS・h]: with 13% O_2 Level.
CO_2[%]: Calculated Data.
( ): Estimated Data.
4. *1: Standby Rating
5.These data are subject to change without notice.

EXHAUST GAS EMISSION DATA OF S12A2-PTA2 FOR GENERATOR

For Reference.

MODEL		S12A2-PTA2	
Stand-by Rating kW/min^{-1} (without fan)		840/1500	950/1800
NOx	g/kW･h	8.35	7.93
CO	g/kW･h	1.56	0.57
HC	g/kW･h	0.26	0.29
PM	g/kW･h	0.273	0.191

※The above values are D2 mode values.

※The value is not guaranteed.

※The value is subject to change without notice.

EXHAUST GAS EMISSION DATA OF Y1 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min-1		EPA Tier1 Emission Regulations (D2 mode)
S6R-Y1PTA-5	583/1500	-	
S6R-Y1PTA-4	-	670/1800	
S12A2-Y1PTA-1	-	900/1800	
S12H-Y1PTA-4	1020/1500	-	
S12H-Y1PTA-3	-	1140/1800	
S12R-Y1PTA-3	1220/1500	-	
S12R-Y1PTA-2	-	1403/1800	
S16R-Y1PTA-4	1701/1500	-	
S16R-Y1PTA-2	-	1750/1800	
S16R-Y1PTAA2-3	1939/1500	-	
S16R-Y1PTAA2-1	-	2149/1800	

NOx	g/kW・h	9.2
CO	g/kW・h	11.4
HC	g/kW・h	1.3
PM	g/kW・h	0.54

※The above values are D2 mode values.

※These engines are EPA Tier1 certified.

EXHAUST GAS EMISSION DATA OF Y2 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min-1		EPA Tier2 Emission Regulations (D2 mode)
S6R-Y2PTAW-1	-	685/1800	
S12A2-Y2PTAW-2	-	900/1800	
S12H-Y2PTAW-1	-	1140/1800	
S12R-Y2PTAW-1	-	1403/1800	
S16R-Y2PTAW-1	-	1750/1800	
S16R-Y2PTAW2-1	-	2180/1800	

NOx + HC	g/kW･h	6.4
CO	g/kW･h	3.5
PM	g/kW･h	0.2

※The above values are D2 mode values.

※These engines are EPA Tier2 certified.

EXHAUST GAS EMISSION DATA OF F1 SERIES ENGINES FOR GENERATOR

MODEL	Stand-by Rating (without fan) kW/min-1		EU Local Emission Regulations (France Local Emission Regulations Included)		
S12R-F1PTAW2	1462/1500	-	NOx	mg/Nm3	2000
S16R-F1PTAW2	1947/1500	-	CO	mg/Nm3	650
			HC	mg/Nm3	150
S16R2-F1PTAW	2167/1500	-	PM	mg/Nm3	50

※The above values are at 100% load (at Stand-by Power).

※The above values are measured at 5% O_2 content.

※Control method of emission level shall be compliant with EPA regulation.

Test Conditions

fa	$0.96 \leqq fa \leqq 1.06$	fa: Engine specific parameter considering atmospheric condition which is determined according to the following provisions. (See EUROMOT 2004 - EC 1997 68 Consolidated - Annex Ⅲ)
		$fa = (99/Ps)^{0.7} (Ta/298)^{1.5}$
		Ps: Dry Atmospheric pressure(kPa)
		Ta:Absolute temperature of the intake air(K)
Fuel	JIS K-2204 Type2	
Tfi	$33^{o}C \leqq Tfi \leqq 43^{o}C$	Tfi: The fuel temperature at the injection pump inlet.

EXHAUST GAS EMISSION DATA OF A2 SERIES ENGINES FOR GENERATOR

Mitsubishi exhaust emission controlled engine <EPA-Tier2 Comparable>
[Green-Oriented Engine Series]

MODEL	Stand-by Rating (without fan) kW/min-1		Emission Controlled (D2 mode)
S6R-A2PTAW-1	595/1500	-	
S6R2-A2PTAW-5	772/1500	-	
S12R-A2PTAW-2	1225/1500	-	
S12R-A2PTAW2-2	1463/1500	-	
S16R-A2PTAW-3	1710/1500	-	
S16R-A2PTAW2-1	1947/1500	-	
S16R2-A2PTAW-1	2167/1500	-	

NOx + HC	g/kW･h	6.4
CO	g/kW･h	3.5
PM	g/kW･h	0.2

※We hereby declare that diesel engine for generator application made by Mitsubishi Heavy Industries Engine & Turbocharger,Ltd. [Green-Oriented Engine Series(G.O.E.S)] satisfy the internal Tier2 standard (EPA Tier2 comparable level) in the prescribed test conditions.

※The above values are D2 mode values.

※Test procedure: Pursuant to EPA CFR 40 Part 89 and ISO8178-1.

※Test conditions: Pursuant to EPA CFR 40 Part 89 except that JIS No.2 diesel fuel is used.

※Above emission results do not include Deterioration Factor (DF).

※These engines are not EPA Tier2 Certified.

※Test report is issued by Vehicle Certification Agency (VCA) (Report/Job number: TBD).

※This document proves that these engine models are manufactured and supplied under the supervision of MHIET quality assurance system and satisfy MHIET internal Tier2 emission standard.

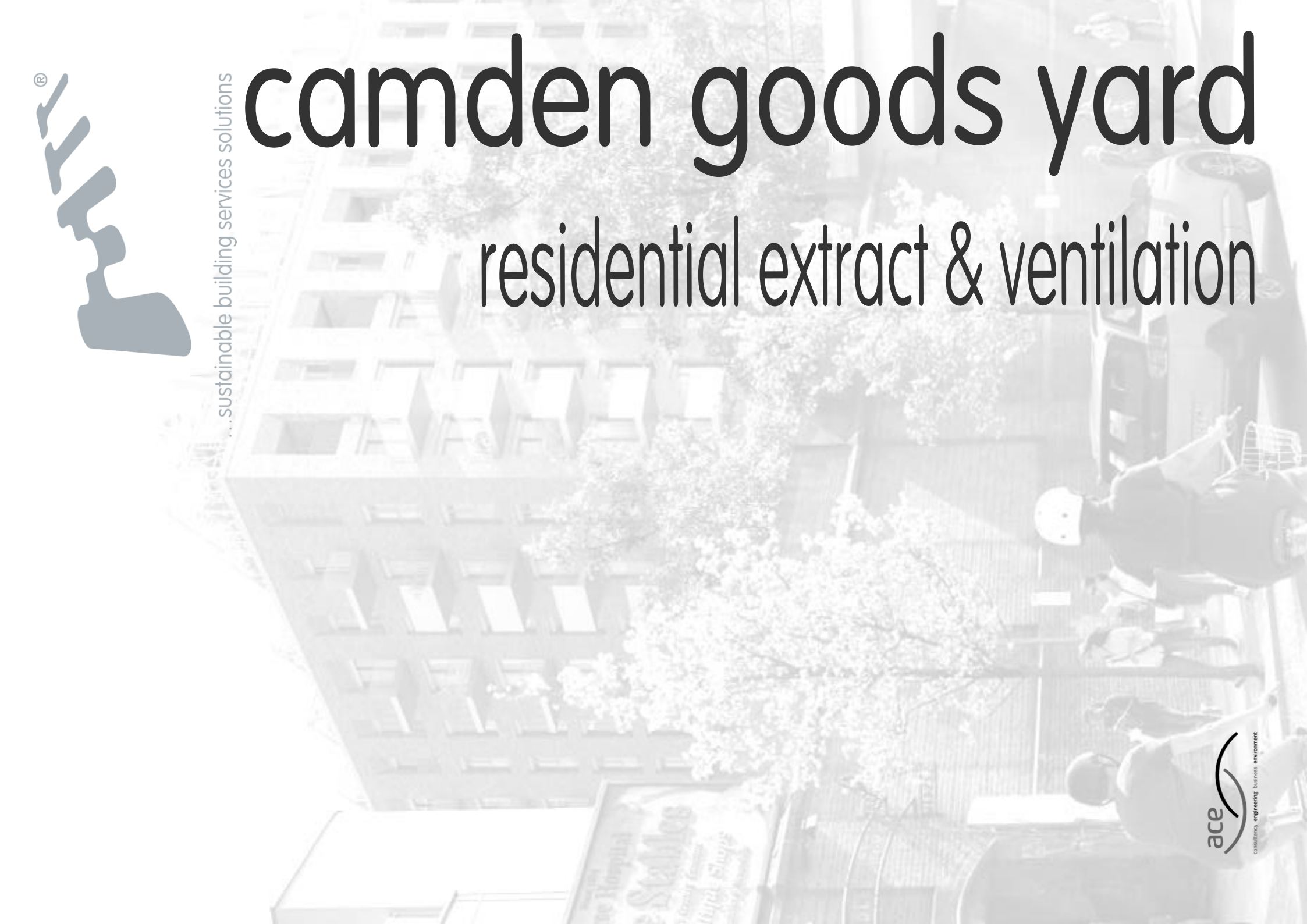
※This document does not guarantee the same emission performance when fuel or operating environment is different.

Appendix 2: Residential Extract and Ventilation

...sustainable building services solutions

camden goods yard

residential extract & ventilation



ace consultancy engineering business environment

DATE OF ISSUE	DETAILS OF CHANGE	AUTHOR	CHECKED
08.04.22	ISSUE ONE	RH	TW

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CONTENTS

MTT Limited 9 Kingsway London WC2B 6XF T: 020 7836 1133 E: info@mtt-limited.com W: www.mtt-limited.com

1.0 INTRODUCTION

Camden Goods Yard is a mixed-use development located next to Camden Market in Camden Town Centre (a metropolitan centre). The site is a former Morrison Supermarket and external car park.

The development is for St. George West London Ltd and comprises the demolition of the existing Morrisons Supermarket and Car park on the site and the construction of a new mixed use scheme providing approximately 644No apartments; tenant facilities including Gym & Swimming Pool; offices; workshops; retail units and a new Morrisons Supermarket with car parking facility.

The aim is to create a vibrant working, recreational and living environment, maximising revenue to commercial tenants and amenities for the residential community. These aims will only be achieved by the creation of a partnership between the Landlord and all of the commercial operators who share this goal. The objective is to generate substantial returns through high turnover trading, ensuring that the consumer is always offered 'value for money' in a quality environment.

This document is not intended to address each and every component of the Agreement and Lease. Any variation between the provisions of this document and the provisions of the Agreement of the Lease, the provisions of the Agreement or Lease as applicable shall prevail.

This strategy considers the extract and ventilation provisions for the residential units contained within the Ealing Filmworks development.

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2.0 GENERAL REQUIREMENTS

A complete domestic ventilation MVHR system shall be provided within all apartments on the proposed new development. The domestic ventilation system will be in accordance with the relevant Building Regulations and British Standards and shall not be limited to the following:

- The Building Regulations, Approved Document Part F
- CIBSE codes of practice
- HVCA
- British Standards

MVHR is proposed to serve all apartments, whereby appropriate noise attenuation in included on ductwork and the unit to ensure breakout noise is at acceptable levels.

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3.0 DESCRIPTION

3.1 Mechanical Ventilation with Heat Recovery (MVHR)

The Mechanical Ventilation Heat Recovery System will provide continually running mechanical ventilation comprising of supply air within all living/dining and bedrooms and then extraction from kitchens, bathrooms, and utility cupboards.

The MVHR system shall be installed complete with room supply / extract valves using a flat ductwork system. The ductwork shall be routed within the ceiling void whereby the intake and exhaust ductwork shall be insulated and routed via externally mounted grille located on the façade of the building.

Image 1: Typical Mechanical Ventilation Heat Recovery Unit (MVHR) Unit with acoustic enclosure

The requirement of an MVHR system within the apartments on the development shall be to meet the air quality standards indicated within the Air Quality Consultants report and Acoustic Consultants report.

The current Air Quality Report produced by Ardent (Rev A) states that "*No additional mitigation is required*". With regards to the Acoustic report, Cole Jarman had produced a Apartment Mechanical Services Noise Memorandum whereby the following measures are to be included within the MVHR system design:

- All intake and exhaust ducts are to be fitted with the Nuaire PVCSIL-1000mm attenuator.
- Supply duct to be fitted with Nuaire PVCSIL-1000mm attenuator.
- Extract duct to be fitted with Nuaire PVCSIL-1000mm attenuator.
- Nuaire units are to be from the Acoustic Enclosure range.

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4.0 MAINTENANCE

All facade terminals (MVHR intake and exhaust ductwork), terminates behind grilles to be installed above windows. The grilles will require periodic cleaning of between 12 and 24 months. However, this is not prescriptive and is likely to vary subject to local conditions. Cleaning can be carried out as part of facade maintenance were carried out by abseiling.

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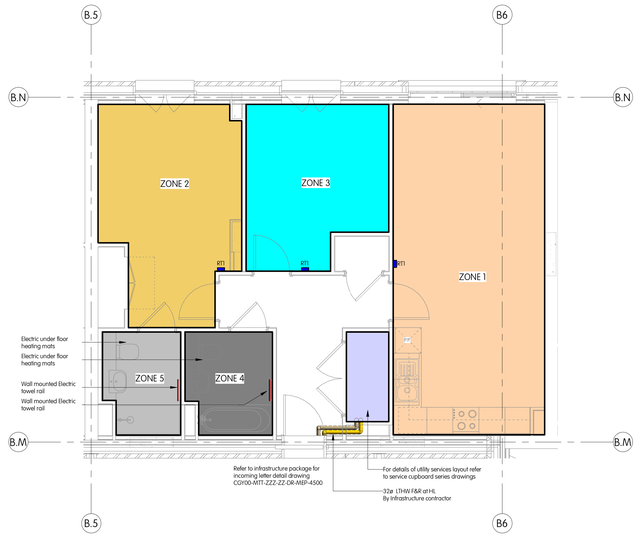
Notes:

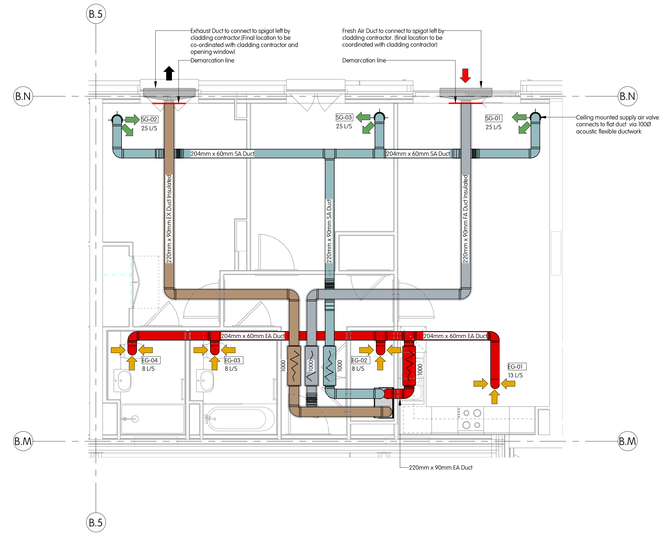
1. This drawing is for enginering services only and is to be read in conjunction with all relevant architectural, structural, mTT drawings and the Contract specification and schedules.
2. THIS IS NOT AN INSTALLATION DRAWING.
3. All services routes and equipment locations are indicative, actual location and configuration to be determined by contractor following completion of contractor design and cordination.
4. This drawing will only be issued in PDF format.
5. Worked to figured dimensions only.
6. For details of services within utility cupboard refer to typical utility cupboard series drawings.
7. For details of services within common corridor refer to infrastructure mechanical layouts.
8. Air transfer between spaces via undercut door. Minimum door undercut of 10mm is required to Allow for the transfer of air.
9. Fan Coil manufacturer shall install Recessed Room Temperature sensors for each zone approximately 1.5m above FFL. On the wall adjacent to each zone away from direct sunlight. Final location of thermostats are to be co-ordinated with architect, FCU supplier and underfloor heating contractor. Room temperature controllers to be within utility cupboard switching off either heating or cooling depending on use.
10. Fire Collars are required where MVHR ducts pass through protected hallways and service cupboard walls.
11. Fan coils along with all associated cable trays and controls have been purchased as part of the infrastructure package and are shown for information only. Contractor is to co-ordinate with the AC contractor.
12. Refer to Architects layouts for all setting out of grilles, access panels and sensors etc. Contractor to co-ordinate final location with relevant codes.
13. Refer to underfloor heating specialist drawings for details of zones and outputs.
14. Kitchen specialist to supply and fit kitchen extract canopy with sufficient duty to meet Part F Building Regulations. Cooker Hood to be supplied by Main Contractor as part of kitchen fit out works and is assumed to be of the room recirculation type without requirements for ducting to atmosphere.
15. Purge ventilation in compliance with Building Regulations Part F to be provided by openable windows in accordance with Architect's calculation & specification.
16. The complete installation shall comply with insurers Warranty requirements & recommendations.
17. All ductwork connected to or passing through unheated spaces shall be thermally insulated in accordance with specification.
18. MVHR has been purchased as part of the infrastructure package MUC module. Contractor is to co-ordinate their service to align with the module.

Heating and Cooling Legend

1000	Nuaire Silencer PVCSIL-1000
500	Nuaire Silencer PVCSIL-500
SG-XX	Supply Grille Reference
EG -XX	Extract Grille Reference
	FCU Access Panel
	Return air (Cooling) arrows
	supply air (Cooling) arrows
	Fresh air intake arrows
	Exhaust air arrows
	Supply air flow arrows
	Extract air flow arrows
	Supply air (SA) duct from MVHR to Grille
	Fresh air (FA) supply duct from outdoor to MVHR
	Extract air (EA) duct from Grille to MVHR
	Exhaust air (EX) duct from MVHR to outside
	Refrigerant Tray by Infrastructure
	Supply Grille, Steel, Dia 125mm similar to Nuaire
	Extract Grille,Steel, Dia 125mm similar to Nuaire.
RT1	Wet Under floor Heating Room Thermostat
FCS	Fan Coil Sensor
	HepVO waterless trap with direct connection to FCU condensate as per st'Gerorge Leak mitigation measures Document
	Fan coil unit within ceiling void by infrastructure



AI_2B4P_A_TYPE 1_B_Heating Layout
1 : 50



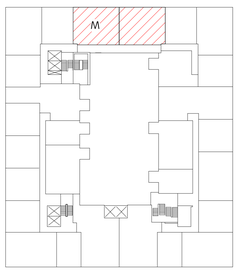
AI_2B4P_A_TYPE 1_B_Ventilation
1 : 50

TYPICAL APARTMENTS SCHEDULE

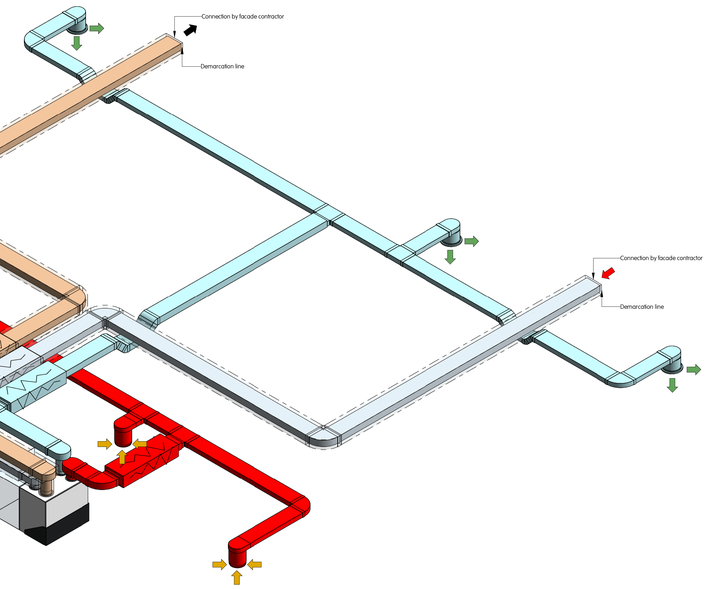
AI_2B4P_A_TYPE 1_B
Plot numbers:

PLOT 114	(AI)	PLOT 132	(AI)	PLOT 150	(AI)
PLOT 115	(AI)	PLOT 133	(AI)	PLOT 151	(AI)
PLOT 123	(AI)	PLOT 141	(AI)		
PLOT 124	(AI)	PLOT 142	(AI)		

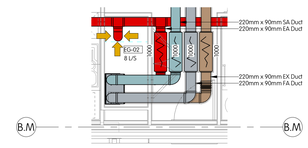
H - Hand Version
S - Standard
P - Premier
A - Afforbable
AI - Affordable intermediate



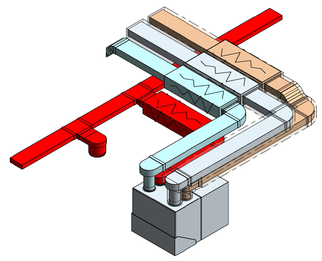
KEY PLAN



AI_2B4P_A_TYPE 1_B_Mechanical 3D View



AI_2B4P_A_TYPE 1_B_Handed version
1 : 50



AI_2B4P_A_TYPE 1_B_Handed version Mechanical 3D View

1. Based on architectural model CGYB0-PTA-ZZZ-ZZ-M3-AR-0001.rvt Date 2022-08-18
2. Based on infrastructure model: CGYB0-WAS_ZZZ-ZZ-M3-ST-0001.rvt Date 2022-08-18

Rev.	Date	Description	Drawn	Checked
T3	17-11-2022	STAGE 4 ISSUE	NK	GS
T2	06-10-2022	STAGE 4 ISSUE	NK	ES
T1	08-09-2022	STAGE 4 ISSUE	NK	ES

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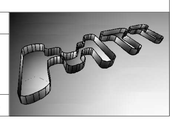
PM	T Ward
Cad	N Keyser
Date	July 2022
Scale	As indicated @ A0
Status	Stage 4

Camden Goods Yard

Mechanical Services
Building B
Typical Apartment Layout
AI_2B4P_A_TYPE 1_B

Drg No. CGYB0-MTT-RES-ZZ-DR-M-4210 Revision T3



Appendix 3: Car Park Ventilation

Car Park Ventilation

The basement will generally be served by a combined day-to-day / smoke ventilation system. The system will consist of:

- Intake from ramp
- Soffit mounted cyclone/impulse fans on level -01 and -02
- Extract fan room on level -01
- Extract point through hit and miss brickwork in western boundary wall above ground level

The system will operate day to day based on temperature and CO levels within the car park switching between level -01 and -02 by way of motorised dampers within the fan room.

Upon receipt of a fire signal the system shall ramp up supplying air to the fire floor only.

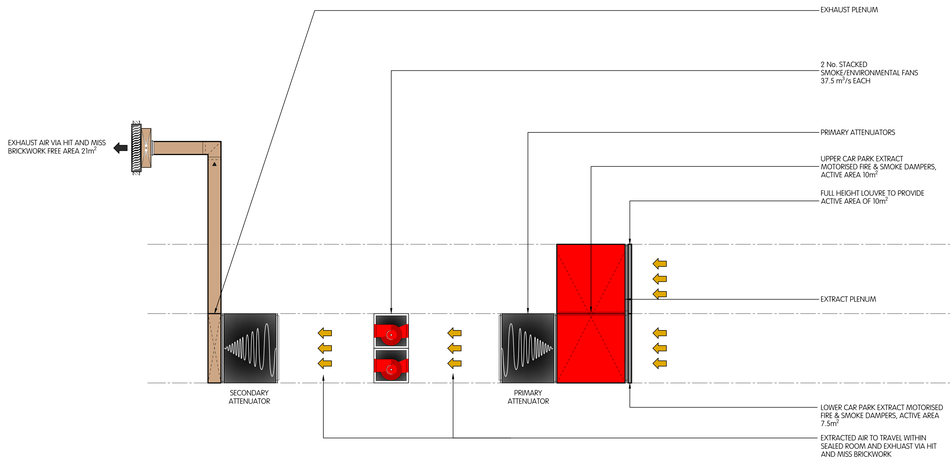
CFD analysis are to be undertaken by the smoke ventilation specialist supplier to confirm the system complies with the requirements set out in BR Part F and Part B.

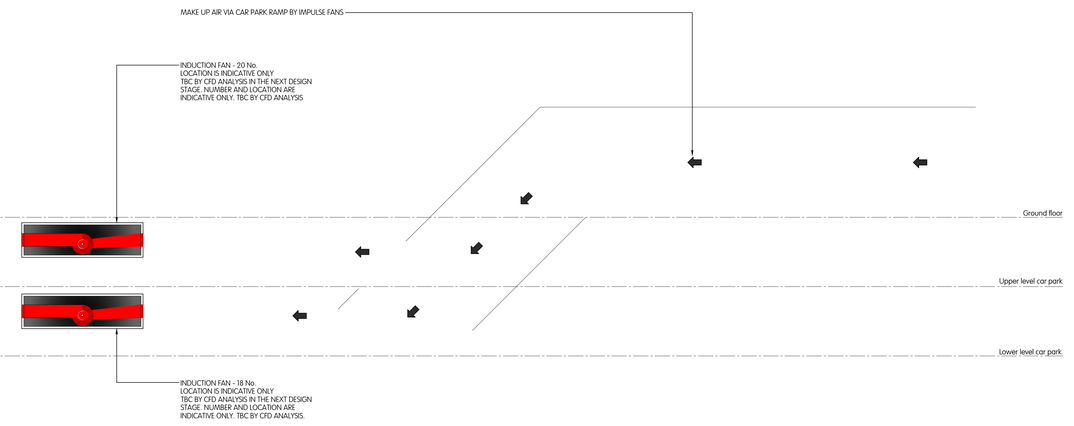
The system will be capable of ramping up on receipt of a fire signal to provide a minimum of 10 ACH to the fire zone.

The system shall be designed in line with the recommendations within the Fire Strategy Report.

NOTES

1. This drawing is for engineering services only and is to be read in conjunction with all relevant architectural, structural, MTT drawings and the Contract specification.
2. THIS IS NOT AN INSTALLATION DRAWING.
3. All services routes and equipment locations are indicative, actual location and configuration to be determined by contractor following completion of contractor design and coordination.





Based on architectural drawing/s:

Rev	Date	Description	Drawn	Checked
P1	14.12.2021	Stage 4 Issue	MM	RH

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Scale	NTS@A0
Status	STAGE 4

Camden Goods Yard

Mechanical Services
Car Park
Ventilation Schematic

Drg No. CGY0B-MTT-ZZZ-ZZ-DR-M-1000 Revision P1