# Air Quality Statement

18 Stukeley Street, Camden

Report Ref: AQ2099

November 2021

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# DOCUMENT CONTROL & DISCLAIMER

## Title:

18 Stukeley Street, Camden:
Air Quality Statement

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# 1 INTRODUCTION

## 1.1 Scope

GEM Air Quality Ltd has been commissioned to undertake an air quality statement in support of a residential development located at 18 Stukeley Street in Camden, London. The proposals are for the demolition of the existing 4th floor extension and the erection of a new 2 storey roof extension to create 2 additional residential units (Class C3), with roof terraces.

It has not been possible to undertake a detailed air quality exposure assessment across the proposed development as there is no local roadside air quality monitoring data in the vicinity of the site. Furthermore, there is no traffic data available for the nearest roads, with data only available for the A40 High Holborn, which is located approximately 50 metres northwest of the proposed development. Modelling these links would not be worthwhile as their impact across the proposed development would be negligible due to the distances involved. Notwithstanding this, the impact of local air quality across the proposed development is considered significant for the following reasons:

- Background NOx, $NO_2$ and PM concentrations have been obtained from Defra[1] and are provided in Table 1. These 1 km x 1 km grid resolution maps are derived from a base year of 2018, which have been adjusted to the relevant baseline year (2019). This corresponds with the latest monitoring data available from the Council[2]. Background $NO_2$ concentrations exceed the air quality objective of 40 µg/m$^3$ across the proposed development site.

**Table 1 – Background NOx, $NO_2$, $PM_{10}$ and $PM_{2.5}$ Concentrations**

| Pollutant | X | Y | 2019 |
|---|---|---|---|
| **$NO_2$** | 530500 | 151500 | 44.2 |
| **NOx** | | | 83.1 |
| **$PM_{10}$** | | | 20.0 |
| **$PM_{2.5}$** | | | 12.9 |

- Pollution maps derived from the London Air website[3] indicate that the annual mean concentrations for $PM_{10}$ and $PM_{2.5}$ across the proposed development would be below the relevant air quality objectives. The annual mean concentration for $NO_2$ would be above the relevant air quality objective. These maps are shown in Figures 1, 2 and 3.

[1] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

[2] Data from 2020 and 2021 has not been considered due to the impact of the Covid-19 pandemic on local air quality

[3] https://www.londonair.org.uk/map-maker/

These concentrations are worst case as they are based on 2016 London Atmospheric Emissions Inventory (LAEI) data. However, they would appear to be consistent with the Defra 2019 background concentrations when considering the improvements in background concentrations since 2016.

Based on this evidence the impact of local air quality ($NO_2$) across the proposed development is considered significant and mitigation measures will need to be adopted to protect the future inhabitants from poor air quality. These measures are discussed further in Section 4.2.

The remainder of this air quality statement has focused on the impacts during construction.

**Figure 1 – Modelled Nitrogen Dioxide ($NO_2$) Concentrations, LAEI 2016**

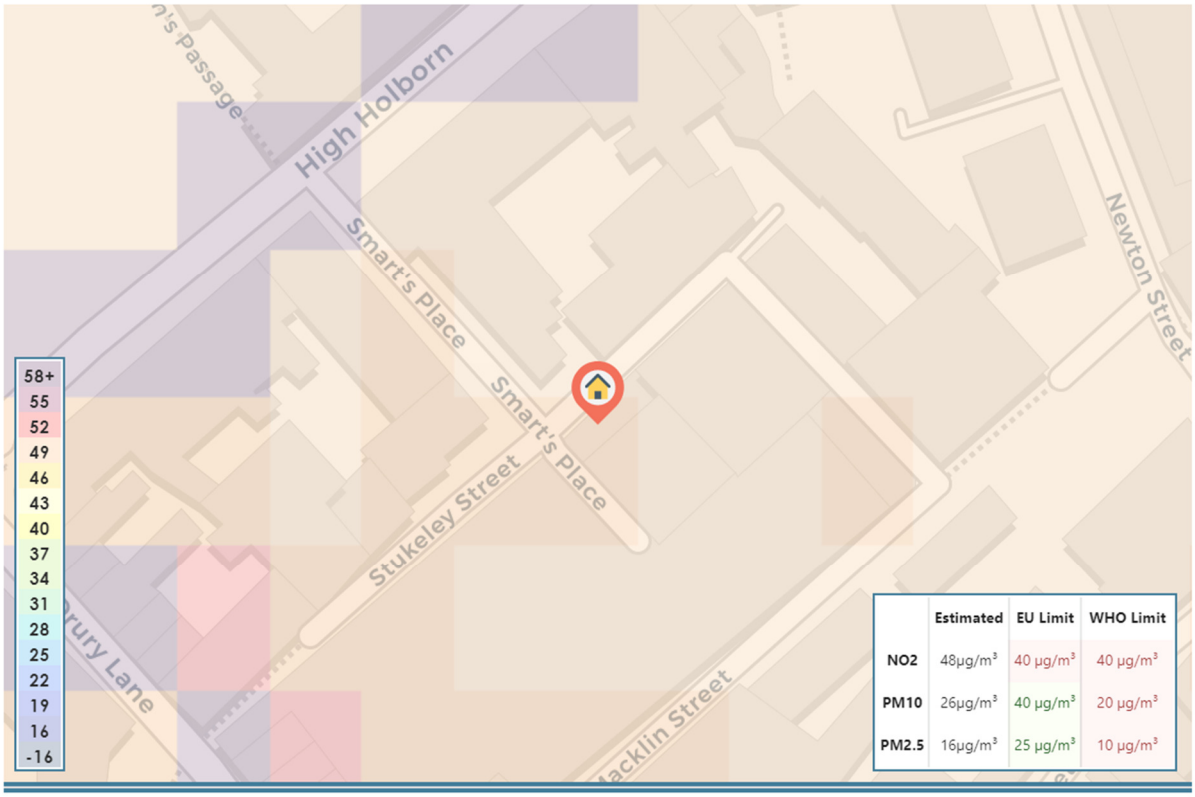
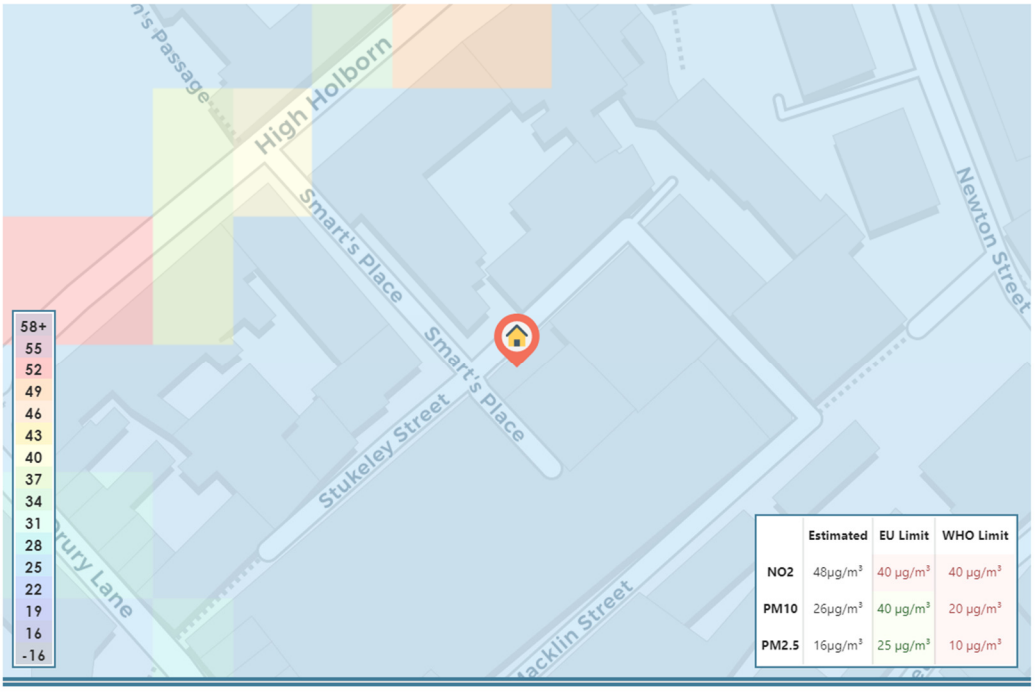
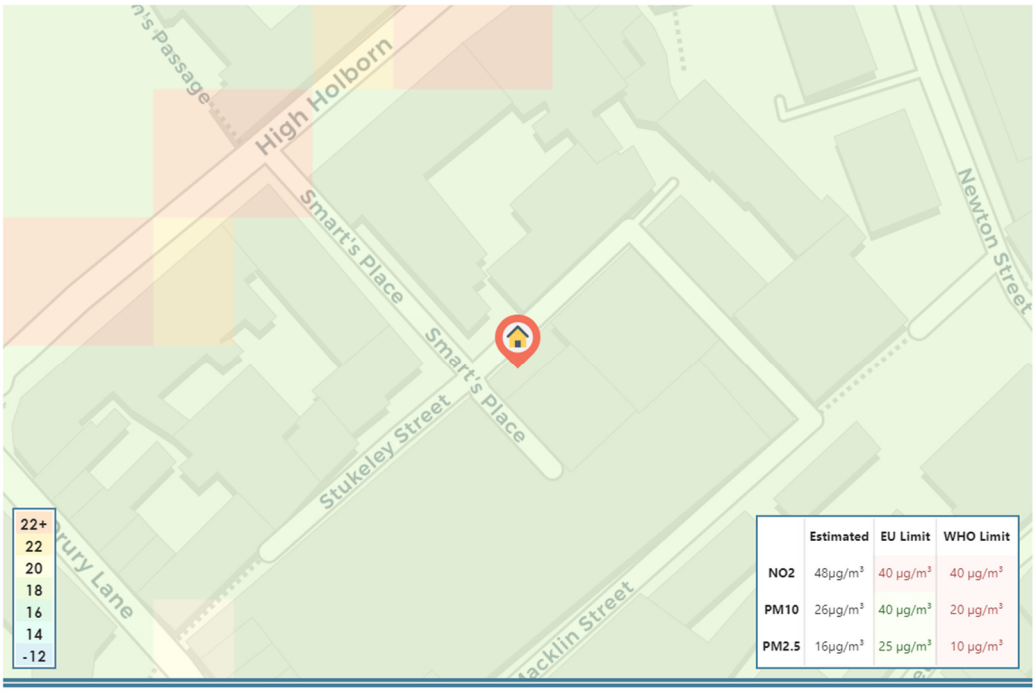


**Figure 2 – Modelled Particulate ($PM_{10}$) Concentrations, LAEI 2016**




PM10 Particulates (µg/m³) - Camden, WC2B 5LR

**Figure 3 – Modelled Particulate ($PM_{2.5}$) Concentrations, LAEI 2016**




PM2.5 Particulates (µg/m³) - Camden, WC2B 5LR

# 2 PLANNING POLICY & GUIDANCE

## 2.1 Construction Phase

The Greater London Authority (GLA) released the "*Control of Dust and Emissions during Construction and Demolition*" SPG in July 2014[4]. Based on this guidance, the main air quality impacts that may arise during construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated $PM_{10}$ concentrations, as a result of dust generating activities on site; and
- An increase in concentrations or airborne particles and nitrogen dioxide due to exhaust emissions from diesel powered vehicles and equipment on site.

In relation to the most likely impacts, the guidance states the following:

"*The most common impacts are dust soiling and increased ambient $PM_{10}$ concentrations due to dust arising from activities on the site. Dust soiling will arise from the deposition of particulate matter in all size fractions.*

*Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed*".

The guidance continues by providing an assessment procedure. This includes sub-dividing construction activities into four types (demolition, earthworks, construction and track out) to reflect their different potential impacts.

[4] The Control of Dust and Emissions during Construction and Demolition SPG. Greater London Authority, July 2014

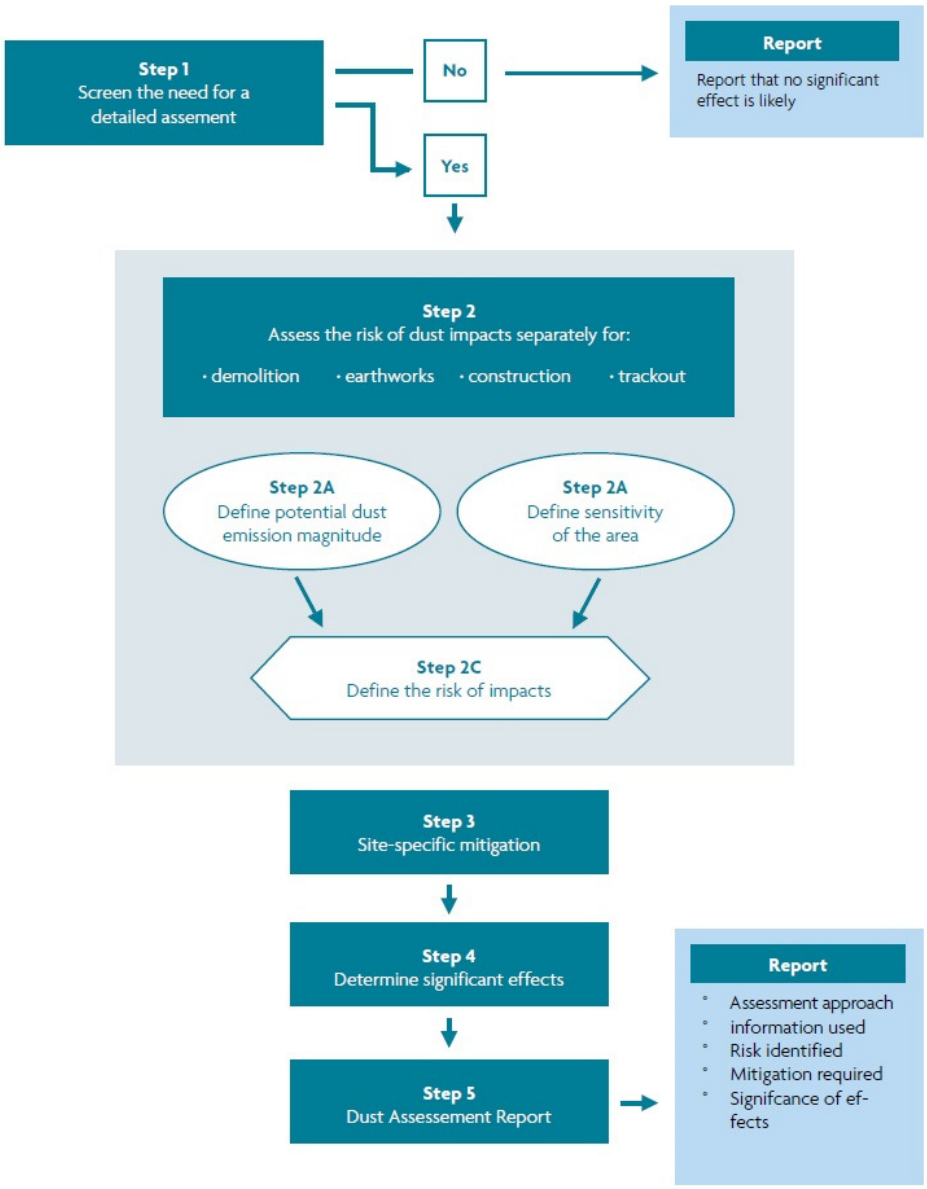
# 3 CONSTRUCTION PHASE

## 3.1 Methodology

Using the guidance published by the GLA the potential for dust emissions to be generated during the construction phase has been assessed for each activity that is likely to take place.

The conditions with no mitigation thus form the baseline or "do-nothing" situation for a construction site. The assessment procedure uses the steps provided in the guidance and summarised in Figure 4.

**Figure 4 – Dust Assessment Procedure**



The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk. A development is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (see Table 2); and
- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity (see Table 3 and 4).

These two factors are combined to determine the risk of dust impacts with no mitigation applied (see Table 5). The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

**Table 2 – Dust Emission Magnitude**

| Activity | Dust Emission Class | | |
|---|---|---|---|
| | Large | Medium | Small |
| **Demolition** | Total building volume >50,000 $m^3$, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level | Total building volume 20,000 – 50 000$m^3$, potentially dusty construction material, demolition activities 10-20 m above ground level | Total building volume <20,000 $m^3$, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months |
| **Earthworks** | Total site area >10,000 $m^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes | Total site area 2,500 – 10,000 $m^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes | Total site area <2,500 $m^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10,000 tonnes, earthworks during wetter months |
| **Construction** | Total building volume >100,000 $m^3$, piling, on site concrete batching; sandblasting | Total building volume 25,000 m3 – 100,000 $m^3$, potentially dusty construction material (e.g. concrete), piling, on site concrete batching | Total building volume <25,000 $m^3$, construction material with low potential for dust release (e.g. metal cladding or timber) |
| **Track out** | >50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m | 10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m; | <10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m. |

**Table 3 – Sensitivity of the Area to Dust Soiling Effects on People and Property**

| Sensitivity of the Area to Dust Soiling Effects | | | | | |
|---|---|---|---|---|---|
| Receptor Sensitivity | Number of Receptors | Distance from the Source (m) | | | |
| | | <20 | <50 | <100 | <350 |
| High | >100 | High | High | Medium | Low |
| | 10-100 | High | Medium | Low | Low |
| | 1-10 | Medium | Low | Low | Low |
| Medium | >1 | Medium | Low | Low | Low |
| Low | >1 | Low | Low | Low | Low |

**Table 4 – Sensitivity of the Area to Human Health Impacts**

| Sensitivity of the Area to Human Health Effects | | | | | | | |
|---|---|---|---|---|---|---|---|
| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | | |
| | | | <20 | <50 | <100 | <200 | <350 |
| High | >32 µg/m$^3$ | >100 | High | High | High | Medium | Low |
| | | 10-100 | High | High | Medium | Low | Low |
| | | 1-10 | High | Medium | Low | Low | Low |
| | 28-32 µg/m$^3$ | >100 | High | High | Medium | Low | Low |
| | | 10-100 | High | Medium | Low | Low | Low |
| | | 1-10 | High | Medium | Low | Low | Low |
| | 24-28 µg/m$^3$ | >100 | High | Medium | Low | Low | Low |
| | | 10-100 | High | Medium | Low | Low | Low |
| | | 1-10 | Medium | Low | Low | Low | Low |
| | <24 µg/m$^3$ | >100 | Medium | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low | Low |
| Medium | - | >10 | High | Medium | Low | Low | Low |
| | - | 1-10 | Medium | Low | Low | Low | Low |
| Low | - | >1 | Low | Low | Low | Low | Low |

**Table 5 – Risk of Dust Impacts**

| Construction Activity | Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|---|
| | | Large | Medium | Small |
| Demolition | High | High Risk | Medium Risk | Medium Risk |
| | Medium | High Risk | Medium Risk | Low Risk |
| | Low | Medium Risk | Low Risk | Negligible |
| Earthworks | High | High Risk | Medium Risk | Low Risk |
| | Medium | Medium Risk | Medium Risk | Low Risk |
| | Low | Low Risk | Low Risk | Negligible |
| Construction | High | High Risk | Medium Risk | Low Risk |
| | Medium | Medium Risk | Medium Risk | Low Risk |
| | Low | Low Risk | Low Risk | Negligible |
| Track out | High | High Risk | Low Risk | Low Risk |
| | Medium | Medium Risk | Low Risk | Negligible |
| | Low | Low Risk | Low Risk | Negligible |

## 3.2 Construction Impact Assessment

The assessment of construction activities has focused on demolition, earthworks, construction and track out activities at the site. Using the criteria provided in Table 3 the dust emission magnitude for each activity is as follows:

- Demolition = Small;
- Earthworks = N/A;
- Construction = Small; and
- Track out = Small.

The sensitivity of the surrounding area to dust soiling and human health (Table 6) is then defined based on the criteria in Table 3 and 4, which includes the number of highly sensitive receptors that fall within a certain distance of the proposed construction phase (see Figure 5).

**Table 6 – Overall Sensitivity of the Surrounding Area**

| Potential Impact | Sensitivity of the Surrounding Area | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Trackout |
| Dust Soiling | High | N/A | High | High |
| Human Health | Medium | N/A | Medium | Medium |

The dust emission magnitudes and sensitivity of the surrounding area are combined to determine the risk of dust impacts with no mitigation applied. These are summarised in Table 7.

**Table 7 – Summary of Dust Risk**

| Potential Impact | Risk | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Track out |
| Dust Soiling | Low Risk[(a)] | N/A | Low Risk | Low Risk |
| Human Health | Low Risk | N/A | Low Risk | Negligible |

(a) The risk associated with dust soiling from the demolition activities has been reduced from a medium risk to a low risk using professional judgement. This is because there is only a small area on the fourth floor to be demolished, measuring approximately 4m x 10m.

It should also be noted that the likelihood of an adverse impact occurring is correlated to wind speed and wind direction. As such, unfavourable wind speeds and wind directions must occur at the same time as a dust generating activity to generate an adverse impact. The overall impacts also assume that the dust generating activities are occurring over the entirety of the site meaning that as an activity moves further away from a potential receptor the magnitude and significance of the impact will be further reduced.

**Figure 5 – Distance from the Proposed Development**

# 4 MITIGATION MEASURES

## 4.1 Construction Phase

A qualitative assessment of dust levels associated with the proposed development has been carried out. The impact of dust soiling and $PM_{10}$ can be reduced to negligible through appropriate mitigation measures, which are listed in Table 8 and are applicable to a low risk site. Implementation of these Best Practice Measures will help reduce the impact of the construction activities.

With these mitigation measures enforced, the likelihood of nuisance dust episodes occurring at those receptors adjacent to the development are considered low. Notwithstanding this, the developer should take into account the potential impact of air quality and dust on occupational exposure standards (in order to minimise worker exposure) and breaches of air quality objectives that may occur outside the site boundary. Monitoring is not recommended at this stage, however, continuous visual assessment of the site should be undertaken and a complaints log maintained in order to determine the origin of a particular dust nuisance. Keeping an accurate and up to date complaints log will isolate particular site activities to a nuisance dust episode and help prevent it from reoccurring in the future.

**Table 8 – Mitigation of Construction Activities**

| Construction Activity | Mitigation Measures |
|---|---|
| **Site Management** | Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary. |
| | Display the head or regional office contact information. |
| | Record and respond to all dust and air quality pollutant emissions complaints. |
| | Make a complaints log available to the local authority when asked. |
| | Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked. |
| | Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions. |
| | Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book. |
| **Preparing and Maintaining the Site** | Plan site layout: machinery and dust causing activities should be located away from receptors. |
| | Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site. |
| | Avoid site runoff of water or mud. |
| **Operating Vehicle/Machinery and Sustainable Travel** | Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone. |
| | Ensure all non-road mobile machinery (NRMM) comply with the relevant standards. |
| | Ensure all vehicles switch off engines when stationary – no idling vehicles. |
| | Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible. |
| | Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing). |
| **Operations** | Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. |
| | Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible). |
| | Use enclosed chutes, conveyors and covered skips. |
| | Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. |
| **Waste Management** | Reuse and recycle waste to reduce dust from waste materials |
| | Avoid bonfires and burning of waste materials. |

## 4.2 Operational Phase

### 4.2.1 Building Mitigation

Based on the outcome of this statement mitigation measures would be required to mitigate the impact of poor air quality ($NO_2$) on the proposed development.

The Institute of Air Quality Management (IAQM) issued a position statement in relation to the mitigation of development air quality impacts[5]. Based on this statement, the IAQM recommends that the following basic hierarchy be used for mitigating the operational air quality impacts associated with the particular development:

1. Preference should be given to **preventing or avoiding** exposure/impacts to the pollutant in the first place by eliminating or isolating potential sources or by replacing sources or activities with alternatives;
2. **Reduction and minimisation** of exposure/impacts should next be considered, once all options for prevention/avoidance have been implemented so far as is reasonably practicable (both technically and economically);
3. **Off-setting** a new development's air quality impact by proportionately contributing to air quality improvements elsewhere (including those identified in air quality action plans and low emission strategies) should only be considered once the solutions for preventing/avoiding, and then for reducing/minimising, impacts have been exhausted.

Where possible, option2 would need to be applied to the proposed development so that the future occupants are not reliant solely on opening windows or doors to ventilate their properties. This would require an additional form of ventilation, whereby clean air is drawn in naturally or mechanically and maintained thereafter. Typically, clean air is drawn in at roof level where pollutant concentrations are lower. These inlets should be placed as high as possible e.g. roof level, and as far away from other emission sources as possible.

The developer intends to install a mechanical ventilation system with the inlets at roof level. The system will also incorporate $NO_2$ filtration. Such filtration systems would "scrub" the incoming air stream of $NO_2$, reducing the concentrations of $NO_2$ to well below the air quality objective within the building.

### 4.2.2 Building Emissions

The Greater London Authority (GLA) released the "*Sustainable Design and Construction*" SPG in July 2014[6]. The SPG aims to support developers, local planning authorities and neighbourhoods to achieve sustainable development. In accordance with this guidance, the proposed development will be all electric with no gas utilised on site.

[5] Position Statement – Mitigation of Development Air Quality Impacts, IAQM, January 2015
[6] Sustainable Design and Construction SPG. Greater London Authority, July 2014