



# VALLE VISTA

## AIR QUALITY MONITORING REPORT

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# Valle Vista Air Quality Monitoring Report 2022

## EXECUTIVE SUMMARY

### Goal

To perform air quality monitoring for Particulate Matter less than 10 microns ( $\mu\text{m}$ ) in diameter ( $\text{PM}_{10}$ ) in Valle Vista. The objective is to understand  $\text{PM}_{10}$  concentrations in the Valle Vista area during calm (stagnant) and high wind conditions.

### What We Did

The Arizona Department of Environmental Quality (ADEQ):

- Evaluated potential monitoring sites in the area of concern that would capture representative ambient particulate matter ( $\text{PM}_{10}$ ) concentrations
- Deployed instrumentation to the Valle Vista Fire Department at 9667 Concho Dr, Kingman, AZ to monitor ambient  $\text{PM}_{10}$  (dust that poses a health risk) concentrations from 5/11/2022–6/16/2022
- Analyzed the data for potential National Ambient Air Quality Standards (NAAQS) exceedances

### What We Learned

During the 37-day air quality monitoring period, one 24-hour  $\text{PM}_{10}$  concentration over the daily NAAQS of  $150 \mu\text{g}/\text{m}^3$  was measured. Findings include:

- The average 24-hour  $\text{PM}_{10}$  concentration during the monitoring period was  $25 \mu\text{g}/\text{m}^3$ , which is significantly below the NAAQS of  $150 \mu\text{g}/\text{m}^3$
- The maximum daily  $\text{PM}_{10}$  concentration was  $264 \mu\text{g}/\text{m}^3$
- The maximum daily concentration occurred due to a high wind event from the northwest that triggered a National Weather Service (NWS) Dust Storm Warning



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### Principle Study Question

Does any 24-hour average during the monitoring period exceed 80% of the  $\text{PM}_{10}$  NAAQS?

### PM Monitoring

ADEQ conducted PM monitoring since dust ( $\text{PM}_{10}$ ) is the primary pollutant of concern based on reports from the Valle Vista community. The findings for particles  $10 \mu\text{m}$  in diameter or less, commonly called dust, were compared to the EPA's NAAQS. The NAAQS represent ambient air quality standards that are protective of public health.

### Data Quality Indicators

- **Completeness:** At least 75% of the hourly concentrations in the 24-hour period for at least 14 days.
- **Representativeness:** The monitor location is representative of the community at large. The monitoring period represents typical weather conditions.
- **Instrument requirements:** Accuracy within 10% for hourly measurements. Minimum instrument sensitivity is  $1 \mu\text{g}/\text{m}^3$ . The lower detectable level is less than  $6 \mu\text{g}/\text{m}^3$ .
- **Instrument precision:** Instrument flow rate maintained within 5% of indicated value. The instrument was calibrated and passed verifications.

# BACKGROUND

The Valle Vista community has expressed concern about the potential for poor ambient air quality due to dust from nearby sources. As a result, ADEQ deployed a study monitor in the area of concern to monitor for potential PM<sub>10</sub> dust impacts from 5/11/2022 - 6/16/2022. Dust presents a human health issue when it is less than 10 µm, which is small enough to penetrate into the lungs and damage lung tissue. The EPA has established a NAAQS stating that ambient levels of PM<sub>10</sub> should not exceed a 24-hour average of 150 µg/m<sup>3</sup> over a three-year period. ADEQ uses this standard as guidance for PM<sub>10</sub> studies to determine areas within Arizona that may exceed the NAAQS.

## Results

A total of 37 days were monitored for dust from 5/11/2022 - 6/16/2022. During this time, the average 24-hour value was 25 µg/m<sup>3</sup>. There was one 24-hour value that exceeded the NAAQS level of 150 µg/m<sup>3</sup> during the monitoring period. On 5/20/22, high winds caused a dust event which was above the threshold of 80% of the PM<sub>10</sub> NAAQS, resulting in a 24-hour value of 264 µg/m<sup>3</sup>. Around 8:45am, high winds from the northwest came through the Hualapai Valley. Dust particles became suspended and created a dust storm encompassing the entire valley.

Elevated wind speeds in excess of 26 mph with gusts to 36 mph were recorded at Hualapai Valley Observatory during the event. The Hualapai Valley Observatory is located approximately 11 miles north of the PM<sub>10</sub> monitoring location and is within the source area. Wind speeds at the Valle Vista Fire Department Monitoring location were the highest during the high wind event within the study period.

See Figure 2 for PM<sub>10</sub> 24-hour concentrations during the monitoring period.

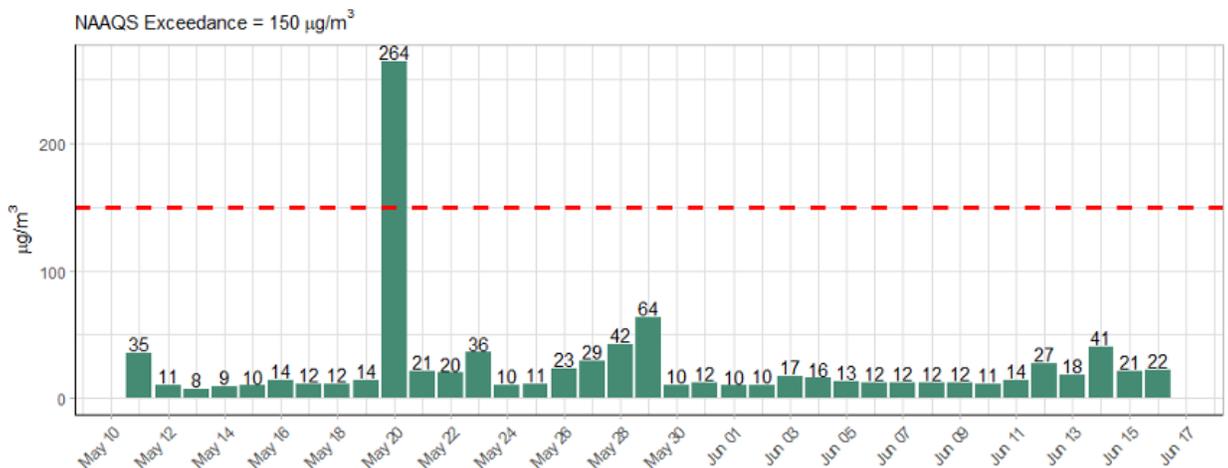
Figure 1



Figure 2

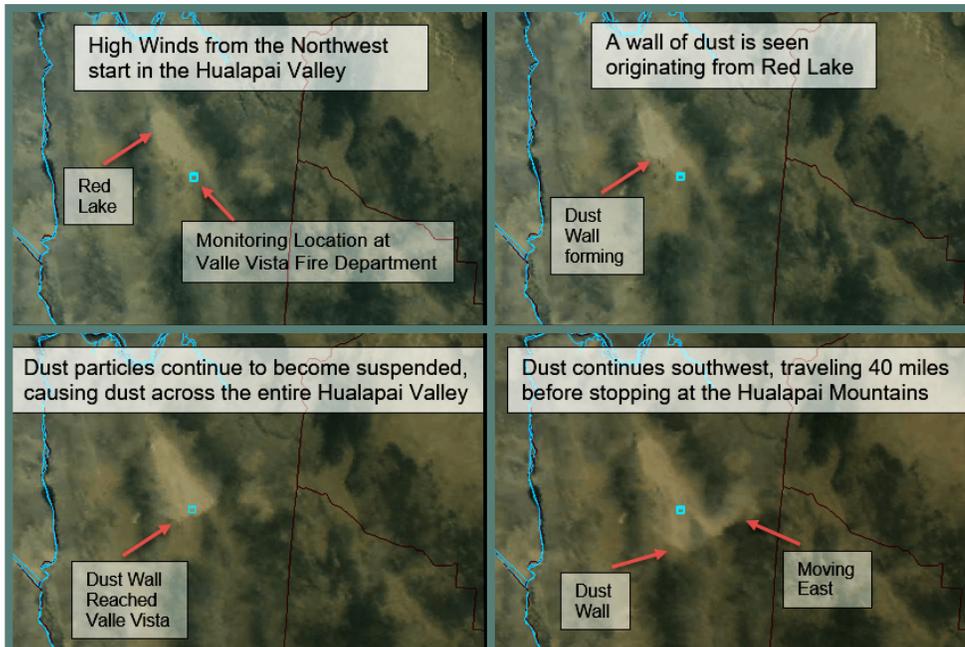
2022 Valle Vista  
PM<sub>10</sub> 24-hour  
Average

■ 24 Hr Average  
- NAAQS Exceedance



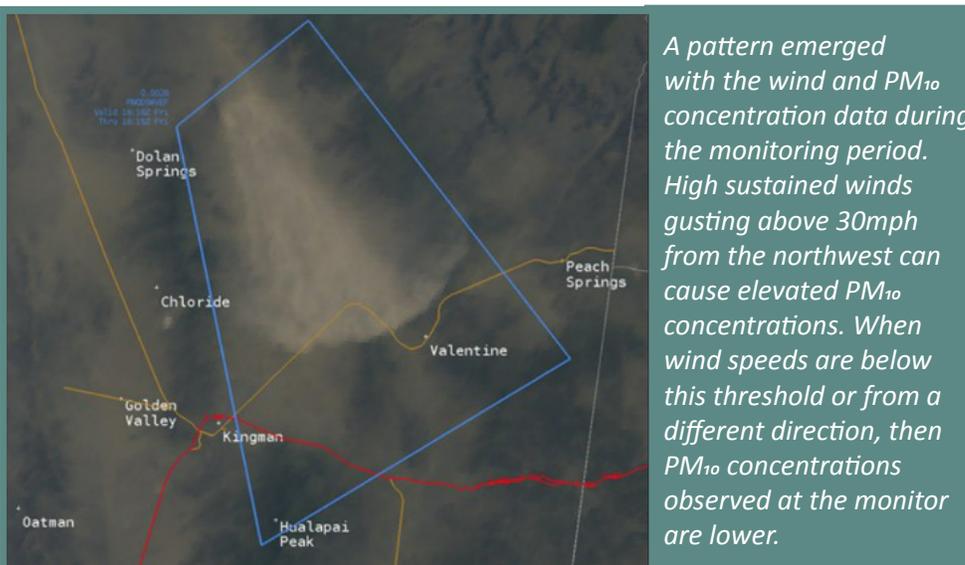
Figures 3 and 4 show the 5/20/2022 dust storm progression and the NWS dust storm warning area. Dust is seen originating from Red Lake and encompassing the entire Hualapai Valley.

**Figure 3: 5/20/2022 Dust Storm Progression**



*The National Weather Service issued a Dust Storm Warning for the area and for drivers on Interstate 40.*

**Figure 4: 5/20/22 NWS Dust Storm Warning Area**



### Conclusion

ADEQ reviewed the study data for strict quality assurance and quality control. ADEQ determined that all data quality indicators were met and could be used to understand Valle Vista air quality conditions in the monitoring area. Data indicate that ambient conditions were 17% of the PM<sub>10</sub> NAAQS for all monitoring days except for 5/20/2022 when high winds prompted the NWS to issue a dust storm warning for the area. On this day, satellite imagery shows a wall of dust originating from Red Lake, which appears to be the primary source of dust among the multiple sources in the area.

Data indicate that dust concentrations are driven by high wind events and not periods of stagnant conditions (calm winds). During high wind events, any controls that are/ could be put in place would be overwhelmed.

With the data showing elevated PM<sub>10</sub> during high wind events and not during stagnant conditions, no additional monitoring is warranted at this time.