

EAST SIDE COASTAL RESILIENCY

SANDRESM2 | PROJECT AREA 2

AIR QUALITY MONITORING REPORT

Q2 | 2022

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SUBCONSULTANT TO PERFETTO CONTRACTING CORPORATION



NEW YORK CITY DEPARTMENT OF DESIGN & CONSTRUCTION IN PARTNERSHIP WITH
THE CITY OF NEW YORK

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PART 1

I. Air Quality Monitoring: Introduction

The East Side Coastal Resiliency (ESCR) project is a coastal protection initiative, jointly funded by the City of New York and the federal government, aimed at reducing flood risk due to coastal storms and sea level rise on Manhattan's East Side from East 25th Street to Montgomery Street. The ESCR project will protect 110,000 New Yorkers from the impacts of climate change by increasing resiliency for communities, properties, businesses, critical infrastructure, and public open spaces. In addition to providing flood protection, the project will strengthen and enhance waterfront spaces on Manhattan's East Side by improving accessibility, increasing ecological diversity, and delivering improved recreational amenities to a vibrant and highly diverse community.

The project is divided into three project areas: Project Area 1 (from Montgomery Street to E. 15th Street, including East River Park), Project Area 2 (E. 15th Street to E. 25th Street, including Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground), and Parallel Conveyance (work to improve inland drainage on local streets between Montgomery Street and E. 25th Street).

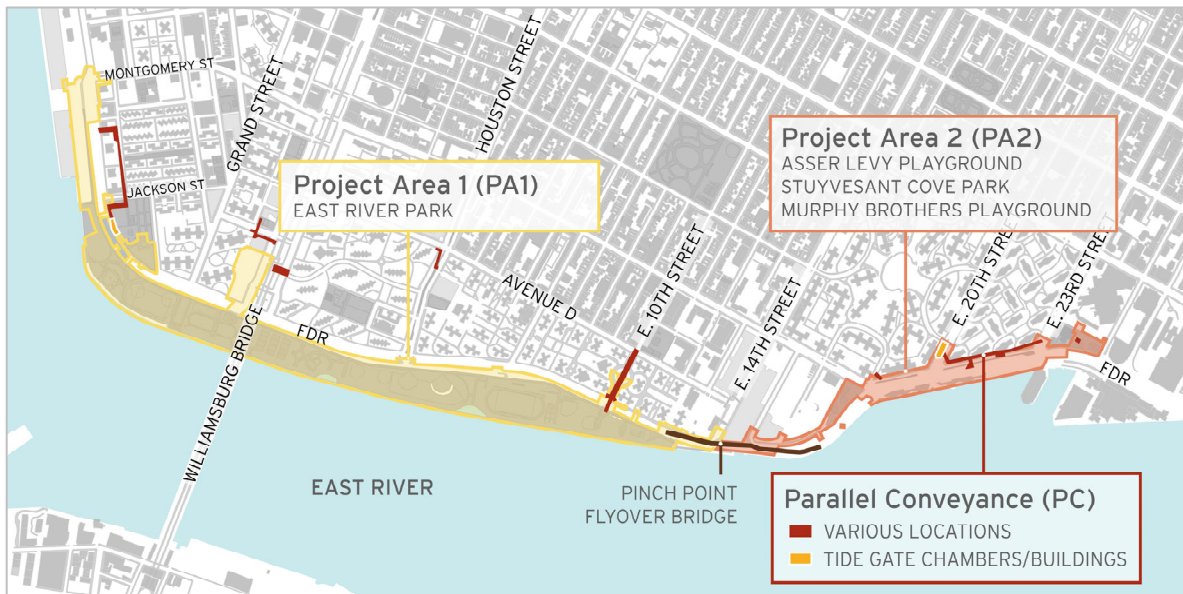


Fig.1 East Side Coastal Resiliency Project Areas

The ESCR team will be conducting air quality monitoring throughout construction in all three Project Areas to ensure the ongoing health and safety of the adjacent community. In particular, the ESCR Air Quality Monitoring program will measure levels of Particulate Matter (PM) at two sizes: PM10 and PM2.5.

As described by the [Environmental Protection Agency \(EPA\)](#):

PM stands for **particulate matter** (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particle pollution includes:

- PM10: inhalable particles, with diameters that are generally 10 micrometers and smaller (typically from dust)

- PM2.5: fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller (typically from vehicle emissions)

The Clean Air Act requires EPA to set national air quality standards for particulate matter, as one of the six criteria pollutants considered harmful to public health and the environment. The law also requires EPA to periodically review the standards to ensure that they provide adequate health and environmental protection, and to update those standards as necessary. National Ambient Air Quality Standards (NAAQS) for PM pollution specify a maximum amount of PM to be present in outdoor air.

The **Permissible Exposure Limit (PEL)** is a regulatory limit to protect public health/welfare set by the National Ambient Air Quality Standards (NAAQS) in line with the requirements of the Clean Air Act on the amount or concentration of a substance in the air. The EPA has set a **24-hour time weighted average (TWA)** as standard for evaluating Particulate Matter (PM) levels, meaning that they average potential PM exposure over a 24-hour period. This is also referred to as the **daily value**. In the line graphs presented in the ESCR monthly data plots, readings are averaged in 15-minute intervals and do not represent the standard TWA of 24-hrs. This more conservative approach will help the ESCR project team monitor the project’s effect on air quality more closely.

The **Action Level (AL)** is lower than the Permissible Exposure Limit (PEL) and represents a level set by the ESCR Air Quality Monitoring Plan which, when reached, will alert the contractor that there has been an increase in particulate matter so that they can assess construction activities and take necessary measures to remediate the condition. Automated alerts are dispatched to the general contractor and the construction management team whenever the AL is exceeded.

The table here illustrates the Permissible Exposure Limit and Action Levels for net PM2.5 and PM10 concentrations over a 24-hour Time Weighted Average (TWA). These levels are measured in micrograms per cubic meter air ($\mu\text{g}/\text{m}^3$):

	Action Level (AL) over a 24-hour TWA	Permissible Exposure Limit (PEL) over a 24-hour TWA
PM2.5	25 $\mu\text{g}/\text{m}^3$	35 $\mu\text{g}/\text{m}^3$
PM10	100 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$

The ESCR Final Environmental Impact Statement analyzed the potential impact of the construction on community air quality and determined that **with consistent air quality monitoring and application of measures to reduce pollutant emissions and suppress dust, “construction of the Preferred Alternative would not result in any predicted concentrations above the National Ambient Air Quality Standards (NAAQS) for NO₂, CO, and PM₁₀ or the de minimis thresholds for PM_{2.5} from nonroad and on-road sources. Therefore, no significant adverse air quality impacts are predicted from the construction of the Preferred Alternative.”** (ESCR FEIS, Chapter 6.10 Construction Air-Quality, 6.10-2)

Along with air quality monitoring, the contractor is required to take extensive preventative measures to control dust and limit vehicle emissions. Potential mitigation techniques include but are not limited to:

- use of water spray for roads, trucks, excavation areas and stockpiles
- use of anchored tarps to cover stockpiles
- use of truck covers during soil transport within site limits and during off-site transport
- employment of extra care during dry and/or high-wind periods

- use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface
- use of a truck wheel wash at site access/egress points to prevent fugitive dust and off-site migration of dust and other particulates

How to Read the Data Plots

The PM readings that follow by month in this report are shown in data plots, as below. The data plots illustrate **Net Particulate Matter (Net PM)** levels (blue line on data plot) in a **15-minute Time Weighted Average (TWA)**. As mentioned above, the federal limits for PM exposure are evaluated on a **24-hour TWA**. By evaluating PM readings on the 15-minute TWA, the ESCR project can ensure that Net PM never exceeds the 24-hour TWA, or daily value.

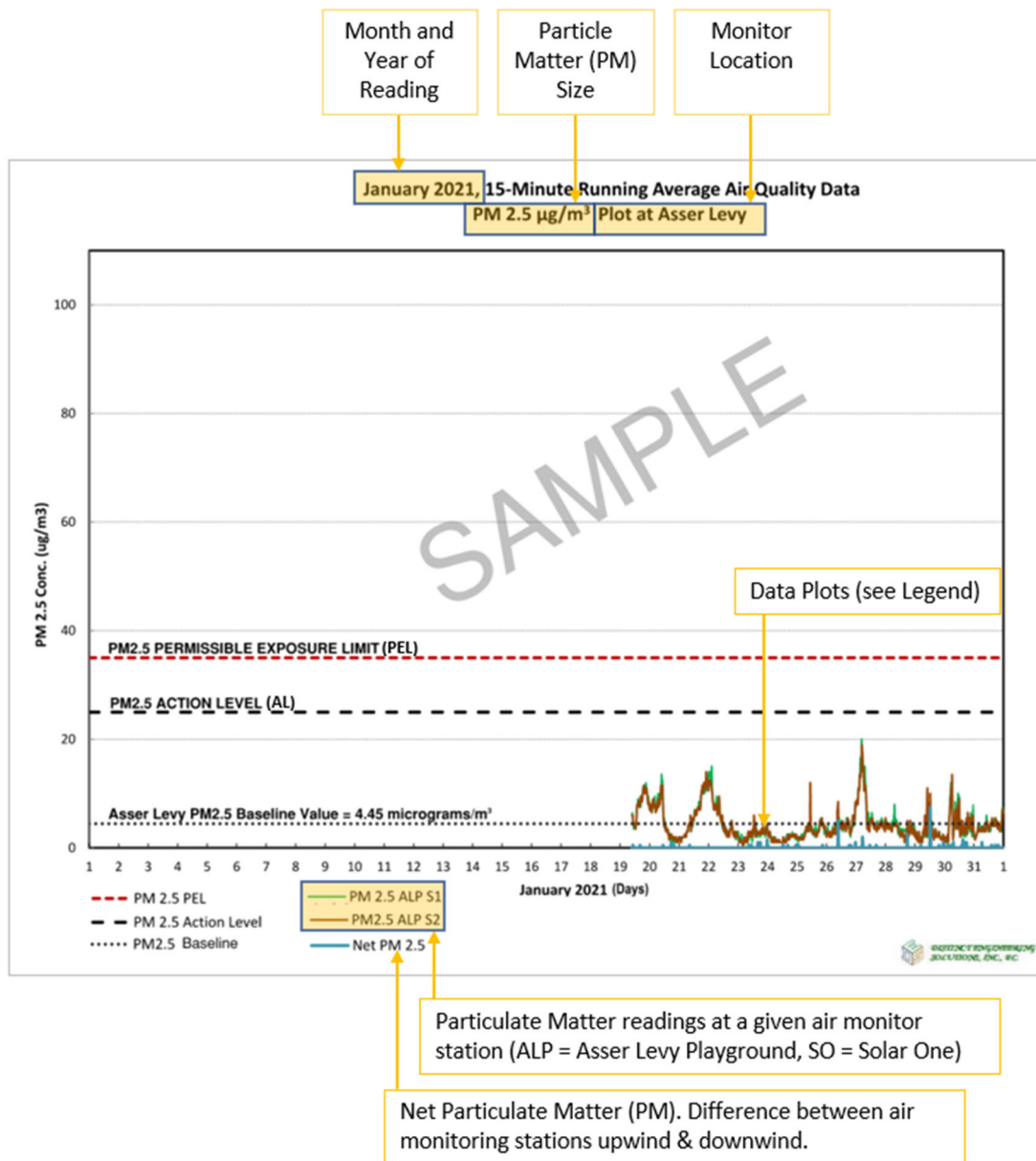


Fig.2 Sample Air Quality Data Plot

The **Net particulate matter (Net PM)** readings are determined as the difference between the upwind and downwind monitoring stations as determined on any day given the wind speed and wind direction. At each construction location at least two air quality monitors are required to determine the Net PM. The Net PM value is important because it measures the **potential increase of particulate matter due to construction activities**. If the wind-speed is less than 0.5 meters per second, the downwind station is considered undetermined and the Net PM will be absent from the data plot. In these circumstances, high readings at one or both of the monitoring stations will still be noted, however the increased levels in the PM readings may be due to conditions unrelated to construction.

And **exceedance** is a daily value that is above the level of the 24-hour time weighted average after rounding to the nearest 10 $\mu\text{g}/\text{m}^3$ (i.e., values ending in 5 or greater are to be rounded up).

An **exceptional event** is an uncontrollable event caused by natural sources of particulate matter or an event that is not expected to recur at a given location. Inclusion of such a value in the computation of exceedances or averages could result in inappropriate estimates of their respective expected annual values.

An **outlier** is a data point on a graph or in a set of results that is very much bigger or smaller than the next nearest data point. For example, outliers among monitoring data can be due to instrument malfunctions, the influence of harsh environments, and the limitation of measuring methods.

II. Executive Summary

This report summarizes the Particulate Matter (PM) readings for ESCR Project Area 2 (PA2), collected by Distinct Environmental Group, environmental subconsultant to the PA2 contractor, Perfetto Contracting Corporation (PCC), from April through June 2022. The PA2 contract requires a minimum of four (4) air quality monitoring stations throughout construction, which will be relocated as necessary to reflect the phased construction activities.

At the start of this period, construction activities occurred in the area along Avenue C, north to Asser Levy Playground (ALP) at E 25th Street, and south to E 20th Street within Stuyvesant Cove Park adjacent to the Solar One (SO) Building. Four stations were set up within the PA2 active construction zone (Fig 6). ALP-S1 and ALP-S2 monitoring stations were installed in Asser Levy Playground (ALP) on January 8, 2021. SO-S3 and SO-S4 monitoring stations were installed around the Solar One (SO) construction site on January 11 and March 25, 2021.

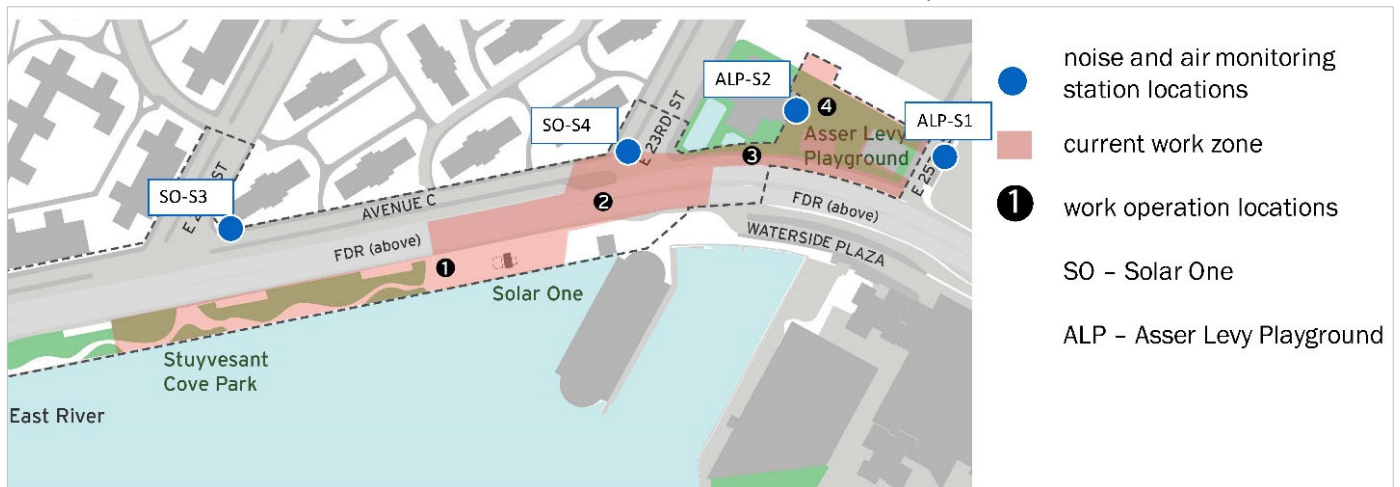


Fig.3 ESCR Project Area 2 Phase 2 Air Quality Monitoring Station Locations, April – May 2022

On May 13, 2022, with construction activities complete at Asser Levy Playground, ALP-S1 and ALP-S2 were relocated further south to accommodate Phase 3 of PA2 construction.

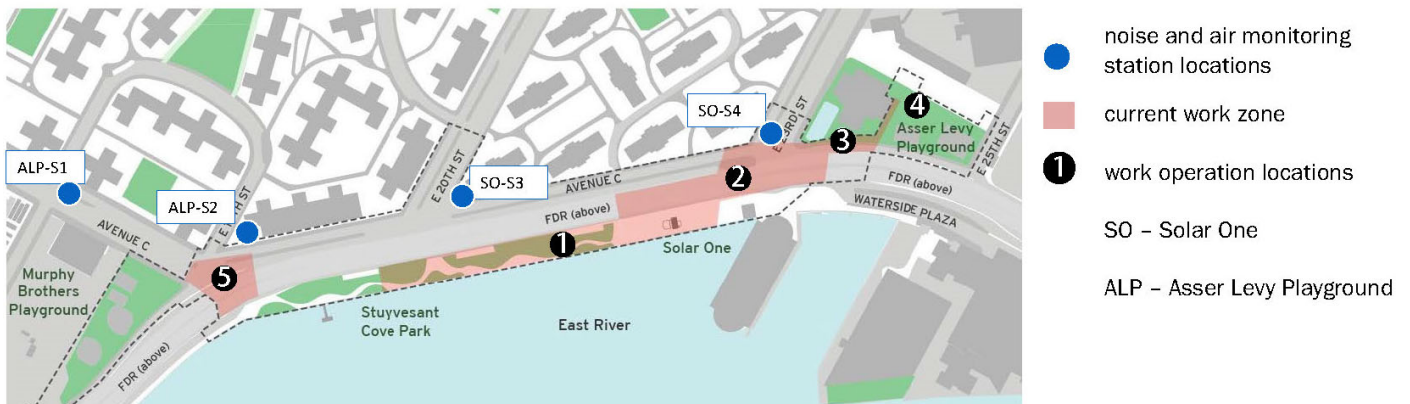


Fig.4 ESCR Project Area 2 Phase 3 Air Quality Monitoring Station Locations, May – June 2022

Work Activities during this period included:

- **Area 1: Stuyvesant Cove Park north of E. 20th Street**

- Construction work in this quarter focused on floodwall construction, seatwall construction, sidewalk installation, and plumbing and electric work
- **Area 2: E 23rd Street Intersection at East Service Road/FDR Drive**
 - Construction activities at this intersection included utility work and floodwall construction.
- **Area 3: West Service Road between E 23rd and E 25th Streets**
 - Work along the West Service Road focused concrete floodwall construction.
- **Area 4: Asser Levy Playground**
 - At Asser Levy Playground, the contractors continued Park reconstruction, including playground equipment assembly, and floodwall construction. The playground reopened to the public on May 13, 2022.
- **Area 5: E 18th Street at southbound FDR entrance ramp and Avenue C**
 - Work at the intersection of E. 18th Street and Avenue C included pile installation and ConEd utility work.

Though air quality is monitored 24/7, typical work hours during the period of this report were 7:00 am – 3:30 pm.

Summary of Air Quality Monitoring Reports:

For the months of April-June 2022, construction-related levels of Particulate Matter (PM) at both net PM2.5 and PM10 levels did not surpass Daily Permissible Exposure Limits (PEL) as set by federal standards for the 24-hour Time Weighted Average (TWA), or daily value, and did not cause air quality concerns to the public or on-site workers. The contractor, PCC, in conjunction with the contractor’s environmental specialist, has successfully implemented mitigation techniques at both Action Levels as well as Permissible Exposure Limits (15-minute TWA) to suppress construction activity effects on air quality at throughout the Project Area 2 work-zone.

April 2022:

- PM10 levels did not surpass the Permissible Exposure Level (PEL) in PA2 in April.
- PM2.5 levels surpassed the PEL (15-minute TWA) at Asser Levy Playground on April 4, 5, 12, 14, and 16. PM2.5 levels did not surpass the PEL (15-minute TWA) at Solar One in April.

May 2022:

- PM10 levels did not surpass the Permissible Exposure Level (PEL) in PA2 in May.
- PM2.5 levels surpassed the PEL (15-minute TWA) at Asser Levy Playground on the following days: May 1, 9, and 12. After relocating the ALP monitors to the area around E. 18th Street, PM2.5 levels surpassed the PEL (15-minute TWA) at those monitors on May 14, 15, 16, 20, and 21. PM2.5 levels did not surpass the PEL (15-minute TWA) at Solar One in May.

June 2022:

- PM10 levels surpassed the Permissible Exposure Limit (PEL) for the 15-minute time weighted average (TWA) at E. 18th Street (ALP-S2) on June 14.
- PM2.5 levels surpassed the Permissible Exposure Limit (PEL) for the 15-minute TWA at ALP-S2 on June 5 and June 14. PM2.5 levels surpassed the PEL (15-minute TWA) at Solar One on June 4.

PART 2

Summary of Data April 2022:

PM10 levels did not surpass the Permissible Exposure Level in Project Area 2 in April.

PM2.5 levels surpassed the PEL (15-minute TWA) at Asser Levy Playground on April 4, 5, 12, 14, and 16.

PM2.5 levels did not surpass the PEL in Solar One in April.

For the month of April 2022, construction-related Particulate Matter (PM) net 2.5 or 10 levels did not surpass Daily Permissible Exposure Limits (PEL) (24-hour time weighted average).

PM 10 $\mu\text{g}/\text{m}^3$

- **Asser Levy Playground (ALP):** There were no recorded exceedances in Asser Levy Playground for PM 10 $\mu\text{g}/\text{m}^3$ in the month of April.
- **Solar One (SO):** There were no recorded exceedances in Solar One for PM 10 $\mu\text{g}/\text{m}^3$ in the month of April.

PM 2.5 $\mu\text{g}/\text{m}^3$

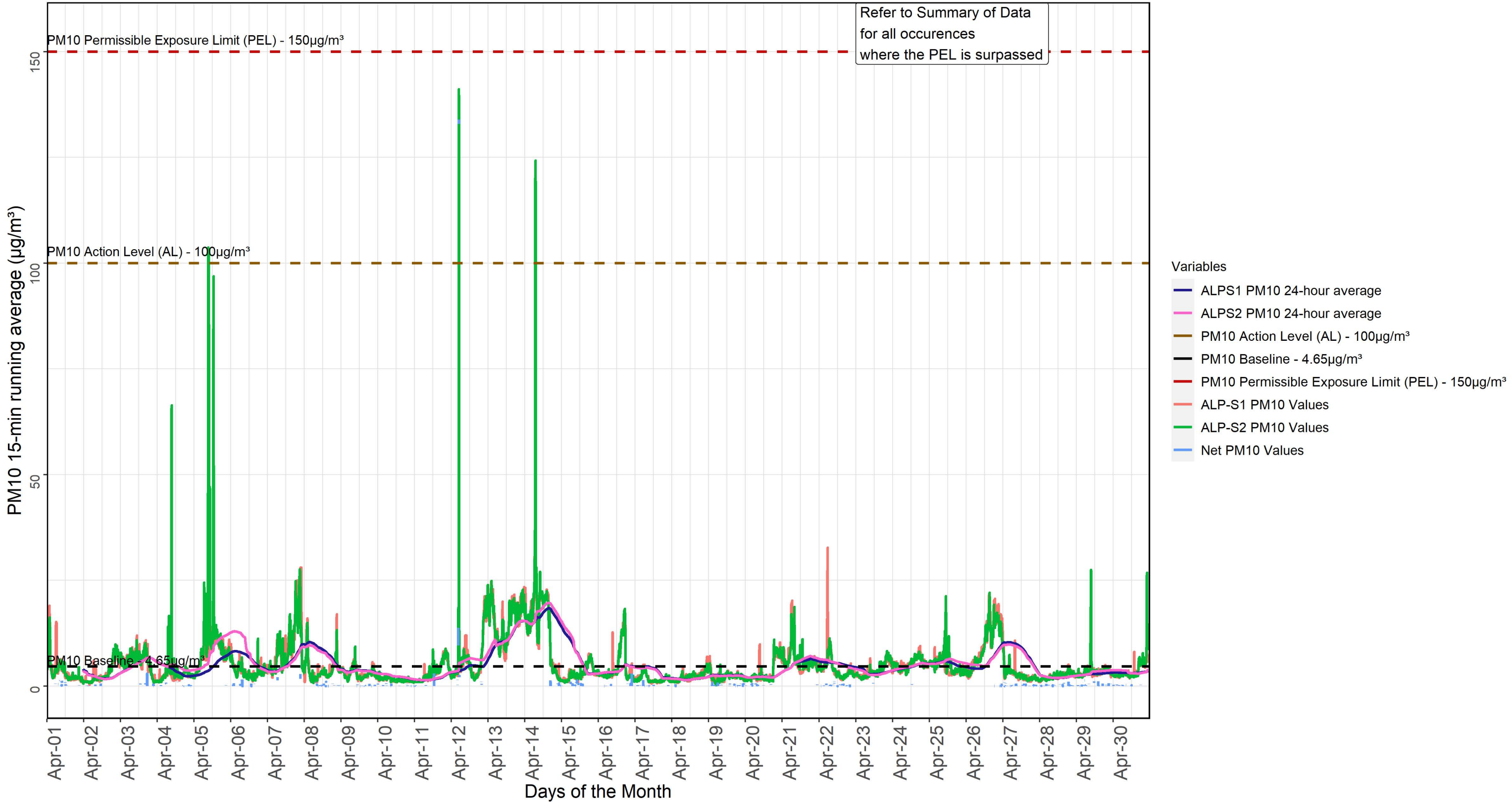
- **Asser Levy Playground (ALP):** High PM2.5 $\mu\text{g}/\text{m}^3$ levels were recorded on five occasions.
 1. On 4/4, 4/12, 4/14, and 4/6, these increased levels occurred for a duration of 15 minutes or less and then abated. On all occasions except for 4/4, these levels occurred outside of working hours.
 2. On 4/5, the higher levels were due to a leaf blower being used close to one of the monitors (ALP-S2). The Net PM levels were not surpassed on this occasion.
- **Solar One (SO):** There were no recorded exceedances in Solar One for PM2.5 $\mu\text{g}/\text{m}^3$ in the month of April.

Mitigation Measures

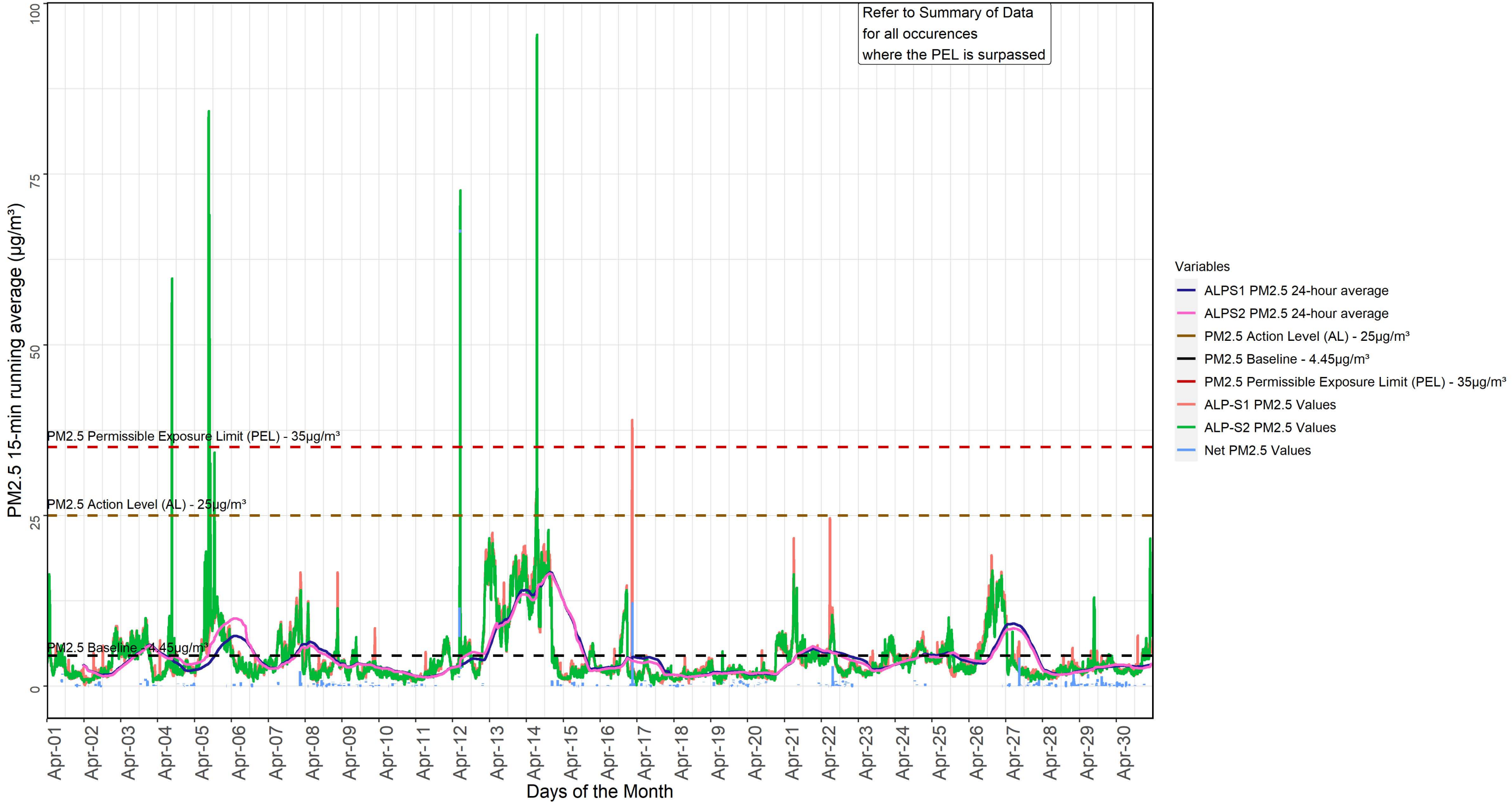
- Throughout the month, construction activity was closely monitored and dust mitigation techniques were continuously implemented to successfully contain any airborne particulates created due to construction activity.

APRIL 2022 DATA PLOTS

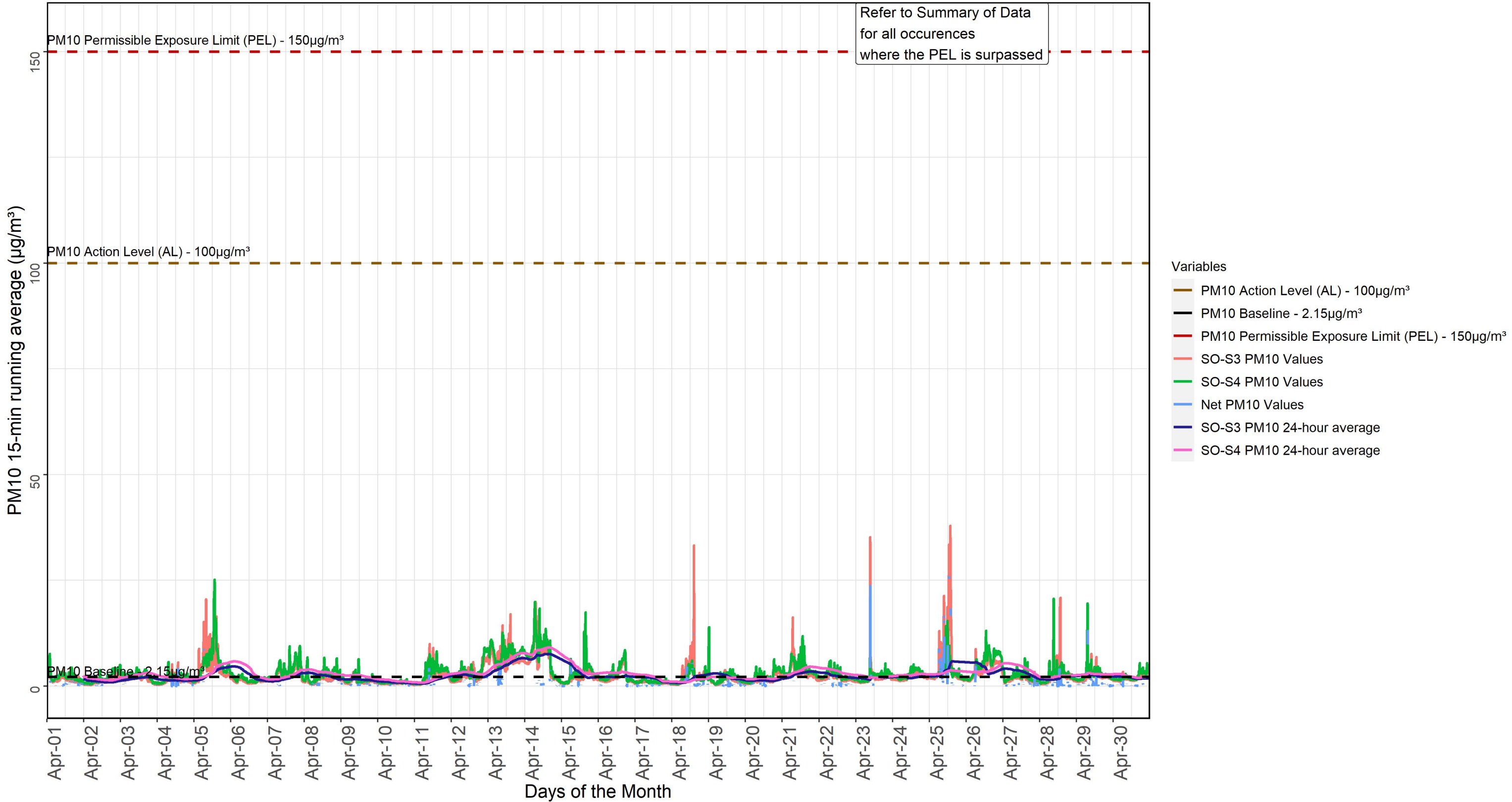
ALP-S1 and ALP-S2 PM 10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of April 2022



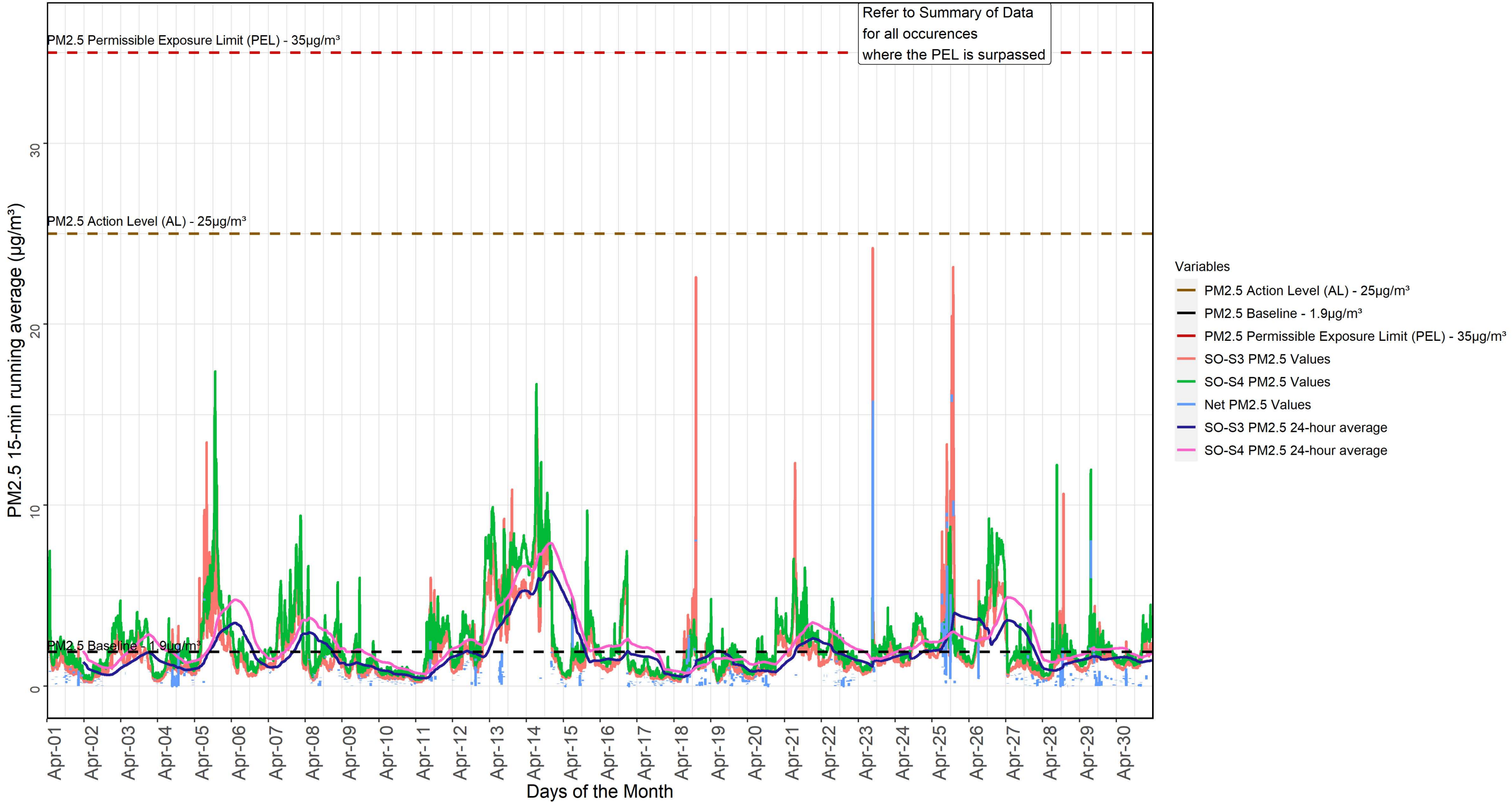
ALP-S1 and ALP-S2 PM 2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of April 2022



SO-S3 and SO-S4 PM10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of April 2022



SO-S3 and SO-S4 PM2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of April 2022



Summary of Data May 2022:

PM10 levels did not surpass the Permissible Exposure Level (PEL) in Project Area 2 in May.

PM2.5 levels surpassed the PEL (15-minute TWA) at Asser Levy Playground on the following days: May 1, 9, and 12. After relocating the ALP monitors to the area around E. 18th Street, PM2.5 levels surpassed the PEL (15-minute TWA) at those monitors on May 14, 15, 16, 20, and 21. PM2.5 levels did not surpass the PEL (15-minute TWA) at Solar One in May.

For the month of May 2022, construction-related Particulate Matter (PM) net 2.5 or 10 levels did not surpass Daily Permissible Exposure Limits (PEL) (24-hour time weighted average).

PM 10 µg/m³

- **Asser Levy Playground (ALP):** PM 10 µg/m³ levels remained under the Permissible Exposure Limit (PEL).
- **Solar One (SO):** PM 10 µg/m³ levels remained under the PEL.

PM 2.5 µg/m³

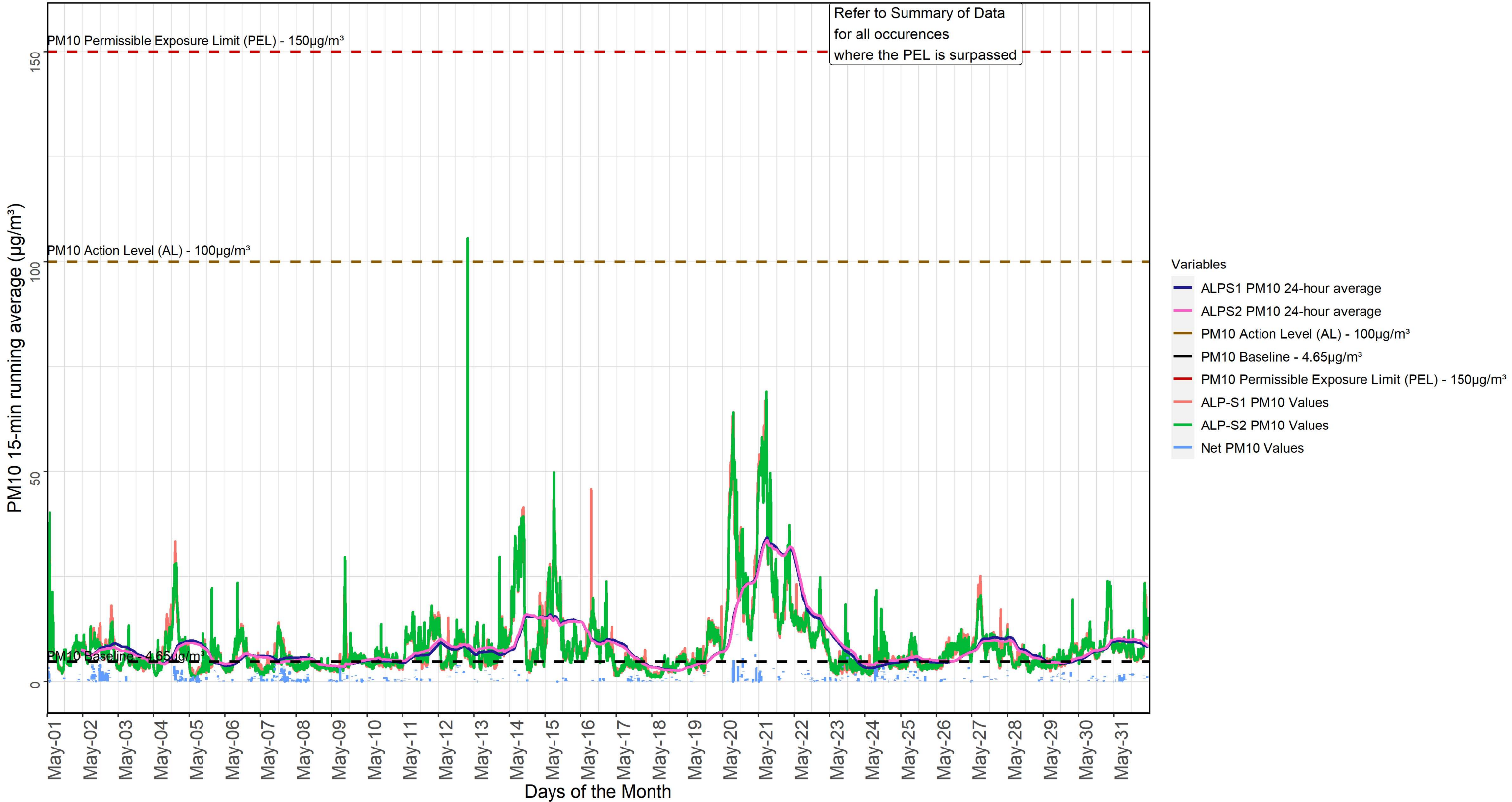
- **Asser Levy Playground and E. 18th Street (ALP):** The PM2.5 µg/m³ levels surpassed the Permissible Exposure Limit (15-minute TWA) on eight occasions:
 1. On 5/14, 5/15, 5/16, and 5/21, these readings occurred over the weekend or in the morning prior to construction hours, when no work was occurring.
 2. On 5/1 and 5/12, high readings were recorded for less than 15 minutes in duration and upon the contractor's investigation, no work was occurring to instigate the readings.
 3. On 5/9, the increased readings were found to be due to utility and garbage truck idling near the monitor. These trucks were not related to construction activities and once the idling ceased, the higher levels abated.
 4. On 5/20, the higher readings began at 4:30 am, prior to the construction work shift. Upon investigation, the contractor did not observe any construction-related activity in the vicinity of the monitors.
- **Solar One (SO):** PM2.5 µg/m³ remained under the Permissible Exposure Limit (PEL).

Mitigation Measures:

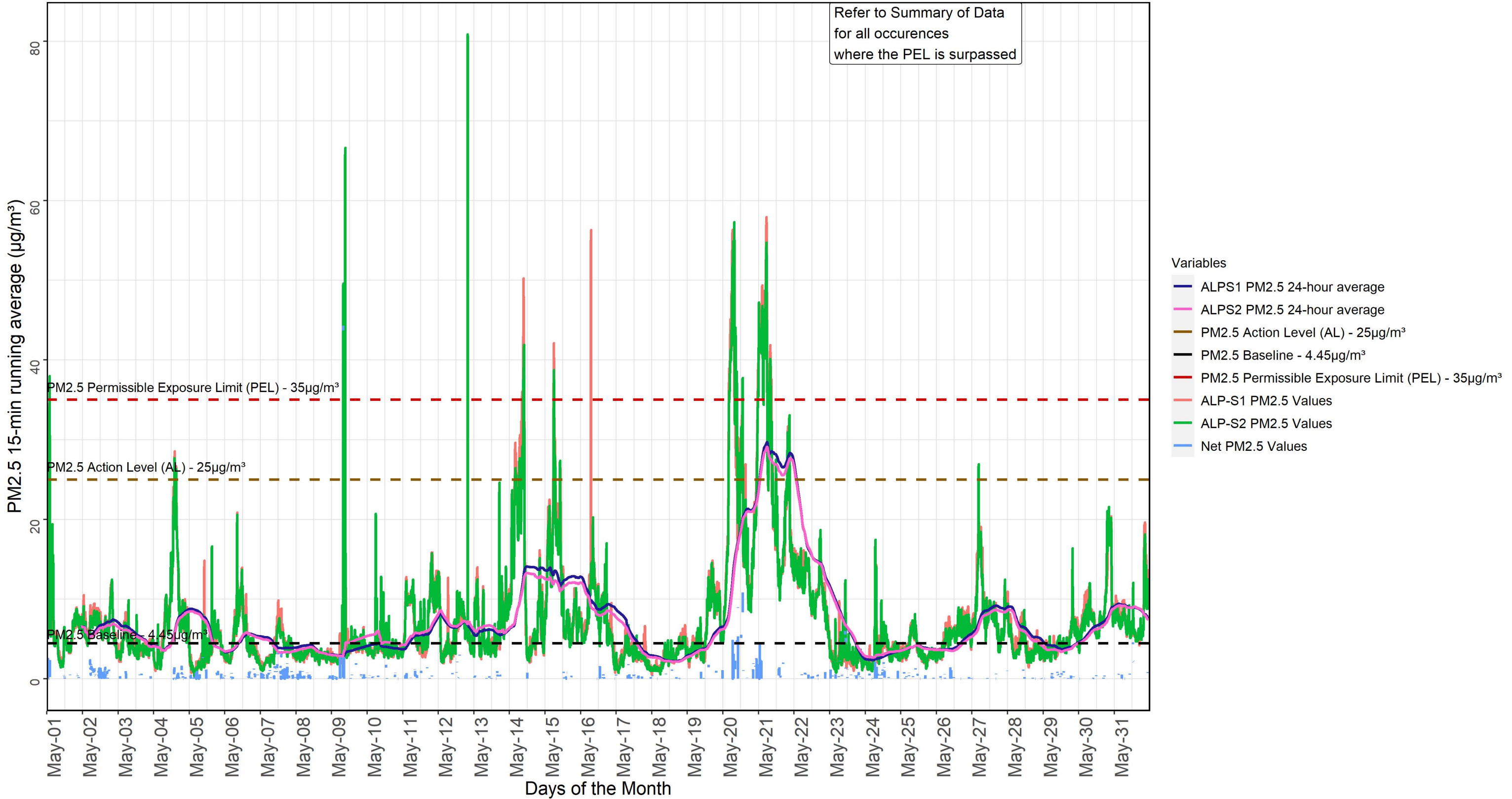
- Construction activity was closely monitored and dust mitigation techniques were continuously implemented to contain airborne particles due to construction activities.

MAY 2022 DATA PLOTS

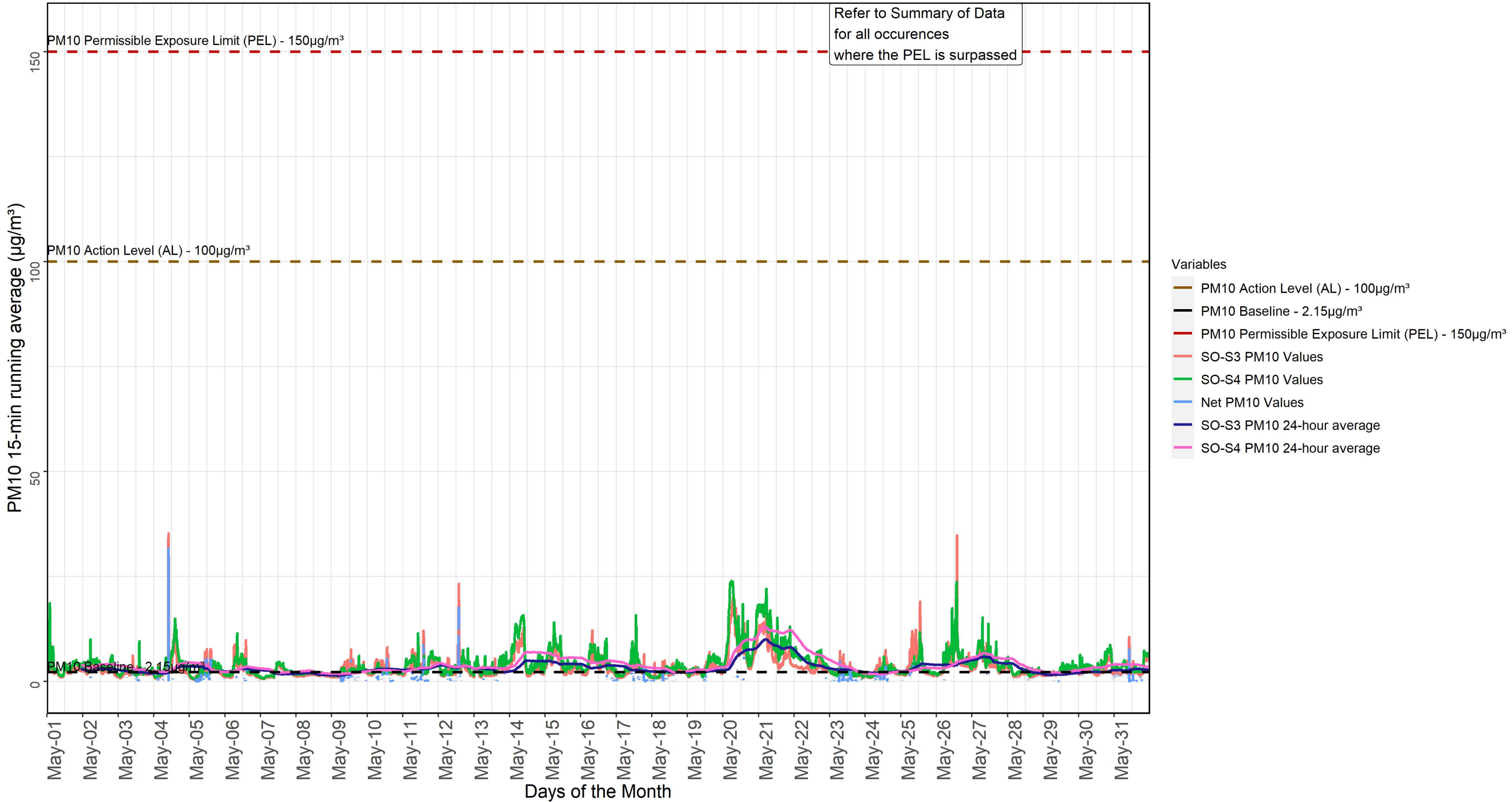
ALP-S1 and ALP-S2 PM 10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of May 2022



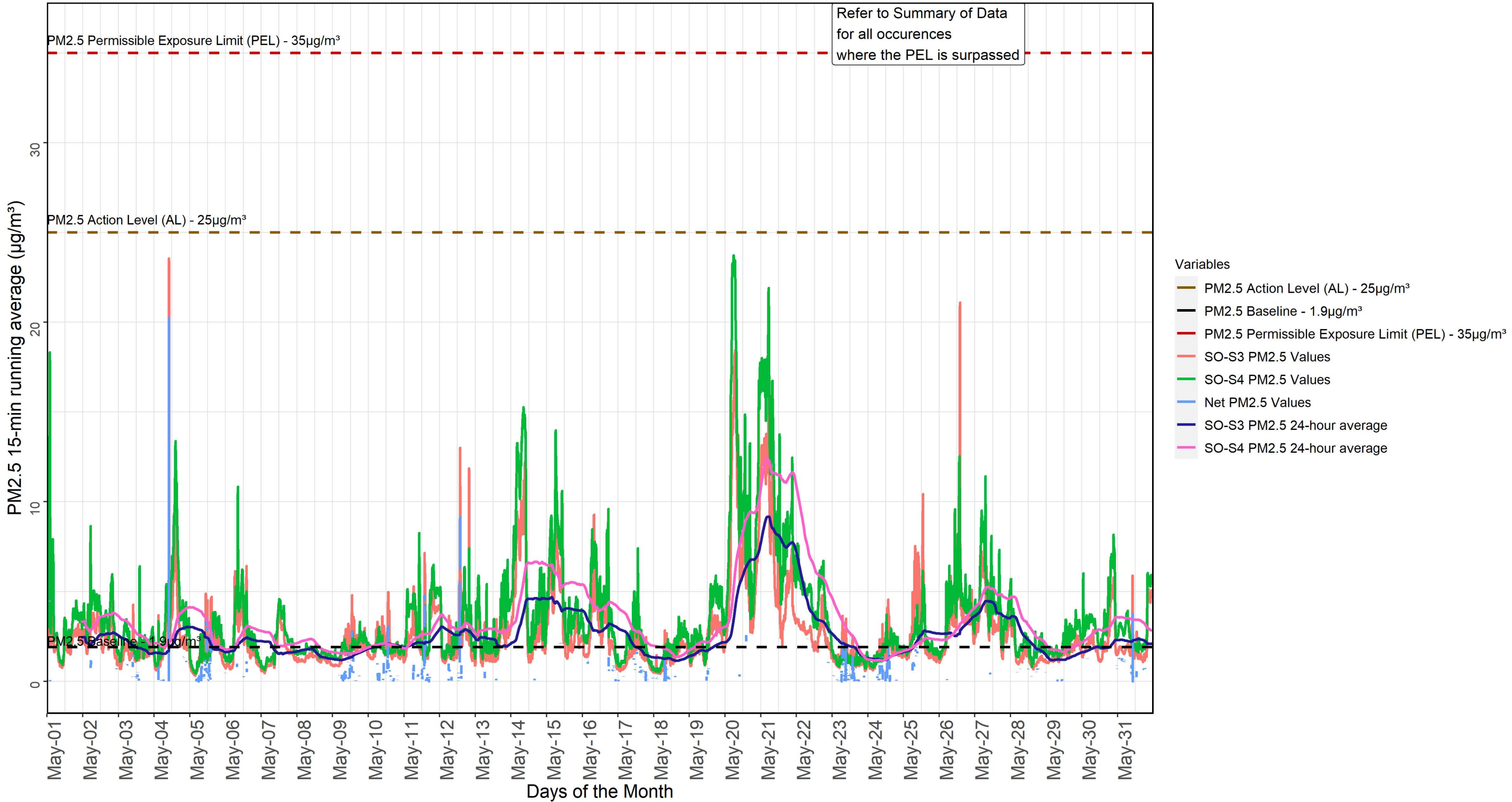
ALP-S1 and ALP-S2 PM 2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of May 2022



SO-S3 and SO-S4 PM10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of May 2022



SO-S3 and SO-S4 PM2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of May 2022



Summary of Data June 2022:

PM10 levels surpassed the Permissible Exposure Limit (PEL) for the 15-minute time weighted average (TWA) at E. 18th Street (ALP-S2) on June 14. There were no PM10 readings recorded above the PEL at Solar One during the month of June.

PM2.5 levels surpassed the Permissible Exposure Limit (PEL) for the 15-minute TWA at ALP-S2 on June 5 and June 14. PM2.5 levels surpassed the PEL (15-minute TWA) at Solar One on June 4.

For the month of June 2022, construction-related Particulate Matter (PM) net 2.5 or 10 levels did not surpass Daily Permissible Exposure Limits (PEL) (24-hour time weighted average).

PM 10 µg/m³

- **E. 18th Street and Avenue C (ALP):** PM10 µg/m³ levels surpassed the Permissible Exposure Limit (15-minute TWA) on June 14 for a duration of 15 minutes. Upon investigation, the contractor observed a piece of construction equipment idling during a coffee break. The contractor took steps to stop the idling and ensure that it would not happen again.
- **Solar One (SO):** PM10 µg/m³ levels remained under the Permissible Exposure Limit (PEL).

PM 2.5 µg/m³

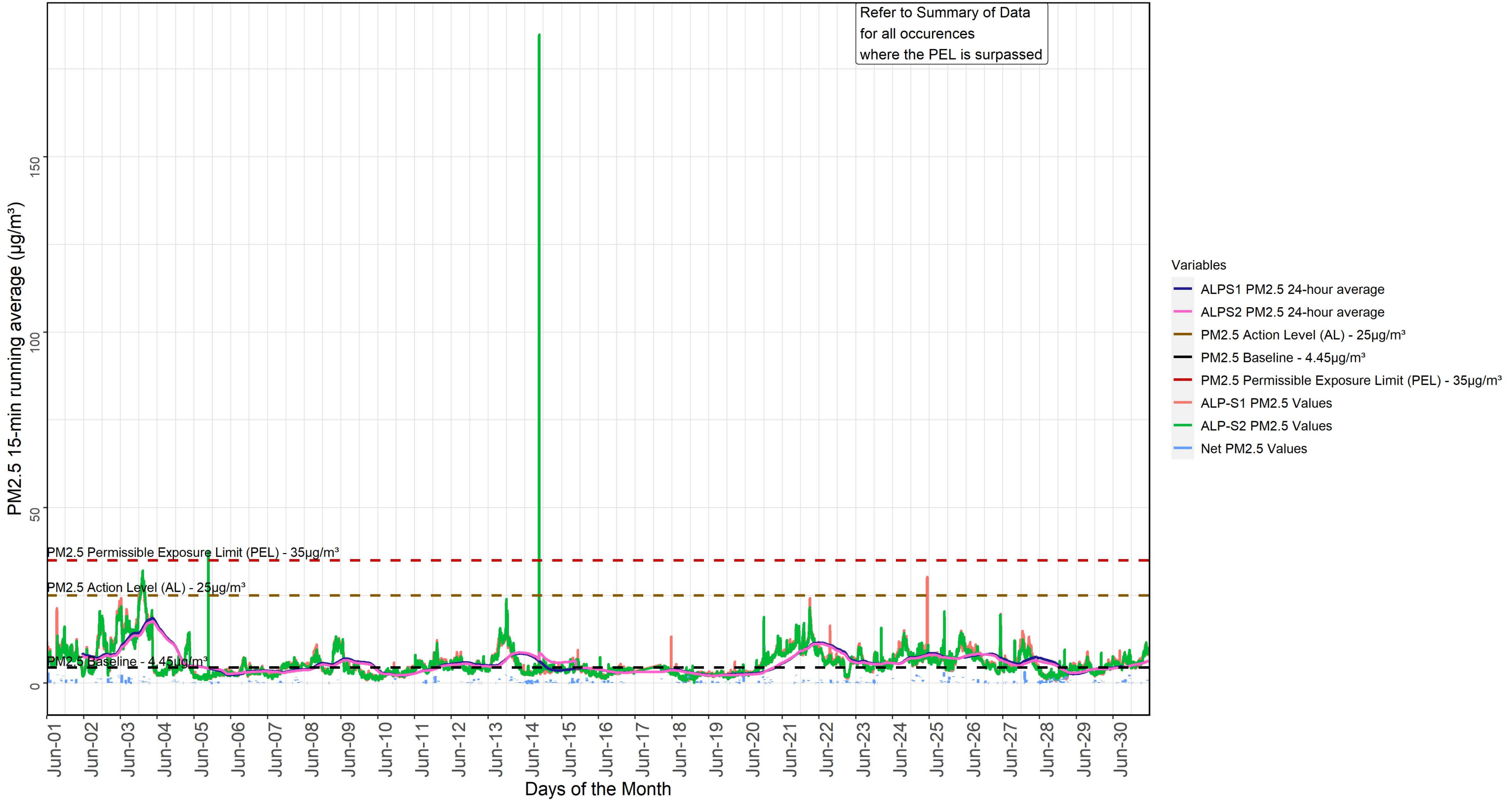
- **E. 18th Street and Avenue C (ALP):** PM2.5 µg/m³ levels surpassed the PEL on two occasions:
 1. On 6/5, levels increased for a short duration (12 minutes) on a Sunday when no construction was occurring.
 2. On 6/14, PM2.5 levels increased for 15 minutes due to the construction vehicle idling, as discussed above.
- **Solar One (SO):** PM2.5 µg/m³ levels surpassed the PEL on 6/4 for a duration of 12 minutes.

Mitigation Measures:

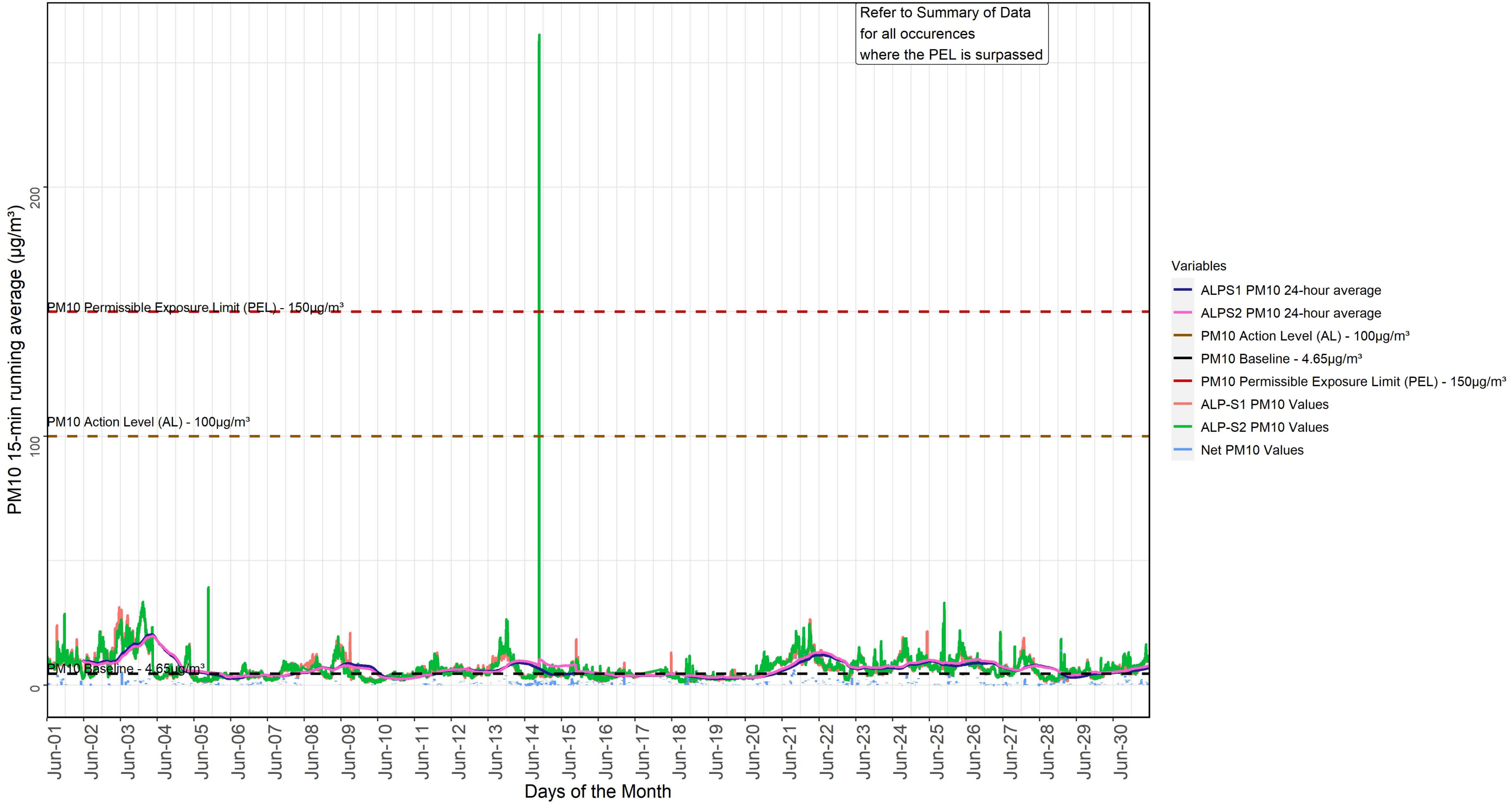
- Construction activity was closely monitored, and dust mitigation techniques were continuously implemented to contain airborne particles due to construction activities.

JUNE 2022 DATA PLOTS

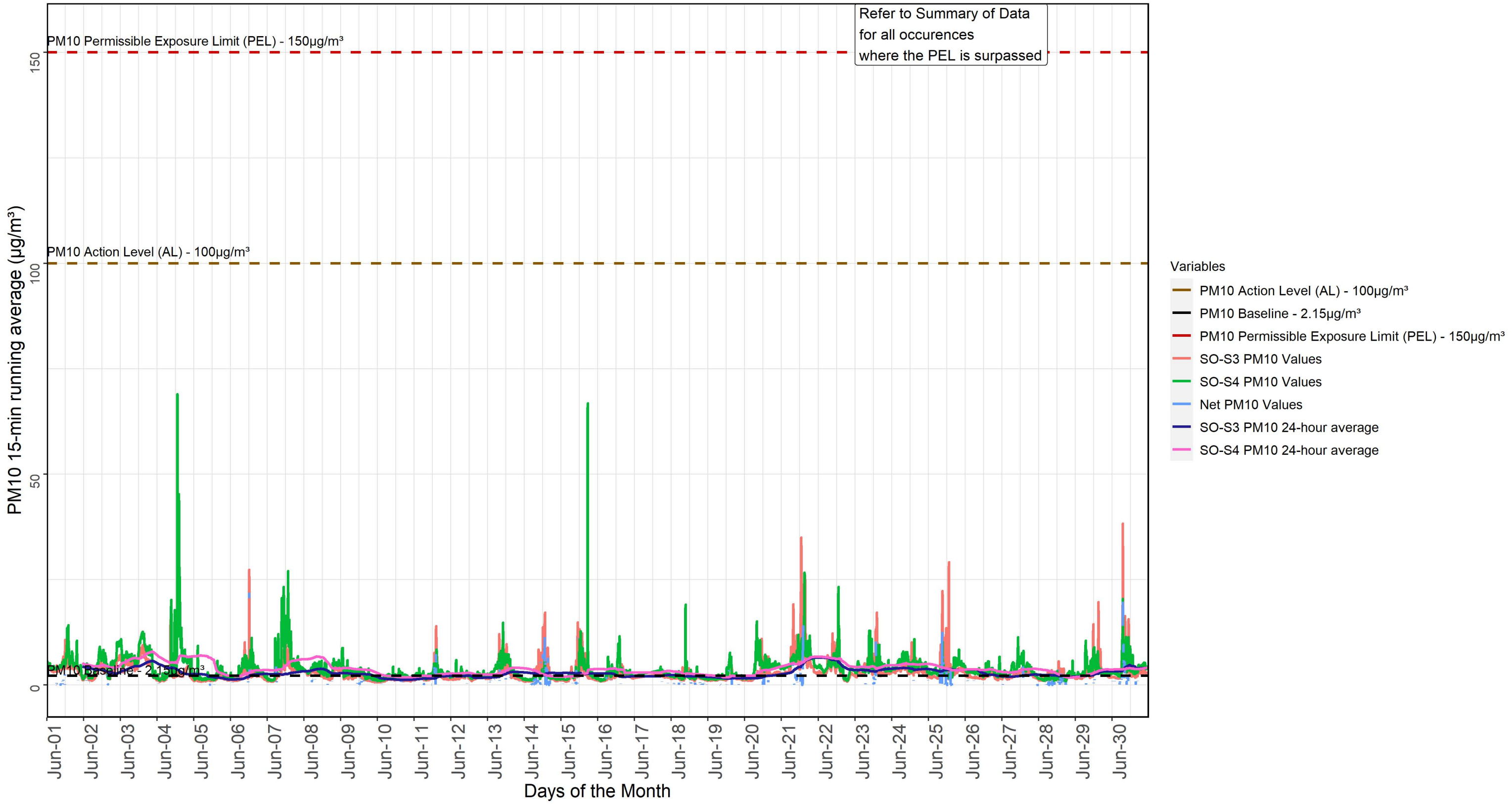
ALP-S1 and ALP-S2 PM 2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of June 2022



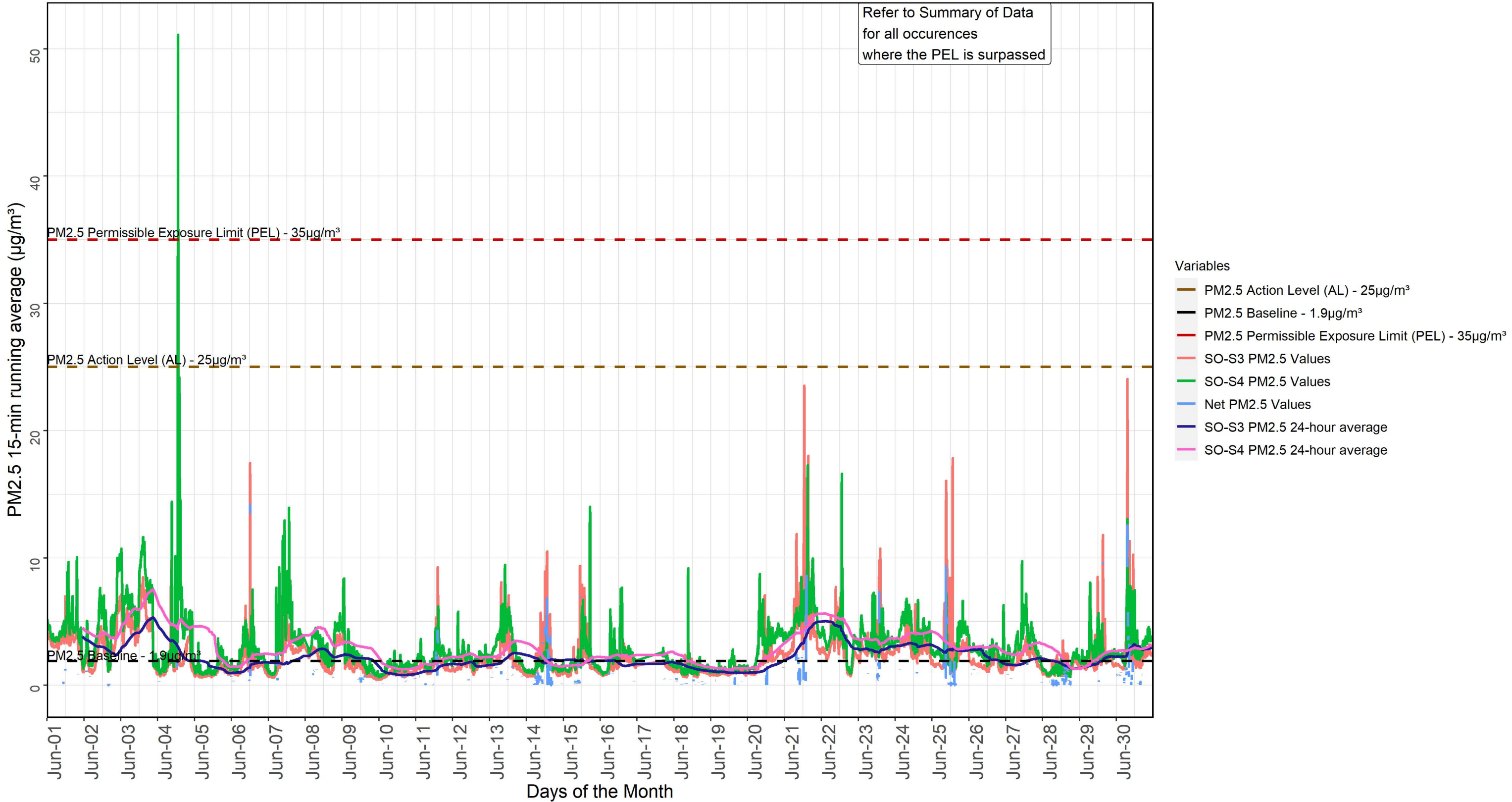
ALP-S1 and ALP-S2 PM 10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of June 2022



SO-S3 and SO-S4 PM10 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of June 2022



SO-S3 and SO-S4 PM2.5 15-min running averages ($\mu\text{g}/\text{m}^3$) For the month of June 2022



APPENDIX

I. Project Area 2 Phasing

Project Area 2

The construction in Project Area 2 will occur in three main phases from north to south and will be staggered to minimize open space impacts. The construction timeline will be broken down as follows by area (subject to change):

- **Phase I:** Asser Levy Playground Flood Wall/Gates and Park Restoration: **Early 2021 to Mid-2022**
- **Phase I:** Stuyvesant Cove Park: Solar One Flood Wall and Gate: **Early 2021 to Mid 2022**
- **Phase II & III:** Stuyvesant Cove Park Flood Wall and Restoration: **Mid-2021 to Mid-2024**
*Construction of Stuyvesant Cove Park will occur in phases, starting with closures from East 20th Street northwards and moving to the southern end of the Park upon completion of the northern side.
- **Phase IV:** Murphy Brothers Playground Flood Wall and Restoration: **Late 2022 to Late 2024**

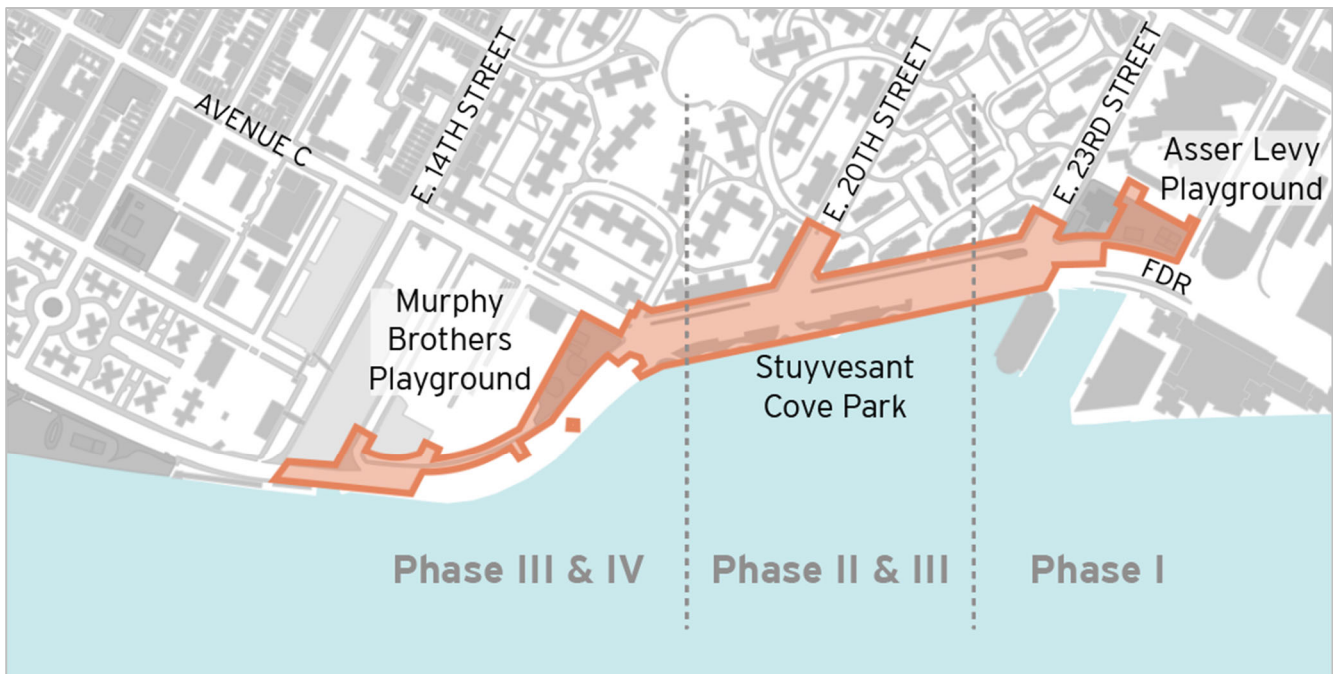


Fig.5 East Side Coastal Resiliency Project Area 2 Proposed Phasing (subject to change)

II. ESCR Air Quality Management Program

Community health and safety is of utmost importance to the City of New York, the NYC Department of Design and Construction (DDC), and the East Side Coastal Resiliency Team. The ESCR Team is implementing a multi-level approach to Air Quality Management with includes:

- Step 1: Air Quality Management Plan
- Step 2: Daily Air Quality Mitigation Techniques
- Step 3: Daily Air Quality Monitoring
- Step 4: Air Quality oversight by environmental specialists

Step 1: The Air Quality Management Plan

The AQM Plan is submitted at the start of the project to outline the management of air quality for the project. It includes contractor roles and responsibilities, mitigation techniques, and action plans. This Plan is reviewed and approved by the Program Management / Construction Management (PMCM) Team HNTB-LiRo-Joint Venture, and the DDC.

Step 2: Daily Air Quality Mitigation Techniques

As mentioned in Chapter 6.6 of the EIS, Construction -Hazardous Materials Section “Dust management during soil-disturbing work would include the following: (1) use of water spray for roads, trucks, excavation areas and stockpiles; (2) use of anchored tarps to cover stockpiles; (3) use of truck covers during soil transport within site limits and during off-site transport; (4) employment of extra care during dry and/or high-wind periods; (5) use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface; and (6) use of a truck wheel wash at site access/egress points to prevent fugitive dust and off-site migration of dust and other particulates. The source(s) of any dust emissions would be identified and addressed immediately and appropriately.

Step 3: Daily Air Quality Monitoring

The air quality monitoring confirms the daily mitigation techniques in place are being implemented and are effective. Action levels are set to alert the contractor when a technique is not working, and adjustments are required to maintain the levels as set by the National Ambient Air Quality Standards (NAAQS) for PM pollution as mentioned above. Step 3 is implemented daily and mitigation techniques will vary depending on work activities. The EPA Standard Time Weighted Average (TWA) for analyzing PM levels is 24hours, the ESCR project is analyzing levels more frequently at 15min TWA.

Step 4: Air Quality Oversight by Environmental Specialists

The oversight for environmental monitoring for the ESCR project is multi-tiered and includes relationships between several agencies and entities. As shown in the exhibit on the following page, a series of checks and balances have been implemented to assure compliance with environmental regulations. See [Fig. 6 East Side Coastal Resiliency Air Quality Monitoring Flow Chart](#)

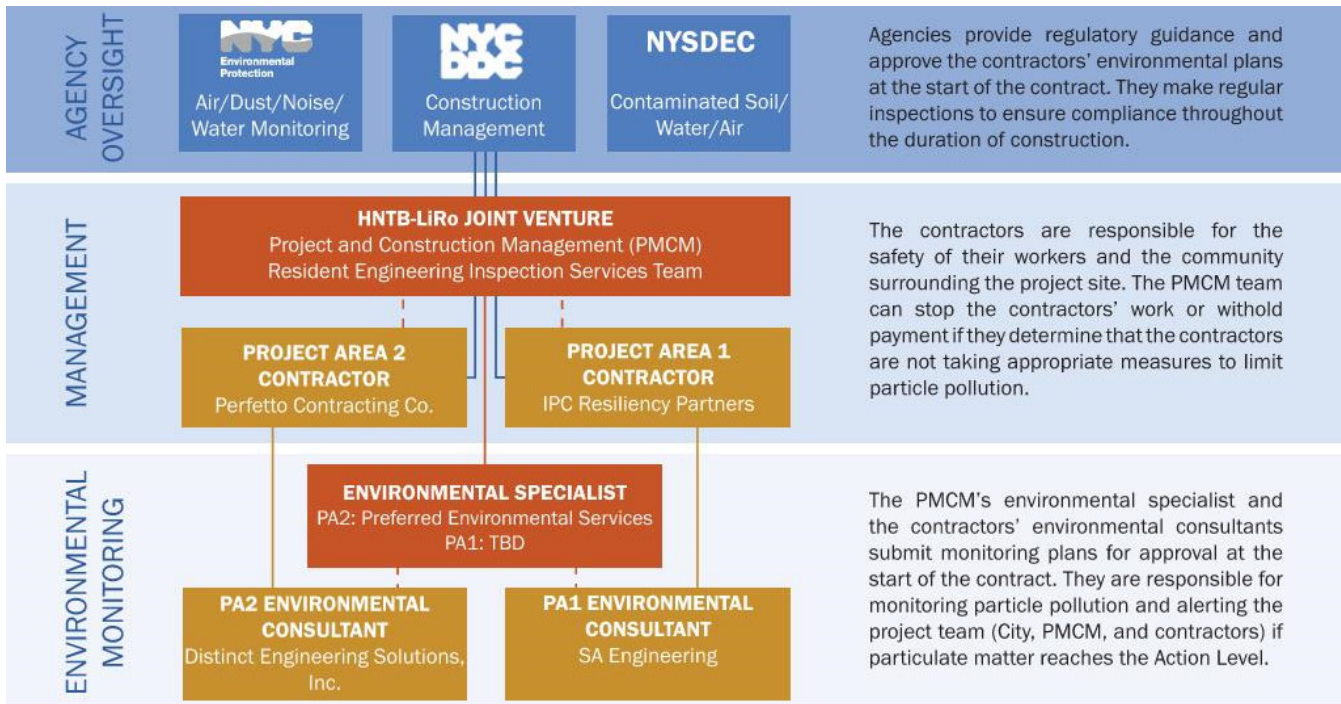


Fig.6 East Side Coastal Resiliency Air Quality Monitoring Flow Chart

III. RESOURCES

- ESCR Website: <https://www1.nyc.gov/site/escr/index.page>
- ESCR Environmental Review Process web page: <https://www1.nyc.gov/site/escr/about/environmental-review.page>
- FEIS Chapter 5.7 Hazardous Materials: <https://www1.nyc.gov/assets/escr/downloads/pdf/FEIS/ESCR-EIS-Chapter-5.7-Hazardous-Materials.pdf>
- FEIS Chapter 6.6 Construction Hazardous Materials: <https://www1.nyc.gov/assets/escr/downloads/pdf/FEIS/ESCR-EIS-Chapter-6.6-Construction-Hazardous-Materials.pdf>
- EPA Particulate Matter (PM) Pollution - Particulate Matter (PM) Basics: <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>
- EPA Particulate Matter (PM) Pollution - Setting and Reviewing Standards to Control Particulate Matter (PM) Pollution: <https://www.epa.gov/pm-pollution/setting-and-reviewing-standards-control-particulate-matter-pm-pollution>
- EPA Particulate Matter (PM) Pollution - National Ambient Air Quality Standards (NAAQS) for PM: <https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm>
- EPA Particulate Matter (PM) Pollution - Applying or Implementing Particulate Matter (PM) Standards: <https://www.epa.gov/pm-pollution/applying-or-implementing-particulate-matter-pm-standards>