



DISPERSION MODELLING ASSESSMENT

AT

DATA CENTRE, GREENWICH VIEW PLACE, ISLE OF DOGS, LONDON

AQ109204

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Prepared For

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EXECUTIVE SUMMARY

Ensafe Consultants was commissioned by Hurley Palmer Flatt to undertake a Dispersion Modelling Assessment in support of an Environmental Permit application for a data centre located at units 1, 2 and 4 Greenwich View Place, Isle of Dogs, London.

Pollutant emissions from the development will be associated with the site's combustion plant. The development comprises the installation of 9 diesel back up (standby) generators.

Impacts were predicted based on a conservative emissions scenarios. As such, predicted concentrations are considered to be assessed robustly.

The dispersion modelling results indicated that impacts upon existing pollutant concentrations at both human and ecological sensitive receptors were predicted to be **not significant** for both operational scenarios assessed (Scenarios 1 and 2).

A third scenario (Scenario 3) is representative of a power outage, which is considered to be an emergency and highly rare event (1 every 10 years) where the minimum number of generators required to meet the electrical load will operate for a maximum of 5 hours. As such, this is a highly infrequent and emergency event and it would not affect the overall significance of the impacts associated with the development site. Modelling based on conservative was undertaken for this scenario however, it cannot determine the overall significance.

Based on the predictions and the use of robust assumptions, it is considered that the overall air quality impacts of the development would be **not significant**.

1.0 INTRODUCTION

1.1 Background

Ensafe Consultants (Ensafe) was commissioned by Hurley Palmer Flatt to undertake a Dispersion Modelling Assessment in support of an Environmental Permit (EP) for a data centre located at units 1, 2 and 4 Greenwich View Place, Isle of Dogs, London.

1.2 Site Location and Context

The proposed development is located at units 1, 2 and 4 Greenwich View Place, Isle of Dogs, London at approximate National Grid Reference (NGR): 537660, 179260. The proposed site is located in an existing residential and commercial area.

Reference should be made to Figure 1 within Appendix I for a map of the proposed generator locations, surrounding area, and the modelling domain.

Pollutant emissions from the development will be associated with the site's combustion plant. The development comprises the installation of 9 diesel back up (standby) generators with an overall rated thermal input at 74.23 Mega Watts (MW). A Dispersion Modelling Assessment has therefore been undertaken in order to support the Part A EP application. This is detailed in the following report.

1.3 Limitations

This report has been produced in accordance with Ensafe's standard terms of engagement. Ensafe has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensafe; a charge may be levied against such approval.

2.0 LEGISLATION, GUIDANCE AND ENVIRONMENTAL STANDARDS

The following legislation and guidance will be considered and adhered to during the preparation of the Dispersion Modelling Assessment:

- *European Union (EU) Directive 2008/50/EC;*
- *Section 82 of the Environment Act (1995) (Part IV);*
- *The Air Quality Standards (Amendment) Regulations (2016)¹;*
- *London Local Air Quality Management (LLAQM) Technical Guidance 2016, LLAQM.TG (16), Greater London Authority (GLA), 2016;²*
- *Air emissions risk assessment for your environmental permit, Environment Agency (EA), updated on 7th October 2020³; and*
- *Environmental permitting: air dispersion modelling reports, EA, updated on 24th May 2019⁴*

The modelling assessment will be undertaken and compared against the relevant long term and short-term environmental standards. The Air Quality Objectives (AQOs) which are applicable to this assessment are summarised in Table 1 with relation to human health receptors. These criteria are collectively referred to as Environmental Quality Standards (EQSs).

Table 1: Environmental Quality Standards for Human Exposure

Pollutant	Air Quality Objectives	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Periods
Nitrogen dioxide (NO_2)	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
Particulate matter with an aerodynamic diameter of less than $10\mu\text{m}$ (PM_{10})	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
Particulate matter with an aerodynamic diameter of less than $2.5\mu\text{m}$ ($\text{PM}_{2.5}$)	25	Annual mean
Carbon monoxide (CO)	10,000	8-hour running mean
Benzene (C_6H_6)	5	Annual mean
Sulphur dioxide (SO_2)	125	24-hour mean; not to be exceeded more than 3 times a year
	350	1-hour mean; not to be exceeded more than 24 times a year
	266	15-minute mean; not to be exceeded more than 35 times a year

Table 2 summarises the advice provided in the GLA guidance LLAQM (TG16)² on where the AQOs for pollutants considered within this report apply.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007

² London Local Air Quality Management Technical Guidance 2016 LLAQM (TG16), GLA, 2016.

³ <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>

⁴ <https://www.gov.uk/guidance/environmental-permitting-air-dispersion-modelling-reports>

Table 2: Examples of Where the Air Quality Objectives Apply

Averaging Periods	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	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 and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. 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
1-hour mean	All locations where the annual mean and 24-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 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 be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access
15-minute mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes	

The modelling assessment will also be undertaken to compare ecological impacts against the relevant critical loads and levels. A critical load (CL) is defined by the UK Air Pollution Information System (APIS) as:

"A quantitative estimate of exposure to deposition of one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge. The exceedance of a critical load is defined as the atmospheric deposition of the pollutant above the critical load."

A critical level is defined as:

"Threshold for direct effects of pollutant concentrations according to current knowledge. Exceedance of a critical level is defined as the atmospheric concentration of the pollutant above the critical level."

A critical load refers to deposition of a pollutant, while a critical level refers to pollutant concentrations in the atmosphere (which usually have direct effects on vegetation or human health).

When pollutant loads (or concentrations) exceed the critical load or level it is considered that there is a risk of harmful effects. The excess over the critical load or level is termed the exceedance. A larger exceedance is often considered to represent a greater risk of damage.

Maps of critical loads and levels and their exceedances have been used to show the potential extent of pollution damage and aid in developing strategies for reducing pollution. Decreasing deposition below the critical load is seen as means for preventing the risk of damage. However, even a decrease in the exceedance may infer that less damage will occur.

Critical loads have been designated within the UK based on the sensitivity of the receiving habitat and have been reviewed for the purpose of this assessment.

Table 3 presents the critical levels for the protection of vegetation for pollutants considered within this assessment. Again, the criteria has been referred to as EQS.

Table 3: Environmental Quality Standards for Vegetation

Pollutant	Environmental Quality Standard	Unit	Averaging Period
Oxides of nitrogen (NO _x)	30	µg/m ³	Annual mean
	75	µg/m ³	24-hour mean
SO ₂	20	µg/m ³	Annual mean

3.0 METHODOLOGY

Emissions associated with the proposed generators have the potential to cause increases in pollutant concentrations in the vicinity of the site. These have been quantified through dispersion modelling in accordance with the methodology outlined in the following Sections.

An industry standard atmospheric dispersion model, ADMS 5.2, was used to model releases of the identified substances. The dispersion modelling procedure was as follows:

- Information on stack dimensions and position were provided by Hurley Palmer Flatt;
- Process conditions were provided by Hurley Palmer Flatt based on technical data sheets for the generator specifications;
- Emission rates were provided by Hurley Palmer Flatt based on technical data sheets for the generator specifications;
- Appropriate data to describe meteorological conditions in the vicinity of the site were obtained from Atmospheric Dispersion Modelling (ADM) Ltd;
- The above information was entered into the dispersion model;
- The dispersion model was run to determine pollutant concentrations in the vicinity of the site; and
- The study results were compared with the relevant assessment criteria.

It has been confirmed by Hurley Palmer Flatt that three operating scenarios will need to be considered as part of the assessment and are outlined below:

- **Scenario 1:** Monthly test – this will be offload (0% load) tests for 30 minutes on a weekend with only 1 generator operating concurrently;
- **Scenario 2:** Annual test – this will be onload (75% load) for 3 hours on a weekend with only 1 generator operating concurrently; and
- **Scenario 3:** Emergency power outage – at a worst-case this will be onload (75% load) for 5 hours with all 9 generators operating cumulatively (In general only the generators required to carry site load would operate).

Scenarios 1 and 2 for plant testing are considered as the normal operation of this facility. As advised by Hurley Palmer Flatt, Scenario 3 is representative of an emergency power outage, which is considered to be a highly rare event (1 every 10 years) and only the minimum number of generators required to meet the electrical load will operate for a maximum of 5 hours. As such, this is a highly short-term emergency event and it would not affect the overall operational significance of the impacts associated with the development site. Modelling based on conservative emissions has been undertaken for this scenario however, it should not determine the overall significance of the operation of the plant. Emissions concentrations have been provided for this scenario for completeness.

3.1 Dispersion Model

Dispersion modelling was undertaken using ADMS 5 (v5.2.4.0), which is developed by Cambridge Environmental Research Consultants (CERC) Ltd. ADMS 5 is a short-range dispersion modelling software package that simulates a wide range of buoyant and passive releases to atmosphere. It is a new generation model utilising boundary layer height and Monin-Obukhov length to describe the atmospheric boundary layer and a skewed Gaussian concentration distribution to calculate dispersion under convective conditions.

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.

It should be noted the modelling prediction produce by the ADMS-5 are widely accepted within the UK by the EA and DEFRA.

3.2 Modelling Scenarios

Three operating scenarios will need to be considered as part of the modelling assessment and are outlined below:

- **Scenario 1:** Monthly test – this will be offload (0% load) tests for 30 minutes on a weekend with only 1 generator operating concurrently;
- **Scenario 2:** Annual test – this will be onload (75% load) for 3 hours on a weekend with only 1 generator operating concurrently; and
- **Scenario 3:** Power outage – at a worst-case this will be onload (75% load) for 5 hours with all 9 generators operating cumulatively (In general only the generators required to carry site load would operate).

To ensure a conservative approach was undertaken for both Scenario 1 and Scenario 2, it was assumed that 2 generators (one on 1 Greenwich View Place and one on 2-4 Greenwich View Place) will be operating cumulatively. In addition, for Scenario 1 all generators were modelled for at 10% load to best represent emissions at 0% load.

The pollutant scenarios considered in the modelling assessment are summarised in Table 4.

Table 4: Dispersion Modelling Scenarios

Parameter	Modelled As	
	Short Term	Long Term
NO ₂	99.79%ile 1-hour mean	Annual mean
PM ₁₀	90.41%ile 24-hour mean	Annual mean
PM _{2.5}		Annual mean
CO	Maximum daily running 8-hour mean	-
Total Hydrocarbons (HC) as C ₆ H ₆		Annual mean
SO ₂	99.9%ile 15-minute mean	Annual mean
	99.73%ile 1-hour mean	
	99.18%ile 24-hour mean	

Some short-term air quality criteria are framed in terms of the number of occasions in a calendar year on which the concentration should not be exceeded. As such, the percentiles (%ile) shown in Table 4 were selected to represent the relationship between the permitted number of exceedances of short-period concentrations and the number of periods within a calendar year.

It is not possible to add short-term peak baseline and process concentrations. The EA guidance³ advises that an estimate of the maximum combined pollutant concentration can be obtained by adding the maximum predicted short-term concentration due to emissions from the source to twice the annual mean baseline concentration. This approach was adopted throughout the assessment.

3.3 Stack Information

Combustion products from the proposed generators will be emitted from dedicated stacks. Relevant details for Scenarios 1 and 2 are presented in Table 5.

Table 5: Stack Information – Scenarios 1 and 2

Plant Reference	Stack Location NGR (m)	
	X	Y
Generator on 2-4 Greenwich View Place	537669.27	179206.22
Generator on 1 Greenwich View Place	537638.54	179307.24

All 9 generators were operation for Scenario 3 with details presented in Table 6.

Table 6: Stack Information – Scenario 3

Plant Reference	Stack Location NGR (m)	
	X	Y
Generator 1	537658.00	179206.72
Generator 2	537664.18	179206.17
Generator 3	537670.05	179205.76
Generator 4	537676.66	179205.07
Generator 5	537682.53	179204.56
Generator 6	537639.06	179315.75
Generator 7	537639.06	179314.26
Generator 8	537638.02	179300.12
Generator 9	537637.94	179298.18

Reference should be made to Figure 1 within Appendix I for a graphical representation of the stack locations.

3.4 Process Conditions

Process conditions for each generator were provided through correspondence with Hurley Palmer Flatt and the technology provider. It should be noted that all 9 generators are the same specification, the MTU 20V4000 DS4000. Reference should be made to Table 7 for the generator parameters for each load modelled.

Table 7: Process Conditions

Parameter	Unit	10% Load	75% Load
Stack diameter	m	0.675	0.675
Stack height	m	26.2	26.2
Flue gas efflux velocity	m/s	6.45	24.38
Volumetric flow rate (actual)	m ³ /s	2.31	8.72
Temperature	°C	269	427

3.5 Emissions

The emission rates from the gas generators were calculated based on referenced emission concentrations outlined within the technical data sheet. The mass emissions rate for each modelled load are shown in Table 8 and Table 9.

Table 8: Emission Rates – 10% Load

Pollutant	Emission Maximum (mg/Nm ³) ^a	Emission Maximum (mg/m ³) ^b	Mass Emission Rate (g/s)
NO _x	2411.00	788.50	1.82
Particulate matter (PM)	13.00	4.25	0.01
CO	723.00	236.45	0.55
HC	187.00	61.16	0.14
SO ₂	1.00	0.33	0.001

a. Reference condition: 5% Oxygen

b. **Actual condition:** 15.7% Oxygen

Table 9: Emission Rates – 75% Load

Pollutant	Emission Maximum (mg/Nm ³) ^a	Emission Maximum (mg/m ³) ^b	Mass Emission Rate (g/s)
NO _x	2172.00	1420.68	12.39
PM	10.00	6.54	0.06
CO	139.00	90.92	0.85
HC	23.00	15.04	0.13
SO ₂	1.00	0.65	0.01

a. **Reference condition:** 5% Oxygen

b. **Actual condition:** 10.5% Oxygen

For the purposes of dispersion modelling it was considered that the entire HC emission consisted of only C₆H₆ and the entire PM emission was used wholly for both PM₁₀ and PM_{2.5}. This allowed the maximum ground level impacts to be assessed with respect to the AQOs. Actual plant emissions of HCs and PM are unlikely to only consist of one species, resulting in a worst-case assessment and an overestimate of predicted concentrations.

3.6 Time Varied Emissions

As mentioned previously, three operating scenarios will need to be considered as part of the modelling. The total operational hours for a full calendar year for each scenario are outlined below:

- **Scenario 1:** 54 hours per annum
- **Scenario 2:** 76.5 hours per annum
- **Scenario 3:** 5 hours (1 every 10 years event)

Specific operating hours are not known and total flexibility is required throughout the year to reflect the ever-changing UK energy market. As such, it is therefore difficult to accurately assess the short-term impacts for NO₂ concentrations, given that objectives are based on the number of allowances that can be exceeded for a specified averaging period.

Therefore, the ADMS model was run for a full calendar year (8,760 hours) of continuous operation to ensure that the varying hourly meteorological conditions were captured. However, as the annual operational hours for each scenario are significantly lower than the full calendar year (8,760 hours), an approach utilising hypergeometric probability distribution was undertaken for 1-hour NO₂ concentrations. The methodology is provided within the EA Guidance 'Specified generators: air dispersion modelling example short term statistical analysis'⁵. It should be noted that when the proposed operating period is continuous of more than 1-hour then the calculated probability is multiplied by a factor of 2.5.

In order to assess the short-term impacts for the remaining pollutants at both human and ecological receptors, the impact assessments was based on operation of the generators for a full calendar year. This ensured a worst-case emissions as predicted concentrations are likely to be overestimations of actual concentrations.

For Scenario 2, the generators will be operational at two loads (10% and 75%). The client has advised that the annual tests (75% load) would take place on a weekend after 18:00 in December. As such, a time varying emissions (VAR) file was produced where operations at 75% load were assigned to all Saturdays in December after 18:00 for 27 hours cumulatively (each generator operational for 3 hours). 10% loads were assigned to all remaining met lines in the year. This ensures a conservative approach has been considered.

⁵ Specified generators: air dispersion modelling example short term statistical analysis, Environment Agency, 2019

With relation to the annual mean assessment, this again was undertaken in accordance with the EA guidance⁵, which suggests the annual mean PCs can be calculated by scaling down long term predictions by the total number of operational hours over the total number of hours in the operating envelope.

In this instance scaling factors of **0.0062**, **0.0087** and **0.0006** were applied to annual mean PC result for human and ecological receptor locations and grid results for Scenarios 1, 2 and 3, respectively. The factor equates to the operational hours per year divided by the operational envelope of 8,760 hours. Annual mean PECs were then calculated by adding the annual mean background concentrations detailed in Table 17.

3.7 Assessment Extents

Ambient concentrations were predicted over the following areas, relating to the modelling domain of human receptor locations:

- NGR: 537520, 179150 to 537760, 179390.

One Cartesian grid with a resolution of 5m and a height of 1.5m was included in the model. Results were subsequently used to produce contour plots within the Surfer software package.

3.8 Meteorological Data

Meteorological data used in this assessment was taken from London City Airport meteorological station over the period 1st January 2015 to 31st December 2019 (inclusive). London City Airport meteorological station is located at approximate NGR: 5430000, 180510, which is approximately 4.7km north-east of the development site.

All meteorological data used in the assessment was provided by ADM Ltd, which is an established distributor of meteorological data within the UK. Reference should be made to Figure 2 within Appendix I for wind roses of utilised meteorological data. As previously stated, maximum emissions across the five years of meteorological data were utilised to ensure a worse case assessment. Hourly sequential formats were used with the dispersion modelling.

3.9 Roughness Length

The specific roughness length (z_0) values used to represent conditions in the vicinity of the application site, as well as conditions at the meteorological are summarised in Table 10.

Table 10: Utilised Roughness Lengths

Location	Roughness length (m)	ADMS Description
Application Site	1.5	Large urban areas
Meteorological Station	1.0	Cities, woodlands

Both values of z_0 are considered appropriate for the morphology of the assessment area.

3.10 Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. The specific length values used to represent conditions in the vicinity of the application site, as well as conditions at the meteorological are summarised in Table 11.

Table 11: Utilised Monin-Obukhov Lengths

Location	Monin-Obukhov length (m)	ADMS Description
Application Site	100	Large conurbations > 1 million
Meteorological Station	100	Large conurbations > 1 million

Both Monin-Obukhov values are considered appropriate for the morphology of the assessment area.

3.11 Terrain Data

Ordnance Survey Landform Panorama terrain data was included for the site and surrounding area in order to take account of the specific flow field produced by variations in ground height throughout the assessment extents. This was pre-processed using the dedicated function within ADMS 5 and covers a 5km x 5km area extending from the centre of the proposed site.

3.12 Building Effects

The dispersion of substances released from elevated sources can be influenced by the presence of buildings close to the emission point. Structures can interrupt the wind flows and cause significantly higher ground-level concentrations close to base of buildings than would arise in the absence of the buildings. Building heights were approximated using the Google Earth Pro software which provides 3D visualisations of building structures. The buildings included within the model are summarised in Table 12.

Table 12: Building Geometries

Building		NGR (m)		Height (m)	Length (m)	Width (m)	Angle (°)
		X	Y				
1	2, 4 Greenwich View Place	537672.8	179240.6	24.2	74.2	31.3	184.6
2	1 Greenwich View Place	537659.3	179305.4	24.2	25.7	43.8	184.5
3	2, 4 Greenwich View Place	537669.8	179285.0	24.2	14.1	18.6	184.5
4	3 Greenwich View Place	537708.3	179235.6	14.1	28.2	8.8	184.0
5	3 Greenwich View Place	537715.3	179235.0	14.1	21.6	6.7	184.2
6	City Reach, 5 Greenwich View Place	537672.0	179176.4	36.0	30.7	25.3	182.1
7	City Reach, 5 Greenwich View Place	537664.9	179161.1	36.0	14.1	12.1	183.0
8	City Reach, 5 Greenwich View Place	537658.0	179147.7	36.0	58.8	11.5	230.1
9	City Reach, 5 Greenwich View Place	537625.8	179122.6	18.8	15.2	23.8	140.0
10	City Reach, 6 Greenwich View Place	537617.6	179123.0	40.0	28.2	12.4	183.4
11	City Reach, 6 Greenwich View Place	537596.3	179120.3	40.0	21.4	55.0	184.1
12	City Reach, 5 Greenwich View Place	537652.7	179173.1	13.4	38.9	12.7	183.3
13	City Reach, 6 Greenwich View Place	537596.9	179134.4	13.4	6.7	30.3	182.5
14	7 Greenwich View Place	537608.4	179180.2	7.5	48.2	32.2	184.3
15	7 Greenwich View Place	537586.4	179170.3	7.5	26.7	10.7	183.9
16	8 Greenwich View Place	537607.5	179250.1	7.5	31.0	43.4	184.1
17	8 Greenwich View Place	537610.2	179270.3	7.5	11.1	26.5	182.1
18	8 Greenwich View Place	537612.5	179226.5	7.5	14.2	30.7	182.9
19	23-39 Pepper Street	537653.3	179339.9	14.3	10.2	51.7	183.6
20	16 Pepper Street	537679.2	179366.2	14.3	22.1	11.8	184.2
21	2-4 Muirfield Crescent	537639.3	179363.4	14.3	10.3	22.0	185.3
22	2-4 Muirfield Crescent	537645.7	179373.5	14.3	10.4	10.6	184.4
23	55-59 Pepper Street	537615.5	179339.9	13.8	6.4	19.1	146.2
24	Bellerive House, Muirfield Crescent	537656.0	179402.1	24.7	20.0	86.6	183.2

Reference should be made to Figure 1 within Appendix I for a graphical representation of the modelled building layout and the ADMS 5 model input.

3.13 NO_x to NO₂ Conversion

Emissions of NO_x from combustion processes are predominantly in the form of NO. Excess oxygen in the combustion gases and further atmospheric reactions cause the oxidation of NO to NO₂.

Ground level NO_x concentrations were predicted through dispersion modelling. NO₂ concentrations reported in the results section assume 70% conversion from NO_x to NO₂ for long term concentrations and 35% conversion for short-term concentrations, based upon EA guidance⁴.

3.14 15 Minute SO₂ Concentration Predictions

Throughout the assessment, 15-minute mean SO₂ concentrations have been calculated using the following correction factor based upon empirical relationships with the 99.9th percentile of 1-hour means, as described in EA guidance³:

- *99.9th percentile of 15-minute means = 1.34 x 99.9th percentile of 1-hour means*

3.15 Deposition Rates

Deposition rates were calculated using the conversion factors provided within EA document 'Technical Guidance on Detailed Modelling approach for an Appropriate Assessment for Emissions to Air AQTAG 06'⁶. Predicted pollutant concentrations were multiplied by the relevant deposition velocity and conversion factor to calculate the speciated dry deposition flux. The conversion factors used are presented within Table 13.

Table 13: Conversion Factors to Determine Dry Deposition Flux

Pollutant	Grassland Deposition Velocity (m/s)	Forest Deposition Velocity (m/s)	Conversion Factor (µg/m ² /s to kg/ha/yr of pollutant species)
NO ₂	0.0015	0.003	96.0
SO ₂	0.0120	0.024	157.7

Acid deposition can occur as a result of NO₂ and SO₂. Predicted ground level pollutant concentrations were converted to kilo-equivalent ion depositions (keq/ha/yr) for comparison with the critical load for acid deposition at each of the identified ecological receptors.

The conversion to units of equivalents, a measure of the potential acidifying effect of a species, was undertaken by multiplying the dry deposition flux by the standard conversion factors shown in Table 14.

Table 14: Conversion Factors to Units of Equivalents

Species	Conversion Factor from kg/ha/yr to keq/ha/yr
N	Divide by 14
S	Divide by 16

The total N and S proportions were calculated from the NO₂ and SO₂ concentrations in accordance with the methodology outlined in AQTAG 06⁶.

⁶ AQTAG 06: Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air, EA, 2014

3.16 Significance of Predicted Impacts

Human Sensitive Receptors

Predicted pollutant concentrations are summarised in the following formats:

- *Process contribution (PC) - Predicted pollutant concentration as a result of emissions from the site only; and*
- *Predicted environmental concentration (PEC) - Total predicted pollutant concentration as a result of emissions from the site plus existing baseline levels.*

The significance of predicted impact has been assessed in accordance with EA criteria and through consideration of likely effects as a result of the proposals. EA guidance³ states that process contributions can be considered insignificant if:

- *the short-term PC is less than 10% of the short-term environmental standard; and*
- *the long-term PC is less than 1% of the long-term environmental standard.*

If you meet both of these criteria you don't need to do any further assessment of the substance.

If these criteria are not met then a second stage of screening to determine the impact of the PEC is required.

- *The short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration; and*
- *The long-term PEC is less than 70% of the long-term environmental standards.*

If the predicted long-term PC is greater than 1% and the PEC is less than 70% of the long-term environmental standard, the emissions can be considered insignificant. Should the predicted PEC be greater than 70% of the long-term environmental standard, a detailed dispersion modelling is required. For short-term environmental standards, impact can be screened out if the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration.

In the case in which PCs and PECs cannot be screened as insignificant, detailed modelling is required. Currently there are no accepted criteria to determine whether PCs or PECs are insignificant or significant. As such the EA guidance⁴ suggest that significance should be based on professional judgement and considered on site specific circumstances.

Ecological Sensitive Receptors

The significance of predicted impacts on ecological receptors has been assessed in accordance with the criteria outlined within EA guidance³ and through consideration of likely effects as a result of the proposals. If your emissions that affect special protection areas (SPAs), special areas of conservation (SACs), RAMSAR sites or site of special scientific interest (SSSIs) meet both of the following criteria, impacts can be considered insignificant:

- *the short-term PC is less than 10% of the short-term environmental standard for protected conservation areas; and*
- *the long-term PC is less than 1% of the long-term environmental standard for protected conservation areas.*

Should these criteria be exceeded then the PEC should be checked against the standard for protected conservation areas. PEC is not required for short-term targets. Should the short-term PC exceed the screening criteria, a detailed modelling is required.

If the predicted long-term PC is greater than 1% and the PEC is less than 70% of the long-term environmental standard, the emissions can be considered insignificant. Should the predicted PEC be greater than 70% of the long-term environmental standard, a detailed dispersion modelling is required.

When considering impacts at local nature reserves (LNRs) and sites of importance for nature conservation (SINCs) and the emissions meet both of the following criteria, impacts can be considered insignificant and there is no further assessment required:

- *the short-term PC is less than 100% of the short-term environmental standard; and*
- *the long-term PC is less than 100% of the long-term environmental standard.*

Should the PC exceed the screening criteria, detailed dispersion modelling is required.

Currently there are no accepted criteria to determine whether PCs are significant, or if PECs are insignificant or significant. As such the EA guidance⁴ suggests that significance should be judged on site specific circumstances.

The EA guidance³ also states that the APIS site relevant critical load tool⁷ should be used to determine whether there is an exceedance of deposition of nutrient nitrogen or acidity, as the standard of exceedance is site-specific.

3.17 Modelling Uncertainty

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

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

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

- **Choice of model** - ADMS 5.2.4.0 is a commonly used atmospheric dispersion model and results have been verified through a number of studies to ensure predictions are as accurate as possible;
- **Meteorological data** - Modelling was undertaken using five meteorological data sets (2015-2019) from the most appropriate observation site to the facility to take account of worst-case conditions;
- **Plant operating conditions** - Operational parameters were supplied by Hurley Palmer Flatt. As such, these are considered to be representative of likely operating conditions;
- **Emission rates** - Were supplied by Hurley Palmer Flatt based on referenced emission concentrations outlined within the technical data sheet. As such, these are considered to be representative of likely emissions;
- **Background concentrations** - Obtained from the DEFRA mapping study for human receptors and from APIS for ecological receptors. Although these may underestimate actual concentrations in the vicinity of pollutant sources, such as roads, they are considered suitable for an assessment of this nature;
- **Receptor locations** - A Cartesian Grid at a height of 1.5m, to replicate breathing height, was included in the model in order to predict concentrations throughout the assessment extents. Specified Receptor points were also included at sensitive locations to provide additional consideration of these areas, varied heights were included to represent the window elevations of each associated building; and
- **Variability** - All model inputs are as accurate as possible and worst-case conditions have been considered where necessary in order to ensure a robust assessment of potential pollutant concentrations.

It is considered that the use of the stated measures to reduce uncertainty and the use of worst-case assumptions when necessary has resulted in model accuracy of an acceptable level.

⁷ <http://www.apis.ac.uk/critical-load-function-tool>.

4.0 BASELINE

Existing air quality conditions in the vicinity of the installation were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 Local Air Quality Management

As required by the Environment Act (1995), the London Borough of Tower Hamlets (LBoTH), has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that annual mean concentrations of NO₂ and 24-hour mean concentrations of PM₁₀ are above their AQOs within this area. As such, one AQMA has been declared, being described as:

- *Tower Hamlets AQMA (London Borough of Tower Hamlets)- The whole borough.*

The application site is located within the AQMA. As such there is potential for the development to cause air quality impacts during the operational phase.

LBoTH has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

4.2 Air Quality Monitoring

LBoTH undertakes monitoring of pollutant concentrations using continuous techniques throughout their area of administration. A review of the most recent Air Quality Monitoring Data indicates that there is one automatic analyser within the assessment extents. Monitoring results at this location for NO₂ and PM₁₀ from recent years are shown in Table 15.

Table 15: Automatic Monitoring Results

Site ID	Location	NGR (m)		Type	Annual Mean NO ₂ Concentration (µg/m ³)		Annual Mean PM ₁₀ Concentration (µg/m ³)	
		X	Y		2018	2019	2018	2019
TH00 1	Milwall Park	538052	178559	Background	23	24	18	18

As indicated in Table 15, the annual mean AQO for NO₂ and PM₁₀ was not exceeded at the automatic site in recent years. Reference should be made to Figure 1 within Appendix I for a graphical representation of the automatic monitoring location.

LBoTH also utilise passive diffusion tubes to monitor NO₂ concentrations throughout the borough. A review of the most recent Air Quality Monitoring Data available indicated that there are 6 diffusion tubes sites located within the assessment extents. Recent monitoring results at these locations are shown in Table 16.

Table 16: Diffusion Tube Monitoring Results

Site ID	Locations	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)	
			X	Y	2018	2019
62	House Terrace	Urban Background	538052	178559	29	32
63	Millwall Park	Kerbside	537348	178690	22	24

Site ID	Locations	Type	NGR (m)		Annual Mean NO ₂ Concentration (µg/m ³)	
			X	Y	2018	2019
64	Limeharbour	Kerbside	538246	178689	38	37
68	Manchester Road/Ollife Street	Kerbside	537953	179357	32	34
69	Lawnhouse Close	Kerbside	538431	179044	34	31
70	Admirals Way	Urban Background	538190	179750	27	29

As indicated in Table 16, the annual mean AQO for NO₂ was not exceeded at any monitoring site in recent years. Reference should be made to Figure 1 within Appendix I for a graphical representation of the diffusion tube monitoring locations.

4.3 Background Pollutant Concentrations

The total concentration of a pollutant is comprised of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR:

- 537500, 179500

Data for this location was downloaded from the DEFRA website⁸ for the purpose of this assessment and an average concentration was taken for the purpose of the assessment. The background concentrations are summarised in Table 17.

Table 17: Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m ³)
NO ₂	26.77
PM ₁₀	18.03
PM _{2.5}	11.67
C ₆ H ₆	0.82
CO	542
SO ₂	4.10

It should be noted that background concentrations of NO₂, PM₁₀ and PM_{2.5} were predicted for 2020 in order to represent current conditions at the installation. The background concentration of C₆H₆, CO and SO₂ were obtained from the 2001 predictions⁹. These are the most recent predictions available from DEFRA and are therefore considered to provide a reasonable representation of background concentrations in the vicinity of the site.

⁸ <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>.

⁹ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2001>

With relation to short-term background concentrations, it was assumed that the short-term concentration of a substance is twice its long-term concentration as suggested within EA risk assessment for your environmental permit guidance³.

4.4 Sensitive Receptors

A sensitive receptor is defined as any location which may be affected by changes in air quality. These have been defined for human and ecological receptors in the following Sections.

4.4.1 Human Sensitive Receptors

A desk-top study was undertaken in order to identify any sensitive human receptor locations in the vicinity of the site that required specific consideration during the assessment. These were modelled at the minimum height of relevant exposure and the maximum height with reference to the flue height. The modelled receptors are summarised in Table 18.

Table 18: Sensitive Human Receptors

Receptor		Use	NGR (m)		Distance from Centre of Site (m)	Height (m)	
			X	Y		Min	Max
R1	Omega Close	Residential	537569.9	179303.2	100	1.5	7.5
R2	Starboard Way	Residential	537510.4	179285.6	152	1.5	10.5
R3	Omega Close	Residential	537547.0	179309.0	123	1.5	7.5
R4	Starboard Way	Residential	537518.6	179312.5	151	1.5	4.5
R5	Omega Close	Residential	537579.4	179339.4	113	1.5	7.5
R6	Tiller Road	Residential	537558.7	179370.2	150	1.5	10.5
R7	Cudweed Court	Residential	537622.1	179440.0	184	7.0	26.0
R8	Clover Court	Residential	537684.7	179435.6	177	7.0	26.0
R9	Westwood House	Residential	537589.5	179430.1	184	7.0	26.0
R10	City Apartments, Pepper Street	Residential	537708.9	179328.9	85	1.5	10.5
R11	City Apartments, Pepper Street	Residential	537706.1	179352.9	104	1.5	13.5
R12	Baltimore Wharf	Residential	537813.6	179363.7	185	7.0	26.0
R13	Baltimore Wharf	Residential	537817.4	179406.4	215	7.0	26.0
R14	Waterford Court	Residential	537805.9	179291.4	149	7.0	26.0
R15	City Harbour	Residential	537800.2	179194.0	155	7.0	26.0
R16	City Reach (Building Roof)	Commercial	537668.4	179192.1	68	N/A	36.0
R16a	City Reach (Second Floor Roof)	Commercial	537657.4	179192.5	68	N/A	13.4
R17	23-39 Pepper Street	Commercial	537654.9	179334.7	75	1.5	12.5
R18	55-59 Pepper Street	Commercial	537616.1	179335.2	87	1.5	9.0
R19	21 Pepper Street	Commercial	537685.6	179326.8	72	1.5	4.5

The sensitive receptors identified in Table 18 represent worst-case locations i.e. the receptors at which air quality impacts from the proposals are expected to be the greatest. It should be noted that the receptor points for City Reach (R16 and R16a) are located at the second floor roof level (13.4m) and building roof level (36m) closest to the generators. This is to represent the location of the air inlets for this building and therefore the effective exposure locations for users within the office spaces. The exact locations of the air inlets are unclear and therefore a conservative approach has been considered by assuming they are located at the point to the generators.

Reference should be made to Figure 1 within Appendix I for a graphical representation of sensitive human receptor locations.

All receptors considered are in the same DEFRA background grid as the development and as such, the background concentrations presented in Table 17 were also used to represent the background concentrations at the receptor locations.

4.4.2 Ecological Sensitive Receptors

With regard to ecological sensitive receptors, the EA guidance³ states:

“Note that conservation sites need only be considered where they fall within set distances of the activity:

- *SPAs, SACs or Ramsar sites within 10km of the installation (or 15km coal or oil-fired power station); and*
- *SSSIs, National Nature Reserves (NNRs), LNRs, Local Wildlife Sites (LWS)/SINCs within 2km of the location.”*

A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the distances stated above. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service¹⁰ which draws information on key environmental schemes and designations.

Table 19 details the ecological receptors that will be considered for the assessment. The receptor points chosen represent the closest points to the development site and are displayed in Table 19 and Figure 1 within Appendix I.

It should be noted that the SINC designations; “Millwall and West India Docks”, “Blackwall Basin”, “Eat India Dock Basin” and “The River Thames and Tidal Tributaries” were not considered within this assessment. This is because their priority habitat is ‘open water’ and therefore, they are not sensitive to accumulations of pollutants. There are other SINCs located in proximity to these designations, which have been considered within this assessment and as such, ensures that the most sensitive habitats have been considered in the context of this assessment.

Table 19: Sensitive Ecological Receptor Locations

Receptor		Ecological Designation	NGR (m)		Approximate Distance from Site (m)
			X	Y	
ER1	Folkestone Gardens	SINC	536217	177889	1,990
ER2	Rainsborough Avenue Embankments	SINC	536374	178622	1,436
ER3	Lavender Pond Nature Park	SINC/LNR	536327	180321	1,704
ER4	Surrey Docks Farm	SINC	536657	179664	1,081

¹⁰ Multi-Agency Geographic Information for the Countryside, www.magic.gov.uk.

Receptor		Ecological Designation	NGR (m)		Approximate Distance from Site (m)
			X	Y	
ER5	Durand's Wharf	SINC	536668	179861	1,160
ER6	St Anne's Churchyard, Limehouse	SINC	536790	180986	1,933
ER7	Pepys Park Nature Area	SINC	536859	178447	1,141
ER8	Sayes Court Park	SINC	536857	178094	1,416
ER9	Cyril Jackson School Nature Area	SINC	536871	180692	1,635
ER10	St Paul's Churchyard and Crossfield Street Open Space	SINC	537350	177521	1,766
ER11	Westcombe Woodlands	SINC	539127	177854	1,998
ER12	Twinkle Park	SINC	537253	178050	1,277
ER13	Millwall Park	SINC	537975	178720	625
ER14	Mudchute Farm and Park	SINC/LNR	537940	179040	356
ER15	Poplar Dock	SINC	538258	180261	1,166
ER16	Robin Hood Gardens	SINC	538298	180780	1,648
ER17	Saffron Avenue Pond	SINC	538646	180861	1,880
ER18	Blackheath and Greenwich Park	SINC	538651	177605	1,929
ER19	New Cross and New Cross Gate Railsides	SINC	536397	177724	1,989
ER20	Creekside Education Centre	SINC	537608	177315	1,946
ER21	Sue Godfrey Local Nature Reserve	SINC	537516	177504	1,762
ER22	St Nicholas Churchyard, Deptford	SINC	537415	177777	1,503
ER23	Russia Dock Woodland	LNR	536204	179469	1,471
ER24	Epping Forest	SAC	539729	188050	9,030
ER25	Lee Valley	SPA/Ramsar	534811	187828	9,029

Habitat features/descriptions for all ecological receptors have been obtained from multiple sources. These have been used to apply the most suitable Air Pollution Information System (APIS) habitat to each receptor to determine the critical loads. The features and APIS habitats are detailed in Table 20.

Table 20: Ecological Habitats

Receptor		Feature/Description	APIS Habitat
ER1	Folkestone Gardens	Amenity grassland, non-native woodland ¹¹	Neutral Grassland
ER2	Rainsborough Avenue Embankments	Non-native woodland, amenity grassland ¹¹	Neutral Grassland
ER3	Lavender Pond Nature Park	Wetland habitats, boggy alder woodland, damp meadow ¹²	Bogs

¹¹ Re-survey of SINCs / Report for London Borough Lewisham, The Ecology Consultancy, 2016

¹² <http://discover-london.gigl.org.uk/site-Details.aspx?slD=SoBI01&sType=sinc>

Receptor		Feature/Description	APIS Habitat
ER4	Surrey Docks Farm	Traditional orchard, mudflats ¹⁰	Broadleaved, Mixed and Yew Woodland
ER5	Durand's Wharf	Semi improved grassland, hedges, bare open ground, scrubland, scattered trees ¹³	Hedgerows
ER6	St Anne's Churchyard, Limehouse	Deciduous woodland ¹⁰	Broadleaved, Mixed and Yew Woodland
ER7	Pepys Park Nature Area	Scattered trees, scrub, bare soil and rock, amenity grassland ¹¹	Broadleaved, Mixed and Yew Woodland
ER8	Sayes Court Park	Deciduous woodland ¹⁰	Broadleaved, Mixed and Yew Woodland
ER9	Cyril Jackson School Nature Area	Marsh/swamp, Pond/lake, Scattered trees, Semi-improved neutral grassland, tall herbs ¹⁴	Fen, Marsh and Swamp
ER10	St Paul's Churchyard and Crossfield Street Open Space	Planted shrubbery, amenity grassland, semi-improved neutral grassland, scattered trees, scrub ¹¹	Neutral Grassland
ER11	Westcombe Woodlands	Natural and seminatural greenspace, mainly woodland ¹⁵	Broadleaved, Mixed and Yew Woodland
ER12	Twinkle Park	Pond, parks and gardens ¹⁵	Broadleaved, Mixed and Yew Woodland
ER13	Millwall Park	Amenity grassland, Bare ground, Planted shrubbery, Scattered trees, Semi-improved neutral grassland ¹⁴	Neutral Grassland
ER14	Mudchute Farm and Park	Ponds, Roughland, Ruderal, Semi-improved neutral grassland, Orchard, Hedge, Secondary woodland ¹⁴	Broadleaved, Mixed and Yew Woodland
ER15	Poplar Dock	Open water, ruderal, woodland, scrub ¹⁴	Broadleaved, Mixed and Yew Woodland
ER16	Robin Hood Gardens	Planted shrubbery, Scattered trees, Semi-improved neutral grassland, Tall herbs ¹⁴	Broadleaved, Mixed and Yew Woodland
ER17	Saffron Avenue Pond	Pond, reed bed, scrub, wet woodland ¹⁴	Broadleaved, Mixed and Yew Woodland
ER18	Blackheath and Greenwich Park	Wood-pasture and Parkland, Deciduous woodland ¹⁰	Broadleaved, Mixed and Yew Woodland
ER19	New Cross and New Cross Gate Railsides	Non-native woodland (broadleaved woodland), scattered trees, semi-improved neutral grassland, tall herbs, ephemeral and ruderal and scrub ¹¹	Broadleaved, Mixed and Yew Woodland
ER20	Creekside Education Centre	Wet marginal vegetation, scrub, tall herbs, semi-improved neutral grassland ¹¹	Neutral Grassland

¹³ Background Paper: Sites of Importance for Nature Conservation April 2011 (CDCWB14), Southwark Council, 2011

¹⁴ Sites of Importance for Nature Conservation in Tower Hamlets, LBoTH, 2020

¹⁵ Towards a Greener Royal Greenwich - Green Infrastructure Study 2017, Land Use Consultants, 2017

Receptor		Feature/Description	APIS Habitat
ER21	Sue Godfrey Local Nature Reserve	Bare soil and rock, ruderal and ephemeral, scattered trees, scrub, vegetated walls, semi improved neutral grassland, tall herbs and amenity grassland ¹¹	Broadleaved, Mixed and Yew Woodland
ER22	St Nicholas Churchyard, Deptford	Numerous mature trees, mostly London planes. Ferns ¹⁵	Broadleaved, Mixed and Yew Woodland
ER23	Russia Dock Woodland	Deciduous woodland ¹⁰	Broadleaved, Mixed and Yew Woodland
ER24	Epping Forest	Northern Atlantic wet heaths ¹⁶	Dwarf shrub heath
ER25	Lee Valley	Fen, marsh and swamp ¹⁶	Fen, marsh and swamp

Critical loads have been designated within the UK based on the sensitivity and relevant features of the receiving habitat. A review of the APIS website¹⁶ was undertaken in order to identify the most suitable habitat description and associated critical load for the designations considered within the model. The nitrogen critical loads are presented in Table 21.

Table 21: Nitrogen Critical Load

Receptor		APIS Habitat	Nitrogen Critical Load (kgN/ha/yr)	
			Min	Max
ER1	Folkestone Gardens	Neutral Grassland	20	30
ER2	Rainsborough Avenue Embankments	Neutral Grassland	20	30
ER3	Lavender Pond Nature Park	Bogs	10	15
ER4	Surrey Docks Farm	Broadleaved, Mixed and Yew Woodland	10	20
ER5	Durand's Wharf	Hedgerows	10	20
ER6	St Anne's Churchyard, Limehouse	Broadleaved, Mixed and Yew Woodland	10	20
ER7	Pepys Park Nature Area	Broadleaved, Mixed and Yew Woodland	10	20
ER8	Sayes Court Park	Broadleaved, Mixed and Yew Woodland	10	20
ER9	Cyril Jackson School Nature Area	Fen, Marsh and Swamp	10	15
ER10	St Paul's Churchyard and Crossfield Street Open Space	Neutral Grassland	20	30
ER11	Westcombe Woodlands	Broadleaved, Mixed and Yew Woodland	10	20
ER12	Twinkle Park	Broadleaved, Mixed and Yew Woodland	10	20
ER13	Millwall Park	Neutral Grassland	20	30
ER14	Mudchute Farm and Park	Broadleaved, Mixed and Yew Woodland	10	20
ER15	Poplar Dock	Broadleaved, Mixed and Yew Woodland	10	20
ER16	Robin Hood Gardens	Broadleaved, Mixed and Yew Woodland	10	20

¹⁶ UK Air Pollution Information System, www.apis.ac.uk.

Receptor		APIS Habitat	Nitrogen Critical Load (kgN/ha/yr)	
			Min	Max
ER17	Saffron Avenue Pond	Broadleaved, Mixed and Yew Woodland	10	20
ER18	Blackheath and Greenwich Park	Broadleaved, Mixed and Yew Woodland	10	20
ER19	New Cross and New Cross Gate Railsides	Broadleaved, Mixed and Yew Woodland	10	20
ER20	Creekside Education Centre	Neutral Grassland	20	30
ER21	Sue Godfrey Local Nature Reserve	Broadleaved, Mixed and Yew Woodland	10	20
ER22	St Nicholas Churchyard, Deptford	Broadleaved, Mixed and Yew Woodland	10	20
ER23	Russia Dock Woodland	Broadleaved, Mixed and Yew Woodland	10	20
ER24	Epping Forest	Dwarf shrub heath	10	20
ER25	Lee Valley	Fen, marsh and swamp	15	30

Table 22 shows the relevant critical loads for acid deposition. The ecological receptor ER25 (Lee Valley) does not have any priority habitats sensitive to acid deposition. As such, acid deposition impacts were not assessed at this location.

Table 22: Acid Critical Load

Receptor		APIS Habitat	Critical Load (ke/ha/yr)		
			CLmaxS	CLmaxN	CLminN
ER1	Folkestone Gardens	Neutral Grassland	4.000	1.071	5.071
ER2	Rainsborough Avenue Embankments	Neutral Grassland	4.000	1.071	5.071
ER3	Lavender Pond Nature Park	Bogs	0.185	0.321	0.506
ER4	Surrey Docks Farm	Broadleaved, Mixed and Yew Woodland	8.319	0.357	8.676
ER5	Durand's Wharf	Hedgerows	8.319	0.357	8.676
ER6	St Anne's Churchyard, Limehouse	Broadleaved, Mixed and Yew Woodland	8.320	0.357	8.677
ER7	Pepys Park Nature Area	Broadleaved, Mixed and Yew Woodland	8.324	0.357	8.681
ER8	Sayes Court Park	Broadleaved, Mixed and Yew Woodland	8.324	0.357	8.681
ER9	Cyril Jackson School Nature Area	Broadleaved/Coniferous Unmanaged Woodland	8.320	0.357	8.677
ER10	St Paul's Churchyard and Crossfield Street Open Space	Neutral Grassland	4.000	1.071	5.071
ER11	Westcombe Woodlands	Broadleaved, Mixed and Yew Woodland	0.725	0.285	1.010
ER12	Twinkle Park	Broadleaved, Mixed and Yew Woodland	8.317	0.357	8.674
ER13	Millwall Park	Neutral Grassland	4.000	1.071	5.071

Receptor		APIS Habitat	Critical Load (ke/ha/yr)		
			CLmaxS	CLmaxN	CLminN
ER14	Mudchute Farm and Park	Broadleaved, Mixed and Yew Woodland	8.318	0.357	8.675
ER15	Poplar Dock	Broadleaved, Mixed and Yew Woodland	8.317	0.357	8.674
ER16	Robin Hood Gardens	Broadleaved, Mixed and Yew Woodland	8.317	0.357	8.674
ER17	Saffron Avenue Pond	Broadleaved, Mixed and Yew Woodland	8.317	0.357	8.674
ER18	Blackheath and Greenwich Park	Broadleaved, Mixed and Yew Woodland	1.717	0.357	2.074
ER19	New Cross and New Cross Gate Railsides	Broadleaved, Mixed and Yew Woodland	1.718	0.357	2.075
ER20	Creekside Education Centre	Neutral Grassland	4.000	1.071	5.071
ER21	Sue Godfrey Local Nature Reserve	Broadleaved, Mixed and Yew Woodland	1.718	0.357	2.075
ER22	St Nicholas Churchyard, Deptford	Broadleaved, Mixed and Yew Woodland	1.718	0.357	2.075
ER23	Russia Dock Woodland	Broadleaved, Mixed and Yew Woodland	8.319	0.357	8.676
ER24	Epping Forest	Dwarf shrub heath	1.660	0.892	2.374

As indicated in Table 22, the APIS habitat 'Broadleaved/Coniferous Unmanaged Woodland' have been used to determine the critical loads for the ecological receptor ER9 (Cyril Jackson School Nature Area) as this is the most sensitive habitat to acid deposition.

Background deposition rates at the ecological receptor location were downloaded from the APIS website¹⁶ and are summarised in Table 23.

Table 23: Background Deposition Rates

Receptor		Background Deposition Rate		
		Nitrogen (kgN/ha/yr)	Acid (keq/ha/yr)	
			N	S
ER1	Folkestone Gardens	19.60	1.40	0.16
ER2	Rainsborough Avenue Embankments	19.60	1.40	0.16
ER3	Lavender Pond Nature Park	22.54	1.61	0.18
ER4	Surrey Docks Farm	35.14	2.51	0.20
ER5	Durand's Wharf	35.14	2.51	0.20
ER6	St Anne's Churchyard, Limehouse	40.46	2.89	0.23
ER7	Pepys Park Nature Area	35.14	2.51	0.20
ER8	Sayes Court Park	35.14	2.51	0.20
ER9	Cyril Jackson School Nature Area	22.54	2.89	0.23
ER10	St Paul's Churchyard and Crossfield Street Open Space	19.60	1.40	0.16

Receptor		Background Deposition Rate		
		Nitrogen (kgN/ha/yr)	Acid (keq/ha/yr)	
			N	S
ER11	Westcombe Woodlands	35.14	2.51	0.20
ER12	Twinkle Park	35.14	2.51	0.20
ER13	Millwall Park	19.60	1.40	0.16
ER14	Mudchute Farm and Park	35.14	2.51	0.20
ER15	Poplar Dock	40.46	2.89	0.23
ER16	Robin Hood Gardens	40.46	2.89	0.23
ER17	Saffron Avenue Pond	40.46	2.89	0.23
ER18	Blackheath and Greenwich Park	35.14	2.51	0.20
ER19	New Cross and New Cross Gate Railsides	35.14	2.51	0.20
ER20	Creekside Education Centre	19.60	1.40	0.16
ER21	Sue Godfrey Local Nature Reserve	35.14	2.51	0.20
ER22	St Nicholas Churchyard, Deptford	35.14	2.51	0.20
ER23	Russia Dock Woodland	35.14	2.51	0.2
ER24	Epping Forest	34.1	2.4	0.2
ER25	Lee Valley	34.1	N/A	N/A

Background concentrations at the ecological receptor location were downloaded from the APIS website¹⁶ and are summarised in Table 24.

Table 24: Background Concentrations

Receptor		Background Concentration ($\mu\text{g}/\text{m}^3$)	
		NO _x	SO ₂
ER1	Folkestone Gardens	45.58	1.66
ER2	Rainsborough Avenue Embankments	46.05	1.66
ER3	Lavender Pond Nature Park	57.16	1.98
ER4	Surrey Docks Farm	46.55	1.66
ER5	Durand's Wharf	46.55	1.66
ER6	St Anne's Churchyard, Limehouse	57.16	1.98
ER7	Pepys Park Nature Area	46.05	1.66
ER8	Sayes Court Park	46.05	1.66
ER9	Cyril Jackson School Nature Area	57.16	1.98
ER10	St Paul's Churchyard and Crossfield Street Open Space	45.86	1.66
ER11	Westcombe Woodlands	41.33	1.66
ER12	Twinkle Park	42.38	1.66
ER13	Millwall Park	42.38	1.66
ER14	Mudchute Farm and Park	49.74	1.66
ER15	Poplar Dock	77.88	1.98

Receptor		Background Concentration ($\mu\text{g}/\text{m}^3$)	
		NO _x	SO ₂
ER16	Robin Hood Gardens	77.88	1.98
ER17	Saffron Avenue Pond	77.88	1.98
ER18	Blackheath and Greenwich Park	46.13	1.66
ER19	New Cross and New Cross Gate Railsides	45.58	1.66
ER20	Creekside Education Centre	45.86	1.66
ER21	Sue Godfrey Local Nature Reserve	45.86	1.66
ER22	St Nicholas Churchyard, Deptford	45.86	1.66
ER23	Russia Dock Woodland	46.55	1.66
ER24	Epping Forest	42.21	2.02
ER25	Lee Valley	43.06	1.58

5.0 RESULTS

Dispersion modelling was undertaken with the inputs described in Section 3. Reference should be made to Figure 3 to Figure 11 within Appendix I for graphical representations of predicted pollutant concentrations throughout the assessment extents. Figures have been shown for Scenario 2 as this is the most robust routine scenario considered. It should be noted that figures for 1-hour NO₂ concentrations are not relevant as an approach using hypergeometric distribution has been undertaken to determine the probability of exceedances at the worst-case receptor locations within the vicinity of the site.

The emission concentrations were predicted separately for 5 assessment years and then processed to ensure that the maximum concentration was analysed.

5.1 Human Sensitive Receptors

5.1.1 Scenario 1

Annual Mean NO₂

Predicted annual mean NO₂ concentrations at sensitive human receptor locations are summarised in Table 25. It should be noted that only residential receptors were considered for predicted changes in annual mean NO₂ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 25: Predicted Annual Mean NO₂ Concentrations

Receptor		Height (m)	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.07	26.84	0.2	67.1
R2	Starboard Way	1.5	0.07	26.84	0.2	67.1
R3	Omega Close	1.5	0.07	26.84	0.2	67.1
R4	Starboard Way	1.5	0.06	26.83	0.1	67.1
R5	Omega Close	1.5	0.04	26.81	0.1	67.0
R6	Tiller Road	1.5	0.03	26.81	0.1	67.0
R7	Cudweed Court	7.0	0.02	26.80	0.1	67.0
R8	Clover Court	7.0	0.04	26.81	0.1	67.0
R9	Westwood House	7.0	0.03	26.80	0.1	67.0
R10	City Apartments, Pepper Street	1.5	0.15	26.92	0.4	67.3
R11	City Apartments, Pepper Street	1.5	0.11	26.88	0.3	67.2
R12	Baltimore Wharf	7.0	0.11	26.88	0.3	67.2
R13	Baltimore Wharf	7.0	0.10	26.87	0.2	67.2
R14	Waterford Court	7.0	0.12	26.90	0.3	67.2
R15	City Harbour	7.0	0.07	26.84	0.2	67.1
R1a	Omega Close	7.5	0.08	26.85	0.2	67.1
R2a	Starboard Way	10.5	0.07	26.84	0.2	67.1
R3a	Omega Close	7.5	0.07	26.84	0.2	67.1
R4a	Starboard Way	4.5	0.06	26.83	0.1	67.1

Receptor		Height (m)	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R5a	Omega Close	7.5	0.04	26.82	0.1	67.0
R6a	Tiller Road	10.5	0.04	26.81	0.1	67.0
R7a	Cudweed Court	26.0	0.03	26.81	0.1	67.0
R8	Clover Court	26.0	0.06	26.83	0.1	67.1
R9a	Westwood House	26.0	0.03	26.80	0.1	67.0
R10a	City Apartments, Pepper Street	10.5	0.15	26.93	0.4	67.3
R11a	City Apartments, Pepper Street	13.5	0.14	26.91	0.3	67.3
R12a	Baltimore Wharf	26.0	0.10	26.87	0.2	67.2
R13a	Baltimore Wharf	26.0	0.09	26.86	0.2	67.1
R14a	Waterford Court	26.0	0.12	26.89	0.3	67.2
R15a	City Harbour	26.0	0.08	26.85	0.2	67.1

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 40µg/m³.

As indicated in Table 25, predicted NO₂ concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean NO₂ PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

1-Hour Mean NO₂

As mentioned in Section 3.6, an approach utilising hypergeometric probability distribution was undertaken in order to potential for exceedances of the 1-hour AQO based on the proposed annual operational hours (54 hours). The cumulative hypergeometric distribution for each sensitive receptor location is detailed Table 26.

Table 26: 1-Hour Mean NO₂ Concentrations - Hypergeometric Distribution

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R1	Omega Close	1.5	<0.1	<0.1
R2	Starboard Way	1.5	<0.1	<0.1
R3	Omega Close	1.5	<0.1	<0.1
R4	Starboard Way	1.5	<0.1	<0.1
R5	Omega Close	1.5	<0.1	<0.1
R6	Tiller Road	1.5	<0.1	<0.1
R7	Cudweed Court	7.0	<0.1	<0.1
R8	Clover Court	7.0	<0.1	<0.1
R9	Westwood House	7.0	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	<0.1	<0.1

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R11	City Apartments, Pepper Street	1.5	<0.1	<0.1
R12	Baltimore Wharf	7.0	<0.1	<0.1
R13	Baltimore Wharf	7.0	<0.1	<0.1
R14	Waterford Court	7.0	<0.1	<0.1
R15	City Harbour	7.0	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	<0.1	<0.1
R17	23-39 Pepper Street	1.5	<0.1	<0.1
R18	55-59 Pepper Street	1.5	<0.1	<0.1
R19	21 Pepper Street	1.5	<0.1	<0.1
R1a	Omega Close	7.5	<0.1	<0.1
R2a	Starboard Way	10.5	<0.1	<0.1
R3a	Omega Close	7.5	<0.1	<0.1
R4a	Starboard Way	4.5	<0.1	<0.1
R5a	Omega Close	7.5	<0.1	<0.1
R6a	Tiller Road	10.5	<0.1	<0.1
R7a	Cudweed Court	26.0	<0.1	<0.1
R8	Clover Court	26.0	<0.1	<0.1
R9a	Westwood House	26.0	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	<0.1	<0.1
R11a	City Apartments, Pepper Street	13.5	<0.1	<0.1
R12a	Baltimore Wharf	26.0	<0.1	<0.1
R13a	Baltimore Wharf	26.0	<0.1	<0.1
R14a	Waterford Court	26.0	<0.1	<0.1
R15a	City Harbour	26.0	<0.1	<0.1
R16a	City Reach (Second Floor Roof Level)	13.4	<0.1	<0.1
R17a	23-39 Pepper Street	12.5	<0.1	<0.1
R18a	55-59 Pepper Street	9.0	<0.1	<0.1
R19a	21 Pepper Street	4.5	<0.1	<0.1

As indicated in Table 26, the cumulative hypergeometric distribution calculates the probability to be <0.1% at all 38 receptor locations. As such, the 1-hour mean EQS for NO₂ will not be exceeded at any location during operations of the development. It is therefore considered that an annual operational period of 54 hours is acceptable.

Annual Mean PM₁₀

Predicted annual mean PM₁₀ concentrations at sensitive human receptor locations are summarised in Table 27. It should be noted that only residential receptors were considered for predicted changes in annual mean

PM₁₀ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 27: Predicted Annual Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0005	18.0347	<0.1	45.1
R2	Starboard Way	1.5	0.0005	18.0347	<0.1	45.1
R3	Omega Close	1.5	0.0005	18.0347	<0.1	45.1
R4	Starboard Way	1.5	0.0005	18.0347	<0.1	45.1
R5	Omega Close	1.5	0.0003	18.0345	<0.1	45.1
R6	Tiller Road	1.5	0.0003	18.0345	<0.1	45.1
R7	Cudweed Court	7.0	0.0002	18.0344	<0.1	45.1
R8	Clover Court	7.0	0.0003	18.0345	<0.1	45.1
R9	Westwood House	7.0	0.0002	18.0344	<0.1	45.1
R10	City Apartments, Pepper Street	1.5	0.0011	18.0353	<0.1	45.1
R11	City Apartments, Pepper Street	1.5	0.0009	18.0351	<0.1	45.1
R12	Baltimore Wharf	7.0	0.0009	18.0351	<0.1	45.1
R13	Baltimore Wharf	7.0	0.0008	18.0349	<0.1	45.1
R14	Waterford Court	7.0	0.0010	18.0352	<0.1	45.1
R15	City Harbour	7.0	0.0005	18.0347	<0.1	45.1
R1a	Omega Close	7.5	0.0006	18.0348	<0.1	45.1
R2a	Starboard Way	10.5	0.0005	18.0347	<0.1	45.1
R3a	Omega Close	7.5	0.0006	18.0348	<0.1	45.1
R4a	Starboard Way	4.5	0.0005	18.0347	<0.1	45.1
R5a	Omega Close	7.5	0.0004	18.0345	<0.1	45.1
R6a	Tiller Road	10.5	0.0003	18.0345	<0.1	45.1
R7a	Cudweed Court	26.0	0.0003	18.0345	<0.1	45.1
R8	Clover Court	26.0	0.0004	18.0346	<0.1	45.1
R9a	Westwood House	26.0	0.0003	18.0344	<0.1	45.1
R10a	City Apartments, Pepper Street	10.5	0.0012	18.0354	<0.1	45.1
R11a	City Apartments, Pepper Street	13.5	0.0011	18.0353	<0.1	45.1
R12a	Baltimore Wharf	26.0	0.0008	18.0350	<0.1	45.1
R13a	Baltimore Wharf	26.0	0.0007	18.0349	<0.1	45.1
R14a	Waterford Court	26.0	0.0009	18.0351	<0.1	45.1
R15a	City Harbour	26.0	0.0006	18.0348	<0.1	45.1

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 40µg/m³.

As indicated in Table 27, predicted PM₁₀ concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean PM₁₀ PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

24-Hour Mean PM₁₀

Predicted 24-hour mean PM₁₀ concentrations at sensitive receptor locations are summarised in Table 28.

Table 28: Predicted 24-Hour Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.28	36.35	0.6	2.0
R2	Starboard Way	1.5	0.27	36.34	0.5	2.0
R3	Omega Close	1.5	0.28	36.35	0.6	2.0
R4	Starboard Way	1.5	0.26	36.33	0.5	1.9
R5	Omega Close	1.5	0.18	36.25	0.4	1.3
R6	Tiller Road	1.5	0.15	36.22	0.3	1.1
R7	Cudweed Court	7.0	0.12	36.19	0.2	0.8
R8	Clover Court	7.0	0.17	36.24	0.3	1.2
R9	Westwood House	7.0	0.12	36.19	0.2	0.9
R10	City Apartments, Pepper Street	1.5	0.37	36.44	0.7	2.7
R11	City Apartments, Pepper Street	1.5	0.31	36.37	0.6	2.2
R12	Baltimore Wharf	7.0	0.29	36.36	0.6	2.1
R13	Baltimore Wharf	7.0	0.27	36.34	0.5	1.9
R14	Waterford Court	7.0	0.31	36.37	0.6	2.2
R15	City Harbour	7.0	0.26	36.33	0.5	1.9
R16	City Reach (Building Roof Level)	36.0	2.56	38.63	5.1	18.4
R17	23-39 Pepper Street	1.5	0.37	36.44	0.7	2.7
R18	55-59 Pepper Street	1.5	0.35	36.42	0.7	2.5
R19	21 Pepper Street	1.5	0.39	36.46	0.8	2.8
R1a	Omega Close	7.5	0.33	36.39	0.7	2.3
R2a	Starboard Way	10.5	0.28	36.35	0.6	2.0
R3a	Omega Close	7.5	0.30	36.37	0.6	2.2
R4a	Starboard Way	4.5	0.26	36.33	0.5	1.9
R5a	Omega Close	7.5	0.19	36.26	0.4	1.4
R6a	Tiller Road	10.5	0.16	36.23	0.3	1.2
R7a	Cudweed Court	26.0	0.17	36.24	0.3	1.2
R8	Clover Court	26.0	0.23	36.30	0.5	1.7
R9a	Westwood House	26.0	0.16	36.23	0.3	1.2

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R10a	City Apartments, Pepper Street	10.5	0.38	36.45	0.8	2.8
R11a	City Apartments, Pepper Street	13.5	0.35	36.42	0.7	2.5
R12a	Baltimore Wharf	26.0	0.26	36.33	0.5	1.9
R13a	Baltimore Wharf	26.0	0.24	36.31	0.5	1.7
R14a	Waterford Court	26.0	0.29	36.36	0.6	2.1
R15a	City Harbour	26.0	0.28	36.35	0.6	2.0
R16a	City Reach (Second Floor Roof Level)	13.4	0.40	36.47	0.8	2.9
R17a	23-39 Pepper Street	12.5	0.37	36.44	0.7	2.7
R18a	55-59 Pepper Street	9.0	0.35	36.42	0.7	2.5
R19a	21 Pepper Street	4.5	0.39	36.46	0.8	2.8

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 50µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 28, predicted 24-hour PM₁₀ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 24-hour mean PM₁₀ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean PM_{2.5}

Predicted annual mean PM_{2.5} concentrations at sensitive human receptor locations are summarised in Table 29. It should be noted that only residential receptors were considered for predicted changes in annual mean PM_{2.5} concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 29: Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0005	11.6742	<0.1	46.7
R2	Starboard Way	1.5	0.0005	11.6742	<0.1	46.7
R3	Omega Close	1.5	0.0005	11.6742	<0.1	46.7
R4	Starboard Way	1.5	0.0005	11.6741	<0.1	46.7
R5	Omega Close	1.5	0.0003	11.6740	<0.1	46.7
R6	Tiller Road	1.5	0.0003	11.6739	<0.1	46.7
R7	Cudweed Court	7.0	0.0002	11.6738	<0.1	46.7
R8	Clover Court	7.0	0.0003	11.6739	<0.1	46.7
R9	Westwood House	7.0	0.0002	11.6738	<0.1	46.7

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R10	City Apartments, Pepper Street	1.5	0.0011	11.6748	<0.1	46.7
R11	City Apartments, Pepper Street	1.5	0.0009	11.6745	<0.1	46.7
R12	Baltimore Wharf	7.0	0.0009	11.6745	<0.1	46.7
R13	Baltimore Wharf	7.0	0.0008	11.6744	<0.1	46.7
R14	Waterford Court	7.0	0.0010	11.6746	<0.1	46.7
R15	City Harbour	7.0	0.0005	11.6741	<0.1	46.7
R1a	Omega Close	7.5	0.0006	11.6743	<0.1	46.7
R2a	Starboard Way	10.5	0.0006	11.6742	<0.1	46.7
R3a	Omega Close	7.5	0.0006	11.6742	<0.1	46.7
R4a	Starboard Way	4.5	0.0005	11.6741	<0.1	46.7
R5a	Omega Close	7.5	0.0004	11.6740	<0.1	46.7
R6a	Tiller Road	10.5	0.0003	11.6739	<0.1	46.7
R7a	Cudweed Court	26.0	0.0003	11.6739	<0.1	46.7
R8	Clover Court	26.0	0.0004	11.6741	<0.1	46.7
R9a	Westwood House	26.0	0.0003	11.6739	<0.1	46.7
R10a	City Apartments, Pepper Street	10.5	0.0012	11.6748	<0.1	46.7
R11a	City Apartments, Pepper Street	13.5	0.0011	11.6747	<0.1	46.7
R12a	Baltimore Wharf	26.0	0.0008	11.6744	<0.1	46.7
R13a	Baltimore Wharf	26.0	0.0007	11.6743	<0.1	46.7
R14a	Waterford Court	26.0	0.0010	11.6746	<0.1	46.7
R15a	City Harbour	26.0	0.0006	11.6742	<0.1	46.7

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 25µg/m³.

As indicated in Table 29, predicted PM_{2.5} concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean PM_{2.5} PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean HC

Predicted annual mean HC concentrations at sensitive human receptor locations are summarised in Table 30. It should be noted that only residential receptors were considered for predicted changes in annual mean HC concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 30: Predicted Annual Mean HC Concentrations

Receptor		Height (m)	Predicted Annual Mean HC Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.008	0.824	0.2	16.5
R2	Starboard Way	1.5	0.008	0.824	0.2	16.5
R3	Omega Close	1.5	0.007	0.823	0.1	16.5
R4	Starboard Way	1.5	0.006	0.822	0.1	16.4
R5	Omega Close	1.5	0.005	0.821	0.1	16.4
R6	Tiller Road	1.5	0.004	0.820	0.1	16.4
R7	Cudweed Court	7.0	0.003	0.819	0.1	16.4
R8	Clover Court	7.0	0.004	0.820	0.1	16.4
R9	Westwood House	7.0	0.003	0.819	0.1	16.4
R10	City Apartments, Pepper Street	1.5	0.016	0.832	0.3	16.6
R11	City Apartments, Pepper Street	1.5	0.012	0.828	0.2	16.6
R12	Baltimore Wharf	7.0	0.012	0.828	0.2	16.6
R13	Baltimore Wharf	7.0	0.011	0.827	0.2	16.5
R14	Waterford Court	7.0	0.014	0.830	0.3	16.6
R15	City Harbour	7.0	0.007	0.823	0.1	16.5
R1a	Omega Close	7.5	0.009	0.825	0.2	16.5
R2a	Starboard Way	10.5	0.008	0.824	0.2	16.5
R3a	Omega Close	7.5	0.008	0.824	0.2	16.5
R4a	Starboard Way	4.5	0.007	0.823	0.1	16.5
R5a	Omega Close	7.5	0.005	0.821	0.1	16.4
R6a	Tiller Road	10.5	0.004	0.820	0.1	16.4
R7a	Cudweed Court	26.0	0.004	0.820	0.1	16.4
R8	Clover Court	26.0	0.006	0.822	0.1	16.4
R9a	Westwood House	26.0	0.004	0.820	0.1	16.4
R10a	City Apartments, Pepper Street	10.5	0.017	0.833	0.3	16.7
R11a	City Apartments, Pepper Street	13.5	0.015	0.831	0.3	16.6
R12a	Baltimore Wharf	26.0	0.011	0.827	0.2	16.5
R13a	Baltimore Wharf	26.0	0.009	0.825	0.2	16.5
R14a	Waterford Court	26.0	0.013	0.829	0.3	16.6
R15a	City Harbour	26.0	0.008	0.824	0.2	16.5

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of $5\mu\text{g}/\text{m}^3$.

As indicated in Table 30, predicted HC concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean HC PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

8-Hour Rolling Mean CO

Predicted CO concentrations at sensitive receptor locations are summarised in Table 31.

Table 31: Predicted 8-hour Rolling Mean CO Concentrations

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	47.82	1,131.82	0.5	0.5
R2	Starboard Way	1.5	35.17	1,119.17	0.4	0.4
R3	Omega Close	1.5	49.53	1,133.53	0.5	0.6
R4	Starboard Way	1.5	41.31	1,125.31	0.4	0.5
R5	Omega Close	1.5	42.66	1,126.66	0.4	0.5
R6	Tiller Road	1.5	47.93	1,131.93	0.5	0.5
R7	Cudweed Court	7.0	29.57	1,113.57	0.3	0.3
R8	Clover Court	7.0	31.54	1,115.54	0.3	0.4
R9	Westwood House	7.0	38.34	1,122.34	0.4	0.4
R10	City Apartments, Pepper Street	1.5	32.12	1,116.12	0.3	0.4
R11	City Apartments, Pepper Street	1.5	31.39	1,115.39	0.3	0.4
R12	Baltimore Wharf	7.0	28.56	1,112.56	0.3	0.3
R13	Baltimore Wharf	7.0	30.79	1,114.79	0.3	0.3
R14	Waterford Court	7.0	30.40	1,114.40	0.3	0.3
R15	City Harbour	7.0	32.21	1,116.21	0.3	0.4
R16	City Reach (Building Roof Level)	36.0	3654.30	4,738.30	36.5	41.0
R17	23-39 Pepper Street	1.5	43.31	1,127.31	0.4	0.5
R18	55-59 Pepper Street	1.5	42.86	1,126.86	0.4	0.5
R19	21 Pepper Street	1.5	36.68	1,120.68	0.4	0.4
R1a	Omega Close	7.5	49.08	1,133.08	0.5	0.6
R2a	Starboard Way	10.5	35.16	1,119.16	0.4	0.4
R3a	Omega Close	7.5	50.44	1,134.44	0.5	0.6
R4a	Starboard Way	4.5	41.32	1,125.32	0.4	0.5
R5a	Omega Close	7.5	61.88	1,145.88	0.6	0.7
R6a	Tiller Road	10.5	50.85	1,134.85	0.5	0.6
R7a	Cudweed Court	26.0	43.23	1,127.23	0.4	0.5
R8	Clover Court	26.0	48.13	1,132.13	0.5	0.5
R9a	Westwood House	26.0	46.18	1,130.18	0.5	0.5
R10a	City Apartments, Pepper Street	10.5	46.63	1,130.63	0.5	0.5
R11a	City Apartments, Pepper Street	13.5	36.54	1,120.54	0.4	0.4

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R12a	Baltimore Wharf	26.0	33.09	1,117.09	0.3	0.4
R13a	Baltimore Wharf	26.0	36.29	1,120.29	0.4	0.4
R14a	Waterford Court	26.0	36.25	1,120.25	0.4	0.4
R15a	City Harbour	26.0	42.76	1,126.76	0.4	0.5
R16a	City Reach (Second Floor Roof Level)	13.4	40.10	1,124.10	0.4	0.4
R17a	23-39 Pepper Street	12.5	43.31	1,127.31	0.4	0.5
R18a	55-59 Pepper Street	9.0	43.80	1,127.80	0.4	0.5
R19a	21 Pepper Street	4.5	36.56	1,120.56	0.4	0.4

Note: Predicted concentrations were assessed against the relevant EQSs: 8-Hour Rolling mean AQO of $10,000\mu\text{g}/\text{m}^3$.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 31, predicted CO concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of $4,738.30\mu\text{g}/\text{m}^3$ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 47% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

The PC proportion of the EQS exceeded 10% at 1 receptor location (R16) and as such, impacts on 8-hour rolling mean CO PC concentrations cannot be screened as **insignificant** in accordance with the initial stage of the EA screening criteria. PC impacts upon all remaining receptor locations are below 10%.

During the secondary stage of assessment, the PEC proportion of the EQS is predicted to be above 20% at the relevant receptor location (R16). Given the sufficient headroom in relation to the relevant EQS, impacts can be considered as **not significant**.

In addition, the assessment considered 2 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations. The overall significance is therefore considered to be **not significant**.

24-Hour Mean SO₂

Predicted 24-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 32.

Table 32: Predicted 24-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.04	8.24	<0.1	<0.1
R2	Starboard Way	1.5	0.04	8.24	<0.1	<0.1
R3	Omega Close	1.5	0.04	8.24	<0.1	<0.1
R4	Starboard Way	1.5	0.04	8.24	<0.1	<0.1
R5	Omega Close	1.5	0.05	8.25	<0.1	<0.1
R6	Tiller Road	1.5	0.04	8.24	<0.1	<0.1

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R7	Cudweed Court	7.0	0.03	8.23	<0.1	<0.1
R8	Clover Court	7.0	0.03	8.23	<0.1	<0.1
R9	Westwood House	7.0	0.03	8.23	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.05	8.25	<0.1	<0.1
R11	City Apartments, Pepper Street	1.5	0.04	8.24	<0.1	<0.1
R12	Baltimore Wharf	7.0	0.04	8.24	<0.1	<0.1
R13	Baltimore Wharf	7.0	0.04	8.24	<0.1	<0.1
R14	Waterford Court	7.0	0.04	8.24	<0.1	<0.1
R15	City Harbour	7.0	0.04	8.24	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	1.18	9.38	0.9	1.0
R17	23-39 Pepper Street	1.5	0.06	8.26	<0.1	<0.1
R18	55-59 Pepper Street	1.5	0.05	8.25	<0.1	<0.1
R19	21 Pepper Street	1.5	0.05	8.25	<0.1	<0.1
R1a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R2a	Starboard Way	10.5	0.04	8.24	<0.1	<0.1
R3a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R4a	Starboard Way	4.5	0.04	8.24	<0.1	<0.1
R5a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R6a	Tiller Road	10.5	0.04	8.24	<0.1	<0.1
R7a	Cudweed Court	26.0	0.04	8.24	<0.1	<0.1
R8	Clover Court	26.0	0.04	8.24	<0.1	<0.1
R9a	Westwood House	26.0	0.04	8.24	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	0.05	8.25	<0.1	<0.1
R11a	City Apartments, Pepper Street	13.5	0.04	8.24	<0.1	<0.1
R12a	Baltimore Wharf	26.0	0.04	8.24	<0.1	<0.1
R13a	Baltimore Wharf	26.0	0.04	8.24	<0.1	<0.1
R14a	Waterford Court	26.0	0.04	8.24	<0.1	<0.1
R15a	City Harbour	26.0	0.05	8.25	<0.1	<0.1
R16a	City Reach (Second Floor Roof Level)	13.4	0.06	8.26	<0.1	0.1
R17a	23-39 Pepper Street	12.5	0.06	8.26	<0.1	<0.1
R18a	55-59 Pepper Street	9.0	0.05	8.25	<0.1	<0.1
R19a	21 Pepper Street	4.5	0.05	8.25	<0.1	<0.1

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 124µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 32, predicted 24-hour SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 24-hour mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

1-Hour Mean SO₂

Predicted 1-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 33.

Table 33: Predicted 1-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.09	8.29	<0.1	<0.1
R2	Starboard Way	1.5	0.06	8.26	<0.1	<0.1
R3	Omega Close	1.5	0.08	8.28	<0.1	<0.1
R4	Starboard Way	1.5	0.06	8.26	<0.1	<0.1
R5	Omega Close	1.5	0.09	8.29	<0.1	<0.1
R6	Tiller Road	1.5	0.09	8.29	<0.1	<0.1
R7	Cudweed Court	7.0	0.06	8.26	<0.1	<0.1
R8	Clover Court	7.0	0.06	8.26	<0.1	<0.1
R9	Westwood House	7.0	0.08	8.28	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.06	8.26	<0.1	<0.1
R11	City Apartments, Pepper Street	1.5	0.06	8.26	<0.1	<0.1
R12	Baltimore Wharf	7.0	0.06	8.26	<0.1	<0.1
R13	Baltimore Wharf	7.0	0.06	8.26	<0.1	<0.1
R14	Waterford Court	7.0	0.06	8.26	<0.1	<0.1
R15	City Harbour	7.0	0.07	8.27	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	6.15	14.35	1.8	1.8
R17	23-39 Pepper Street	1.5	0.09	8.29	<0.1	<0.1
R18	55-59 Pepper Street	1.5	0.09	8.29	<0.1	<0.1
R19	21 Pepper Street	1.5	0.08	8.28	<0.1	<0.1
R1a	Omega Close	7.5	0.09	8.29	<0.1	<0.1
R2a	Starboard Way	10.5	0.06	8.26	<0.1	<0.1
R3a	Omega Close	7.5	0.08	8.28	<0.1	<0.1
R4a	Starboard Way	4.5	0.07	8.27	<0.1	<0.1
R5a	Omega Close	7.5	0.11	8.31	<0.1	<0.1
R6a	Tiller Road	10.5	0.10	8.30	<0.1	<0.1
R7a	Cudweed Court	26.0	0.10	8.30	<0.1	<0.1
R8	Clover Court	26.0	0.10	8.30	<0.1	<0.1
R9a	Westwood House	26.0	0.11	8.31	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	0.07	8.27	<0.1	<0.1

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R11a	City Apartments, Pepper Street	13.5	0.06	8.26	<0.1	<0.1
R12a	Baltimore Wharf	26.0	0.07	8.27	<0.1	<0.1
R13a	Baltimore Wharf	26.0	0.07	8.27	<0.1	<0.1
R14a	Waterford Court	26.0	0.07	8.27	<0.1	<0.1
R15a	City Harbour	26.0	0.08	8.28	<0.1	<0.1
R16a	City Reach (Second Floor Roof Level)	13.4	0.09	8.29	<0.1	<0.1
R17a	23-39 Pepper Street	12.5	0.09	8.29	<0.1	<0.1
R18a	55-59 Pepper Street	9.0	0.09	8.29	<0.1	<0.1
R19a	21 Pepper Street	4.5	0.08	8.28	<0.1	<0.1

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 350µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 33, predicted 1-hour SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 1-hour mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

15-Minute Mean SO₂

Predicted 15-minute mean SO₂ concentrations at sensitive receptor locations are summarised in Table 34.

Table 34: Predicted 15-Minute Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.14	8.34	0.1	0.1
R2	Starboard Way	1.5	0.09	8.29	<0.1	<0.1
R3	Omega Close	1.5	0.14	8.34	0.1	0.1
R4	Starboard Way	1.5	0.10	8.30	<0.1	<0.1
R5	Omega Close	1.5	0.12	8.32	<0.1	<0.1
R6	Tiller Road	1.5	0.13	8.33	<0.1	<0.1
R7	Cudweed Court	7.0	0.08	8.28	<0.1	<0.1
R8	Clover Court	7.0	0.09	8.29	<0.1	<0.1
R9	Westwood House	7.0	0.11	8.31	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.09	8.29	<0.1	<0.1
R11	City Apartments, Pepper Street	1.5	0.09	8.29	<0.1	<0.1
R12	Baltimore Wharf	7.0	0.08	8.28	<0.1	<0.1

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R13	Baltimore Wharf	7.0	0.09	8.29	<0.1	<0.1
R14	Waterford Court	7.0	0.08	8.28	<0.1	<0.1
R15	City Harbour	7.0	0.10	8.30	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	9.64	17.84	3.6	3.7
R17	23-39 Pepper Street	1.5	0.13	8.33	<0.1	<0.1
R18	55-59 Pepper Street	1.5	0.12	8.32	<0.1	<0.1
R19	21 Pepper Street	1.5	0.11	8.31	<0.1	<0.1
R1a	Omega Close	7.5	0.14	8.34	0.1	0.1
R2a	Starboard Way	10.5	0.09	8.29	<0.1	<0.1
R3a	Omega Close	7.5	0.14	8.34	0.1	0.1
R4a	Starboard Way	4.5	0.10	8.30	<0.1	<0.1
R5a	Omega Close	7.5	0.22	8.42	0.1	0.1
R6a	Tiller Road	10.5	0.14	8.34	0.1	0.1
R7a	Cudweed Court	26.0	0.15	8.35	0.1	0.1
R8	Clover Court	26.0	0.14	8.34	0.1	0.1
R9a	Westwood House	26.0	0.18	8.38	0.1	0.1
R10a	City Apartments, Pepper Street	10.5	0.10	8.30	<0.1	<0.1
R11a	City Apartments, Pepper Street	13.5	0.09	8.29	<0.1	<0.1
R12a	Baltimore Wharf	26.0	0.10	8.30	<0.1	<0.1
R13a	Baltimore Wharf	26.0	0.10	8.30	<0.1	<0.1
R14a	Waterford Court	26.0	0.10	8.30	<0.1	<0.1
R15a	City Harbour	26.0	0.11	8.31	<0.1	<0.1
R16a	City Reach (Second Floor Roof Level)	13.4	0.12	8.32	<0.1	<0.1
R17a	23-39 Pepper Street	12.5	0.13	8.33	<0.1	<0.1
R18a	55-59 Pepper Street	9.0	0.13	8.33	<0.1	<0.1
R19a	21 Pepper Street	4.5	0.11	8.31	<0.1	<0.1

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 266µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 34, predicted 15-minute SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 15-minute mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

5.1.2 Scenario 2

Annual Mean NO₂

Predicted annual mean NO₂ concentrations at sensitive human receptor locations are summarised in Table 35. It should be noted that only residential receptors were considered for predicted changes in annual mean NO₂ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 35: Predicted Annual Mean NO₂ Concentrations

Receptor		Height (m)	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.10	26.87	0.2	67.2
R2	Starboard Way	1.5	0.10	26.87	0.2	67.2
R3	Omega Close	1.5	0.10	26.87	0.2	67.2
R4	Starboard Way	1.5	0.08	26.86	0.2	67.1
R5	Omega Close	1.5	0.06	26.83	0.1	67.1
R6	Tiller Road	1.5	0.05	26.82	0.1	67.1
R7	Cudweed Court	7.0	0.04	26.81	0.1	67.0
R8	Clover Court	7.0	0.06	26.84	0.2	67.1
R9	Westwood House	7.0	0.04	26.81	0.1	67.0
R10	City Apartments, Pepper Street	1.5	0.22	26.99	0.5	67.5
R11	City Apartments, Pepper Street	1.5	0.17	26.94	0.4	67.3
R12	Baltimore Wharf	7.0	0.17	26.94	0.4	67.4
R13	Baltimore Wharf	7.0	0.15	26.92	0.4	67.3
R14	Waterford Court	7.0	0.19	26.96	0.5	67.4
R15	City Harbour	7.0	0.10	26.87	0.2	67.2
R1a	Omega Close	7.5	0.11	26.89	0.3	67.2
R2a	Starboard Way	10.5	0.10	26.87	0.2	67.2
R3a	Omega Close	7.5	0.10	26.88	0.3	67.2
R4a	Starboard Way	4.5	0.09	26.86	0.2	67.1
R5a	Omega Close	7.5	0.06	26.84	0.2	67.1
R6a	Tiller Road	10.5	0.05	26.83	0.1	67.1
R7a	Cudweed Court	26.0	0.05	26.82	0.1	67.1
R8	Clover Court	26.0	0.09	26.86	0.2	67.2
R9a	Westwood House	26.0	0.05	26.82	0.1	67.1
R10a	City Apartments, Pepper Street	10.5	0.23	27.00	0.6	67.5
R11a	City Apartments, Pepper Street	13.5	0.20	26.98	0.5	67.4
R12a	Baltimore Wharf	26.0	0.15	26.93	0.4	67.3
R13a	Baltimore Wharf	26.0	0.13	26.91	0.3	67.3

Receptor		Height (m)	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R14a	Waterford Court	26.0	0.19	26.96	0.5	67.4
R15a	City Harbour	26.0	0.12	26.89	0.3	67.2

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 40µg/m³.

As indicated in Table 35, predicted NO₂ concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean NO₂ PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

1-Hour Mean NO₂

As mentioned in Section 3.6, an approach utilising hypergeometric probability distribution was undertaken in order to potential for exceedances of the 1-hour AQO based on the proposed annual operational hours (76.5 hours). The cumulative hypergeometric distribution for each sensitive receptor location is detailed in Table 36.

Table 36: Predicted 1-Hour Mean NO₂ Concentrations

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R1	Omega Close	1.5	<0.1	<0.1
R2	Starboard Way	1.5	<0.1	<0.1
R3	Omega Close	1.5	<0.1	<0.1
R4	Starboard Way	1.5	<0.1	<0.1
R5	Omega Close	1.5	<0.1	<0.1
R6	Tiller Road	1.5	<0.1	<0.1
R7	Cudweed Court	7.0	<0.1	<0.1
R8	Clover Court	7.0	<0.1	<0.1
R9	Westwood House	7.0	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	<0.1	<0.1
R11	City Apartments, Pepper Street	1.5	<0.1	<0.1
R12	Baltimore Wharf	7.0	<0.1	<0.1
R13	Baltimore Wharf	7.0	<0.1	<0.1
R14	Waterford Court	7.0	<0.1	<0.1
R15	City Harbour	7.0	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	0.5	1.2
R17	23-39 Pepper Street	1.5	<0.1	<0.1
R18	55-59 Pepper Street	1.5	<0.1	<0.1

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R19	21 Pepper Street	1.5	<0.1	<0.1
R1a	Omega Close	7.5	<0.1	<0.1
R2a	Starboard Way	10.5	<0.1	<0.1
R3a	Omega Close	7.5	<0.1	<0.1
R4a	Starboard Way	4.5	<0.1	<0.1
R5a	Omega Close	7.5	<0.1	<0.1
R6a	Tiller Road	10.5	<0.1	<0.1
R7a	Cudweed Court	26.0	<0.1	<0.1
R8	Clover Court	26.0	<0.1	<0.1
R9a	Westwood House	26.0	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	<0.1	<0.1
R11a	City Apartments, Pepper Street	13.5	<0.1	<0.1
R12a	Baltimore Wharf	26.0	<0.1	<0.1
R13a	Baltimore Wharf	26.0	<0.1	<0.1
R14a	Waterford Court	26.0	<0.1	<0.1
R15a	City Harbour	26.0	<0.1	<0.1
R16a	City Reach (Second Floor Roof Level)	13.4	<0.1	<0.1
R17a	23-39 Pepper Street	12.5	<0.1	<0.1
R18a	55-59 Pepper Street	9.0	<0.1	<0.1
R19a	21 Pepper Street	4.5	<0.1	<0.1

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 200µg/m³.

a: PC proportion of the EQS minus twice the long-term background

b: PEC proportion of the EQS

As indicated in Table 36, the cumulative hypergeometric distribution calculates the probability to be 1.2% at one receptor location (R16) and <0.1% at all remaining receptor locations. As such, the 1-hour mean EQS for NO₂ will not be exceeded at any location (less than 5% at all receptor locations) during operations of the development. It is therefore considered that an annual operational period of 76.5 hours is acceptable.

Annual Mean PM₁₀

Predicted annual mean PM₁₀ concentrations at sensitive human receptor locations are summarised in Table 37. It should be noted that only residential receptors were considered for predicted changes in annual mean PM₁₀ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 37: Predicted Annual Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0008	18.0350	<0.1	45.1

Receptor		Height (m)	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R2	Starboard Way	1.5	0.0008	18.0350	<0.1	45.1
R3	Omega Close	1.5	0.0007	18.0349	<0.1	45.1
R4	Starboard Way	1.5	0.0007	18.0349	<0.1	45.1
R5	Omega Close	1.5	0.0005	18.0347	<0.1	45.1
R6	Tiller Road	1.5	0.0004	18.0346	<0.1	45.1
R7	Cudweed Court	7.0	0.0003	18.0345	<0.1	45.1
R8	Clover Court	7.0	0.0005	18.0347	<0.1	45.1
R9	Westwood House	7.0	0.0003	18.0345	<0.1	45.1
R10	City Apartments, Pepper Street	1.5	0.0017	18.0359	<0.1	45.1
R11	City Apartments, Pepper Street	1.5	0.0013	18.0355	<0.1	45.1
R12	Baltimore Wharf	7.0	0.0013	18.0355	<0.1	45.1
R13	Baltimore Wharf	7.0	0.0012	18.0353	<0.1	45.1
R14	Waterford Court	7.0	0.0015	18.0357	<0.1	45.1
R15	City Harbour	7.0	0.0008	18.0350	<0.1	45.1
R1a	Omega Close	7.5	0.0009	18.0351	<0.1	45.1
R2a	Starboard Way	10.5	0.0008	18.0350	<0.1	45.1
R3a	Omega Close	7.5	0.0008	18.0350	<0.1	45.1
R4a	Starboard Way	4.5	0.0007	18.0349	<0.1	45.1
R5a	Omega Close	7.5	0.0005	18.0347	<0.1	45.1
R6a	Tiller Road	10.5	0.0004	18.0346	<0.1	45.1
R7a	Cudweed Court	26.0	0.0004	18.0346	<0.1	45.1
R8	Clover Court	26.0	0.0007	18.0349	<0.1	45.1
R9a	Westwood House	26.0	0.0004	18.0346	<0.1	45.1
R10a	City Apartments, Pepper Street	10.5	0.0018	18.0360	<0.1	45.1
R11a	City Apartments, Pepper Street	13.5	0.0016	18.0358	<0.1	45.1
R12a	Baltimore Wharf	26.0	0.0012	18.0354	<0.1	45.1
R13a	Baltimore Wharf	26.0	0.0010	18.0352	<0.1	45.1
R14a	Waterford Court	26.0	0.0015	18.0356	<0.1	45.1
R15a	City Harbour	26.0	0.0009	18.0351	<0.1	45.1

Note: Predicted concentrations were assessed against the relevant EQS: Annual mean AQO of 40µg/m³.

As indicated in Table 37, predicted PM₁₀ concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean PM₁₀ PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

24-Hour Mean PM₁₀

Predicted 24-hour mean PM₁₀ concentrations at sensitive receptor locations are summarised in Table 38.

Table 38: Predicted 24-Hour Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.28	36.35	0.6	2.0
R2	Starboard Way	1.5	0.27	36.34	0.5	2.0
R3	Omega Close	1.5	0.28	36.35	0.6	2.0
R4	Starboard Way	1.5	0.26	36.33	0.5	1.9
R5	Omega Close	1.5	0.18	36.25	0.4	1.3
R6	Tiller Road	1.5	0.16	36.23	0.3	1.1
R7	Cudweed Court	7.0	0.13	36.20	0.3	0.9
R8	Clover Court	7.0	0.17	36.24	0.3	1.2
R9	Westwood House	7.0	0.13	36.19	0.3	0.9
R10	City Apartments, Pepper Street	1.5	0.38	36.45	0.8	2.7
R11	City Apartments, Pepper Street	1.5	0.31	36.38	0.6	2.2
R12	Baltimore Wharf	7.0	0.31	36.38	0.6	2.2
R13	Baltimore Wharf	7.0	0.27	36.34	0.5	2.0
R14	Waterford Court	7.0	0.31	36.38	0.6	2.2
R15	City Harbour	7.0	0.26	36.33	0.5	1.9
R16	City Reach (Building Roof Level)	36.0	2.67	38.73	5.3	19.1
R17	23-39 Pepper Street	1.5	0.38	36.45	0.8	2.7
R18	55-59 Pepper Street	1.5	0.36	36.43	0.7	2.6
R19	21 Pepper Street	1.5	0.39	36.46	0.8	2.8
R1a	Omega Close	7.5	0.33	36.39	0.7	2.3
R2a	Starboard Way	10.5	0.28	36.35	0.6	2.0
R3a	Omega Close	7.5	0.30	36.37	0.6	2.2
R4a	Starboard Way	4.5	0.26	36.33	0.5	1.9
R5a	Omega Close	7.5	0.19	36.26	0.4	1.4
R6a	Tiller Road	10.5	0.17	36.24	0.3	1.2
R7a	Cudweed Court	26.0	0.18	36.25	0.4	1.3
R8	Clover Court	26.0	0.23	36.30	0.5	1.7
R9a	Westwood House	26.0	0.16	36.23	0.3	1.2
R10a	City Apartments, Pepper Street	10.5	0.39	36.46	0.8	2.8
R11a	City Apartments, Pepper Street	13.5	0.36	36.43	0.7	2.6
R12a	Baltimore Wharf	26.0	0.27	36.34	0.5	2.0
R13a	Baltimore Wharf	26.0	0.25	36.32	0.5	1.8

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R14a	Waterford Court	26.0	0.31	36.38	0.6	2.2
R15a	City Harbour	26.0	0.28	36.35	0.6	2.0
R16a	City Reach (Second Floor Roof Level)	13.4	0.41	36.48	0.8	3.0
R17a	23-39 Pepper Street	12.5	0.39	36.45	0.8	2.8
R18a	55-59 Pepper Street	9.0	0.36	36.43	0.7	2.6
R19a	21 Pepper Street	4.5	0.39	36.46	0.8	2.8

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 50µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 38, predicted 24-hour PM₁₀ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 24-hour mean PM₁₀ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean PM_{2.5}

Predicted annual mean PM_{2.5} concentrations at sensitive human receptor locations are summarised in Table 39. It should be noted that only residential receptors were considered for predicted changes in annual mean PM_{2.5} concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 39: Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0008	11.6744	<0.1	46.7
R2	Starboard Way	1.5	0.0008	11.6744	<0.1	46.7
R3	Omega Close	1.5	0.0007	11.6744	<0.1	46.7
R4	Starboard Way	1.5	0.0007	11.6743	<0.1	46.7
R5	Omega Close	1.5	0.0005	11.6741	<0.1	46.7
R6	Tiller Road	1.5	0.0004	11.6740	<0.1	46.7
R7	Cudweed Court	7.0	0.0003	11.6739	<0.1	46.7
R8	Clover Court	7.0	0.0005	11.6741	<0.1	46.7
R9	Westwood House	7.0	0.0003	11.6739	<0.1	46.7
R10	City Apartments, Pepper Street	1.5	0.0017	11.6753	<0.1	46.7
R11	City Apartments, Pepper Street	1.5	0.0013	11.6749	<0.1	46.7
R12	Baltimore Wharf	7.0	0.0013	11.6749	<0.1	46.7
R13	Baltimore Wharf	7.0	0.0012	11.6748	<0.1	46.7

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R14	Waterford Court	7.0	0.0015	11.6751	<0.1	46.7
R15	City Harbour	7.0	0.0008	11.6744	<0.1	46.7
R1a	Omega Close	7.5	0.0009	11.6745	<0.1	46.7
R2a	Starboard Way	10.5	0.0008	11.6744	<0.1	46.7
R3a	Omega Close	7.5	0.0008	11.6744	<0.1	46.7
R4a	Starboard Way	4.5	0.0007	11.6743	<0.1	46.7
R5a	Omega Close	7.5	0.0005	11.6741	<0.1	46.7
R6a	Tiller Road	10.5	0.0004	11.6741	<0.1	46.7
R7a	Cudweed Court	26.0	0.0004	11.6740	<0.1	46.7
R8	Clover Court	26.0	0.0007	11.6743	<0.1	46.7
R9a	Westwood House	26.0	0.0004	11.6740	<0.1	46.7
R10a	City Apartments, Pepper Street	10.5	0.0018	11.6754	<0.1	46.7
R11a	City Apartments, Pepper Street	13.5	0.0016	11.6752	<0.1	46.7
R12a	Baltimore Wharf	26.0	0.0012	11.6748	<0.1	46.7
R13a	Baltimore Wharf	26.0	0.0010	11.6747	<0.1	46.7
R14a	Waterford Court	26.0	0.0015	11.6751	<0.1	46.7
R15a	City Harbour	26.0	0.0009	11.6745	<0.1	46.7

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 25µg/m³.

As indicated in Table 39, predicted PM_{2.5} concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean PM_{2.5} PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean HC

Predicted annual mean HC concentrations at sensitive human receptor locations are summarised in Table 40. It should be noted that only residential receptors were considered for predicted changes in annual mean HC concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 40: Predicted Annual Mean HC Concentrations

Receptor		Height (m)	Predicted Annual Mean HC Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.011	0.827	0.2	16.5
R2	Starboard Way	1.5	0.011	0.827	0.2	16.5
R3	Omega Close	1.5	0.010	0.826	0.2	16.5
R4	Starboard Way	1.5	0.009	0.825	0.2	16.5

Receptor		Height (m)	Predicted Annual Mean HC Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R5	Omega Close	1.5	0.006	0.822	0.1	16.4
R6	Tiller Road	1.5	0.005	0.821	0.1	16.4
R7	Cudweed Court	7.0	0.004	0.820	0.1	16.4
R8	Clover Court	7.0	0.006	0.822	0.1	16.4
R9	Westwood House	7.0	0.004	0.820	0.1	16.4
R10	City Apartments, Pepper Street	1.5	0.022	0.838	0.4	16.8
R11	City Apartments, Pepper Street	1.5	0.017	0.833	0.3	16.7
R12	Baltimore Wharf	7.0	0.017	0.833	0.3	16.7
R13	Baltimore Wharf	7.0	0.015	0.831	0.3	16.6
R14	Waterford Court	7.0	0.019	0.835	0.4	16.7
R15	City Harbour	7.0	0.010	0.826	0.2	16.5
R1a	Omega Close	7.5	0.012	0.828	0.2	16.6
R2a	Starboard Way	10.5	0.011	0.827	0.2	16.5
R3a	Omega Close	7.5	0.011	0.827	0.2	16.5
R4a	Starboard Way	4.5	0.009	0.825	0.2	16.5
R5a	Omega Close	7.5	0.007	0.823	0.1	16.5
R6a	Tiller Road	10.5	0.006	0.822	0.1	16.4
R7a	Cudweed Court	26.0	0.005	0.821	0.1	16.4
R8	Clover Court	26.0	0.009	0.825	0.2	16.5
R9a	Westwood House	26.0	0.005	0.821	0.1	16.4
R10a	City Apartments, Pepper Street	10.5	0.024	0.840	0.5	16.8
R11a	City Apartments, Pepper Street	13.5	0.021	0.837	0.4	16.7
R12a	Baltimore Wharf	26.0	0.015	0.831	0.3	16.6
R13a	Baltimore Wharf	26.0	0.013	0.829	0.3	16.6
R14a	Waterford Court	26.0	0.019	0.835	0.4	16.7
R15a	City Harbour	26.0	0.012	0.828	0.2	16.6

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of $5\mu\text{g}/\text{m}^3$.

As indicated in Table 40, predicted HC concentrations were below the relevant long term EQS at all sensitive receptor locations.

The PC proportion of the EQS is below 1% at all 30 receptor locations sensitive to long term exposure. As such, impacts on annual mean HC PC concentrations at these locations can be screened as **insignificant** in accordance with the initial stage of the EA screening criteria.

8-Hour Rolling Mean CO

Predicted CO concentrations at sensitive receptor locations are summarised in Table 41.

Table 41: Predicted 8-hour Rolling Mean CO Concentrations

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	47.82	1,131.82	0.5	0.5
R2	Starboard Way	1.5	35.17	1,119.17	0.4	0.4
R3	Omega Close	1.5	49.53	1,133.53	0.5	0.6
R4	Starboard Way	1.5	41.31	1,125.31	0.4	0.5
R5	Omega Close	1.5	42.66	1,126.66	0.4	0.5
R6	Tiller Road	1.5	47.93	1,131.93	0.5	0.5
R7	Cudweed Court	7.0	29.57	1,113.57	0.3	0.3
R8	Clover Court	7.0	31.54	1,115.54	0.3	0.4
R9	Westwood House	7.0	38.34	1,122.34	0.4	0.4
R10	City Apartments, Pepper Street	1.5	32.12	1,116.12	0.3	0.4
R11	City Apartments, Pepper Street	1.5	31.39	1,115.39	0.3	0.4
R12	Baltimore Wharf	7.0	28.56	1,112.56	0.3	0.3
R13	Baltimore Wharf	7.0	30.79	1,114.79	0.3	0.3
R14	Waterford Court	7.0	30.40	1,114.40	0.3	0.3
R15	City Harbour	7.0	32.21	1,116.21	0.3	0.4
R16	City Reach (Building Roof Level)	36.0	3654.30	4,738.30	36.5	41.0
R17	23-39 Pepper Street	1.5	43.31	1,127.31	0.4	0.5
R18	55-59 Pepper Street	1.5	42.86	1,126.86	0.4	0.5
R19	21 Pepper Street	1.5	36.68	1,120.68	0.4	0.4
R1a	Omega Close	7.5	49.08	1,133.08	0.5	0.6
R2a	Starboard Way	10.5	35.16	1,119.16	0.4	0.4
R3a	Omega Close	7.5	50.44	1,134.44	0.5	0.6
R4a	Starboard Way	4.5	41.32	1,125.32	0.4	0.5
R5a	Omega Close	7.5	61.88	1,145.88	0.6	0.7
R6a	Tiller Road	10.5	50.85	1,134.85	0.5	0.6
R7a	Cudweed Court	26.0	43.23	1,127.23	0.4	0.5
R8	Clover Court	26.0	48.13	1,132.13	0.5	0.5
R9a	Westwood House	26.0	46.18	1,130.18	0.5	0.5
R10a	City Apartments, Pepper Street	10.5	46.63	1,130.63	0.5	0.5
R11a	City Apartments, Pepper Street	13.5	36.54	1,120.54	0.4	0.4
R12a	Baltimore Wharf	26.0	33.09	1,117.09	0.3	0.4
R13a	Baltimore Wharf	26.0	36.29	1,120.29	0.4	0.4
R14a	Waterford Court	26.0	36.25	1,120.25	0.4	0.4
R15a	City Harbour	26.0	42.76	1,126.76	0.4	0.5

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R16a	City Reach (Second Floor Roof Level)	13.4	40.10	1,124.10	0.4	0.4
R17a	23-39 Pepper Street	12.5	43.31	1,127.31	0.4	0.5
R18a	55-59 Pepper Street	9.0	43.80	1,127.80	0.4	0.5
R19a	21 Pepper Street	4.5	36.56	1,120.56	0.4	0.4

Note: Predicted concentrations were assessed against the relevant EQSs: 8-Hour Rolling mean AQO of $10,000\mu\text{g}/\text{m}^3$.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 41, predicted CO concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of $4,738.30\mu\text{g}/\text{m}^3$ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 47% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

The PC proportion of the EQS exceeded 10% at 1 receptor location (R16) and as such, impacts on 8-hour rolling mean CO PC concentrations cannot be screened as **insignificant** in accordance with the initial stage of the EA screening criteria. PC impacts upon all remaining receptor locations are below 10%.

During the secondary stage of assessment, the PEC proportion of the EQS is predicted to be above 20% at the relevant receptor location (R16). Given the sufficient headroom in relation to the relevant EQS, impacts can be considered as **not significant**.

In addition, the assessment considered 2 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations. The overall impact is therefore considered to be **not significant**.

24-Hour Mean SO₂

Predicted 24-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 42.

Table 42: Predicted 24-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.04	8.24	<0.1	<0.1
R2	Starboard Way	1.5	0.04	8.24	<0.1	<0.1
R3	Omega Close	1.5	0.04	8.24	<0.1	<0.1
R4	Starboard Way	1.5	0.04	8.24	<0.1	<0.1
R5	Omega Close	1.5	0.05	8.25	<0.1	<0.1
R6	Tiller Road	1.5	0.04	8.24	<0.1	<0.1
R7	Cudweed Court	7.0	0.03	8.23	<0.1	<0.1
R8	Clover Court	7.0	0.09	8.29	0.1	0.1
R9	Westwood House	7.0	0.03	8.23	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.14	8.34	0.1	0.1

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R11	City Apartments, Pepper Street	1.5	0.19	8.39	0.2	0.2
R12	Baltimore Wharf	7.0	0.15	8.35	0.1	0.1
R13	Baltimore Wharf	7.0	0.15	8.35	0.1	0.1
R14	Waterford Court	7.0	0.15	8.35	0.1	0.1
R15	City Harbour	7.0	0.07	8.27	0.1	0.1
R16	City Reach (Building Roof Level)	36.0	1.18	9.38	0.9	1.0
R17	23-39 Pepper Street	1.5	0.16	8.36	0.1	0.1
R18	55-59 Pepper Street	1.5	0.14	8.34	0.1	0.1
R19	21 Pepper Street	1.5	0.18	8.38	0.1	0.2
R1a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R2a	Starboard Way	10.5	0.04	8.24	<0.1	<0.1
R3a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R4a	Starboard Way	4.5	0.04	8.24	<0.1	<0.1
R5a	Omega Close	7.5	0.05	8.25	<0.1	<0.1
R6a	Tiller Road	10.5	0.05	8.25	<0.1	<0.1
R7a	Cudweed Court	26.0	0.05	8.25	<0.1	<0.1
R8	Clover Court	26.0	0.14	8.34	0.1	0.1
R9a	Westwood House	26.0	0.04	8.24	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	0.14	8.34	0.1	0.1
R11a	City Apartments, Pepper Street	13.5	0.20	8.40	0.2	0.2
R12a	Baltimore Wharf	26.0	0.14	8.34	0.1	0.1
R13a	Baltimore Wharf	26.0	0.14	8.34	0.1	0.1
R14a	Waterford Court	26.0	0.17	8.37	0.1	0.1
R15a	City Harbour	26.0	0.11	8.31	0.1	0.1
R16a	City Reach (Second Floor Roof Level)	13.4	0.19	8.39	0.2	0.2
R17a	23-39 Pepper Street	12.5	0.16	8.36	0.1	0.1
R18a	55-59 Pepper Street	9.0	0.14	8.34	0.1	0.1
R19a	21 Pepper Street	4.5	0.18	8.38	0.1	0.2

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 124µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 42, predicted 24-hour SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 24-hour mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

1-Hour Mean SO₂

Predicted 1-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 43.

Table 43: Predicted 1-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.10	8.30	<0.1	<0.1
R2	Starboard Way	1.5	0.08	8.28	<0.1	<0.1
R3	Omega Close	1.5	0.11	8.31	<0.1	<0.1
R4	Starboard Way	1.5	0.07	8.27	<0.1	<0.1
R5	Omega Close	1.5	0.09	8.29	<0.1	<0.1
R6	Tiller Road	1.5	0.09	8.29	<0.1	<0.1
R7	Cudweed Court	7.0	0.06	8.26	<0.1	<0.1
R8	Clover Court	7.0	0.18	8.38	0.1	0.1
R9	Westwood House	7.0	0.08	8.28	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.28	8.48	0.1	0.1
R11	City Apartments, Pepper Street	1.5	0.24	8.44	0.1	0.1
R12	Baltimore Wharf	7.0	0.27	8.47	0.1	0.1
R13	Baltimore Wharf	7.0	0.25	8.45	0.1	0.1
R14	Waterford Court	7.0	0.25	8.45	0.1	0.1
R15	City Harbour	7.0	0.22	8.42	0.1	0.1
R16	City Reach (Building Roof Level)	36.0	6.17	14.37	1.8	1.8
R17	23-39 Pepper Street	1.5	0.24	8.44	0.1	0.1
R18	55-59 Pepper Street	1.5	0.20	8.40	0.1	0.1
R19	21 Pepper Street	1.5	0.28	8.48	0.1	0.1
R1a	Omega Close	7.5	0.11	8.31	<0.1	<0.1
R2a	Starboard Way	10.5	0.08	8.28	<0.1	<0.1
R3a	Omega Close	7.5	0.10	8.30	<0.1	<0.1
R4a	Starboard Way	4.5	0.07	8.27	<0.1	<0.1
R5a	Omega Close	7.5	0.13	8.33	<0.1	<0.1
R6a	Tiller Road	10.5	0.10	8.30	<0.1	<0.1
R7a	Cudweed Court	26.0	0.11	8.31	<0.1	<0.1
R8	Clover Court	26.0	0.24	8.44	0.1	0.1
R9a	Westwood House	26.0	0.13	8.33	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	0.28	8.48	0.1	0.1
R11a	City Apartments, Pepper Street	13.5	0.25	8.45	0.1	0.1
R12a	Baltimore Wharf	26.0	0.28	8.48	0.1	0.1
R13a	Baltimore Wharf	26.0	0.24	8.44	0.1	0.1

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R14a	Waterford Court	26.0	0.31	8.51	0.1	0.1
R15a	City Harbour	26.0	0.38	8.58	0.1	0.1
R16a	City Reach (Second Floor Roof Level)	13.4	0.25	8.45	0.1	0.1
R17a	23-39 Pepper Street	12.5	0.24	8.44	0.1	0.1
R18a	55-59 Pepper Street	9.0	0.20	8.40	0.1	0.1
R19a	21 Pepper Street	4.5	0.28	8.48	0.1	0.1

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 350µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 43, predicted 1-hour SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 1-hour mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

15-Minute Mean SO₂

Predicted 15-minute mean SO₂ concentrations at sensitive receptor locations are summarised in Table 44.

Table 44: Predicted 15-Minute Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.23	8.43	0.1	0.1
R2	Starboard Way	1.5	0.35	8.55	0.1	0.1
R3	Omega Close	1.5	0.30	8.50	0.1	0.1
R4	Starboard Way	1.5	0.27	8.47	0.1	0.1
R5	Omega Close	1.5	0.14	8.34	0.1	0.1
R6	Tiller Road	1.5	0.23	8.43	0.1	0.1
R7	Cudweed Court	7.0	0.09	8.29	<0.1	<0.1
R8	Clover Court	7.0	0.38	8.58	0.1	0.1
R9	Westwood House	7.0	0.13	8.33	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	0.42	8.62	0.2	0.2
R11	City Apartments, Pepper Street	1.5	0.35	8.55	0.1	0.1
R12	Baltimore Wharf	7.0	0.42	8.62	0.2	0.2
R13	Baltimore Wharf	7.0	0.43	8.63	0.2	0.2
R14	Waterford Court	7.0	0.36	8.56	0.1	0.1
R15	City Harbour	7.0	0.37	8.57	0.1	0.1

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R16	City Reach (Building Roof Level)	36.0	9.65	17.85	3.6	3.7
R17	23-39 Pepper Street	1.5	0.38	8.58	0.1	0.1
R18	55-59 Pepper Street	1.5	0.32	8.52	0.1	0.1
R19	21 Pepper Street	1.5	0.44	8.64	0.2	0.2
R1a	Omega Close	7.5	0.32	8.52	0.1	0.1
R2a	Starboard Way	10.5	0.36	8.56	0.1	0.1
R3a	Omega Close	7.5	0.32	8.52	0.1	0.1
R4a	Starboard Way	4.5	0.28	8.48	0.1	0.1
R5a	Omega Close	7.5	0.26	8.46	0.1	0.1
R6a	Tiller Road	10.5	0.34	8.54	0.1	0.1
R7a	Cudweed Court	26.0	0.16	8.36	0.1	0.1
R8	Clover Court	26.0	0.55	8.75	0.2	0.2
R9a	Westwood House	26.0	0.23	8.43	0.1	0.1
R10a	City Apartments, Pepper Street	10.5	0.42	8.62	0.2	0.2
R11a	City Apartments, Pepper Street	13.5	0.37	8.57	0.1	0.1
R12a	Baltimore Wharf	26.0	0.45	8.65	0.2	0.2
R13a	Baltimore Wharf	26.0	0.41	8.61	0.2	0.2
R14a	Waterford Court	26.0	0.47	8.67	0.2	0.2
R15a	City Harbour	26.0	0.56	8.76	0.2	0.2
R16a	City Reach (Second Floor Roof Level)	13.4	0.34	8.54	0.1	0.1
R17a	23-39 Pepper Street	12.5	0.38	8.58	0.1	0.1
R18a	55-59 Pepper Street	9.0	0.35	8.55	0.1	0.1
R19a	21 Pepper Street	4.5	0.44	8.64	0.2	0.2

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 266µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 44, predicted 15-minute SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 10% at all 38 receptor locations. As such, impacts on 15-minute mean SO₂ concentrations are considered to be **insignificant** in accordance with the initial stage of the EA screening criteria.

5.1.3 Scenario 3

Annual Mean NO₂

Predicted annual mean NO₂ concentrations at sensitive human receptor locations are summarised in Table 45. It should be noted that only residential receptors were considered for predicted changes in annual mean NO₂ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 45: Predicted Annual Mean NO₂ Concentrations

Receptor		Height (m)	Predicted Annual Mean NO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.07	26.84	0.2	67.1
R2	Starboard Way	1.5	0.11	26.88	0.3	67.2
R3	Omega Close	1.5	0.09	26.87	0.2	67.2
R4	Starboard Way	1.5	0.09	26.87	0.2	67.2
R5	Omega Close	1.5	0.05	26.82	0.1	67.1
R6	Tiller Road	1.5	0.05	26.82	0.1	67.1
R7	Cudweed Court	7.0	0.04	26.81	0.1	67.0
R8	Clover Court	7.0	0.07	26.84	0.2	67.1
R9	Westwood House	7.0	0.04	26.82	0.1	67.0
R10	City Apartments, Pepper Street	1.5	0.22	26.99	0.5	67.5
R11	City Apartments, Pepper Street	1.5	0.18	26.96	0.5	67.4
R12	Baltimore Wharf	7.0	0.23	27.00	0.6	67.5
R13	Baltimore Wharf	7.0	0.20	26.97	0.5	67.4
R14	Waterford Court	7.0	0.24	27.02	0.6	67.5
R15	City Harbour	7.0	0.11	26.89	0.3	67.2
R1a	Omega Close	7.5	0.09	26.86	0.2	67.2
R2a	Starboard Way	10.5	0.12	26.89	0.3	67.2
R3a	Omega Close	7.5	0.10	26.88	0.3	67.2
R4a	Starboard Way	4.5	0.10	26.87	0.2	67.2
R5a	Omega Close	7.5	0.06	26.83	0.1	67.1
R6a	Tiller Road	10.5	0.06	26.83	0.1	67.1
R7a	Cudweed Court	26.0	0.06	26.83	0.2	67.1
R8	Clover Court	26.0	0.10	26.87	0.3	67.2
R9a	Westwood House	26.0	0.06	26.83	0.2	67.1
R10a	City Apartments, Pepper Street	10.5	0.23	27.00	0.6	67.5
R11a	City Apartments, Pepper Street	13.5	0.21	26.98	0.5	67.4
R12a	Baltimore Wharf	26.0	0.23	27.00	0.6	67.5
R13a	Baltimore Wharf	26.0	0.19	26.97	0.5	67.4
R14a	Waterford Court	26.0	0.29	27.06	0.7	67.7
R15a	City Harbour	26.0	0.17	26.94	0.4	67.4

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 40µg/m³.

As indicated in Table 45, predicted NO₂ concentrations were below the relevant long term EQS at all sensitive receptor locations. A maximum PEC of 27.06µg/m³ as predicted at sensitive residential location R14a (Water Court) is equivalent to 68% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

1-Hour Mean NO₂

As mentioned in Section 3.6, an approach utilising hypergeometric probability distribution was undertaken in order to potential for exceedances of the 1-hour AQO based on the proposed annual operational hours (5 hours). However, as this is under the number of times of allowed exceedances (18 times), the hypergeometric distribution approach is based on the minimum operational hours (19 hours). The cumulative hypergeometric distribution for each sensitive receptor location is detailed in Table 46.

Table 46: Predicted 1-Hour Mean NO₂ Concentrations

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R1	Omega Close	1.5	<0.1	<0.1
R2	Starboard Way	1.5	<0.1	<0.1
R3	Omega Close	1.5	<0.1	<0.1
R4	Starboard Way	1.5	<0.1	<0.1
R5	Omega Close	1.5	<0.1	<0.1
R6	Tiller Road	1.5	<0.1	<0.1
R7	Cudweed Court	7.0	<0.1	<0.1
R8	Clover Court	7.0	<0.1	<0.1
R9	Westwood House	7.0	<0.1	<0.1
R10	City Apartments, Pepper Street	1.5	20.1	50.2
R11	City Apartments, Pepper Street	1.5	14.1	35.2
R12	Baltimore Wharf	7.0	22.9	57.3
R13	Baltimore Wharf	7.0	15.7	39.2
R14	Waterford Court	7.0	22.4	56.0
R15	City Harbour	7.0	<0.1	<0.1
R16	City Reach (Building Roof Level)	36.0	1.4	3.6
R17	23-39 Pepper Street	1.5	46.5	100.0
R18	55-59 Pepper Street	1.5	4.1	10.3
R19	21 Pepper Street	1.5	39.6	99.1
R1a	Omega Close	7.5	<0.1	<0.1
R2a	Starboard Way	10.5	<0.1	<0.1
R3a	Omega Close	7.5	<0.1	<0.1
R4a	Starboard Way	4.5	<0.1	<0.1
R5a	Omega Close	7.5	<0.1	<0.1
R6a	Tiller Road	10.5	<0.1	<0.1
R7a	Cudweed Court	26.0	<0.1	<0.1
R8	Clover Court	26.0	<0.1	<0.1

Receptor		Height (m)	Hypergeometric Distribution (%)	Hypergeometric Distribution for Continuous Operation (%)
R9a	Westwood House	26.0	<0.1	<0.1
R10a	City Apartments, Pepper Street	10.5	25.4	63.5
R11a	City Apartments, Pepper Street	13.5	24.0	60.0
R12a	Baltimore Wharf	26.0	24.8	61.9
R13a	Baltimore Wharf	26.0	15.8	39.6
R14a	Waterford Court	26.0	35.4	88.4
R15a	City Harbour	26.0	0.2	0.5
R16a	City Reach (Second Floor Roof Level)	13.4	85.7	100.0
R17a	23-39 Pepper Street	12.5	46.9	100.0
R18a	55-59 Pepper Street	9.0	4.2	10.6
R19a	21 Pepper Street	4.5	39.7	99.3

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 200µg/m³.

a: PC proportion of the EQS minus twice the long-term background

b: PEC proportion of the EQS

As indicated in Table 46, the cumulative hypergeometric distribution calculates the probability to be greater than 5% at 17 sensitive receptor locations considered, 3 of which are predicted to have a probably of 100% during continuous operation. As such, the 1-hour mean EQS for NO₂ could be exceeded at these receptor locations during Scenario 3.

It should be noted that this is a worst-case approach as the hypergeometric distribution has been based on annual operations of 19 hours. As mentioned previously, Scenario 3 is representative of a power outage, which is considered to be a highly rare event (1 every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Annual Mean PM₁₀

Predicted annual mean PM₁₀ concentrations at sensitive human receptor locations are summarised in Table 47. It should be noted that only residential receptors were considered for predicted changes in annual mean PM₁₀ concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 47: Predicted Annual Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0005	18.0347	<0.1	45.1
R2	Starboard Way	1.5	0.0008	18.0350	<0.1	45.1
R3	Omega Close	1.5	0.0006	18.0348	<0.1	45.1
R4	Starboard Way	1.5	0.0007	18.0348	<0.1	45.1
R5	Omega Close	1.5	0.0003	18.0345	<0.1	45.1

Receptor		Height (m)	Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R6	Tiller Road	1.5	0.0003	18.0345	<0.1	45.1
R7	Cudweed Court	7.0	0.0003	18.0345	<0.1	45.1
R8	Clover Court	7.0	0.0005	18.0347	<0.1	45.1
R9	Westwood House	7.0	0.0003	18.0345	<0.1	45.1
R10	City Apartments, Pepper Street	1.5	0.0015	18.0357	<0.1	45.1
R11	City Apartments, Pepper Street	1.5	0.0013	18.0355	<0.1	45.1
R12	Baltimore Wharf	7.0	0.0016	18.0358	<0.1	45.1
R13	Baltimore Wharf	7.0	0.0014	18.0356	<0.1	45.1
R14	Waterford Court	7.0	0.0017	18.0359	<0.1	45.1
R15	City Harbour	7.0	0.0008	18.0350	<0.1	45.1
R1a	Omega Close	7.5	0.0006	18.0348	<0.1	45.1
R2a	Starboard Way	10.5	0.0008	18.0350	<0.1	45.1
R3a	Omega Close	7.5	0.0007	18.0349	<0.1	45.1
R4a	Starboard Way	4.5	0.0007	18.0349	<0.1	45.1
R5a	Omega Close	7.5	0.0004	18.0346	<0.1	45.1
R6a	Tiller Road	10.5	0.0004	18.0346	<0.1	45.1
R7a	Cudweed Court	26.0	0.0004	18.0346	<0.1	45.1
R8	Clover Court	26.0	0.0007	18.0349	<0.1	45.1
R9a	Westwood House	26.0	0.0004	18.0346	<0.1	45.1
R10a	City Apartments, Pepper Street	10.5	0.0016	18.0358	<0.1	45.1
R11a	City Apartments, Pepper Street	13.5	0.0014	18.0356	<0.1	45.1
R12a	Baltimore Wharf	26.0	0.0016	18.0358	<0.1	45.1
R13a	Baltimore Wharf	26.0	0.0013	18.0355	<0.1	45.1
R14a	Waterford Court	26.0	0.0020	18.0362	<0.1	45.1
R15a	City Harbour	26.0	0.0012	18.0354	<0.1	45.1

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 40µg/m³.

As indicated in Table 47, predicted 24-hour PM₁₀ concentrations were below the relevant long term EQS at all sensitive receptor locations. A maximum PEC of 18.0362µg/m³ as predicted at sensitive residential location R14a (Water Court) is equivalent to 45% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

24-Hour Mean PM₁₀

Predicted 24-hour mean PM₁₀ concentrations at sensitive receptor locations are summarised in Table 48. Exceedances of the EQS are shown in **bold**.

Table 48: Predicted 24-Hour Mean PM₁₀ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	2.83	38.90	5.7	20.3
R2	Starboard Way	1.5	4.70	40.77	9.4	33.7
R3	Omega Close	1.5	3.90	39.97	7.8	28.0
R4	Starboard Way	1.5	4.08	40.14	8.2	29.3
R5	Omega Close	1.5	1.90	37.97	3.8	13.6
R6	Tiller Road	1.5	2.30	38.37	4.6	16.5
R7	Cudweed Court	7.0	1.99	38.05	4.0	14.3
R8	Clover Court	7.0	2.80	38.87	5.6	20.1
R9	Westwood House	7.0	1.94	38.01	3.9	13.9
R10	City Apartments, Pepper Street	1.5	5.56	41.63	11.1	39.9
R11	City Apartments, Pepper Street	1.5	5.10	41.17	10.2	36.6
R12	Baltimore Wharf	7.0	5.81	41.88	11.6	41.7
R13	Baltimore Wharf	7.0	5.29	41.36	10.6	38.0
R14	Waterford Court	7.0	6.17	42.24	12.3	44.3
R15	City Harbour	7.0	4.41	40.48	8.8	31.7
R16	City Reach (Building Roof Level)	36.0	120.95	157.02	241.9	868.1
R17	23-39 Pepper Street	1.5	4.95	41.02	9.9	35.5
R18	55-59 Pepper Street	1.5	4.00	40.06	8.0	28.7
R19	21 Pepper Street	1.5	5.69	41.76	11.4	40.8
R1a	Omega Close	7.5	3.58	39.65	7.2	25.7
R2a	Starboard Way	10.5	4.89	40.96	9.8	35.1
R3a	Omega Close	7.5	4.35	40.42	8.7	31.3
R4a	Starboard Way	4.5	4.09	40.16	8.2	29.3
R5a	Omega Close	7.5	2.32	38.38	4.6	16.6
R6a	Tiller Road	10.5	2.55	38.61	5.1	18.3
R7a	Cudweed Court	26.0	2.97	39.03	5.9	21.3
R8	Clover Court	26.0	3.92	39.99	7.8	28.1
R9a	Westwood House	26.0	2.78	38.85	5.6	20.0
R10a	City Apartments, Pepper Street	10.5	5.71	41.78	11.4	41.0
R11a	City Apartments, Pepper Street	13.5	5.47	41.54	10.9	39.3
R12a	Baltimore Wharf	26.0	5.78	41.85	11.6	41.5
R13a	Baltimore Wharf	26.0	5.07	41.13	10.1	36.4
R14a	Waterford Court	26.0	6.76	42.83	13.5	48.6
R15a	City Harbour	26.0	6.05	42.12	12.1	43.4

Receptor		Height (m)	Predicted 24-Hour Mean PM ₁₀ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R16a	City Reach (Second Floor Roof Level)	13.4	6.20	42.27	12.4	44.5
R17a	23-39 Pepper Street	12.5	5.09	41.16	10.2	36.5
R18a	55-59 Pepper Street	9.0	4.01	40.08	8.0	28.8
R19a	21 Pepper Street	4.5	5.70	41.77	11.4	40.9

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 50µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 48, predicted 24-hour PM₁₀ concentrations are above the relevant EQS at one sensitive receptor location (R16). It is important to note that the assessment considered all 9 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations given that Scenario 3 is considered to be a highly rare event (1 every 10 years) and only the generators required to meet the electrical load will be operating for a maximum of 5 hours.

As mentioned previously, Scenario 3 is representative of a power outage and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Annual Mean PM_{2.5}

Predicted annual mean PM_{2.5} concentrations at sensitive human receptor locations are summarised in Table 49. It should be noted that only residential receptors were considered for predicted changes in annual mean PM_{2.5} concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 49: Predicted Annual Mean PM_{2.5} Concentrations

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.0005	11.6741	<0.1	46.7
R2	Starboard Way	1.5	0.0008	11.6744	<0.1	46.7
R3	Omega Close	1.5	0.0006	11.6743	<0.1	46.7
R4	Starboard Way	1.5	0.0007	11.6743	<0.1	46.7
R5	Omega Close	1.5	0.0003	11.6740	<0.1	46.7
R6	Tiller Road	1.5	0.0003	11.6740	<0.1	46.7
R7	Cudweed Court	7.0	0.0003	11.6739	<0.1	46.7
R8	Clover Court	7.0	0.0005	11.6741	<0.1	46.7
R9	Westwood House	7.0	0.0003	11.6739	<0.1	46.7
R10	City Apartments, Pepper Street	1.5	0.0015	11.6751	<0.1	46.7
R11	City Apartments, Pepper Street	1.5	0.0013	11.6749	<0.1	46.7
R12	Baltimore Wharf	7.0	0.0016	11.6752	<0.1	46.7
R13	Baltimore Wharf	7.0	0.0014	11.6750	<0.1	46.7

Receptor		Height (m)	Predicted Annual Mean PM _{2.5} Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R14	Waterford Court	7.0	0.0017	11.6753	<0.1	46.7
R15	City Harbour	7.0	0.0008	11.6744	<0.1	46.7
R1a	Omega Close	7.5	0.0006	11.6743	<0.1	46.7
R2a	Starboard Way	10.5	0.0008	11.6744	<0.1	46.7
R3a	Omega Close	7.5	0.0007	11.6744	<0.1	46.7
R4a	Starboard Way	4.5	0.0007	11.6743	<0.1	46.7
R5a	Omega Close	7.5	0.0004	11.6740	<0.1	46.7
R6a	Tiller Road	10.5	0.0004	11.6740	<0.1	46.7
R7a	Cudweed Court	26.0	0.0004	11.6740	<0.1	46.7
R8	Clover Court	26.0	0.0007	11.6743	<0.1	46.7
R9a	Westwood House	26.0	0.0004	11.6740	<0.1	46.7
R10a	City Apartments, Pepper Street	10.5	0.0016	11.6752	<0.1	46.7
R11a	City Apartments, Pepper Street	13.5	0.0014	11.6751	<0.1	46.7
R12a	Baltimore Wharf	26.0	0.0016	11.6752	<0.1	46.7
R13a	Baltimore Wharf	26.0	0.0013	11.6750	<0.1	46.7
R14a	Waterford Court	26.0	0.0020	11.6756	<0.1	46.7
R15a	City Harbour	26.0	0.0012	11.6748	<0.1	46.7

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of 25µg/m³.

As indicated in Table 49, predicted PM_{2.5} concentrations were below the relevant long term EQS at all sensitive receptor locations. A maximum PEC of 11.6756µg/m³ as predicted at sensitive residential location R14a (Water Court) is equivalent to 47% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Annual Mean HC

Predicted annual mean HC concentrations at sensitive human receptor locations are summarised in Table 50. It should be noted that only residential receptors were considered for predicted changes in annual mean HC concentrations as they are considered sensitive to annual mean concentrations in accordance with the LLAQM.TG(16) guidance².

Table 50: Predicted Annual Mean HC Concentrations

Receptor		Height (m)	Predicted Annual Mean HC Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R1	Omega Close	1.5	0.001	0.817	<0.1	16.3
R2	Starboard Way	1.5	0.002	0.818	<0.1	16.4

Receptor		Height (m)	Predicted Annual Mean HC Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC
R3	Omega Close	1.5	0.001	0.817	<0.1	16.3
R4	Starboard Way	1.5	0.001	0.817	<0.1	16.3
R5	Omega Close	1.5	0.001	0.817	<0.1	16.3
R6	Tiller Road	1.5	0.001	0.817	<0.1	16.3
R7	Cudweed Court	7.0	0.001	0.817	<0.1	16.3
R8	Clover Court	7.0	0.001	0.817	<0.1	16.3
R9	Westwood House	7.0	0.001	0.817	<0.1	16.3
R10	City Apartments, Pepper Street	1.5	0.003	0.819	0.1	16.4
R11	City Apartments, Pepper Street	1.5	0.003	0.819	0.1	16.4
R12	Baltimore Wharf	7.0	0.003	0.819	0.1	16.4
R13	Baltimore Wharf	7.0	0.003	0.819	0.1	16.4
R14	Waterford Court	7.0	0.004	0.820	0.1	16.4
R15	City Harbour	7.0	0.002	0.818	<0.1	16.4
R1a	Omega Close	7.5	0.001	0.817	<0.1	16.3
R2a	Starboard Way	10.5	0.002	0.818	<0.1	16.4
R3a	Omega Close	7.5	0.002	0.818	<0.1	16.4
R4a	Starboard Way	4.5	0.001	0.817	<0.1	16.3
R5a	Omega Close	7.5	0.001	0.817	<0.1	16.3
R6a	Tiller Road	10.5	0.001	0.817	<0.1	16.3
R7a	Cudweed Court	26.0	0.001	0.817	<0.1	16.3
R8	Clover Court	26.0	0.002	0.818	<0.1	16.4
R9a	Westwood House	26.0	0.001	0.817	<0.1	16.3
R10a	City Apartments, Pepper Street	10.5	0.003	0.819	0.1	16.4
R11a	City Apartments, Pepper Street	13.5	0.003	0.819	0.1	16.4
R12a	Baltimore Wharf	26.0	0.003	0.819	0.1	16.4
R13a	Baltimore Wharf	26.0	0.003	0.819	0.1	16.4
R14a	Waterford Court	26.0	0.004	0.820	0.1	16.4
R15a	City Harbour	26.0	0.003	0.819	0.1	16.4

Note: Predicted concentrations were assessed against the relevant EQSs: Annual mean AQO of $5\mu\text{g}/\text{m}^3$.

As indicated in Table 50, predicted HC concentrations were below the relevant long term EQS at all sensitive receptor locations. A maximum PEC of $0.820\mu\text{g}/\text{m}^3$ as predicted at sensitive residential location R14 and R14a (Water Court) is equivalent to 16% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

8-Hour Rolling Mean CO

Predicted CO concentrations at sensitive receptor locations are summarised in Table 51.

Table 51: Predicted 8-hour Rolling Mean CO Concentrations

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	112.84	1,196.84	1.1	1.3
R2	Starboard Way	1.5	112.61	1,196.61	1.1	1.3
R3	Omega Close	1.5	127.47	1,211.47	1.3	1.4
R4	Starboard Way	1.5	127.96	1,211.96	1.3	1.4
R5	Omega Close	1.5	130.59	1,214.59	1.3	1.5
R6	Tiller Road	1.5	186.30	1,270.30	1.9	2.1
R7	Cudweed Court	7.0	115.91	1,199.91	1.2	1.3
R8	Clover Court	7.0	110.83	1,194.83	1.1	1.2
R9	Westwood House	7.0	153.30	1,237.30	1.5	1.7
R10	City Apartments, Pepper Street	1.5	101.07	1,185.07	1.0	1.1
R11	City Apartments, Pepper Street	1.5	133.92	1,217.92	1.3	1.5
R12	Baltimore Wharf	7.0	110.81	1,194.81	1.1	1.2
R13	Baltimore Wharf	7.0	127.50	1,211.50	1.3	1.4
R14	Waterford Court	7.0	116.89	1,200.89	1.2	1.3
R15	City Harbour	7.0	120.76	1,204.76	1.2	1.4
R16	City Reach (Building Roof Level)	36.0	6369.76	7,453.76	63.7	71.4
R17	23-39 Pepper Street	1.5	136.20	1,220.20	1.4	1.5
R18	55-59 Pepper Street	1.5	152.90	1,236.90	1.5	1.7
R19	21 Pepper Street	1.5	140.97	1,224.97	1.4	1.6
R1a	Omega Close	7.5	120.82	1,204.82	1.2	1.4
R2a	Starboard Way	10.5	114.03	1,198.03	1.1	1.3
R3a	Omega Close	7.5	133.61	1,217.61	1.3	1.5
R4a	Starboard Way	4.5	128.45	1,212.45	1.3	1.4
R5a	Omega Close	7.5	136.82	1,220.82	1.4	1.5
R6a	Tiller Road	10.5	208.80	1,292.80	2.1	2.3
R7a	Cudweed Court	26.0	170.86	1,254.86	1.7	1.9
R8	Clover Court	26.0	162.49	1,246.49	1.6	1.8
R9a	Westwood House	26.0	197.10	1,281.10	2.0	2.2
R10a	City Apartments, Pepper Street	10.5	170.82	1,254.82	1.7	1.9
R11a	City Apartments, Pepper Street	13.5	140.76	1,224.76	1.4	1.6
R12a	Baltimore Wharf	26.0	127.20	1,211.20	1.3	1.4

Receptor		Height (m)	Predicted Maximum Daily Running 8-hour Mean CO Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R13a	Baltimore Wharf	26.0	128.96	1,212.96	1.3	1.4
R14a	Waterford Court	26.0	150.85	1,234.85	1.5	1.7
R15a	City Harbour	26.0	175.42	1,259.42	1.8	2.0
R16a	City Reach (Second Floor Roof Level)	13.4	153.65	1,237.65	1.5	1.7
R17a	23-39 Pepper Street	12.5	136.20	1,220.20	1.4	1.5
R18a	55-59 Pepper Street	9.0	152.12	1,236.12	1.5	1.7
R19a	21 Pepper Street	4.5	141.12	1,225.12	1.4	1.6

Note: Predicted concentrations were assessed against the relevant EQSs: 8-Hour Rolling mean AQO of $10,000\mu\text{g}/\text{m}^3$.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 51, predicted CO concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of $7,453.76\mu\text{g}/\text{m}^3$ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 75% of the EQS. It is important to note that the assessment considered all 9 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations given that Scenario 3 is considered to be a highly rare event (1 every 10 years) and only the generators required to meet the electrical load will be operating for a maximum of 5 hours.

As mentioned previously, Scenario 3 is representative of a power outage and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

24-Hour Mean SO₂

Predicted 24-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 52.

Table 52: Predicted 24-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration ($\mu\text{g}/\text{m}^3$)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	0.93	9.13	0.7	0.8
R2	Starboard Way	1.5	1.09	9.29	0.9	0.9
R3	Omega Close	1.5	1.07	9.27	0.9	0.9
R4	Starboard Way	1.5	1.06	9.26	0.8	0.9
R5	Omega Close	1.5	0.93	9.13	0.7	0.8
R6	Tiller Road	1.5	1.06	9.26	0.8	0.9
R7	Cudweed Court	7.0	0.84	9.04	0.7	0.7
R8	Clover Court	7.0	0.99	9.19	0.8	0.8
R9	Westwood House	7.0	0.96	9.16	0.8	0.8
R10	City Apartments, Pepper Street	1.5	1.10	9.30	0.9	0.9

Receptor		Height (m)	Predicted 24-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R11	City Apartments, Pepper Street	1.5	1.04	9.24	0.8	0.9
R12	Baltimore Wharf	7.0	1.24	9.44	1.0	1.1
R13	Baltimore Wharf	7.0	1.19	9.39	1.0	1.0
R14	Waterford Court	7.0	1.17	9.37	0.9	1.0
R15	City Harbour	7.0	1.15	9.35	0.9	1.0
R16	City Reach (Building Roof Level)	36.0	40.05	48.25	32.0	34.3
R17	23-39 Pepper Street	1.5	1.33	9.53	1.1	1.1
R18	55-59 Pepper Street	1.5	1.17	9.37	0.9	1.0
R19	21 Pepper Street	1.5	1.07	9.27	0.9	0.9
R1a	Omega Close	7.5	0.98	9.18	0.8	0.8
R2a	Starboard Way	10.5	1.18	9.38	0.9	1.0
R3a	Omega Close	7.5	1.16	9.36	0.9	1.0
R4a	Starboard Way	4.5	1.07	9.27	0.9	0.9
R5a	Omega Close	7.5	1.02	9.22	0.8	0.9
R6a	Tiller Road	10.5	1.15	9.35	0.9	1.0
R7a	Cudweed Court	26.0	1.10	9.30	0.9	0.9
R8	Clover Court	26.0	1.24	9.44	1.0	1.1
R9a	Westwood House	26.0	1.26	9.46	1.0	1.1
R10a	City Apartments, Pepper Street	10.5	1.10	9.30	0.9	0.9
R11a	City Apartments, Pepper Street	13.5	1.12	9.32	0.9	1.0
R12a	Baltimore Wharf	26.0	1.28	9.48	1.0	1.1
R13a	Baltimore Wharf	26.0	1.17	9.37	0.9	1.0
R14a	Waterford Court	26.0	1.48	9.68	1.2	1.3
R15a	City Harbour	26.0	1.62	9.82	1.3	1.4
R16a	City Reach (Second Floor Roof Level)	13.4	1.64	9.84	1.3	1.4
R17a	23-39 Pepper Street	12.5	1.33	9.53	1.1	1.1
R18a	55-59 Pepper Street	9.0	1.20	9.40	1.0	1.0
R19a	21 Pepper Street	4.5	1.07	9.27	0.9	0.9

Note: Predicted concentrations were assessed against the relevant EQSs: 24-hour mean AQO of 124µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 52, predicted 24-hour SO₂ concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of 48.25µg/m³ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 39% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

1-Hour Mean SO₂

Predicted 1-hour mean SO₂ concentrations at sensitive receptor locations are summarised in Table 53.

Table 53: Predicted 1-Hour Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	1.61	9.81	0.5	0.5
R2	Starboard Way	1.5	1.48	9.68	0.4	0.4
R3	Omega Close	1.5	1.57	9.77	0.4	0.5
R4	Starboard Way	1.5	1.60	9.80	0.5	0.5
R5	Omega Close	1.5	2.01	10.21	0.6	0.6
R6	Tiller Road	1.5	2.26	10.46	0.6	0.7
R7	Cudweed Court	7.0	1.57	9.77	0.4	0.5
R8	Clover Court	7.0	1.55	9.75	0.4	0.5
R9	Westwood House	7.0	1.91	10.11	0.5	0.6
R10	City Apartments, Pepper Street	1.5	1.31	9.51	0.4	0.4
R11	City Apartments, Pepper Street	1.5	1.39	9.59	0.4	0.4
R12	Baltimore Wharf	7.0	1.49	9.69	0.4	0.4
R13	Baltimore Wharf	7.0	1.63	9.83	0.5	0.5
R14	Waterford Court	7.0	1.50	9.70	0.4	0.4
R15	City Harbour	7.0	1.65	9.85	0.5	0.5
R16	City Reach (Building Roof Level)	36.0	79.61	87.81	22.7	23.3
R17	23-39 Pepper Street	1.5	1.84	10.04	0.5	0.5
R18	55-59 Pepper Street	1.5	2.01	10.21	0.6	0.6
R19	21 Pepper Street	1.5	1.58	9.78	0.5	0.5
R1a	Omega Close	7.5	1.63	9.83	0.5	0.5
R2a	Starboard Way	10.5	1.51	9.71	0.4	0.4
R3a	Omega Close	7.5	1.67	9.87	0.5	0.5
R4a	Starboard Way	4.5	1.61	9.81	0.5	0.5
R5a	Omega Close	7.5	2.00	10.20	0.6	0.6
R6a	Tiller Road	10.5	2.48	10.68	0.7	0.7
R7a	Cudweed Court	26.0	2.46	10.66	0.7	0.7
R8	Clover Court	26.0	2.25	10.45	0.6	0.7
R9a	Westwood House	26.0	2.88	11.08	0.8	0.8
R10a	City Apartments, Pepper Street	10.5	1.52	9.72	0.4	0.4
R11a	City Apartments, Pepper Street	13.5	1.47	9.67	0.4	0.4
R12a	Baltimore Wharf	26.0	1.71	9.91	0.5	0.5
R13a	Baltimore Wharf	26.0	1.87	10.07	0.5	0.5

Receptor		Height (m)	Predicted 1-Hour Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R14a	Waterford Court	26.0	2.29	10.49	0.7	0.7
R15a	City Harbour	26.0	2.28	10.48	0.7	0.7
R16a	City Reach (Second Floor Roof Level)	13.4	2.09	10.29	0.6	0.6
R17a	23-39 Pepper Street	12.5	1.84	10.04	0.5	0.5
R18a	55-59 Pepper Street	9.0	2.02	10.22	0.6	0.6
R19a	21 Pepper Street	4.5	1.585	9.785	0.5	0.5

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 350µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 53, predicted 1-hour SO₂ concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of 87.81µg/m³ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 25% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

15-Minute Mean SO₂

Predicted 15-minute mean SO₂ concentrations at sensitive receptor locations are summarised in Table 54.

Table 54: Predicted 15-Minute Mean SO₂ Concentrations

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R1	Omega Close	1.5	2.33	10.53	0.9	0.9
R2	Starboard Way	1.5	2.09	10.29	0.8	0.8
R3	Omega Close	1.5	2.35	10.55	0.9	0.9
R4	Starboard Way	1.5	2.31	10.51	0.9	0.9
R5	Omega Close	1.5	2.84	11.04	1.1	1.1
R6	Tiller Road	1.5	3.13	11.33	1.2	1.2
R7	Cudweed Court	7.0	2.12	10.32	0.8	0.8
R8	Clover Court	7.0	2.13	10.33	0.8	0.8
R9	Westwood House	7.0	2.71	10.91	1.0	1.1
R10	City Apartments, Pepper Street	1.5	1.79	9.99	0.7	0.7
R11	City Apartments, Pepper Street	1.5	2.05	10.25	0.8	0.8
R12	Baltimore Wharf	7.0	2.02	10.22	0.8	0.8
R13	Baltimore Wharf	7.0	2.24	10.44	0.8	0.9
R14	Waterford Court	7.0	2.12	10.32	0.8	0.8

Receptor		Height (m)	Predicted 15-Minute Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
			PC	PEC	PC	PEC ^a
R15	City Harbour	7.0	2.40	10.60	0.9	0.9
R16	City Reach (Building Roof Level)	36.0	108.15	116.35	40.7	42.0
R17	23-39 Pepper Street	1.5	2.54	10.74	1.0	1.0
R18	55-59 Pepper Street	1.5	2.88	11.08	1.1	1.1
R19	21 Pepper Street	1.5	2.19	10.39	0.8	0.9
R1a	Omega Close	7.5	2.34	10.54	0.9	0.9
R2a	Starboard Way	10.5	2.12	10.32	0.8	0.8
R3a	Omega Close	7.5	2.45	10.65	0.9	1.0
R4a	Starboard Way	4.5	2.32	10.52	0.9	0.9
R5a	Omega Close	7.5	2.87	11.07	1.1	1.1
R6a	Tiller Road	10.5	3.49	11.69	1.3	1.4
R7a	Cudweed Court	26.0	3.46	11.66	1.3	1.3
R8	Clover Court	26.0	3.16	11.36	1.2	1.2
R9a	Westwood House	26.0	4.22	12.42	1.6	1.6
R10a	City Apartments, Pepper Street	10.5	2.22	10.42	0.8	0.9
R11a	City Apartments, Pepper Street	13.5	2.14	10.34	0.8	0.8
R12a	Baltimore Wharf	26.0	2.43	10.63	0.9	0.9
R13a	Baltimore Wharf	26.0	2.58	10.78	1.0	1.0
R14a	Waterford Court	26.0	3.14	11.34	1.2	1.2
R15a	City Harbour	26.0	3.13	11.33	1.2	1.2
R16a	City Reach (Second Floor Roof Level)	13.4	2.94	11.14	1.1	1.1
R17a	23-39 Pepper Street	12.5	2.54	10.74	1.0	1.0
R18a	55-59 Pepper Street	9.0	2.89	11.09	1.1	1.1
R19a	21 Pepper Street	4.5	2.19	10.39	0.8	0.9

Note: Predicted concentrations were assessed against the relevant EQSs: 1-hour mean AQO of 266µg/m³.

a: PC proportion of the EQS minus twice the long-term background

As indicated in Table 54, predicted 15-minute SO₂ concentrations were below the relevant EQS at all sensitive receptor locations. A maximum PEC of 116.35µg/m³ as predicted at sensitive commercial location R16 (City Reach) is equivalent to 44% of the EQS and provides sufficient headroom and is therefore well below the relevant EQS.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

5.2 Ecological Sensitive Receptors

5.2.1 Scenario 1

Annual Mean NO_x

Predicted annual mean NO_x concentrations at sensitive ecological receptors are summarised in Table 55.

Table 55: Predicted Annual Mean NO_x Concentrations

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.002	45.582	<0.1	151.9
ER2	Rainsborough Avenue Embankments (SINC)	0.004	46.054	<0.1	153.5
ER3	Lavender Pond Nature Park (SINC/LNR)	0.001	57.161	<0.1	190.5
ER4	Surrey Docks Farm (SINC)	0.003	46.553	<0.1	155.2
ER5	Durand's Wharf (SINC)	0.002	46.552	<0.1	155.2
ER6	St Anne's Churchyard, Limehouse (SINC)	0.001	57.161	<0.1	190.5
ER7	Pepys Park Nature Area (SINC)	0.004	46.054	<0.1	153.5
ER8	Sayes Court Park (SINC)	0.003	46.053	<0.1	153.5
ER9	Cyril Jackson School Nature Area (SINC)	0.001	57.161	<0.1	190.5
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.002	45.862	<0.1	152.9
ER11	Westcombe Woodlands (SINC)	0.001	41.331	<0.1	137.8
ER12	Twinkle Park (SINC)	0.003	42.383	<0.1	141.3
ER13	Millwall Park (SINC)	0.009	42.389	<0.1	141.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.026	49.766	0.1	165.9
ER15	Poplar Dock (SINC)	0.006	77.886	<0.1	259.6
ER16	Robin Hood Gardens (SINC)	0.003	77.883	<0.1	259.6
ER17	Saffron Avenue Pond (SINC)	0.003	77.883	<0.1	259.6
ER18	Blackheath and Greenwich Park (SINC)	0.001	46.131	<0.1	153.8
ER19	New Cross and New Cross Gate Railsides (SINC)	0.002	45.582	<0.1	151.9
ER20	Creekside Education Centre (SINC)	0.001	45.861	<0.1	152.9
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.002	45.862	<0.1	152.9
ER22	St Nicholas Churchyard, Deptford (SINC)	0.002	45.862	<0.1	152.9
ER23	Russia Dock Woodland (SINC)	0.003	46.553	<0.1	155.2
ER24	Epping Forest (SAC)	0.0001	42.2101	<0.1	140.7
ER25	Lee Valley (SPA/Ramsar)	0.0001	43.0601	<0.1	143.5

As indicated in Table 55, predicted annual mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

24-Hour Mean NO_x

Predicted 24-hour mean NO_x concentrations are summarised in Table 56.

Table 56: Predicted 24-Hour Mean NO_x Concentrations

Receptor		Predicted 24-Hour Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	4.41	95.57	5.9	127.4
ER2	Rainsborough Avenue Embankments (SINC)	8.59	100.69	11.4	134.2
ER3	Lavender Pond Nature Park (SINC/LNR)	6.39	120.71	8.5	161.0
ER4	Surrey Docks Farm (SINC)	8.98	102.08	12.0	136.1
ER5	Durand's Wharf (SINC)	9.58	102.68	12.8	136.9
ER6	St Anne's Churchyard, Limehouse (SINC)	2.45	116.77	3.3	155.7
ER7	Pepys Park Nature Area (SINC)	8.77	100.87	11.7	134.5
ER8	Sayes Court Park (SINC)	5.87	97.97	7.8	130.6
ER9	Cyril Jackson School Nature Area (SINC)	3.71	118.03	4.9	157.4
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	4.91	96.63	6.5	128.8
ER11	Westcombe Woodlands (SINC)	3.31	85.97	4.4	114.6
ER12	Twinkle Park (SINC)	6.94	91.70	9.3	122.3
ER13	Millwall Park (SINC)	26.29	111.05	35.1	148.1
ER14	Mudchute Farm and Park (SINC/LNR)	42.07	141.55	56.1	188.7
ER15	Poplar Dock (SINC)	7.11	162.87	9.5	217.2
ER16	Robin Hood Gardens (SINC)	3.87	159.63	5.2	212.8
ER17	Saffron Avenue Pond (SINC)	3.61	159.37	4.8	212.5
ER18	Blackheath and Greenwich Park (SINC)	5.69	97.95	7.6	130.6
ER19	New Cross and New Cross Gate Railsides (SINC)	3.47	94.63	4.6	126.2
ER20	Creekside Education Centre (SINC)	4.31	96.03	5.7	128.0
ER21	Sue Godfrey Local Nature Reserve (SINC)	4.91	96.63	6.5	128.8
ER22	St Nicholas Churchyard, Deptford (SINC)	6.09	97.81	8.1	130.4
ER23	Russia Dock Woodland (SINC)	6.78	99.88	9.0	133.2
ER24	Epping Forest (SAC)	0.42	84.84	0.6	113.1
ER25	Lee Valley (SPA/Ramsar)	0.27	86.39	0.4	115.2

As indicated in Table 56, predicted 24-hour mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

The PC proportion of the EQS is less than 10% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

Nitrogen Deposition

Predicted annual mean nitrogen deposition rates are summarised in Table 57.

Table 57: Predicted Annual Mean Nitrogen Deposition Rates

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
				PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.0002	19.6002	<0.1	98.0	<0.1	65.3
ER2	Rainsborough Avenue Embankments (SINC)	0.0006	19.6006	<0.1	98.0	<0.1	65.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.0001	22.5401	<0.1	225.4	<0.1	150.3
ER4	Surrey Docks Farm (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER5	Durand's Wharf (SINC)	0.0003	35.1403	<0.1	351.4	<0.1	175.7
ER6	St Anne's Churchyard, Limehouse (SINC)	0.0002	40.4602	<0.1	404.6	<0.1	202.3
ER7	Pepys Park Nature Area (SINC)	0.0011	35.1411	<0.1	351.4	<0.1	175.7
ER8	Sayes Court Park (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER9	Cyril Jackson School Nature Area (SINC)	0.0002	22.5402	<0.1	225.4	<0.1	150.3
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.0002	19.6002	<0.1	98.0	<0.1	65.3
ER11	Westcombe Woodlands (SINC)	0.0003	35.1403	<0.1	351.4	<0.1	175.7
ER12	Twinkle Park (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER13	Millwall Park (SINC)	0.0013	19.6013	<0.1	98.0	<0.1	65.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.0076	35.1476	<0.1	351.5	<0.1	175.7
ER15	Poplar Dock (SINC)	0.0019	40.4619	<0.1	404.6	<0.1	202.3
ER16	Robin Hood Gardens (SINC)	0.0007	40.4607	<0.1	404.6	<0.1	202.3
ER17	Saffron Avenue Pond (SINC)	0.0009	40.4609	<0.1	404.6	<0.1	202.3
ER18	Blackheath and Greenwich Park (SINC)	0.0004	35.1404	<0.1	351.4	<0.1	175.7
ER19	New Cross and New Cross Gate Railsides (SINC)	0.0004	35.1404	<0.1	351.4	<0.1	175.7
ER20	Creekside Education Centre (SINC)	0.0002	19.6002	<0.1	98.0	<0.1	65.3
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.0005	35.1405	<0.1	351.4	<0.1	175.7
ER22	St Nicholas Churchyard, Deptford (SINC)	0.0006	35.1406	<0.1	351.4	<0.1	175.7

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
		PC	PEC	PC	PEC	PC	PEC
ER23	Russia Dock Woodland (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER24	Epping Forest (SAC)	0.00002	34.10002	<0.1	341.0	<0.1	170.5
ER25	Lee Valley (SPA/Ramsar)	0.00001	34.10001	<0.1	227.3	<0.1	113.7

As indicated in Table 57, predicted annual mean nitrogen deposition rates were above both the Low and High EQS at 20 sensitive receptor locations. This is due to the high background deposition rates, which exceed both EQSs as a base condition.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean SO₂

Predicted annual mean SO₂ concentrations at sensitive ecological receptors are summarised in Table 58.

Table 58: Predicted Annual Mean SO₂ Concentrations

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.000001	1.660001	<0.1	8.3
ER2	Rainsborough Avenue Embankments (SINC)	0.000002	1.660002	<0.1	8.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.000000	1.980000	<0.1	9.9
ER4	Surrey Docks Farm (SINC)	0.000001	1.660001	<0.1	8.3
ER5	Durand's Wharf (SINC)	0.000001	1.660001	<0.1	8.3
ER6	St Anne's Churchyard, Limehouse (SINC)	0.000000	1.980000	<0.1	9.9
ER7	Pepys Park Nature Area (SINC)	0.000002	1.660002	<0.1	8.3
ER8	Sayes Court Park (SINC)	0.000001	1.660001	<0.1	8.3
ER9	Cyril Jackson School Nature Area (SINC)	0.000001	1.980001	<0.1	9.9
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.000001	1.660001	<0.1	8.3
ER11	Westcombe Woodlands (SINC)	0.000001	1.660001	<0.1	8.3
ER12	Twinkle Park (SINC)	0.000002	1.660002	<0.1	8.3
ER13	Millwall Park (SINC)	0.000005	1.660005	<0.1	8.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.000015	1.660015	<0.1	8.3
ER15	Poplar Dock (SINC)	0.000004	1.980004	<0.1	9.9
ER16	Robin Hood Gardens (SINC)	0.000001	1.980001	<0.1	9.9
ER17	Saffron Avenue Pond (SINC)	0.000002	1.980002	<0.1	9.9

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER18	Blackheath and Greenwich Park (SINC)	0.000001	1.660001	<0.1	8.3
ER19	New Cross and New Cross Gate Railsides (SINC)	0.000001	1.660001	<0.1	8.3
ER20	Creekside Education Centre (SINC)	0.000001	1.660001	<0.1	8.3
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.000001	1.660001	<0.1	8.3
ER22	St Nicholas Churchyard, Deptford (SINC)	0.000001	1.660001	<0.1	8.3
ER23	Russia Dock Woodland (SINC)	0.000002	1.660002	<0.1	8.3
ER24	Epping Forest (SAC)	0.000000	2.020000	<0.1	10.1
ER25	Lee Valley (SPA/Ramsar)	0.000000	1.580000	<0.1	7.9

As indicated in Table 58, predicted annual mean SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

Acid Deposition

Predicted annual mean acid deposition rates are summarised in Table 59. In accordance with the EA guidance⁷, the APIS site relevant critical load tool⁷ was used to determine whether there is an exceedance of the CL function for acid deposition.

Table 59: Predicted Annual Mean Acid Deposition Rates

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)		Exceedance of CL Function (keq/ha/yr)
		S	N	Total	PC	PEC	
ER1	Folkestone Gardens	0.0000001	0.00002	0.00002	<0.1	30.8	None
ER2	Rainsborough Avenue Embankments	0.0000003	0.00004	0.00004	<0.1	30.8	None
ER3	Lavender Pond Nature Park	0.0000001	0.00001	0.00001	<0.1	353.8	None
ER4	Surrey Docks Farm	0.0000003	0.00006	0.00006	<0.1	31.2	None
ER5	Durand's Wharf	0.0000001	0.00002	0.00002	<0.1	31.2	None
ER6	St Anne's Churchyard, Limehouse	0.0000001	0.00002	0.00002	<0.1	36.0	None
ER7	Pepys Park Nature Area	0.0000005	0.00008	0.00008	<0.1	31.2	None
ER8	Sayes Court Park	0.0000003	0.00005	0.00006	<0.1	31.2	None
ER9	Cyril Jackson School Nature Area	0.0000001	0.00001	0.00001	<0.1	36.0	None

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)		Exceedance of CL Function (keq/ha/yr)
		S	N	Total	PC	PEC	
ER10	St Paul's Churchyard and Crossfield Street Open Space	0.0000001	0.00002	0.00002	<0.1	30.8	None
ER11	Westcombe Woodlands	0.0000002	0.00002	0.00002	<0.1	268.3	None
ER12	Twinkle Park	0.0000004	0.00006	0.00006	<0.1	31.2	None
ER13	Millwall Park	0.0000006	0.00009	0.00009	<0.1	30.8	None
ER14	Mudchute Farm and Park	0.0000034	0.00054	0.00055	<0.1	31.2	None
ER15	Poplar Dock	0.0000008	0.00013	0.00013	<0.1	36.0	None
ER16	Robin Hood Gardens	0.0000003	0.00005	0.00005	<0.1	36.0	None
ER17	Saffron Avenue Pond	0.0000004	0.00006	0.00006	<0.1	36.0	None
ER18	Blackheath and Greenwich Park	0.0000002	0.00003	0.00003	<0.1	130.7	None
ER19	New Cross and New Cross Gate Railsides	0.0000002	0.00003	0.00003	<0.1	130.6	None
ER20	Creekside Education Centre	0.0000001	0.00002	0.00002	<0.1	30.8	None
ER21	Sue Godfrey Local Nature Reserve	0.0000002	0.00003	0.00004	<0.1	130.6	None
ER22	St Nicholas Churchyard, Deptford	0.0000003	0.00004	0.00004	<0.1	130.6	None
ER23	Russia Dock Woodland	0.0000004	0.00006	0.00006	<0.1	31.2	None
ER24	Epping Forest	0.0000000	0.00000	0.00000	<0.1	109.5	None

As shown in Table 59, the PC proportion of the EQS is less than 1% at all sensitive receptor locations. Furthermore, the APIS site relevant critical load tool indicated that no receptors exceeded the CL function for acid deposition.

5.2.2 Scenario 2

Annual Mean NO_x

Predicted annual mean NO_x concentrations at sensitive ecological receptors are summarised in Table 60.

Table 60: Predicted Annual Mean NO_x Concentrations

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.002	45.582	<0.1	151.9
ER2	Rainsborough Avenue Embankments (SINC)	0.006	46.056	<0.1	153.5
ER3	Lavender Pond Nature Park (SINC/LNR)	0.001	57.161	<0.1	190.5
ER4	Surrey Docks Farm (SINC)	0.004	46.554	<0.1	155.2

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER5	Durand's Wharf (SINC)	0.003	46.553	<0.1	155.2
ER6	St Anne's Churchyard, Limehouse (SINC)	0.001	57.161	<0.1	190.5
ER7	Pepys Park Nature Area (SINC)	0.006	46.056	<0.1	153.5
ER8	Sayes Court Park (SINC)	0.004	46.054	<0.1	153.5
ER9	Cyril Jackson School Nature Area (SINC)	0.002	57.162	<0.1	190.5
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.002	45.862	<0.1	152.9
ER11	Westcombe Woodlands (SINC)	0.002	41.332	<0.1	137.8
ER12	Twinkle Park (SINC)	0.004	42.384	<0.1	141.3
ER13	Millwall Park (SINC)	0.013	42.393	<0.1	141.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.040	49.780	0.1	165.9
ER15	Poplar Dock (SINC)	0.010	77.890	<0.1	259.6
ER16	Robin Hood Gardens (SINC)	0.004	77.884	<0.1	259.6
ER17	Saffron Avenue Pond (SINC)	0.005	77.885	<0.1	259.6
ER18	Blackheath and Greenwich Park (SINC)	0.002	46.132	<0.1	153.8
ER19	New Cross and New Cross Gate Railsides (SINC)	0.002	45.582	<0.1	151.9
ER20	Creekside Education Centre (SINC)	0.002	45.862	<0.1	152.9
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.002	45.862	<0.1	152.9
ER22	St Nicholas Churchyard, Deptford (SINC)	0.003	45.863	<0.1	152.9
ER23	Russia Dock Woodland (SINC)	0.004	46.554	<0.1	155.2
ER24	Epping Forest (SAC)	0.0002	42.2102	<0.1	140.7
ER25	Lee Valley (SPA/Ramsar)	0.0001	43.0601	<0.1	143.5

As indicated in Table 60, predicted annual mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

24-Hour Mean NO_x

Predicted 24-hour mean NO_x concentrations are summarised in Table 61.

Table 61: Predicted 24-Hour Mean NO_x Concentrations

Receptor		Predicted 24-Hour Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	8.37	99.53	11.2	132.7
ER2	Rainsborough Avenue Embankments (SINC)	22.12	114.22	29.5	152.3
ER3	Lavender Pond Nature Park (SINC/LNR)	6.39	120.71	8.5	161.0
ER4	Surrey Docks Farm (SINC)	8.98	102.08	12.0	136.1
ER5	Durand's Wharf (SINC)	9.58	102.68	12.8	136.9
ER6	St Anne's Churchyard, Limehouse (SINC)	3.56	117.88	4.8	157.2
ER7	Pepys Park Nature Area (SINC)	17.00	109.10	22.7	145.5
ER8	Sayes Court Park (SINC)	9.74	101.84	13.0	135.8
ER9	Cyril Jackson School Nature Area (SINC)	5.06	119.38	6.7	159.2
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	4.91	96.63	6.5	128.8
ER11	Westcombe Woodlands (SINC)	3.31	85.97	4.4	114.6
ER12	Twinkle Park (SINC)	6.94	91.70	9.3	122.3
ER13	Millwall Park (SINC)	26.29	111.05	35.1	148.1
ER14	Mudchute Farm and Park (SINC/LNR)	82.83	182.31	110.4	243.1
ER15	Poplar Dock (SINC)	31.63	187.39	42.2	249.9
ER16	Robin Hood Gardens (SINC)	18.05	173.81	24.1	231.7
ER17	Saffron Avenue Pond (SINC)	17.21	172.97	22.9	230.6
ER18	Blackheath and Greenwich Park (SINC)	5.69	97.95	7.6	130.6
ER19	New Cross and New Cross Gate Railsides (SINC)	7.60	98.76	10.1	131.7
ER20	Creekside Education Centre (SINC)	4.31	96.03	5.7	128.0
ER21	Sue Godfrey Local Nature Reserve (SINC)	4.91	96.63	6.5	128.8
ER22	St Nicholas Churchyard, Deptford (SINC)	6.09	97.81	8.1	130.4
ER23	Russia Dock Woodland (SINC)	9.16	102.26	12.2	136.3
ER24	Epping Forest (SAC)	0.93	85.35	1.2	113.8
ER25	Lee Valley (SPA/Ramsar)	0.27	86.39	0.4	115.2

As indicated in Table 61, predicted 24-hour mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

The PC proportion of the EQS is less than 10% at all SAC/SPA/Ramsar ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

The PC proportion of the EQS is less marginally above 100% at one SINC/LNR ecological receptor location and as such, impacts on 24-hour mean NO_x PC concentrations cannot be screened as **insignificant** in accordance

with the EA screening criteria at this location. PC impacts upon all remaining SINC/LNR receptor locations are below 100%.

The assessment has considered 2 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations given that Scenario 2 is anticipated to be operational for 76.5 hours per annum. The overall significance is therefore considered to be **not significant**.

Nitrogen Deposition

Predicted annual mean nitrogen deposition rates are summarised in Table 62.

Table 62: Predicted Annual Mean Nitrogen Deposition Rates

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
				PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.0003	19.6003	<0.1	98.0	<0.1	65.3
ER2	Rainsborough Avenue Embankments (SINC)	0.0008	19.6008	<0.1	98.0	<0.1	65.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.0002	22.5402	<0.1	225.4	<0.1	150.3
ER4	Surrey Docks Farm (SINC)	0.0011	35.1411	<0.1	351.4	<0.1	175.7
ER5	Durand's Wharf (SINC)	0.0004	35.1404	<0.1	351.4	<0.1	175.7
ER6	St Anne's Churchyard, Limehouse (SINC)	0.0004	40.4604	<0.1	404.6	<0.1	202.3
ER7	Pepys Park Nature Area (SINC)	0.0016	35.1416	<0.1	351.4	<0.1	175.7
ER8	Sayes Court Park (SINC)	0.0011	35.1411	<0.1	351.4	<0.1	175.7
ER9	Cyril Jackson School Nature Area (SINC)	0.0002	22.5402	<0.1	225.4	<0.1	150.3
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.0003	19.6003	<0.1	98.0	<0.1	65.3
ER11	Westcombe Woodlands (SINC)	0.0005	35.1405	<0.1	351.4	<0.1	175.7
ER12	Twinkle Park (SINC)	0.0012	35.1412	<0.1	351.4	<0.1	175.7
ER13	Millwall Park (SINC)	0.0018	19.6018	<0.1	98.0	<0.1	65.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.0115	35.1515	<0.1	351.5	<0.1	175.8
ER15	Poplar Dock (SINC)	0.0030	40.4630	<0.1	404.6	<0.1	202.3
ER16	Robin Hood Gardens (SINC)	0.0012	40.4612	<0.1	404.6	<0.1	202.3
ER17	Saffron Avenue Pond (SINC)	0.0014	40.4614	<0.1	404.6	<0.1	202.3
ER18	Blackheath and Greenwich Park (SINC)	0.0005	35.1405	<0.1	351.4	<0.1	175.7
ER19	New Cross and New Cross Gate Railsides (SINC)	0.0007	35.1407	<0.1	351.4	<0.1	175.7
ER20	Creekside Education Centre (SINC)	0.0003	19.6003	<0.1	98.0	<0.1	65.3
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.0007	35.1407	<0.1	351.4	<0.1	175.7

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
		PC	PEC	PC	PEC	PC	PEC
ER22	St Nicholas Churchyard, Deptford (SINC)	0.0009	35.1409	<0.1	351.4	<0.1	175.7
ER23	Russia Dock Woodland (SINC)	0.0011	35.1411	<0.1	351.4	<0.1	175.7
ER24	Epping Forest (SAC)	0.00002	34.10002	<0.1	341.0	<0.1	170.5
ER25	Lee Valley (SPA/Ramsar)	0.00002	34.10002	<0.1	227.3	<0.1	113.7

As indicated in Table 62, predicted annual mean nitrogen deposition rates were above both the Low and High EQS at 20 sensitive receptor locations. This is due to the high background deposition rates, which exceed both EQSs as a base condition.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

Annual Mean SO₂

Predicted annual mean SO₂ concentrations at sensitive ecological receptors are summarised in Table 63.

Table 63: Predicted Annual Mean SO₂ Concentrations

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.000001	1.660001	<0.1	8.3
ER2	Rainsborough Avenue Embankments (SINC)	0.000003	1.660003	<0.1	8.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.000001	1.980001	<0.1	9.9
ER4	Surrey Docks Farm (SINC)	0.000002	1.660002	<0.1	8.3
ER5	Durand's Wharf (SINC)	0.000002	1.660002	<0.1	8.3
ER6	St Anne's Churchyard, Limehouse (SINC)	0.000001	1.980001	<0.1	9.9
ER7	Pepys Park Nature Area (SINC)	0.000003	1.660003	<0.1	8.3
ER8	Sayes Court Park (SINC)	0.000002	1.660002	<0.1	8.3
ER9	Cyril Jackson School Nature Area (SINC)	0.000001	1.980001	<0.1	9.9
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.000001	1.660001	<0.1	8.3
ER11	Westcombe Woodlands (SINC)	0.000001	1.660001	<0.1	8.3
ER12	Twinkle Park (SINC)	0.000002	1.660002	<0.1	8.3
ER13	Millwall Park (SINC)	0.000007	1.660007	<0.1	8.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.000023	1.660023	<0.1	8.3
ER15	Poplar Dock (SINC)	0.000006	1.980006	<0.1	9.9

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER16	Robin Hood Gardens (SINC)	0.000002	1.980002	<0.1	9.9
ER17	Saffron Avenue Pond (SINC)	0.000003	1.980003	<0.1	9.9
ER18	Blackheath and Greenwich Park (SINC)	0.000001	1.660001	<0.1	8.3
ER19	New Cross and New Cross Gate Railsides (SINC)	0.000001	1.660001	<0.1	8.3
ER20	Creekside Education Centre (SINC)	0.000001	1.660001	<0.1	8.3
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.000001	1.660001	<0.1	8.3
ER22	St Nicholas Churchyard, Deptford (SINC)	0.000002	1.660002	<0.1	8.3
ER23	Russia Dock Woodland (SINC)	0.000002	1.660002	<0.1	8.3
ER24	Epping Forest (SAC)	0.000000	2.020000	<0.1	10.1
ER25	Lee Valley (SPA/Ramsar)	0.000000	1.580000	<0.1	7.9

As indicated in Table 63, predicted annual mean SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

The PC proportion of the EQS is less than 1% at all SAC/SPA/Ramsar ecological receptor locations. Additionally, the PC proportion of the EQS is less than 100% at all SINC/LNR ecological receptor locations. As such, impacts on annual mean NO_x concentrations can be screened out as **insignificant** in accordance with the initial stage of the EA screening criteria.

Acid Deposition

Predicted annual mean acid deposition rates are summarised in Table 64. In accordance with the EA guidance⁷, the APIS site relevant critical load tool⁷ was used to determine whether there is an exceedance of the CL function for acid deposition.

Table 64: Predicted Annual Mean Acid Deposition Rates

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)		Exceedance of CL Function (keq/ha/yr)
		S	N	Total	PC	PEC	
ER1	Folkestone Gardens	0.0000002	0.00002	0.00002	<0.1	30.8	None
ER2	Rainsborough Avenue Embankments	0.0000004	0.00006	0.00006	<0.1	30.8	None
ER3	Lavender Pond Nature Park	0.0000001	0.00001	0.00001	<0.1	353.8	None
ER4	Surrey Docks Farm	0.0000005	0.00008	0.00008	<0.1	31.2	None
ER5	Durand's Wharf	0.0000002	0.00003	0.00003	<0.1	31.2	None
ER6	St Anne's Churchyard, Limehouse	0.0000002	0.00003	0.00003	<0.1	36.0	None
ER7	Pepys Park Nature Area	0.0000008	0.00011	0.00012	<0.1	31.2	None
ER8	Sayes Court Park	0.0000005	0.00008	0.00008	<0.1	31.2	None

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)		Exceedance of CL Function (keq/ha/yr)
		S	N	Total	PC	PEC	
ER9	Cyril Jackson School Nature Area	0.0000001	0.000002	0.000002	<0.1	36.0	None
ER10	St Paul's Churchyard and Crossfield Street Open Space	0.0000002	0.000002	0.000002	<0.1	30.8	None
ER11	Westcombe Woodlands	0.0000002	0.000003	0.000003	<0.1	268.3	None
ER12	Twinkle Park	0.0000005	0.000008	0.000008	<0.1	31.2	None
ER13	Millwall Park	0.0000008	0.000013	0.000013	<0.1	30.8	None
ER14	Mudchute Farm and Park	0.0000054	0.000082	0.000083	<0.1	31.2	None
ER15	Poplar Dock	0.0000014	0.000021	0.000021	<0.1	36.0	None
ER16	Robin Hood Gardens	0.0000006	0.000009	0.000009	<0.1	36.0	None
ER17	Saffron Avenue Pond	0.0000007	0.000010	0.000010	<0.1	36.0	None
ER18	Blackheath and Greenwich Park	0.0000002	0.000004	0.000004	<0.1	130.7	None
ER19	New Cross and New Cross Gate Railsides	0.0000003	0.000005	0.000005	<0.1	130.6	None
ER20	Creekside Education Centre	0.0000001	0.000002	0.000002	<0.1	30.8	None
ER21	Sue Godfrey Local Nature Reserve	0.0000003	0.000005	0.000005	<0.1	130.6	None
ER22	St Nicholas Churchyard, Deptford	0.0000004	0.000006	0.000006	<0.1	130.6	None
ER23	Russia Dock Woodland	0.0000005	0.000008	0.000008	<0.1	31.2	None
ER24	Epping Forest	0.0000000	0.000000	0.000000	<0.1	109.5	None

As shown in Table 64, the PC proportion of the EQS is less than 1% at all sensitive receptor locations. Furthermore, the APIS site relevant critical load tool indicated that no receptors exceeded the CL function for acid deposition.

5.2.3 Scenario 3

Annual Mean NO_x

Predicted annual mean NO_x concentrations at sensitive ecological receptors are summarised in Table 65.

Table 65: Predicted Annual Mean NO_x Concentrations

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.003	45.583	<0.1	151.9
ER2	Rainsborough Avenue Embankments (SINC)	0.009	46.059	<0.1	153.5

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER3	Lavender Pond Nature Park (SINC/LNR)	0.002	57.162	<0.1	190.5
ER4	Surrey Docks Farm (SINC)	0.006	46.556	<0.1	155.2
ER5	Durand's Wharf (SINC)	0.004	46.554	<0.1	155.2
ER6	St Anne's Churchyard, Limehouse (SINC)	0.002	57.162	<0.1	190.5
ER7	Pepys Park Nature Area (SINC)	0.007	46.057	<0.1	153.5
ER8	Sayes Court Park (SINC)	0.005	46.055	<0.1	153.5
ER9	Cyril Jackson School Nature Area (SINC)	0.003	57.163	<0.1	190.5
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.003	45.863	<0.1	152.9
ER11	Westcombe Woodlands (SINC)	0.003	41.333	<0.1	137.8
ER12	Twinkle Park (SINC)	0.005	42.385	<0.1	141.3
ER13	Millwall Park (SINC)	0.017	42.397	0.1	141.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.058	49.798	0.2	166.0
ER15	Poplar Dock (SINC)	0.014	77.894	<0.1	259.6
ER16	Robin Hood Gardens (SINC)	0.006	77.886	<0.1	259.6
ER17	Saffron Avenue Pond (SINC)	0.007	77.887	<0.1	259.6
ER18	Blackheath and Greenwich Park (SINC)	0.003	46.133	<0.1	153.8
ER19	New Cross and New Cross Gate Railsides (SINC)	0.003	45.583	<0.1	151.9
ER20	Creekside Education Centre (SINC)	0.003	45.863	<0.1	152.9
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.003	45.863	<0.1	152.9
ER22	St Nicholas Churchyard, Deptford (SINC)	0.004	45.864	<0.1	152.9
ER23	Russia Dock Woodland (SINC)	0.006	46.556	<0.1	155.2
ER24	Epping Forest (SAC)	0.0003	42.2103	<0.1	140.7
ER25	Lee Valley (SPA/Ramsar)	0.0002	43.0602	<0.1	143.5

As indicated in Table 65, predicted annual mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

24-Hour Mean NO_x

Predicted 24-hour mean NO_x concentrations are summarised in Table 66.

Table 66: Predicted 24-Hour Mean NO_x Concentrations

Receptor		Predicted 24-Hour Mean NO _x Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	120.54	211.70	160.7	282.3
ER2	Rainsborough Avenue Embankments (SINC)	162.32	254.42	216.4	339.2
ER3	Lavender Pond Nature Park (SINC/LNR)	126.44	240.76	168.6	321.0
ER4	Surrey Docks Farm (SINC)	242.53	335.63	323.4	447.5
ER5	Durand's Wharf (SINC)	145.45	238.55	193.9	318.1
ER6	St Anne's Churchyard, Limehouse (SINC)	68.11	182.43	90.8	243.2
ER7	Pepys Park Nature Area (SINC)	182.42	274.52	243.2	366.0
ER8	Sayes Court Park (SINC)	149.74	241.84	199.7	322.5
ER9	Cyril Jackson School Nature Area (SINC)	107.35	221.67	143.1	295.6
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	146.83	238.55	195.8	318.1
ER11	Westcombe Woodlands (SINC)	75.34	158.00	100.5	210.7
ER12	Twinkle Park (SINC)	193.29	278.05	257.7	370.7
ER13	Millwall Park (SINC)	443.71	528.47	591.6	704.6
ER14	Mudchute Farm and Park (SINC/LNR)	821.84	921.32	1095.8	1228.4
ER15	Poplar Dock (SINC)	159.00	314.76	212.0	419.7
ER16	Robin Hood Gardens (SINC)	93.01	248.77	124.0	331.7
ER17	Saffron Avenue Pond (SINC)	89.04	244.80	118.7	326.4
ER18	Blackheath and Greenwich Park (SINC)	137.46	229.72	183.3	306.3
ER19	New Cross and New Cross Gate Railsides (SINC)	87.31	178.47	116.4	238.0
ER20	Creekside Education Centre (SINC)	93.50	185.22	124.7	247.0
ER21	Sue Godfrey Local Nature Reserve (SINC)	115.69	207.41	154.3	276.5
ER22	St Nicholas Churchyard, Deptford (SINC)	181.38	273.10	241.8	364.1
ER23	Russia Dock Woodland (SINC)	124.02	217.12	165.4	289.5
ER24	Epping Forest (SAC)	12.73	97.15	17.0	129.5
ER25	Lee Valley (SPA/Ramsar)	8.15	94.27	10.9	125.7

As indicated in Table 66, predicted 24-hour mean NO_x concentrations are above the relevant EQS at all sensitive receptor locations. This is due to the high background concentrations, which exceed the EQSs as a base condition.

It is important to note that the assessment considered all 9 generators operating cumulatively for a full calendar year. As such, predicted concentrations are likely to be an overestimation of actual concentrations given that Scenario 3 is considered to be a highly rare event (1 every 10 years) and only the generators required to meet the electrical load will be operating for a maximum of 5 hours.

As mentioned previously, Scenario 3 is representative of a power outage and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Nitrogen Deposition

Predicted annual mean nitrogen deposition rates are summarised in Table 67.

Table 67: Predicted Annual Mean Nitrogen Deposition Rates

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
				PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.0005	19.6005	<0.1	98.0	<0.1	65.3
ER2	Rainsborough Avenue Embankments (SINC)	0.0013	19.6013	<0.1	98.0	<0.1	65.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.0003	22.5403	<0.1	225.4	<0.1	150.3
ER4	Surrey Docks Farm (SINC)	0.0017	35.1417	<0.1	351.4	<0.1	175.7
ER5	Durand's Wharf (SINC)	0.0006	35.1406	<0.1	351.4	<0.1	175.7
ER6	St Anne's Churchyard, Limehouse (SINC)	0.0006	40.4606	<0.1	404.6	<0.1	202.3
ER7	Pepys Park Nature Area (SINC)	0.0021	35.1421	<0.1	351.4	<0.1	175.7
ER8	Sayes Court Park (SINC)	0.0016	35.1416	<0.1	351.4	<0.1	175.7
ER9	Cyril Jackson School Nature Area (SINC)	0.0004	22.5404	<0.1	225.4	<0.1	150.3
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.0005	19.6005	<0.1	98.0	<0.1	65.3
ER11	Westcombe Woodlands (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER12	Twinkle Park (SINC)	0.0015	35.1415	<0.1	351.4	<0.1	175.7
ER13	Millwall Park (SINC)	0.0024	19.6024	<0.1	98.0	<0.1	65.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.0166	35.1566	0.2	351.6	0.1	175.8
ER15	Poplar Dock (SINC)	0.0041	40.4641	<0.1	404.6	<0.1	202.3
ER16	Robin Hood Gardens (SINC)	0.0017	40.4617	<0.1	404.6	<0.1	202.3
ER17	Saffron Avenue Pond (SINC)	0.0021	40.4621	<0.1	404.6	<0.1	202.3
ER18	Blackheath and Greenwich Park (SINC)	0.0008	35.1408	<0.1	351.4	<0.1	175.7
ER19	New Cross and New Cross Gate Railsides (SINC)	0.0010	35.1410	<0.1	351.4	<0.1	175.7
ER20	Creekside Education Centre (SINC)	0.0005	19.6005	<0.1	98.0	<0.1	65.3
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.0010	35.1410	<0.1	351.4	<0.1	175.7
ER22	St Nicholas Churchyard, Deptford (SINC)	0.0012	35.1412	<0.1	351.4	<0.1	175.7
ER23	Russia Dock Woodland (SINC)	0.0018	35.1418	<0.1	351.4	<0.1	175.7
ER24	Epping Forest (SAC)	0.00004	34.10004	<0.1	341.0	<0.1	170.5

Receptor		Predicted Annual Mean Nitrogen Deposition Rate (kgN/ha/yr)		Proportion of EQS (%)			
				Low EQS		High EQS	
		PC	PEC	PC	PEC	PC	PEC
ER25	Lee Valley (SPA/Ramsar)	0.00003	34.10003	<0.1	227.3	<0.1	113.7

As indicated in Table 67, predicted annual mean nitrogen deposition rates were above both the Low and High EQS at 20 sensitive receptor locations. This is due to the high background deposition rates, which exceed both EQSs as a base condition.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Annual Mean SO₂

Predicted annual mean SO₂ concentrations at sensitive ecological receptors are summarised in Table 68.

Table 68: Predicted Annual Mean SO₂ Concentrations

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER1	Folkestone Gardens (SINC)	0.000003	1.660003	<0.1	8.3
ER2	Rainsborough Avenue Embankments (SINC)	0.000007	1.660007	<0.1	8.3
ER3	Lavender Pond Nature Park (SINC/LNR)	0.000002	1.980002	<0.1	9.9
ER4	Surrey Docks Farm (SINC)	0.000005	1.660005	<0.1	8.3
ER5	Durand's Wharf (SINC)	0.000003	1.660003	<0.1	8.3
ER6	St Anne's Churchyard, Limehouse (SINC)	0.000002	1.980002	<0.1	9.9
ER7	Pepys Park Nature Area (SINC)	0.000006	1.660006	<0.1	8.3
ER8	Sayes Court Park (SINC)	0.000004	1.660004	<0.1	8.3
ER9	Cyril Jackson School Nature Area (SINC)	0.000002	1.980002	<0.1	9.9
ER10	St Paul's Churchyard and Crossfield Street Open Space (SINC)	0.000003	1.660003	<0.1	8.3
ER11	Westcombe Woodlands (SINC)	0.000002	1.660002	<0.1	8.3
ER12	Twinkle Park (SINC)	0.000004	1.660004	<0.1	8.3
ER13	Millwall Park (SINC)	0.000014	1.660014	<0.1	8.3
ER14	Mudchute Farm and Park (SINC/LNR)	0.000047	1.660047	<0.1	8.3
ER15	Poplar Dock (SINC)	0.000012	1.980012	<0.1	9.9
ER16	Robin Hood Gardens (SINC)	0.000005	1.980005	<0.1	9.9
ER17	Saffron Avenue Pond (SINC)	0.000006	1.980006	<0.1	9.9
ER18	Blackheath and Greenwich Park (SINC)	0.000002	1.660002	<0.1	8.3
ER19	New Cross and New Cross Gate Railsides (SINC)	0.000003	1.660003	<0.1	8.3
ER20	Creekside Education Centre (SINC)	0.000003	1.660003	<0.1	8.3

Receptor		Predicted Annual Mean SO ₂ Concentration (µg/m ³)		Proportion of EQS (%)	
		PC	PEC	PC	PEC
ER21	Sue Godfrey Local Nature Reserve (SINC)	0.000003	1.660003	<0.1	8.3
ER22	St Nicholas Churchyard, Deptford (SINC)	0.000003	1.660003	<0.1	8.3
ER23	Russia Dock Woodland (SINC)	0.000005	1.660005	<0.1	8.3
ER24	Epping Forest (SAC)	0.000000	2.020000	<0.1	10.1
ER25	Lee Valley (SPA/Ramsar)	0.000000	1.580000	<0.1	7.9

As indicated in Table 68, predicted annual mean SO₂ concentrations are below the relevant EQS at all sensitive receptor locations.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

Acid Deposition

Predicted annual mean acid deposition rates are summarised in Table 69.

Table 69: Predicted Annual Mean Acid Deposition Rates

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)	
		S	N	Total	PC	PEC
ER1	Folkestone Gardens	0.0000003	0.00003	0.00003	<0.1	30.8
ER2	Rainsborough Avenue Embankments	0.0000008	0.00009	0.00009	<0.1	30.8
ER3	Lavender Pond Nature Park	0.0000002	0.00002	0.00002	<0.1	353.8
ER4	Surrey Docks Farm	0.0000011	0.00012	0.00012	<0.1	31.2
ER5	Durand's Wharf	0.0000004	0.00004	0.00004	<0.1	31.2
ER6	St Anne's Churchyard, Limehouse	0.0000004	0.00004	0.00004	<0.1	36.0
ER7	Pepys Park Nature Area	0.0000014	0.00015	0.00015	<0.1	31.2
ER8	Sayes Court Park	0.0000010	0.00011	0.00011	<0.1	31.2
ER9	Cyril Jackson School Nature Area	0.0000003	0.00003	0.00003	<0.1	36.0
ER10	St Paul's Churchyard and Crossfield Street Open Space	0.0000003	0.00003	0.00004	<0.1	30.8
ER11	Westcombe Woodlands	0.0000005	0.00006	0.00006	<0.1	268.3
ER12	Twinkle Park	0.0000010	0.00011	0.00011	<0.1	31.2
ER13	Millwall Park	0.0000016	0.00017	0.00017	<0.1	30.8
ER14	Mudchute Farm and Park	0.0000110	0.00119	0.00120	<0.1	31.2
ER15	Poplar Dock	0.0000027	0.00030	0.00030	<0.1	36.0
ER16	Robin Hood Gardens	0.0000011	0.00012	0.00012	<0.1	36.0

Receptor		Predicted Annual Mean Acid Deposition Rate (keq/ha/yr)			Proportion of EQS (%)	
		S	N	Total	PC	PEC
ER17	Saffron Avenue Pond	0.0000014	0.00015	0.00015	<0.1	36.0
ER18	Blackheath and Greenwich Park	0.0000006	0.00006	0.00006	<0.1	130.7
ER19	New Cross and New Cross Gate Railsides	0.0000007	0.00007	0.00007	<0.1	130.6
ER20	Creekside Education Centre	0.0000003	0.00003	0.00003	<0.1	30.8
ER21	Sue Godfrey Local Nature Reserve	0.0000007	0.00007	0.00007	<0.1	130.6
ER22	St Nicholas Churchyard, Deptford	0.0000008	0.00008	0.00008	<0.1	130.6
ER23	Russia Dock Woodland	0.0000012	0.00013	0.00013	<0.1	31.2
ER24	Epping Forest	0.0000000	0.00000	0.00000	<0.1	109.5

As shown in Table 69, predicted annual mean acid deposition rates were above the EQS at 7 sensitive receptor locations. This is due to the high background deposition rates, which exceed both EQSs as a base condition.

Scenario 3 is representative of a power outage (1 in every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. Therefore, the modelling results indicated above cannot determine the significance of impacts of the development site.

6.0 CONCLUSION

Ensafe was commissioned by Hurley Palmer Flatt to undertake a Dispersion Modelling Assessment in support an EP application for a data centre located at units 1, 2 and 4 Greenwich View Place, Isle of Dogs, London.

Dispersion modelling of a number of pollutants was undertaken using ADMS 5 (v5.2). Impacts at sensitive receptors were quantified and the results compared with the relevant EQSs.

Predicted impacts on existing annual mean NO₂ concentrations, all PM concentrations, HC concentrations and all SO₂ concentrations could be screened out as **insignificant** at all receptor locations for both Scenario 1 and Scenario 2 (normally operational testing scenarios) in accordance EA significance criteria.

Predicted impacts on 1-hour mean NO₂ concentrations and CO concentrations for both Scenario 1 and Scenario 2 were considered to be **not significant** due to the concentrations being below the relevant EQS and the conservative approach of the assessment.

Predicted impacts on all NO_x concentrations, SO₂ concentrations and nitrogen and acid deposition rates at ecological receptor locations could be screened out as **insignificant** for Scenario 1 in accordance EA significance criteria.

Predicted impacts on annual mean NO_x concentrations, SO₂ concentrations and nitrogen and acid deposition rates at ecological receptor locations could be screened out as **insignificant** for Scenario 2 in accordance EA significance criteria. Predicted impacts on 24-hour mean NO_x concentrations for Scenario 2 were considered to be **not significant** due to the conservative approach of the assessment.

Scenario 3 is representative of a power outage, which is considered to be a highly rare emergency event (1 every 10 years) and only the generators required to meet the electrical load will operate for a maximum of 5 hours. As such, this is a highly short-term emergency event and it would not affect the overall significance of the impacts associated with the development site. Modelling based on conservative was undertaken for this scenario however, it should not determine the overall significance.

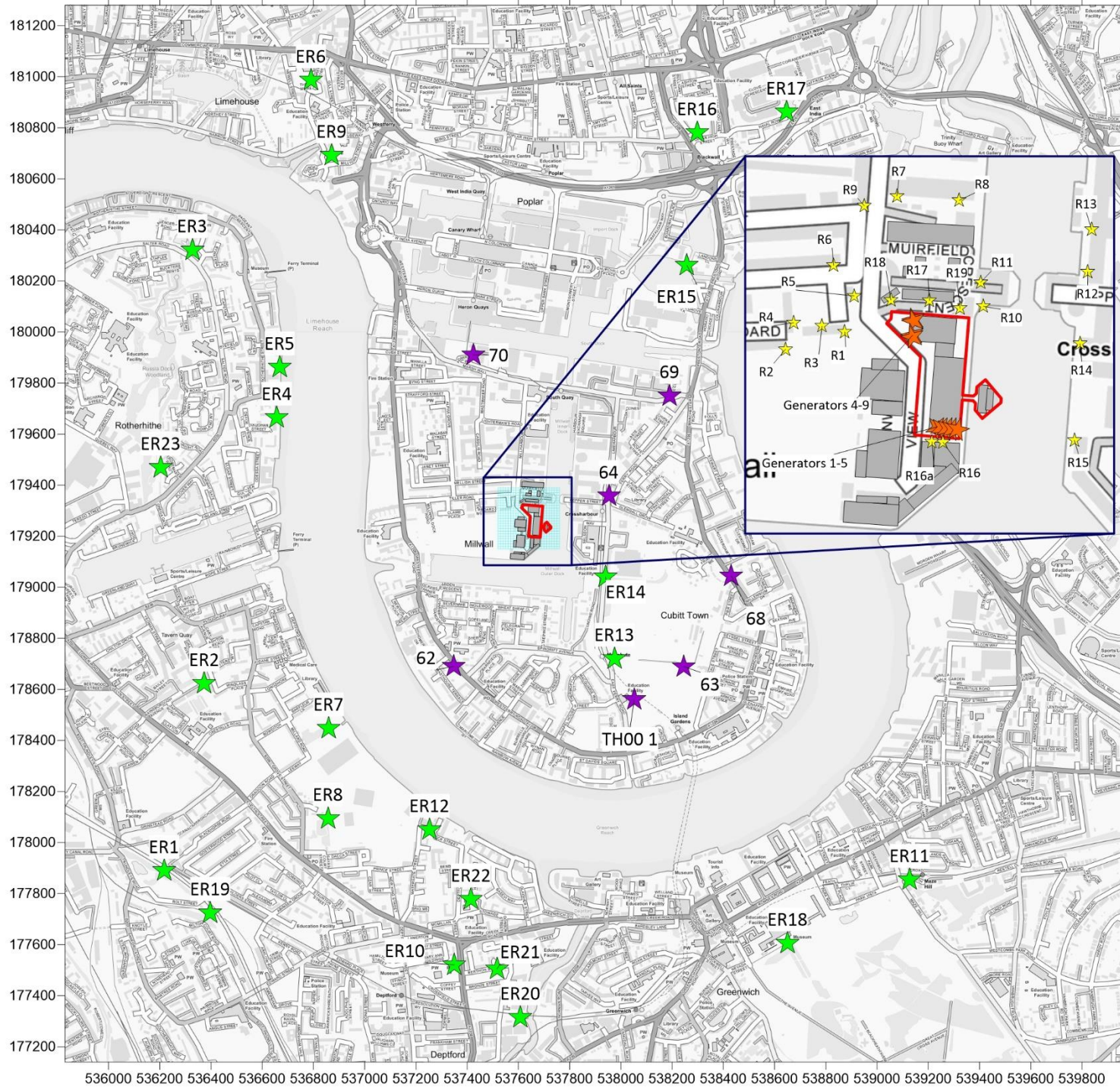
Based on the predictions and the use of robust assumptions, it is considered that the overall air quality impacts of the development would be **not significant**.








7.0 ABBREVIATIONS

%ile	Percentile
AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQO	Air Quality Objective
CERC	Cambridge Environmental Research Consultants
CL	Critical Load
C ₆ H ₆	Benzene
CO	Carbon Monoxide
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
ELV	Emission Limit Value
EPR	Environmental Permitting Regulations
EPUK	Environmental Protection UK
EQS	Environmental Quality Standard
EU	European Union
GLA	Greater London Authority
HC	Hydrocarbons
LA	Local Authority
LBoTH	London Borough of Tower Hamlets
LLAQM	London Local Air Quality Management
LNR	Local Nature Reserve
MAGIC	Multi-Agency Geographic Information for the Countryside
MW	Mega Watt
NGR	National Grid Reference
NNR	National Nature Reserve
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM	Particulate matter
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
SAC	Special Areas of Conservation
SINC	Sites of Importance for Nature Conservation
SPA	Special Protection Area
SSSI	Site of Specific Scientific Interest
SO ₂	Sulphur Dioxide
z ₀	Roughness Length

END OF REPORT

APPENDIX I - FIGURES



- Legend**
-  Site Boundary
 -  Modelled Buildings
 -  Cartesian Grid
 -  Monitoring Locations
 -  Human Receptor Locations
 -  Ecological Receptor Locations
 -  Modelled Point Sources

Title
 Figure 1
 Site Location & Surrounding Context

Project
 Data Centre, Greenwich View Place
 Isle of Dogs, London

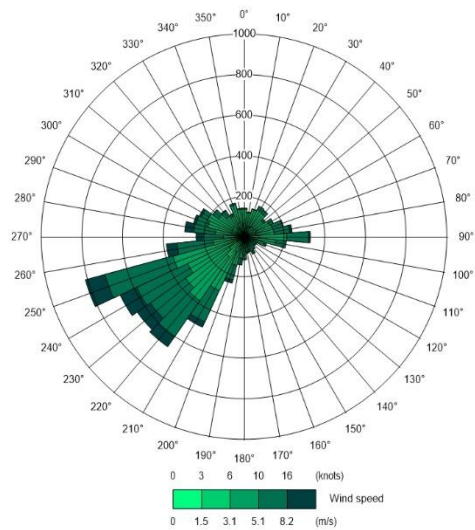
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Client
 Hurley Palmer Flatt

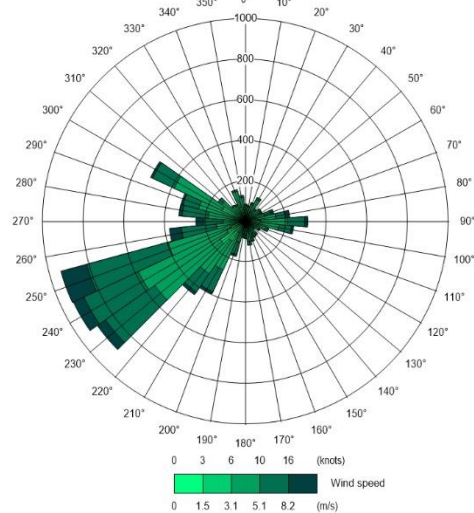
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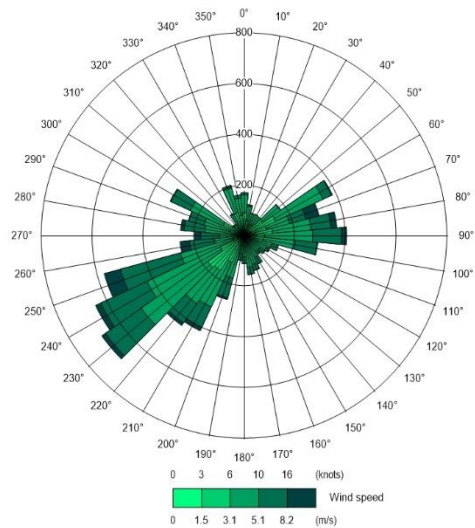
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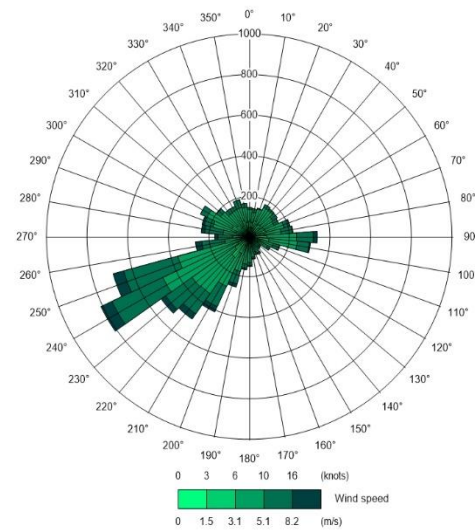
Wind Rose of 2015 Meteorological Data



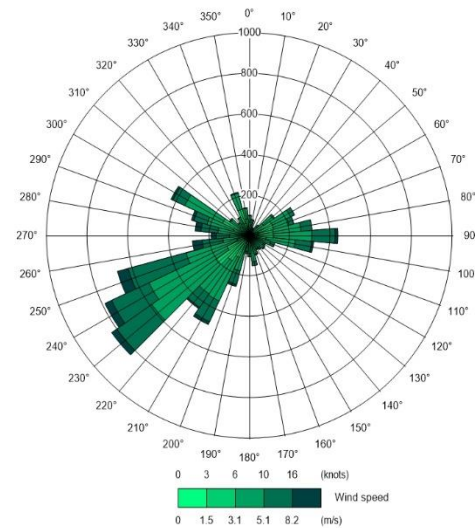
Wind Rose of 2017 Meteorological Data



Wind Rose of 2018 Meteorological Data



Wind Rose of 2016 Meteorological Data



Wind Rose of 2019 Meteorological Data

Legend

Title
 Figure 2
 2015 to 2019 Wind Roses
 London City Airport Meteorological Data

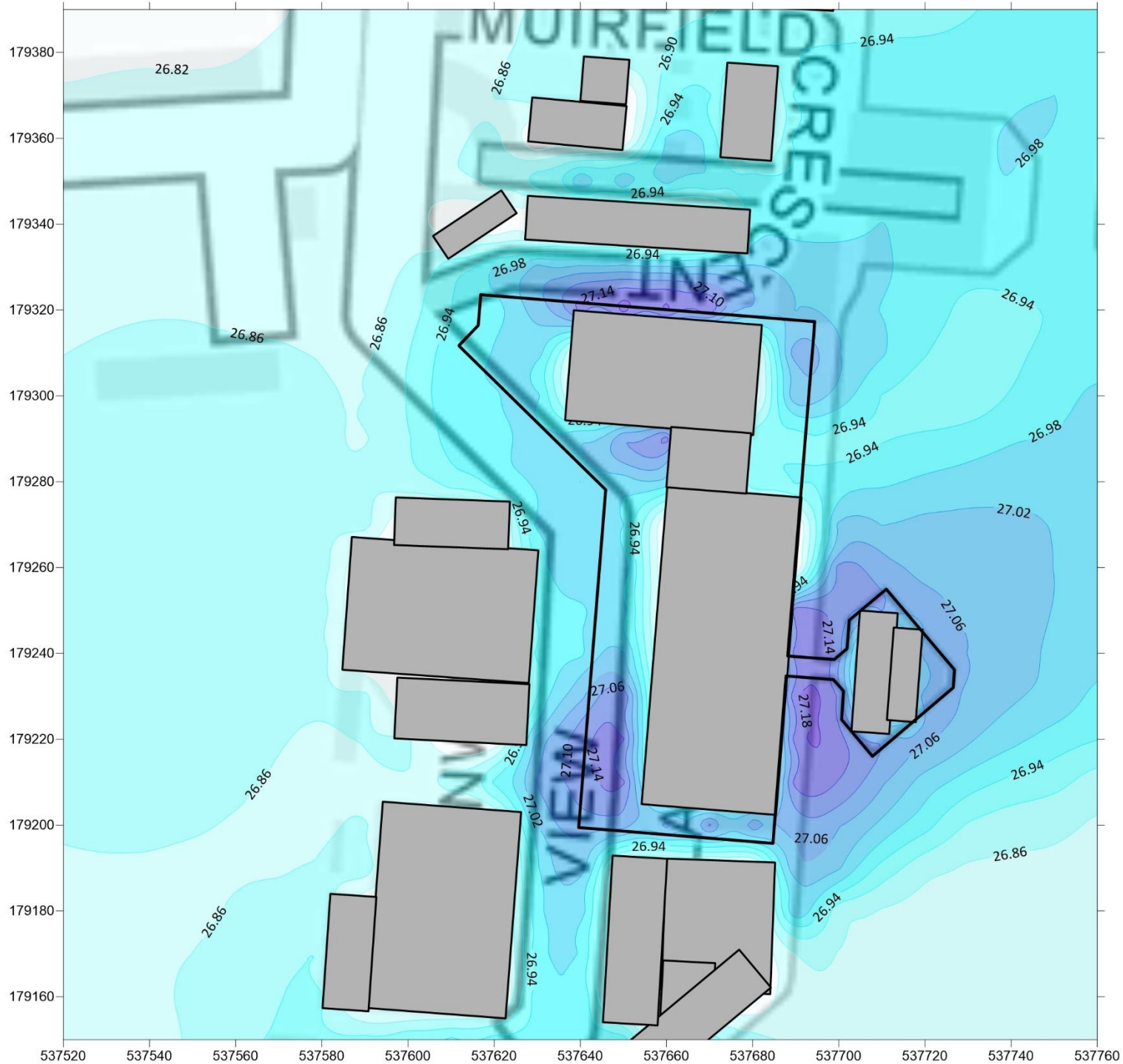
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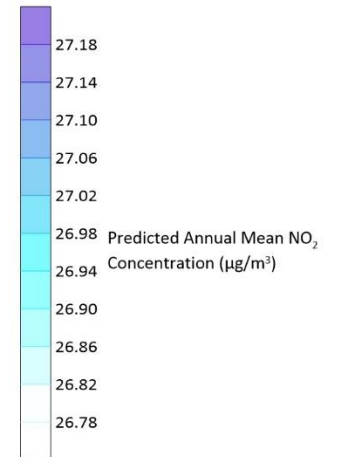


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Legend

 Site Boundary



Title

Figure 3
Predicted 5-Year Maximum Annual Mean NO₂
Concentrations (µg/m³)

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Project Number

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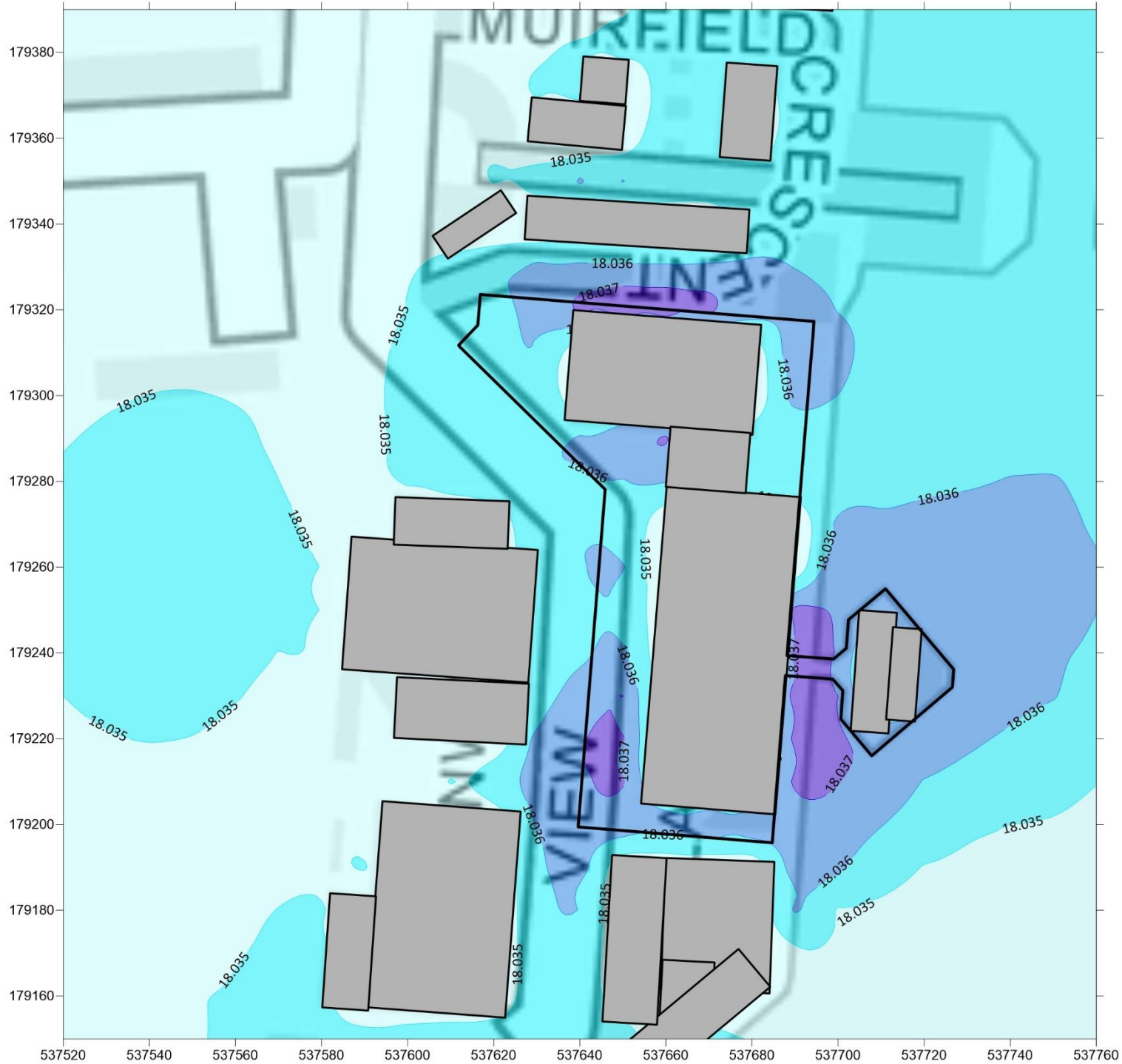
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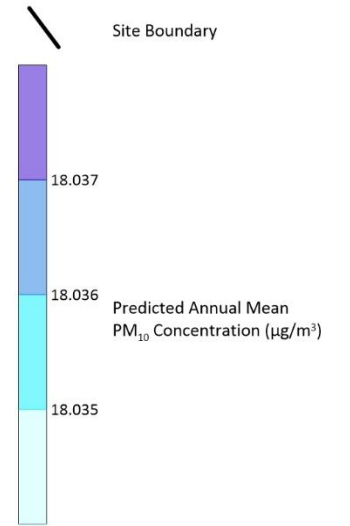
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Legend



Title

Figure 4
Predicted 5-Year Maximum Annual Mean PM₁₀ Concentrations (µg/m³)

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Isle of Dogs, London

Project Number

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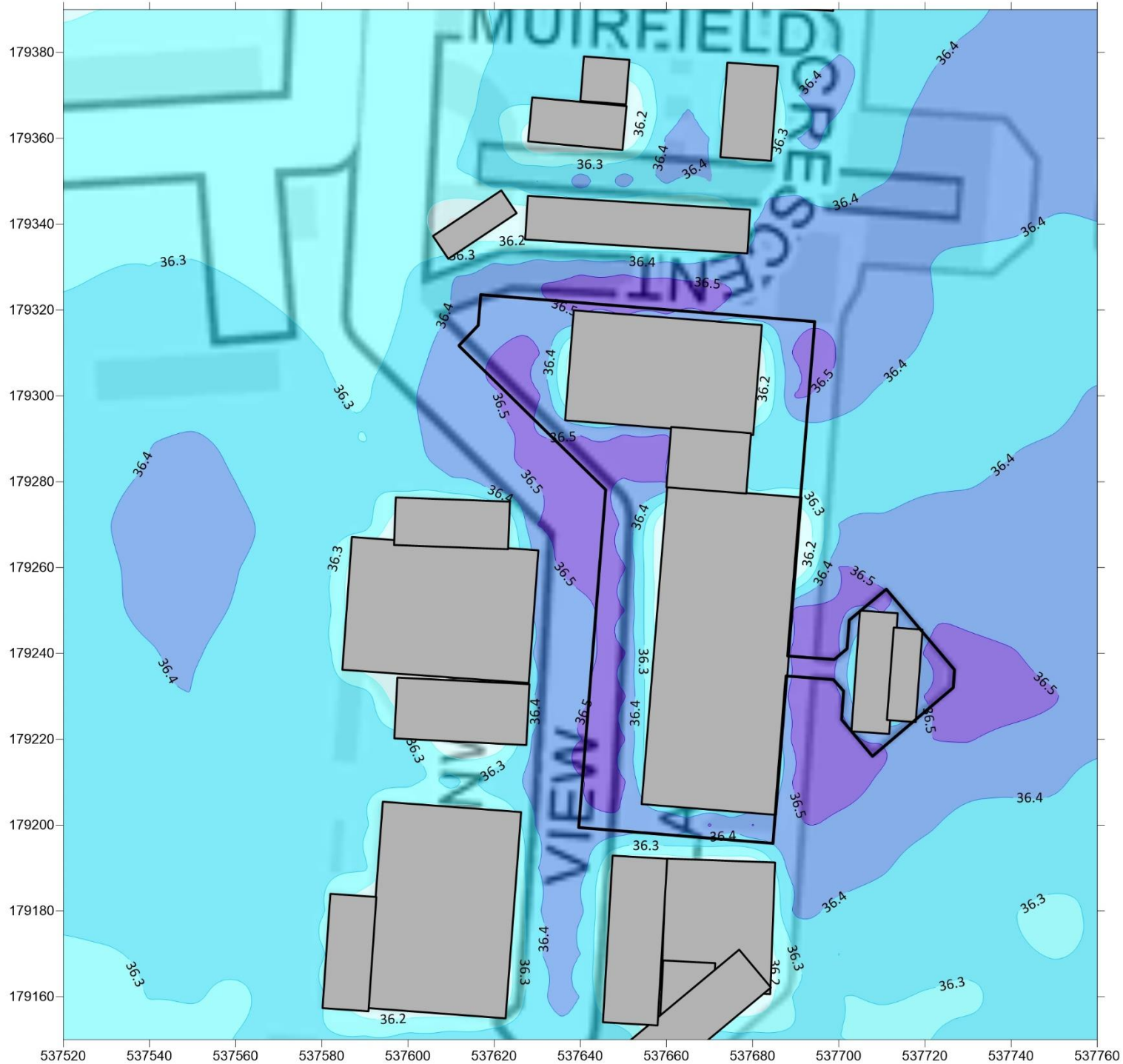
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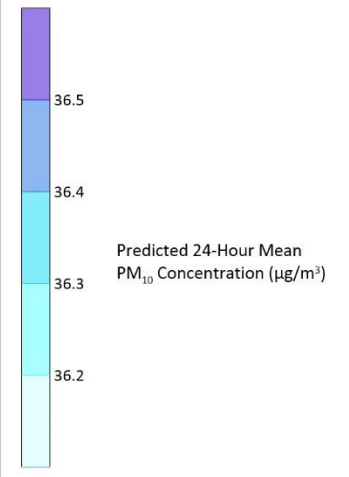


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Legend

 Site Boundary



Title

Figure 5
Predicted 5-Year Maximum 24-Hour Mean
PM₁₀ Concentration (µg/m³)

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Isle of Dogs, London

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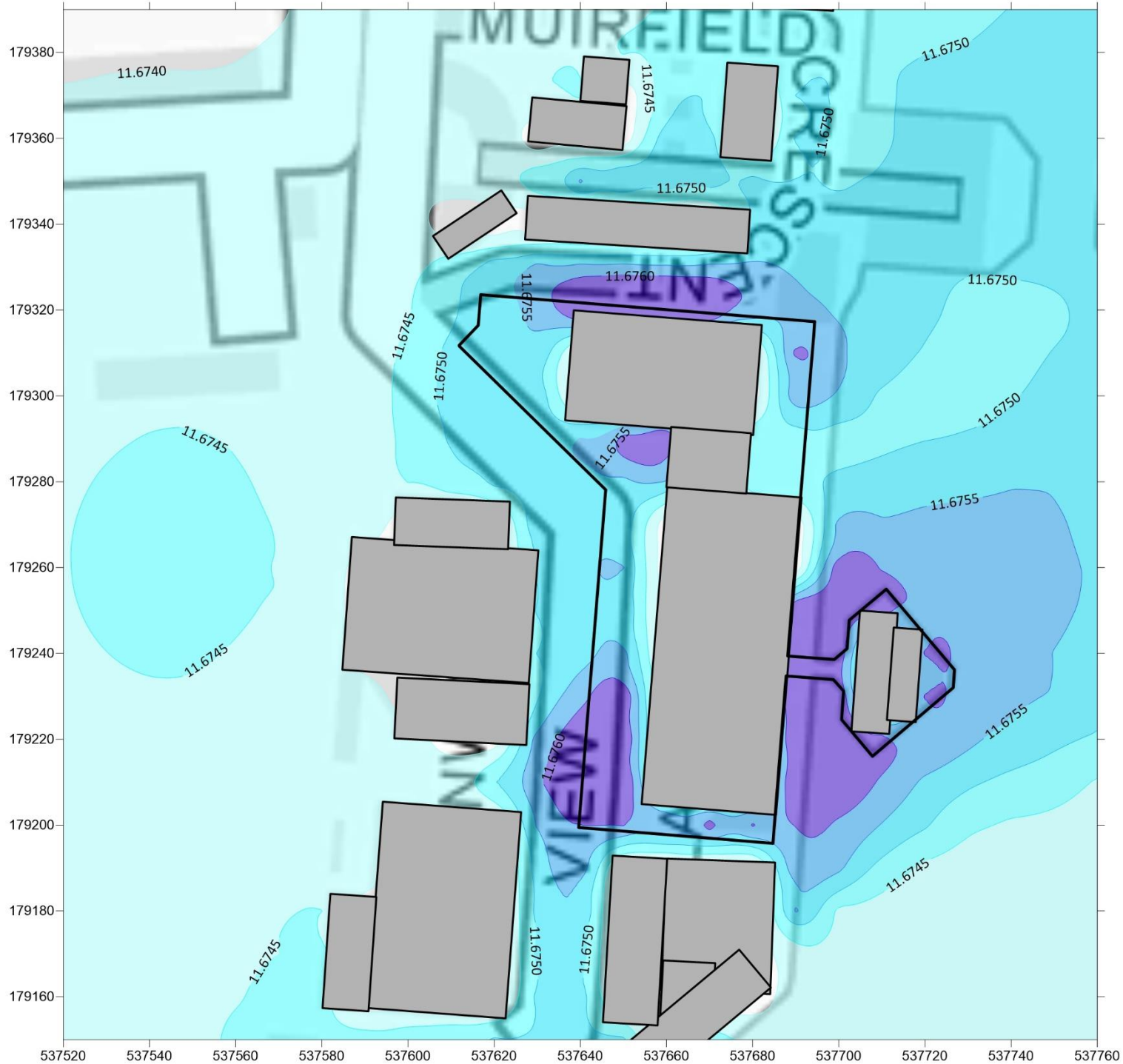
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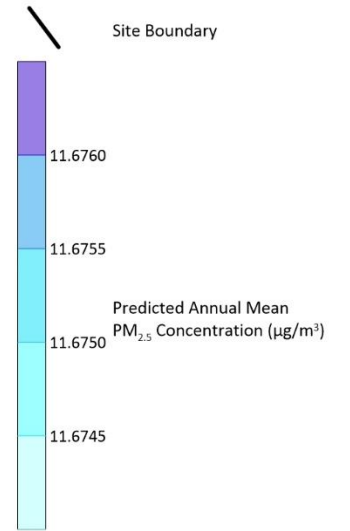
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Title

Figure 6
Predicted 5-Year Maximum
Annual Mean PM_{2.5}
Concentrations (µg/m³)

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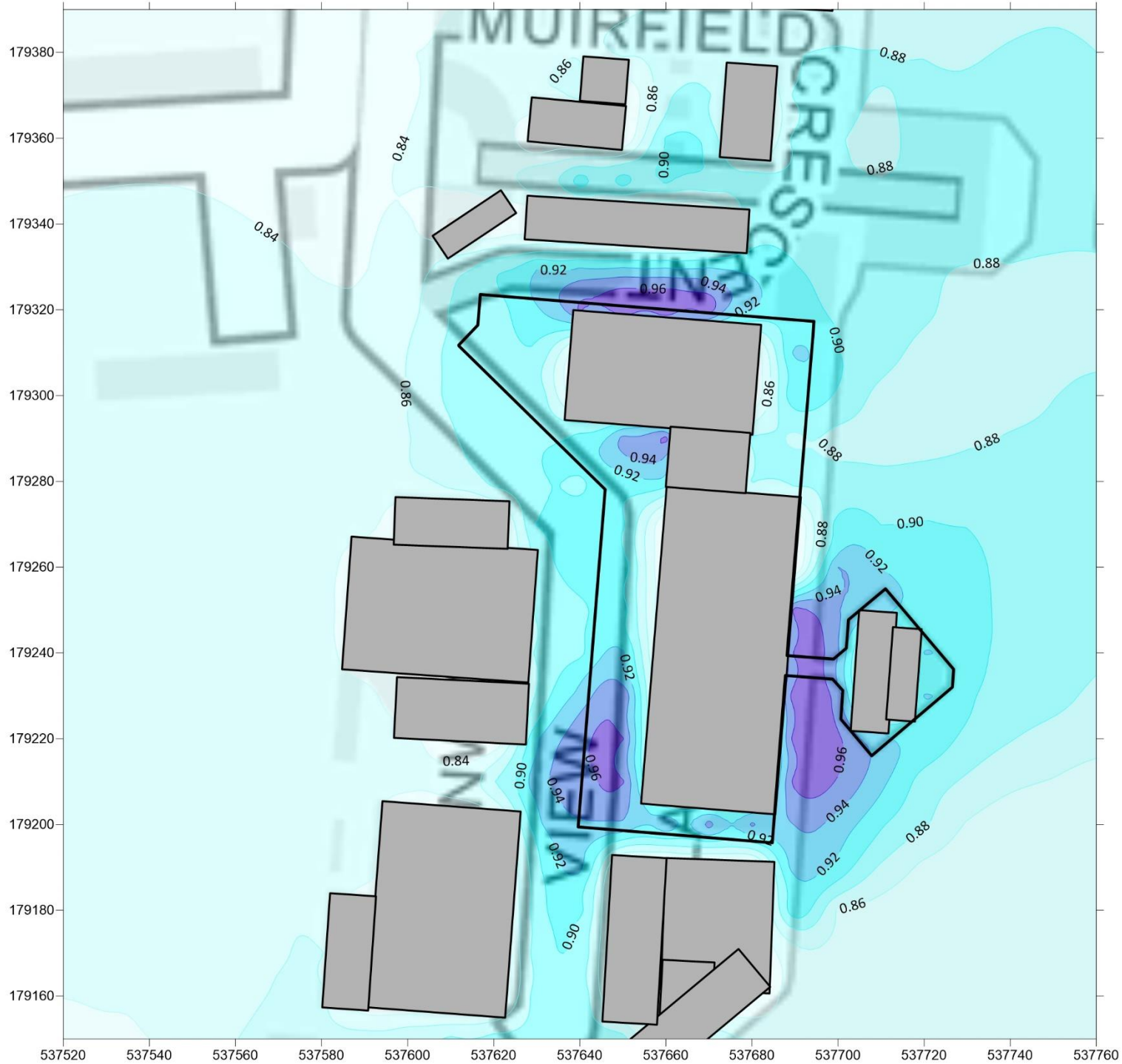
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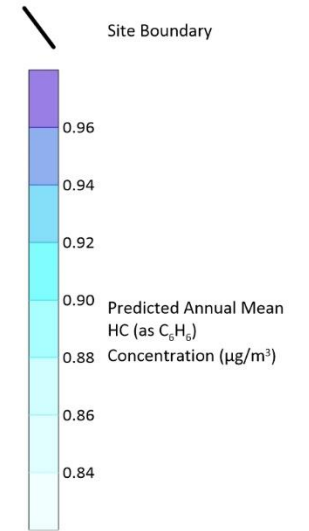
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Title

Figure 7
Predicted 5-Year Maximum Annual Mean
HC (as C₆H₆) Concentrations (µg/m³)

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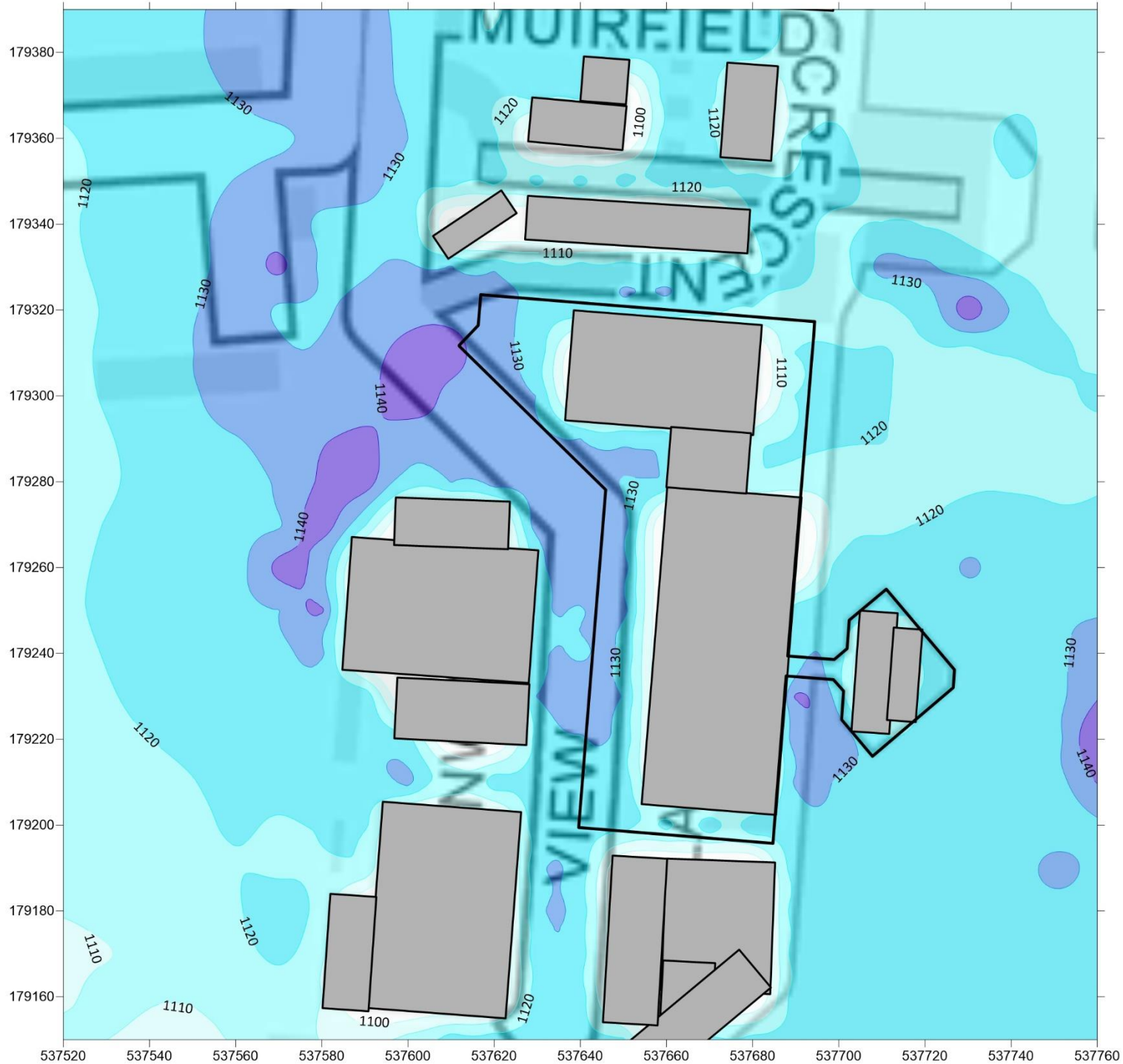
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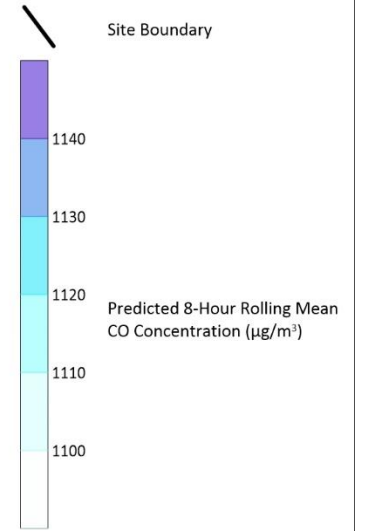
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Legend



Title

Figure 8
Predicted 5-Year Maximum 8-Hour
Rolling Mean CO Concentrations ($\mu\text{g}/\text{m}^3$)

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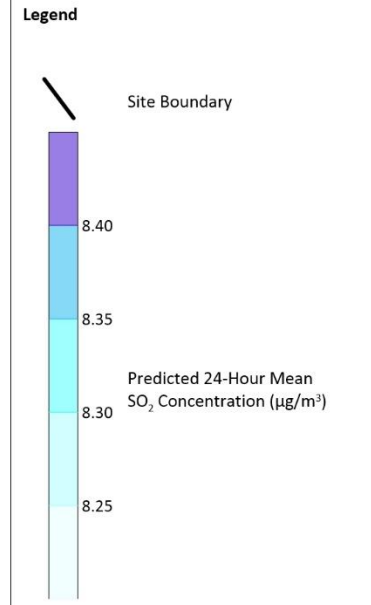
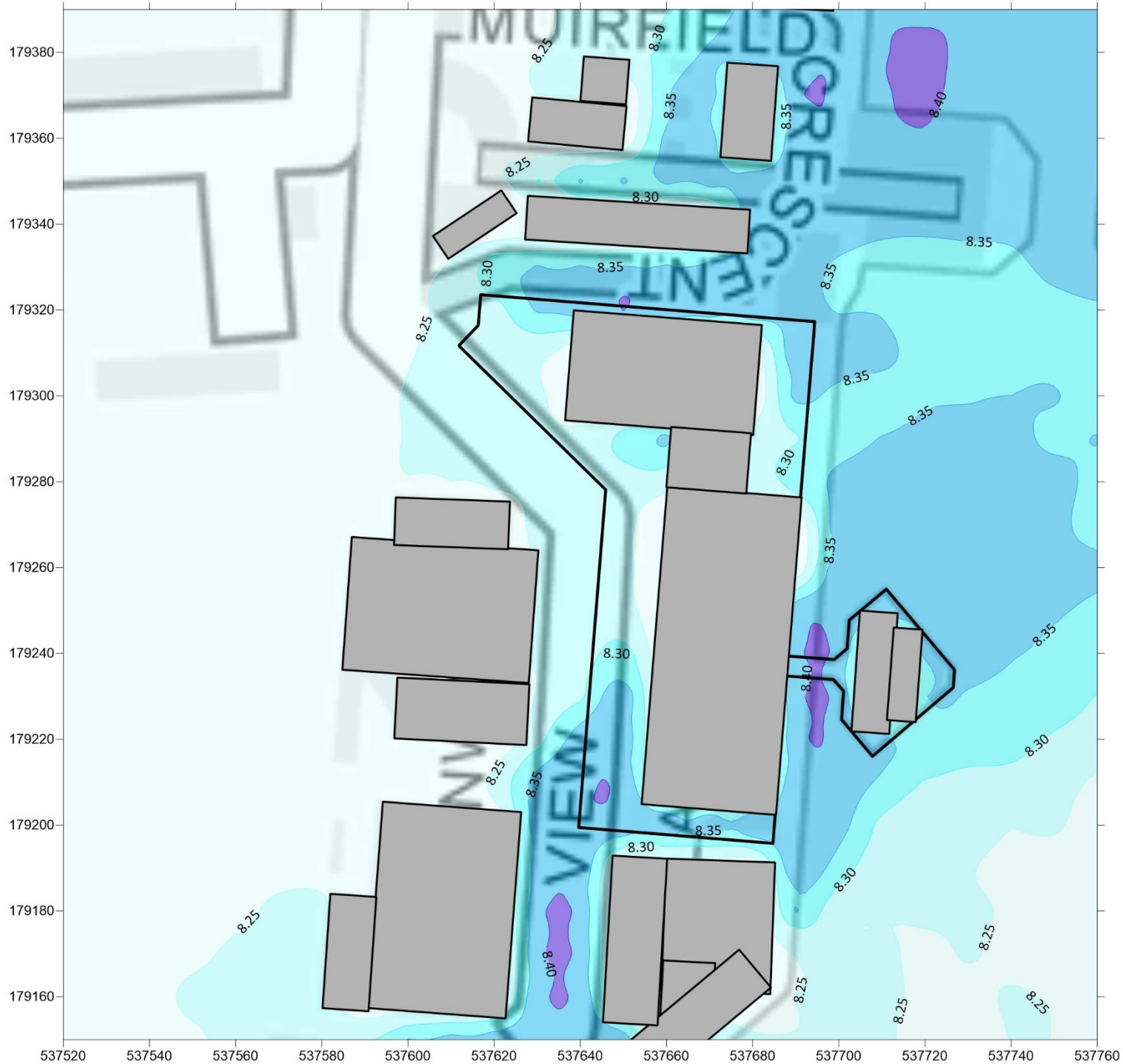
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Title
Figure 9
Predicted 5-Year Maximum 24-Hour Mean
SO₂ Concentration (µg/m³)

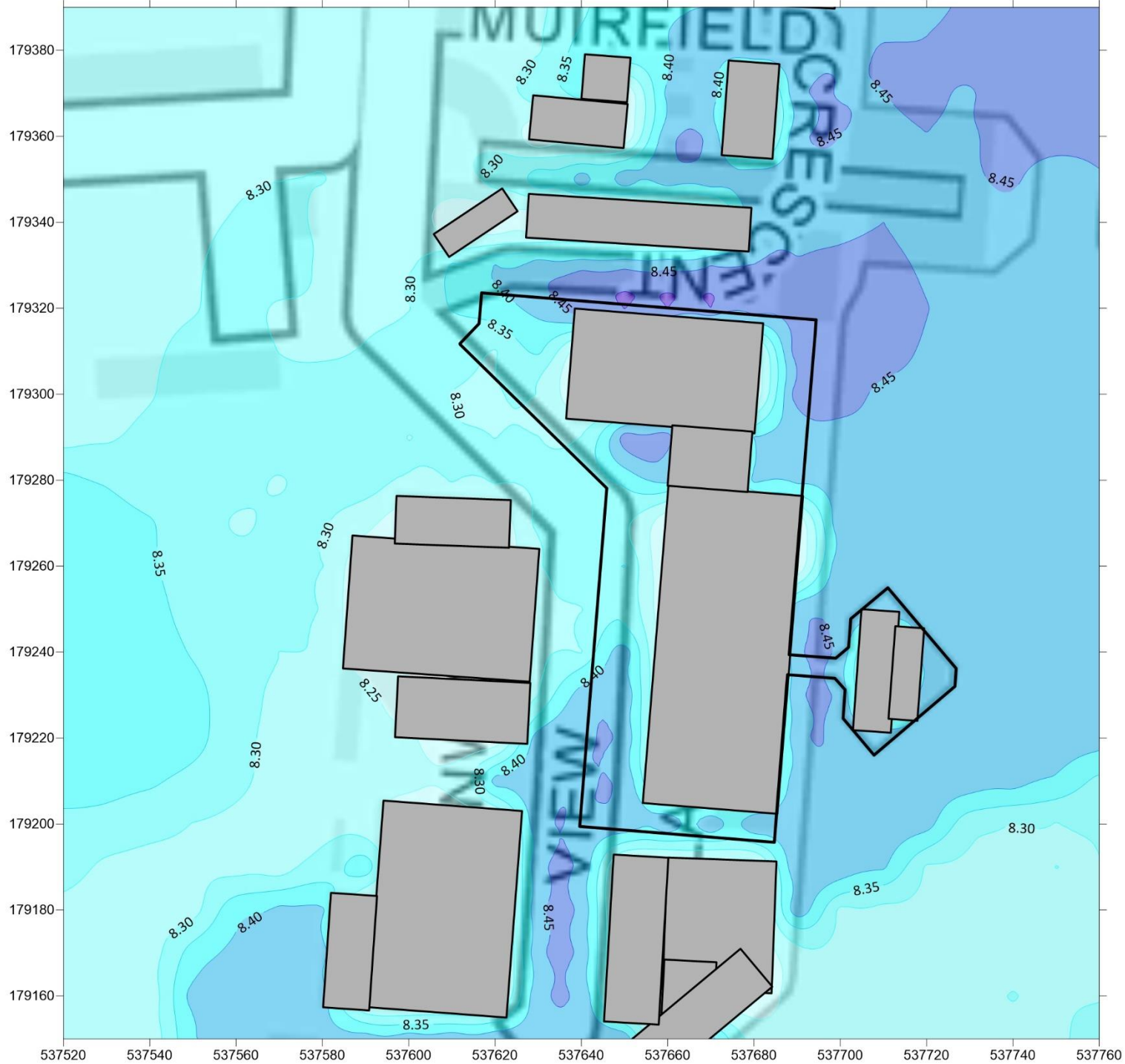
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Legend

Site Boundary

Predicted 1-Hour Mean SO₂ Concentration (µg/m³)

8.50

8.45

8.40

8.35

8.30

8.25

Title
Figure 10
Predicted 5-Year Maximum 1-Hour Mean SO₂ Concentration (µg/m³)

Project
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Isle of Dogs, London

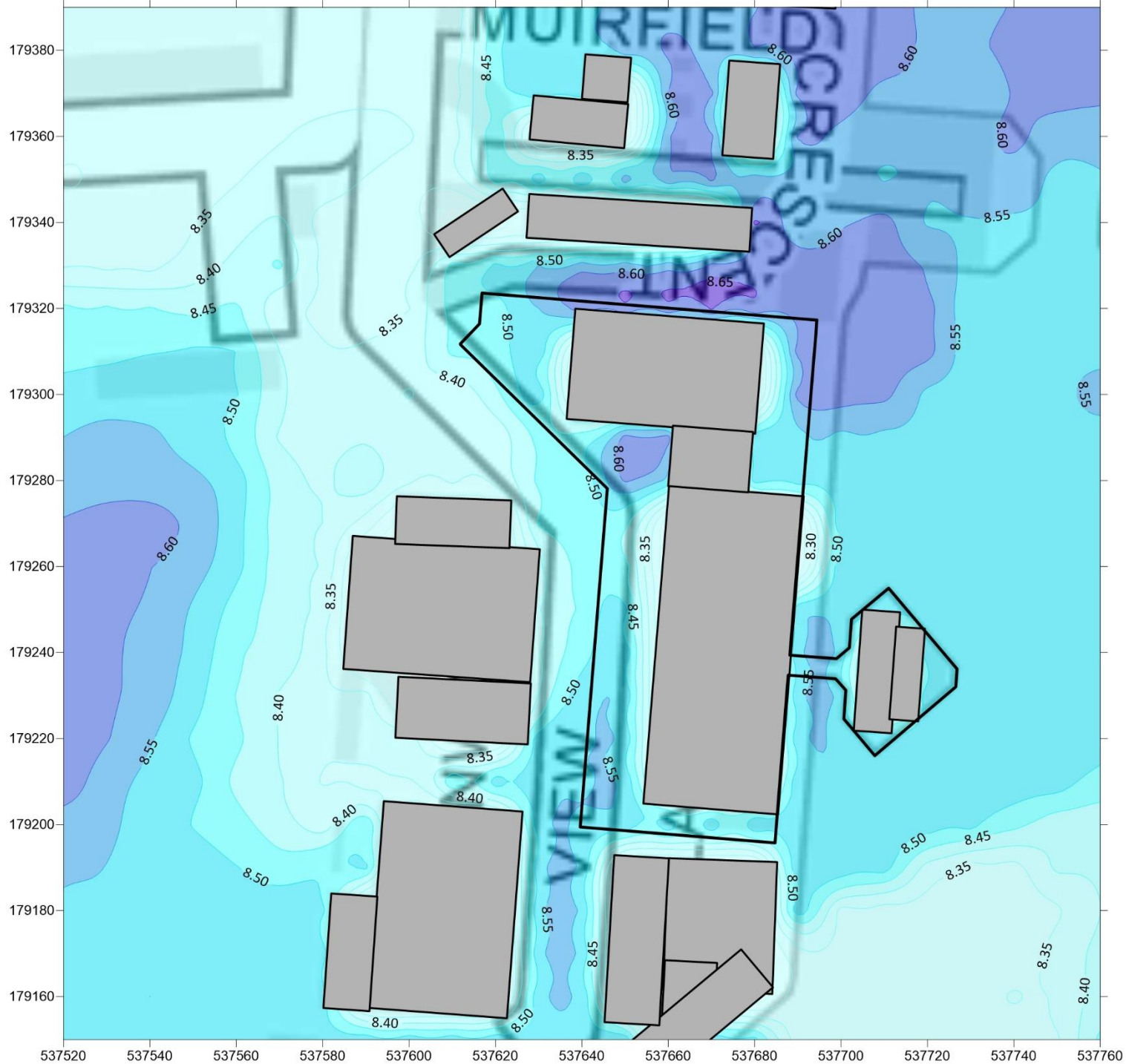
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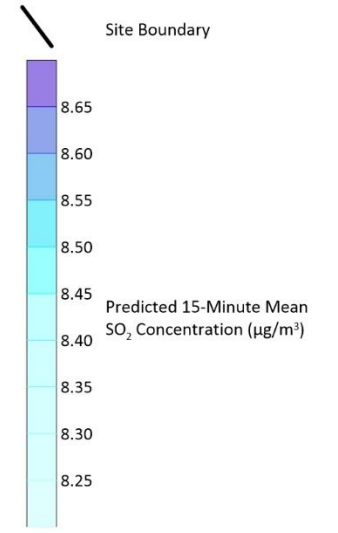
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Title
Figure 11
Predicted 5-Year Maximum 15-Minute Mean
SO₂ Concentration (µg/m³)

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APPENDIX II – ASSESSOR’ S CURRICULUM VITAE

CONAL KEARNEY

Head of Noise and Air Quality

BEng(Hons), MSc, MIAQM, MIEEnvSc

KEY EXPERIENCE

Conal is Head of Noise and Air with specialist experience in the air quality and odour sector. His key capabilities include:

- Representing clients at public inquiries and planning hearings as an expert witness.
- Advanced atmospheric air dispersion modelling of road vehicle and industrial emissions using ADMS and AIRVIRO.
- Preparation of factual and interpretative Air Quality Assessments and Environmental Statement chapters for proposed developments in accordance with UK Government, Environment Agency and Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) methodologies.
- Management and delivery of project work on key, land development and urban regeneration projects.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Dust and Odour impact assessments from minerals and waste sites
- Management of Environmental Permit Applications primarily for the Medium Combustion Plant Directive (MCDP)

SELECT PROJECTS SUMMARY

Industrial Developments

- Land at Mossdown Road, Oldham – energy from waste incinerator. Industrial and road impacts on air quality dust and odour.
- Messingham Quarry, North Lincolnshire - AQA and dust impacts for proposed new sand extraction site.
- Arden Quarry, Derbyshire - AQA for proposed mineral extraction and site restoration
- Granta Park, Oxfordshire. Assessment of VOC fume emissions.
- University of Birmingham. Permit application for CHP scheme.
- Arbroath Road, Carnoustie. Odour and AQA for biogas CHP scheme.
- Brenda Road, Hartlepool – Dispersion modelling to inform stack design for biogas AD facility environmental permit.

Highways Developments

- Alderley Edge Bypass, Cheshire - AQA for major new road scheme.
- South Heywood – EIA for new link road and mixed use joint development

Residential and Mixed-Use Developments

- Orchard Close, Knaresborough. AQA and public inquiry evidence.
- Friars School, Southwark, London. School development for mixed use education and residential building in AQMA.
- Fair Oaks Garden Village – ES chapter and input for major mixed use development
- Westcraig, Edinburgh - EIA chapter and input for major residential development
- Manor Place, London. Road and energy generation dispersion emissions assessment
- Craven Park, London. Mitigation statement and planning hearing expert opinion

Public Sector

- Technical advisor on Manchester Airport Consultative Committee - advise members on environmental technical matters in relation to the airport's operations.
- Cheshire County Council - compile AQ chapters for Local Transport Plan
- Cheshire East Council - specialist AQ advice on highways, minerals and waste projects

Local Air Quality Management

- Broughton Gyrotory, Chester - dispersion model for City Centre detailed assessment report
- Congleton town centre - dispersion modelling assessment for detailed and further assessment reports.
- Disley - dispersion modelling assessment for detailed and further assessments
- Holmes Chapel - dispersion modelling assessment for detailed and further assessment reports for road and rail sources.
- Crewe - town centre dispersion modelling for detailed and further assessment reports.

Expert Witness

- Abacus School, Hamstead – air quality expert witness at planning public inquiry
- North Street, Stilton – air quality and noise expert witness for residential development at planning hearing.
- Nesscliffe Crematorium – air quality and noise expert witness for residential development at planning hearing.
- Queensway, Lytham St Annes. Dust and odour assessment for development. Public Inquiry expert witness
- Paxton Academy, Croydon – Planning hearing air quality expert witness for proposed new school

QUALIFICATIONS

- Bachelor of Engineering
- Master of Science
- Odour Acuity Certified Master of Science
- Member of the Institute of Air Quality Management
- Member of the Institute of Environmental Science