



BAY AREA  
AIR QUALITY  
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DISTRICT

# Mapping Dust Fallout from the November 2022 Martinez Refining Company Incident Using Observations and Modeling

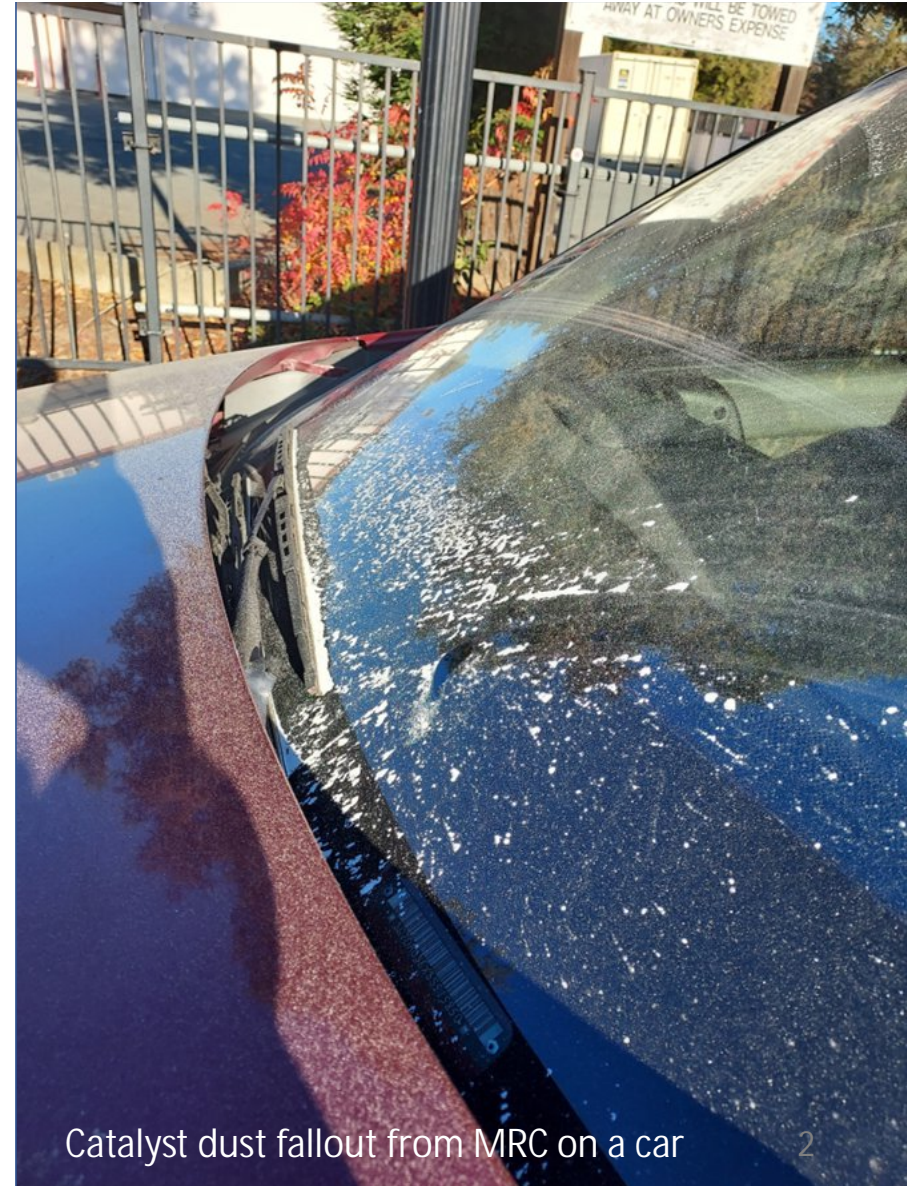
Martinez City Council Meeting  
April 5, 2023

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# Martinez Refining Company (MRC) Catalyst Dust Release

- Late Sun. Nov. 20<sup>th</sup>, 2022: Upset at MRC's Fluid Catalytic Cracking Unit (FCCU)
- Until Nov. 25<sup>th</sup>: Electrostatic precipitators (ESPs) remained off
- On Nov. 21<sup>st</sup> after repairs: MRC operators had trouble restarting the FCCU
- Nov. 24<sup>th</sup> to 25<sup>th</sup>: MRC released 20 to 24 tons of catalyst from two CO boilers (COBs)
- Catalyst dust fallout was visible on surfaces in parts of Martinez

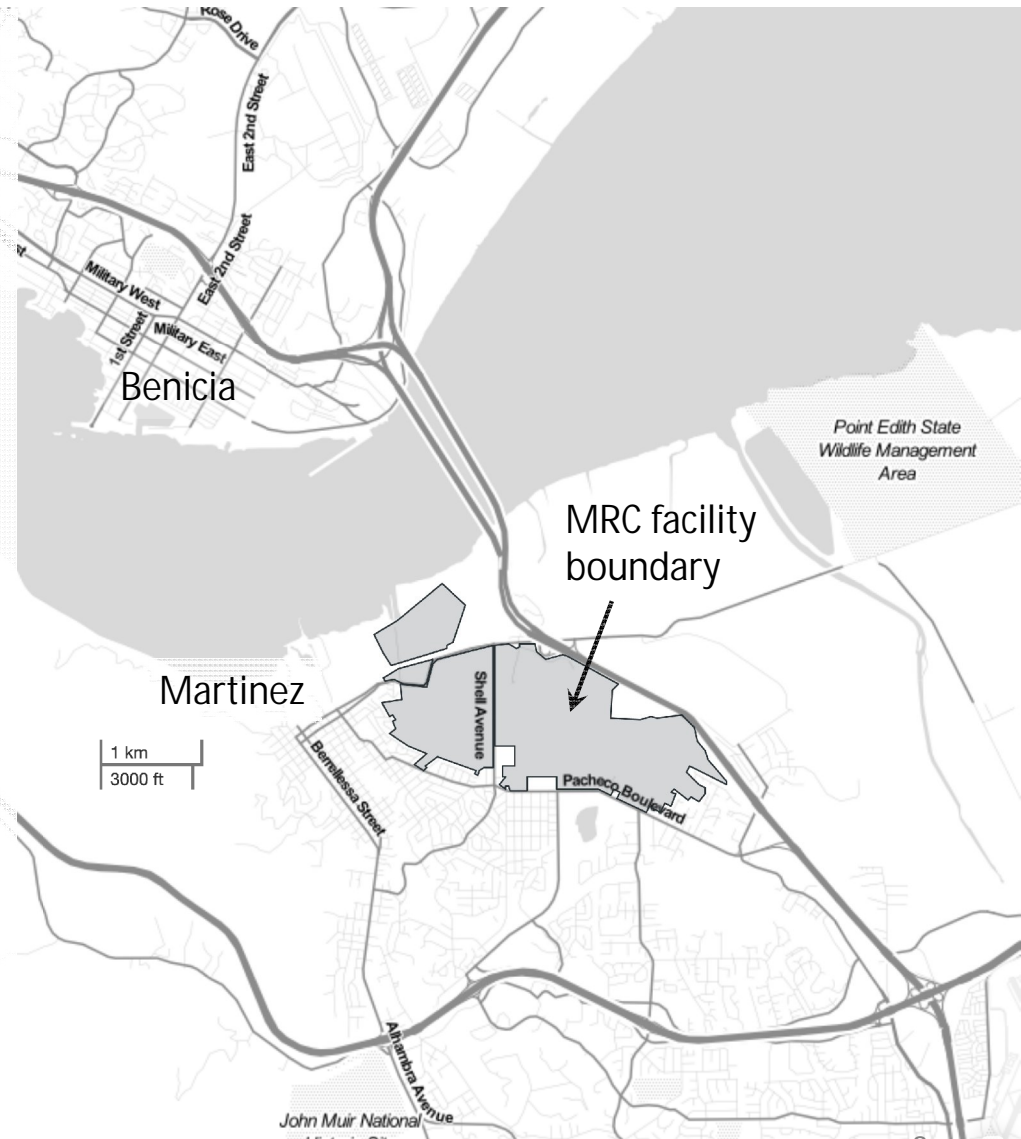
April 5, 2023



Catalyst dust fallout from MRC on a car

# Mapping to Inform a Soil Sampling Program

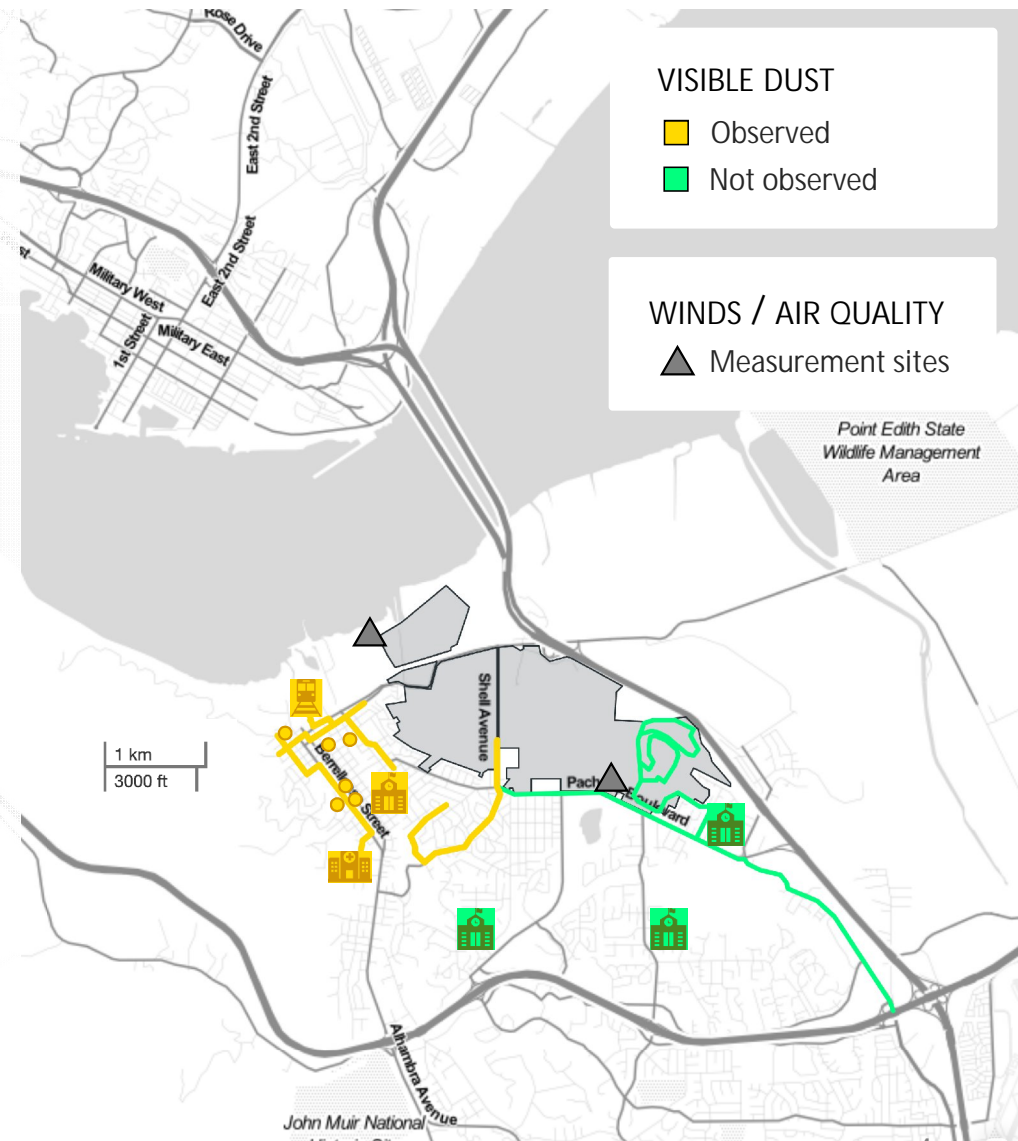
- Bay Area Air District and Contra Costa Health have acted on multiple fronts
- Contra Costa Health is preparing to conduct soil sampling
- To help develop a soil-sampling plan, Air District created a map using observations and air quality modeling
- The map does not definitively establish levels or locations of impacts, but can help guide soil sampling





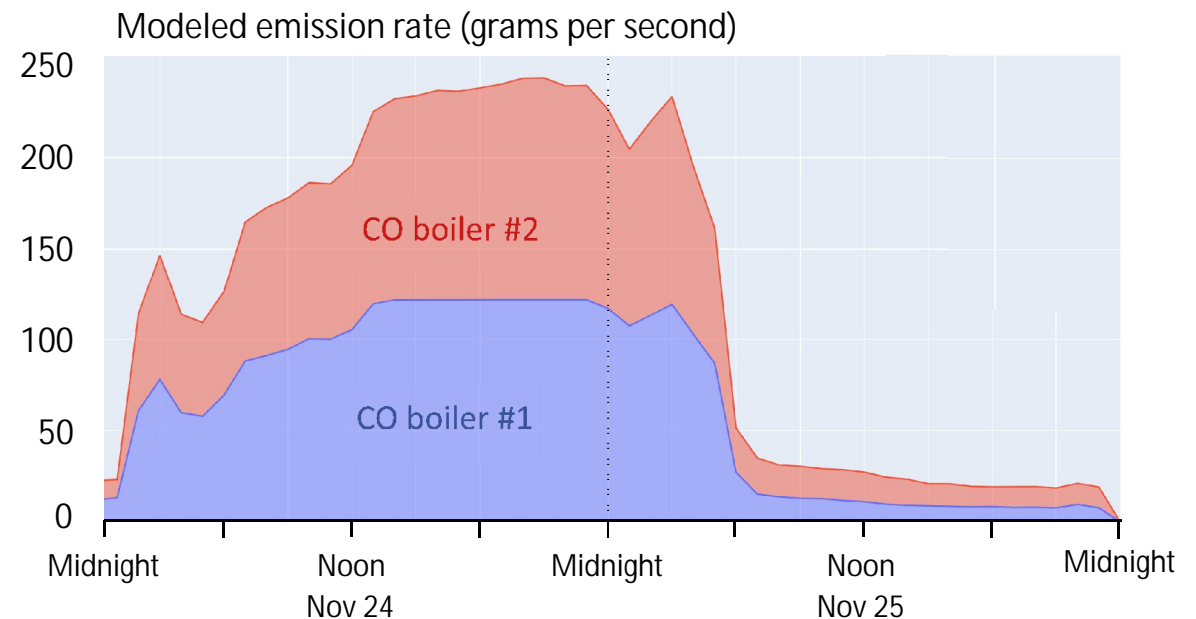
# Using Available Observations

- Visual observations of dust were recorded at schools, Amtrak station, health center, and other locations
- Dust was mostly observed west of MRC
- Winds were light and toward the west, southwest, or northwest, as observed at the eastern measurement site
- Observed dust was consistent with the release location and measured winds



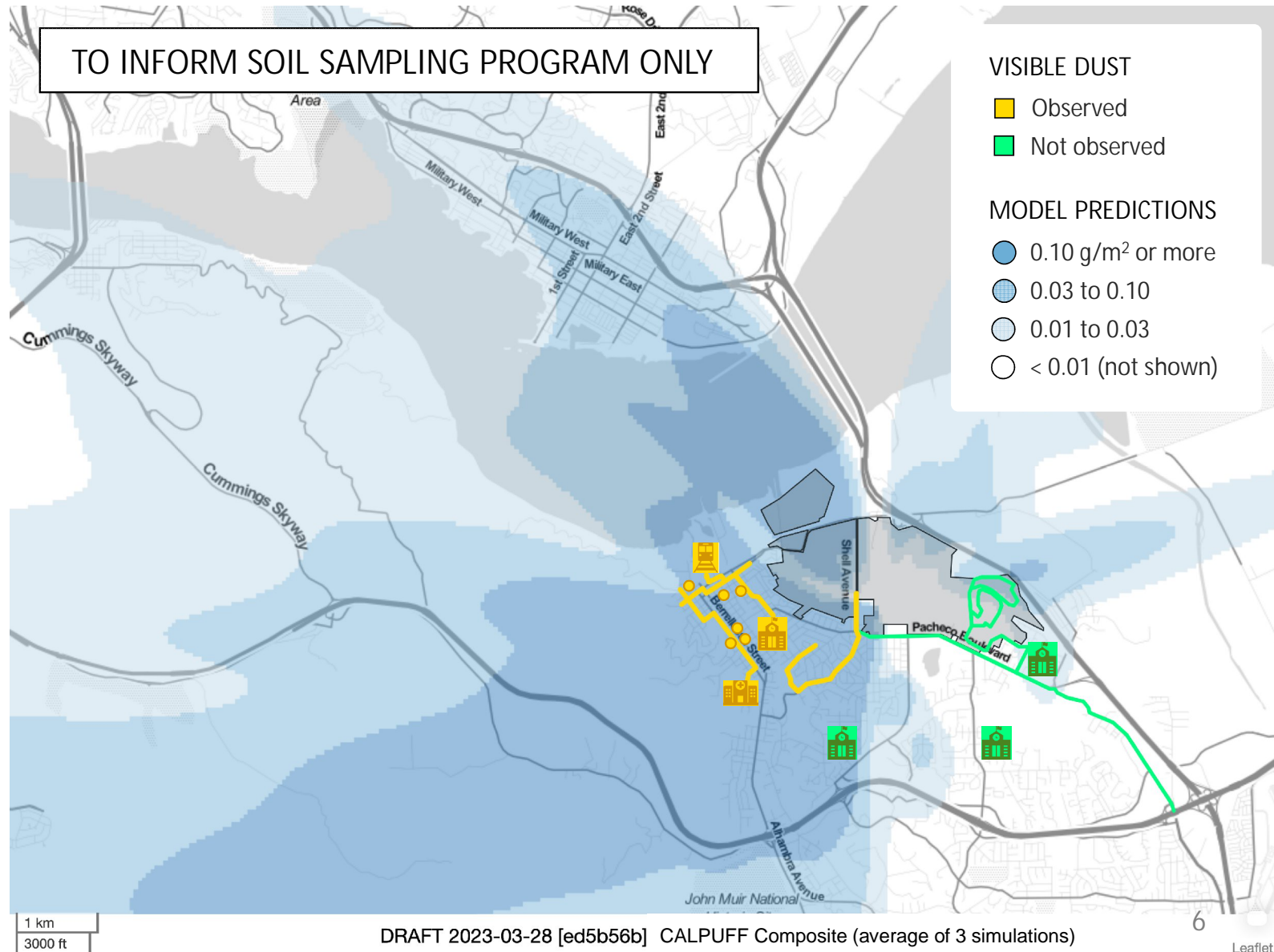
# Dust Modeling Setup

- Used an air quality model (CALPUFF) to simulate potential dust fallout
- Used stack opacity measurements to inform the timing of simulated emissions
- Ran simulations of two days (Nov. 24<sup>th</sup>, 25<sup>th</sup>) using three particle sizes (24, 50, and 85 micrometers)
- Smaller particles tend to travel farther
- Averaged multiple simulations to develop a composite map to inform soil sampling



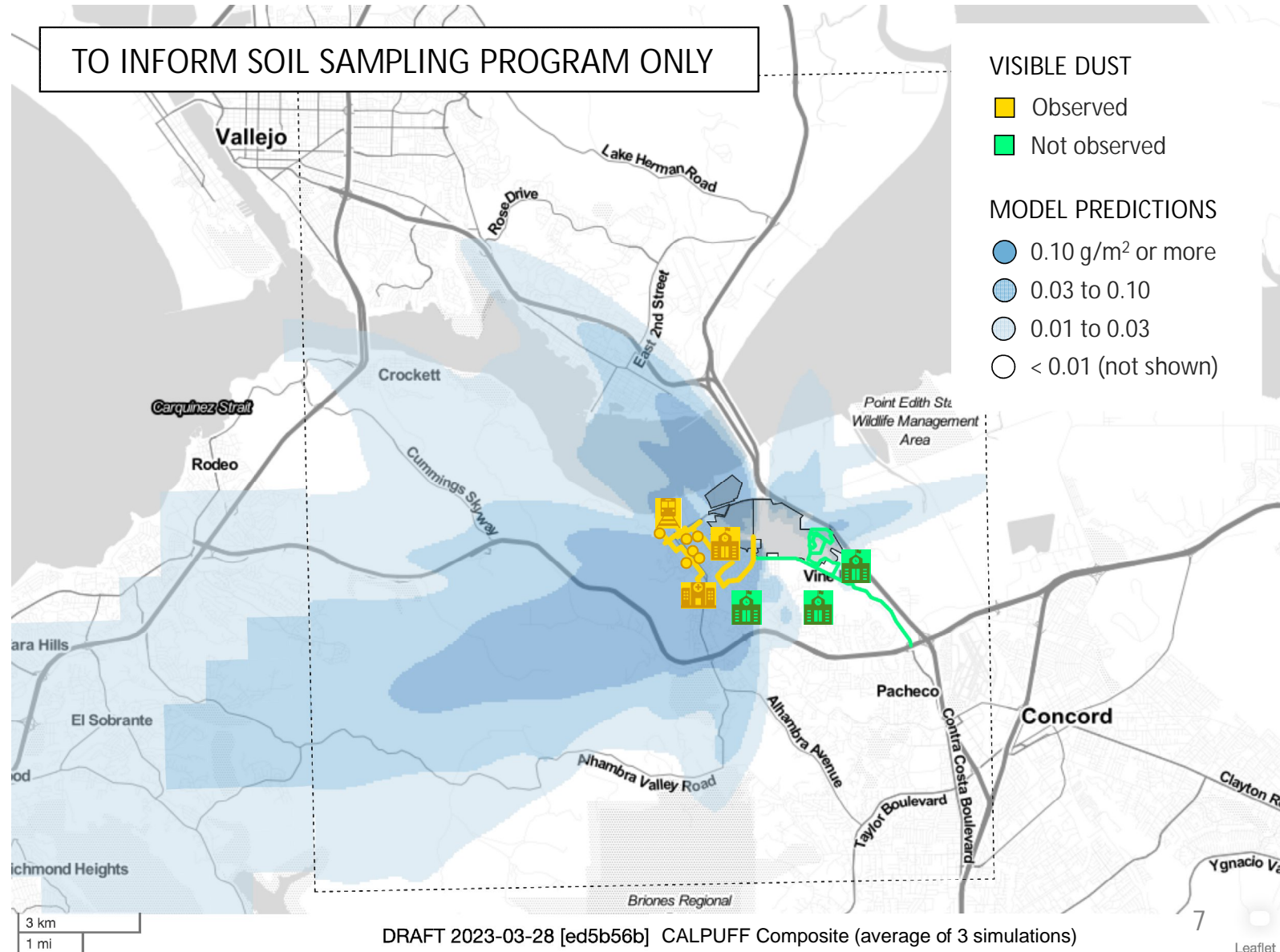
# Composite Map

- Simulated levels of dust fallout on outdoor surfaces
- Overlaid with observations of visible dust
- Generally in agreement



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# Uses and Limitations

The modeling-based map will inform soil sampling, but has limitations:

- Simulations are highly uncertain, because key inputs are highly uncertain:
  - Exact timing of the catalyst emissions; and
  - Sizes of the catalyst particles when they were released.
- In view of the large amount of rain since the event, the catalyst material has likely moved since the initial fallout. Soil sampling aims to determine how much catalyst material is currently in the soil.
- The County's Oversight Committee has selected a toxicologist that will develop a sampling plan to determine the extent of community impact from the release.



# Next Steps

- Air District will continue to pursue actions toward preventing future problems at MRC
- Air District will be available to assist in applying the map to inform the sampling plan
- CC Health next steps