


To: Jim Provenza, Chair
and Members of the Board of Directors

From: Mat Ehrhardt, P.E., Executive Director/APCO 

Date: May 12, 2021

Subject: Informational Report on 2020-21 PM2.5 Season

Recommended Action

This is an informational report only.

Background

Fine particulate pollution (PM2.5) is one of two main criteria pollutants of concern for the District. Fine particulates are less than 2.5 microns in diameter, and as such can bypass the body's natural defenses and get lodged deep in the lungs or enter the bloodstream. Science-based standards determine at what concentration PM2.5 causes health effects in both sensitive and healthy groups.

According to the U.S. Environmental Protection Agency, the health effects of PM2.5 exposure include premature death in people with heart or lung disease, non-fatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

Most PM2.5 is produced by the combustion of fuels. Sources that contribute PM2.5 primarily through fuel combustion include motor vehicles, wood burning, diesel engines, construction, emergency generators, manufacturing, farming, agricultural burning, mineral operations, and food processing.

The peak PM2.5 season is typically November through February due to increased residential wood burning and the presence of inversion layers, which prevent dispersion of particulate pollution.

The District operates three PM2.5 monitors: in Woodland, Rio Vista and Vacaville. There are 10 additional monitors throughout the region, including one operated by the Air Resources Board in Davis and several Purple Air real-time sensors.

The Standards

There are two federal standards for PM2.5 attainment: an annual standard and a 24-hour standard. The annual standard is exceeded when the annual average concentration of PM2.5 in the ambient air is 12 micrograms per cubic meter. The District and its regional partners remain well below this standard.

The 24-hour standard is exceeded when the concentration of PM2.5 is 35 micrograms per cubic meter or greater. The EPA determines attainment of this standard by using the 98th percentile of the daily PM2.5 values reported, averaged over three years.

2020-2021 Season Data

In 2009, the EPA determined that most of the Yolo-Solano AQMD (excluding the portion of Yolo County west of Esparto) would be included in the greater Sacramento Federal Non-Attainment Area (SFNA) for PM2.5. Despite regional attainment requirements, the impacts of PM2.5 are typically felt nearest the source.

Yolo-Solano and the broader Sacramento region experienced air quality during the 2020-21 winter season was similar to 2019-2020. This was the second winter season where there were no large wildfires in the area in the winter months. Additionally, this year we experienced temperatures slightly above normal and precipitation well-below normal compared to averages from 2007-2016. The District again saw 58% of days in the Good AQI category, 42% in the Moderate AQI category.

The highest PM2.5 AQI levels were observed on January 12, 2021, when a strong temperature inversion trapped pollutants near the surface, calm-to-light winds and an upper-level ridge of high pressure reduced atmospheric mixing over Northern California, leading to an AQI of 86.

Attainment of the 24-Hour Standard

The region originally attained the federal 24-hour standard for PM2.5 during the 2009-2011 period. EPA subsequently made a “clean data finding” for the region at the request of the air districts and the Air Resources Board (ARB). However, the region recorded high PM2.5 concentrations in 2013 and narrowly missed attaining the federal standard for the 2011-2013 time period. Consequently, no action was taken on the official redesignation request and maintenance plan submitted by the air districts to the ARB. Recent data shows that the region is once again in attainment of the standard. An updated redesignation request and maintenance plan will need to be submitted, provided the region can demonstrate that it continues to achieve the federal standard in future years.

Don't Light Tonight

Don't Light Tonight is Yolo-Solano AQMD's voluntary wood smoke curtailment program. On days in which higher PM2.5 levels are forecast, the District calls a Don't Light Tonight advisory and asks residents to refrain from burning wood. It was launched in 1990.

The current threshold for a Don't Light Tonight advisory is a forecast of 25 micrograms per cubic meter or greater. This threshold allows the District to effectively limit the number of days in which local air quality is unhealthy for sensitive groups. Every idle fireplace on those days helps reduce local PM2.5 concentrations.

The District called 7 advisories during the 2020-21 season, two (2) more than in 2019-20 due to temperature and precipitation anomalies and lack of wildfires during the 2020-21 winter season.