Update on South Central Fresno Community Air Monitoring

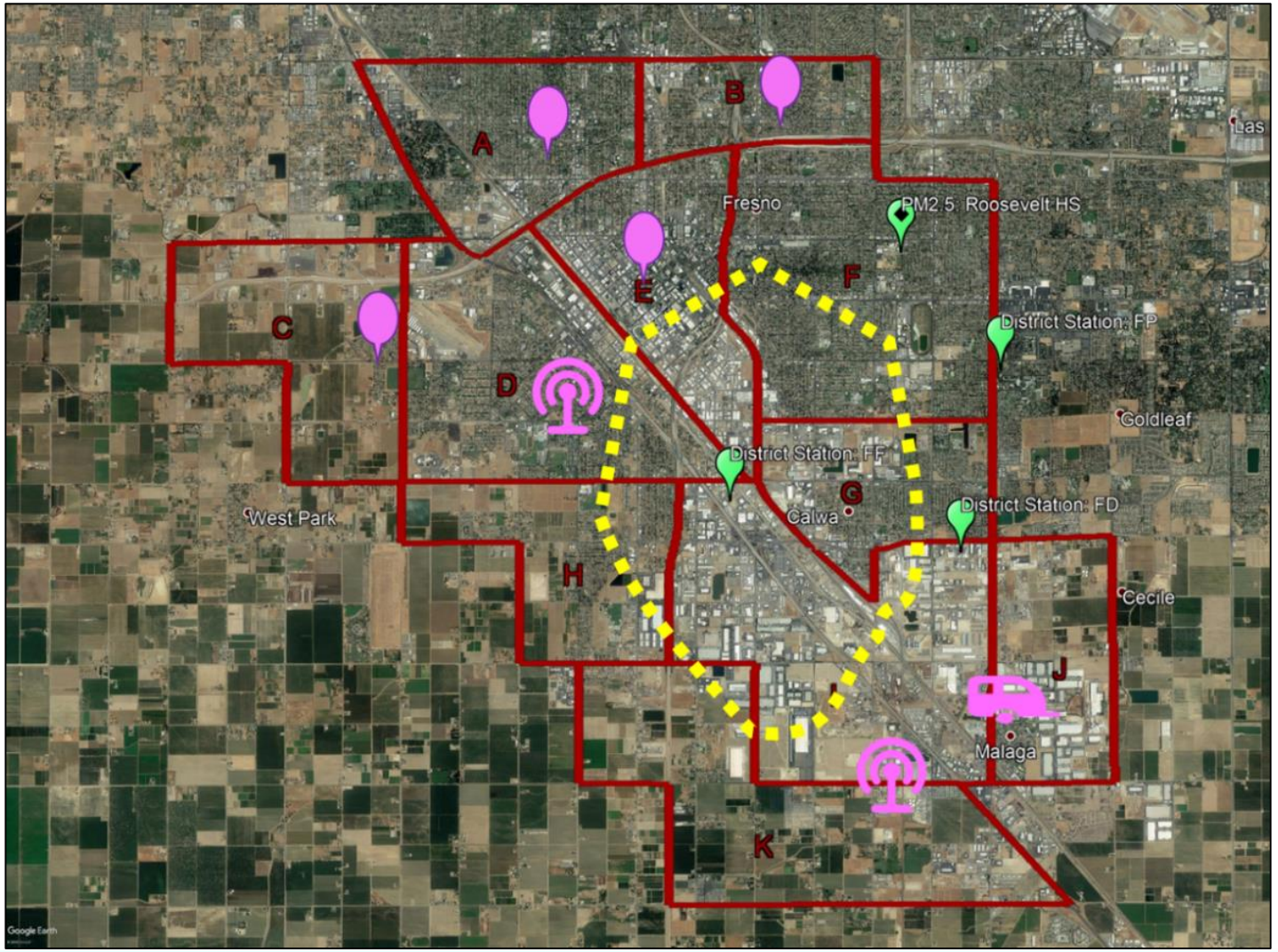
South Central Fresno CSC
Air Monitoring Subcommittee Meeting

December 15, 2020

Agenda

- Status of community air monitoring plan implementation
- Review air monitoring data collected
- What we have learned so far
- Next steps
- Request for feedback from committee regarding implementation and best way to present and provide air monitoring information to committee

South Central Fresno
Community Air Monitoring Network Design



- **Stand-Alone PM2.5**
- **Compact Air Monitoring System**
- **Trailer**
- **Mobile Monitoring Van**
  - Drive on a regular schedule throughout entire boundary all year
  - Respond to community concerns
  - Recommended focus route

Community Air Monitoring Platforms

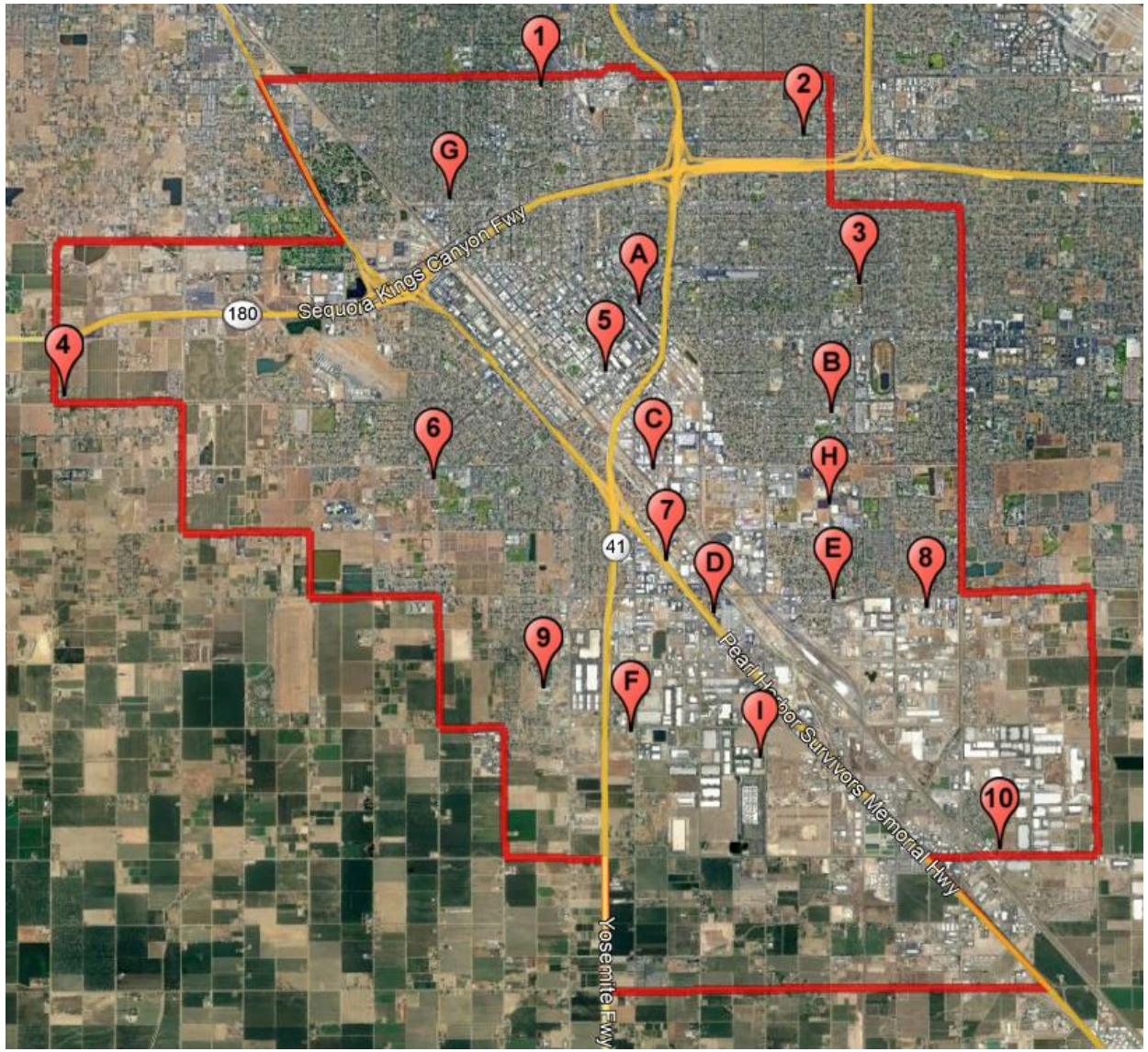
Community Air Monitoring Platforms (cont'd)

Community Air Monitoring Platforms (cont'd)

Ongoing Community Air Monitoring

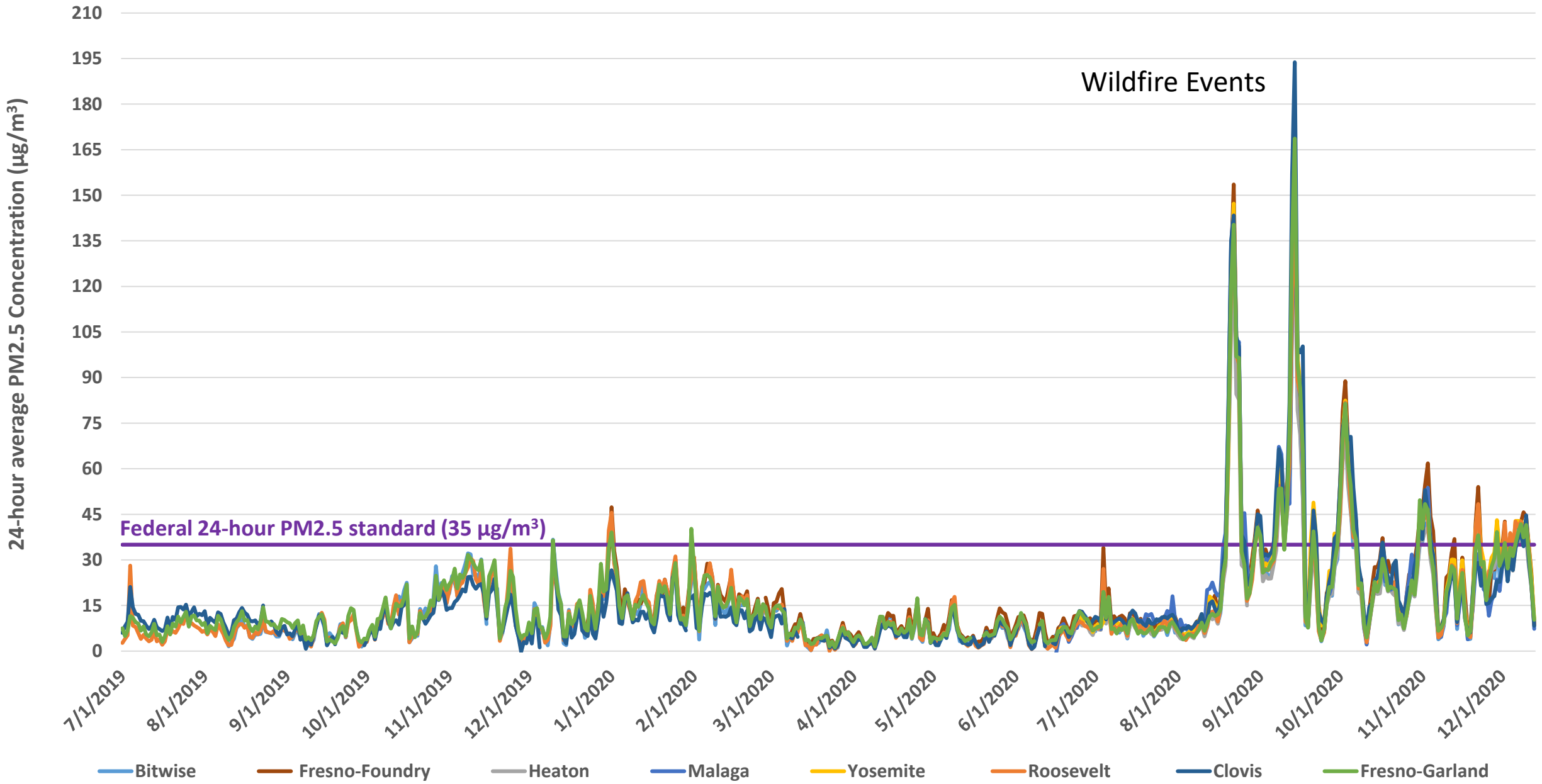
- District continuing to conduct localized air monitoring in the South Central Fresno community
- Working to deploy additional air monitoring platforms across the community, according to Community Steering Committee recommended network design
  - Almost complete except for 2 sites
- Air monitoring van actively being used to regularly monitor pollutants in areas of interest of the community and near recommended site locations for network design
- Extensive PM2.5 and VOC speciation sampling and laboratory analysis being conducted since late 2019

CAMP Implementation Status

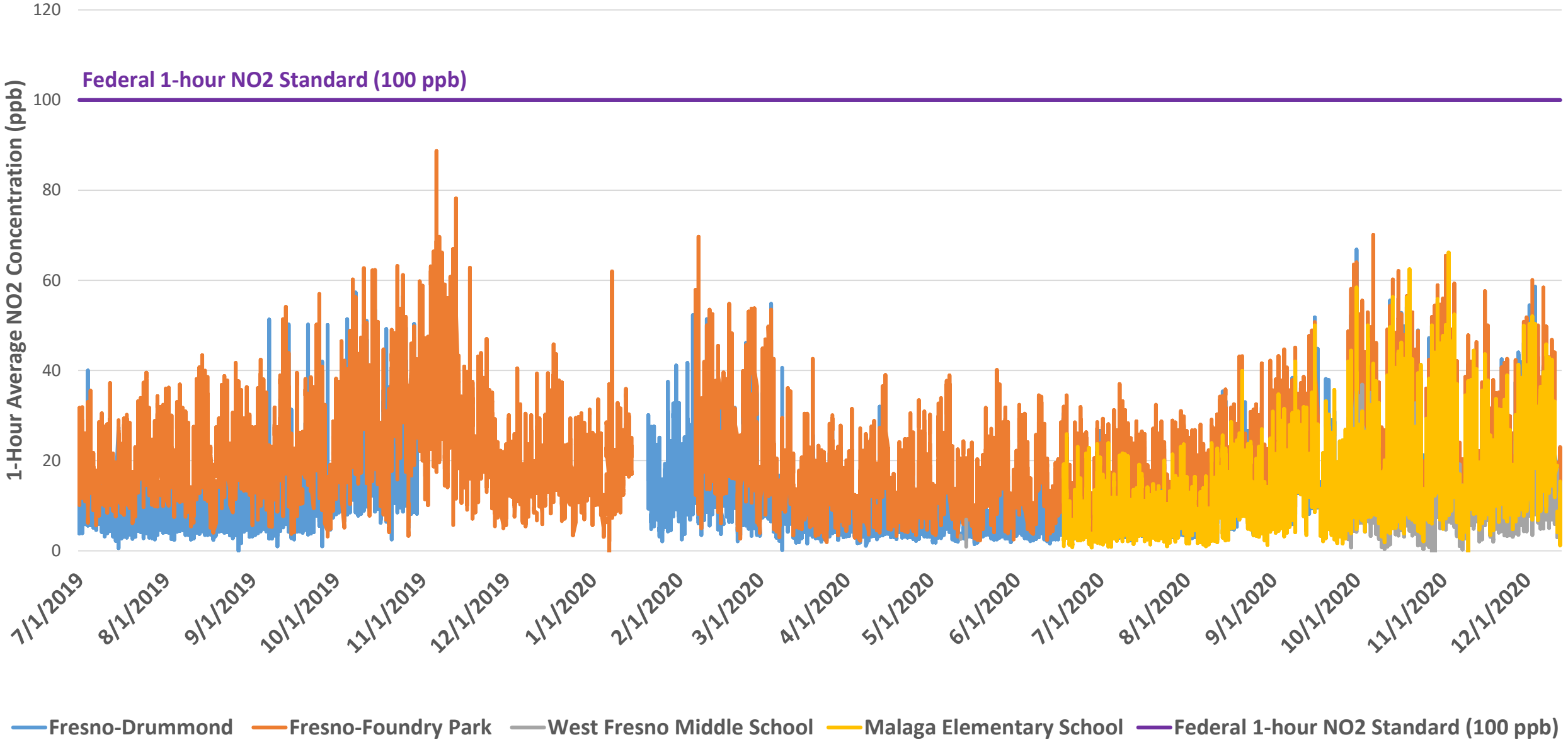


#	Location	Monitoring	Done
1	Heaton Elementary	PM2.5	Y
2	Yosemite Middle School	PM2.5	Y
3	Roosevelt High	PM2.5	Y
4	Madison Elementary	PM2.5	N / Van
5	Bitwise South Stadium	PM2.5	Y
6	Edison High	Multi-Pollutant	N / Van
7	Fresno-Foundry Park	PM2.5 & Speciation	Y
8	Fresno-Drummond	Ozone, NO2, PM10	Y
9	West Fresno Middle School/Orange Center	Multi-Pollutant	Y
10	Malaga Elementary	Trailer/ Speciation	Y
A	Tulare & 'R' St	Van	Y
B	E Butler & S Cedar	Van	Y
C	E California & S Van Ness	Van	Y
D	2nd St & Jensen	Van	Y
E	E Jensen & S Cedar	Van	Y
F	E North & S Cherry	Van	Y
G	Ferger & E Belmont	Van	Y
H	E Florence & S Cedar	Van	Y
I	Orange Center Elementary	Van	Y

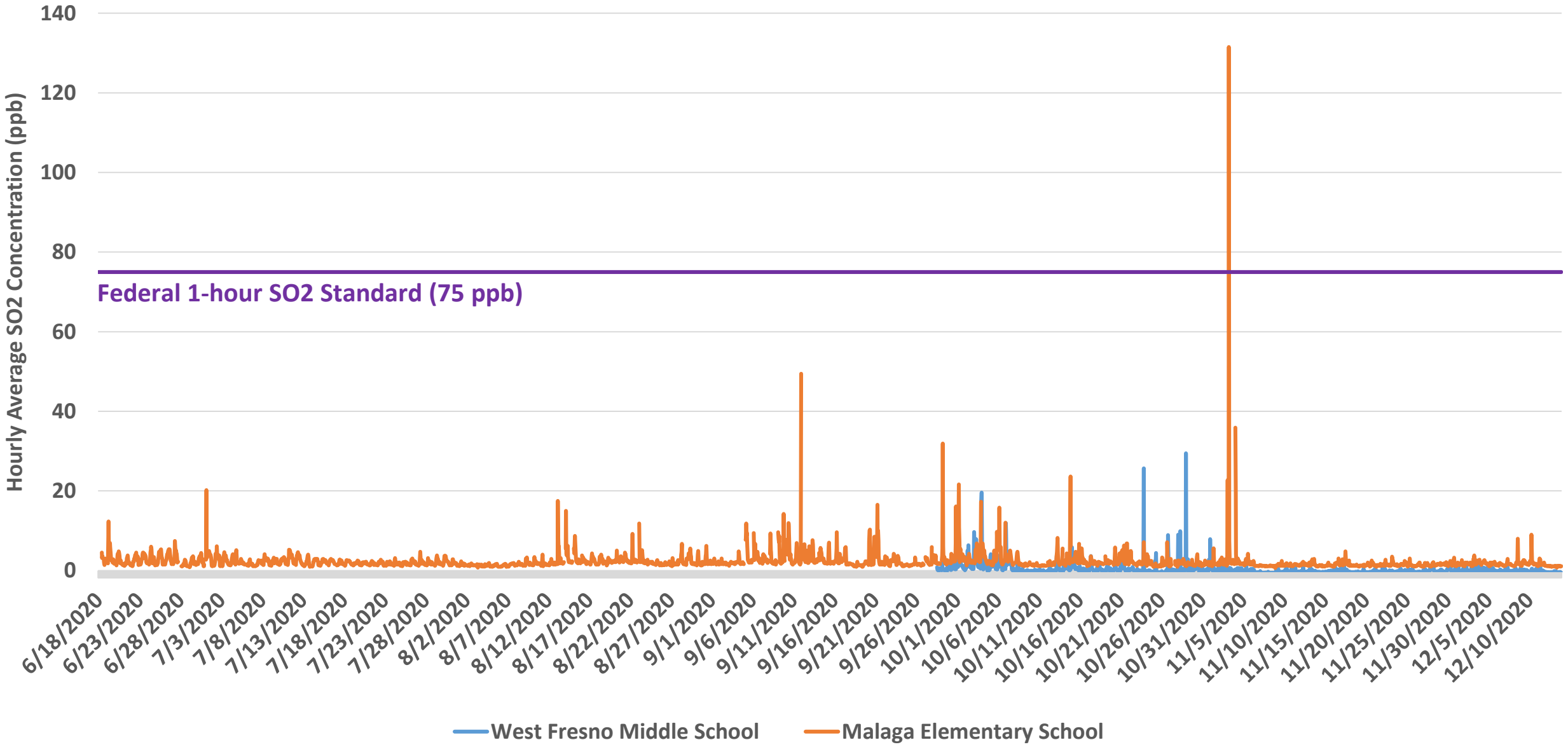
PM2.5 Comparison with Regulatory Monitors



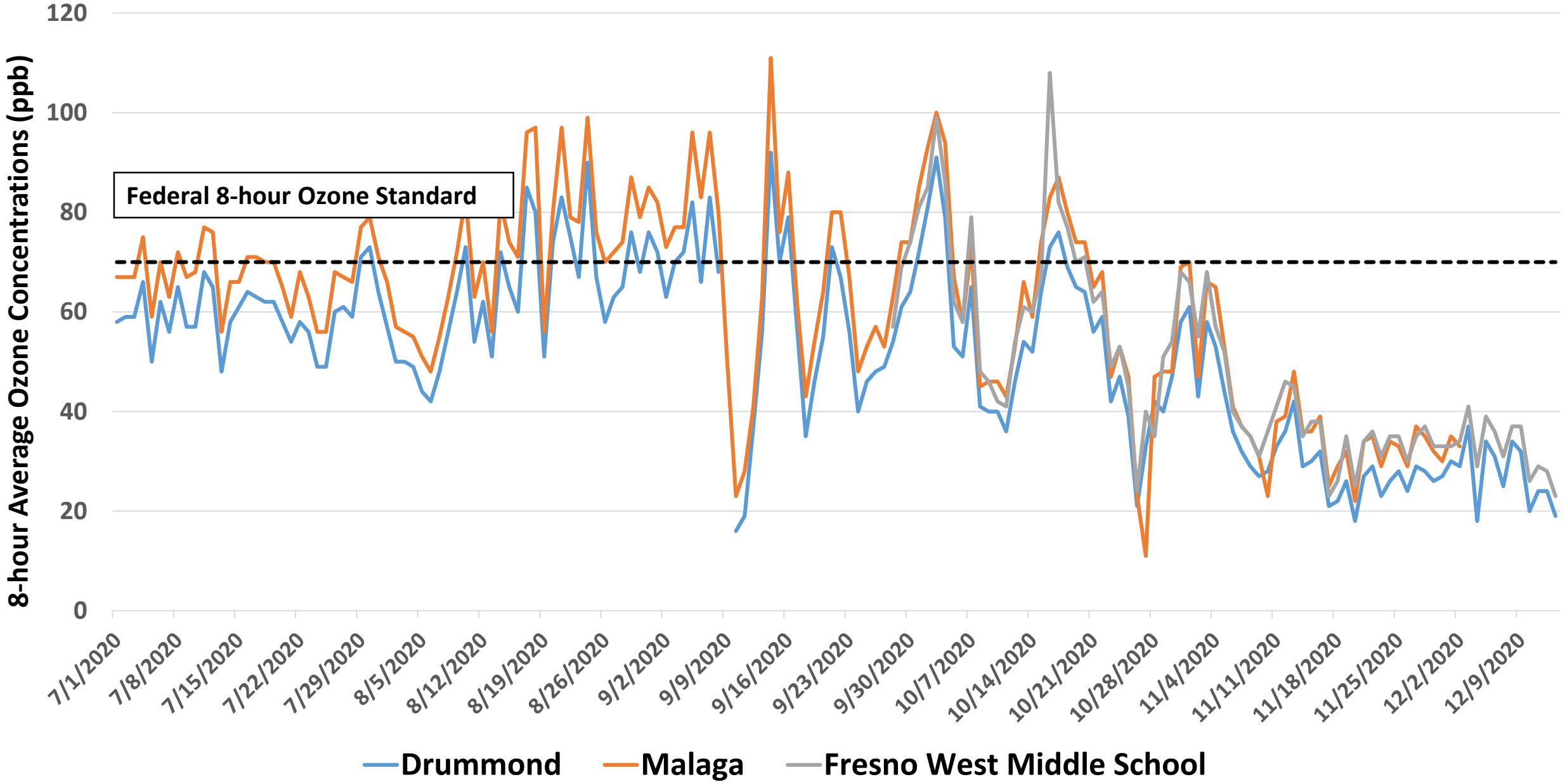
NO2 Concentration Comparison



SO2 Concentration Comparison



Ozone Concentration Comparison



Summary of BTEX Trailer Data at Malaga Elementary (*June 2020 – December 2020*)

Pollutant	Average Value (hourly)	Peak Value (hourly)	Applicable Standard
Benzene	0.0	0.5	n/a
Toluene	0.0	5.9	111 ppb for Toluene (chronic Risk Exposure Level)
Ethylbenzene	0.0	11.5	n/a
Xylene	0.1	0.8	n/a

Link: http://community.valleyair.org/media/2193/malaga-btex.pdf

Summary of Air Monitoring Van Data
January 2020 - Present

Pollutant	Average Value (hourly)	Peak Value (hourly)	Applicable Standard
BTEX	0.0	9.6 ppb (Toluene)	111 ppb for Toluene (chronic Risk Exposure Level)
PM2.5	14.7 µg/m^3 (wildfire)	160.6 µg/m^3 (wildfire)	35 µg/m^3 (24-hr average)
Ozone	34.6 ppb	82.2 ppb (65.4 ppb 8-hr avg)	70 ppb (8-hr average)
CO	0.3 ppm	1.3 ppm	35 ppm (1-hr average)
NO2	10.2 ppb	148.7 ppb	100 ppb (1-hr average)
SO2	1.5 ppb	19.6 ppb	75 ppb (1-hr average)

PM2.5 Speciation Sampling

- Collected samples sent to third-party laboratory for analysis to determine contribution of various species of PM2.5 to overall measured PM2.5
- November 2019, sampling began at Fresno-Foundry Park site near intersection of Jensen Avenue and Highway 99
- June 2020, sampling moved to air monitoring trailer at Malaga Elementary School

PM2.5 Categories

- **Ammonium Nitrate:** Formed from reaction of ammonia and nitric acid, where nitric acid is formed from nitrogen oxides. Key sources of nitrogen oxides is from burning of fuel.

- **Ammonium Sulfate:** Form from reaction of ammonia and sulfuric acid, where sulfuric acid is formed primarily from sulfur oxide, with smaller amounts forming from direct sulfur. Key sources of sulfur oxides is burning of fuel.

- **Organic carbon:** Organic carbon (OC) are generated as primary organic aerosol, predominantly through combustion of fuel. Key sources include cooking, industrial processes, mobile source exhaust, tire wear, and wood burning.

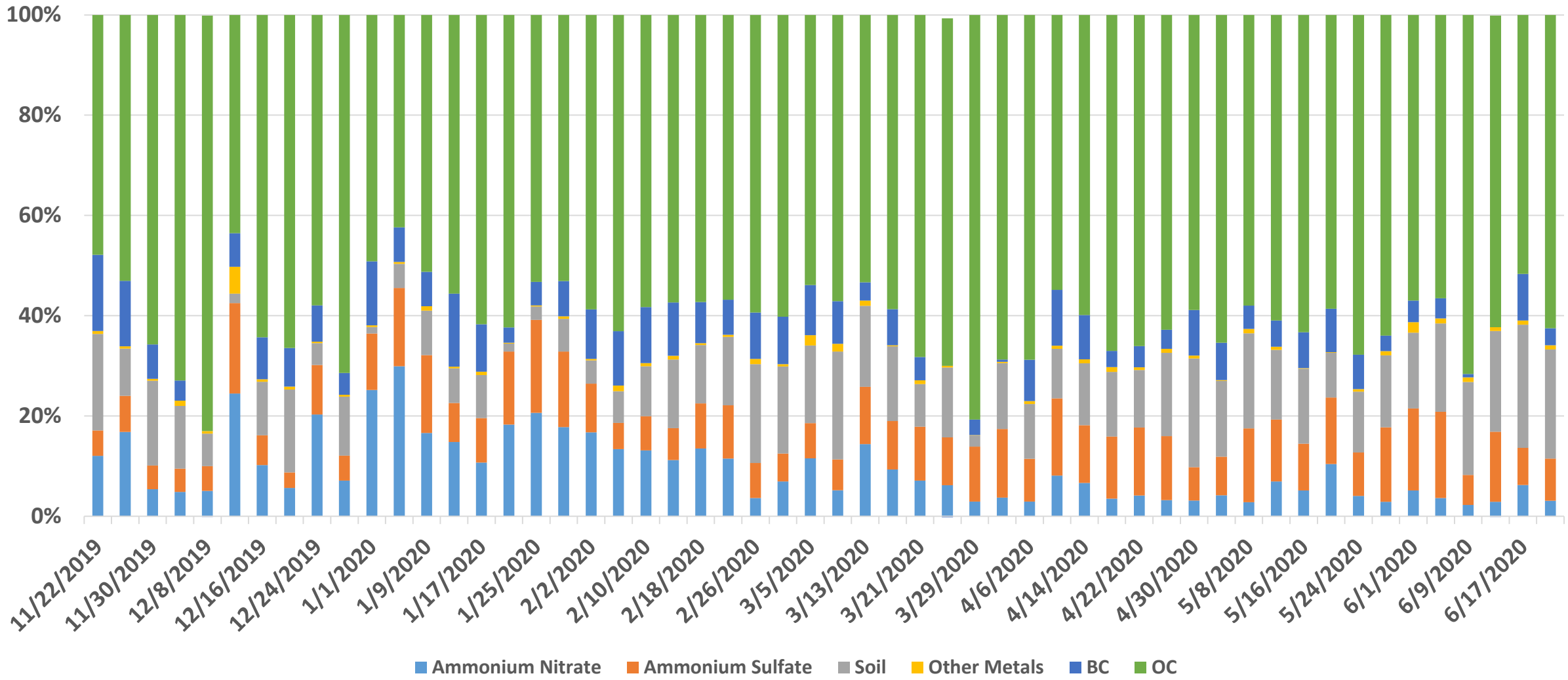
PM2.5 Categories (cont'd)

- **Black Carbon:** Known as soot or elemental carbon, and is formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel) and wood burning.

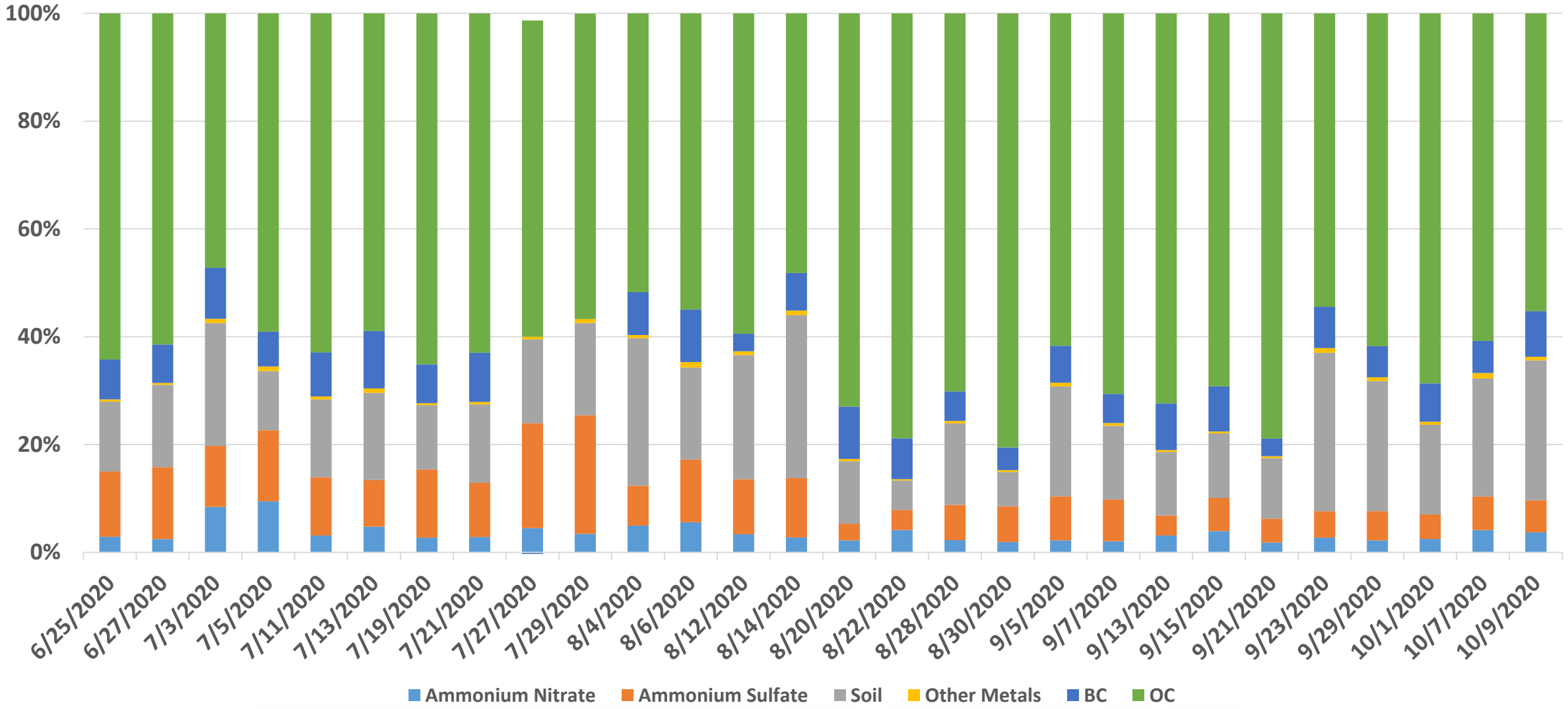
- **Soil:** Road dust and soil dust entrained in air from activity, such as soil disturbance or airflow from traffic.

- **Other Metals:** Particulates having been emitted in connection with combustion from engine wear, brake wear, and similar processes. Certain metals are also emitted from use of fireworks.

Relative Comparison of PM2.5 Species Measured at Foundry (November 2019 – June 2020)



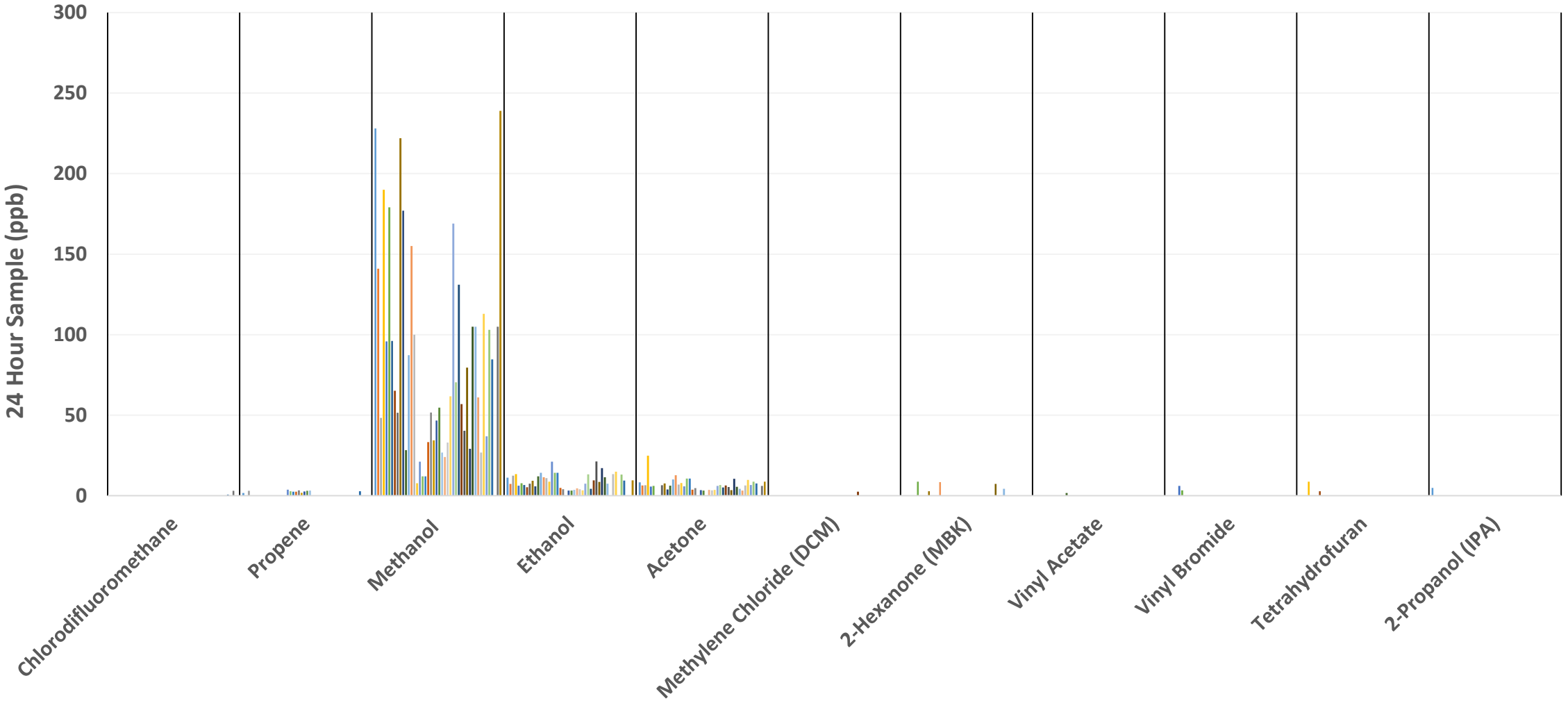
Relative Comparison of PM2.5 Species Measured at Malaga Elementary School (June 2020 – Oct 2020)



VOC Speciation Sampling

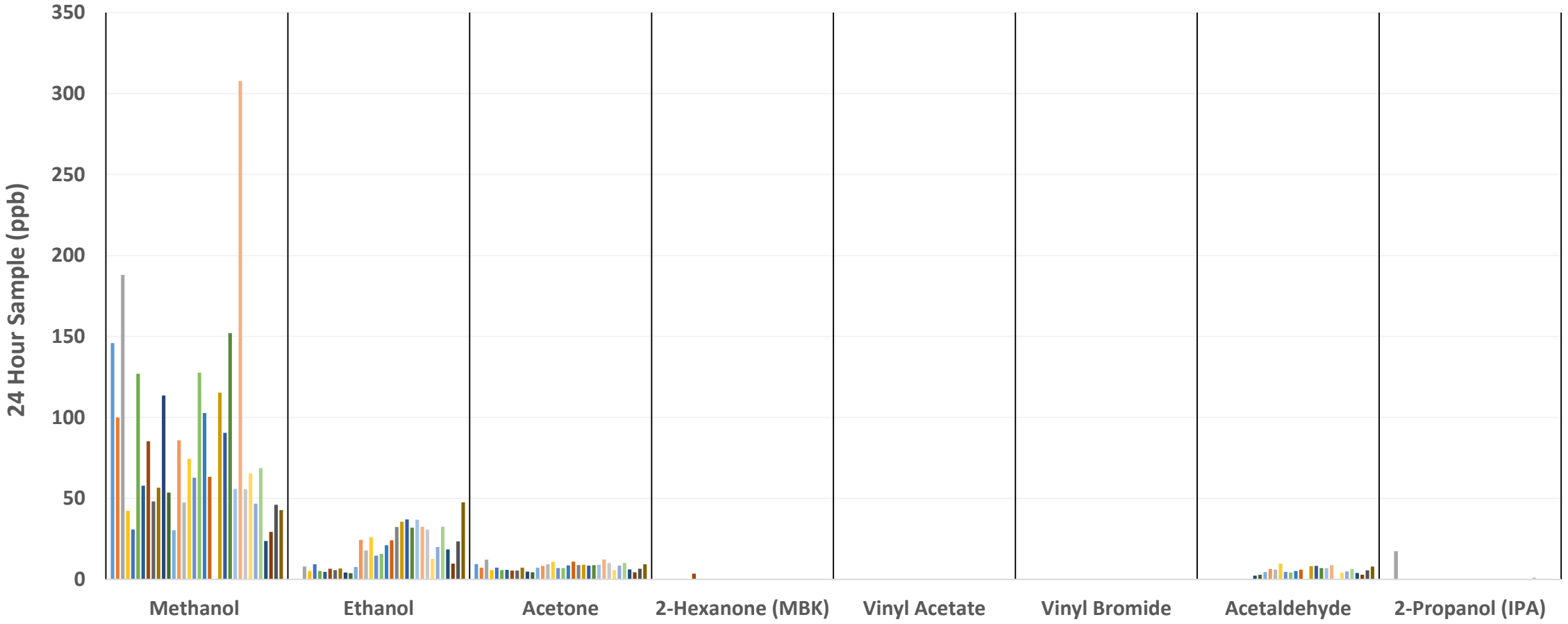
- Collected samples sent to third-party laboratory for analysis to determine various specific VOC detected in atmosphere
  - Capable of isolating 68 to 86 different VOCs from each air sample
- November 2019, sampling began at Foundry Park site near intersection of Jensen Avenue and Highway 99
- June 2020, sampling moved to air monitoring trailer at Malaga Elementary School

VOC Species Detected at Foundry (Dec 2019 – June 2020)



NOTE: Only methanol has associated health risk metric. All values below OEHHA chronic REL Value of 3000 ppb for methanol.

VOC Species Detected at Malaga Elementary School (June 2020 – Nov 2020)



NOTE: OEHHA chronic REL Value of 3000 ppb for methanol and 80 ppb for acetaldehyde.

Summary of Air Monitoring Results

- PM2.5
  - Community monitors consistent with each other and nearby regulatory monitors outside of community
  - Based on monitoring so far, few levels detected above emission standards, primarily during extreme wildfire period, from all stationary and mobile monitors throughout the community.
- NO2, SO2, and Ozone
  - Based on monitoring so far, although readings are for the most part below standards
  - Investigating to get a better understanding of the spikes in emissions
  - All monitors trend fairly consistent
- BTEX
  - Based on monitoring so far, virtually non-detect at all locations monitored with van and trailer

Summary of Air Monitoring Results (cont'd)

- PM2.5 Speciation
  - Organic carbon: more than 50% (fuel combustion)
  - Organic carbon sources include cooking, industrial processes, mobile source exhaust, tire wear, and wood burning
  - Soil: 10% - 20% (dust)
- VOC Speciation
  - Primarily methanol at levels less than 250 ppb (well below OEHHA REL value of 3,000 ppb)
  - Methanol sources include solvent use and automobile exhaust
  - Trace levels of other pollutants

Moving Forward

- Continue deeper investigation to better understand emission changes
- For more recently established sites, recommend leaving for at least one full year after COVID restrictions are lifted to ensure capturing full trend of emissions representative of area
- Under what circumstances could air monitors be moved

Community Air Quality Data

- District AB 617 webpage at: http://community.valleyair.org/community-air-monitoring
  - Real-time community air monitoring data
  - Raw BTEX data for Malaga
  - Air monitoring data from vans
  - Quarterly reports
  - Weekly air monitoring updates
- CARB's statewide air quality data portal (AQview) displays and provides community air monitoring data from AB 617 communities
  - AQview website located at: https://ww2.arb.ca.gov/es/community-air-quality-portal
  - Air quality data from Valley AB 617 communities available at this website
  - Development ongoing, new features to be added

Comments/Questions?