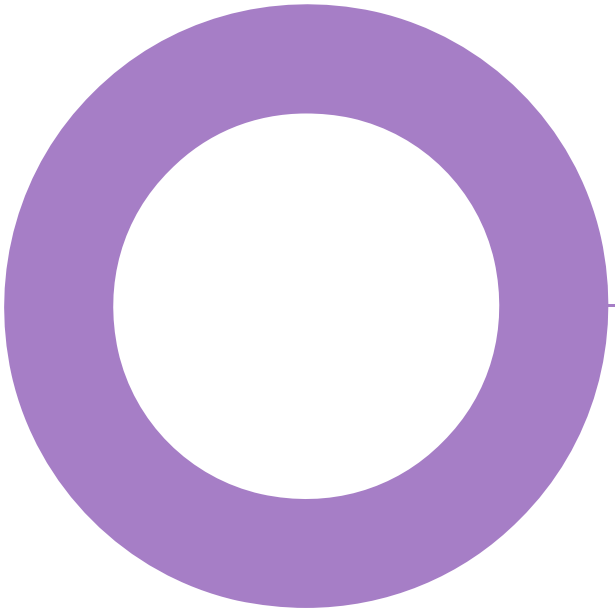
HOARE LEA

Stephenson Way.
London.
GPF Lewis Solutions Ltd.

AIR QUALITY
MONTHLY DUST MONITORING REPORT
01/12/2023 - 31/12/2023
REVISION 00 – 16 JANUARY 2024



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	16/01/2024	First Issue	AJ	RH	AD

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Project number: 34/22120
Document reference: 3422120-HLE-RP-AQ-Monthly Dust Monitoring Report-December 2023-Rev00.docx

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1. Introduction.

1.1 London Borough of Camden Requirements.

The London Borough of Camden (LBoC) requirements for real-time dust monitoring are consistent with LBoC and Greater London Authority (GLA) policy and industry best practice guidance. These requirements are triggered when an Air Quality Assessment (AQA) for a proposed development finds that there is a medium or high risk of dust impacts (without considering mitigation measures) during demolition or construction.

Real-time dust monitoring can be used to enable effective on-site management of the air quality impacts of demolition and construction activities through comprehensive preventative dust mitigation and, in the case of triggering a dust alert from the monitoring equipment, through the application of additional reactive dust mitigation measures.

The purpose of real-time dust monitoring is to ensure that the air quality impacts of demolition and construction activities are minimised as far as possible for the protection of amenity and health, both for local residents, the general public, and operatives on-site.

1.2 Development Information.

Hoare Lea have been commissioned by GPF Lewis Solutions Limited to provide construction dust monitoring for the land fronting Stephenson Way, NW1 2HD (the 'Site').

Plans comprise the erection of a 7-storey building plus basement for student accommodation on the upper floors, including shared amenity space at ground and sixth floor level and terrace at the sixth floor level fronting Stephenson Way (Sui Generis) (the 'Development').

Planning permission (ref: 2018/2316/P) was granted in October 2020 subject to a number of planning conditions. Condition 11 outlines the requirement for dust monitoring through the duration of works at the Site:

> *"No development shall take place until full details of the air quality monitors have been submitted to and approved by the local planning authority in writing. Such details shall include the location, number and specification of the monitors, including evidence of the fact that they have been installed in line with guidance outlined in the GLA's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance and have been in place for 3 months prior to the proposed implementation date. The monitors shall be retained and maintained on site for the duration of the development in accordance with the details thus approved.*
>
> *Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies G1, A1, D1 and CC4 of the London Borough of Camden Local Plan 2017."*

The working hours for the demolition and construction activities, as detailed in the planning permission, are as follows:

- 08:00 – 18:00 on Monday to Friday;
- 08:00 – 13:00 on Saturdays; and
- No working on Sundays or Public Holidays.

As per the planning condition, particulate matter (PM_{10}) monitoring is being undertaken in order to protect nearby sensitive receptors from the effects of dust exposure as a consequence of on-going works.

This report presents the monthly monitoring results of the dust monitoring from the 1st of December 2023 to the 31st of December 2023. This period represents baseline air quality monitoring data as construction has not yet started on-site. See Appendix 1 for the locations of the monitors on Site.

2. Site Updates.

Two monitors have been in place for the full duration of the month with no changes. These monitors will be in place until the end of January to gather monitoring data to inform baseline air quality conditions.

Both monitors were provided with external batteries to provide supplementary power through the winter months and improve data capture. This work was done on the 19th of December 2023.

There have been no works taking place on-site during this monitoring period.

3. Monitoring Summary.

- There have been no exceedances of the 15 minute alert level, 15 minute action level, 1-hour action level or the 24-hour limit value at the.
- There have been no dust generating works on-site during this monitoring period.
- The 15 minute average data capture was 58.9% at monitoring location 1. The 15 minute average data capture has been 100% since the installation of larger batteries on the monitor on the 19th of December.
- The 15 minute average data capture was 15.8% at monitoring location 2. The 15 minute average data capture has been 22.9% for PM_{10} since the installation of external batteries on the monitor on the 19th of December. This was limited by an error in the manufacturer's online dashboard resulting in PM_{10} monitoring not being able to be exported in full. As such, a portion of the data has been unretrievable. However, $PM_{2.5}$ and PM_{1} data capture since the installation of the external batteries on the 19th of December 2023 has been 100% at this monitor. This issue has been resolved as of the 8th of January 2024, and will be reflected in future reports.
- $PM_{2.5}$ data at location 2 has been compared to Location 1 to identify any elevated concentrations that may lead to elevated PM_{10} concentrations at Location 2 during the monitoring period. Location 2 consistently monitored lower concentrations compared to Location 1 and it is not expected that there were any exceedances of the relevant action levels based on the available data.
- Both monitors have had limited solar power due to shorter hours of daylight. Additionally, as the sun is lower in the sky during winter, the impact of the surrounding buildings on overshadowing is increased. Therefore, lower solar power has led to losses in data capture. External battery power supplies were installed on the monitors on the 19th of December which has resulted in improved data capture.

Further information on the monitored data is provided in Section 5.

4. Methodology.

4.1 Monitoring Equipment.

Two EarthSense Zephyrs have been deployed to record PM_{10} and $PM_{2.5}$ concentrations. The equipment is supplied with power from connected solar panels to provide active sampling throughout the monitoring period.

The EarthSense Zephyr is an MCERTS Certified Indicative Ambient Particulate Monitor and is used for the purposes of construction dust monitoring across the UK. The equipment has been deemed acceptable for use by LBoC on the 1st of August 2023. The monitor is capable of recording particulate matter within 5 $\mu g/m^3$ of accuracy on 10 second intervals. The monitor will send data to an online dashboard which provides real-time data and has the capability to send alerts when set action levels are exceeded.

Both monitors were serviced and calibrated ahead of installation on-site.

4.2 Monitoring Locations.

The monitoring locations are presented in the Construction Management Plan (CMP) submitted to LBoC and agreed with the Environmental Health Officer.

Two monitoring locations have been determined to provide a transect across the Site. Based on publicly available data at Heathrow Airport, the prevailing wind direction is south-westerly. As such, the monitors have been positioned within the north east and south west corners of the Site in the prevailing wind direction, to determine whether any dust is leaving the Site during construction works.

The locations and photographs of the installed monitors are displayed in Appendix 1.

4.2.1 Monitor 1

Monitor 1 is located towards the north-east corner of the Site, on a lamppost on the adjacent footpath and has been recording data at this location since 31st July 2023.

This location is deemed safe and does not obstruct pedestrian and vehicle traffic. The monitor on the lamppost has been located at 1.9 m height, this is the highest point at which the monitor can be affixed safely without interfering with signage associated affixed to the lamppost, ensuring a free flow of air around the inlet. In line with manufacturer's guidance, the solar panel has been positioned above the monitor to prevent interference with the air flow around the inlet (positioned at the bottom of the monitor). The lamppost location allows for a consistent monitoring location throughout the Development baseline and construction phases, as it is unlikely to require relocation during works commencing on-site.

An external battery was installed on the monitor on the 19th of December 2023 which will provide additional power to the monitor and can be manually recharged when power is low.

4.2.2 Monitor 2

Monitor 2 is located on the fence towards the south west corner of the Site at a height of 3.2 m to be above the current fencing and away from the adjacent building to allow free flow of air around the inlet. It has been in monitoring from 9th of August.

An external battery was installed on the monitor on the 19th of December 2023 which will provide additional power to the monitor and can be manually recharged when power is low.

4.3 Action Levels.

In line with the requirements of the planning condition, action levels have been set for monitored PM_{10} concentrations on-site, above which steps must be taken to reduce and minimise the risk of dust-related impacts. Notification of exceedances of these levels will be automatically received by email to inform the on-site team. The 15 minute and 1-hour mean action levels are set out in Table 1 and is based on the Site Action Level provided within the most recent IAQM guidance, in addition to recommendations from LBoC.

Table 1: Action Level for PM_{10}.

Action Level	Concentration
Alert Level (as a 15 minute average)	150 µg/m^3
Action Level (as a 15 minute average)	250 µg/m^3
Action Level (as a 1-hour average)	190 µg/m^3

In addition to these levels, the 24-hour average limit value 50 µg/m^3 must also be considered, as set out by the Air Quality Standards legislation.

5. Dust Monitoring Results.

A summary of 15 minute average, 1-hour average and 24-hour average PM_{10} levels are presented for monitoring locations 1 and 2. Graphs of the dust monitoring results are presented in Appendix 2.

5.1 Data Capture.

Table 2 illustrates the 15 minute average data capture for both of the monitors on-site. This shows the proportion of samples that the monitors were able to capture throughout each monitoring period. Both monitors are expected to be capturing data 24 hours a day throughout the monitoring period. Each monitoring period represents a week (Monday to Sunday) throughout the month, with the exception of the first and last monitoring periods which may be longer or shorter.

Table 2: Summary of 15-Minute Average Data Capture at Each Monitor.

Monitoring Period	Monitor 1 Data Capture (15 mins)	Monitor 2 Data Capture (15 mins)	
		PM_{10}	$PM_{2.5}$
01/12/2023 - 03/12/2023	24.4%	7.8%	7.8%
04/12/2023 - 10/12/2023	14.6%	8.0%	8.0%
11/12/2023 - 17/12/2023	35.7%	12.5%	12.5%
18/12/2023 - 24/12/2023	100.0%	23.1%	100.0%
25/12/2023 - 31/12/2023	100.0%	22.9%	100.0%
Overall	58.9%	15.8%	58.0%

5.2 Monitoring Location 1.

Table 3, Table 4, and Table 5 present a summary of the 15 minute, 1-hour and 24-hour average PM_{10} levels at monitoring location 1.

Table 3: Summary of 15-Minute Dust Monitoring Results at Monitoring Location 1.

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 150 $\mu g/m^3$ Alert Level (15 minute)	Number of Exceedances of 250 $\mu g/m^3$ Action Level (15 minute)
01/12/2023 - 03/12/2023	33.9	8.4	21.7	0	0
04/12/2023 - 10/12/2023	43.2	4.2	12.1	0	0
11/12/2023 - 17/12/2023	39.9	3.7	9.5	0	0
18/12/2023 - 24/12/2023	22.6	2.7	5.5	0	0

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 150 $\mu g/m^3$ Alert Level (15 minute)	Number of Exceedances of 250 $\mu g/m^3$ Action Level (15 minute)
25/12/2023 - 31/12/2023	19.2	2.5	6.1	0	0
Overall	43.2	2.5	7.2	0	0

Table 4: Summary of 1-Hour Dust Monitoring Results at Monitoring Location 1.

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 190 $\mu g/m^3$ Action Level (1-hour)
01/12/2023 - 03/12/2023	33.3	8.6	20.5	0
04/12/2023 - 10/12/2023	36.2	4.7	11.4	0
11/12/2023 - 17/12/2023	18.5	4.8	9.5	0
18/12/2023 - 24/12/2023	13.6	2.9	5.5	0
25/12/2023 - 31/12/2023	12.5	2.9	6.1	0
Overall	36.2	2.9	7.3	0

Table 5: Summary of 24-Hour Dust Monitoring Results at Monitoring Location 1.

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 50 $\mu g/m^3$ (24-hour)
01/12/2023 - 03/12/2023	27.5	15.0	20.7	0
04/12/2023 - 10/12/2023	20.9	5.6	12.4	0
11/12/2023 - 17/12/2023	13.6	7.0	9.6	0
18/12/2023 - 24/12/2023	8.6	4.3	6.3	0
25/12/2023 - 31/12/2023	8.3	3.4	5.9	0
Overall	27.5	3.4	9.6	0

5.3 Monitoring Location 2.

Table 6, Table 7, and Table 8 present a summary of the 15 minute, 1-hour and 24-hour average PM_{10} levels at monitoring location 2.

Table 6: Summary of 15-Minute Average Dust Monitoring Results at Monitoring Location 2.

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 150 $\mu g/m^3$ Alert Level (15 minute)	Number of Exceedances of 250 $\mu g/m^3$ Action Level (15 minute)
01/12/2023 - 03/12/2023	23.6	3.1	14.3	0	0
04/12/2023 - 10/12/2023	24.0	2.8	9.0	0	0
11/12/2023 - 17/12/2023	20.3	3.0	8.2	0	0
18/12/2023 - 24/12/2023	13.7	2.1	5.0	0	0
25/12/2023 - 31/12/2023	14.1	3.0	5.5	0	0
Overall	24.0	2.1	6.7	0	0

Table 7: Summary of 1-Hour Average Dust Monitoring Results at Monitoring Location 2.

Monitoring Period	Maximum PM_{10} Concentration ($\mu g/m^3$)	Minimum PM_{10} Concentration ($\mu g/m^3$)	Average PM_{10} Concentration ($\mu g/m^3$)	Number of Exceedances of 190 $\mu g/m^3$ (1-hour)
01/12/2023 - 03/12/2023	23.1	6.1	15.0	0
04/12/2023 - 10/12/2023	24.0	2.8	8.8	0
11/12/2023 - 17/12/2023	20.3	3.2	8.4	0
18/12/2023 - 24/12/2023	13.7	2.1	5.0	0
25/12/2023 - 31/12/2023	14.1	2.9	5.5	0
Overall	24.0	2.1	6.3	0

Table 8: Summary of 24-Hour Average Dust Monitoring Results at Monitoring Location 2.

Monitoring Period	Maximum PM_{10} Concentration (µg/m³)	Minimum PM_{10} Concentration (µg/m³)	Average PM_{10} Concentration (µg/m³)	Number of Exceedances of 50 µg/m³ (24-hour)
01/12/2023 - 03/12/2023	18.8	12.9	16.0	0
04/12/2023 - 10/12/2023	23.0	5.0	10.1	0
11/12/2023 - 17/12/2023	10.8	4.0	6.7	0
18/12/2023 - 24/12/2023	8.4	3.9	5.7	0
25/12/2023 - 31/12/2023	7.7	3.4	5.3	0
Overall	23.0	3.4	7.9	0

Although PM_{10} data capture at monitor 2 was limited for the monitoring period due to an error with the manufacturer's online dashboard, data capture for $PM_{2.5}$ was 58.0% (100% after the external battery was installed on the 19th of December 2023) which is comparable to the data capture at monitor 1. The maximum $PM_{2.5}$ concentration recorded at Location 2 was 14.5 µg/m³ at 12:30pm on the 1st of December 2023. As no works were taking place at this time, this can be attributed to natural variability. This aligns with similar concentrations at monitor 1, indicating that conditions were similar at both monitors. From the 19th of December, when the external batteries were installed on both monitors data capture was 100% for $PM_{2.5}$. $PM_{2.5}$ concentrations at monitor 2 are consistently lower than $PM_{2.5}$ concentrations at monitor 1 as shown in Figure 1.

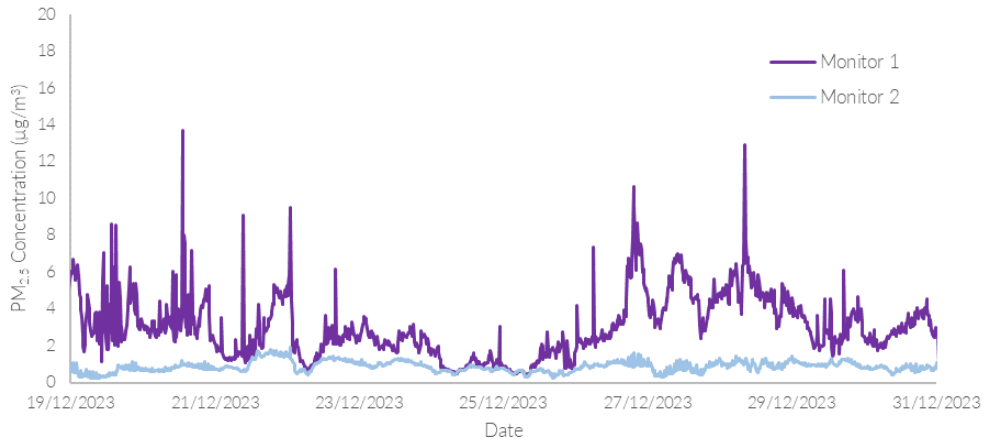


Figure 2: Comparison of monitored PM2.5 concentrations at Monitor 1 and Monitor 2.

As such, it can be assumed that PM_{10} concentrations at monitor 2 during this period are similar or lower than concentrations recorded at monitor 1, and as there are no exceedances of the action levels at monitor 1 it can be predicted that there are no exceedances of the action level at monitor 2.

6. Dust Monitoring Conclusions.

6.1 Monitoring Location 1.

The results in Table 4 indicate that there has been no exceedance of the 15 minute alert level, 15 minute action level, or 1-hour action level during this monitoring period. The highest 1-hour average concentration recorded was 36.2 µg/m^3 on the 6th of December 2023 at 12:00pm. The results in Table 5 indicate that there were no exceedances of the 24-hour limit value. The highest 24-hour average concentration recorded was 27.5 µg/m^3 on the 3rd of December 2023. These concentrations can be attributed to natural variability of the background concentrations as there were no works being undertaken on during this period.

6.2 Monitoring Location 2.

The results in Table 7 indicate that there has been no exceedance of the 15 minute alert level, 15 minute action level, or 1-hour action level during this monitoring period. The maximum 1-hour concentration recorded was 24.0 µg/m^3 on the 6th of December 2023 at 12:00pm. The results in Table 8 indicate that there were no exceedances of the 24-hour limit value. The 24-hour average highest concentration recorded was 23.0 µg/m^3 on the 7th of December 2023. These concentrations can be attributed to natural variability as there were no works being undertaken on during this period.

Appendix 1 – Photographs of Installed Monitors.

Monitor Locations.

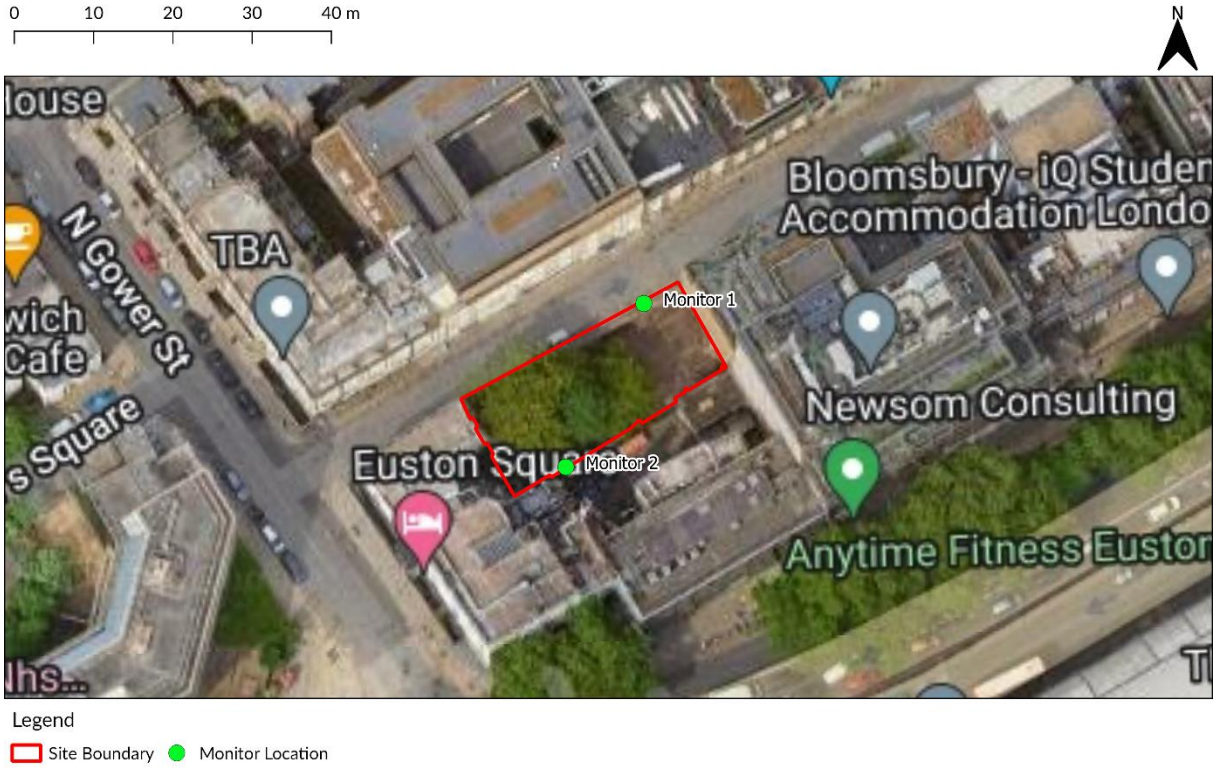
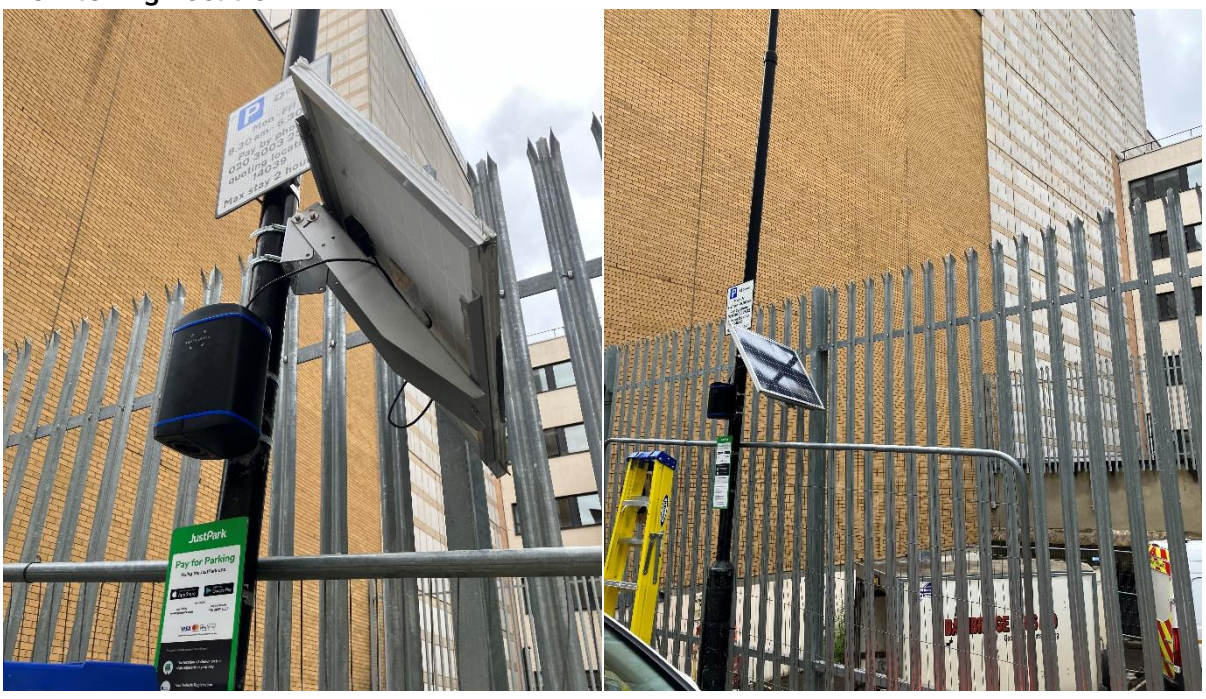
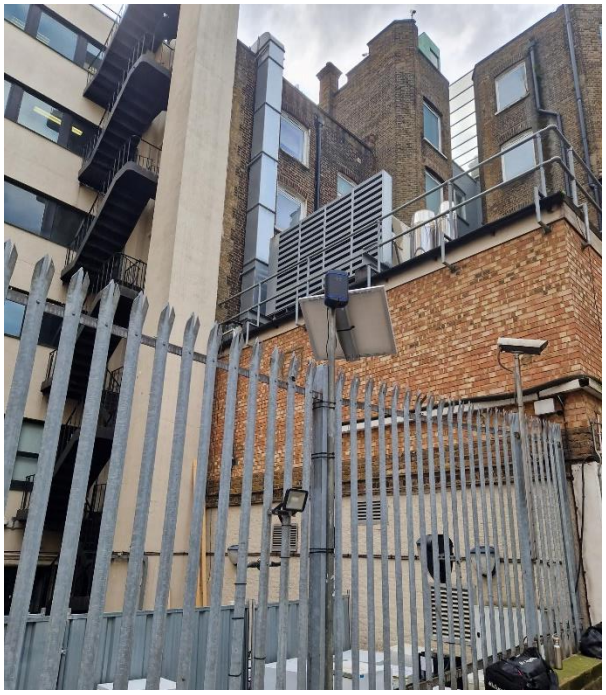


Figure 3: Locations of the EarthSense Zephyrs on the Site. Contains Google Maps Data (2023) [Retrieved 26/10/2023].

Monitoring Location 1



Monitoring Location 2



Appendix 2 – Dust Monitoring Graphs.

Monitoring Location 1.

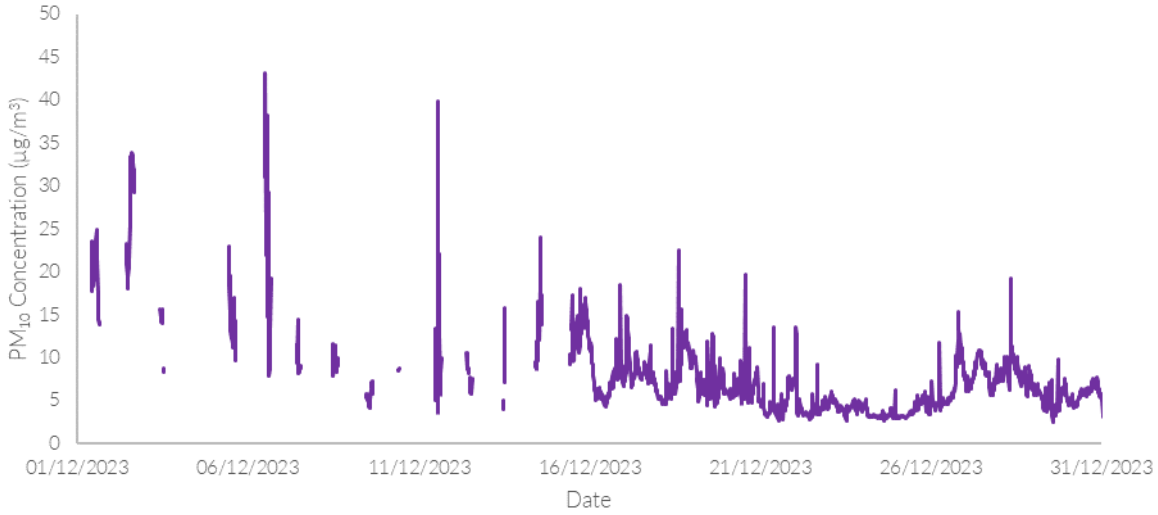


Figure 4: 15 Minute Average PM_{10} Concentrations at Monitoring Location 1.

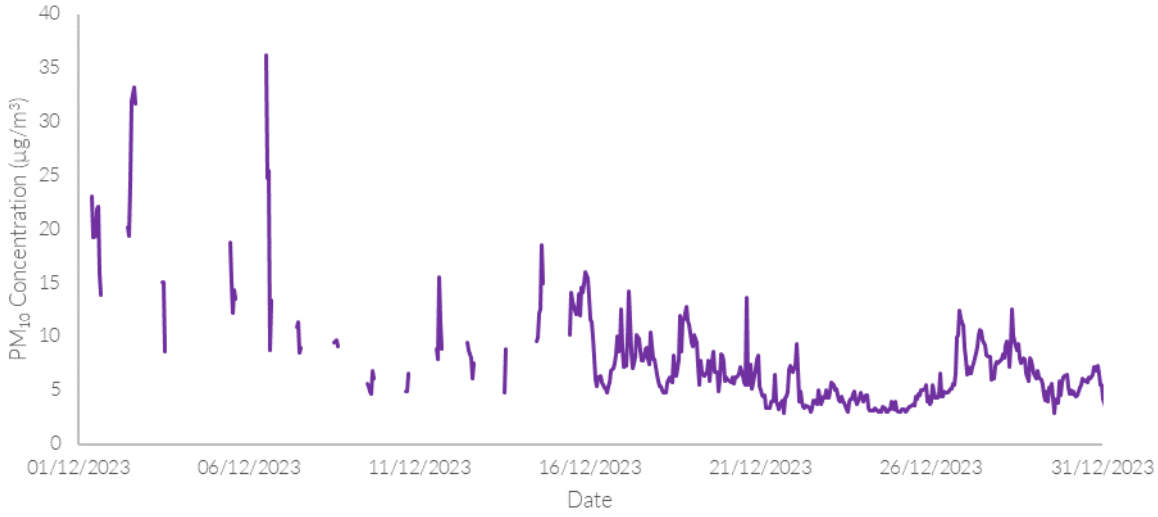


Figure 5: 1-Hour Average PM_{10} Concentrations at Monitoring Location 1.

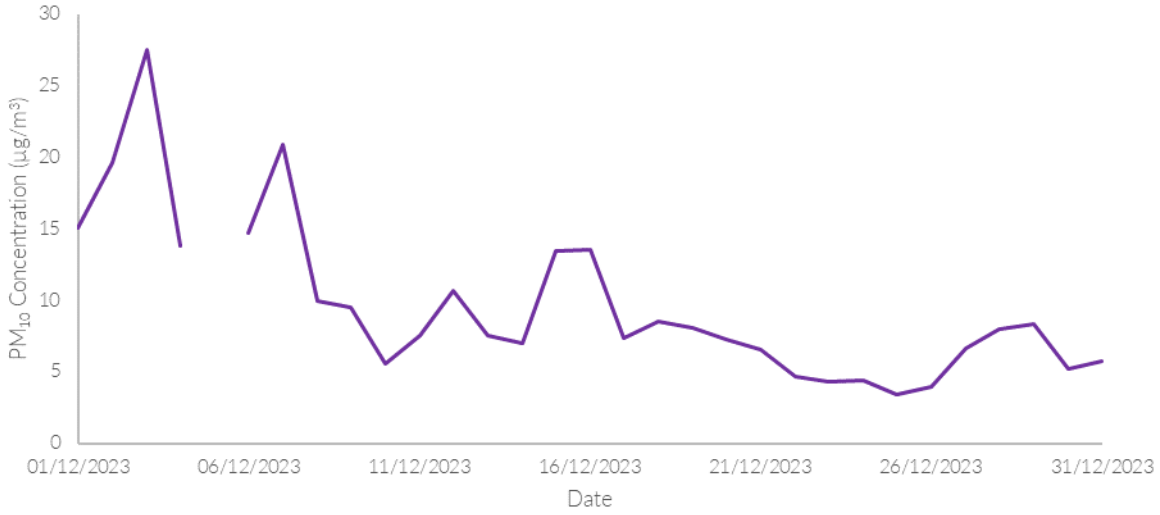


Figure 6: 24 Hour Average PM_{10} Concentrations at Monitoring Location 1.

Monitoring Location 2.

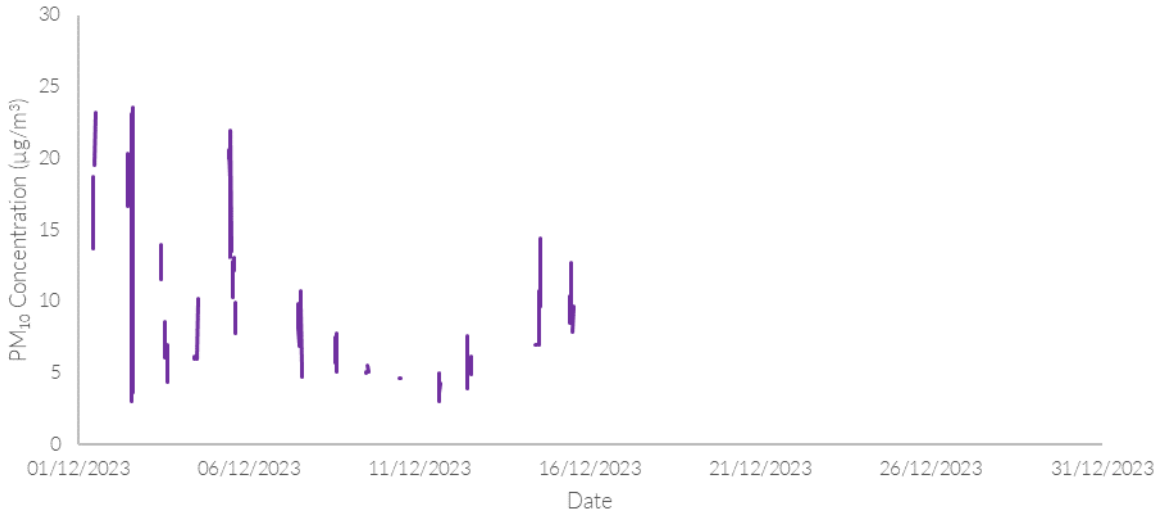


Figure 7: 15 Minute Average PM_{10} Concentrations at Monitoring Location 2.

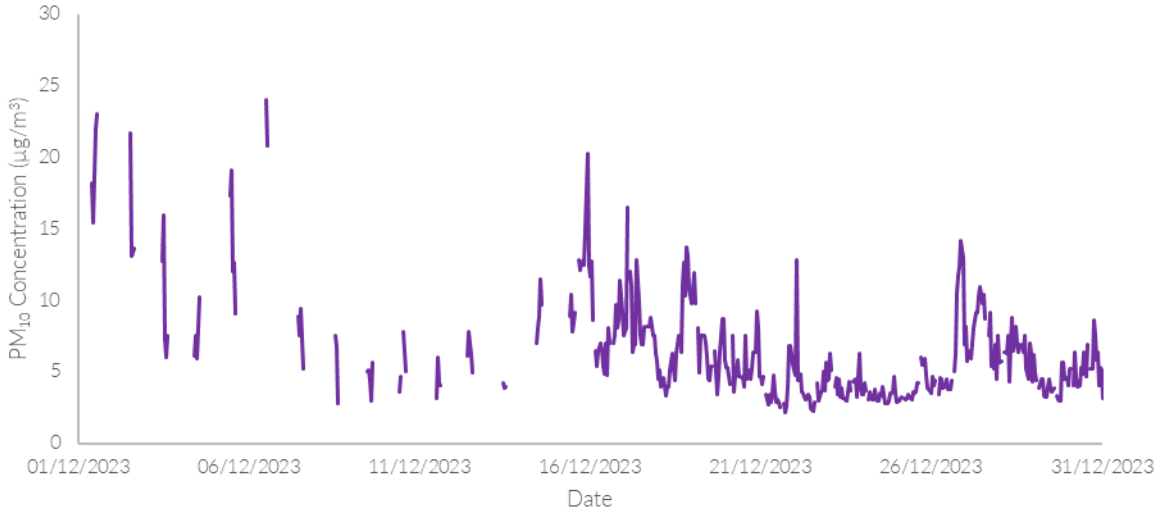


Figure 8: 1-hour Average PM_{10} Concentrations at Monitoring Location 2.

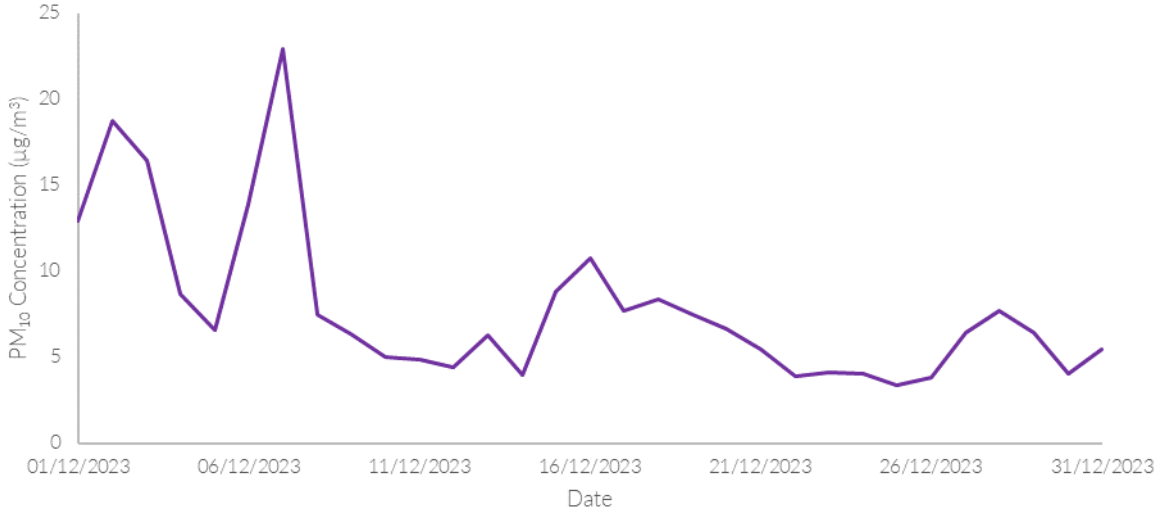


Figure 9: 24-hour Average PM_{10} Concentrations at Monitoring Location 2.

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