

Northern Bus Garage

Noise, Vibration, and Dust Monitoring Report (September 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 September 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. Mic1, Mic2, and Mic3 recorded their highest noise exceedance outside of working hours. Mics 1 and 5 recorded over 50% of their 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.

There were two (2) vibration exceedances in the month of September.

- VM1 exhibited a vibration exceedance of 0.21 in/sec on September 4 at 11:25, due to waterproofing subcontractor moving materials into the jobsite.
- VM1 exhibited a vibration exceedance of 0.21 in/sec on September 19 at 11:52, caused by rolling/vibrating temporary pavement on 14th Street.

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 |

No operating issue with the monitoring instruments was identified.

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

There were four (4) Air Quality exceedances in the month of September.

- DM1 – Exceedance of the PM_{2.5} limit on 9/18 at 07:16 with a reading of 100 µg/m³.
 - Exceedance due to Demolition subcontractor using hydraulic hammer to chip concrete next to monitoring station.
 - Subcontractor was using water hose to control dust at that time.
- DM1 – Exceedance of the PM₁₀ limit on 9/18 at 07:16 with a reading of 164 µg/m³.
 - Exceedance due to Demolition subcontractor using hydraulic hammer to chip concrete next to monitoring station.
 - Subcontractor was using water hose to control dust at that time.
- DM1 – Exceedance of the PM_{2.5} limit on 9/18 at 09:16 with a reading of 128 µg/m³.
 - Exceedance due to Demolition subcontractor using hydraulic hammer to chip concrete next to monitoring station.
 - Subcontractor was using water hose to control dust at that time.
- DM1 – Exceedance of the PM₁₀ limit on 9/18 at 09:16 with a reading of 217 µg/m³.
 - Exceedance due to Demolition subcontractor using hydraulic hammer to chip concrete next to monitoring station.
 - Subcontractor was using water hose to control dust at that time.

Figure 1: Vibration and Noise Monitor Location Plan

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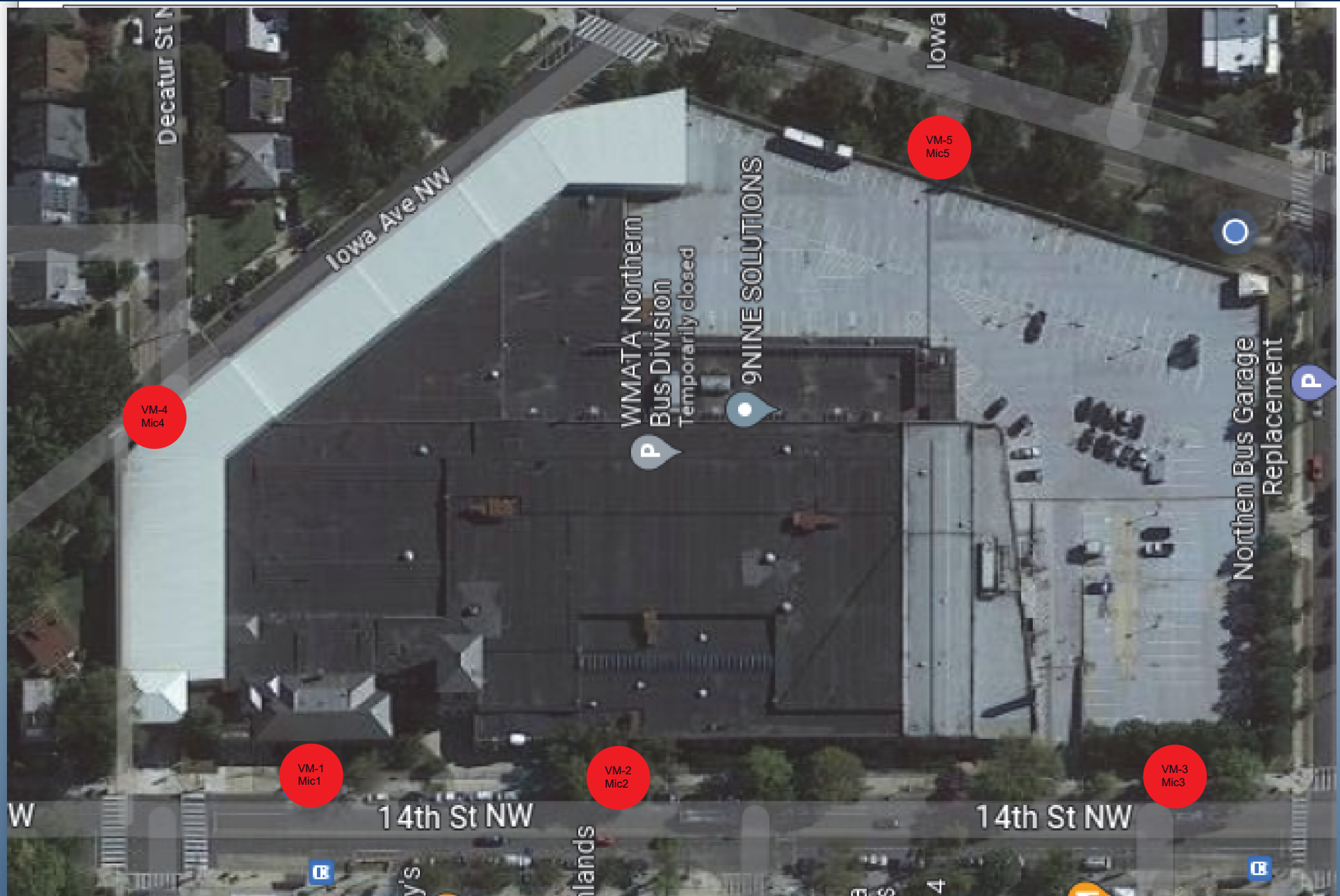


Figure 2: Dust Monitor Location Plan

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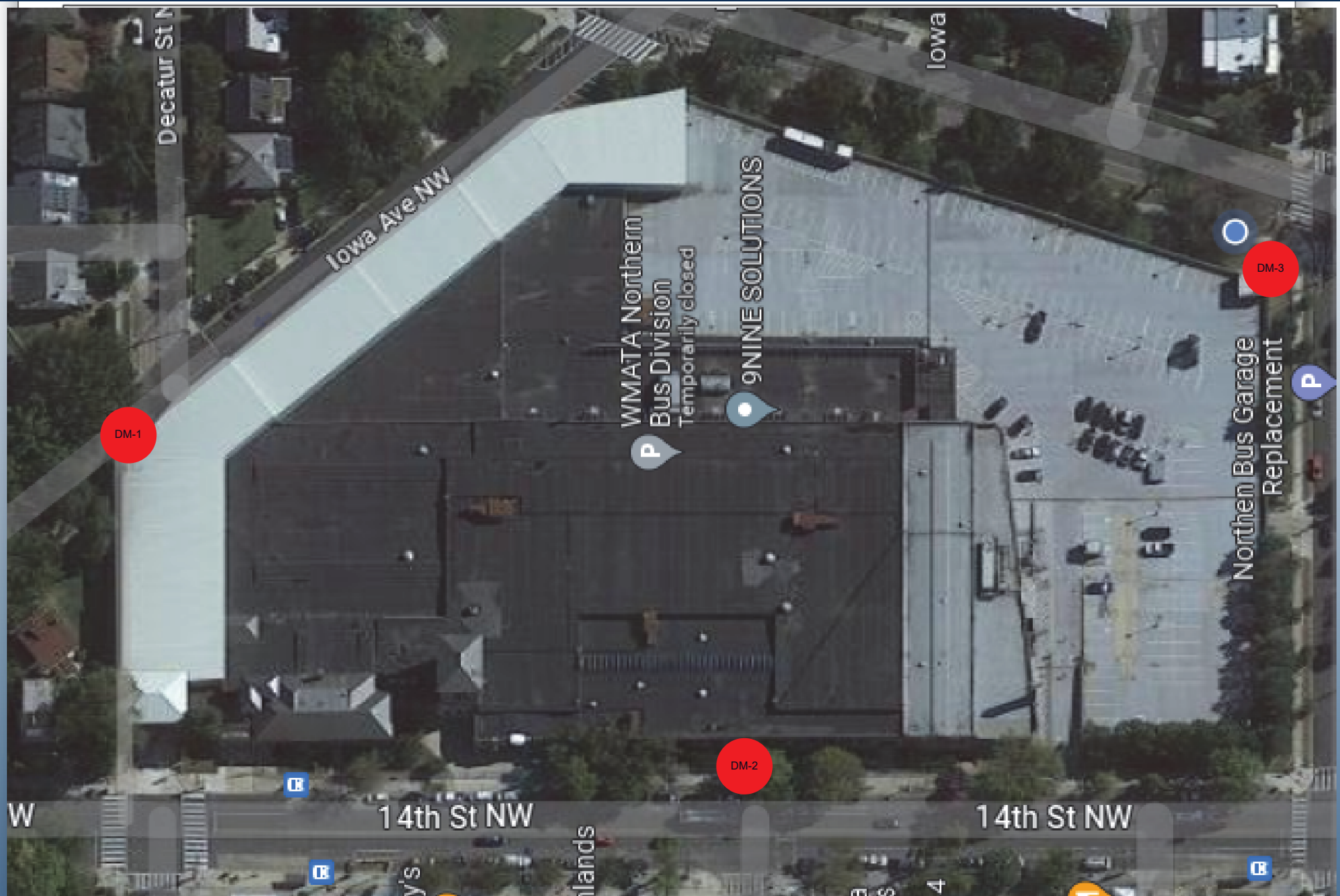


Table 1: Noise Summaries

| VM1-MIC | | |
|-------------|------------|------------|
| | Exceedance | Percentage |
| Work hours | 855 | 46.64% |
| After hours | 575 | 31.37% |
| Weekends | 403 | 21.99% |
| Total | 1833 | 100% |

| VM1-MIC | | | |
|------------|------------|-------------|----------|
| | Work hours | After hours | Weekends |
| Lmax (dBA) | 118.7 | 119.5 | 116.7 |
| Lmin (dBA) | 80.4 | 57.5 | 53.9 |
| L10 (dBA) | 96 | 85 | 79 |
| L90 (dBA) | 85 | 68 | 62 |
| Leq (dBA) | 92.5 | 87.4 | 86.4 |

| VM2-MIC | | |
|-------------|------------|------------|
| | Exceedance | Percentage |
| Work hours | 459 | 55.70% |
| After hours | 197 | 23.91% |
| Weekends | 168 | 20.39% |
| Total | 824 | 100% |

| VM2-MIC | | | |
|------------|------------|-------------|----------|
| | Work hours | After hours | Weekends |
| Lmax (dBA) | 113.4 | 114.4 | 109.7 |
| Lmin (dBA) | 68.9 | 60.6 | 60 |
| L10 (dBA) | 83 | 84 | 73 |
| L90 (dBA) | 72 | 67 | 62 |
| Leq (dBA) | 80.8 | 83.2 | 78.7 |

| VM3-MIC | | |
|-------------|------------|------------|
| | Exceedance | Percentage |
| Work hours | 628 | 51.48% |
| After hours | 378 | 30.98% |
| Weekends | 214 | 17.54% |
| Total | 1220 | 100% |

| VM3-MIC | | | |
|------------|------------|-------------|----------|
| | Work hours | After hours | Weekends |
| Lmax (dBA) | 109.3 | 108.1 | 111.5 |
| Lmin (dBA) | 69.9 | 61.2 | 53.5 |
| L10 (dBA) | 87.7 | 75 | 71 |
| L90 (dBA) | 71 | 64 | 57 |
| Leq (dBA) | 83.1 | 79 | 80.1 |

| VM4-MIC | | |
|-------------|------------|------------|
| | Exceedance | Percentage |
| Work hours | 476 | 94.26% |
| After hours | 17 | 3.37% |
| Weekends | 12 | 2.38% |
| Total | 505 | 100% |

| VM4-MIC | | | |
|------------|------------|-------------|----------|
| | Work hours | After hours | Weekends |
| Lmax (dBA) | 113.4 | 92.6 | 104.3 |
| Lmin (dBA) | 81.4 | 47.9 | 56.5 |
| L10 (dBA) | 105 | 62 | 72 |
| L90 (dBA) | 84 | 51 | 63 |
| Leq (dBA) | 99.9 | 64.9 | 73.8 |

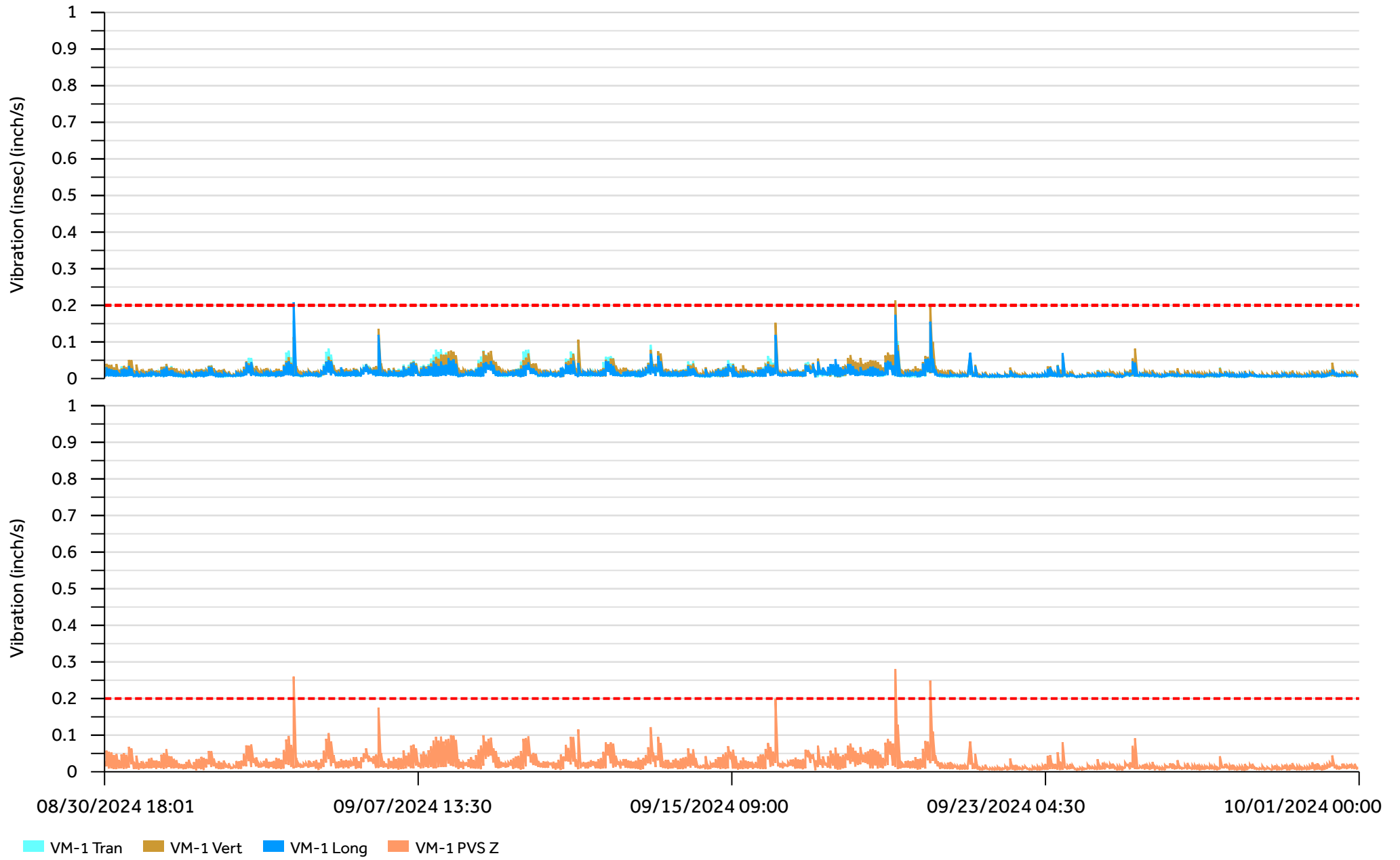
| VM5-MIC | | |
|-------------|------------|------------|
| | Exceedance | Percentage |
| Work hours | 129 | 47.60% |
| After hours | 87 | 32.10% |
| Weekends | 55 | 20.30% |
| Total | 271 | 100% |

| VM5-MIC | | | |
|------------|------------|-------------|----------|
| | Work hours | After hours | Weekends |
| Lmax (dBA) | 108.8 | 108.6 | 108.7 |
| Lmin (dBA) | 56.5 | 54.8 | 53.9 |
| L10 (dBA) | 73 | 73 | 66 |
| L90 (dBA) | 61 | 58 | 56 |
| Leq (dBA) | 78.4 | 77.7 | 77.5 |

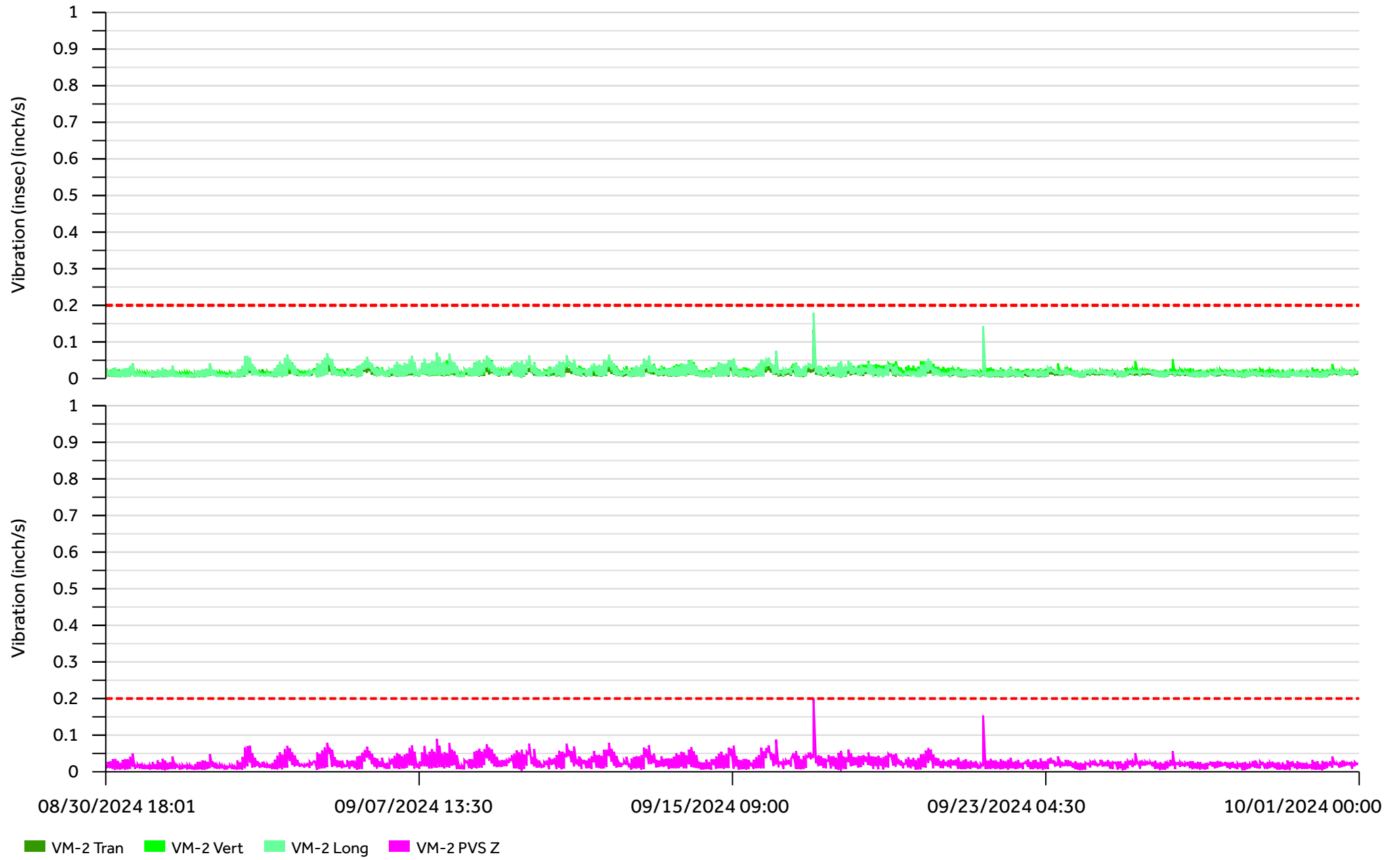
Summary tables contain values for working hours, after hours, and weekend time periods:

- Lmax: Highest Maximum Noise Level recorded for the month, in dBA.
- Lmin: Highest Minimum Noise Level recorded for the month, in dBA.
- L10: Highest noise level that was exceeded 10% of the time of all recording periods this month, in dBA.
- L90: Highest noise level that was exceeded 90% of the time of all recording periods this month, in dBA.
- Leq: Highest Equivalent Continuous Sound Level, or 'average' of all recording periods this month, in dBA.

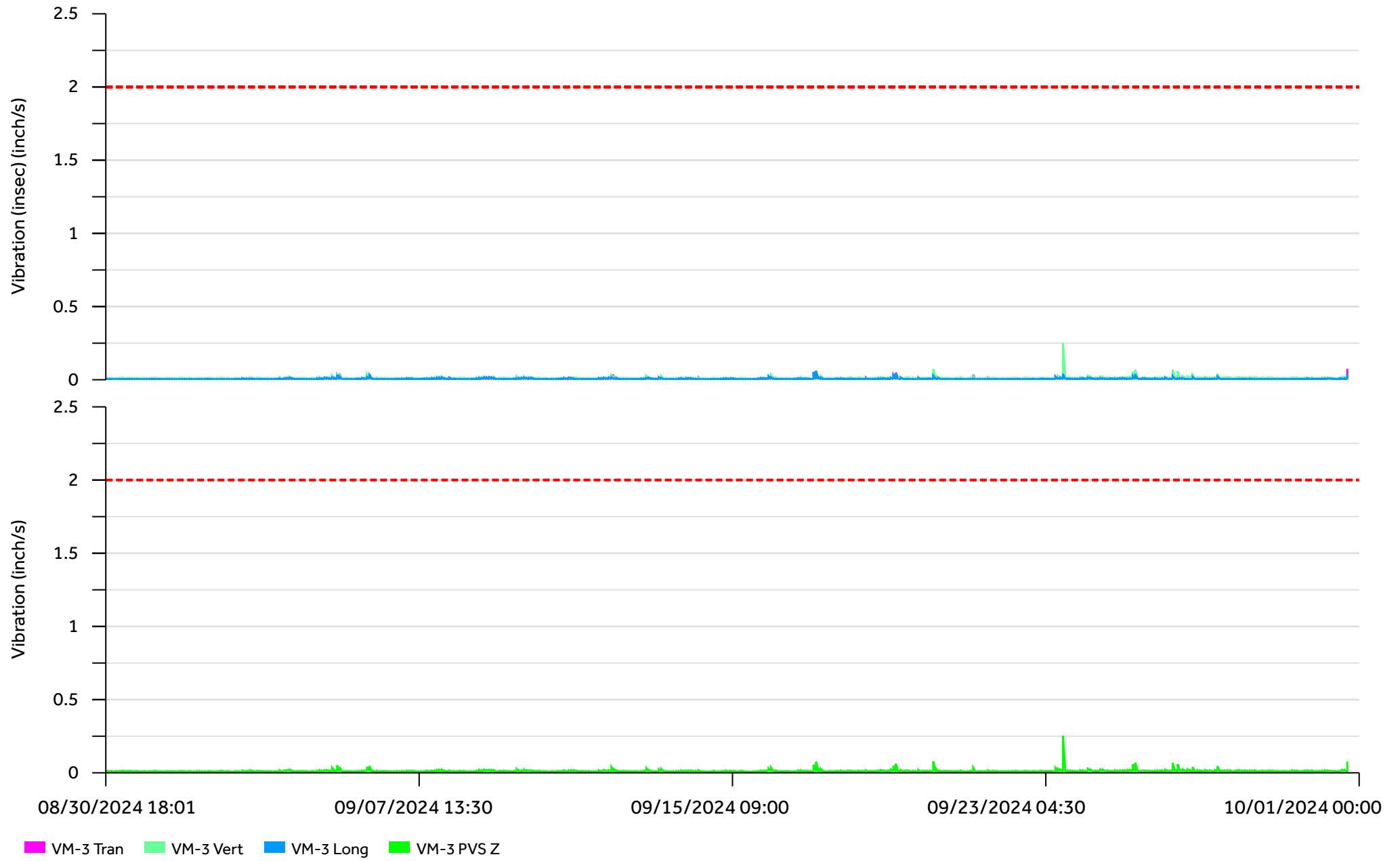
Graph 1
VM-1- Vibration Monitor



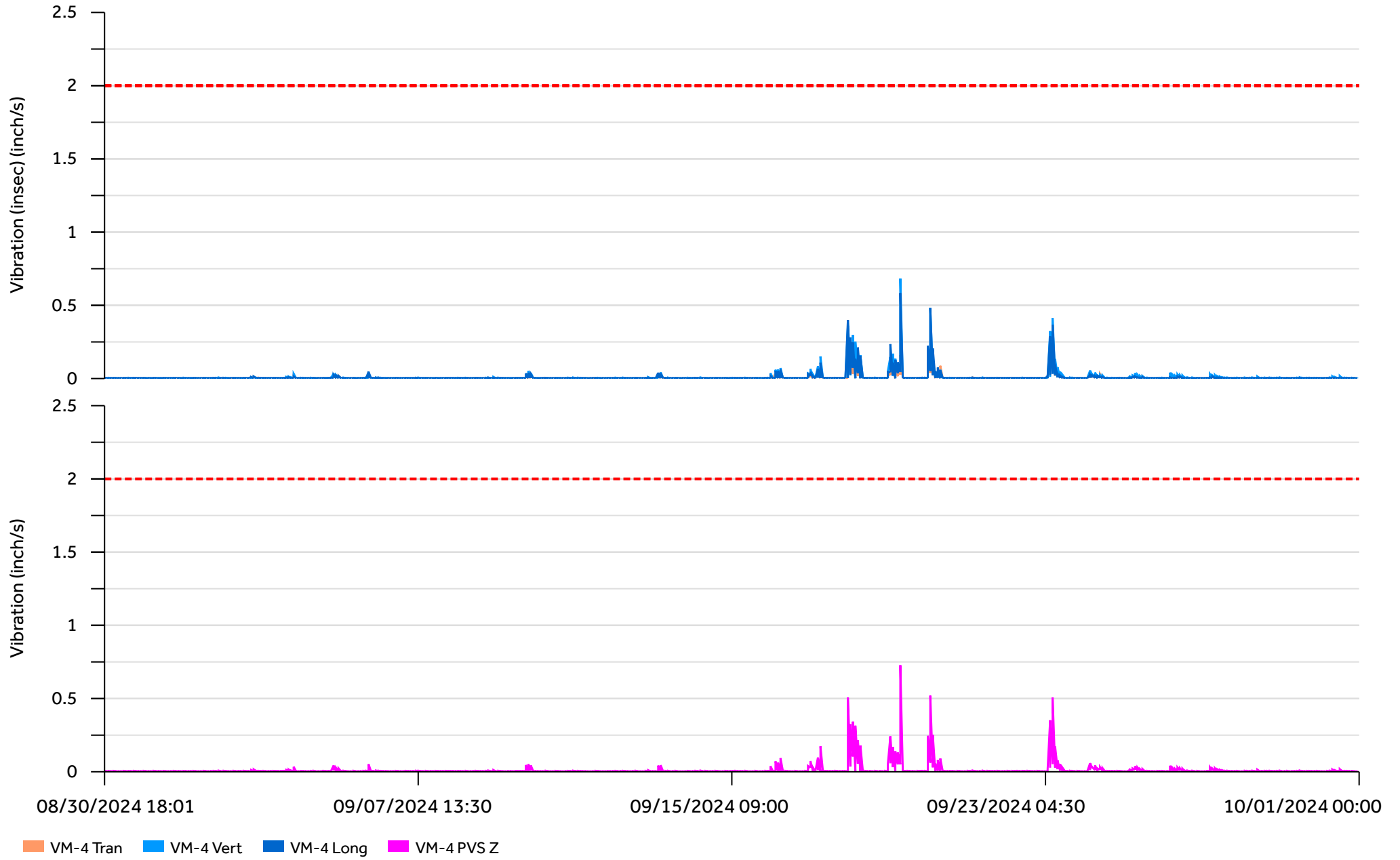
Graph 2
VM-2- Vibration Monitor



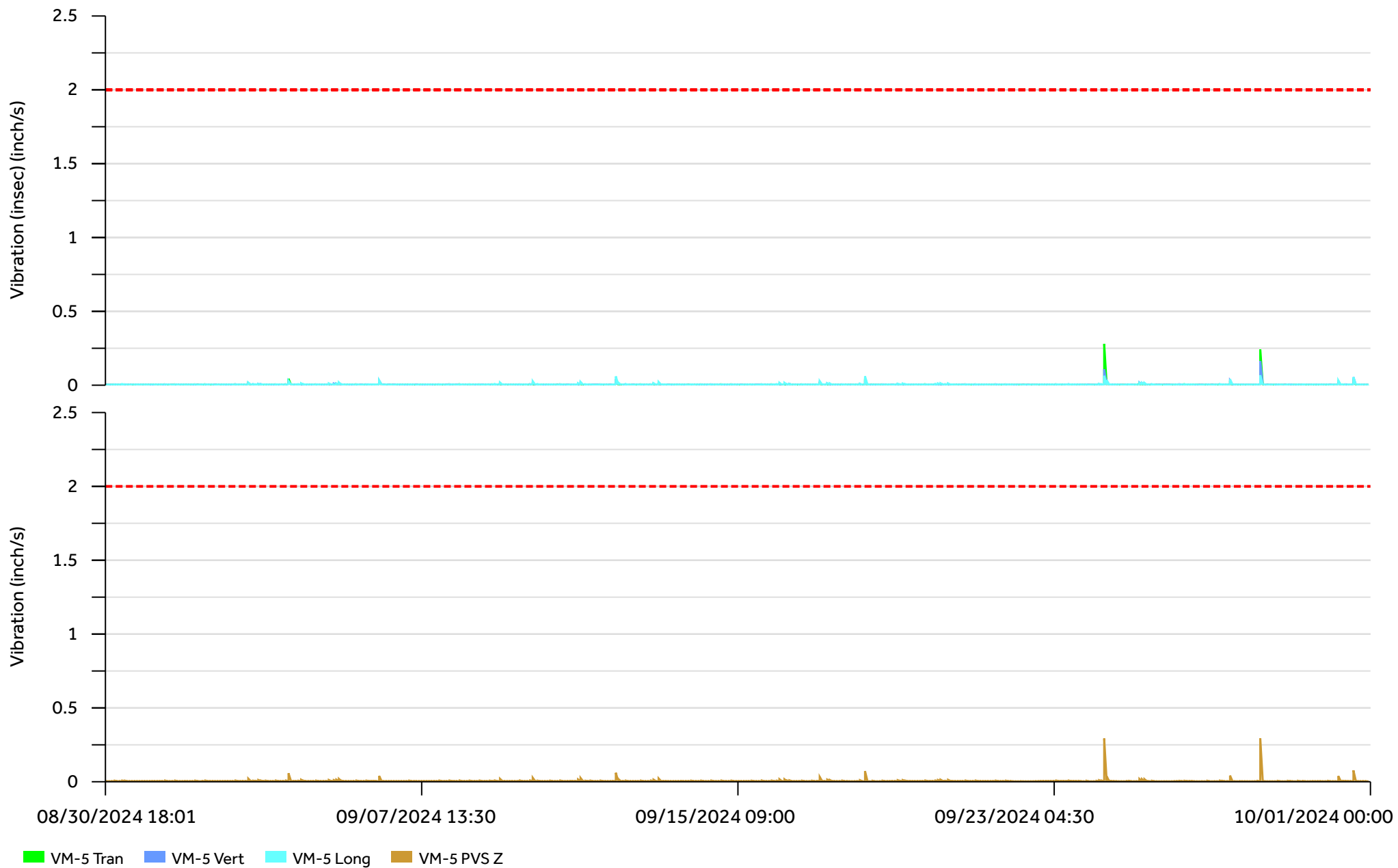
Graph 3
VM-3- Vibration Monitor



Graph 4
VM-4- Vibration Monitor

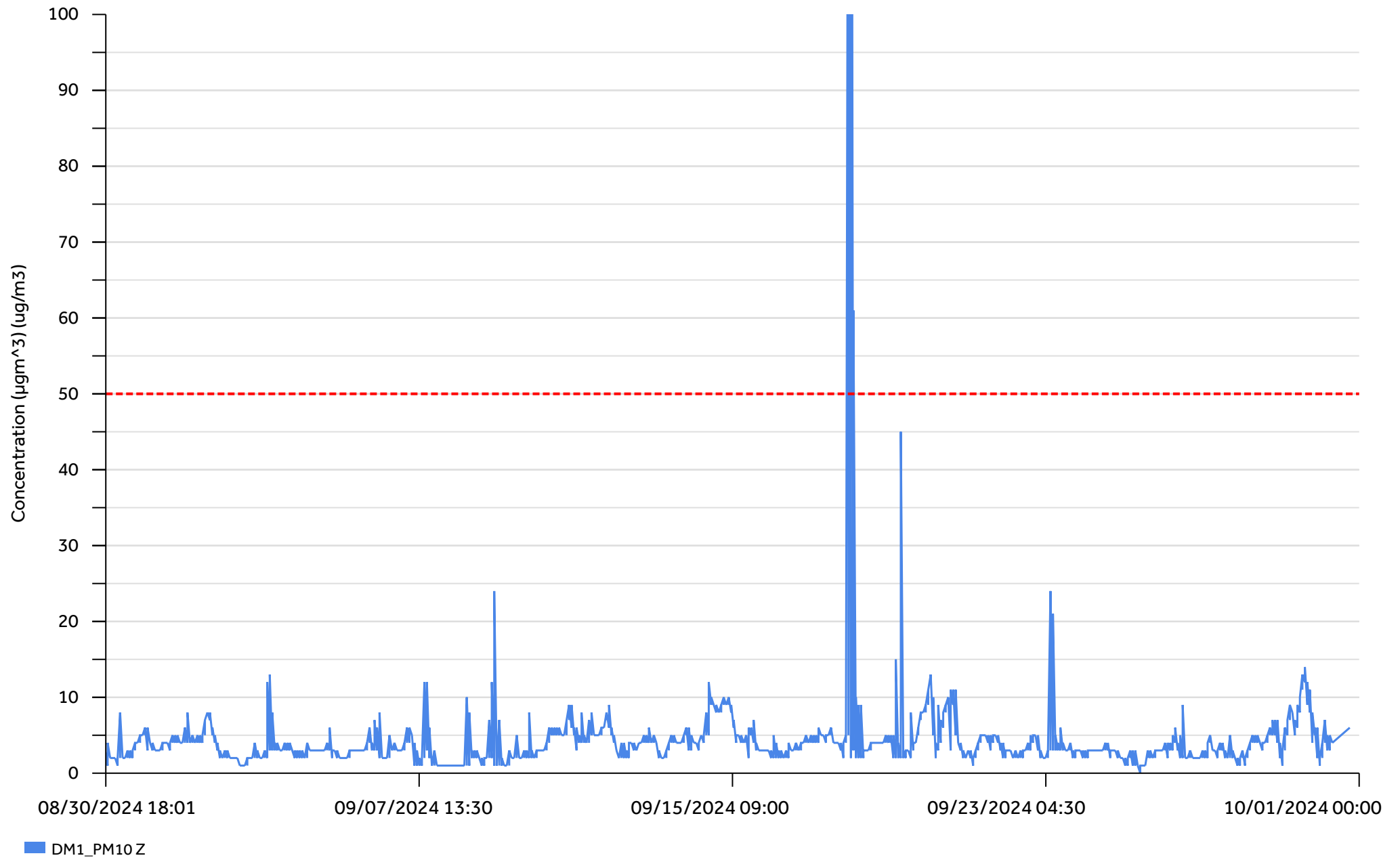


Graph 5
VM-5- Vibration Monitor



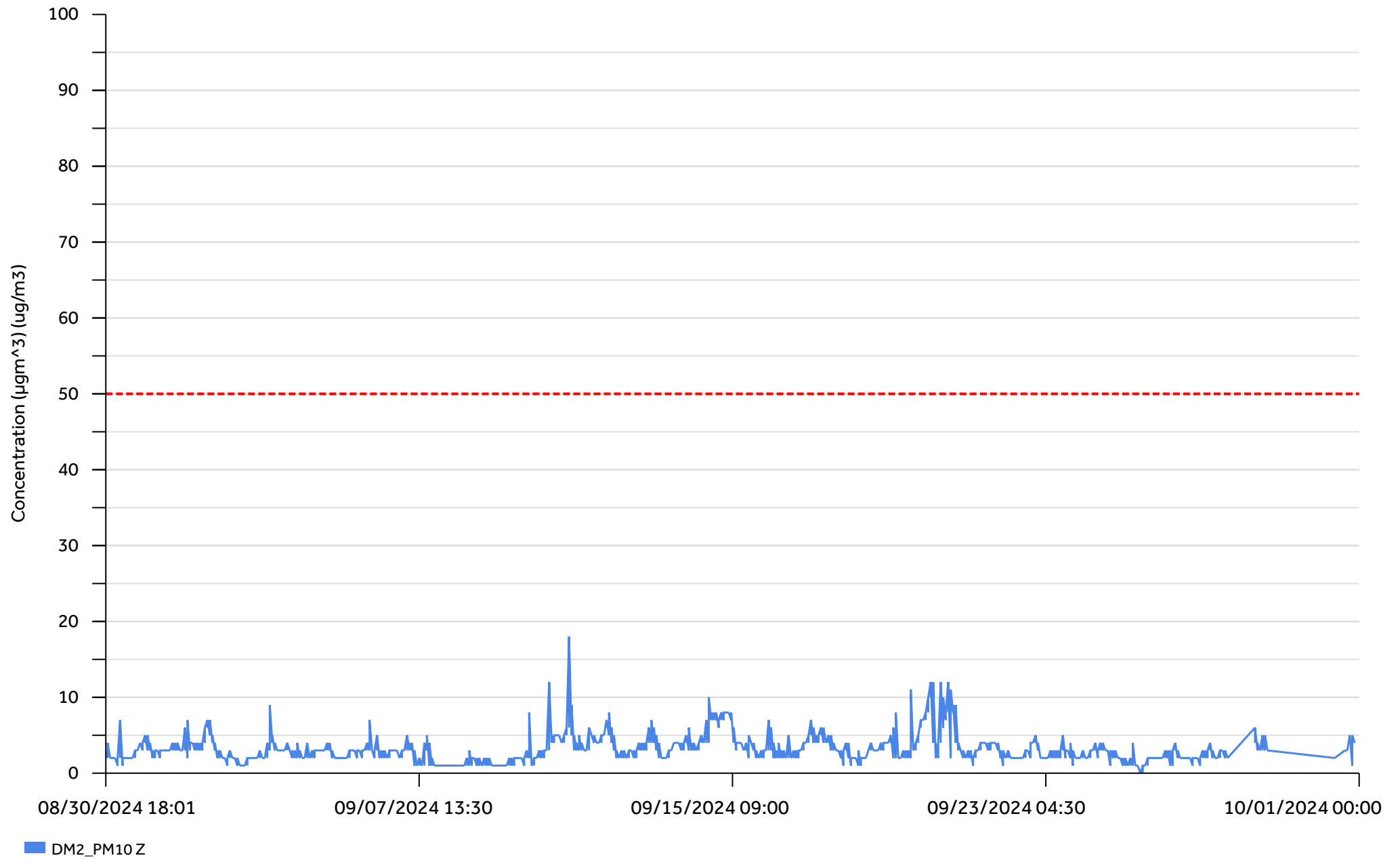
Graph 6

DM1 - PM10

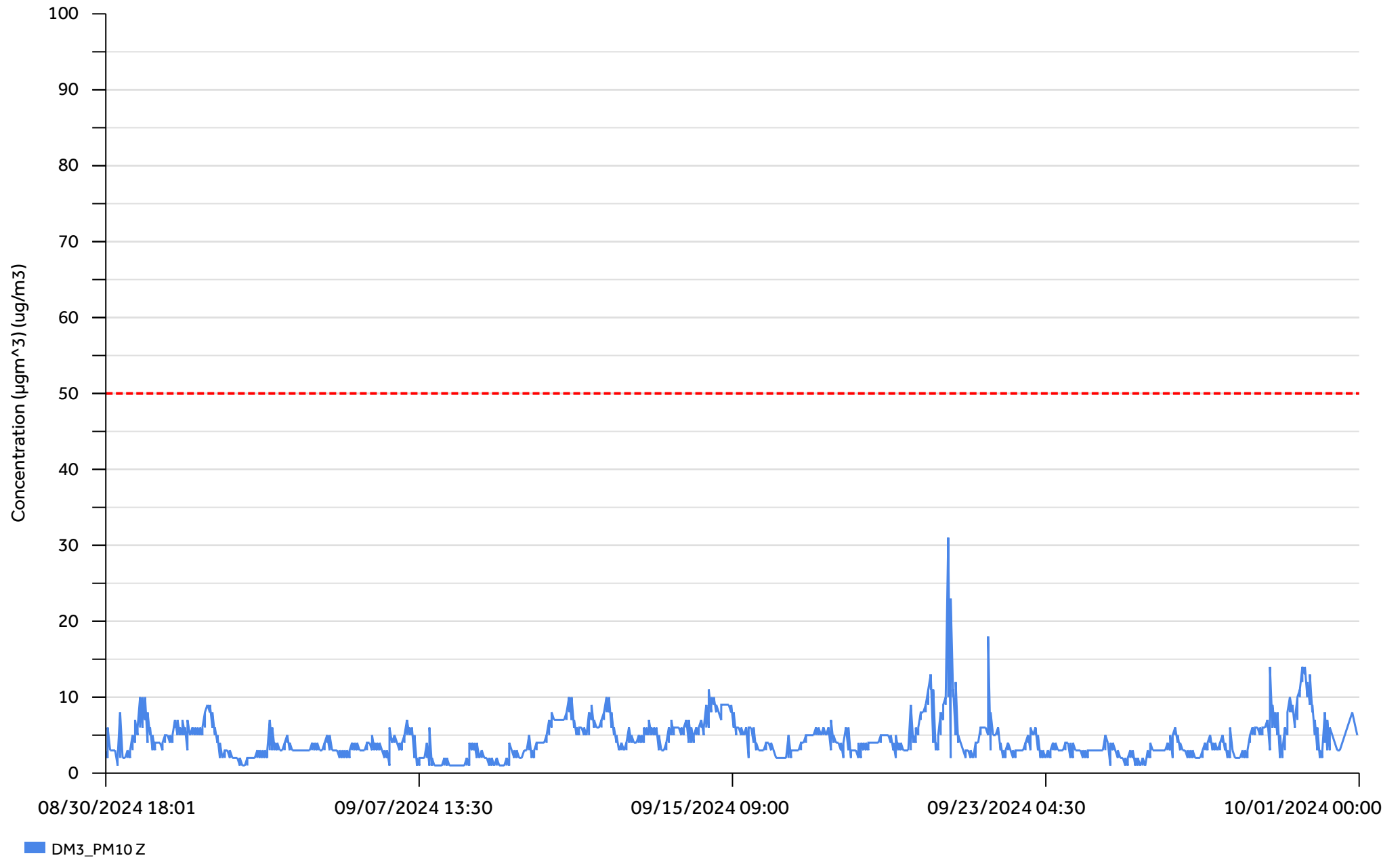


Graph 7

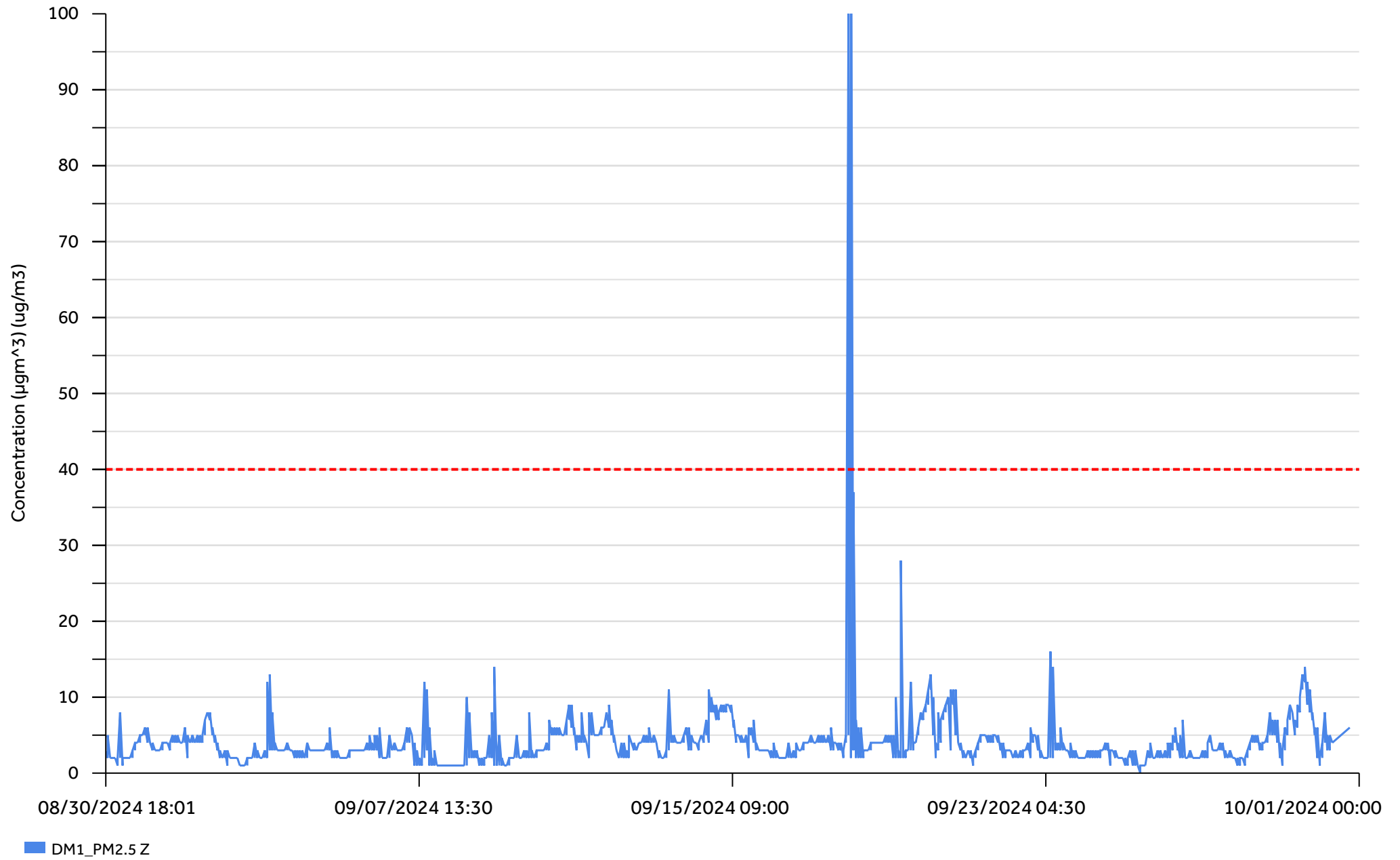
DM2-PM10



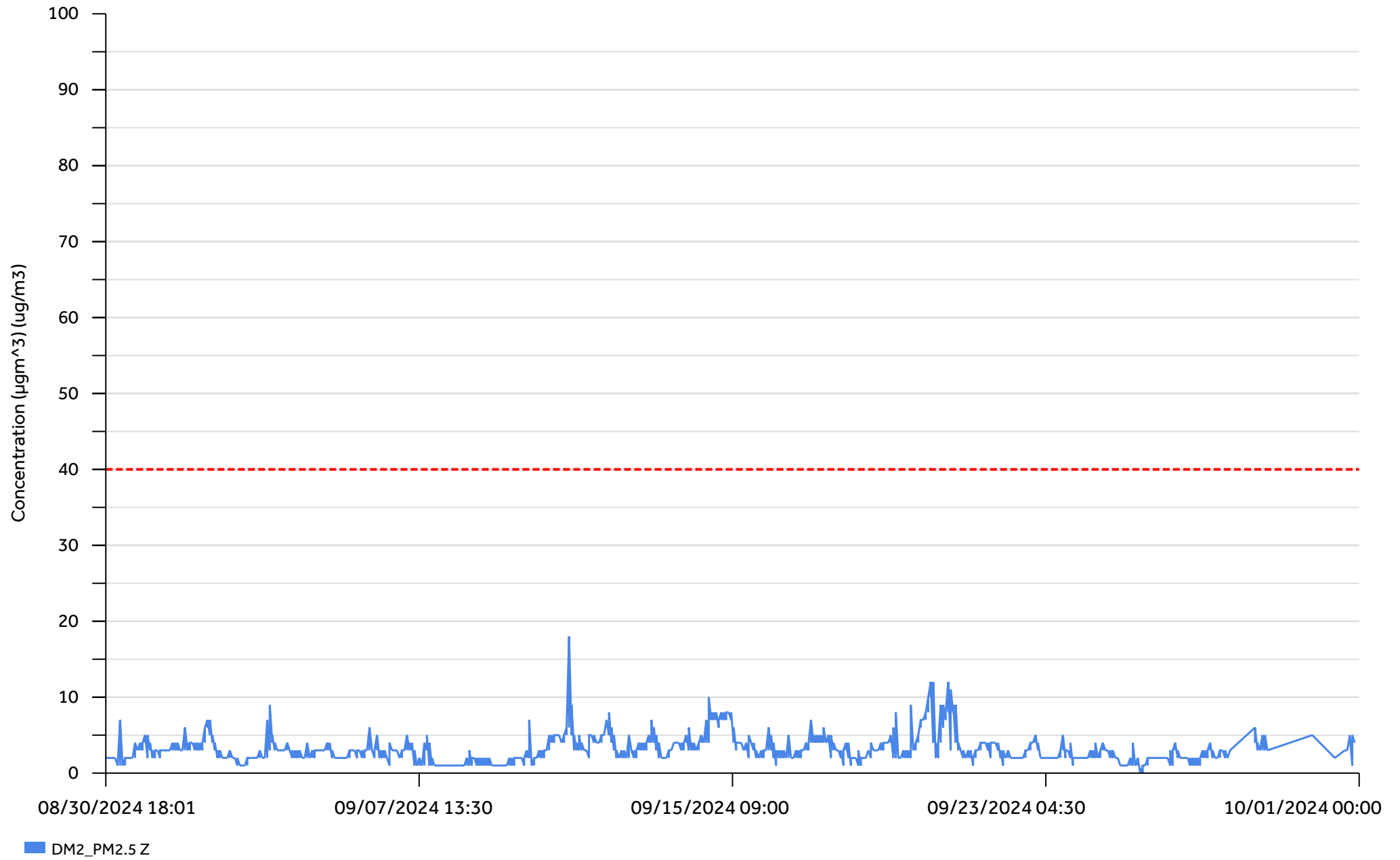
Graph 8
DM3-PM10



Graph 9
DM1-PM2.5



Graph 10
DM2-PM2.5



Graph 11

DM3-PM2.5

