

Northern Bus Garage

Noise, Vibration, and Dust Monitoring Report (January 2024)

Noise, Vibration, and Dust levels were monitored as part of the reconstruction of Northern Bus Garage, 4615 14th Street, NW, Washington, DC, for the month of January 2024.

The following memorandum identifies the monitoring points and instruments, presents the data, and provides a brief analysis of the results per monthly monitoring report attached by Geo Instruments for Clark Construction. The report is organized by medium: noise, vibration, and dust. Figures and graphs are attached. The red dashed line on each of the graphs represents the monitoring thresholds, which are summarized below for each instrument.

Noise Monitoring

Five noise monitors are positioned around the perimeter of the project site. (See Figure 1) Under DC regulations, the regulatory standard is 80 dBA, measured 25 ft from the property line (20 DCMR 2802.1). Because the noise monitoring devices are placed on the property line (rather than a 25 ft offset), the monitoring threshold for site activities is adjusted to 85 dBA (assuming the noise level will dissipate). Noise levels and vibration levels were measured automatically with Micromate and Geophone Instrument.

No operating issue with the monitoring instruments was identified.

Numerous noise level exceedances at all hours of the day and all days of the week. Mic3 recorded the highest noise levels of any location during work hours. In addition, Mic1 and Mic3 were similar to one another with 50% of the exceedances coming outside of working hours. Mic2 had 48% of its exceedances outside of working hours. Mic4 recorded 36% of its exceedances during nights and weekends. Mic5 had 54% of its exceedances outside of working hours. Please see table 1 (The "Work Hours" category includes all weekend shifts and evening shifts that were worked during the month).

Vibration Monitoring

Five vibration monitors are positioned around the perimeter of the project site. (See Figure 1) Vibration thresholds are based the WMATA Design Criteria. Monitors VM-1 and VM-2 are set at a lower vibration threshold due to their proximity to the historic façade, which is more sensitive to any movement. Noise levels and vibration levels were measured automatically with Micromate and Geophone Instrument.

Table 2

Instrument Type	Monitoring Threshold
Vibration Monitor (VM-1)	0.2 in/sec
Vibration Monitor (VM-2)	0.2 in/sec
Vibration Monitor (VM-3)	2.0 in/sec
Vibration Monitor (VM-4)	2.0 in/sec
Vibration Monitor (VM-5)	2.0 in/sec

No operating issue with the monitoring instruments was identified.

Graphs showing monitoring results are presented in Graphs 1 to 5.

A single vibration spike of 0.27 in/sec occurred at the VM1 location on January 18th at 1:40 pm due to the monitor being bumped by a piece of equipment.

Dust Monitoring Threshold Values and Exceedances:

Three dust monitors are positioned at the project site. (See Figure 2) EPA regulatory thresholds are based on a 24-hour monitoring period; the project has adopted thresholds to monitor site levels and provide an indication of when EPA standards might be exceeded. (See Table 3) Dust measurements were monitored using Aeroqual Dust Sentry Pro.

Table 3

Dust Monitoring Measurement	Monitoring Threshold
Particulates (PM2.5)	40 µg/m ³
Particulates (PM10)	50 µg/m ³

DM1 began experiencing power interruptions on January 1, 2024. The solar panel was relocated and replaced with a larger one on January 4. DM1 lost power again on January 18 and the battery was exchanged on the 19th. All three of the units have been fitted with hardware that allows tracking and alarming upon low voltage. It is not possible to plug the DM1 unit into mains power and the structure wall left in place shades the solar panel much of the day. Continued battery swaps will be the interim solution until site

conditions change.

Graphs showing monitoring results are presented in Graphs 6-11.

There were no dust monitoring exceedances in the month of January 2024.



Monitoring Report

WMATA Bus Garage Monthly Report

January 2024

Figure 1: Vibration and Noise Monitor Location Plan

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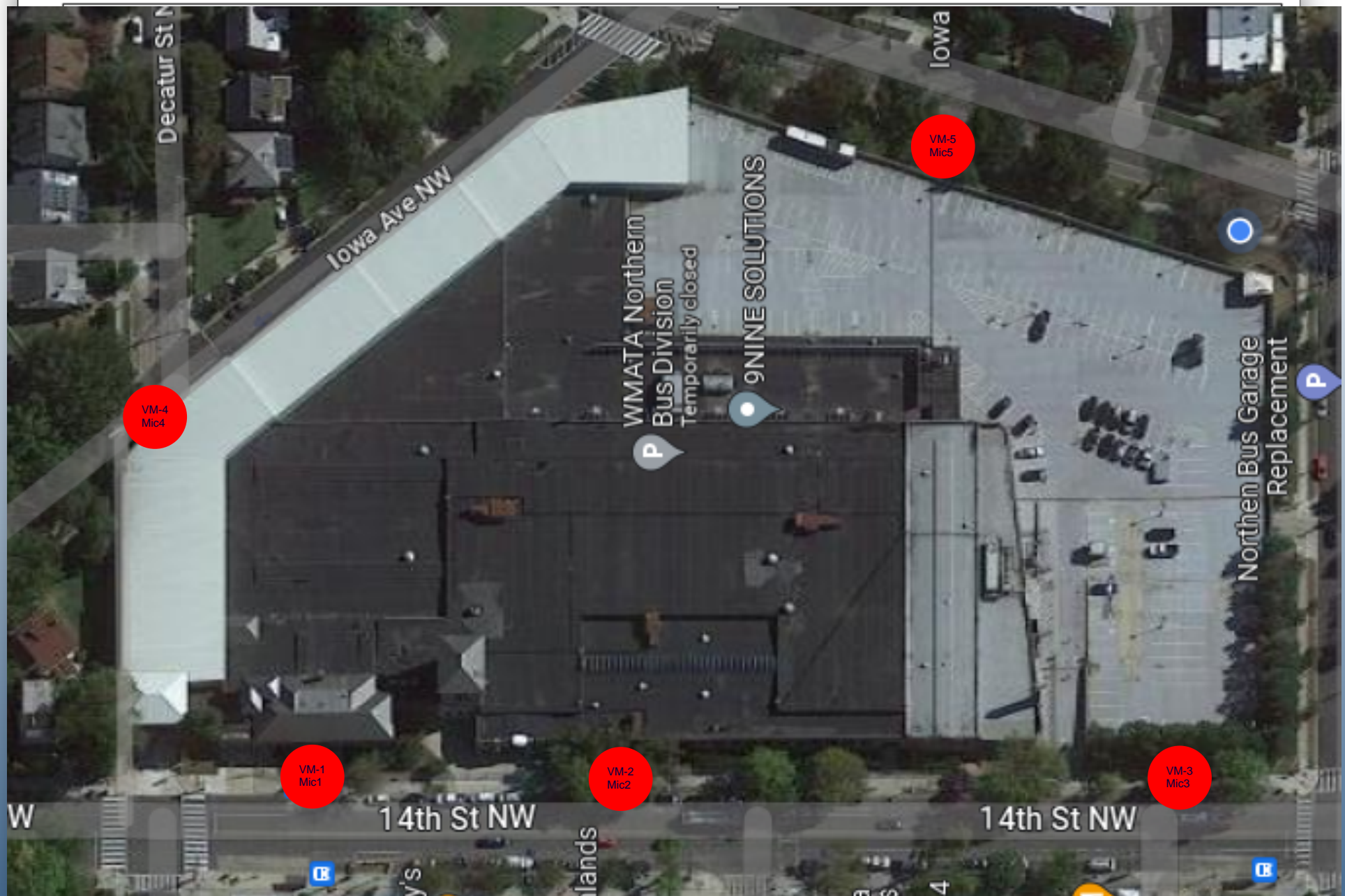


Figure 2: Dust Monitor Location Plan

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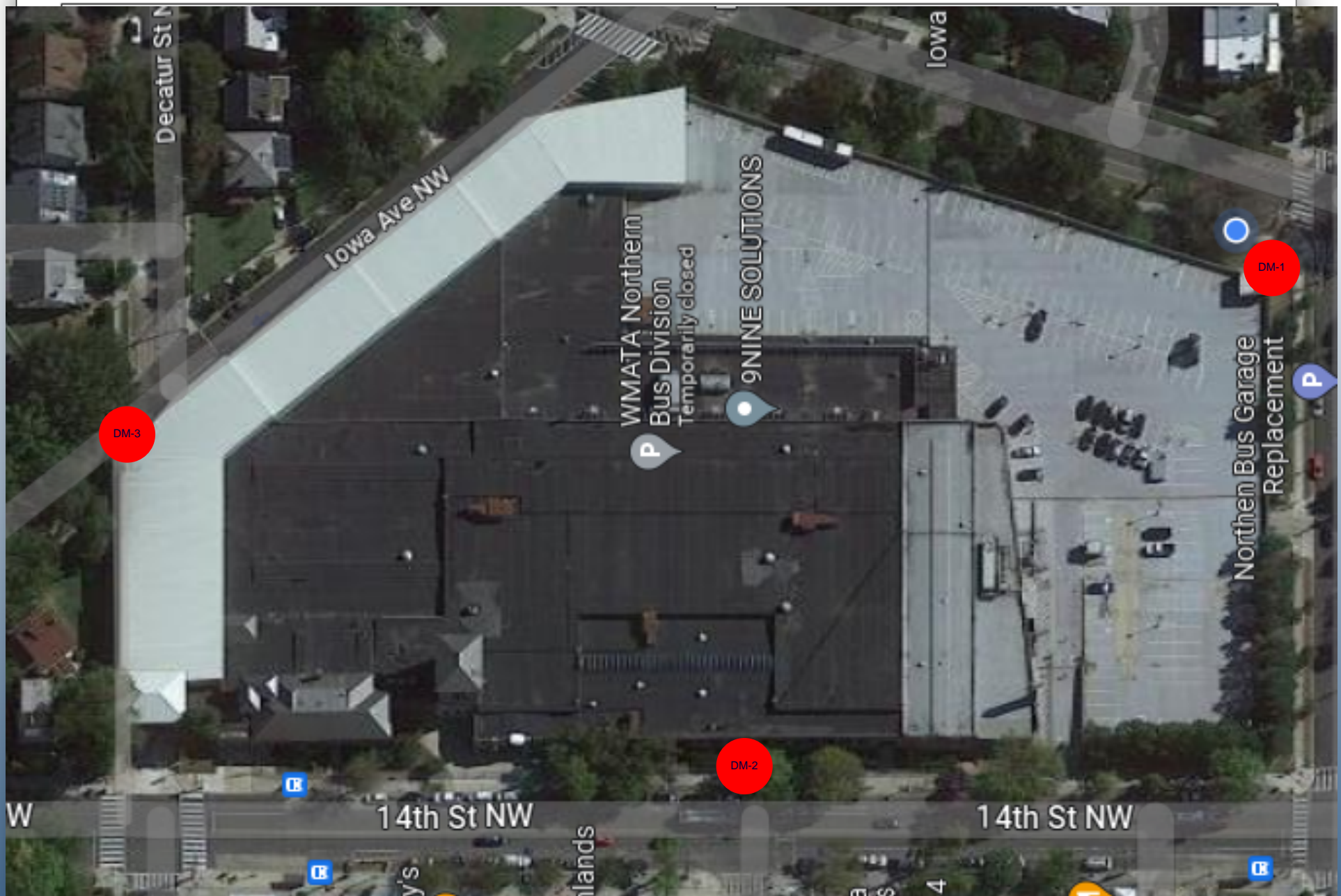


Table 1: Noise Summaries

VM1-MIC		
	Exceedance	Percentage
Work hours	387	50.06%
After hours	205	26.52%
Weekends	181	23.42%
Total	773	100%

VM1-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	110.1	114.2	112.4
Lmin (dBA)	75.1	61.6	60
L10 (dBA)	85	78	76
L90 (dBA)	78	64	63
Leq (dBA)	81.4	81.4	79.4

VM2-MIC		
	Exceedance	Percentage
Work hours	186	52.84%
After hours	85	24.15%
Weekends	81	23.01%
Total	352	100%

VM2-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	114	112.3	112.5
Lmin (dBA)	77	53.2	52.1
L10 (dBA)	97	74	68
L90 (dBA)	78	57	54
Leq (dBA)	90.1	79.5	80

VM3-MIC		
	Exceedance	Percentage
Work hours	377	49.09%
After hours	218	28.39%
Weekends	173	22.53%
Total	768	100%

VM3-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	117.5	110.5	114.7
Lmin (dBA)	73.7	74.7	61.6
L10 (dBA)	80	78	77
L90 (dBA)	75	76	70
Leq (dBA)	87.5	81	80.7

VM4-MIC		
	Exceedance	Percentage
Work hours	60	64.52%
After hours	14	15.05%
Weekends	19	20.43%
Total	93	100%

VM4-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	99.2	100.2	97.7
Lmin (dBA)	68.4	44.4	46
L10 (dBA)	84	65	62
L90 (dBA)	71	47	49
Leq (dBA)	79.1	67.3	68

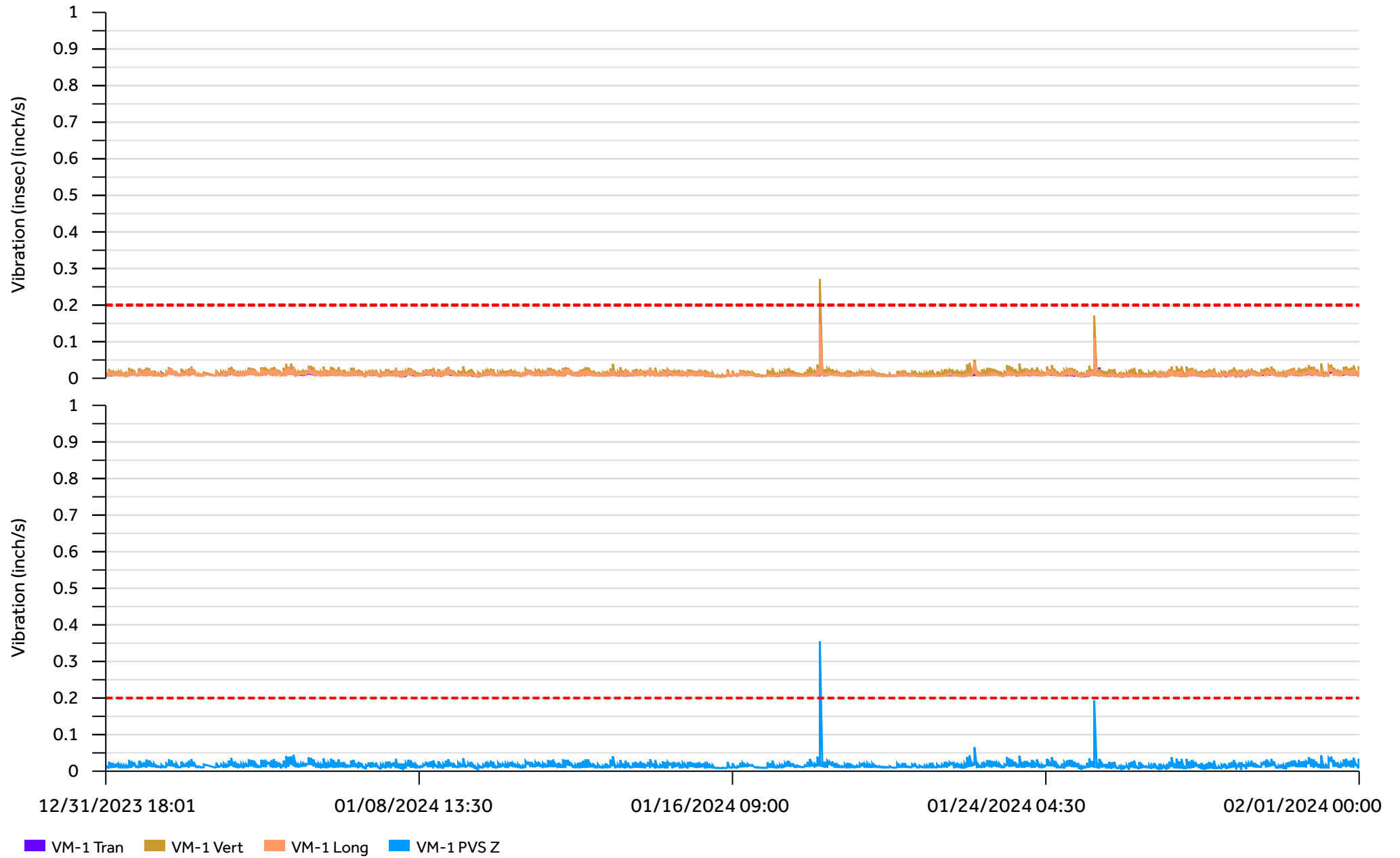
VM5-MIC		
	Exceedance	Percentage
Work hours	125	46.13%
After hours	68	25.09%
Weekends	78	28.78%
Total	271	100%

VM5-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	115	106.6	110
Lmin (dBA)	51.9	51.2	61.2
L10 (dBA)	81	76	73
L90 (dBA)	57	57	64
Leq (dBA)	85.8	74	80.7

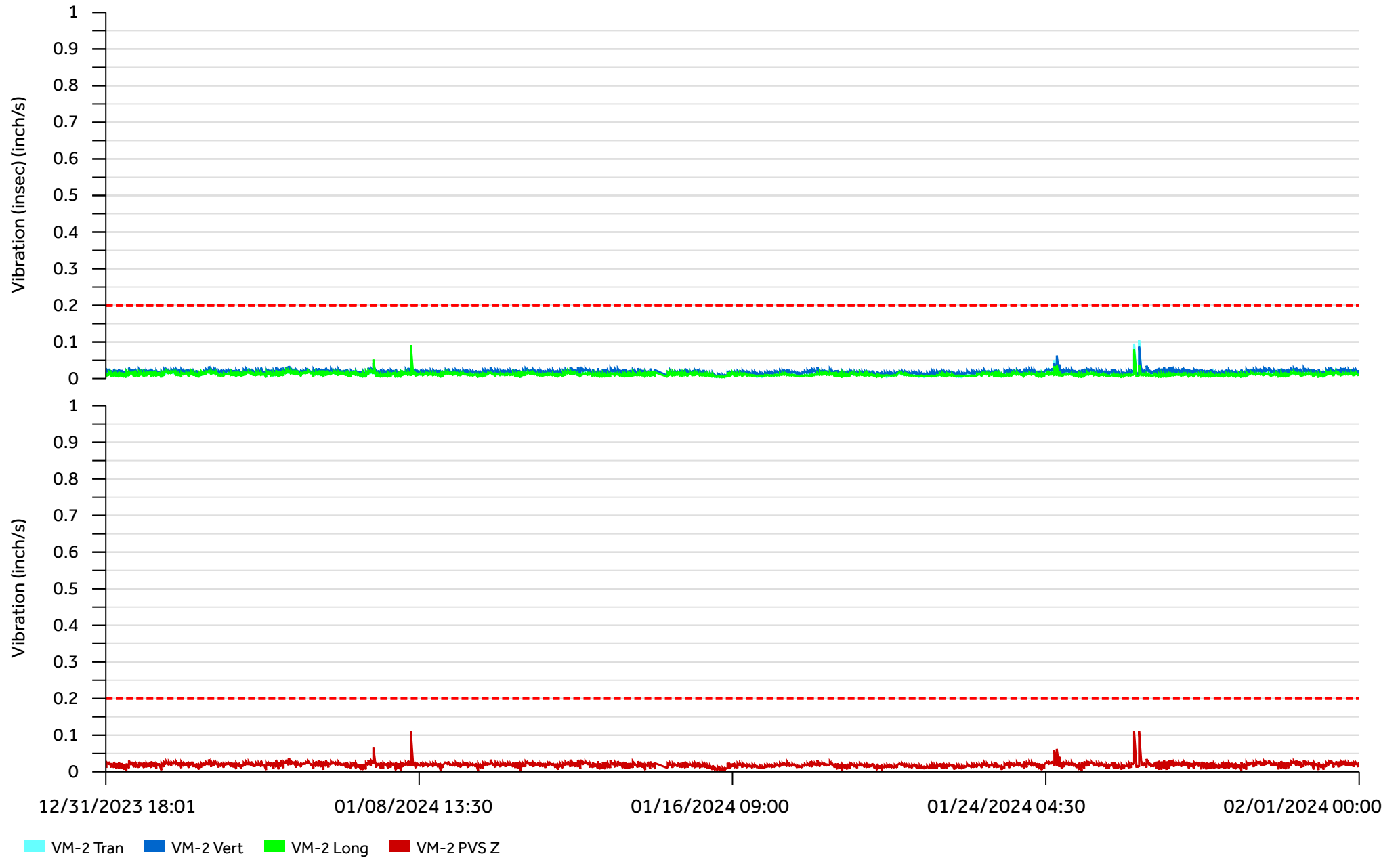
NOTES:

- Exceedance analyses are presented in the left table. Noise level summaries are presented in the right table.
- Measurements and Key:
 Lmax: Maximum Noise Level (for the month, in dBA)
 Lmin: Minimum Noise Level (for the month, in dBA)
 L10: The noise level exceeded 10% of the time (for the month, in dBA)
 L90: The noise level exceeded 90% of the time (for the month, in dBA)
 Leq: Equivalent Continuous Sound Level, an 'average' (for the month, in dBA)

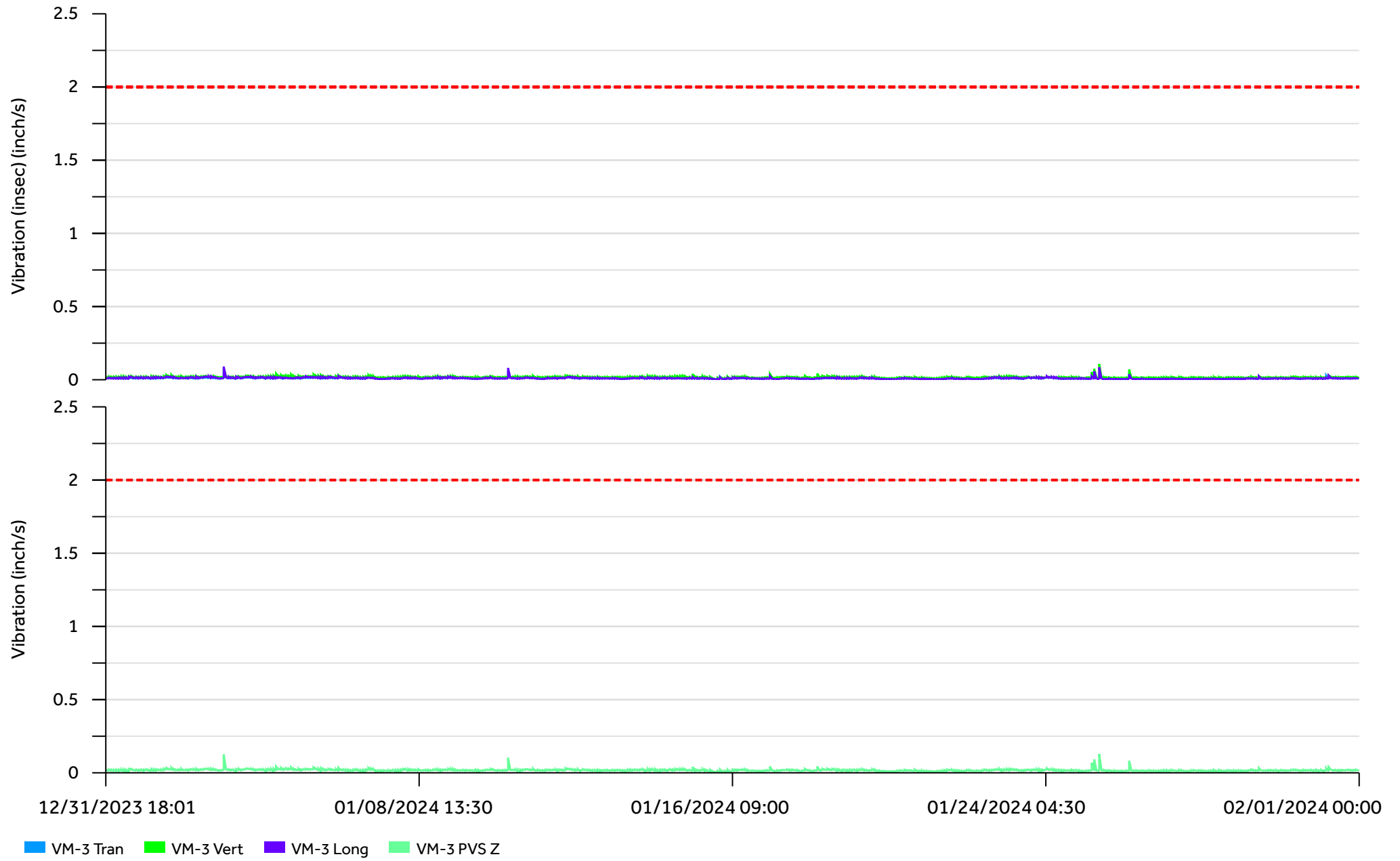
Graph 1:
VM-1- Vibration Monitor



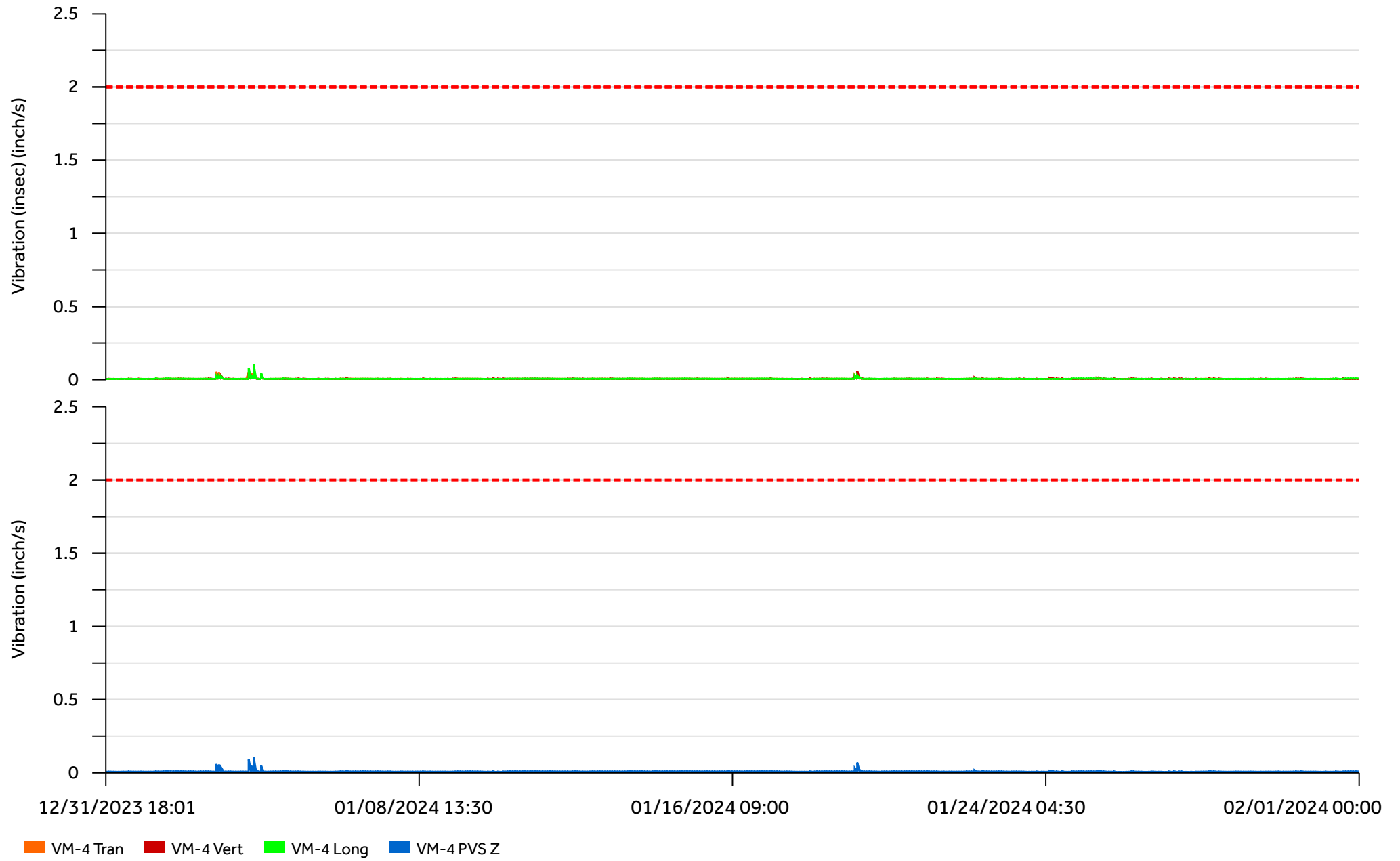
Graph 2:
VM-2- Vibration Monitor



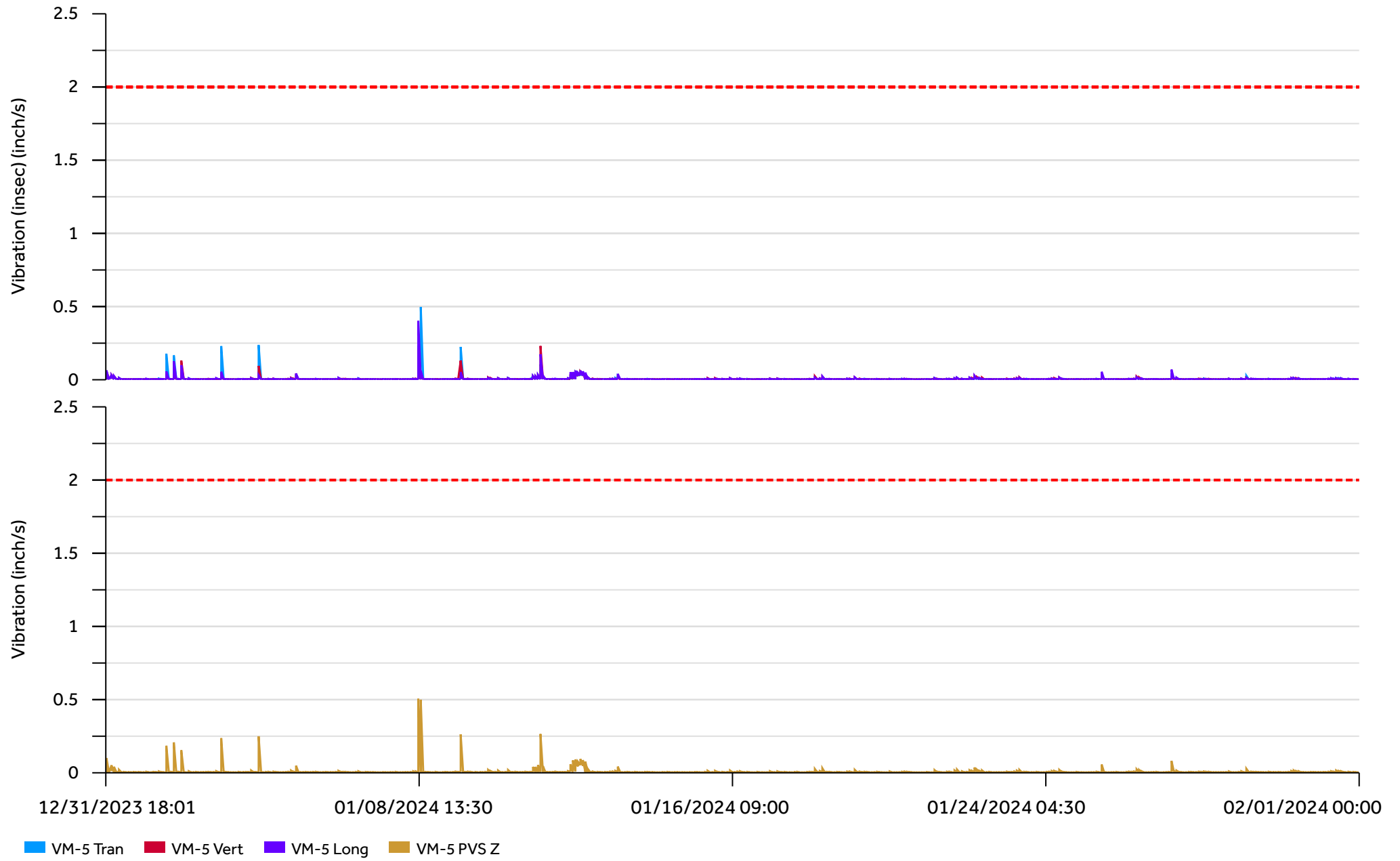
Graph 3:
VM-3- Vibration Monitor



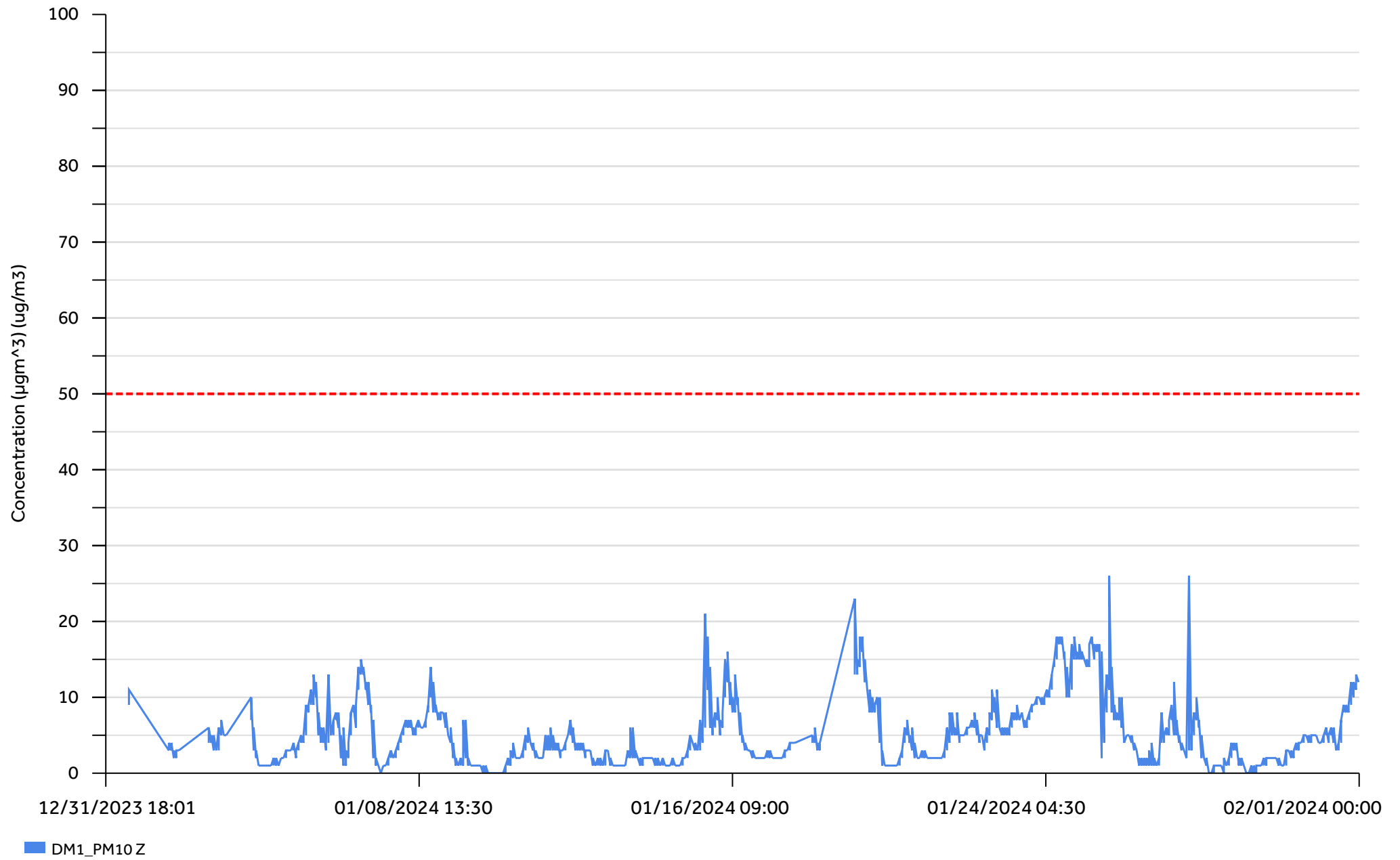
Graph 4:
VM-4- Vibration Monitor



Graph 5:
VM-5- Vibration Monitor

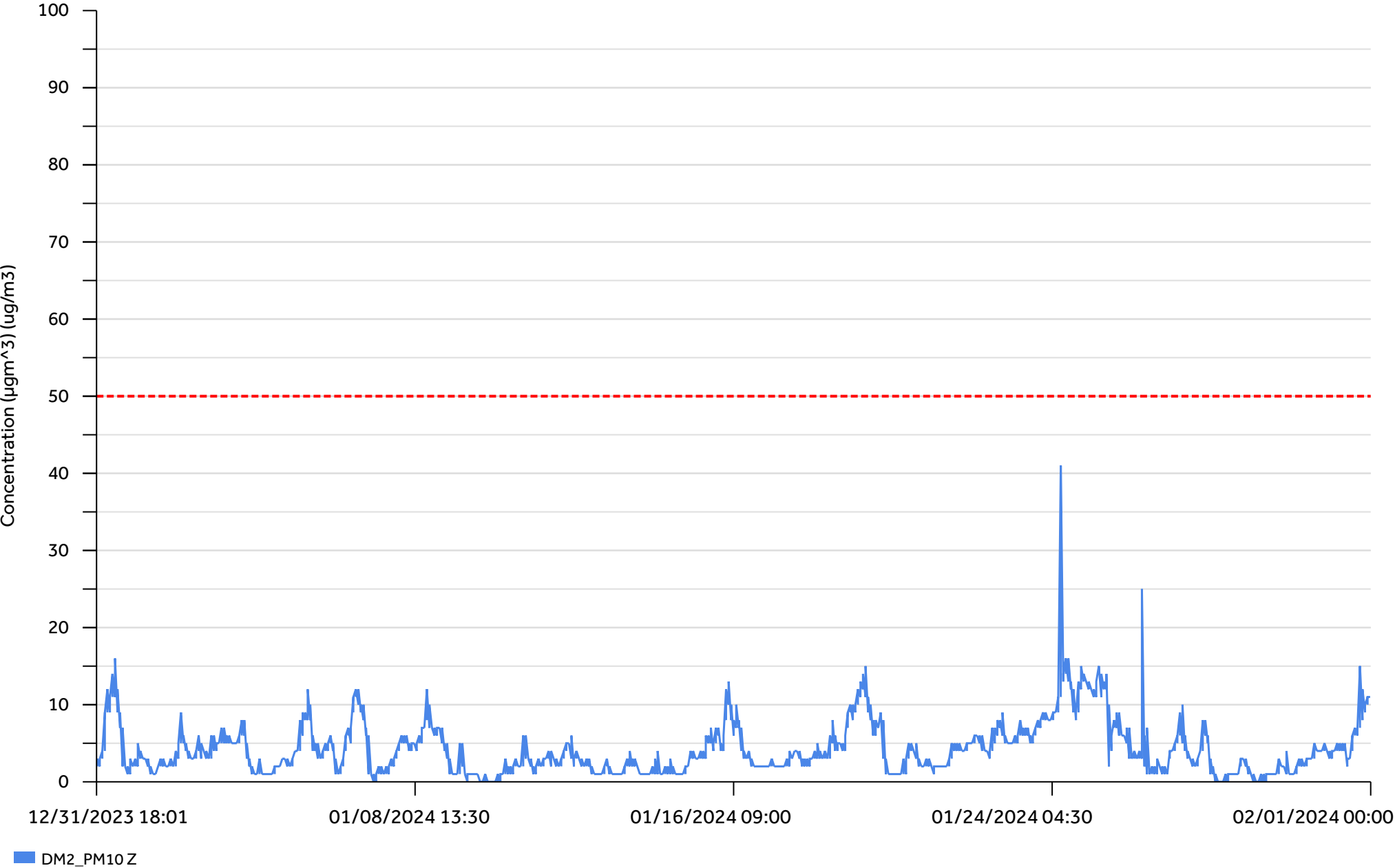


Graph 6:
DM1 - PM10



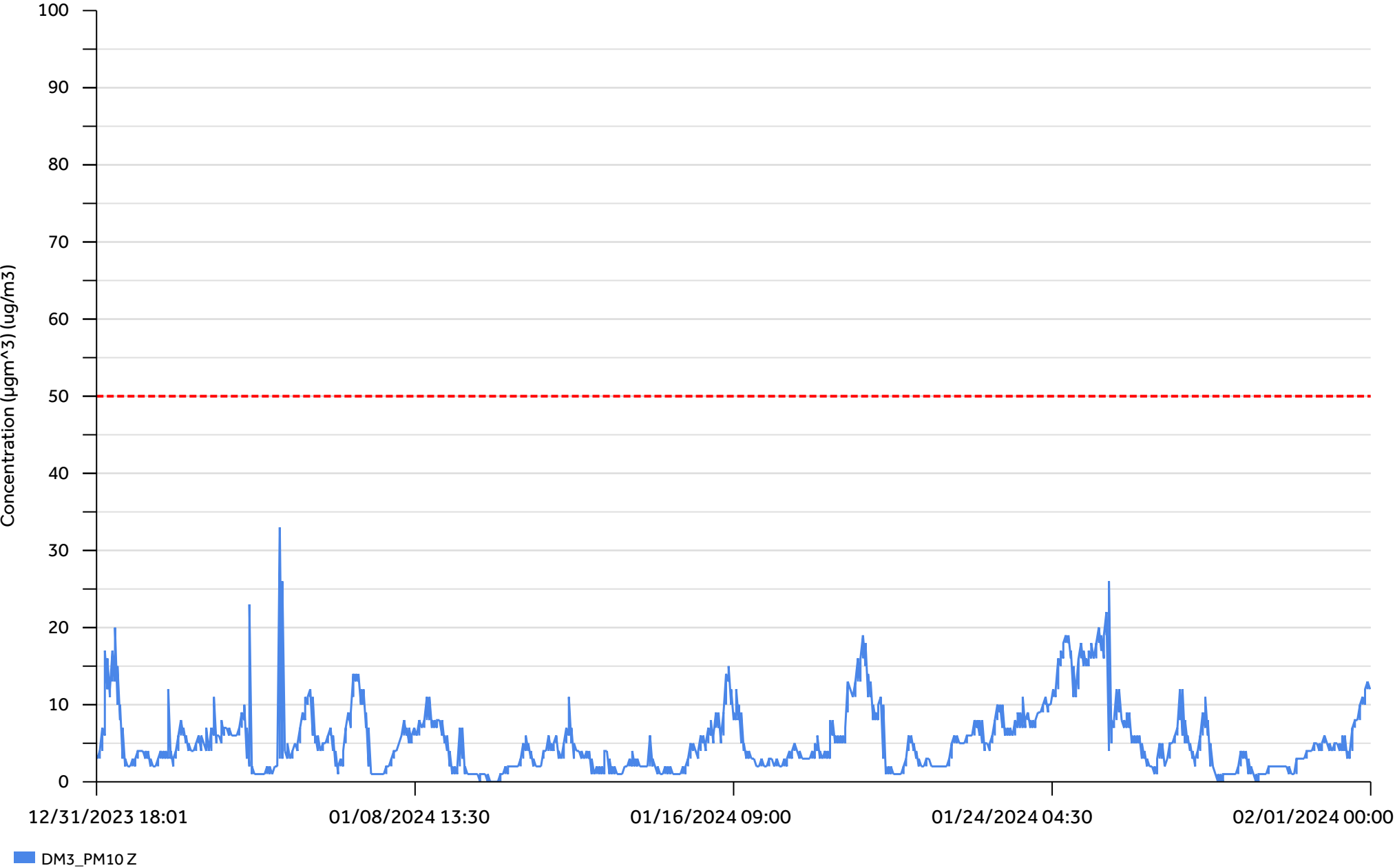
Graph 7:

DM2-PM10



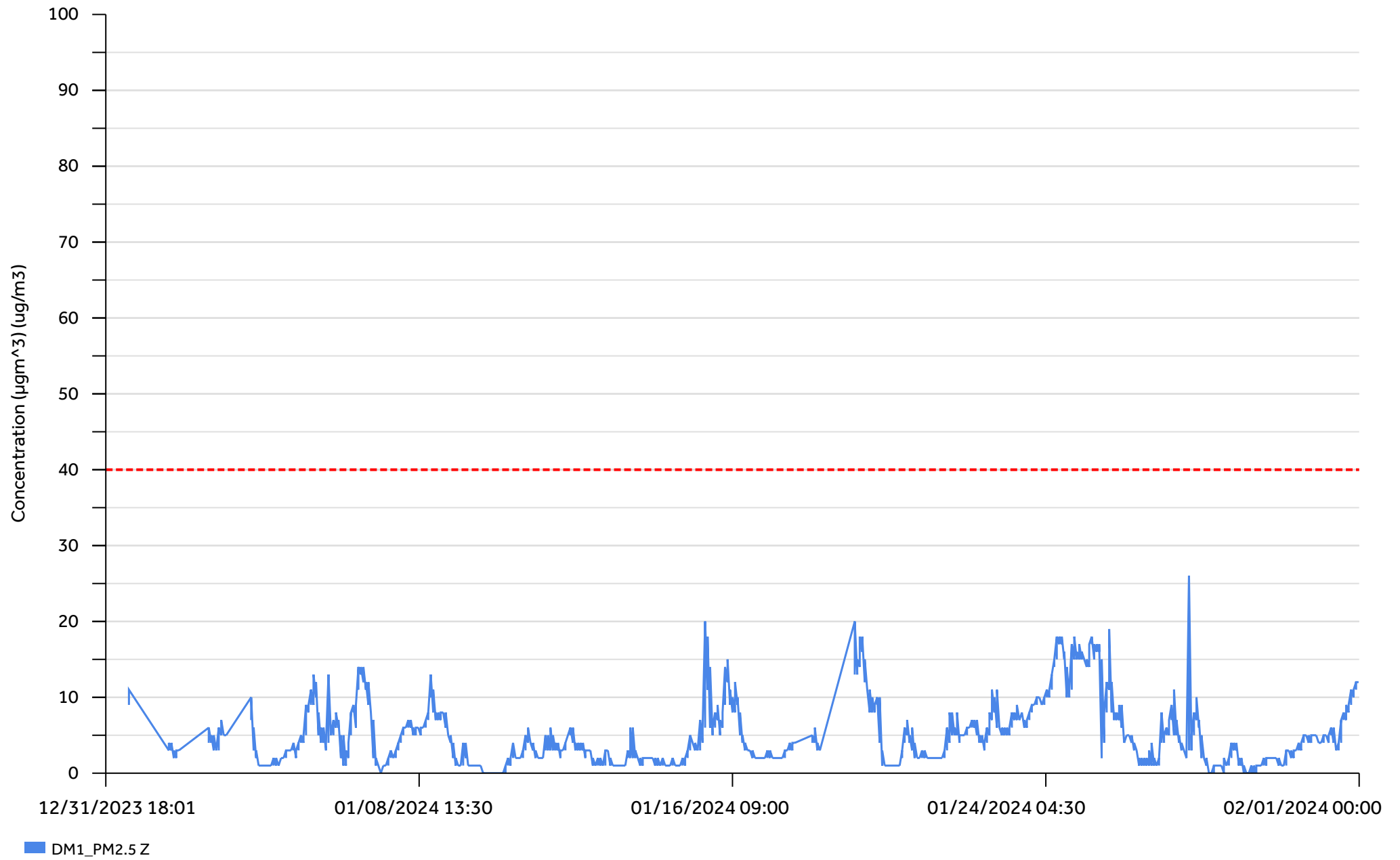
Graph 8:

DM3-PM10

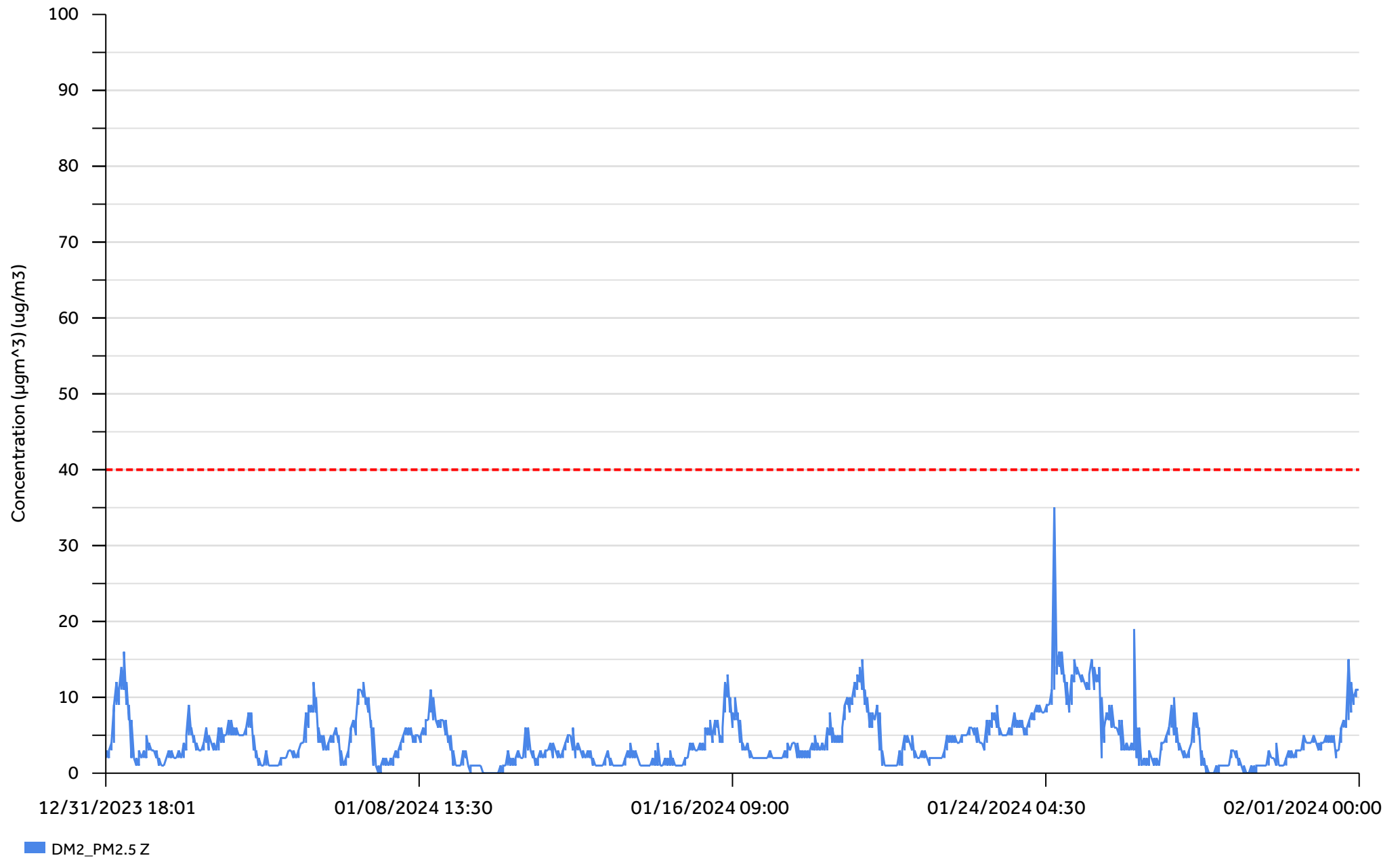


DM3_PM10 Z

Graph 9:
DM1-PM2.5



Graph 10:
DM2-PM2.5



Graph 11:
DM3-PM2.5

