



COMMUNITY AIR MONITORING REPORT
(OCTOBER 2020 - DECEMBER 2020)

Community of South Central Fresno

San Joaquin Valley Air Pollution Control District
May 17, 2021

Contents

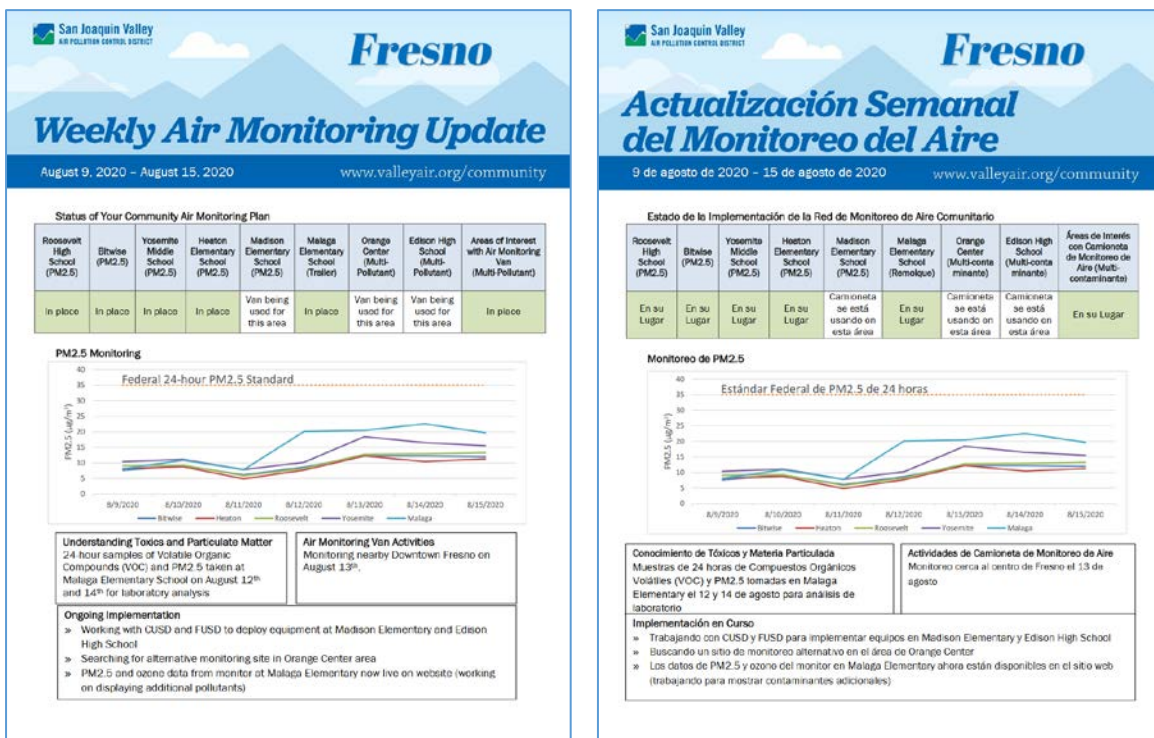
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I. Overview

The District has invested an extensive amount of work into implementing the community air monitoring plan as expeditiously as possible, including researching, developing, configuring, deploying, trouble-shooting, and maintaining new state-of-the-art high precision air monitoring equipment. This also includes the use of the mobile air monitoring van to take measurements in a variety of locations of interest and to respond to community concerns. The District has also contracted with analytical laboratories to conduct the needed analysis to speciate the VOC and PM2.5 samples being taken in the community. In addition, the District has worked closely with organizations to negotiate leases to authorize the deployment of the equipment on site, followed by logistical, electrical, and site preparation work for the installation of the air monitoring equipment.

In addition to these quarterly reports, the District is continuing its efforts to enhance the availability of air monitoring data and information to ensure that the community is fully apprised of the ongoing air monitoring efforts and are receiving the latest air quality information. This includes continued regular updates to the Community Steering Committee (CSC), continuously posting real-time and all historical air monitoring data, and bilingual weekly updates in South Central Fresno, which are all available on the [South Central Fresno Air Monitoring webpage](http://www.valleyair.org/community).

Figure 1 Examples of Bilingual Weekly Air Monitoring Update



During the first part of this year, due to the COVID-19 local shelter-in-place orders that affected activities across a variety of sectors, the District was able to observe air quality without “normal” activities and emissions, particularly with respect to mobile sources. During the 3-month period of March to May 2020, the District observed lower concentrations of NO₂ and ozone compared to the 5-year average. In June of 2020, NO₂ and ozone returned back to expected levels. More information on this can be found in the June 2020 presentation to the District Governing Board located at https://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2020/June/presentations/11.pdf.

In the second quarter of 2020, the District’s continued efforts resulted in the deployment of real-time PM_{2.5} monitoring at Heaton Elementary School and Yosemite Middle School and deployment of the air monitoring trailer with a comprehensive suite of tools to measure a variety of pollutants at Malaga Elementary School.

In the third quarter of 2020, the District deployed a compact multi-pollutant air monitoring system that is capable of measuring a variety of pollutants at West Fresno Middle School. This system was initially planned for Orange Center Elementary School but the request was denied by the board of the Orange Center School District. As approved by the steering committee, this has instead been placed at West Fresno Middle School.

During this quarter, the District is continuing work on the remaining two sites that have yet to be implemented. This quarter was also impacted by extreme wildfires that resulted in high PM_{2.5} emissions in the community as shown in this report.

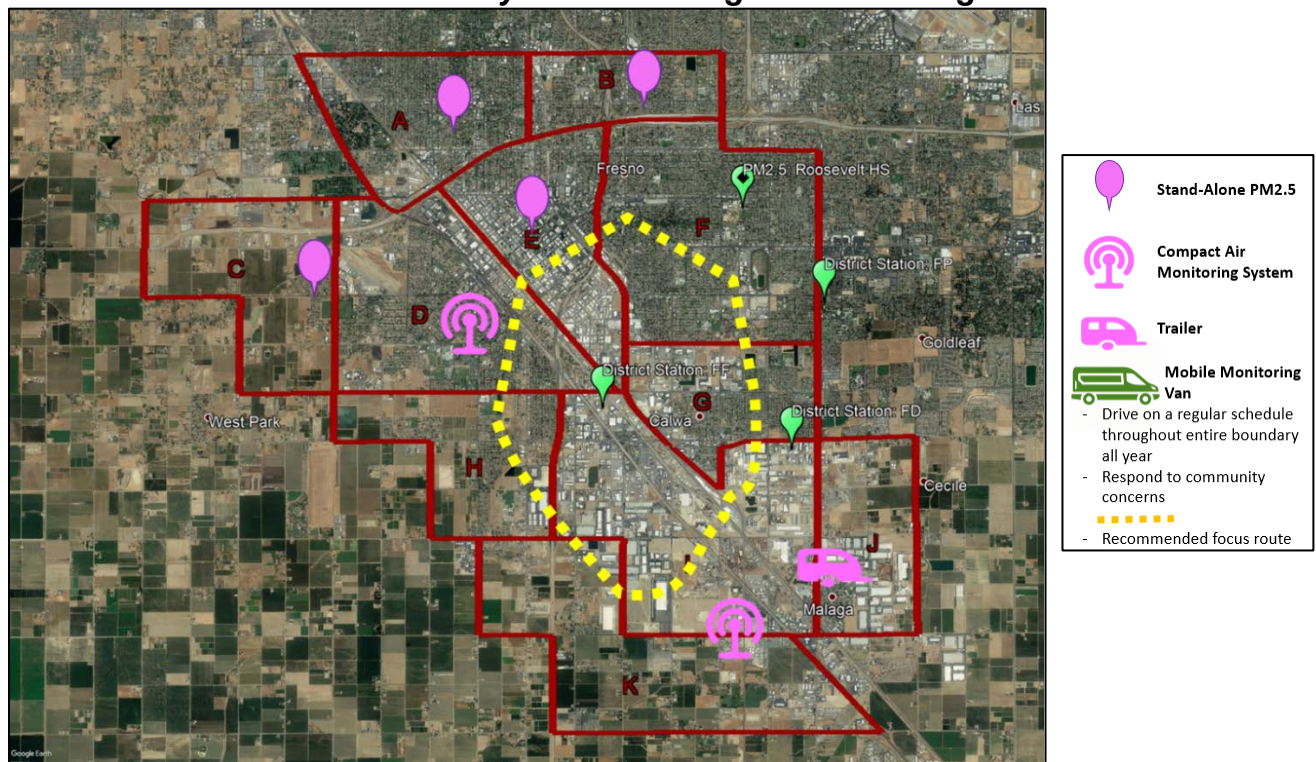
Moving forward, the District will continue to expand and establish the community air monitoring network in the community of South Central Fresno in addition to enhancing the availability and presentation of air monitoring data to the public.

II. Community Air Monitoring and Status of Network Deployment

Assembly Bill (AB) 617, signed into law in July 2017, has resulted in a statewide effort to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants statewide through new community-focused and community-driven actions. AB 617 provides mechanisms and resources to implement community-specific air quality monitoring networks, develop and implement emission reduction programs; improve availability of data and other technical information; and invest substantial funding in the community through voluntary incentive funding measures. South Central Fresno, a densely populated community within the city of Fresno, was selected as a first year community by CARB in September of 2018.

District staff provided assistance to the Community Steering Committee (CSC) members by helping them to develop their recommended air monitoring priorities. The District worked with CSC members as they reviewed and evaluated a variety of different resources, including maps of stationary sources, area sources, mobile sources, prevailing wind direction data, and sensitive receptor locations relative to sources of air pollution within the community. The CSC adopted their official recommendation on June 12, 2019, including the deployment of various air monitoring platforms within the community as identified in below.

South Central Fresno Community Air Monitoring Network Design



Community Air Monitoring Platforms and Equipment

The District has been working to site and deploy the following high-precision regulatory grade air monitoring systems and platforms, providing flexible options to meet air monitoring needs for the community air monitoring network:

- **Stand-Alone PM2.5 Monitors:** The District operate fixed air monitoring analyzers to measure ambient PM2.5. These are placed in their respective locations for sufficient lengths of time to capture annual and peak PM2.5 pollution trends throughout the community, unless monitoring priorities change and monitor relocation is necessary.



- **Compact Multi-Pollutant Air Monitoring System:** These compact air monitoring systems operate as semi-mobile platforms. Each platform is equipped with advanced air monitoring analyzers measuring various pollutants, with the ability to communicate the community-level air quality in real time.



- **Air Monitoring Trailer:** The air monitoring trailer system operates as a semi-mobile platform. This platform is equipped with advanced air monitoring analyzers with the ability to communicate the community-level air quality in real time.



- **Mobile Air Monitoring Van:** The van is ideal for focusing on unmonitored areas of concern and regularly surveying the entire community within short timeframes, allowing for a better understanding of the spatial differences in air quality across the community. The air monitoring van can also be used for measuring pollution from on-road sources, and identifying sources of community-level air pollution. Additionally, the van can be parked in one location for longer periods of time to capture daily or weekly pollution from unmonitored areas within the community.



The air monitoring van is a useful tool for evaluation of a large geographic region, but these platforms are best designed for taking a short-term look at the measured pollutants when and where the monitoring occurred. The fixed and semi-mobile platforms are outfitted with instrumentation that is capable of more accurately measuring daily and long-term variations in pollutant concentrations. The use of both mobile and semi-mobile monitoring platforms is necessary to capture the full picture of the community's air pollution profile.

These air monitoring systems provide real-time hourly average readings of the following pollutants:

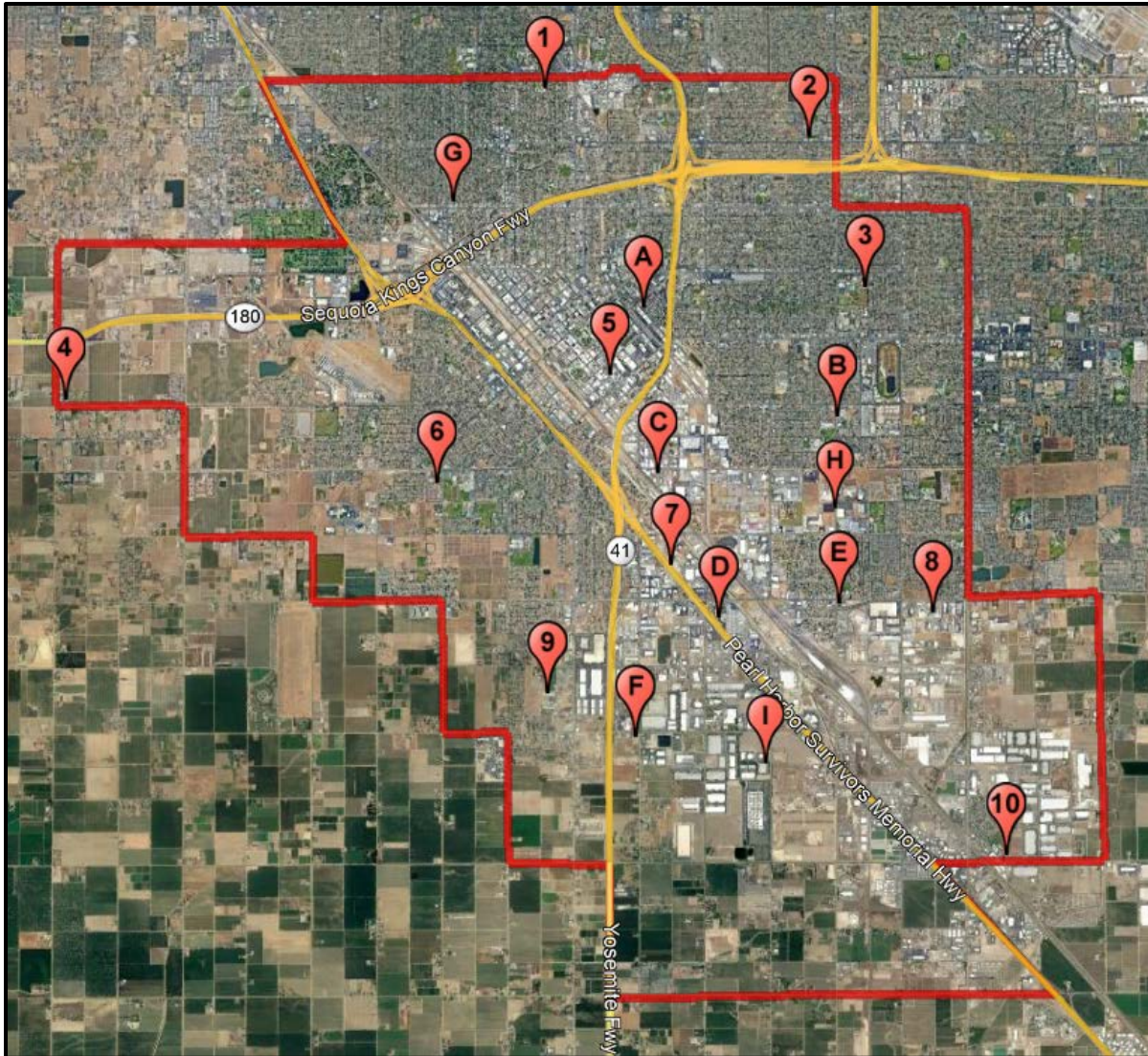
- **PM2.5:** PM2.5 can be composed of any material that has a diameter of 2.5 microns or less. PM2.5 can be emitted directly as primary PM2.5 from various sources or formed secondarily through chemical reactions in the atmosphere.

- **Black Carbon (BC):** Black carbon is also known as soot or elemental carbon and formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel), and wood burning
- **Nitrogen Oxides (NO, NO₂, NO_x):** Nitrogen oxides (NO_x) are chemical compounds formed by the combination of nitrogen and oxygen, and are primarily emitted through the combustion of fossil fuels from mobile and stationary sources
- **Volatile Organic Compounds (VOC):** VOCs are released through the burning of various fuels such as gasoline, wood, coal, or natural gas, and can also be released through the use of solvent based consumer products
- **Ozone:** Ozone is not emitted directly into the air, but is created by chemical reactions between NO_x and VOC in the presence of heat and sunlight
- **Carbon Monoxide (CO):** CO is a colorless, odorless gas that can be harmful when inhaled in large amounts. The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels.
- **BTEX:** BTEX is a specified subset of VOCs containing benzene, toluene, ethylbenzene, and xylene. These chemicals appear naturally in crude oil and can be associated with emissions from petroleum refineries, and petroleum storage and fueling stations.
- **Sulfur Dioxide (SO₂):** SO₂ is a colorless gas with a pungent odor. Sulfur dioxide is produced largely by fossil fuel combustion.
- **Hydrogen Sulfide (H₂S):** H₂S is a colorless gas characterized by its foul odor of rotten eggs and can be smelled at low concentrations. Hydrogen sulfide is often produced from the breakdown of organic matter in the absence of oxygen gas, such as in swamps, sewers, and in the crude oil extraction/refining process.

South Central Fresno community air monitoring also includes the capturing of air samples using canisters and filters that are sent to third party laboratories to be analyzed for VOC and PM_{2.5} compounds and species present in the local air.

Status of South Central Fresno Community Air Monitoring Network

Consistent with the community recommended air monitoring network design, the District has completed the implementation of air monitoring systems in almost all the locations identified in the community air monitoring plan, with the exception of two remaining sites. The progress in implementing the community air monitoring network in South Central Fresno is listed below:



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

1. Heaton Elementary School (PM2.5)

The District has placed a real-time, standalone PM2.5 monitor on the roof of Heaton Elementary near the corner of McKinley Avenue and San Pablo Avenue. Operation of this analyzer began in June 2020. In the interim, the air monitoring van was utilized to monitor areas nearby this location. Data collected from this site is available on the District's South Central Fresno AB 617 air monitoring webpage and is being uploaded to CARB's [AQview portal](#) on a regular basis.

2. Yosemite Middle School (PM2.5)

The District has placed a real-time, standalone PM2.5 monitor at Yosemite Middle School near the intersection of Olive Avenue and North 9th Street. Operation of this analyzer began in June 2020. Prior to installing the monitor, the air monitoring van was utilized to monitor air quality in areas nearby this location. Data collected from this site is available on the District's South Central Fresno AB 617 air monitoring webpage and is being uploaded to CARB's [AQview portal](#) on a regular basis.

3. Roosevelt High School (PM2.5)

The District has placed a real-time, standalone PM2.5 monitor at Roosevelt High School on the corner of Tulare and Barton Avenues. Operation of this analyzer began in March 2019. Data collected from this site is available on the District's South Central Fresno AB 617 air monitoring webpage and is being uploaded to CARB's [AQview portal](#) on a regular basis.

4. Madison Elementary School (PM2.5)

The District has been in discussions with Central Unified School District to place a real-time PM2.5 monitor at the school on the corner of S. Brawley Avenue and W. Madison Avenue. The District is still awaiting approval from Central Unified School District. In the interim, the air monitoring van is being utilized to monitor areas nearby this location. In addition, the District is looking at alternative locations near the school to begin air monitoring operations while details continue to be developed with Central Unified School District, or should an agreement with the school district not be reached.

5. Bitwise South Stadium (PM2.5)

The District has placed a real-time PM2.5 monitor on the roof at Bitwise South Stadium on the corner of Van Ness Avenue and Mono Street in downtown Fresno. Operation of this analyzer began in August 2019. Data collected from this site is available on the District's South Central Fresno AB 617 air monitoring webpage and is being uploaded to CARB's [AQview portal](#) on a regular basis.

6. Edison High School (Compact Multi-Pollutant System)

The District has been working with Fresno Unified School District (FUSD) to place a compact multi-pollutant air monitoring system at Edison High School on the corner of California and Walnut Avenues. The District is continuing to attempt to schedule further meetings with Fresno Unified School District to discuss opportunities to install the monitor at the school. In the interim, the air monitoring van is being utilized to monitor areas nearby the school. In addition, the District is looking at alternative locations near the school to begin air monitoring operations should an agreement with the school district not be reached.

7. Fresno-Foundry Park (PM2.5, VOC/PM2.5 speciation)

The District has placed a real-time PM2.5 monitor (Met One BAM-1020) at the existing District air monitoring site at Foundry Park Ave near the intersection of Jensen Avenue and Highway 99 in December 2019. The PM2.5 analyzer began its official operation in January 2020. The District also began operating VOC and PM2.5 speciation sampling at this location to begin to build an understanding of the relative comparison between the constituents that comprise the VOC and PM2.5 concentrations present in the community. These speciation measurements began in December of 2019. On June 23, 2020, VOC and PM2.5 speciation air monitoring efforts were shifted to the air monitoring trailer at Malaga Elementary School.

8. Fresno-Drummond Air Monitoring Station (Ozone, NO2, Filter Based PM10)

The District operates the Drummond Regulatory Air Monitoring Station near Jenson and Maple Avenues. This site monitors Ozone and NO2 in near real time and filter-based PM10 where filter samples are sent to the California Air Resources Board lab for analysis.

9. West Fresno Middle School (Compact Multi-Pollutant System)

The District worked with Washington Unified School District to install the compact multi-pollutant air monitoring system at West Fresno Middle School, located on the southwest corner of South Ivy Avenue and East Annadale Avenue. This system was initially planned for Orange Center Elementary School. On September 2019, District staff presented a proposal to the superintendent and the board of the Orange Center School District. On February 13, 2020, the superintendent informed District staff that the school board had voted and denied the request due to a high number of ongoing projects already in progress at the school. As an alternative, the steering committee approved installation of the air monitoring system at West Fresno Middle School, only about a mile away from Orange Center Elementary School.

Operation of this system began on September 29, 2020. PM2.5 and ozone data from this site is available on the District's South Central Fresno AB 617 air monitoring web page and is uploaded to CARB's [AQview portal](#) on a regular basis. Additional pollutants including black carbon, BTEX, NOx, H2S, and SO2 are also monitored.

10. Malaga Elementary School (Air Monitoring Trailer)

The District worked with Fowler Unified School District to install the multi-pollutant air monitoring trailer at Malaga Elementary School on the corner of South Ward Avenue and East Central Avenue. Operation of this trailer began on June 18, 2020. In the interim, the air monitoring van was utilized to monitor areas nearby this location. PM_{2.5} and ozone data from this site is available on the District's South Central Fresno AB 617 air monitoring web page and is uploaded to CARB's [AQview portal](#) on a regular basis. Additional pollutants including black carbon, BTEX, CO, NO, NO₂, NO_x, H₂S, and SO₂ are also monitored and is in the process of being integrated into the District's South Central Fresno AB 617 air monitoring web page. On June 23, 2020, the District shifted its VOC and PM_{2.5} speciation sampling operations from the Fresno-Foundry site to the Malaga Elementary School site, which will build an understanding of the relative comparison between the constituents that comprise the VOC and PM_{2.5} concentrations present in this area of the community.

Mobile Air Monitoring Van

In addition to the semi-mobile and fixed platforms, the District has been maximizing the usage of the considerable air monitoring capabilities of the air monitoring van to measure a variety of air pollutants of concern throughout the community. Measurements taken with the air monitoring van will allow the District and the community steering committee to understand local air pollution in the communities while also giving the District the ability to rapidly respond to air pollution concerns in other unmonitored regions. Intensive air monitoring operations with the mobile van began in January 2020. As mentioned earlier, the air monitoring van has enabled the District to commence air monitoring activities in areas that are still awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

III. Summary of PM_{2.5}, Ozone, and NO₂ Air Monitoring

During this reporting period, concentrations of hourly PM_{2.5} were measured at the air monitoring sites of Roosevelt High School, Bitwise South Stadium, Fresno-Foundry, Heaton Elementary, Yosemite Middle School and Malaga Elementary within the South Central Fresno community boundary. The results of these measurements are summarized in the following table. As shown below, the community continued to experience elevated PM_{2.5} emissions during this quarter due to smoke impacts from extreme wildfires experienced by the entire valley.

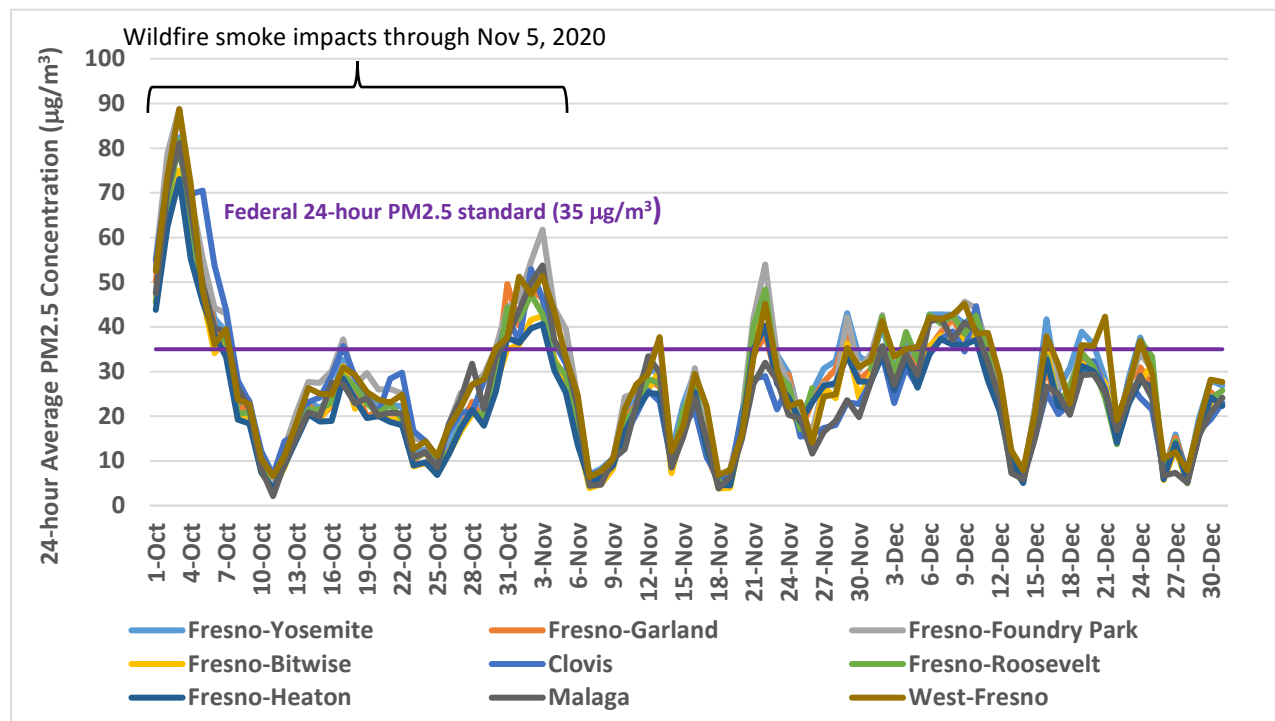
Quarterly 24-Hour Average PM2.5 ($\mu\text{g}/\text{m}^3$)

Quarter	Roosevelt High School	Bitwise South Stadium	Fresno-Foundry	Heaton Elementary School	Yosemite Middle School	Malaga Elementary School	West Fresno Middle School
2019 Q2	6.6	--	--	--	--	--	--
2019 Q3	5.7	6.2	--	--	--	--	--
2019 Q4	14.2	14.3	--	--	--	--	--
2020 Q1	13.7	12.5	14.7	--	--	--	--
2020 Q2	5.9	6.3	7.8	5.5*	7.1*	7.8*	--
2020 Q3	26.3	25	29.7	23.4	28.7	30.2	--
2020 Q4	26.1	24.3	28.1	23.8	28.2	25.1	28.8

*Site was not online for entire quarter

The following provides a comparison of daily PM2.5 concentrations during this period between the air monitoring site within the community boundary and the nearby Clovis and Fresno-Garland air monitoring sites north of the community boundary.

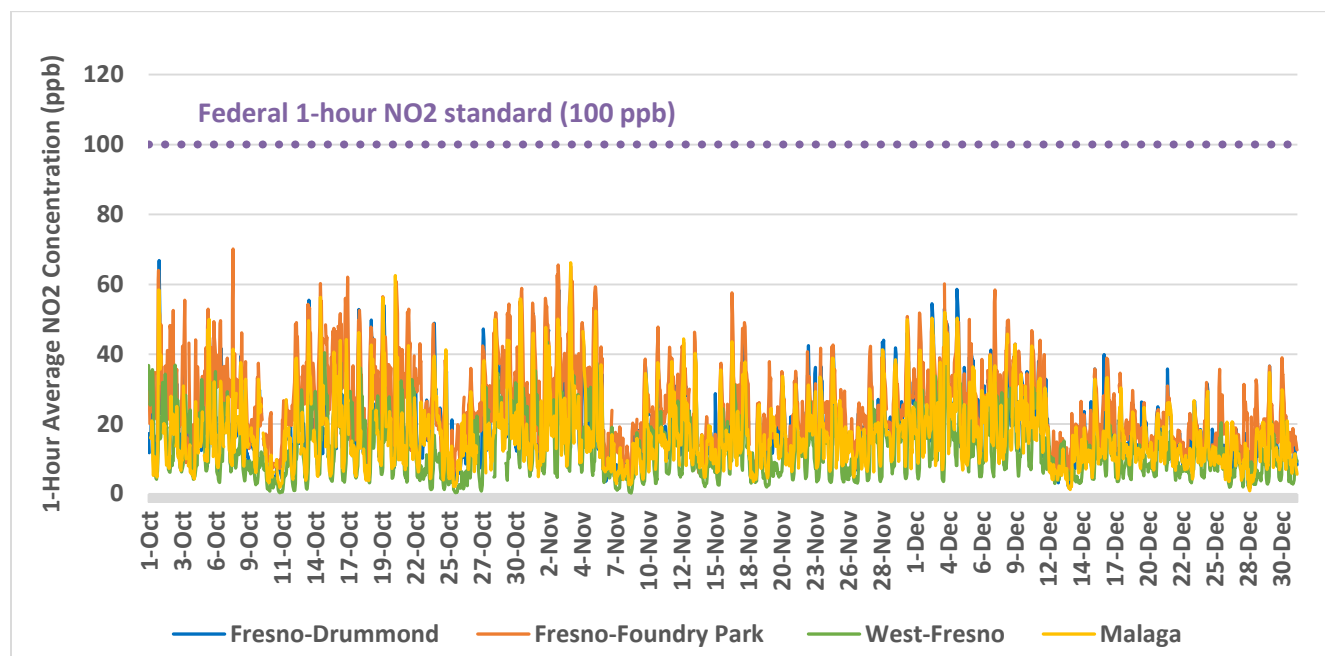
2020 Q4 24-Hour PM2.5 at Bitwise South Stadium, Roosevelt High School, Heaton Elementary School, Yosemite Middle School, Malaga Elementary School, Fresno-Foundry Air Monitoring Station, Fresno-Garland Air Monitoring Station, West Fresno Middle School, and Clovis Air Monitoring Station



Through November 5th, the above exceedances of the federal 24-hour PM2.5 standard were due to wildfire smoke impacts. Strong high pressure throughout the rest of November and December caused poor dispersion leading to elevated PM2.5 concentrations across the community.

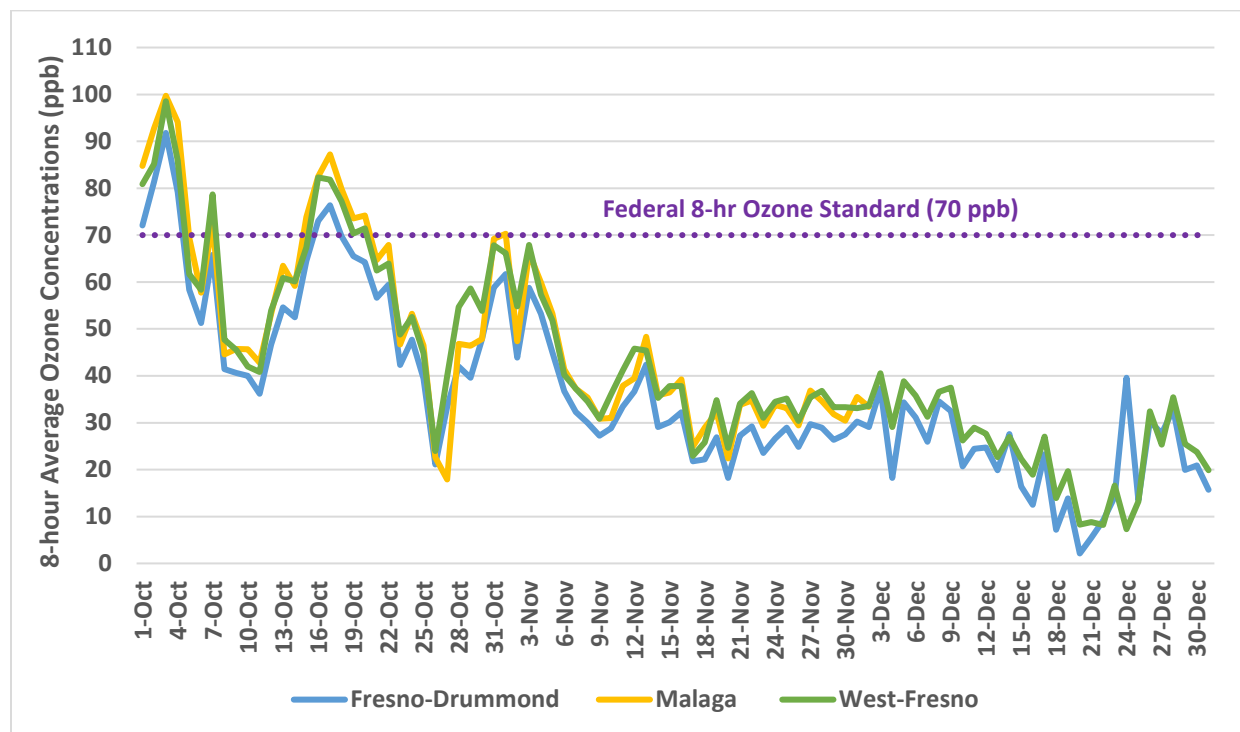
The following provides a comparison of 1-hour NO₂ concentrations between multiple locations in the community during this period. The concentration levels measured at all locations were below the federal 1-hour NO₂ standard during this quarter.

2020 Q4 1-hr NO₂ Concentrations at Malaga Elementary School, West Fresno Middle School, Fresno-Drummond Air Monitoring Station, and Fresno-Foundry Air Monitoring Station



The following provides a comparison of 8-hour ozone concentrations between multiple locations in the community during this period. As shown below, these sites are trending fairly consistent with each other.

2020 Q4 8-hr Average Max Ozone Concentrations at Malaga Elementary School, West Fresno Middle School, and Fresno-Drummond Air Monitoring Station



IV. Summary of Data Collected using Mobile Air Monitoring Van

In addition to the expanded PM2.5 measurements that have been occurring in the South Central Fresno community, the District has been taking advantage of the considerable air monitoring capabilities of the mobile air monitoring van to measure a variety of air pollutants throughout the community.

The air monitoring van is ideal for taking measurements in unmonitored areas of concern and for regular surveillance over the entire community of South Central Fresno in short timeframes. The air monitoring van has also enabled the District to commence air monitoring activities in areas that are still awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

The air monitoring van was used to measure a variety of air pollutants within the South Central Fresno community in the map below. The blue boundary in the map was identified by the South Central Fresno community steering committee as an area of interest for taking air quality measurements with the mobile air monitoring van.

CSC Recommended Areas of Interest for using Mobile Air Monitoring Van

Site A: Parking lot on east corner of Tulare and 'R' Street

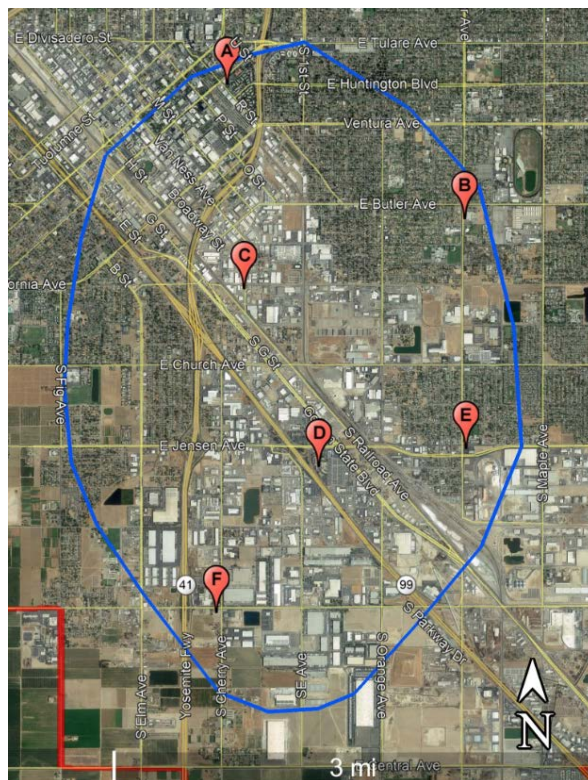
Site B: Parking lot on south east corner of East Butler Ave and South Cedar Ave

Site C: Parking lot on southwest corner of East California Ave and South Van Ness Ave

Site D: On 2nd Street south of intersection with Jensen Ave

Site E: Parking lot on southeast corner of E Jensen Ave and S Cedar Ave

Site F: Unpaved lot on southwest corner of E North Ave and S Cherry Ave



Starting in January 2020 air monitoring van monitored the sites described above. In March 2020, the District re-focused its efforts using the air monitoring van to also monitor emissions near the aforementioned school sites that are awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

During the 3rd quarter of 2020, the van was also used to monitor a residential location near Ferger Avenue and East Belmont Avenue as requested by the steering committee due to odor concerns and potential emissions from nearby sources. No significant emission concentrations were detected, as shared with the Community Steering Committee. Emissions concentrations measured were consistent with other air monitors in the community. In addition, in response to a Community Steering Committee request, van air monitoring was also performed at E Florence Ave and South Cedar Avenue due to concerns of high emissions from vehicular traffic. High PM_{2.5} emissions were measured, however those emissions were from extreme wildfire smoke that the Valley was experiencing. Elevated NO₂ emissions were detected early in the morning, indicating heavy traffic. See Appendix B of the 2020 3rd quarter report for details of emissions at the specific locations.

The concentrations of pollutants measured with the air monitoring van at all locations during this quarter are summarized below.

Average and Peak Pollutant Concentrations in Areas Monitored with the Mobile Air Monitoring Van

Pollutant	Overall Average Value	Peak 1-hr Average Value	Applicable Standard
Benzene	0	0	1 ppb (Chronic Risk Exposure Level)
Toluene	0	0	111 ppb (Chronic Risk Exposure Level)
Ethylbenzene	0	0	461 ppb (Chronic Risk Exposure Level)
Xylene	0	0	161 ppb (Chronic Risk Exposure Level)
PM2.5	21.8 µg/m ³	58 µg/m ³	35 µg/m ³ (24-hr average)
Ozone	32.7 ppb	82.2 ppb	70 ppb (8-hr average)
CO	0.5 ppm	1.1 ppm	35 ppm (1-hr average)
NO2	16 ppb	34.7 ppb	100 ppb (1-hr average)
SO2	1.3 ppb	6.4 ppb	75 ppb (1-hr average)
H2S	1.5 ppb	4.9 ppb	7 ppb (Chronic Risk Exposure Level)

The air monitoring van did not measure any quantifiable amount of BTEX. Although the peak 1-hr average for ozone is greater than the 70 ppb 8-hr federal ozone standard, the 8-hr average is below 70 ppb. The high PM2.5 concentrations were due to smoke impacts from surrounding wildfires. The concentration levels measured for the other pollutants were below applicable air quality standards.

Appendix A to this report includes more details of daily measurements at each location using the mobile air monitoring van during this period.

V. Summary of PM2.5 Speciation Analysis

To build a fuller understanding of the various constituents that comprise the overall PM2.5 concentrations in the South Central Fresno community, and their relative comparison, in November 2019 the District began operating PM2.5 speciation sampling at the Fresno-Foundry site near the intersection of Jensen Avenue and Highway 99. On June 23, 2020, VOC and PM2.5 speciation air monitoring efforts were shifted to the air monitoring trailer at Malaga Elementary School. The collected samples were sent to a third-party laboratory for analysis to determine the contribution of various species of PM2.5 to the overall measured PM2.5 mass.

The nature and formation of PM2.5 in the San Joaquin Valley is highly complex as it can be composed of any material that has a diameter of 2.5 microns or less. PM2.5 can be emitted directly as primary PM2.5 from various sources or formed secondarily through chemical reactions in the atmosphere. The resulting ambient PM2.5 mixture can include aerosols (fine airborne solid particles and liquid droplets) consisting of components of nitrates, sulfates, organic carbon, black carbon, soil, trace metals, and more.

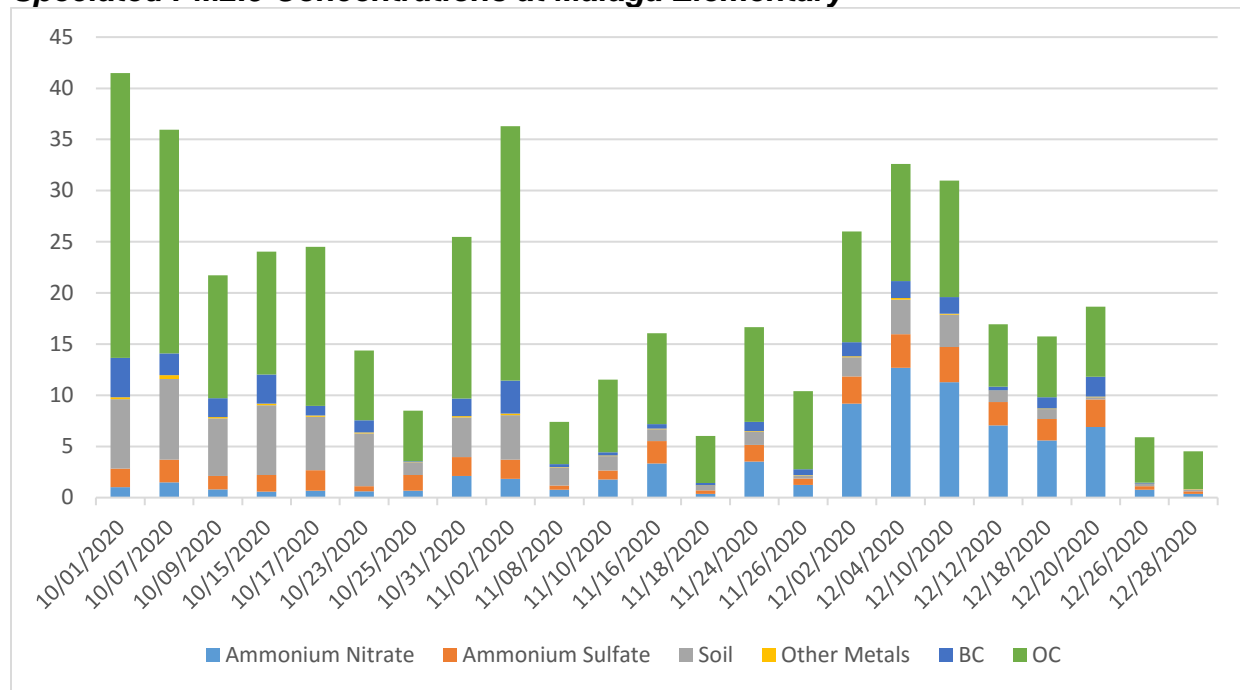
PM2.5 in the Valley is comprised of many species that contribute to the total PM2.5 mass. This complex mixture is attributable to emissions from stationary, mobile, and area-wide sources, as well as naturally occurring emissions. Although the list of

species contributing to PM_{2.5} in the Valley is lengthy, it can be grouped into larger representative categories. The following is a brief description of each of these larger species categories:

- **Ammonium Nitrate:** Ammonium nitrate is formed from the reaction of ammonia and nitric acid, where the nitric acid is formed from emissions of nitrogen oxides.
- **Ammonium Sulfate:** Ammonium sulfate is formed from the reaction of ammonia and sulfuric acid, where the sulfuric acid is formed primarily from emissions of sulfur oxide, with smaller amounts forming from direct emissions of sulfur.
- **Organic carbon:** Organic carbon (OC) are generated as primary organic aerosol, predominantly through the combustion of hydrocarbons. Key sources include cooking, industrial processes, mobile source exhaust, tire wear, and wood burning. Secondary organic aerosols are formed from the oxidation of motor vehicle hydrocarbons, wood burning, solvent use, and industrial processes.
- **Black Carbon:** Black carbon is also known as soot or elemental carbon, and is formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel) and wood burning.
- **Soil:** This category consists of road dust and soil dust that are entrained in the air from activity, such as soil disturbance or airflow from traffic.
- **Other Metals:** Identified as components from soil emissions or found in other particulates having been emitted in connection with combustion from engine wear, brake wear, and similar processes. Certain metals are also emitted from the use of fireworks.

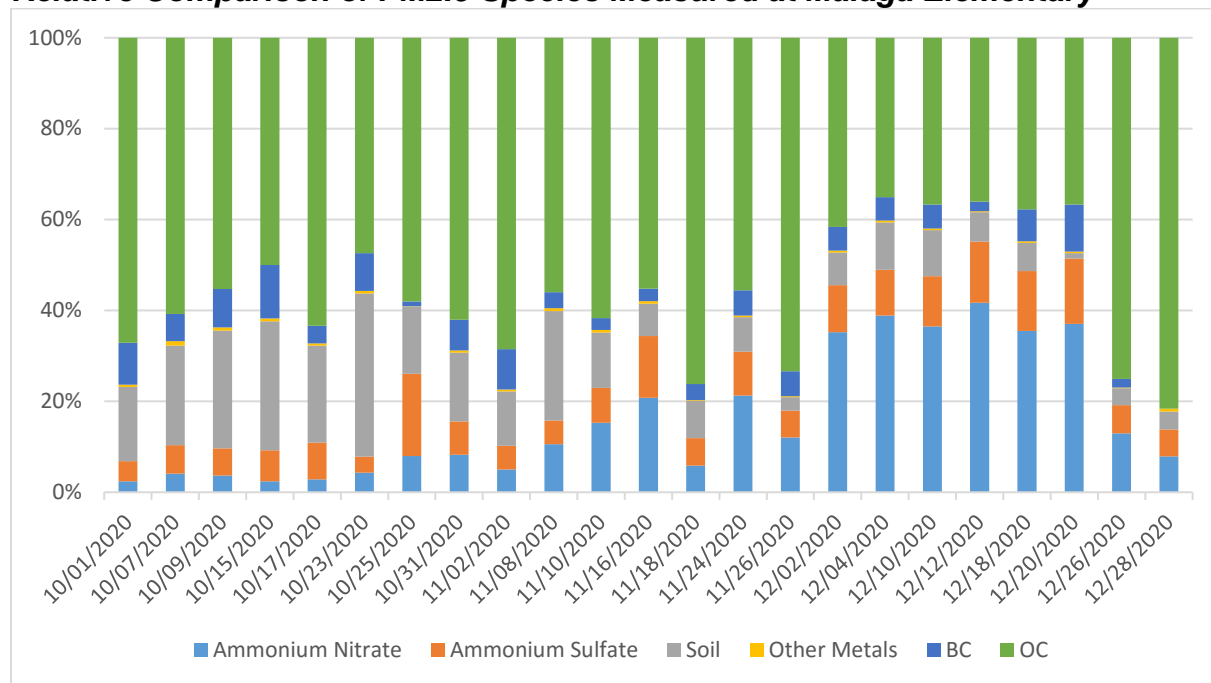
The following figures show the concentration levels and relative comparison of the various PM_{2.5} species sampled at Malaga Elementary School. Samples were taken through the entire three month period. Note that in the speciation results below, organic carbon was a large portion of the total as wildfires emissions, a source of organic carbon, significantly impacted PM_{2.5} measurements during this quarter. Later in the period, under stable conditions, higher concentrations were mostly driven by ammonium nitrate, which is common during the fall/winter seasons in the Valley.

Speciated PM2.5 Concentrations at Malaga Elementary



The spikes in PM2.5 concentrations shown above were from the wildfire smoke impacts during this period. The percentage of PM2.5 species found in each sample is shown in the following chart.

Relative Comparison of PM2.5 Species Measured at Malaga Elementary



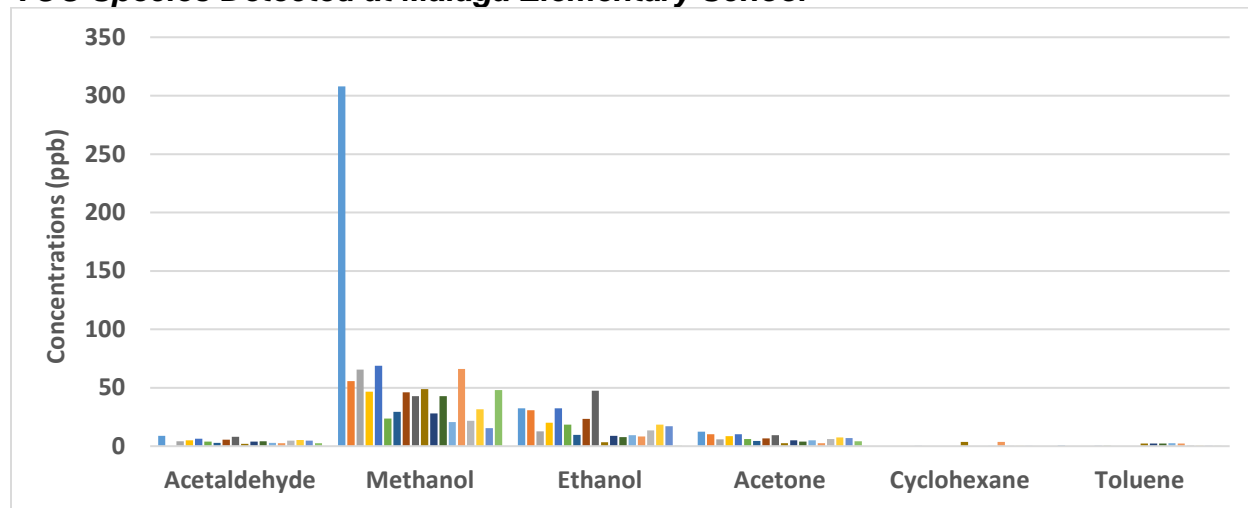
VI. Summary of VOC Speciation Analysis

To build a fuller understanding of the various compounds that contribute to VOC concentrations in the South Central Fresno community, in December 2019 the District began operating VOC speciation sampling at the Fresno-Foundry site near the intersection of Jensen Avenue and Highway 99. On June 23, 2020, VOC and PM2.5 speciation air monitoring efforts were shifted to the air monitoring trailer at Malaga Elementary School. The collected samples were sent to a third party laboratory for analysis to determine the various specific VOCs that were detected in the atmosphere. This laboratory analysis is able to isolate the concentrations of nearly 83 different VOCs from each air sample collected in the field.

VOCs are carbon chained compounds that vaporize in ambient conditions. Among these compounds include but, are not limited to, BTEX, 1,3-butadiene, PAH, aldehydes, naphthalene, and diethanolamine. These compounds are typically emitted from products such as paints, inks, organic solvents, petroleum products as well as vehicle exhaust. The health effects of these compounds vary but, long term exposure can have lasting adverse health effects. A more detailed list of possible VOCs and their health effects is provided by the California Office of Environmental Health Hazard Assessment (OEHHA)¹.

During this period, the District collected 18 air samples for laboratory analysis. The VOC laboratory analysis is capable of isolating concentrations of 83 VOC species, however during this period most VOCs were not detected in the atmosphere. The following chart displays the small number of VOCs that were detected during this period, with most of these reporting only trace levels. Each color represents a sample.

VOC Species Detected at Malaga Elementary School



¹ <https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary>

During this period, acetaldehyde, methanol, ethanol, and acetone were the primary VOCs detected. Of these four, only acetaldehyde and methanol have an associated Reference Exposure Level (REL), a health risk metric established by the OEHHA.

Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. It is released into ambient air from its evaporation during solvent uses or from automobile exhaust. The highest concentrations of methanol detected during this quarter was 307.8 ppb. This is well below the OEHHA REL chronic value of 3000 ppb, which is a more protective value than the acute REL.

Acetaldehyde is ubiquitous in the ambient environment. It is an intermediate product of higher plant respiration and formed as a product of incomplete wood combustion in fireplaces and woodstoves, coffee roasting, burning of tobacco, vehicle exhaust fumes, and coal refining and waste processing. The highest concentrations of acetaldehyde detected during this quarter was 8.8 ppb. This is well below the OEHHA REL chronic value of 80 ppb, which is a more protective value than the acute REL.

Overall, during this monitoring period no concerning concentrations of VOCs were detected in the samples taken.

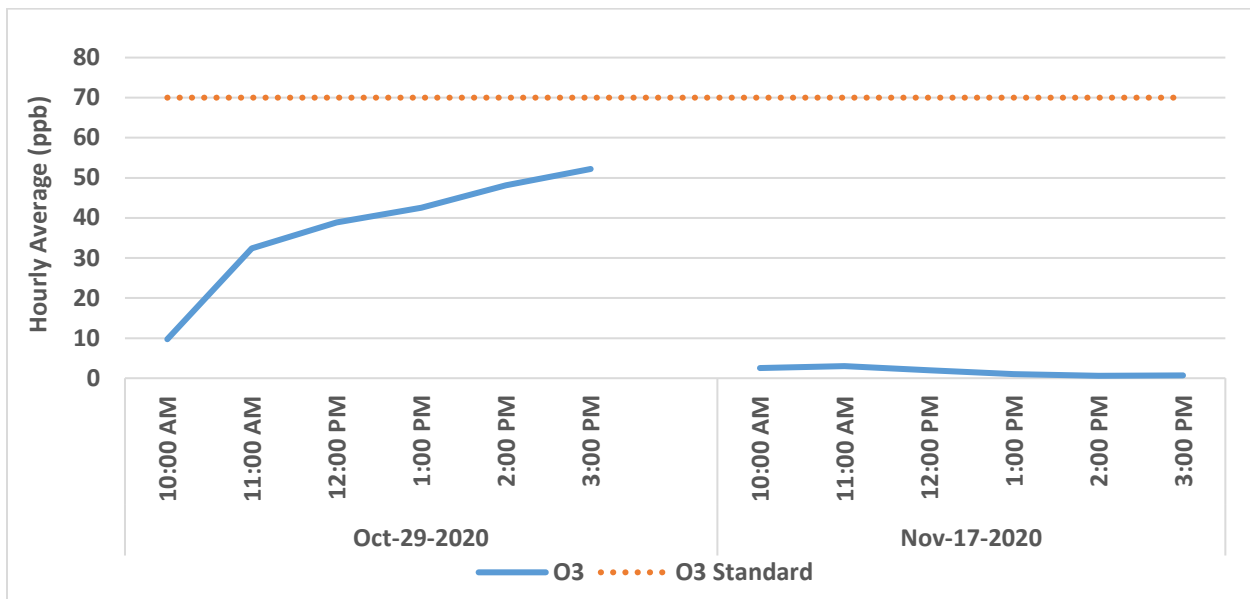
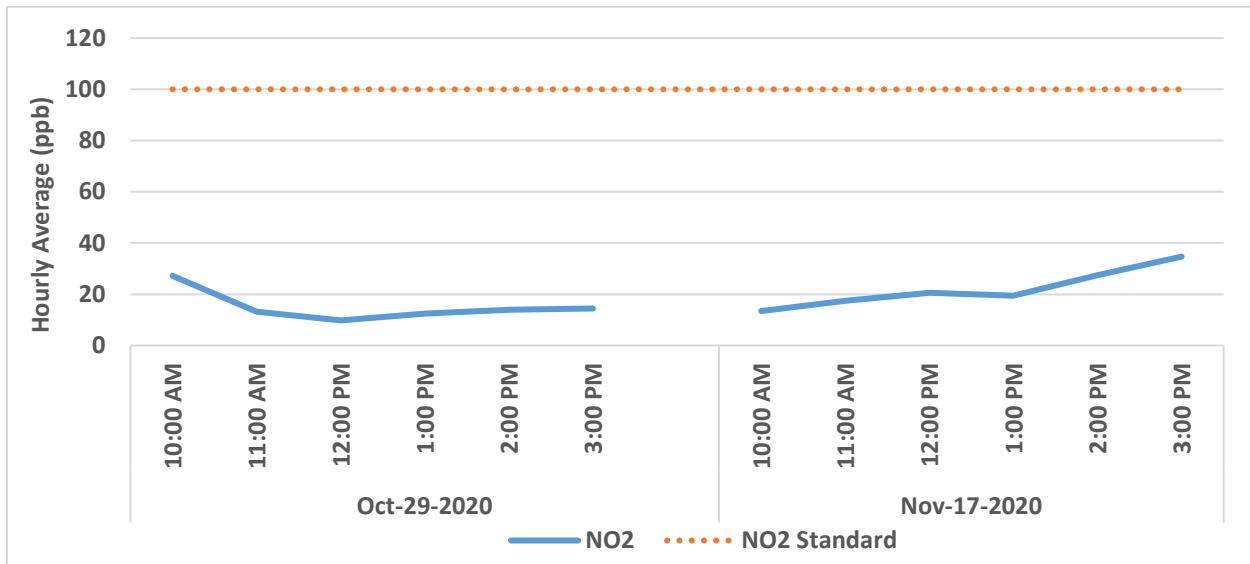
VII. Availability and Access to Community Air Monitoring Data

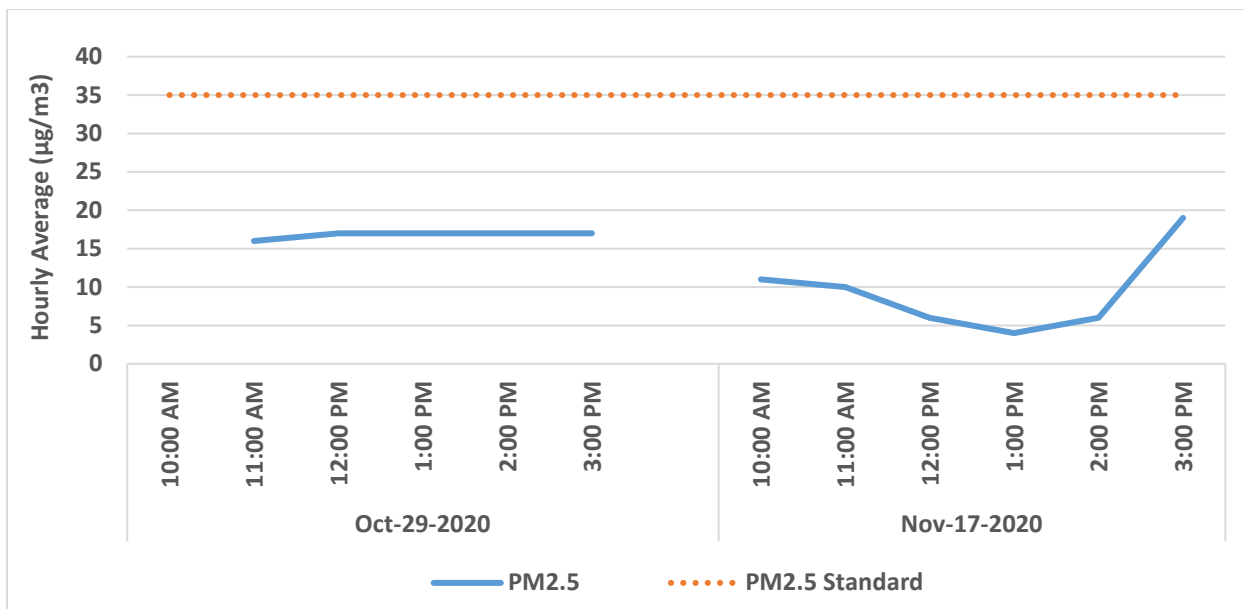
Specific air quality data collected within the South Central Fresno community air monitoring network is available in real-time at the community air monitoring page located at <http://community.valleyair.org/selected-communities/south-central-fresno/air-monitoring/>. The District will continue to develop and publish quarterly reports summarizing collected data to the District's AB 617 air monitoring website. Collected community air monitoring data is also available for download on the California Air Resources Board (CARB) AQview tool located at <https://ww2.arb.ca.gov/es/community-air-quality-portal>, where collected air monitoring data from all AB 617 communities is uploaded. Moving forward, the District will continue to enhance the availability and presentation of air monitoring data to the public.

Appendix A: Data Collected using Mobile Air Monitoring Van

The measured pollutant concentrations are detailed in the following tables.

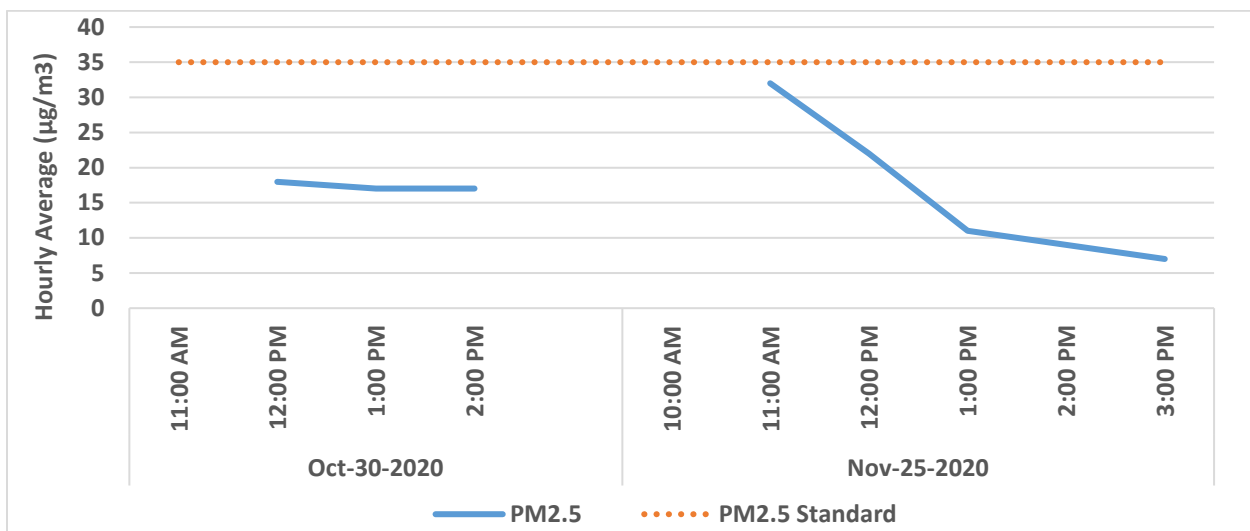
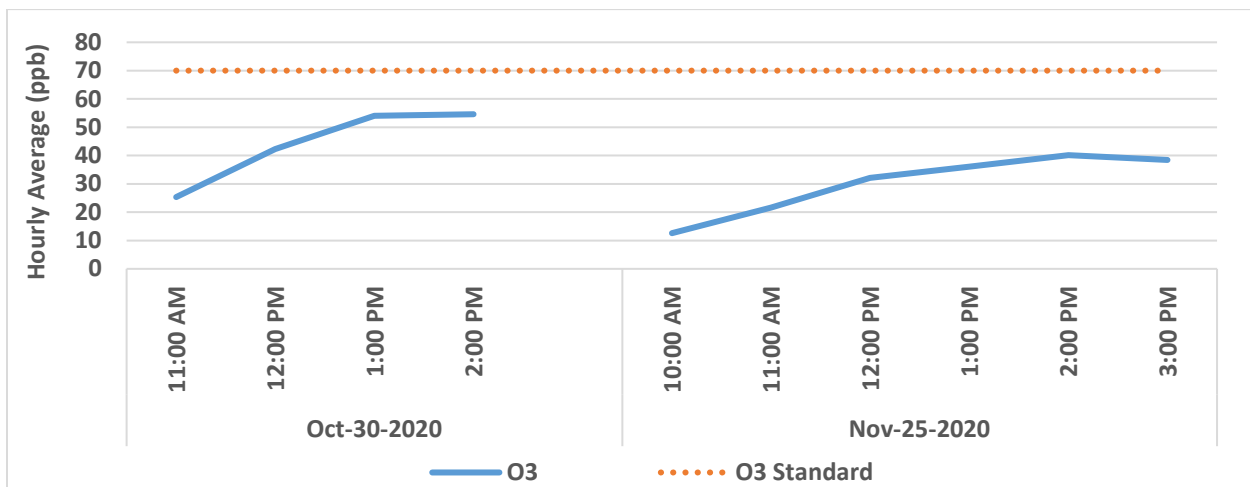
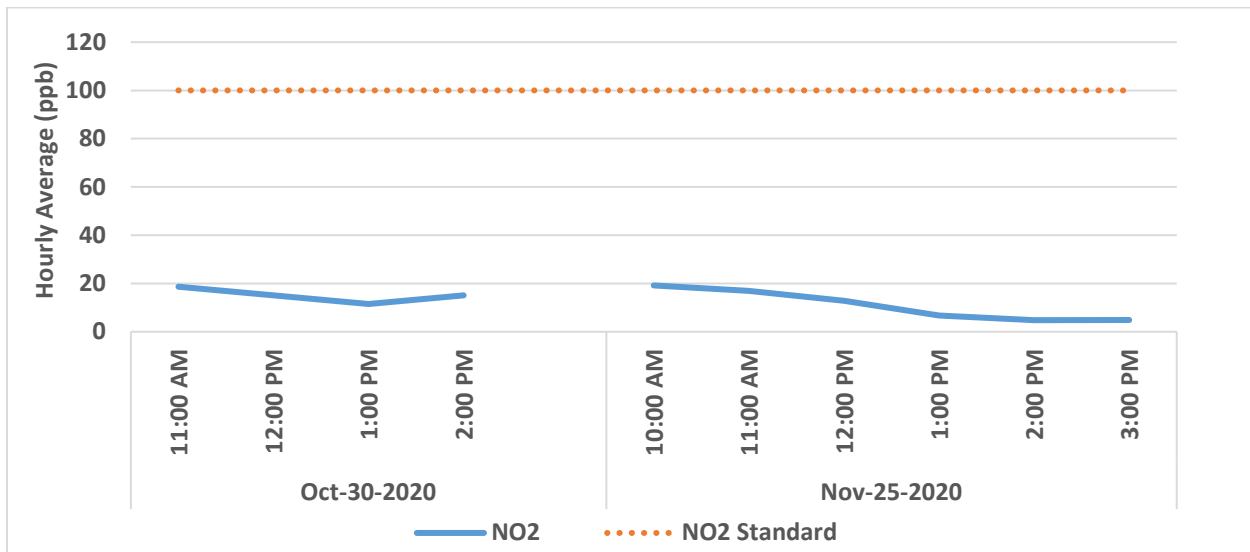
Tulare & 'R' Street





Date	Time	BETX (ppb)	CO (ppm)	H2S (ppb)	NO2 (ppb)	O3 (ppb)	SO2 (ppb)	PM2.5 (µg/m³)
10/29/2020	10:00 AM	0	0.86	0.6	27.2	9.7	0.1	N/A
	11:00 AM	0	0.42	0.5	13.2	32.4	0.1	16
	12:00 PM	0	0.39	0.7	9.8	38.9	0.7	17
	1:00 PM	0	0.41	0.9	12.5	42.5	0.8	17
	2:00 PM	0	0.31	0.4	14	48.1	0.6	17
	3:00 PM	0	0.35	0.2	14.5	52.2	0.4	17
11/17/2020	10:00 AM	0	0.29	0.9	13.4	2.5	1.3	11
	11:00 AM	0	0.27	1.1	17.5	3	0.8	10
	12:00 PM	0	0.22	1.2	20.6	2	0.6	6
	1:00 PM	0	0.27	1.2	19.4	1	0.7	4
	2:00 PM	0	0.33	1.2	27.5	0.6	0.7	6
	3:00 PM	0	0.49	1.8	34.7	0.7	1.1	19

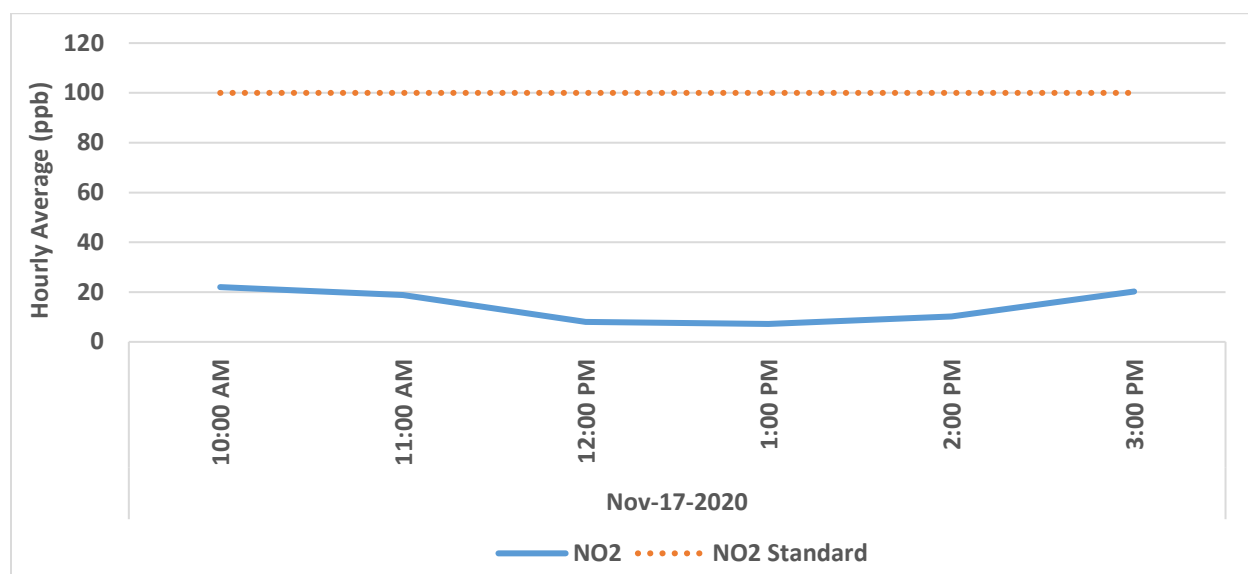
S Cedar Ave & E Butler Ave

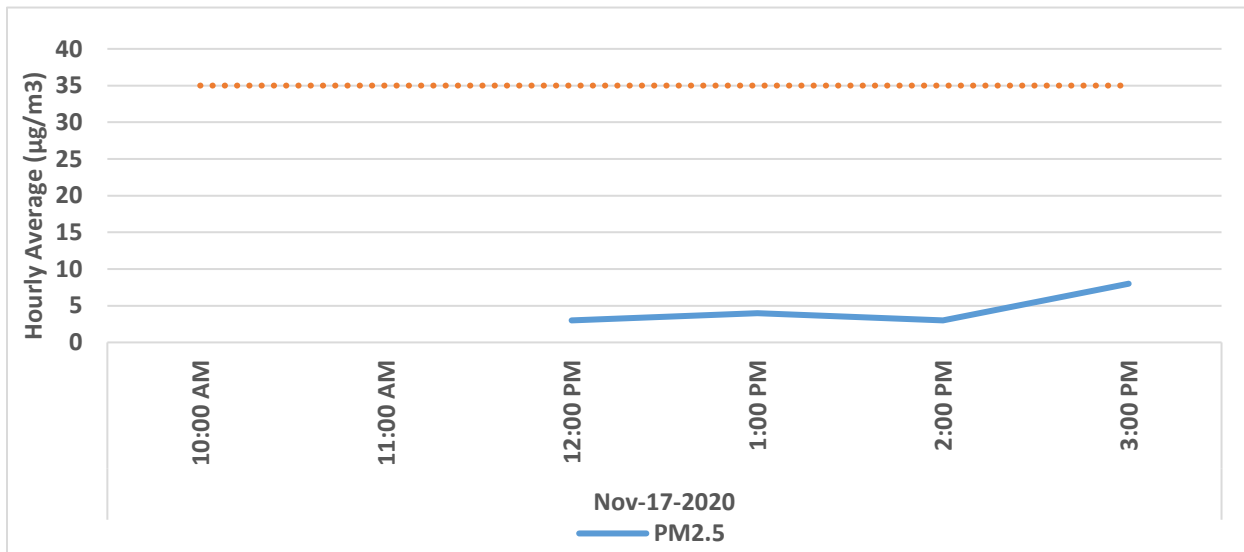
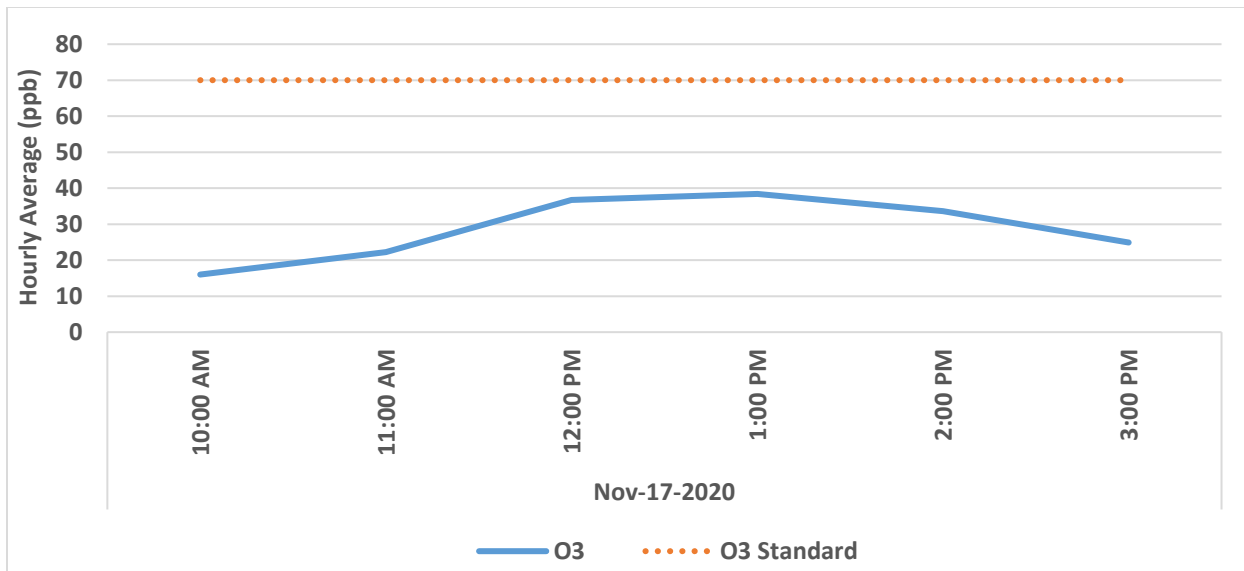


Date	Time	BTEX (ppb)	CO (ppm)	H2S (ppb)	NO2 (ppb)	O3 (ppb)	SO2 (ppb)	PM2.5 (µg/m ³)
10/30/2020	11:00 AM	0	0.51	0.9	18.6	25.4	0	N/A
	12:00 PM	0	0.45	1	15.1	42.3	0.4	18
	1:00 PM	0	0.39	0.3	11.5	54	0.1	17
	2:00 PM	0	0.4	0.3	15.1	54.6	0.2	17

11/25/2020	10:00 AM	0	N/A	3	19.2	12.6	0.3	N/A
	11:00 AM	0	N/A	2.7	16.9	21.6	0.9	32
	12:00 PM	0	N/A	1.7	12.8	32.1	0.5	22
	1:00 PM	0	N/A	1	6.7	36.1	0.4	11
	2:00 PM	0	N/A	0.8	4.8	40.2	0.2	9
	3:00 PM	0	N/A	0.9	4.9	38.5	0.4	7

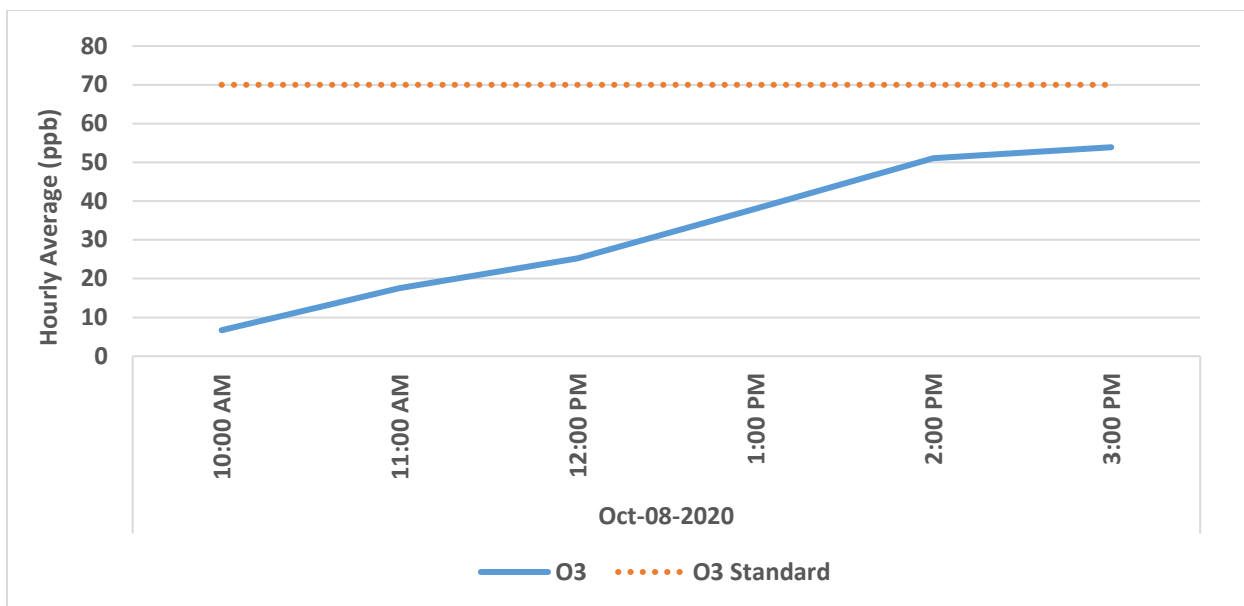
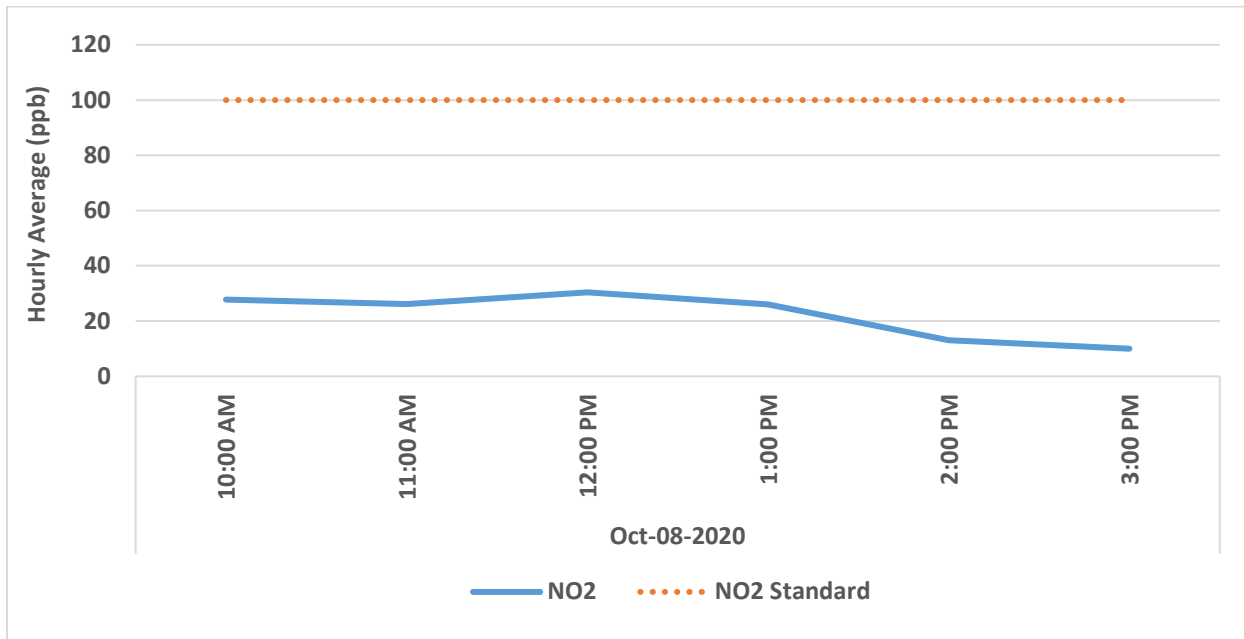
Near Edison High School

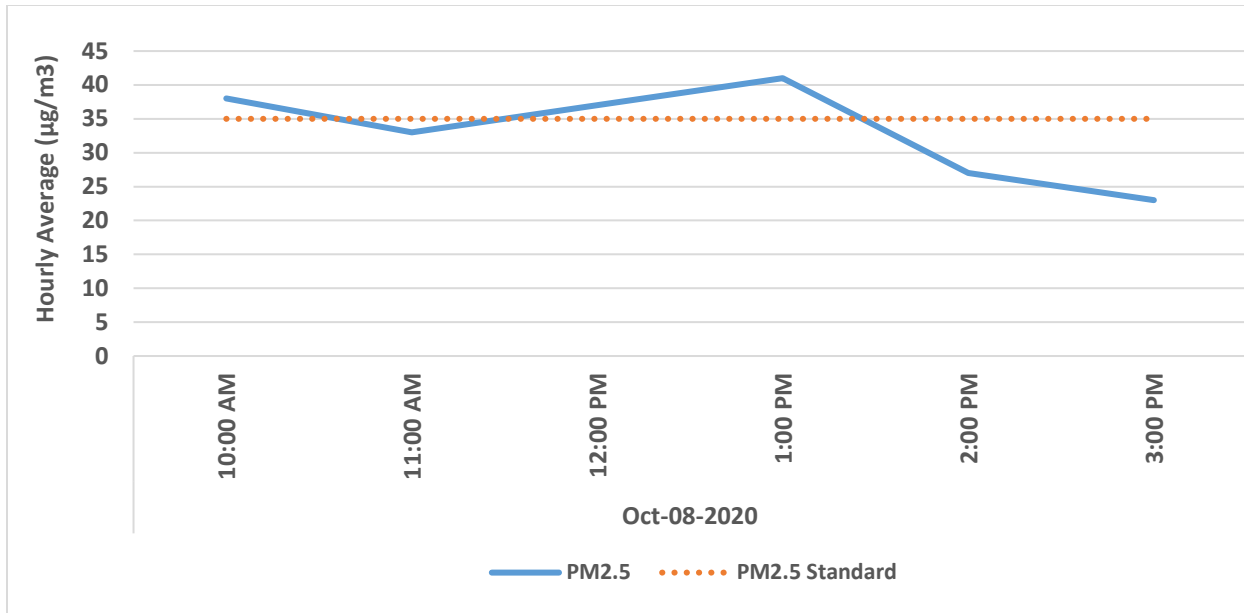




Date	Time	BTEX (ppb)	H2S (ppb)	NO2 (ppb)	O3 (ppb)	SO2 (ppb)	PM2.5 (µg/m³)
11-17-2020	10:00 AM	0	1.3	22	16	1.5	N/A
	11:00 AM	0.6	1.2	18.8	22.2	0.5	N/A
	12:00 PM	0	1.1	8	36.7	0.7	3
	1:00 PM	0	0.9	7.2	38.4	0.6	4
	2:00 PM	0	0.9	10.2	33.6	0.4	3
	3:00 PM	0	1.4	20.2	24.9	0.8	8

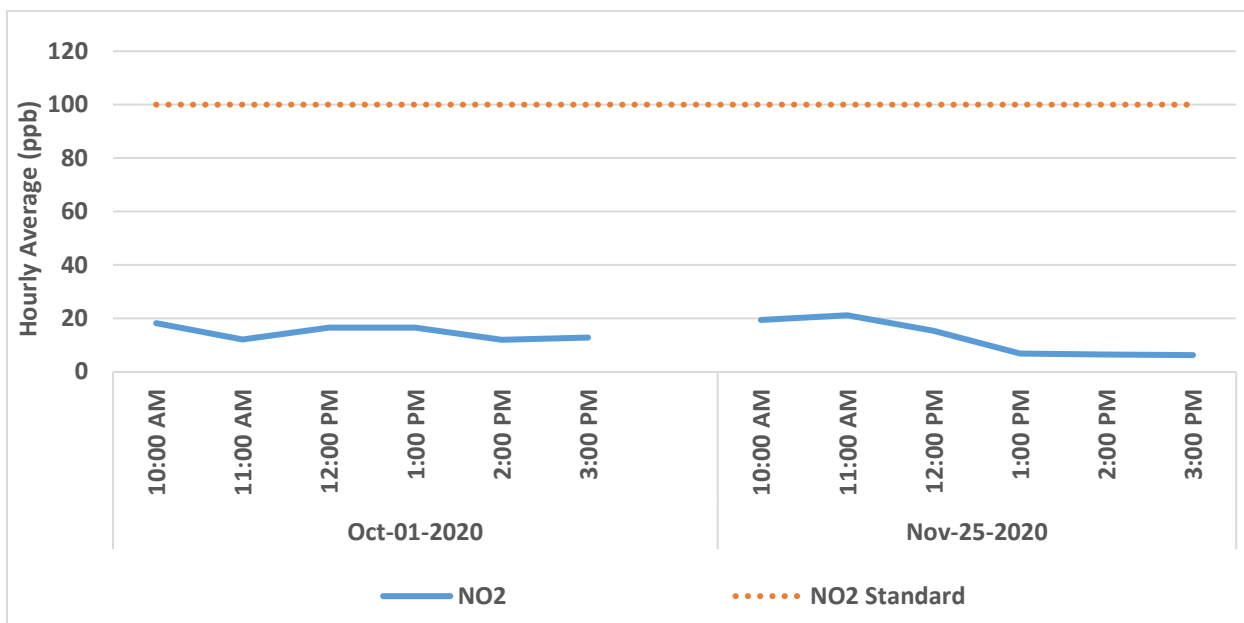
Van Ness Ave and California Ave

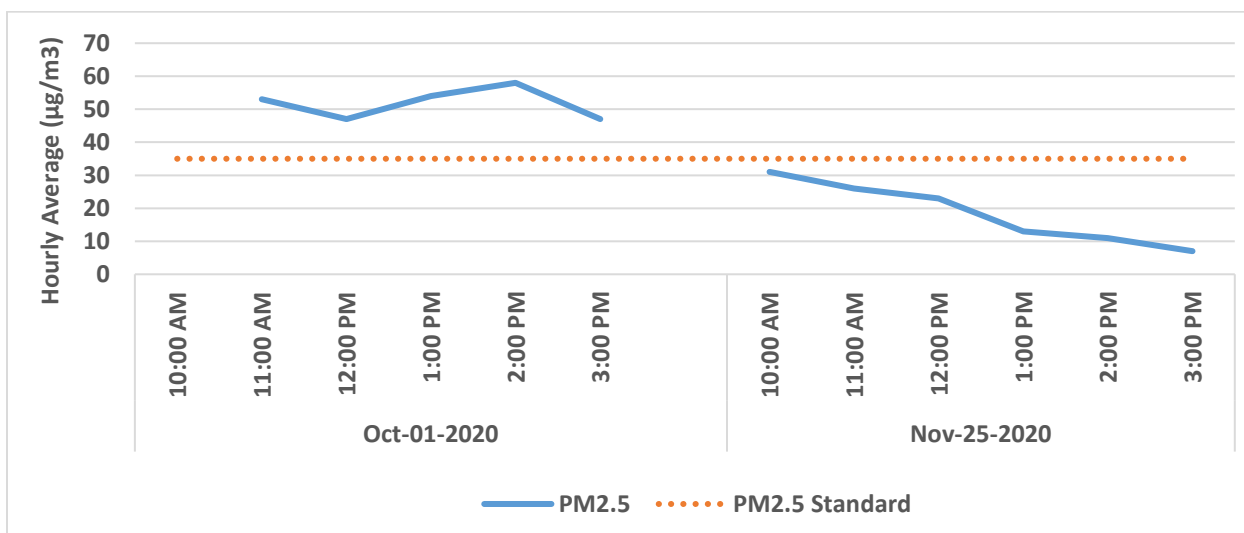
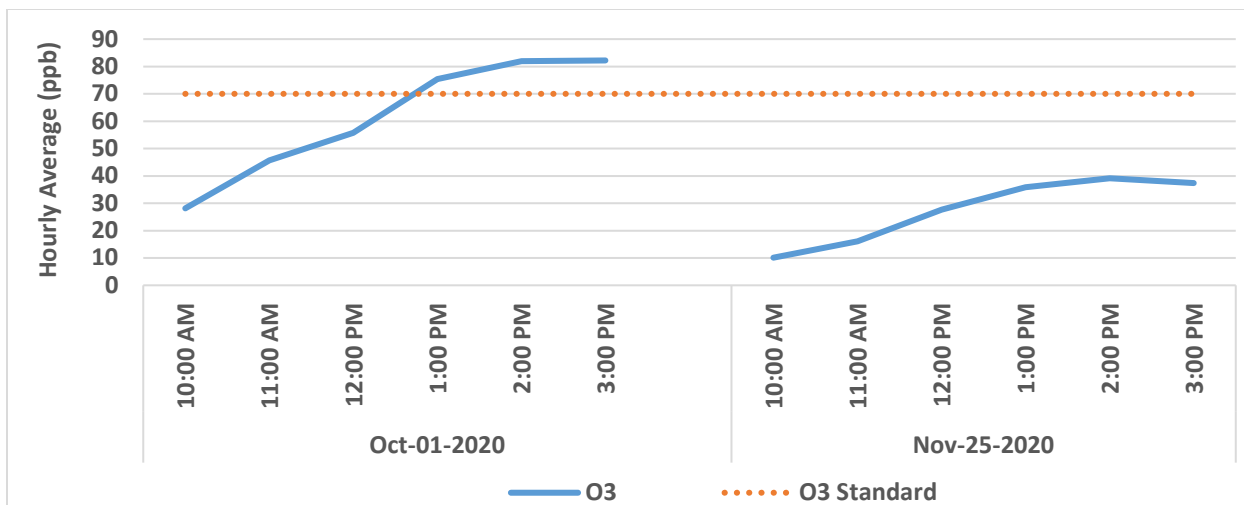




Date	Time	BTEX (ppb)	CO (ppm)	H2S (ppb)	NO2 (ppb)	O3 (ppb)	SO2 (ppb)	PM2.5 (µg/m³)
10/08/2020	10:00 AM	0	0.87	3.4	27.8	6.7	3	38
	11:00 AM	0	0.62	3.5	26.1	17.6	3.8	33
	12:00 PM	0	0.59	3.5	30.4	25.2	4	37
	1:00 PM	0	0.57	3.1	26	38	4	41
	2:00 PM	0	0.42	2.5	13.1	51.1	3.2	27
	3:00 PM	0	0.34	2.1	10	53.9	2.8	23

Cedar Ave and Jensen Ave





Date	Time	BTEX (ppb)	CO (ppm)	H2S (ppb)	NO2 (ppb)	O3 (ppb)	SO2 (ppb)	PM2.5 (µg/m ³)
10/01/2020	10:00 AM	0	1.06	2.4	18.2	28.1	6.4	n/a
	11:00 AM	0	0.84	0	12.1	45.7	2.7	53
	12:00 PM	0	0.82	0.2	16.6	55.7	2.1	47
	1:00 PM	0	0.78	1.1	16.6	75.4	5.3	54
	2:00 PM	0	0.62	0.9	12	81.9	3.1	58
	3:00 PM	0	0.51	1.2	12.9	82.2	2.6	47

11/25/2020	10:00 AM	0	0.61	3.8	19.5	10.1	0.6	31
	11:00 AM	0	0.6	3.5	21.2	16.1	1.1	26
	12:00 PM	0	0.4	1.8	15.4	27.7	0.7	23
	1:00 PM	0	0.24	0.7	6.9	35.9	0.3	13
	2:00 PM	0	0.23	0.8	6.5	39.1	0.4	11
	3:00 PM	0	0.21	0.6	6.3	37.4	0.1	7