

Air Quality Data Assessment

San Jose Monitoring Site

Pre/post- August 6th 2023 Fire

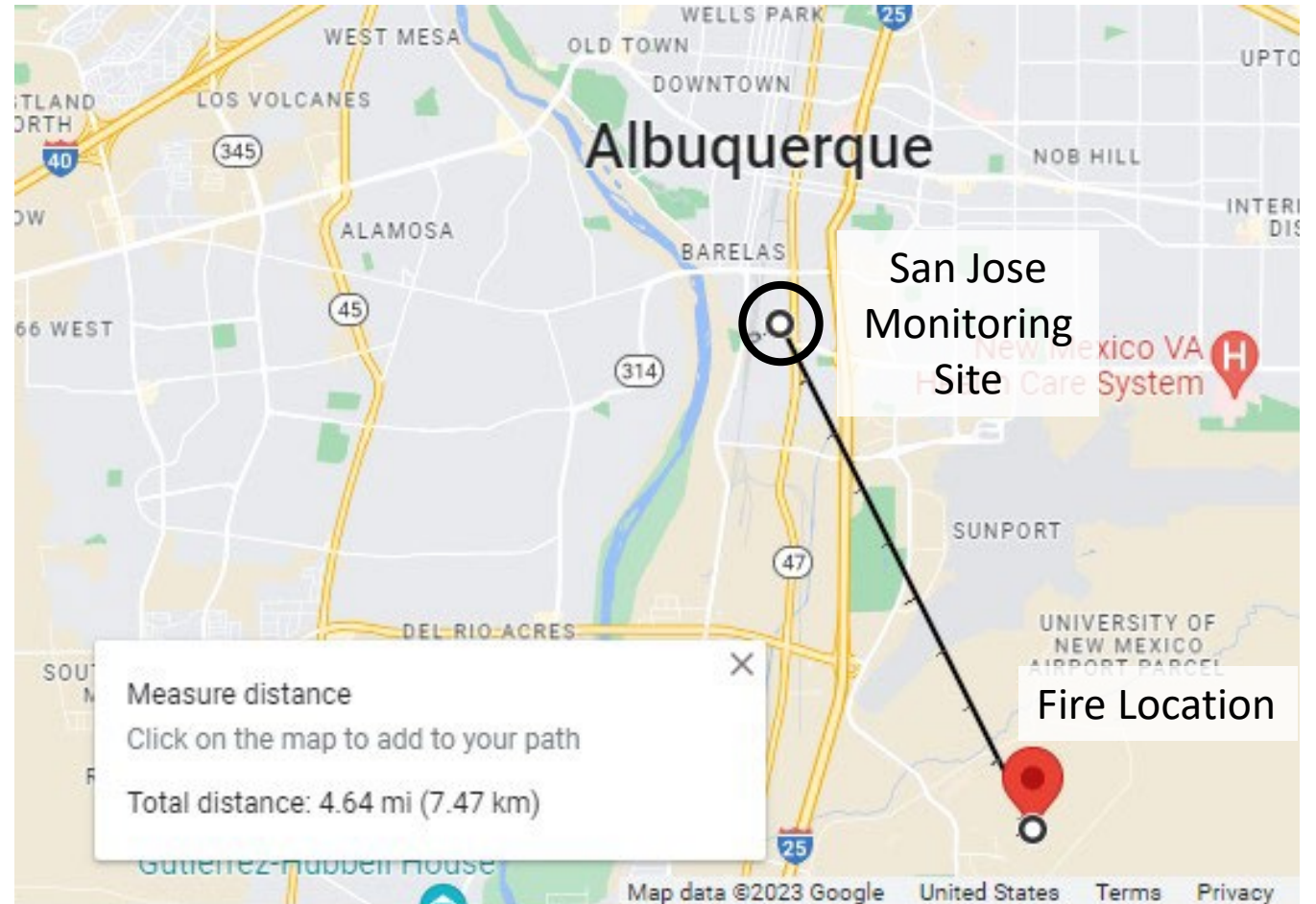
Prepared by P. Hudson, PhD

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Pollution Sampling Site

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

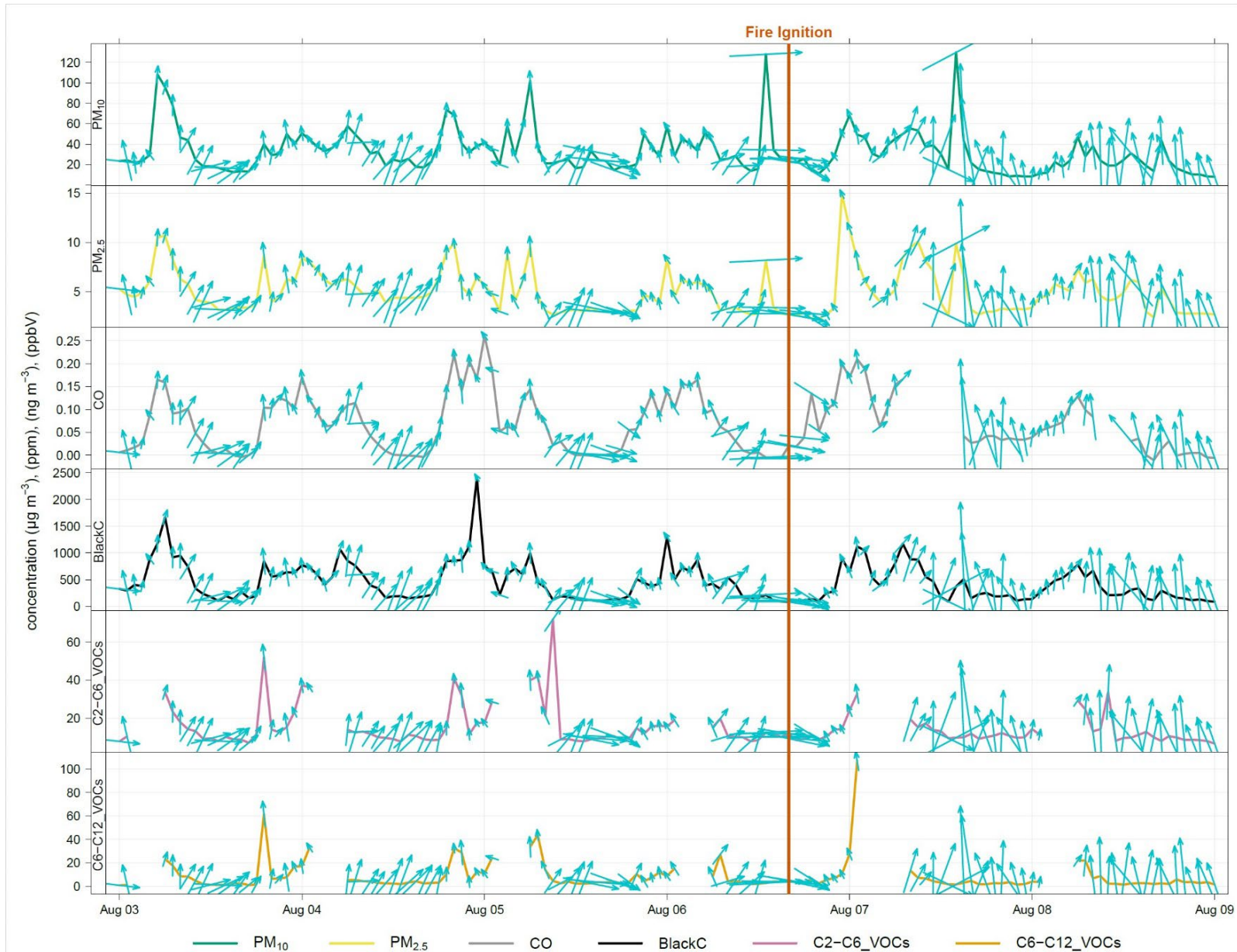


Pollution Sampling Capabilities

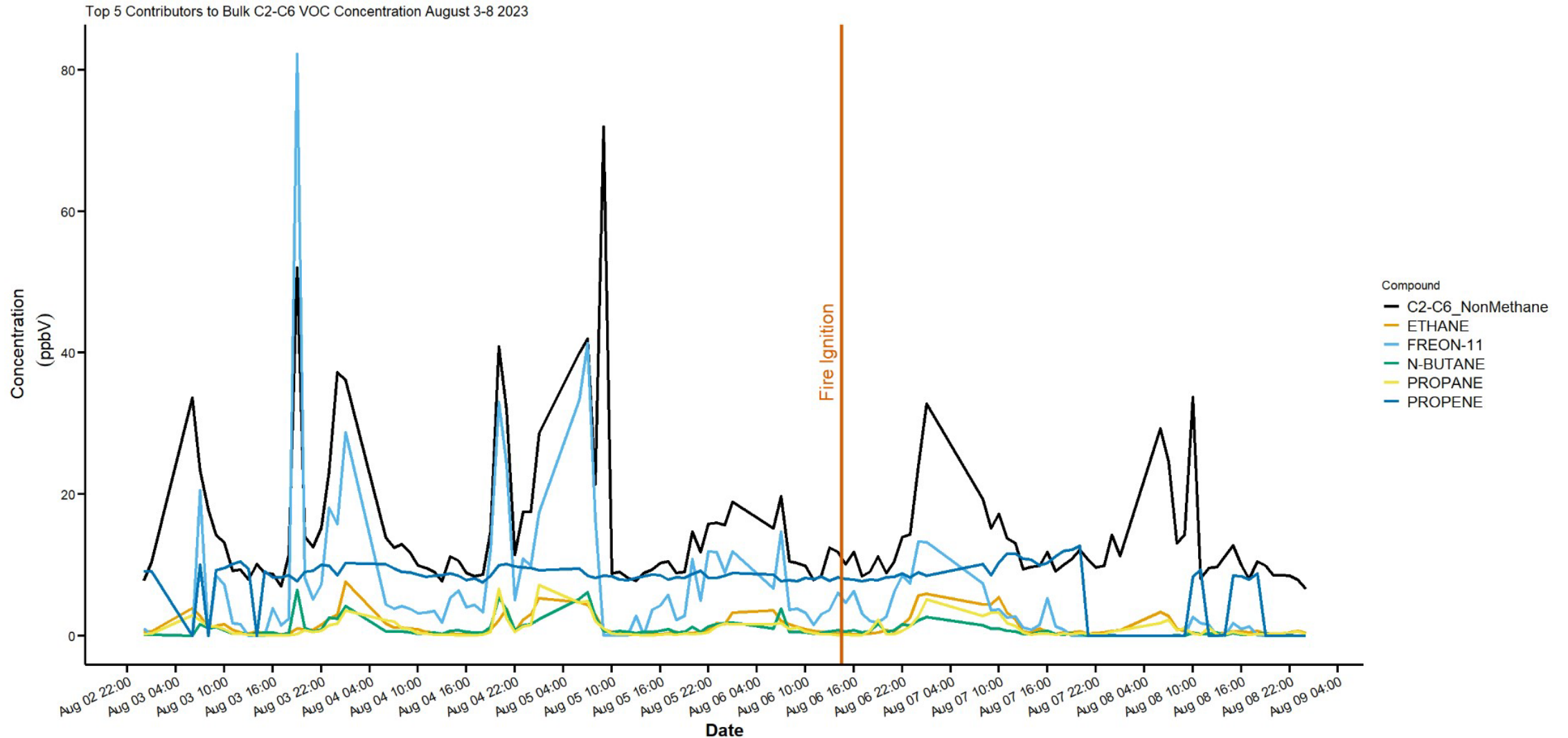
- Particulate Matter
 - 10 micron (Coarse) and 2.5 micron (Fine)
- Carbon Monoxide
- Black Carbon
- Gas Chromatography/Mass Spectrometry
 - Capable of detecting and identifying 88 volatile organic compounds (VOCs) to 15 parts per trillion (ppt)



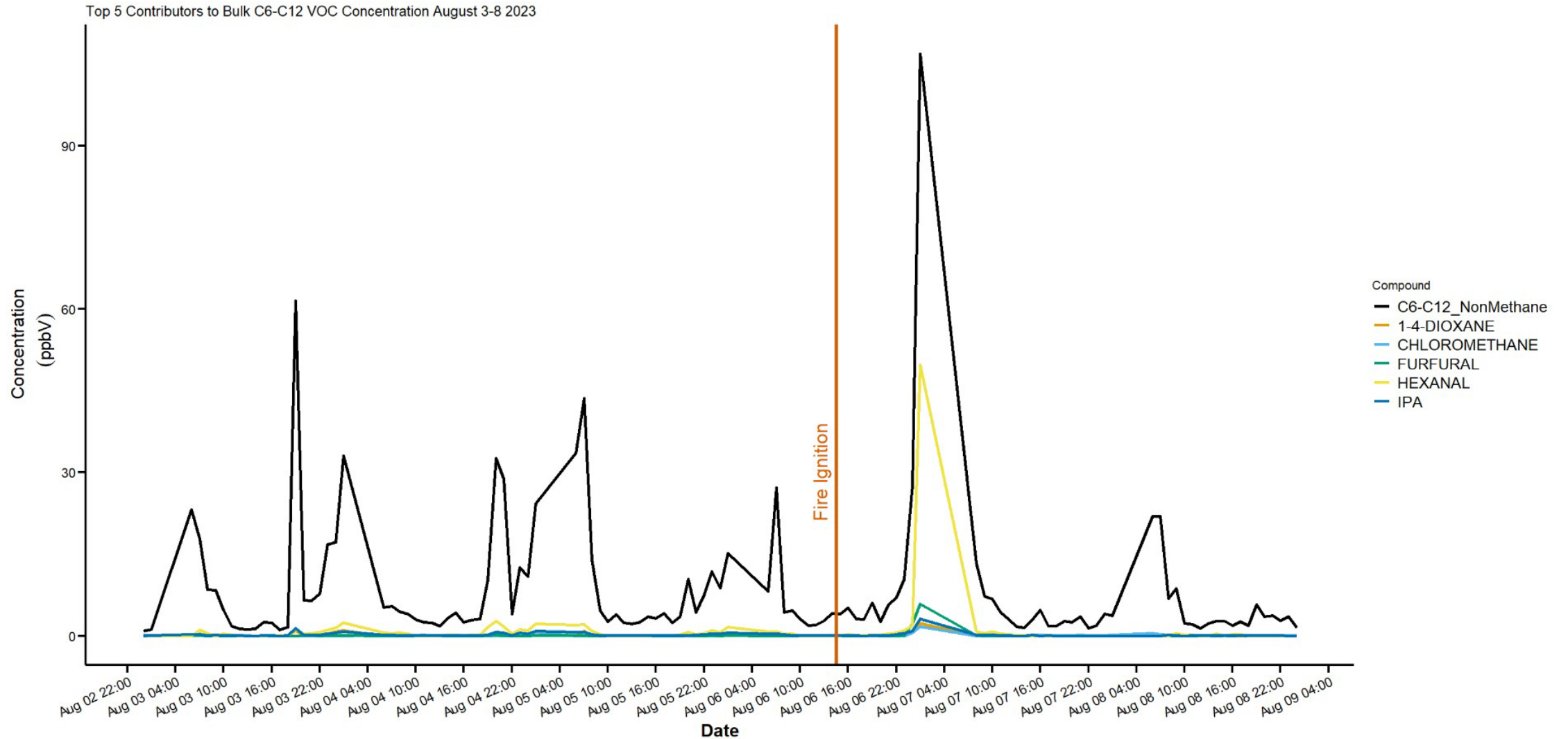
Pollutants with wind vectors August 3-8 2023



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



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



Top 5 Highest Concentration VOCs Post-Fire

Category	Chemical Name	CAS Number	Post-Fire Peak (ppbV)	Exposure Limit (ppmV)	Post-Fire Peak % Exposure Limit
C2-C6	Freon-11, trichlorofluoromethane	75-69-4	13.22	1000	0.0013
C2-C6	Propene	115-07-1	8.51	500	0.0017
C2-C6	Ethane	74-84-0	5.88	1000	0.0006
C2-C6	Propane	74-98-6	5.11	1000	0.0005
C2-C6	N-Butane	106-97-8	2.60	800	0.0003
C6-C12	Hexanal	66-25-1	49.74	None Given	-
C6-C12	Furfural	98-01-1	5.86	0.2	2.93
C6-C12	IPA, Isopropyl Alcohol	67-63-0	3.12	400	0.00078
C6-C12	1,4-Dioxane	123-91-1*	2.34	0.28	0.84
C6-C12	Chloromethane	74-87-3*	1.66	100	0.0017

* On the EPA Initial List of Hazardous Air Pollutants with Modifications
<https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications>

Exposure Limits provided by Occupational Safety and Health Administration
<https://www.osha.gov/chemicaldata>

VOCs Expected from HDPE Combustion

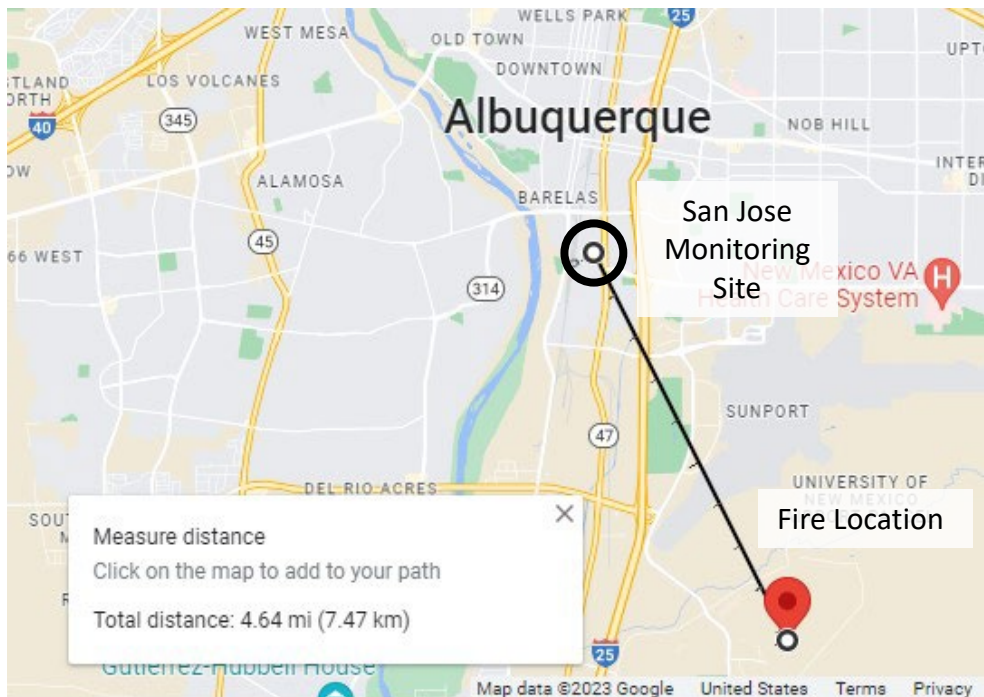
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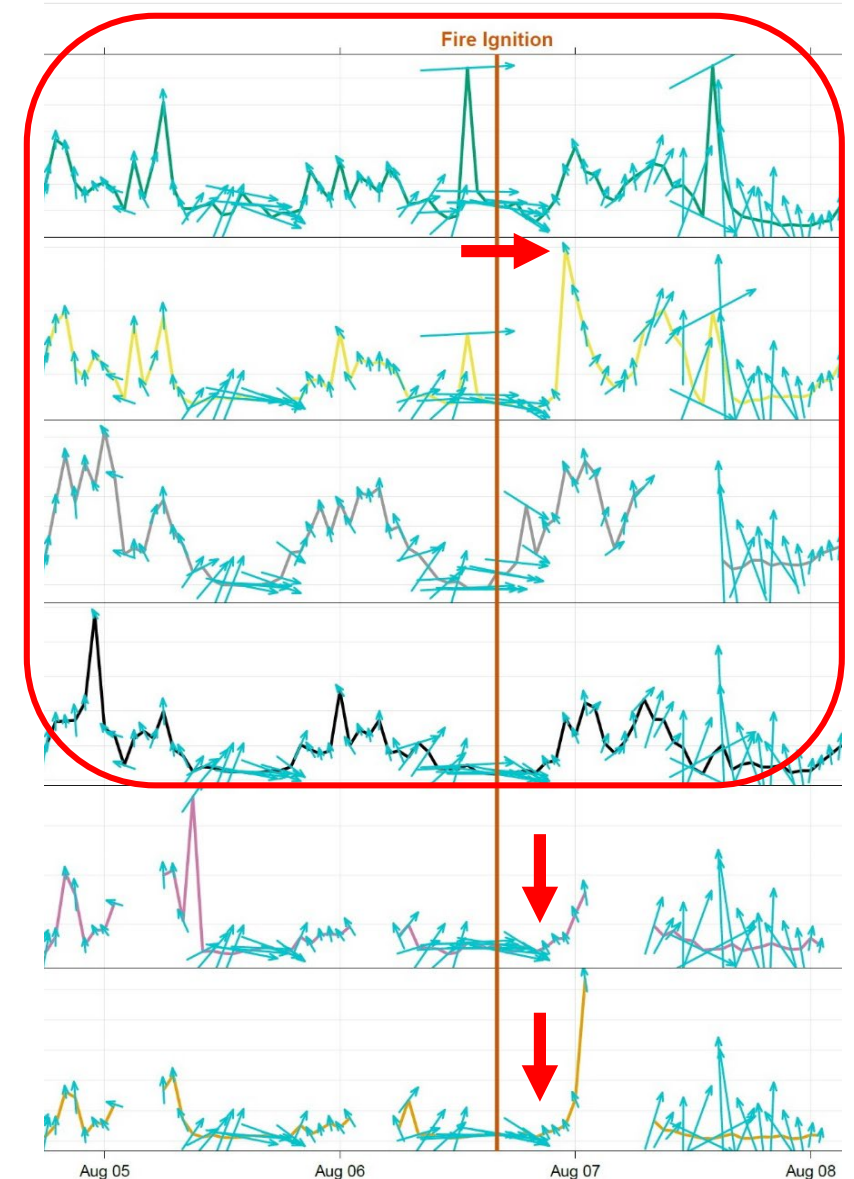
Conclusions

- Sensor location was not ideally situated for sampling smoke plume.
 - San Jose Monitoring Station is located ~5 miles northwest of fire site.
 - Wind direction for ~six hours following fire ignition was **from** the west (*i.e.*, blowing smoke **away** from San Jose analyzers).



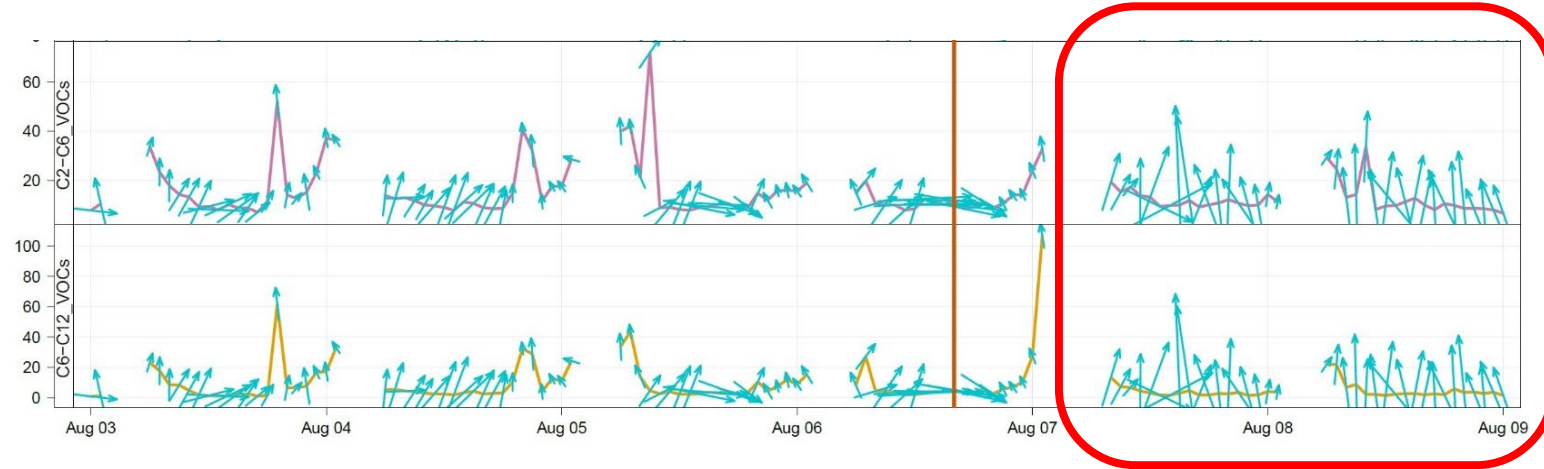
Conclusions

- Pollution concentrations increased when winds shifted **to** the northwest, circa 21:00.
 - Only PM_{2.5} reached concentrations greater than pre-fire activity for the previous two days.
 - PM_{2.5} concentrations peaked at less than 2x pre-fire values, and dissipated within 24 hours of fire ignition.
- Bulk VOCs, particularly C6-C12 compounds, increased coincident with wind shift **to** the northwest.
 - **VOC concentrations measured at San Jose were well below Exposure Limit values.**
 - **Maximum % of Exposure Limit = 2.93%, Furfural**



Conclusions

- VOC concentrations returned to pre-fire values within 24 hours, even when winds shifted **to** the northwest.
- VOCs detected at San Jose did not fully match HDPE combustion VOC profile¹.
 - may be the result of other combusted materials.



Category	Chemical Name	CAS Number	Post-Fire Peak (ppbV)	Exposure Limit (ppmV)	Post-Fire Peak % Exposure Limit
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References

- ¹ Font R., Aracil I., Fullana A., and Conesa JA. 2004. Semivolatile and volatile compounds in combustion of polyethylene. *Chemosphere* **57**, 615-627
- Exposure Limits provided by Occupational Safety and Health Administration: <https://www.osha.gov/chemicaldata>

Top 5 Highest Concentration VOCs Post-Fire

Category	Chemical Name	CAS Number	Post-Fire Peak (ppbV)	Post-Fire Peak (µg/m ³)	Exposure Limit (µg/m ³)	Post-Fire Peak %EL
C2-C6	Freon-11, trichlorofluoromethane	75-69-4	13.22	74.28	5,617,996	0.0013
C2-C6	Propene	115-07-1	8.51	14.65	860,556	0.0017
C2-C6	Ethane	74-84-0	5.88	7.23	1,229,863	0.0006
C2-C6	Propane	74-98-6	5.11	9.21	1,803,567	0.0006
C2-C6	N-Butane	106-97-8	2.60	6.18	2,377,272	0.0003
C6-C12	Hexanal	66-25-1	49.74	203.76	None Given	-
C6-C12	Furfural	98-01-1	5.86	23.03	785	2.93
C6-C12	IPA, Isopropyl Alcohol	67-63-0	3.12	7.67	400	0.00078
C6-C12	1,4-Dioxane	123-91-1*	2.34	8.43	1	0.84
C6-C12	Chloromethane	74-87-3*	1.66	3.43	100	0.0017

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VOCs Expected from HDPE Combustion

Category	Chemical Name	CAS Number	Post-Fire Peak (ppbV)	Post-Fire Peak ($\mu\text{g}/\text{m}^3$)	Exposure Limit ($\mu\text{g}/\text{m}^3$)	Post-Fire Peak %EL
C2-C6	Freon-11, trichlorofluoromethane	75-69-4	13.22	74.28	5,617,996	0.0013
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