1 TRITON SQUARE, LONDON

Baseline Dust Monitoring

Prepared for: Lendlease Construction (Europe) Ltd

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1.0 INTRODUCTION

SLR Consulting Ltd (SLR) has been commissioned by Lendlease Construction (Europe) Ltd to undertake Dust Monitoring to support pre-commencement condition discharge in relation to the development of the consented at 1 Triton Square, London site.

1.1 Background

The Consented Development of 1 Triton Square is located within London Borough of Camden (LBC), and was granted planning consent on 21st of November 2017 (application number: **2016/6069/P**).

The Consented Development is an extension of the existing 1 Triton Square office building by three storeys for office use (B1 use class), introduction of retail (A1, A3 and A4 use classes) and affordable workspace (B1 use class), re-provision of gym space (D2 use class); remodelling of the electricity substation; hard and soft landscaping; reconfigured vehicle and pedestrian accesses and works to the public highway; and all necessary ancillary and enabling works, plant and equipment.

The application was granted consent by LBC subject to a number of conditions. The following prior to operation condition was including in regard to air quality:

> *"16 Air Quality Monitoring:*
>
> *Air quality monitoring shall be implemented on site. No development shall take place wihtin:*
>
> *A) The commercnial element; or*
> *B) The residential element of the development*
>
> *until full details of the air quality monitors for that element 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 A1, D1 and CC4 of the London Borough of Camden Local Plan 2017."

This report provides full details of the air quality monitors for the Commercial Element of the Development only (Part A above).

1.2 Site Description

The site is currently occupied by a 5 storey plus basement office building, with some leisure, community and retail use at ground floor. 1 Triton Square is surrounded on all sides by buildings of a similar height to the Consented Development, with the exception of 33 Euston Road which is approximately 25m higher and lies to the south-west of the Consented Development.

Surrounding the Consented Development is mostly pedestrianised space, with the exception of a vehicle ramp immediately to the west, a taxi drop-off immediately to the east, and traffic on Longford Street to the north. To the west of the development lies an electricity substation, theatre and a residential block (One Osnaburgh Street) on the corner of Longford Street. To the south lies 2 Triton Square, an office block, and to the east, 10 Brock Street containing an arts centre and retail space below offices. Beyond Longford Street to the north lies Westminster Kingsway College, an educational establishment and to the north-west, Saint Anne's, which is a separate section of the Consented Development, site being completed by a different contractor.

1.3 Scope

This report has been prepared to show compliance with pre-commencement condition 16(A), and demonstrate that the air quality monitoring has been installed. Attempts were made to consult with LBC via both email[1] and telephone, no response has been received at the time of writing this report.

The scope of the assessment includes the following aspects:

- monitoring of air quality during the baseline phase; and
- monitoring of air quality during the construction phase.

1.4 Structure of Report

The remainder of this report is structured as follows:

- Section 2 describes the relevant legislation and guidance referred to in the report;
- Section 3 describes the monitoring methodology; and
- Section 4 concludes the report.

[1] Email to Adam Webber at LBC dated the 29th of November 2017

2.0 RELEVANT AIR QUALITY LEGISLATION AND GUIDANCE

2.1 Air Quality Strategy

The United Kingdom Air Quality Strategy (UK AQS) 2007 for England, Scotland, Wales and Northern Ireland[2] sets out the Government's policies aimed at delivering cleaner air in the United Kingdom (UK). It sets out a comprehensive strategic framework within which air quality policy will be taken forward in the short to medium term, and the roles that Government, industry, the Environment Agency (EA), local government, business, individuals and transport have in protecting and improving air quality.

2.2 Air Quality Standards

The Air Quality Standards Regulations 2010 seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2010 No. 1001 Regulation 14 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

The UK AQS is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution. For each nominated pollutant, the UK AQS sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. The UK AQS includes more exacting Objectives for some pollutants than those required by EU legislation. This Air Quality Assessment refers to UK Air Quality Standards, as compliance with these standards will also ensure that the less demanding EU Air Quality limit values would also be met.

The Air Quality Strategy defines 'standards' and 'objectives' in paragraph 17:

> *'For the purposes of the strategy:*
>
> *standards are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on assessment of the effects of each pollutant on human health including the effects on sensitive subgroups or on ecosystems;*
>
> *objectives are policy targets often expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedences, within a specified timescale.'*

The Air Quality Standards and Objectives considered within this report are presented within Table 2-1.

Table 2-1
Relevant Air Quality Strategy Standards and Objectives

Pollutant	Standard (µg/m^3)	Measured As	Equivalent percentile
Particulate matter within an aerodynamic diameter of less than 10µm (PM_{10}) (gravimetric)	40	Annual Mean	-
	50	24-hour mean	90.41th percentile of 24-hour means (equivalent

[2] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA. July 2007.

Pollutant	Standard (µg/m^3)	Measured As	Equivalent percentile
			to 35 24-hour exceedences)
Particulate matter within an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$) (gravimetric)	25	Annual Mean	-

Applicable Public Exposure

In accordance with the Department for Environment, Food and Rural Affairs' (DEFRA) technical guidance on London Local Air Quality Management (LLAQM.TG(16)), the AQOs should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. A summary of relevant exposure for the objectives presented in Table 2-1 are shown below in Table 2-2.

Table 2-2
Relevant Public Exposure

Objective Averaging Period	Relevant Locations	Objectives should apply at	Objectives should not apply at
Annual Mean	Where individuals are exposed for a cumulative period of 6-months in a year	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term

2.3 Dust Nuisance

Dust is the generic term which the British Standard document BS 6069 (Part Two) used to describe particulate matter in the size range 1 – 75µm (micrometres) in diameter. Dust nuisance is the result of the perception of the soiling of surfaces by excessive rates of dust deposition. Under provisions in the Environmental Protection Act 1990, and subsequent amendments, dust nuisance is defined as a statutory nuisance. There are currently no standards or guidelines for dust nuisance in the UK, nor are formal dust deposition standards specified. This reflects the uncertainties in dust monitoring technology, and the highly subjective relationship between deposition events, surface soiling and the perception of such events as a nuisance. In law, complaints about excessive dust deposition would have to be investigated by the local authority and any complaint upheld for a statutory nuisance to occur. However, dust deposition is generally managed by suitable on-site practices and mitigation rather than by the determination of statutory nuisance and/or prosecution or enforcement notice(s).

2.4 Relevant Guidance

2.4.1 Sustainable Design & Construction SPG

The Greater London Authority (GLA) published Supplementary Planning Guidance[3] (SPG) on the implementation of London Plan Policy 5.3 - Sustainable Design and Construction, as well as a range of policies, primarily in Chapters 5 and 7 that deal with matters relating to environmental sustainability in 2014. The Mayor's priorities concerning air quality, and of relevance to this Dust Monitoring, are outlined below:

- Developers are to design their schemes so that they are at least 'air quality neutral' (Policy 7.14);
- Developments should be designed to minimise the generation of air pollution (Policies 5.3, 7.14);
- Developments should be designed to minimise and mitigate against increased exposure to poor air quality (Policies 3.2, 5.3, 7.14); and
- Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during Construction and Demolition SPG when constructing their development (Policies 5.3, 7.14).

2.4.2 Construction and Dust Demolition Guidance

The Control of Dust and Emissions during Construction and Demolition, SPG for The Control of Dust and Emissions during Construction and Demolition was published in July 2014 by the GLA. It seeks to reduce emissions of dust, PM_{10} and $PM_{2.5}$ from construction and demolition activities in London.

With regard to monitoring of dust emissions at demolition and construction sites, the guidance states the following:

"All demolition and construction sites should be monitored for the generation of air pollution. It is essential to monitor for dust generation, including PM_{10}. For smaller sites this can be simply visual monitoring. The need to monitor $PM_{2.5}$ and NO_2 will be determined on a case by case basis by the local planning authority. The need for monitoring will generally depend on existing air quality, air pollution risks from the development, the technical practicalities and financial implications of such monitoring".

The guidance states that monitoring schemes vary from simple visual assessments for low risk sites to the installation of real time automatic monitors for PM_{10} for high risk sites. The guidance also states that for certain sites, it may be appropriate to determine the existing (baseline) pollution levels prior to commencement of any construction activities.

A summary of the best practice monitoring methods for automatic analysers set out by the SPG is as follows:

- provision of high resolution measurements (typically hourly or shorter time periods);
- maintain a high standard of maintenance, calibration and QA/QC procedures;
- acknowledgement that monitors are able to measure various particulate fractions when fitted with designated inlet heads;
- ensure results from monitors with heated inlets (i.e. TEOM or beta-attenuation analysers) are corrected by a factor of 1.3 when comparison to AQS objectives is undertaken; and
- gravimetric monitoring is considered to be the most accurate, however this method typically measures over 24hrs and cannot be used as a trigger system given that instantaneous readings are not possible.

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3 Greater London Authority. Sustainable Design and Construction – SPG, Greater London Authority, 2014.

3.0 DUST MONITORING METHODOLOGY

3.1 Monitoring Introduction

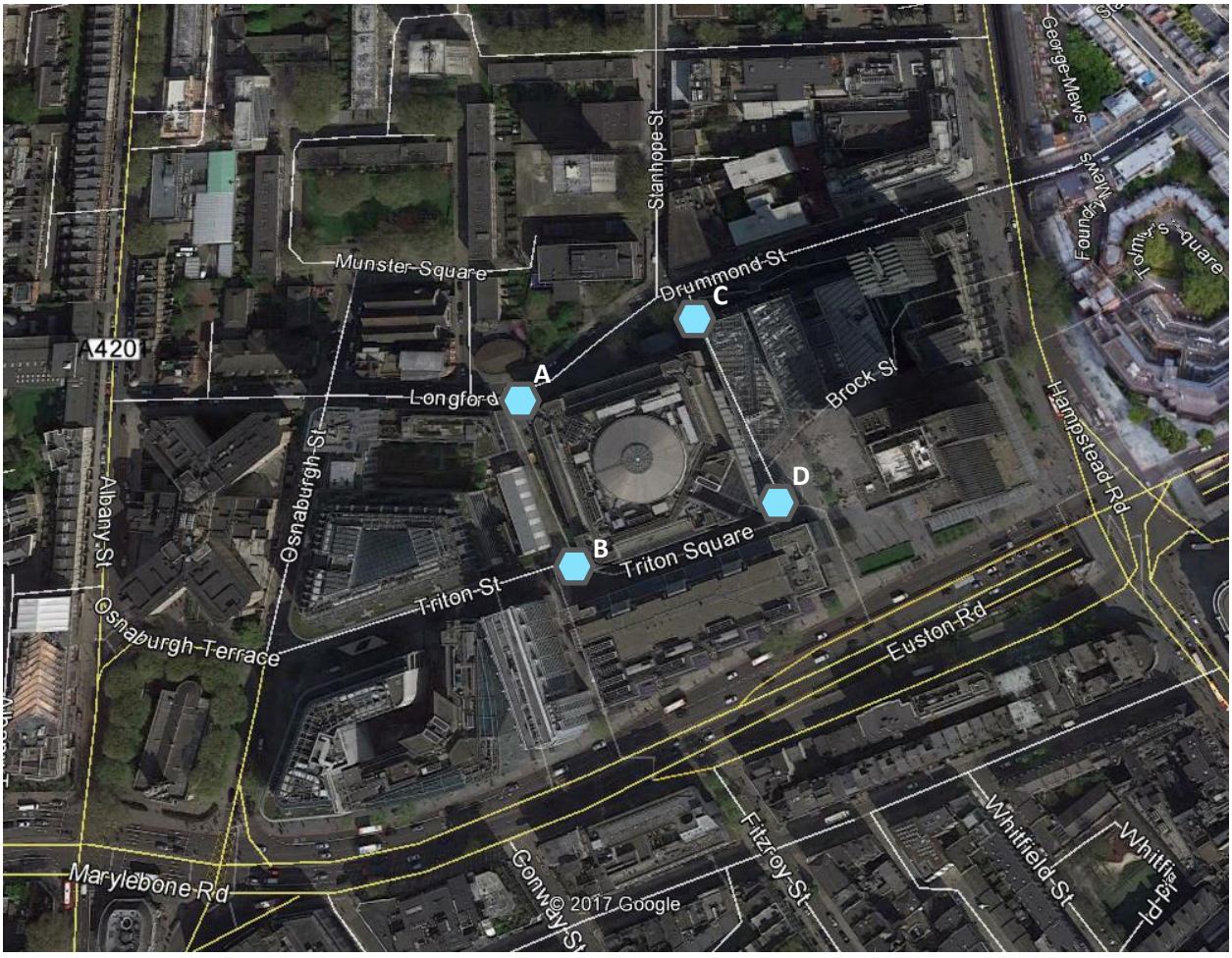
In line with the Control of Dust and Emissions during Construction and Demolition SPG, real time automatic monitoring for PM_{10} and $PM_{2.5}$ has been installed at the consented site. Condition 16(A) attached to the planning permission requires a 3-month air quality monitoring baseline period to be completed for the Commercial Element, prior to the Development commencing within that element. Dust monitoring commenced for the Commercial Element on 12th December 2017, which, as required by planning condition 16, is at least 3 months prior to implementation. Evidence that the monitoring stations A and B have been in place since the 12th December 2017 are provided by the results for the period 12th to 31st December 2017 in Appendix 02. Appendix 02 includes all monitoring results for all four monitoring locations from their installation until the 31st March.

3.2 Monitoring Locations

The consented site was until March 2018 a public area pedestrianised in all directions from the development. Therefore, the monitors needed to be positioned such that they were secure, able to access the required mains power supply and without posing a health and safety risk to members of the public. Monitoring locations A and B during the 'baseline' period prior to construction works commencing are indicated in Figure 3-1, with photographs presented in Appendix 01.

Following the installation of the hoarding around the perimeter of the construction site, monitoring locations have been moved to within the hoarding to provide a more secure monitoring location throughout the duration of the construction works. In accordance with the GLA SPG all monitors inlets have been located above the hoarding to allow for free air flow. A total of four locations have now been installed at all four corners of the application site, to cover all sensitive receptors in all directions from the construction site.

Figure 3-1
Site Map Indicating Approximate Monitoring Locations



Dust Monitoring Locations

A description of each monitoring location is given in Table 3-1.

Table 3-1
Description of Dust Monitoring Locations

Position	Description	Sensitive receptors	Grid Reference
Measurement Position A	Monitors placed at approximately 2.5m above ground level near to the north west boundary of the site, on the junction of Longford Street and Triton Square (see Appendix 01)	A residential block (One Osnaburgh Street)	X 529014 Y 182376
Measurement Position B	Monitors placed at approximately 1.5m above ground level near to the south west boundary of the site, on the junction of Triton Square (see Appendix 01)	2 Triton Square and 338 Euston Road both office blocks and the New Diorama theatre with further office in 20 Triton Street	X 529029 Y 182318

Position	Description	Sensitive receptors	Grid Reference
Measurement Position C	Monitors placed at approximately 2.5m above ground level near to the north east boundary of the site, on the junction of Longford Street, Drummond Street and Triton Square (see Appendix 01)	Office blocks in Brock street, Drummond Street and Longford Street	X 529081 Y 182415
Measurement Position D	Monitors placed at approximately 2.5m above ground level near to the south east boundary of the site, on the junction of Triton Square (see Appendix 01)	2 Triton Square office block and further office in Brock street and café spaces in the square.	X 529113 Y 182345

Site photographs of the dust monitoring installations at each monitoring position are included in Appendix 01 of this report.

3.3 Monitoring Equipment

Table 3-2 presents a description of the equipment used for the dust monitoring at each monitoring location.

Table 3-2
Description of Equipment used for Dust Monitoring

Monitoring Position	Installation Date	Equipment	Description	Serial Number
A	12/12/2017	Sigicom Infra Master	Data logger and GSM communication device	2527
		Sigicom X20DM2	Dust particulate sensor	11235
B		Sigicom Infra Master	Data logger and GSM communication device	2526
		Sigicom X20DM2	Dust particulate sensor	11236
C	02/03/2018	Sigicom Infra Master	Data logger and GSM communication device	2571
		Sigicom X20DM2	Dust particulate sensor	11318
D	23/03/2018	Osiris	Dust particulate sensor	TNO30410

The installed INFRA X20DM2 Dust Monitor is a high quality sensor that simultaneously measures the airborne particle concentrations of PM_{10}, $PM_{2.5}$, $PM_{1.0}$ and TSP (Total Suspended Particles), in accordance with the best practice guidelines of the GLA SPG. The measurement range of the INFRA X20DM2 Dust Monitor is:

- 0.1 – 6000µg/m³ for PM_{10} and TSP; and
- 0.01 – 600µg/m³ for $PM_{2.5}$ and PM_1.

The dust monitors that have been installed monitor in real time and have a remote telemetry online portal to view monitoring data. As such, the monitors meet the requirements of the GLA SPG.

4.0 CONCLUSIONS

SLR has installed dust monitoring at 1 Triton Square, to monitor concentrations of PM_{10} and $PM_{2.5}$ over a 3-month baseline period and throughout the duration of the construction phase.

It is therefore considered that pre-commencement planning condition 16(A) in association with application reference: 2016/6069/P has in part been met with reference to the installation of the equipment for a three month baseline period in line with the GLA control of dust and emissions during construction and demolition SPG requirements.

APPENDIX 01

Site Photographs

Monitoring Location A

Monitoring Location B – relocated

Monitoring Location C – relocated

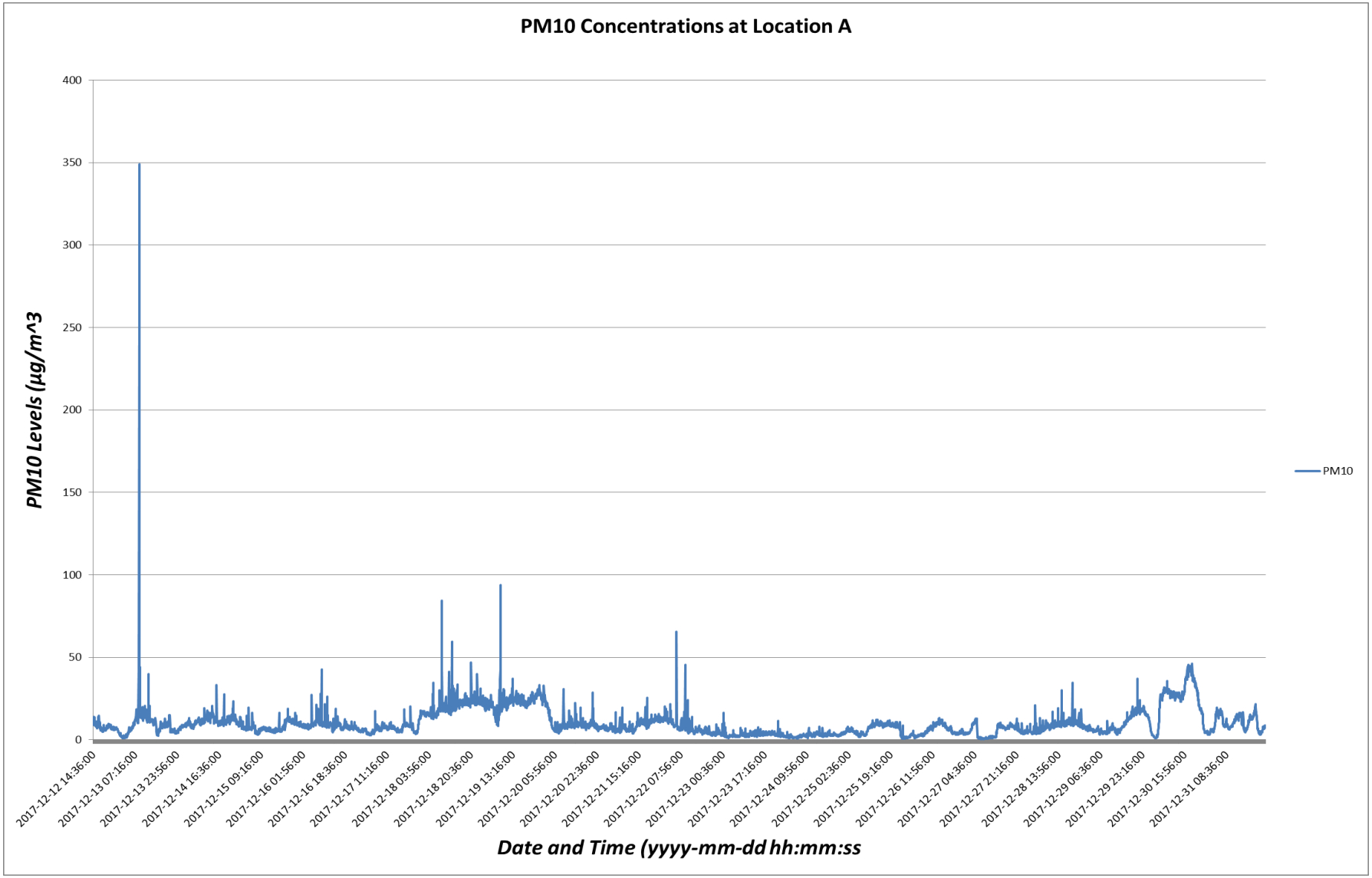
Monitoring Location D

APPENDIX 02

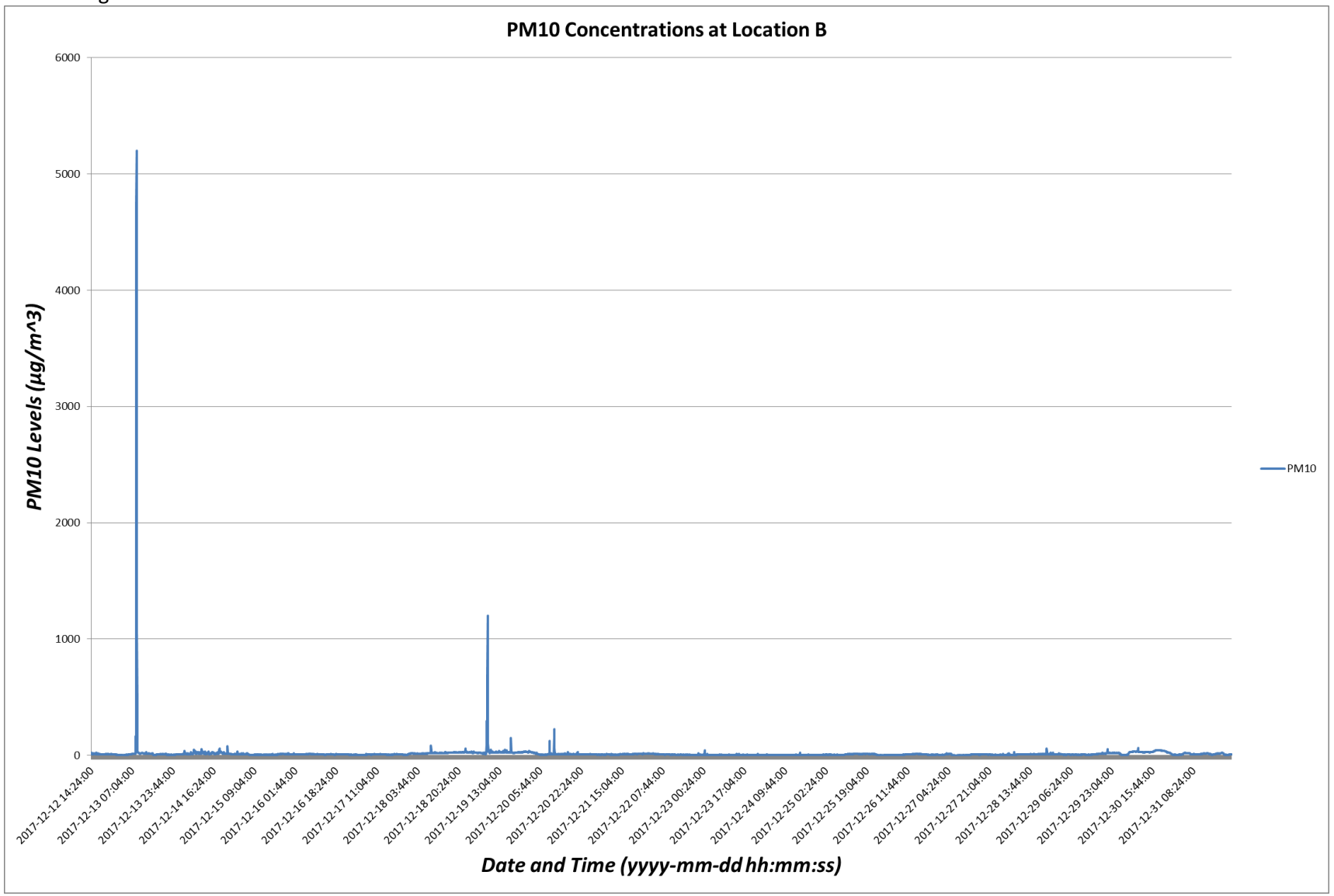
Monitoring Results

December 2017

Monitoring Location A

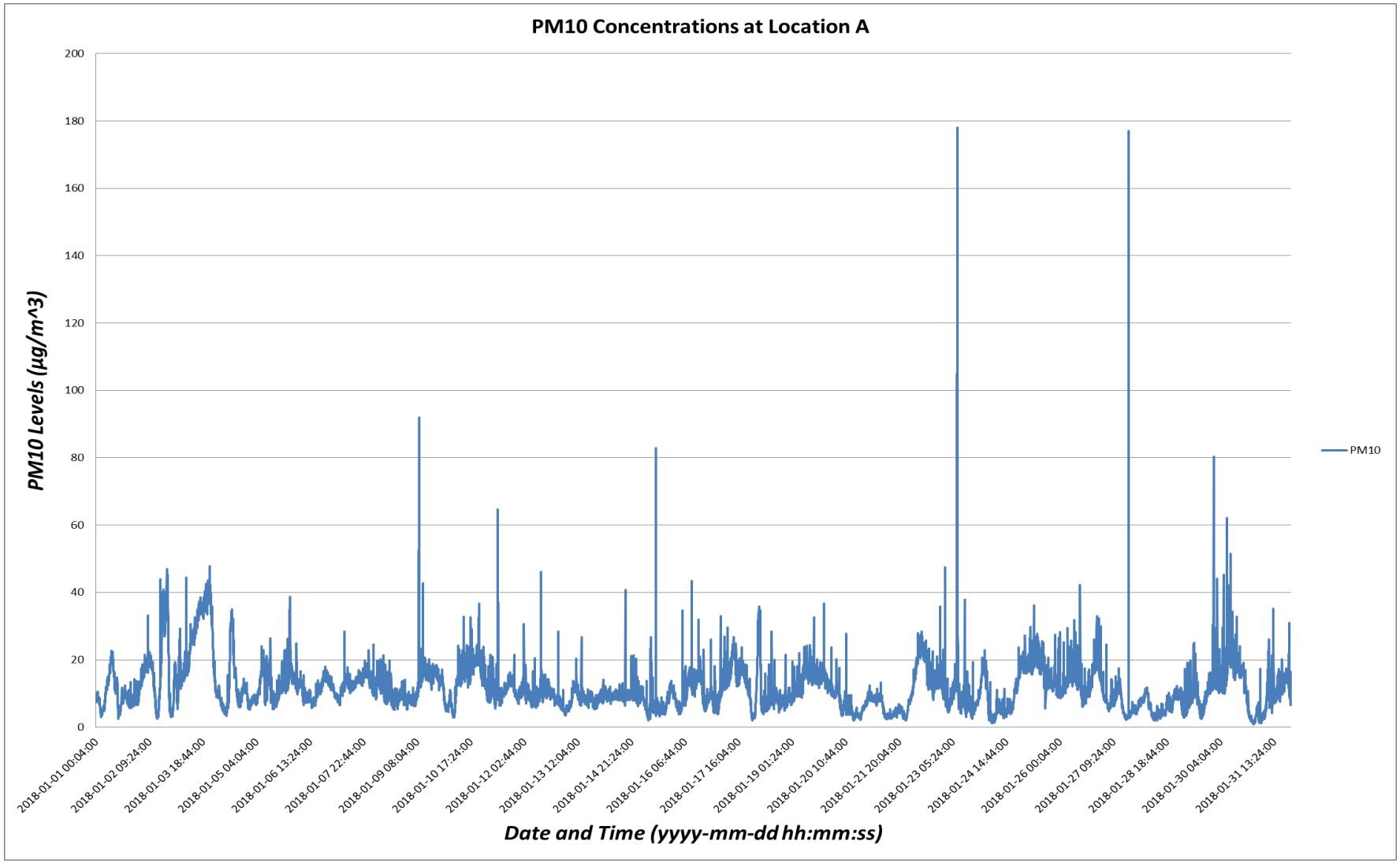


Monitoring Location B

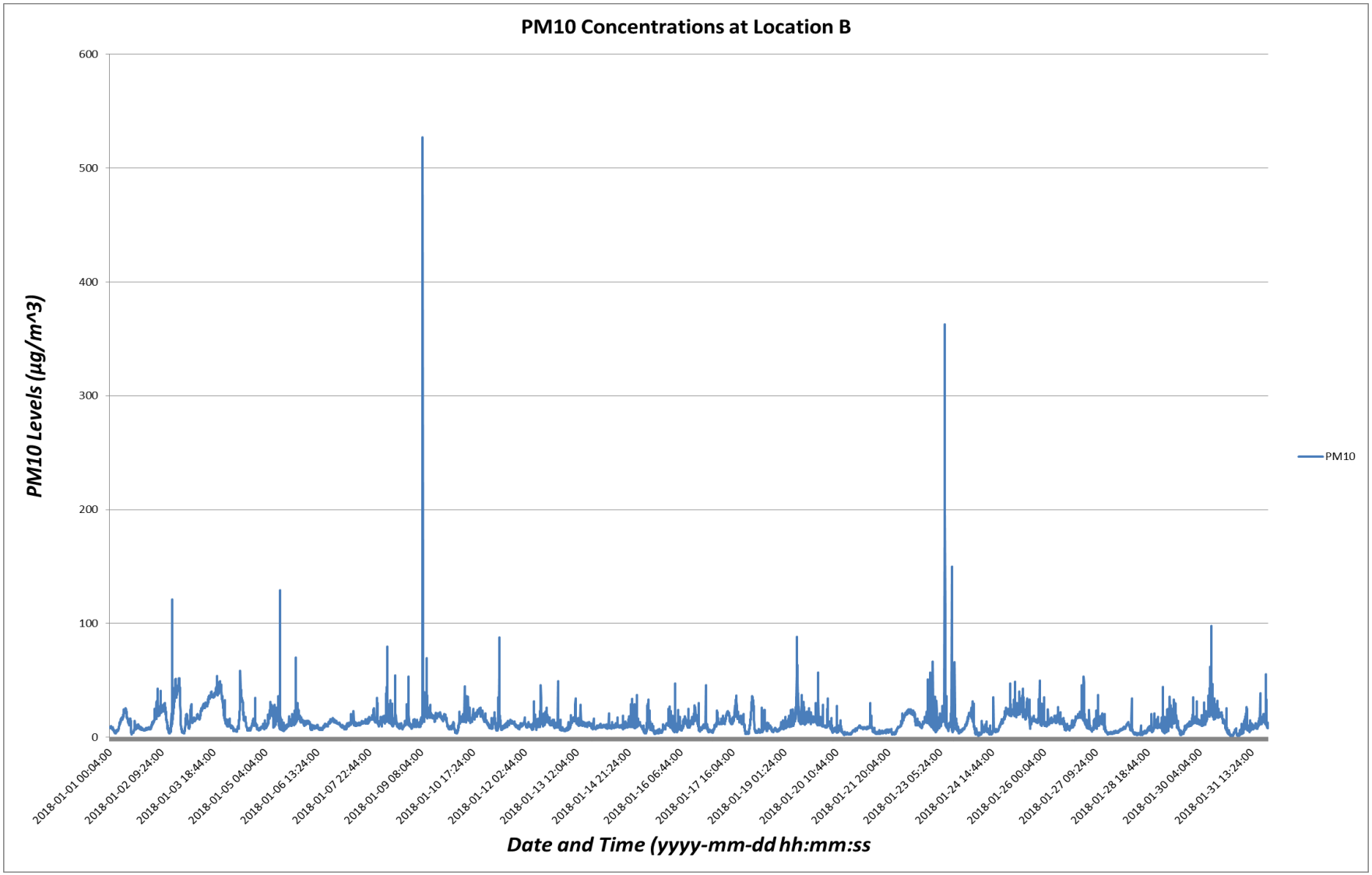


January 2018

Monitoring Location A

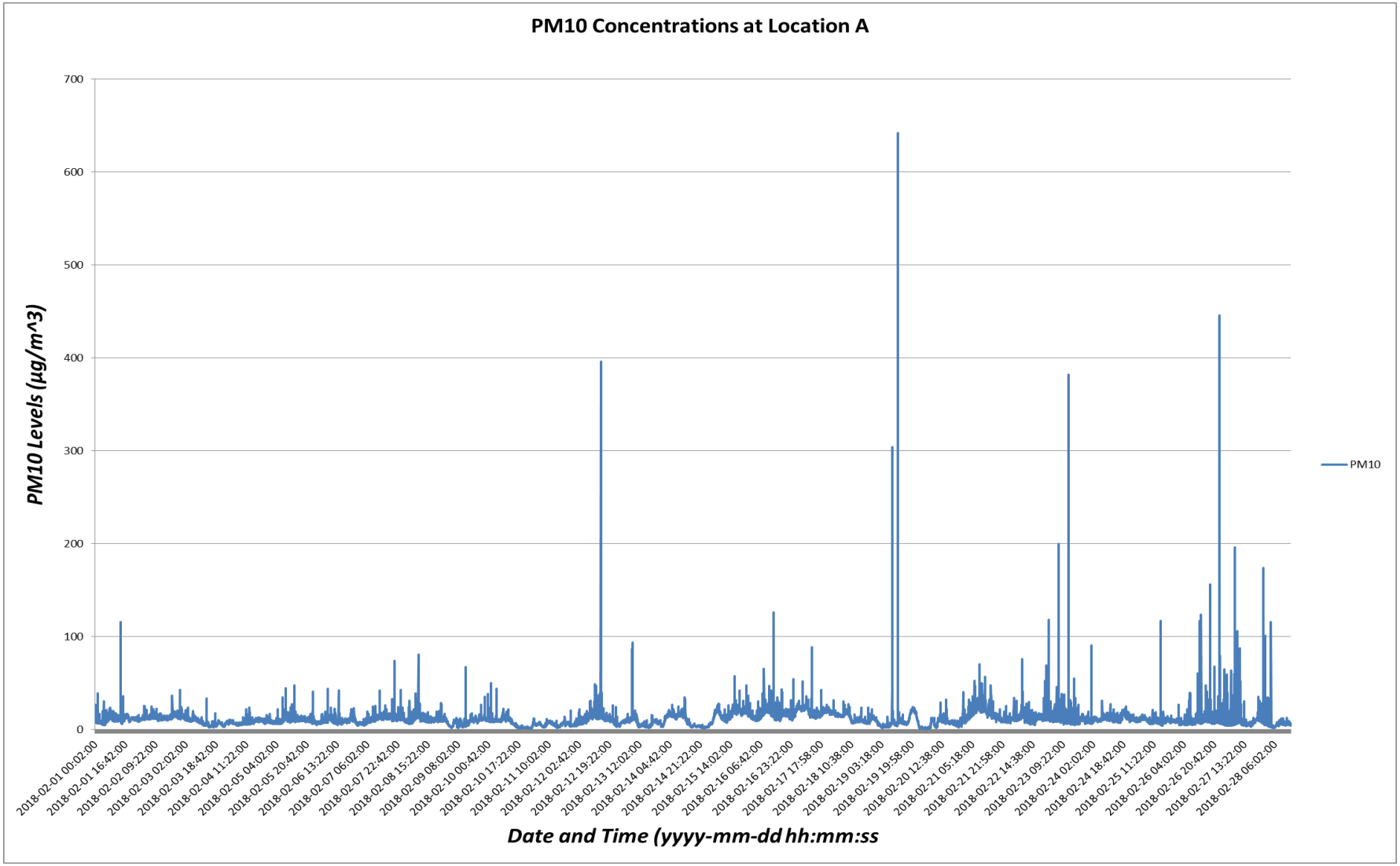


Monitoring Location B

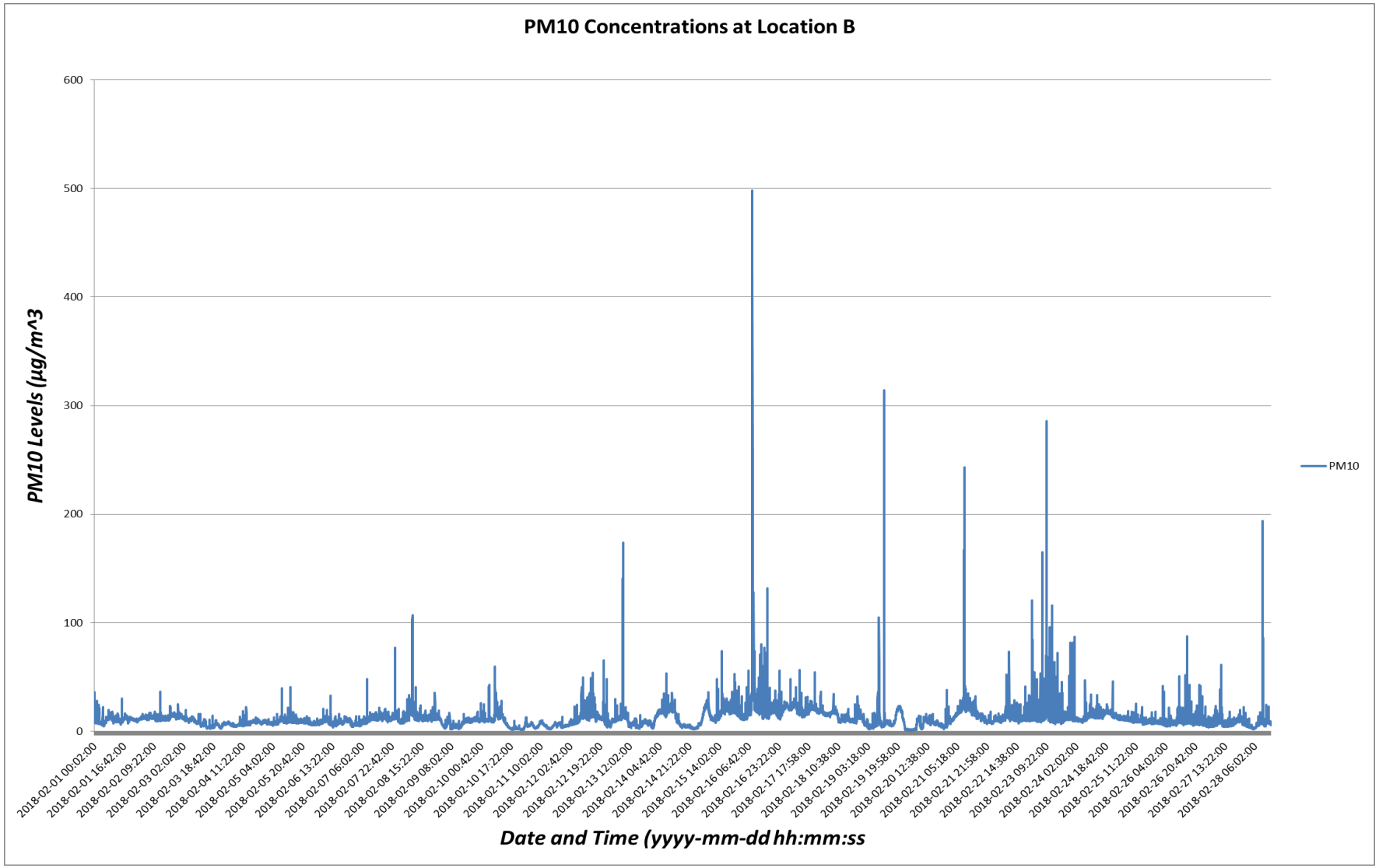


February 2018

Monitoring Location A

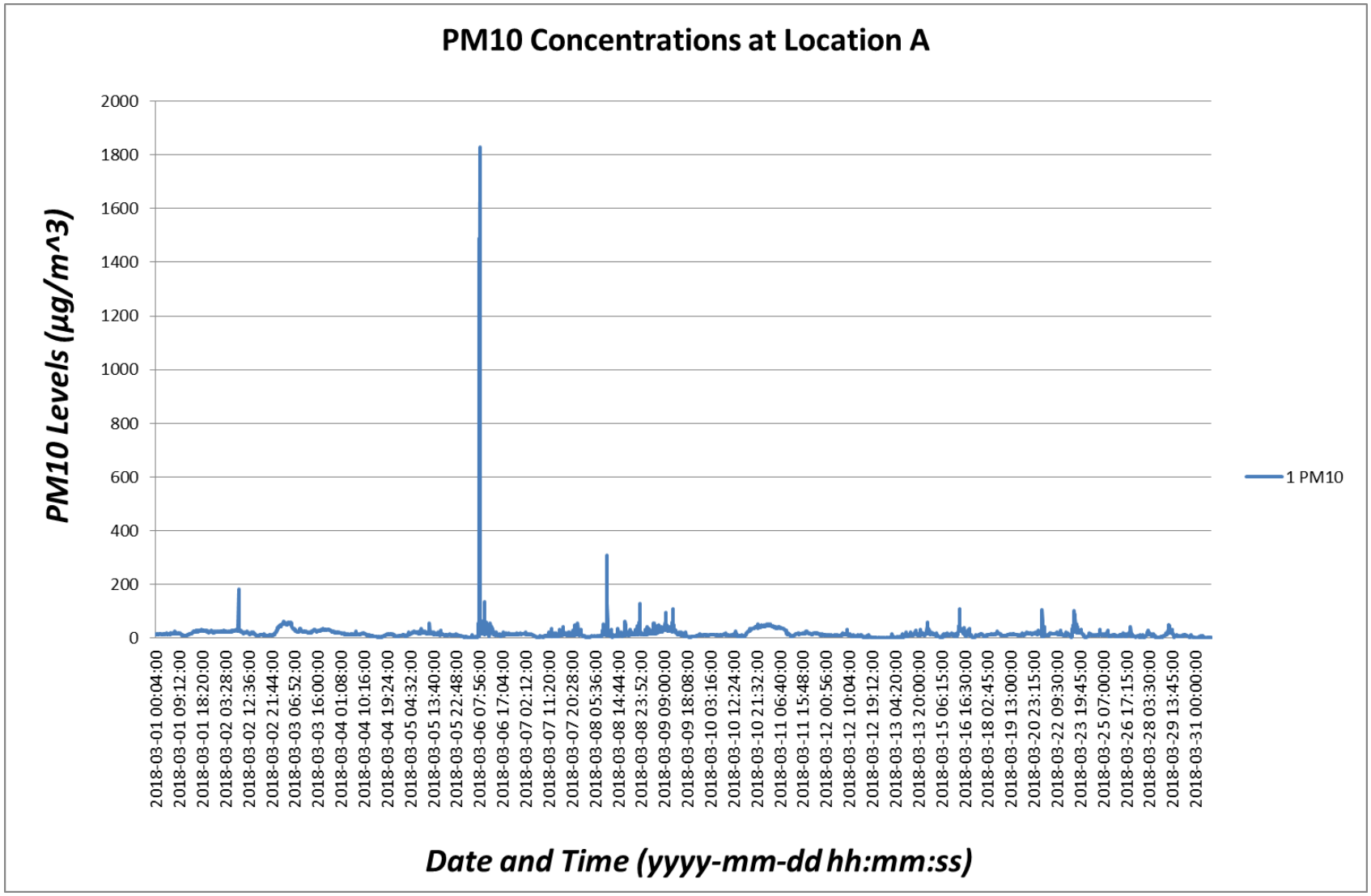


Monitoring Location B

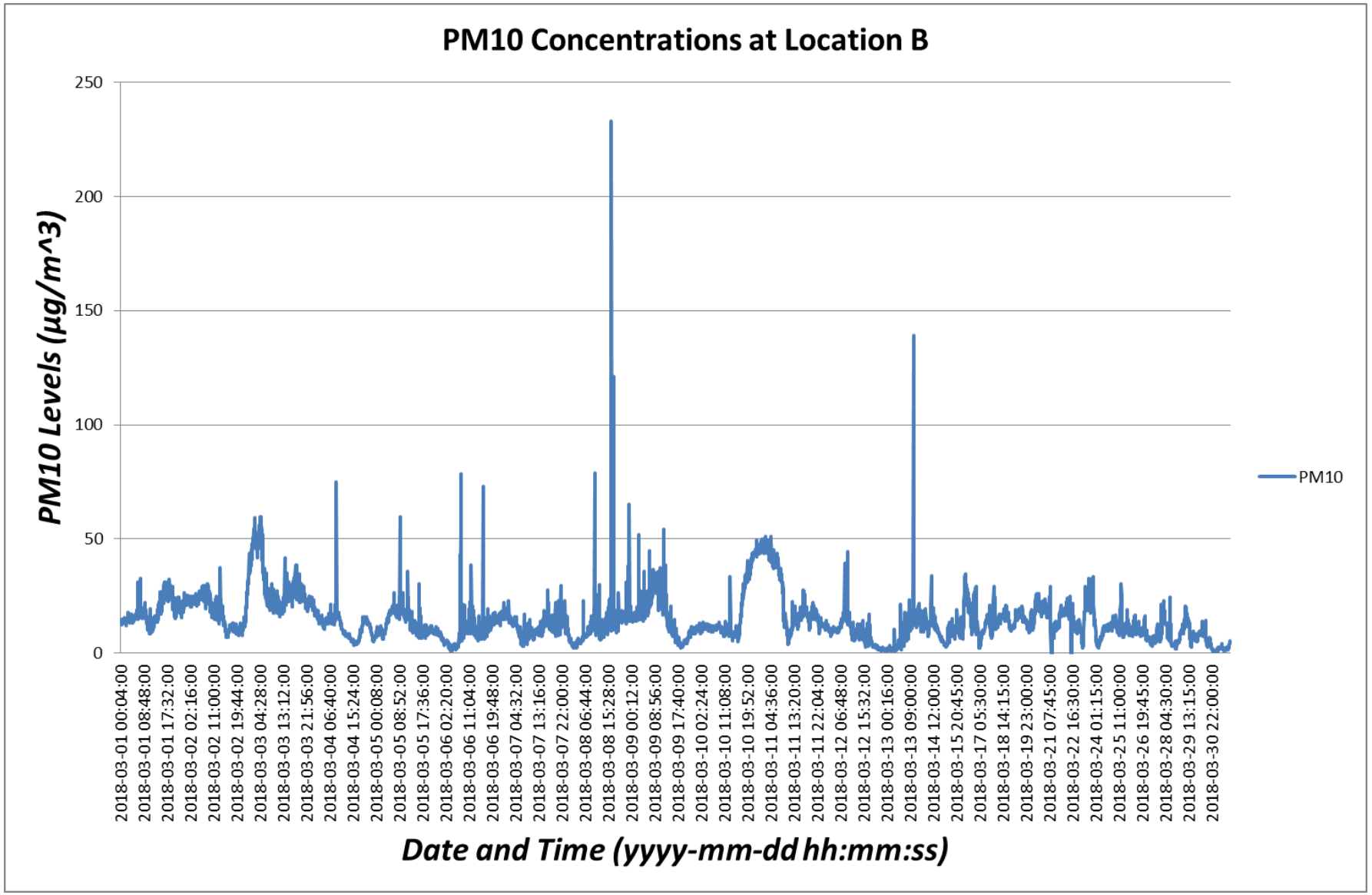


March 2018

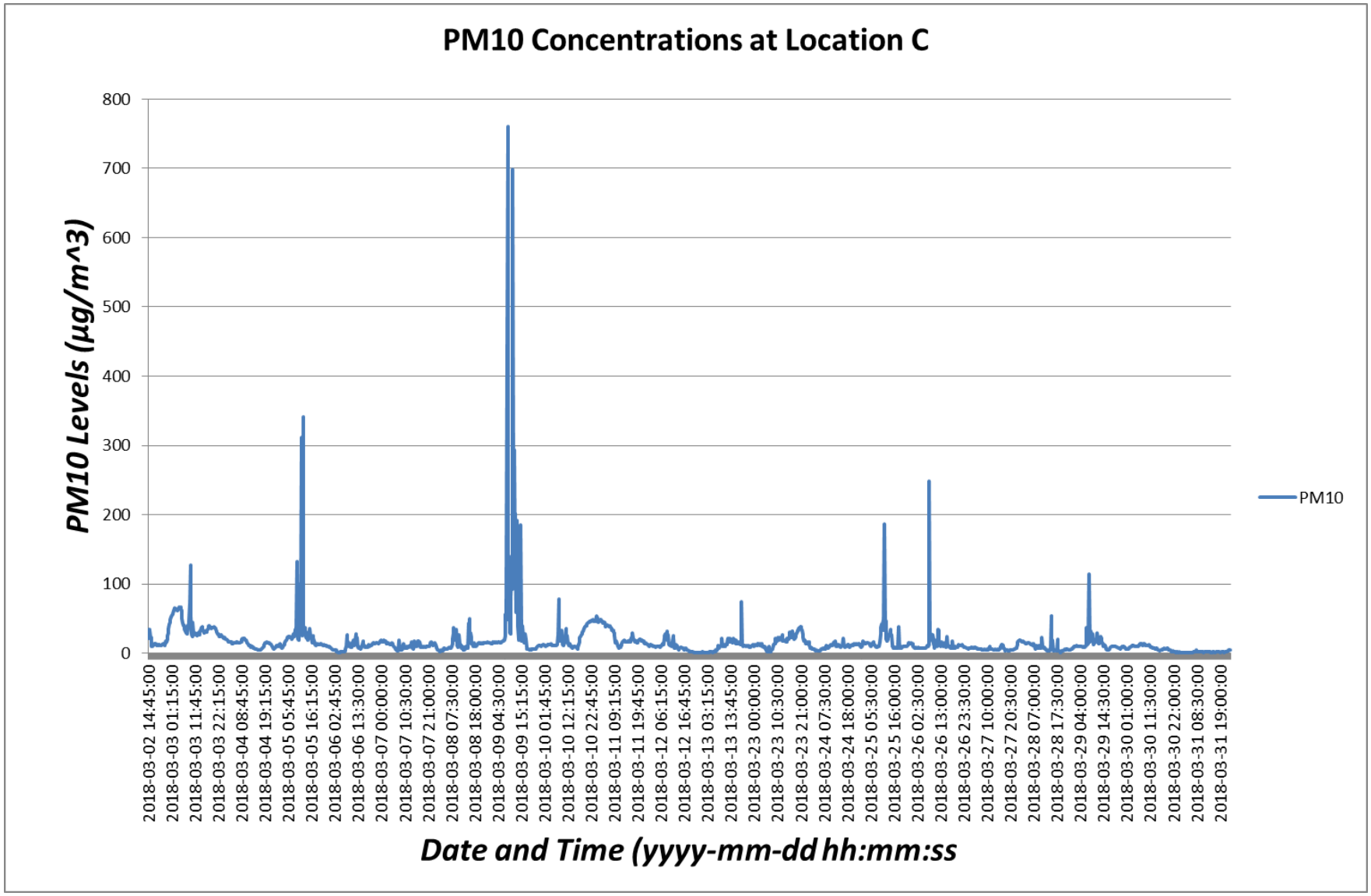
Monitoring Location A



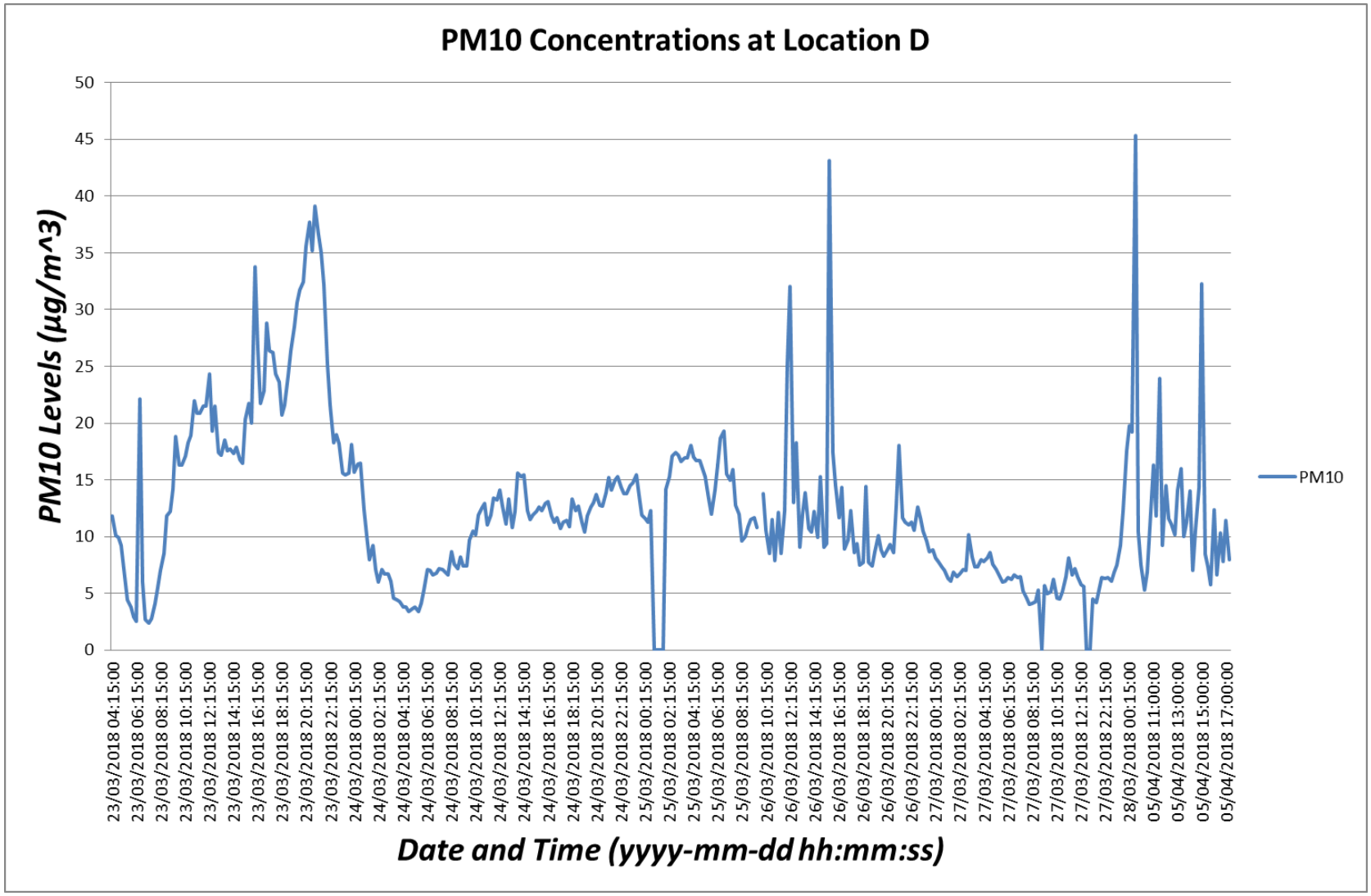
Monitoring Location B



Monitoring Location C



Monitoring Location D



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