

# Air Monitoring in Maywood, CA

## Heliotrope Elementary School

Interim Update  
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# Aims of Study



- Determine the levels of toxic metals (e.g., chromium, lead, arsenic, and manganese), black carbon, and  $PM_{2.5}$  at Heliotrope Elementary
- Identify where these pollutants are coming from
- Work with local community members, LA Unified School District, and the South Coast Air Quality Management District on actions to reduce outdoor exposure to these pollutants

# Instruments and Data Collection

- Study Dates: **May 16<sup>th</sup> 2019 – July 8<sup>th</sup> 2019**
- All data are valid except for days when instruments were offline for maintenance

| Measurement                           | Data collected     |
|---------------------------------------|--------------------|
| Continuous metals measurements (Xact) | 1027 hrs (47 days) |
| Black carbon                          | 1307 hrs           |
| Particulate matter                    | 1306 hrs           |
| Meteorological data                   | 1307 hrs           |
| Hexavalent Cr filter measurements     | 19 filters         |
| Purple Air                            | 3 instruments      |



Continuous  
metals sampler



Black carbon  
sampler



Monitoring shelter and  
particulate matter sampler



Hexavalent  
chromium sampler



Purple Air low  
cost sensor

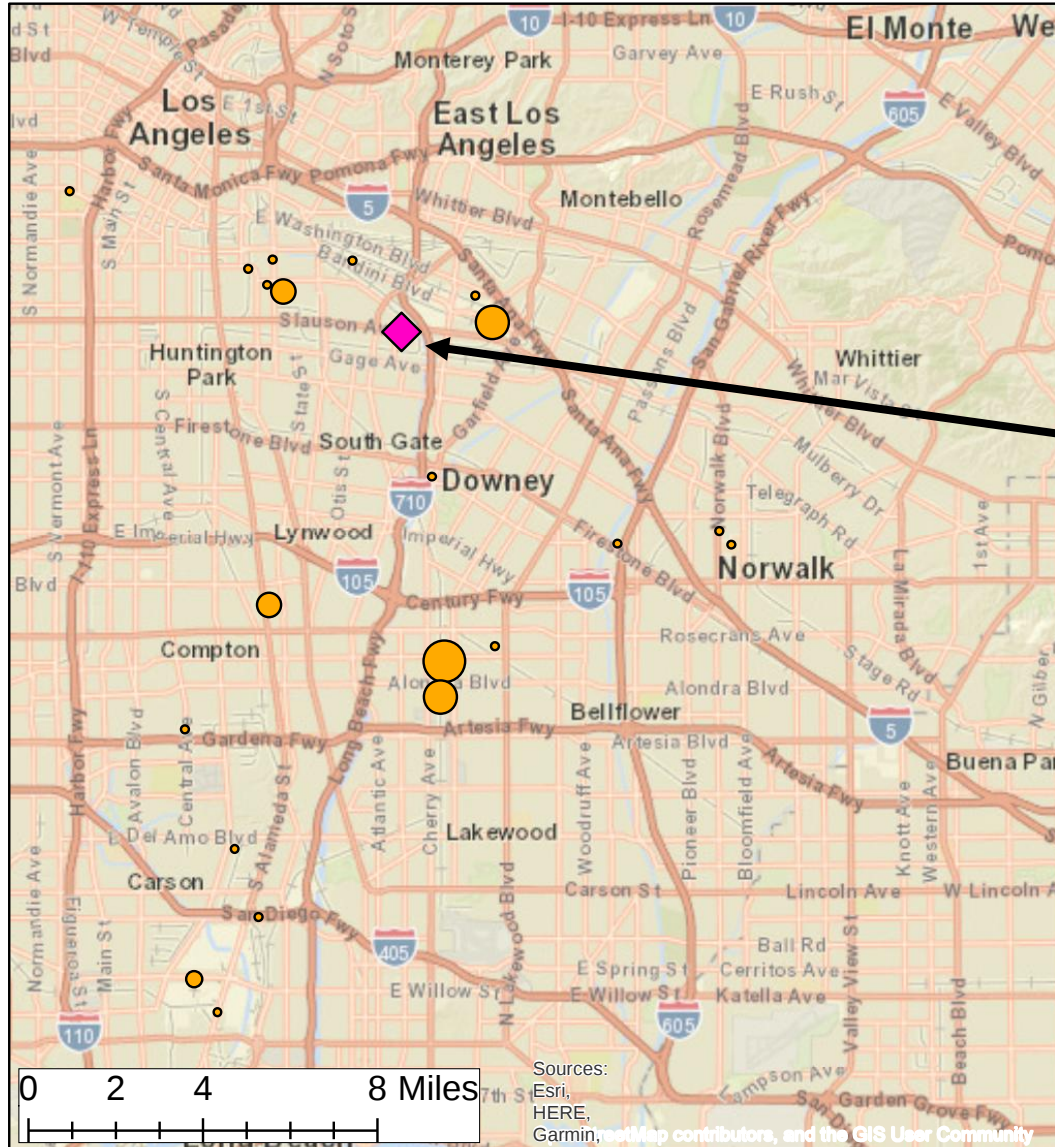
# Hexavalent Chromium (Cr-6)

- Text below is from AQMD: <https://www.aqmd.gov/docs/default-source/air-quality/special-monitoring-and-emissions-studies/hexavalent-chromium-study/hc-aqmd-summary-of-health-effects.pdf?sfvrsn=2>
- Hexavalent Chromium is a toxic form of chromium, exposure of which leads to increased cancer risk. At a level of 1 ng/m<sup>3</sup> exposure over 70 years the additional cancer risk is 150 per million people.
- Hexavalent Chromium was sampled 2-3 times a week during the study.

# California Air Resources Board Emission Inventory

- Cr<sup>6</sup> data shown on map in next slide are from **CARB's Emission Inventory**
- Emission Inventory: estimation of the amount of pollutants discharged into the atmosphere from **large facilities** in CA
- Data shown are from 2017 (most recent available)

# Locations of Facilities Known to Emit Cr-6



Heliotrope Elementary School

◆ Heliotrope Elementary

**Industrial Cr-6 Emissions (lbs/year)**

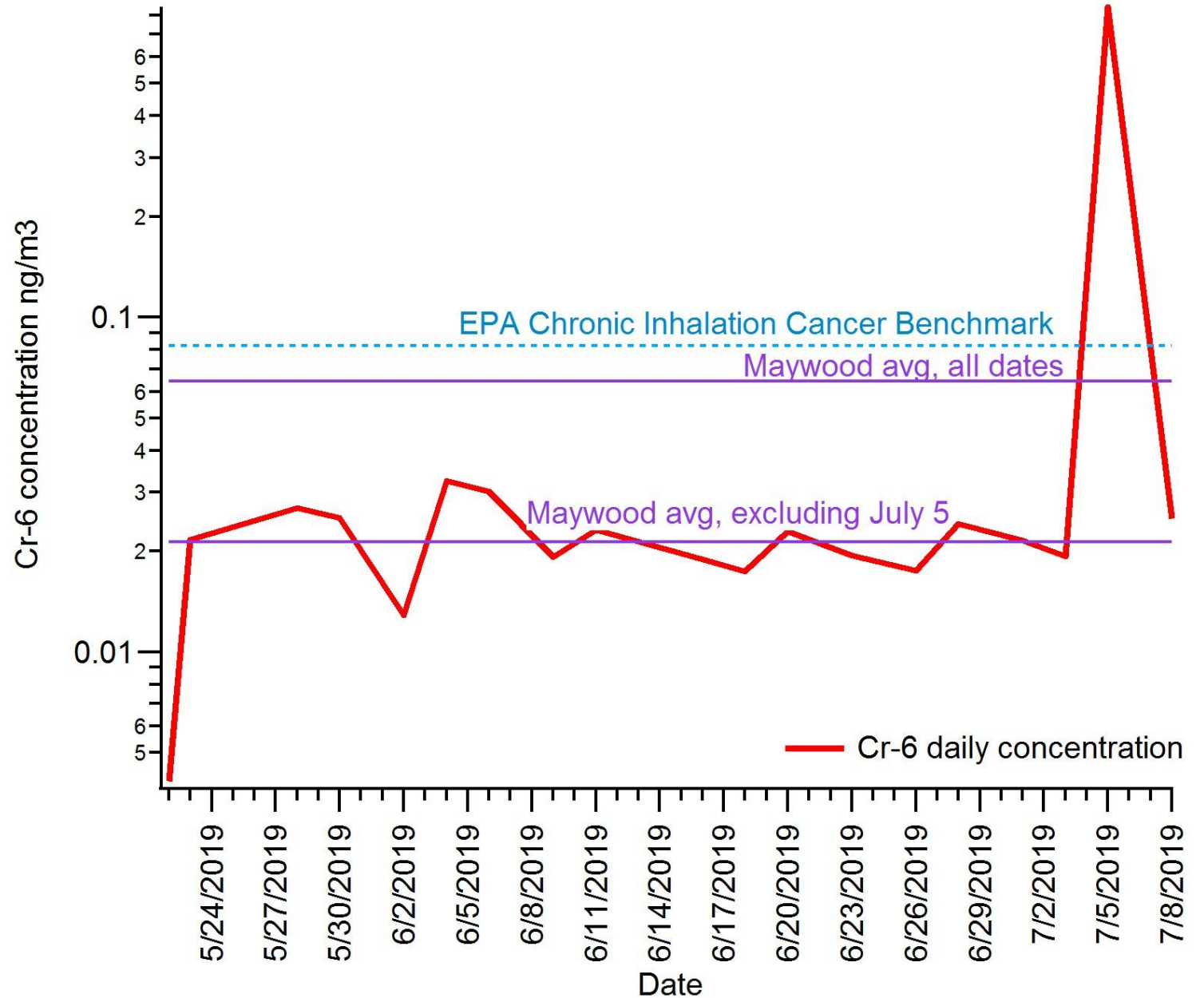
- 0.0005 - 0.015
- 0.0151 - 0.037
- 0.0371 - 0.080
- 0.0801 - 0.280
- 0.2801 - 0.644

# Cr-6 Results

- Cr-6 average was an order of magnitude less than concentrations in Paramount (0.065 ng/m<sup>3</sup> in Maywood versus 0.24-0.38 ng/m<sup>3</sup> in Paramount).
- On July 5 Cr-6 concentrations were 10 times the concentration level seen on average, due to fireworks overnight on the 4<sup>th</sup> of July.
- Excluding July 5, the average Cr-6 concentration was less than the OEHHA and EPA cancer benchmark levels. Including July 5, the average was over the OEHHA but less than the EPA benchmark levels.
- Cr-6 was on average 4% of total Cr.

# Time Series

- Cr-6 concentrations fairly steady throughout the study, except for July 5
- July 5 sample started at midnight so had firework emissions as part of the sample (see next slide for more on this)



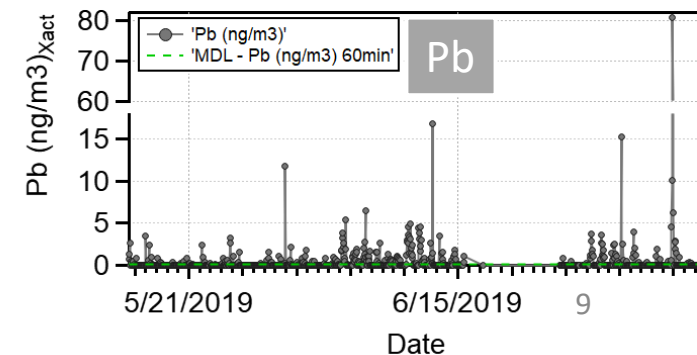
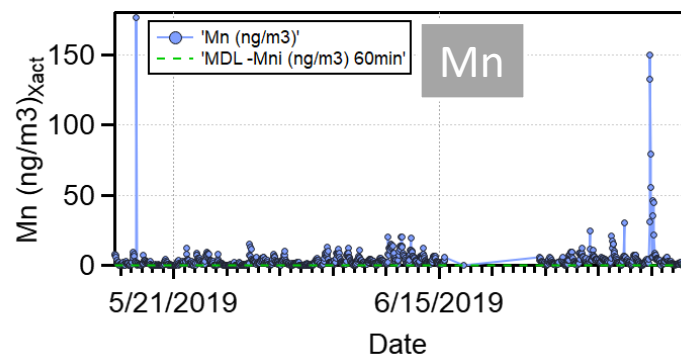
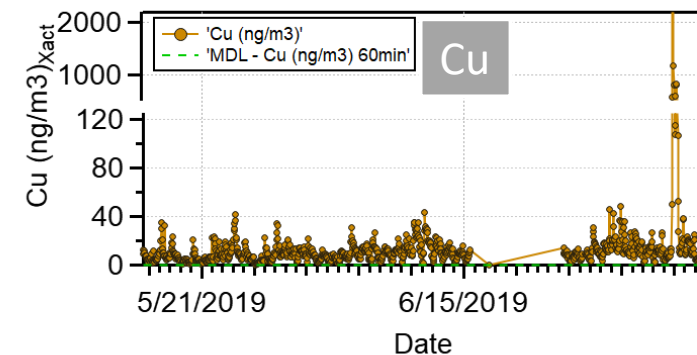
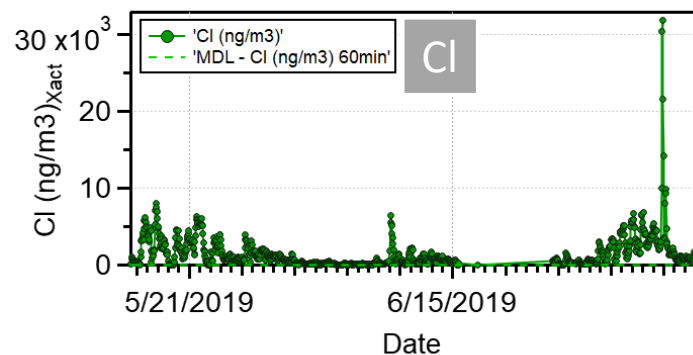
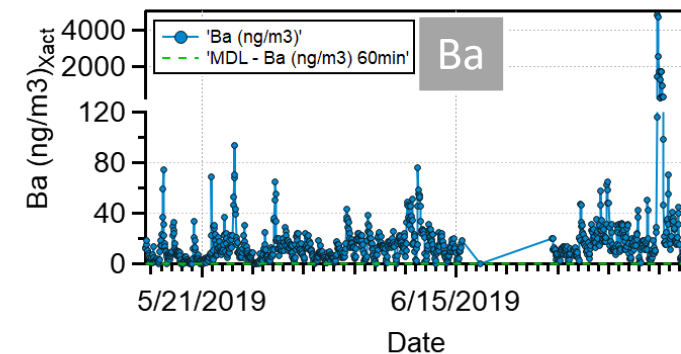
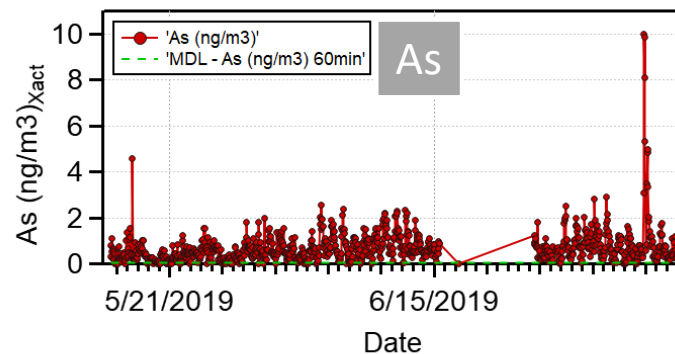
# Case Study: July 4th

- 4<sup>th</sup> July evident in As, Ba, (Bi), Cl, Cu, K, Mn, (Pb), S, Ti, (V), Zn
- Higher concentrations seen starting ~ 8pm

| Species | # times above mean |
|---------|--------------------|
| As      | 14×                |
| Ba      | 233×               |
| Cl      | 23×                |
| Cu      | 165×               |
| K       | 280×               |
| Mn      | 45×                |
| (Pb)    | 242×               |
| S       | 26×                |
| Ti      | 17×                |
| (V)     | 35×                |
| Zn      | 10×                |

- ( ) = species above MDL <50% of the time
- July 4<sup>th</sup> is excluded from mean

Select metal time series' showing July 4<sup>th</sup> peak



# Cr-6 Comparison to Benchmarks

| Benchmark or Ambient Concentration                          | Cr 6 (ng/m <sup>3</sup> ) |
|-------------------------------------------------------------|---------------------------|
| Non-cancer Hazard Index <sup>a</sup>                        | 100                       |
| OEHHA <sup>b</sup> chronic Reference Exposure Level (REL)   | 200                       |
| Cancer 1-in-a-million benchmark <sup>a</sup>                | 0.083                     |
| OEHHA <sup>b</sup> 25-in-a-million (continual for 30 years) | 0.045                     |
| Maywood Study Period Mean (May 22 - Jul 8, 2019)            | 0.065                     |
| Paramount Study 2018-2019 (near school areas)               | 0.24                      |
| Paramount Study 2018-2019 (near residential areas)          | 0.32                      |
| Paramount Study 2018-2019 (near industrial areas)           | 0.38                      |

<sup>a</sup>Chronic Inhalation from Dose-Assessment Tables, EPA – benchmark is 1/0.0012 ug/m<sup>3</sup> equating to a 1-in-a-million risk of 0.083 ng/m<sup>3</sup>

<sup>b</sup>Cal EPA's Office of Environmental Health Hazard Assessment

# Next Steps

- Analyze hourly metals, black carbon and PM<sub>2.5</sub> data to better understand impacts of local sources
- Analyze Purple Air PM<sub>2.5</sub> data collected in the Maywood community during 2019
- Report on interim results with CARB, LAUSD and community members