

Air Quality Data Assessment Pre/Post Fire

August 25, 2023

Environmental Health Department

Air Quality Division



Atkore United Poly Systems

A fire ignited in southern Albuquerque on August 6, 2023 at approximately 14:30 at the Atkore United Poly Systems LLC. United Poly Systems is a manufacturer of high-density polyethylene pipe products. The pipe extrusion line consists of a number of pieces of equipment. An extruder converts the polyethylene raw material (mostly pellets) to a continuous tubular melt by extrusion through an annular die. The molten pipe then proceeds through a sizing or calibration device for sizing then to a cooling unit. United Poly Systems has an air quality source registration with the Albuquerque/ Bernalillo County Air Quality Program (AQP) Atkore Unite Poly Systems annual potential emission rate is 1.641 tons of Volatile Organic Compounds (VOCs) per year and 18.18 pounds of hazardous air pollutants. Both numbers are well under the permitting level requirements.

The closest COA EHD AQP facility equipped with instrumentation to identify and measure smoke- and VOC-associated pollutants was located 4.62 miles to the northwest of the fire. For the first 6.5 hours of fire activity, wind directions measured at this AQP sampling site were to the east, which would have transported the smoke plume away from the sampling location and away from populated areas also making sensor location not in an ideal location for sampling smoke plume. However, the monitoring system continued to operate on a continuous basis which would have capture any pollution changes if the wind direction shifted. The San Jose Monitoring site was utilized as a key site in case of wind shifts. The San Jose Monitoring Site is located ~5 miles northwest of the fire site. Wind direction for six hours following fire ignition was from the west (i.e., blowing smoke away from San Jose).

Pollution Sampling Site

- San Jose Monitoring Site
 - Located at 2015 Galena St. SE
- ~ 5 miles NE of fire
 - Located at 5301 Hawking Dr. SE



Pollution Sampling

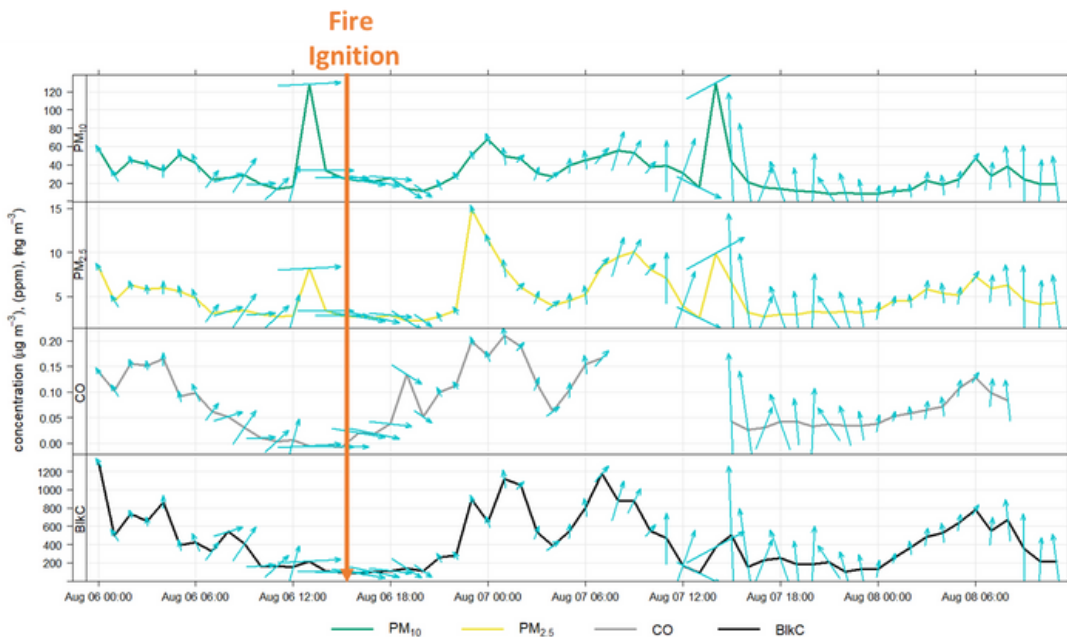
- Particulate Matter
 - 10 micron (Coarse) and 2.5 micron (Fine)
- Carbon Monoxide
- Black Carbon
- Gas Chromatography/Mass Spectrometry
 - Capable of detecting 88 volatile organic compounds (VOCs) to 15 parts per trillion (ppt)



Findings

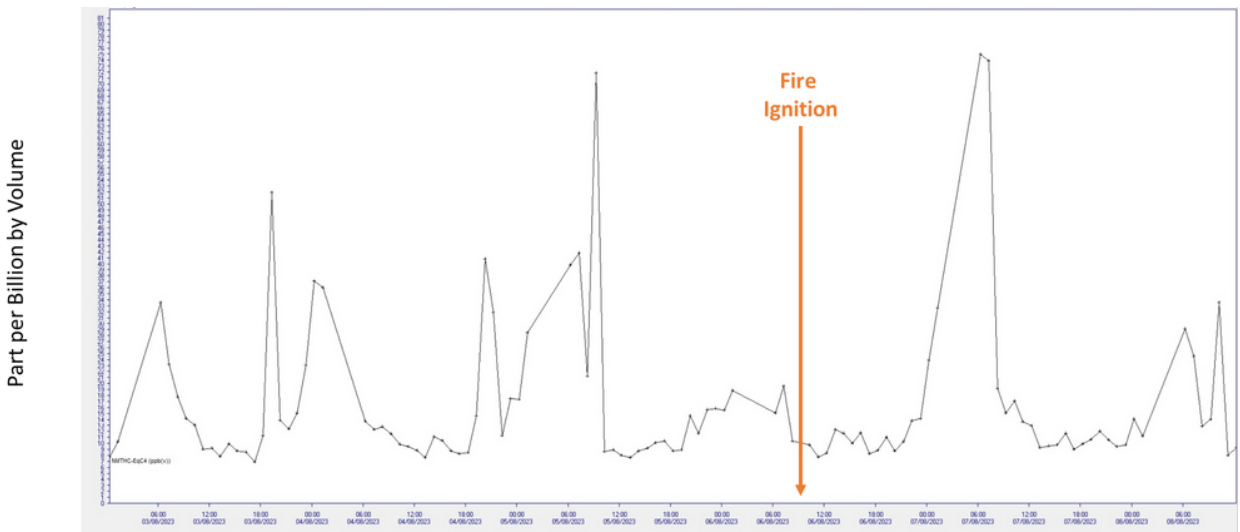
1. The fire ignited at approximately 14:30. Within 30 minutes, Environmental Health Department staff became technical and scientific support to Incident Command.
2. The primary focus in support of the Incident Command was to monitor wind speeds, wind direction and air quality monitoring stations and report data on an ongoing basis back to the Incident Commander.
3. PM10, PM2.5, CO and Black Carbon were the primary targeted pollutants to track since they are the most indicative of the major plume characteristics. After fire ignition there were some slight spikes of Carbon Monoxide (CO) at levels of .14 parts per million (PPM). The one-hour standard for CO is 35 ppm. The plume was driven by the South by South East winds towards the North West away from the monitoring stations and populated area.

Particulate and gaseous pollutants with wind vectors August 6-8, 2023



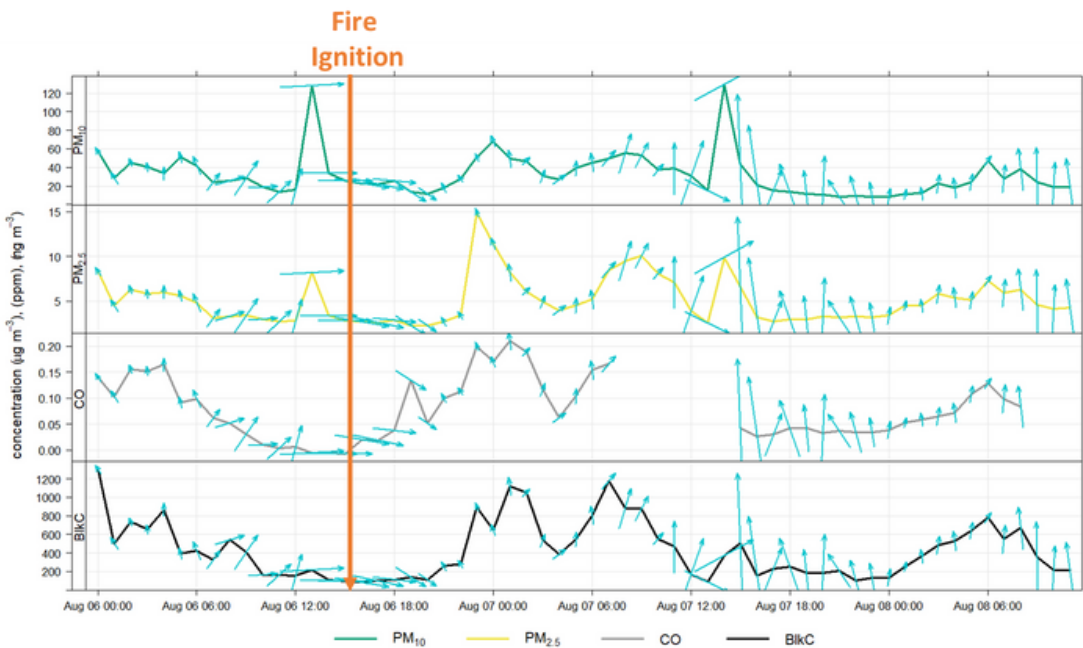
4. Approximately one hour after the fire had been extinguished, a wind shift to the northwest circa 21:00 coincided with increases in smoke related pollutants (particulate matter at 10 and 2.5 microns, carbon monoxide, and black carbon) as well as VOCs.

Bulk VOCs (C2-C6) August 3-8 2023



5. Particulate, gaseous, and black carbon pollutant concentrations increased when winds shifted to the northwest, circa 21:00. These concentrations peaked at less than 2x the pre-fire highs, and dissipated within 12 hours of fire ignition but well within standards.

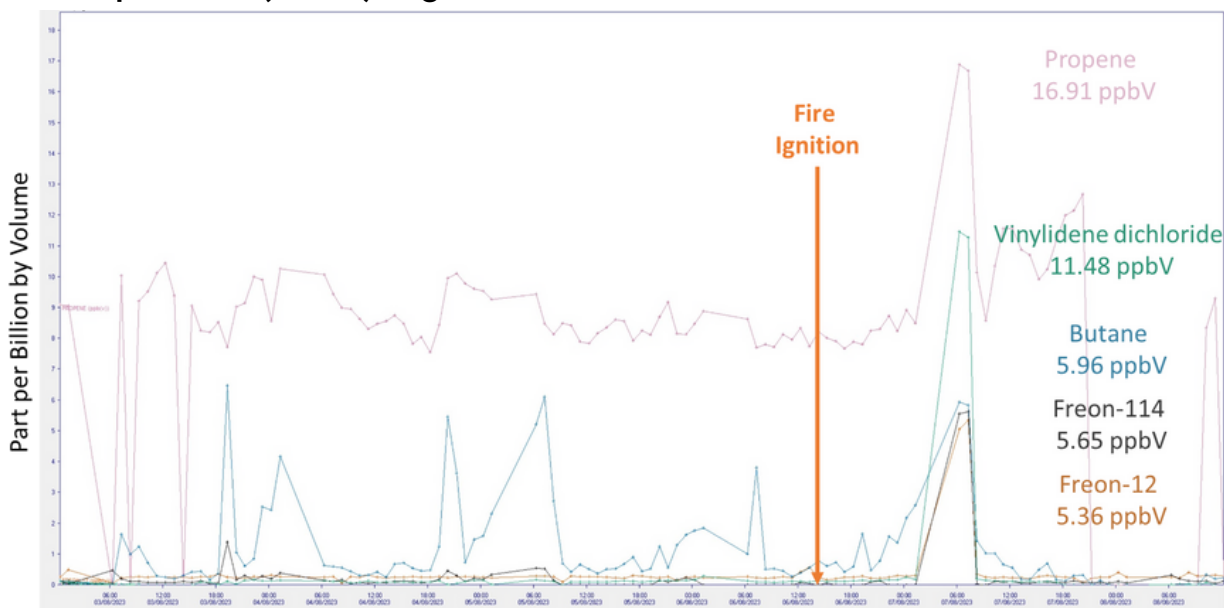
Particulate and gaseous pollutants with wind vectors August 6-8, 2023



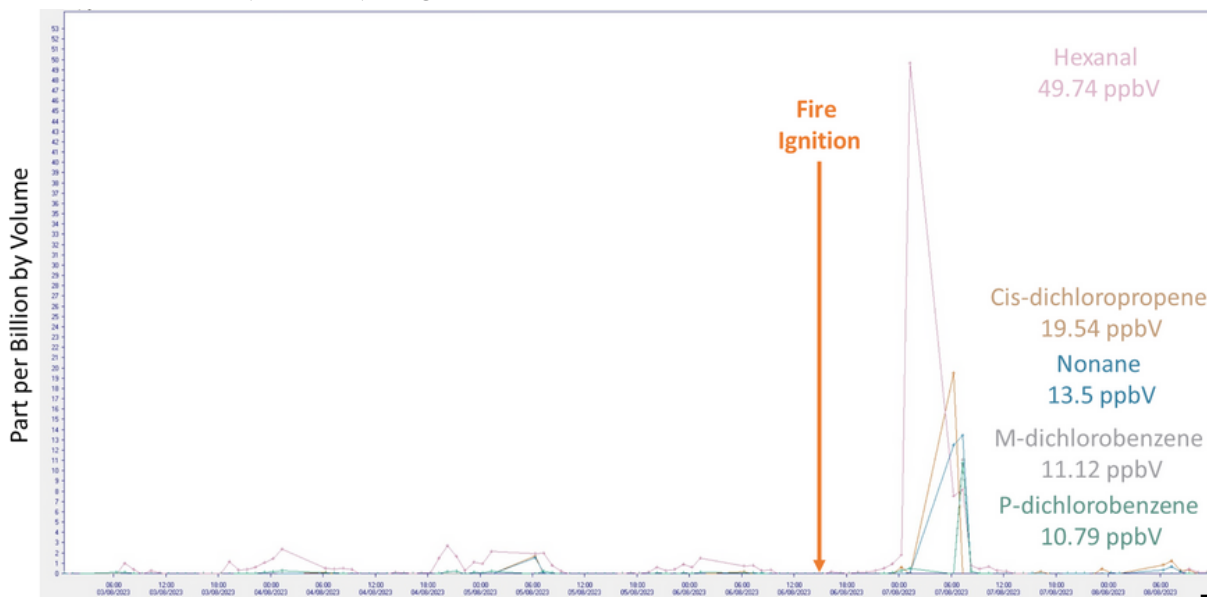
6. The increased smoke pollutants peaked between 23:00-1:00, while VOC concentrations peaked later, between 01:00-04:00. The VOCs detected at peak bulk VOC concentration did not match combustions profiles of HDPE, the purported material contributing to the smoke produced by the fire.

7. Smoke pollutant concentrations returned to pre-fire values by 4:00 on August 7th, while VOC concentrations returned to pre-fire values by 7:00. Subsequent fluctuations in pollutant and VOC concentrations were associated with winds from the southwest.

Top 5 VOCs (C2-C6) August 3-8 2023

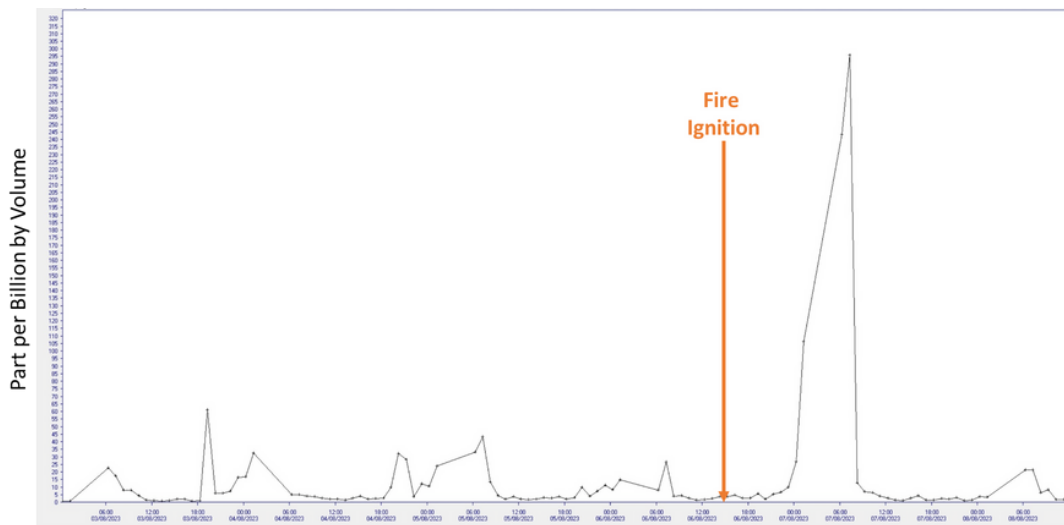


Top 5 VOCs (C6-C12) August 3-8 2023



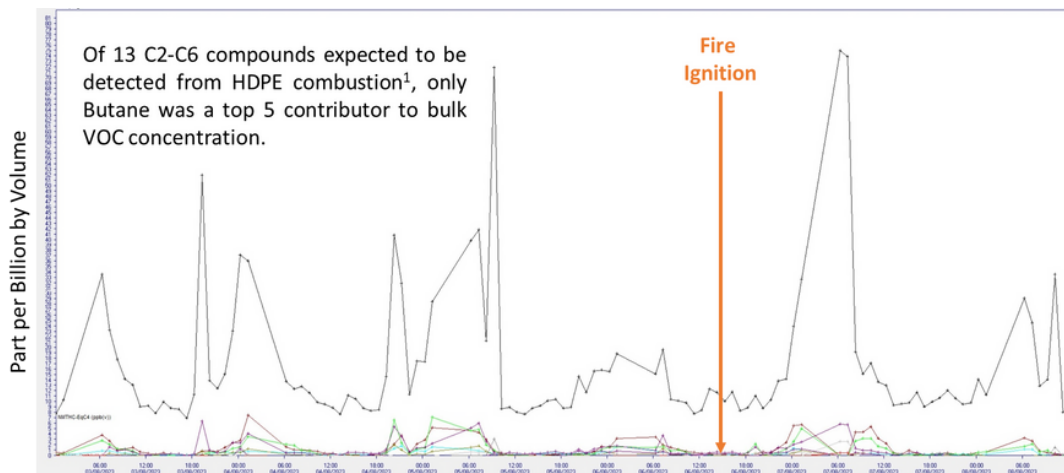
8. Bulk VOCs, particularly C6-C12 compounds, which include more than 100 compounds, including various paraffins, olefins, aromatics, ethers, alcohols, aldehydes, ketones, halogenated hydrocarbons, phenols, and sulfides increased coincident with fire activity.

Bulk VOCs (C6-C12) August 3-8 2023

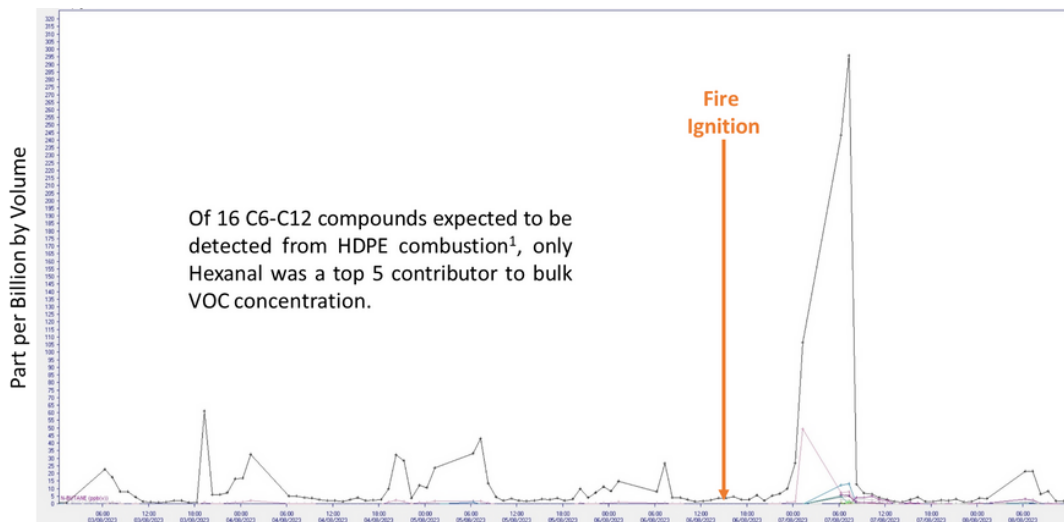


9. VOCs detected at San Jose did not match HDPE combustion VOC profile may be the result of other combusted materials.

Bulk and HDPE Combustion VOCs (C2-C6) August 3-8 2023



Bulk and HDPE Combustion VOCs (C6-C12) August 3-8 2023



10. The day after the fire the air quality remained well within the standards with the Air Quality Index averaging an excellent rating.

Overall Air Quality Index for August 07, 2023 (Post Fire)

O3

Fair

Ground-level Ozone can aggravate existing respiratory diseases and also lead to throat irritation, headaches, and chest pain.

42AQI

89 $\mu\text{g}/\text{m}^3$

PM 10

Excellent

Particulate Matter are inhalable pollutant particles with a diameter less than 10 micrometers. Particles that are larger than 2.5 micrometers can be deposited in airways, resulting in health issues. Exposure can result in eye and throat irritation, coughing or difficulty breathing, and aggravated asthma. More frequent and excessive exposure can result in more serious health effects.

18AQI

14 $\mu\text{g}/\text{m}^3$

PM 2.5

Excellent

Fine Particulate Matter are inhalable pollutant particles with a diameter less than 2.5 micrometers that can enter the lungs and bloodstream, resulting in serious health issues. The most severe impacts are on the lungs and heart. Exposure can result in coughing or difficulty breathing, aggravated asthma, and the development of chronic respiratory disease.

17AQI

4 $\mu\text{g}/\text{m}^3$

NO2

Excellent

Breathing in high levels of Nitrogen Dioxide increases the risk of respiratory problems. Coughing and difficulty breathing are common and more serious health issues such as respiratory infections can occur with longer exposure.

10AQI

5 $\mu\text{g}/\text{m}^3$

CO

Excellent

Carbon Monoxide is a colorless and odorless gas and when inhaled at high levels can cause headache, nausea, dizziness, and vomiting. Repeated long-term exposure can lead to heart disease

1AQI

104 $\mu\text{g}/\text{m}^3$

SO 2

Excellent

Exposure to Sulfur Dioxide can lead to throat and eye irritation and aggravate asthma as well as chronic bronchitis.

1AQI

1 $\mu\text{g}/\text{m}^3$

Conclusion

The AQP monitoring stations were not able to capture the true characteristics of the plume created by the Atkore United Poly fire due to where the wind carried the plume, away from the populated areas and the monitoring stations. After the shift in wind direction happened the monitoring station did capture some slight elevations of Black Carbon, VOCs, PM10 and PM2.5. The elevated levels were all well within the standards which resulted in the need to not issue any specific health alerts. The data for the two days after the fire showed no numbers of concern therefore no health alerts were necessary.