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COMMUNITY

PATH TO CLEAN AIR

Community Emission Reduction Plan (CERP)
Community Steering Committee Meeting #12

March 21, 2022

Welcome!


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Today's Agenda

1. Roll Call
2. Welcome and Timeline Review
3. Approval of February 28, 2022, Meeting Minutes
4. Updates from Ad Hoc Groups
5. Technical Assessment Insights: Part I
6. Compliance & Enforcement Data Findings from 2019 - 2021
7. Environmental Justice Updates
8. Public Comment on Non-agenda Items and Next Steps

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Timeline: Where are We Today?

Approval of February 28, 2022 Meeting Minutes

Public Comment

Update from Community Description and Technical Assessment Ad Hocs

Community Description Ad Hoc co-leads: Nancy Aguirre

Technical Assessment Ad Hoc co-leads: Jeff Kilbreth

Town Hall Update: Alfredo Angulo

Public Comment

Technical Assessment Insights: Part I

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Topics for this Presentation

- Insights from emissions inventory information and air quality modeling and monitoring
- Air quality overview for the CERP area
- Information organized around categories of community concerns
  - Fuel refining, support facilities, storage, and distribution

Informing Key Issues

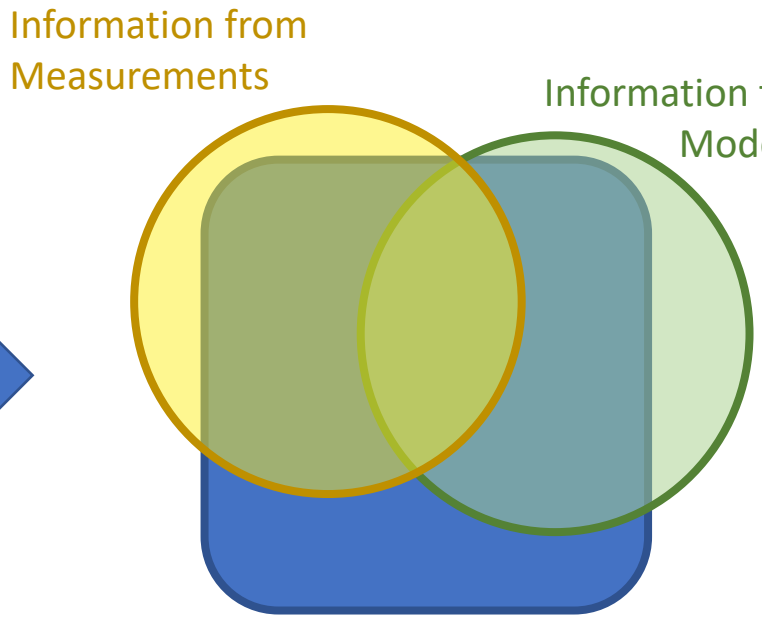
Community-Identified Air Pollution Concerns

Social Pinpoint

Monitoring Plan Development

Air Quality Complaints

Technical Assessment for a Key Issue



Inform

Insights
on key air issues

Strategies
to Reduce Pollution Emissions and Exposure

Setting **targets** and tracking **progress**

Air Quality Overview for the CERP Area

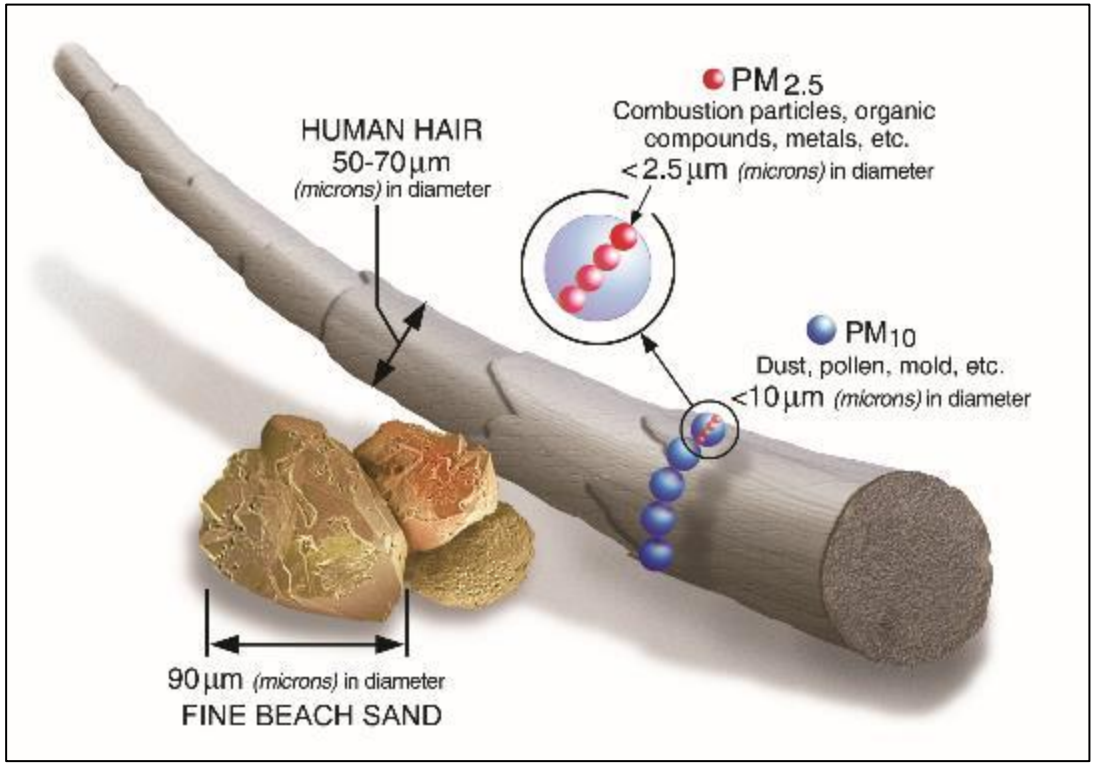
Categories of Pollutants

	Criteria Air Pollutants (CAPs)		Toxic Air Contaminants (TACs)
Description	Six common air pollutants that harm human health and have National Ambient Air Quality Standards (NAAQS) set by the U.S. EPA		Pollutants that are known or suspected to cause cancer or other serious health effects Includes U.S. EPA Hazardous Air Pollutants (HAPs)
Pollutants in this Category	Ozone (O_3)	Particulate matter ($PM_{2.5}$ and PM_{10})	Examples of TACs: Benzene, toluene, ethylbenzene, xylene (BTEX), volatile organic compounds (VOCs), found in gasoline and released through combustion of fossil fuels Diesel particulate matter (DPM), resulting from combustion of diesel fuel Certain metals such as mercury, chromium, and arsenic
	Carbon monoxide (CO)	Nitrogen dioxide (NO_2)	
	Sulfur dioxide (SO_2)	Lead (Pb)	

More info: Criteria air pollutants: https://www.epa.gov/criteria-air-pollutants
Toxic air contaminants: https://oehha.ca.gov/air/toxic-air-contaminants

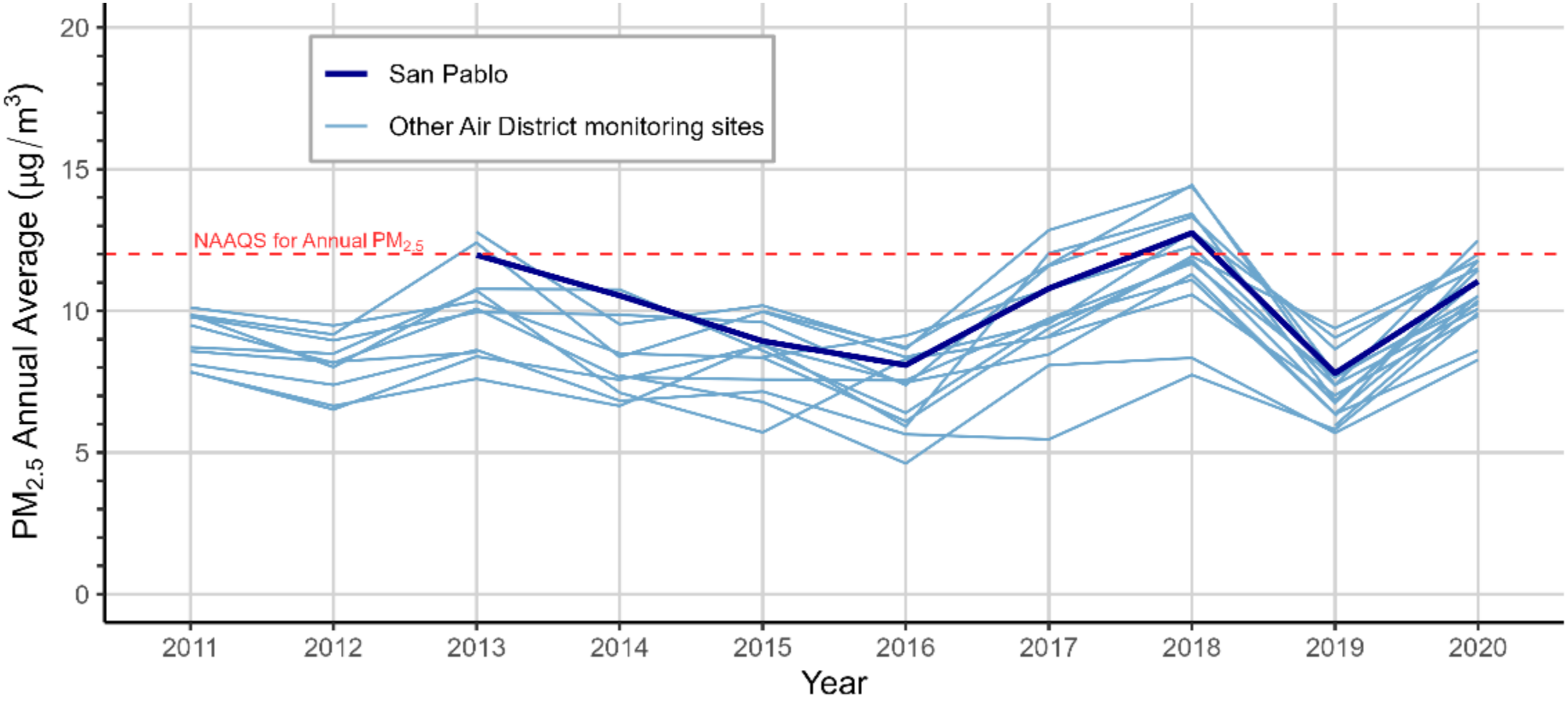
Fine Particulate Matter ($PM_{2.5}$)

- Fine inhalable particles with diameters of 2.5 micrometers or smaller
- These small particles can travel deep into the lungs and into the bloodstream
- Examples of sources:
  - Combustion of fuels or other materials (industrial operations, cars and trucks, trains, ships, off-road equipment, wildfires)
  - Dust from unpaved surfaces, vehicle brakes, construction, sand and gravel facilities
  - Natural sources such as wind-blown dust and sea salt
  - Formation in the atmosphere through complex reactions of other pollutants



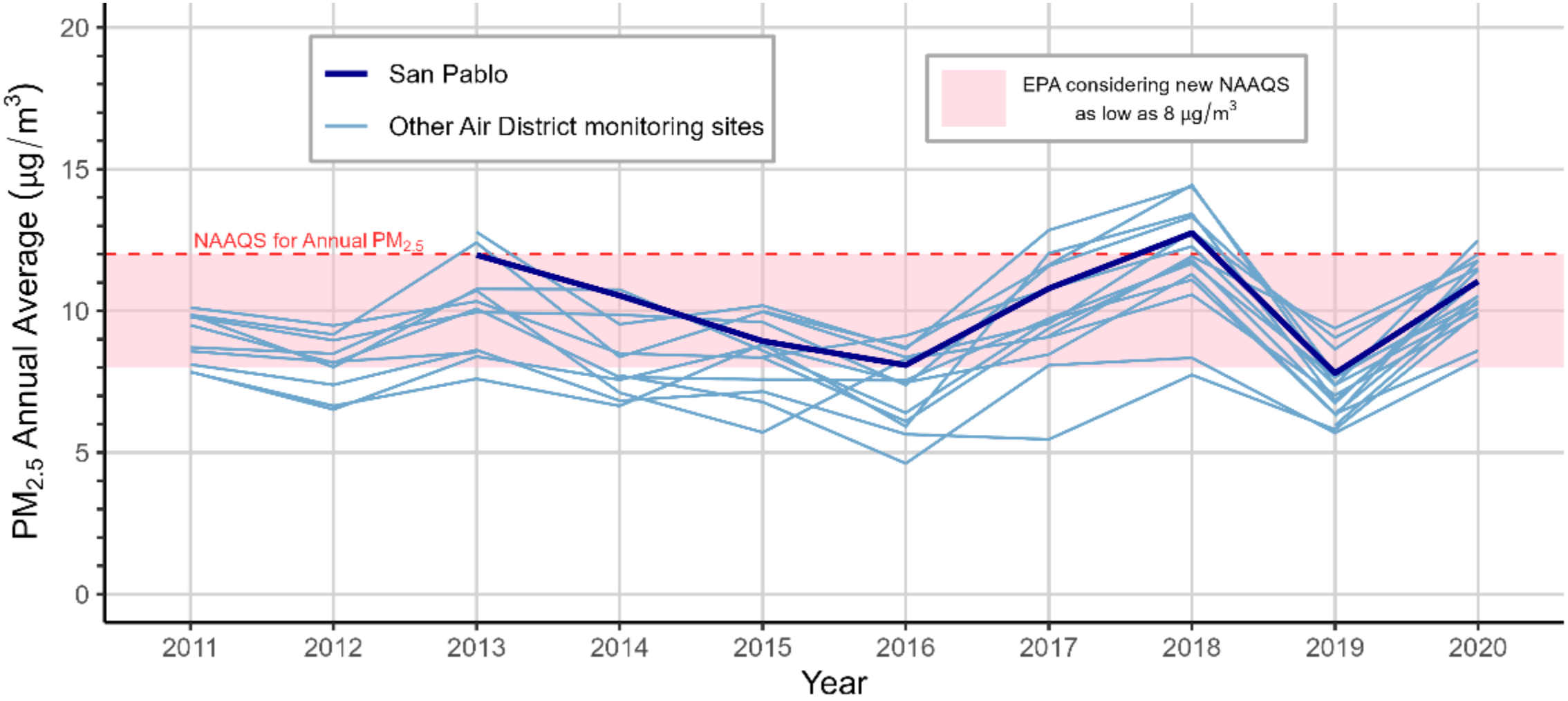
https://www.epa.gov/pm-pollution/particulate-matter-pm-basics

Annual Average $PM_{2.5}$ Levels



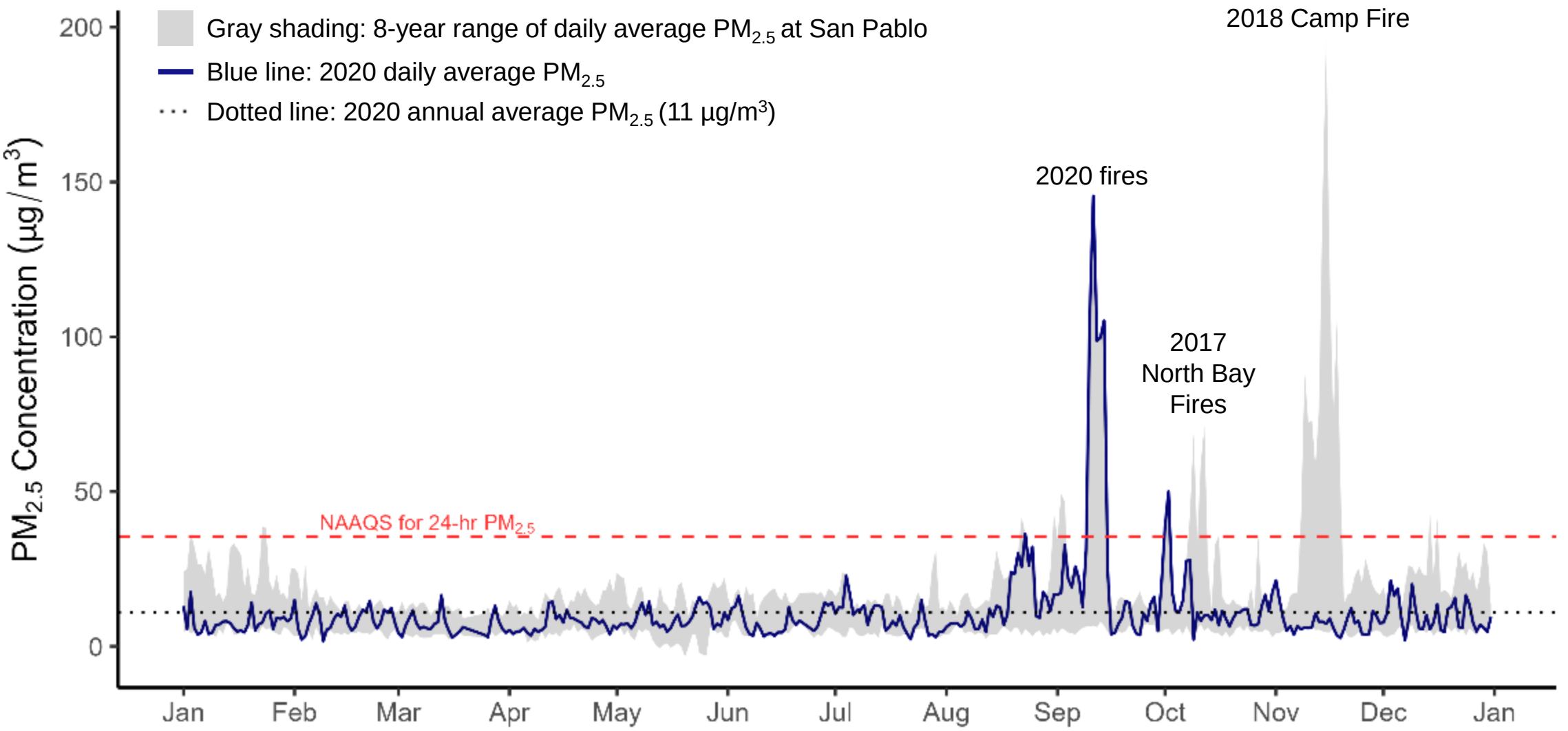
- Variability over time driven by **changes in emissions, meteorology, wildfires**
- Peak site varies from year to year; **San Pablo is often one of the higher sites**
- In recent years, annual averages at San Pablo have ranged from about 8 µg/m^3 to over 12 µg/m^3

Annual Average $PM_{2.5}$ Levels



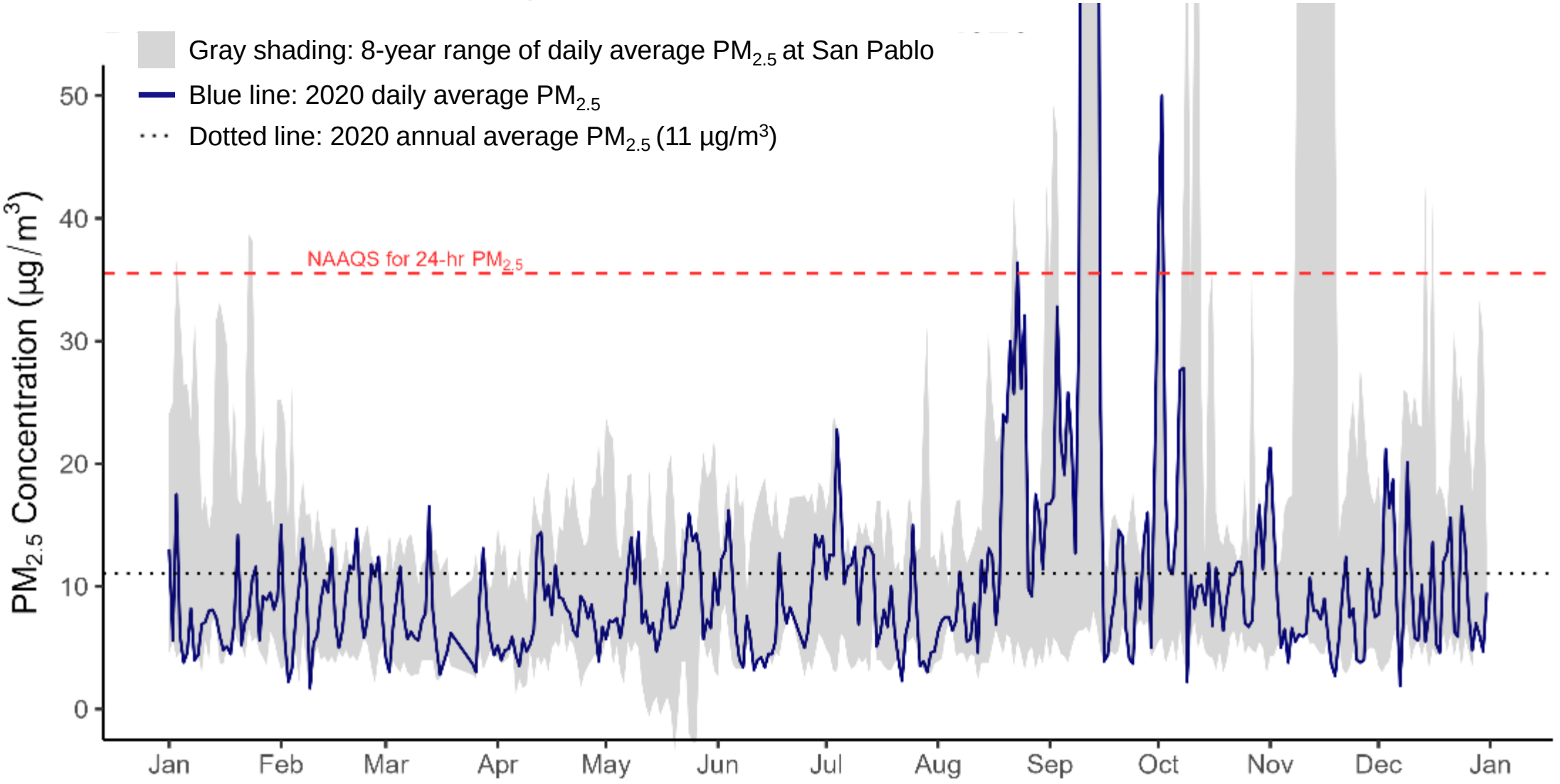
- The current standard for annual average $PM_{2.5}$ is **not health protective** and EPA is reconsidering the current standard
- There are **health benefits for additional reductions in $PM_{2.5}$** even at levels below the standard

Daily Average $PM_{2.5}$ Levels at San Pablo, 2013-2020



- Highest daily levels recently have been during wildfires
- Day-to-day air quality can be quite variable, due to changes in meteorology and emissions

Daily Average $PM_{2.5}$ Levels at San Pablo, 2013-2020



Higher $PM_{2.5}$ levels also occur during **wintertime episodes**, when meteorological conditions allow pollution to build up and bring additional pollutants into the area from outside regions

Questions?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Air Quality Overview

Emissions and Modeled Exposures

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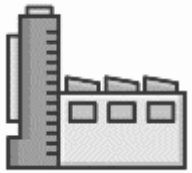
Emissions: What is included?

- Inventories for all stationary and mobile sources for which data are available to support estimates
- Criteria air pollutants (CAPs) and associated compounds: fine particulate matter ($PM_{2.5}$), oxides of nitrogen (NO_x), reactive organic gases (ROG), etc.
- Toxic air contaminants (TACs): 158 compounds included in the R-NR-SP inventory
    - TAC emissions weighted by toxicity (cancer, chronic, acute)

Emissions: How are they organized?

Source Sectors

Stationary Point Sources w/Permits



Refineries, power plants, gas stations, autobody shops

Stationary Area Sources

Fireplaces, water heaters, consumer products

On-Road Mobile

Cars, trucks, buses

Off-Road Mobile

Ships, aircraft, rail, construction equipment

Emission "Buckets"

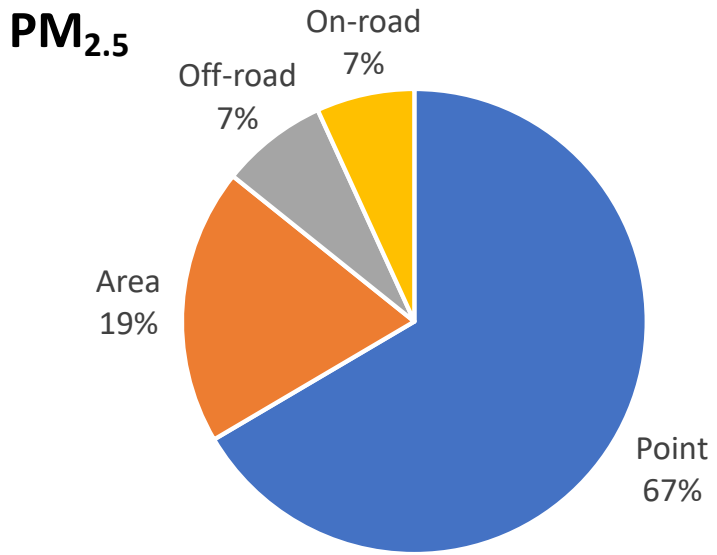
- Petroleum Refining
- On-road/Freeway
- Auto Body
- Port
- Rail
- Etc.

Emissions Overview: Criteria Pollutants

By Source Sector

Source Contributions to 2019 Criteria Pollutant Emissions for the Path to Clean Air Project Area

SECTOR	NOx	TOG	ROG	SOx	PM_{10}	$PM_{2.5}$
Point	19%	47%	26%	83%	49%	67%
Area	12%	37%	43%	9%	23%	19%
Off-road	49%	9%	18%	7%	5%	7%
On-road	20%	7%	13%	1%	23%	7%
Total Emissions (tons/year)	*2,982*	*6,009*	*2,834*	*587*	*1,135*	*756*



Permitted (point) sources contributions to total emissions range from 19% to 83% for the pollutants shown

Emissions Overview: Toxic Air Contaminants

Toxicity Weighted Emissions (TWE)

- TAC emissions weighted by OEHHA health values
- These calculations provide assessments of the relative toxicity of each compound
- Toxicity weighting is also applied to modeled pollutant concentrations

TAC Rankings from the 2019 the Path to Clean Air Project Area Inventory

Rank	Emissions by mass	Toxicity Weighted Emissions		
		Cancer Score	Non-Cancer Chronic Effects Score	Non-Cancer Acute Effects Score
1	Ammonia	Diesel Particulate Matter (DPM)	Manganese	Benzene
2	Toluene	Benzene	Nickel	Acrolein
3	Ethylene	Chromium (hexavalent)	Benzene	Formaldehyde
4	Formaldehyde	1,3-butadiene	Acrolein	Nickel
5	Propylene	Acrylonitrile	Sulfuric acid	Arsenic

The Top 5 pollutants under each TWE category account for:

- ***92%** of the total cancer score*
- ***66%** of the total chronic effects score*
- ***90%** of the total acute effects score*

Emissions Overview: Toxic Air Contaminants

By Source Sector

Source Contributions to 2019 Emissions of Selected TACs for the Path to Clean Air Project Area

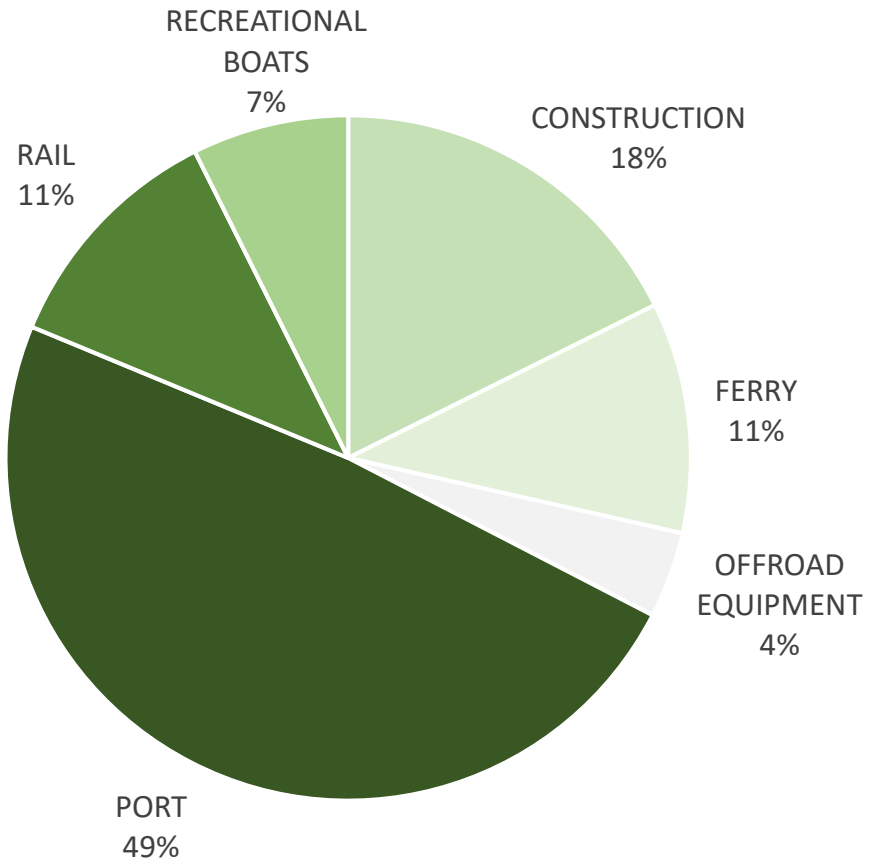
SECTOR	DPM	Hex Chrom	Formaldehyde	Manganese	Hydrogen Sulfide
Point	1%	93%	18%	77%	100%
Area	1%	0%	27%	9%	0%
Off-road	81%	6%	43%	0%	0%
On-road	17%	1%	12%	13%	0%
Total Emissions (tons/year)	*35.23*	*0.01*	*60.13*	*1.49*	*4.36*

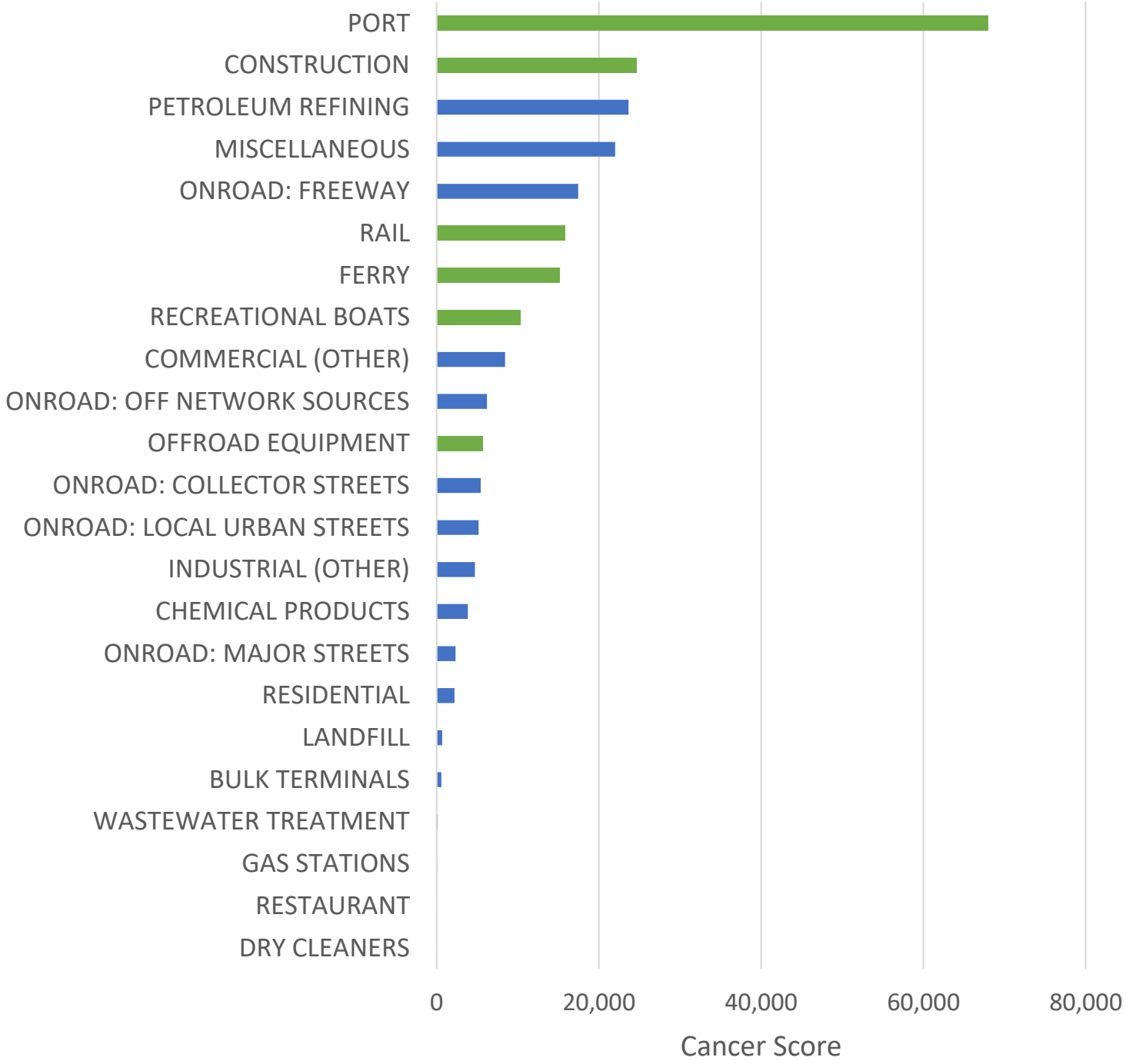
- For TACs, we must consider both mass and toxicity
- Permitted (point) sources contributions to total emissions range from 1% to 100% for the TACs shown

Emissions: Cancer Score

By Activity Type (Bucket)

Offroad Cancer Score by Source Group





Community Comparisons
Permitted Sources

Metric	R-NR-SP	San Rafael	Concord
Population	159,000	61,000	125,000
Permitted Sources	303	146	153
TACs in Inventory	79	33	23
TAC Emissions (tpy)	284.1	7.1	7.3
$PM_{2.5}$ Emissions (tpy)	502.8	7.6	0.7

Note: all emissions shown in the table above are for permitted sources only.

Permitted Sources

- Total TAC emissions in San Rafael and Concord are comparable
- Total TAC emissions in R-NR-SP ~40x higher

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Community Comparisons
Permitted Sources

Rank	Pollutant	Emissions (lbs/year)		
		R-NR-SP	San Rafael	Concord
1	Manganese	2,282.87	0.07	0.04
2	Nickel Compounds	300.44	0.80	0.51
3	Sulfuric Acid	18,134.12	N/A	7.03
4	Hydrogen Cyanide	91,667.17	N/A	N/A
5	Hydrochloric Acid	33,846.32	7.06	N/A
6	Formaldehyde	21,920.19	145.15	158.34
7	Benzene	7,001.52	138.57	241.35
8	Arsenic	32.25	0.02	0.01
9	Diethanolamine	2,994.27	N/A	N/A
10	Hydrogen Sulfide	8,716.54	N/A	N/A

*Note: the 10 compounds shown above account for **97%** of the chronic TWE from permitted sources in R-NR-SP (the top 5 compounds account for 87%)*

- For permitted sources, formaldehyde emissions in R-NR-SR are **150x** higher than in San Rafael and **140x** higher than in Concord
- Similar or much larger differences can be seen across all pollutants

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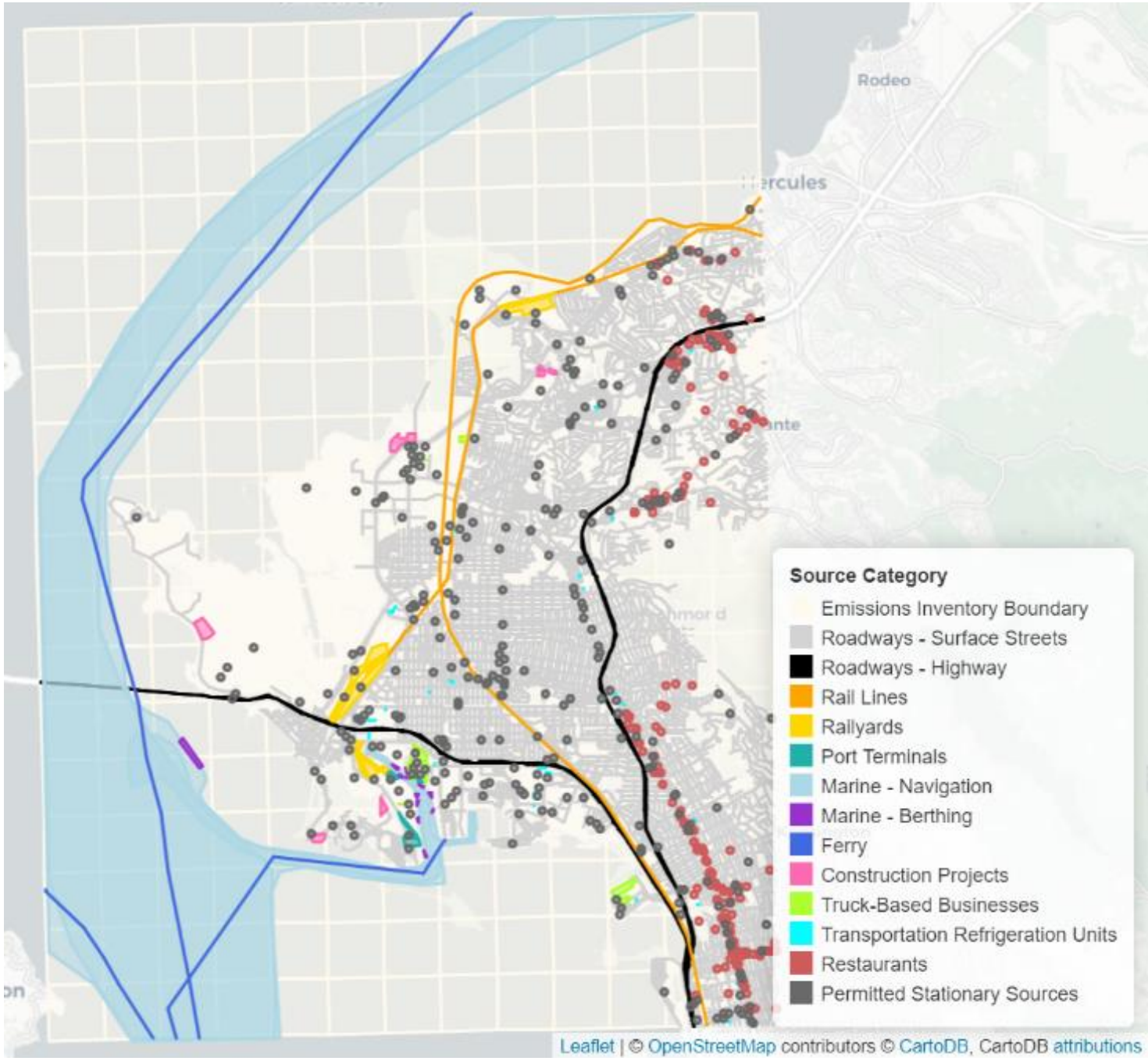
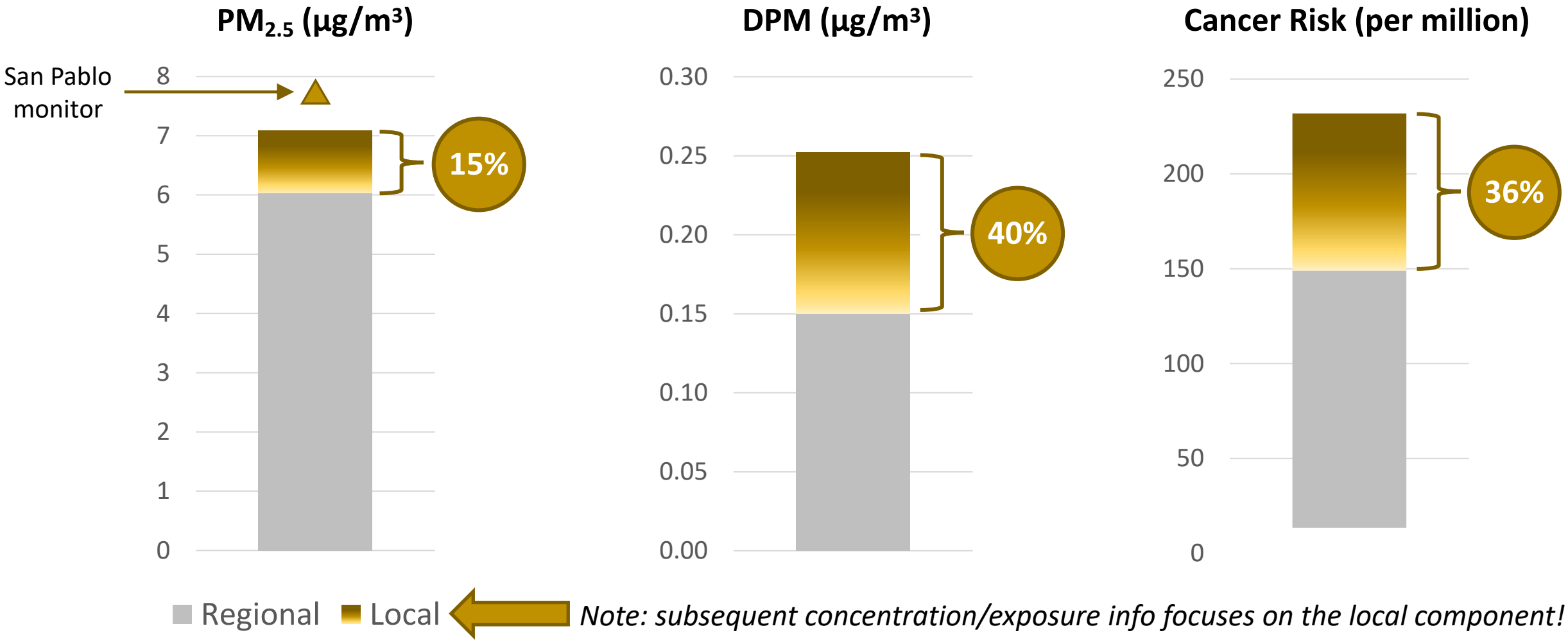
Modeling & Exposure Assessment

- Modeling estimates pollutant concentrations at 50 m spacing
- Concentrations combined with population data to evaluate exposures
- Source contributions to concentrations/exposures also calculated

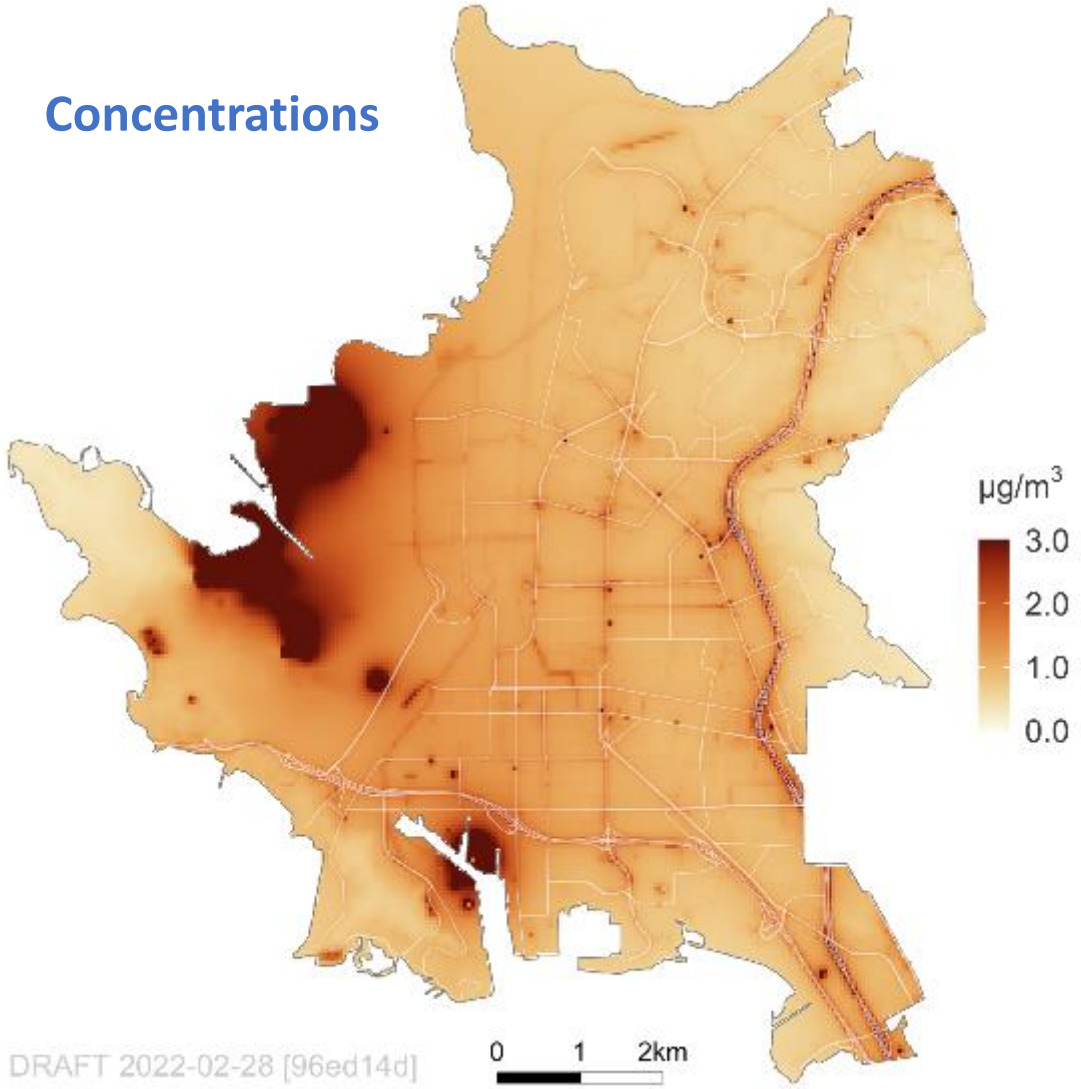


How Much is Local?

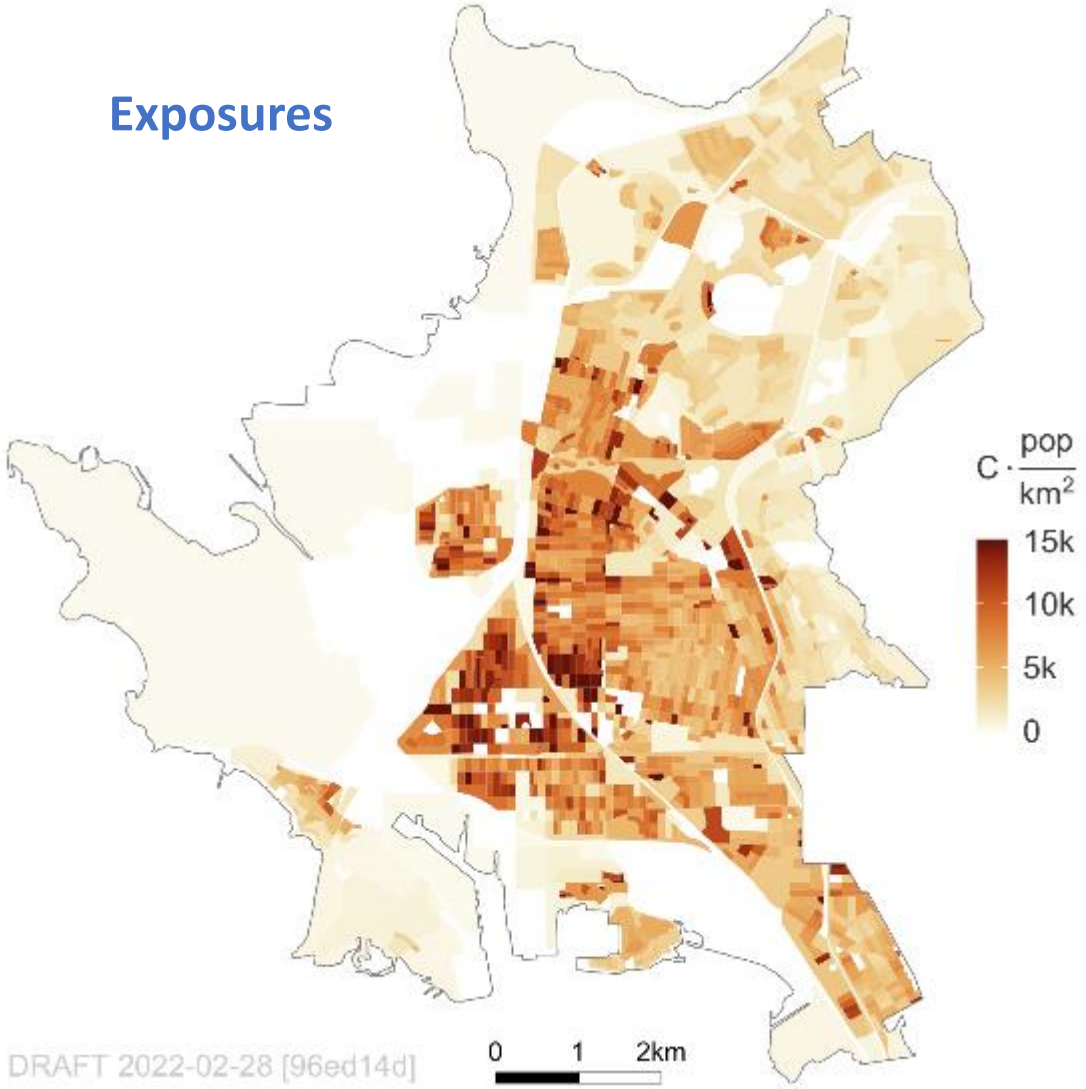


Modeled $PM_{2.5}$ Impacts from Local Sources

Concentrations



Exposures



Technical Assessment Insights:
Air Quality Overview

- San Pablo is often one of the higher monitoring sites for annual average $PM_{2.5}$ in the Bay Area
- Trends in $PM_{2.5}$ levels influenced by fires in recent years
- There are health benefits for additional reductions in $PM_{2.5}$ even at levels below air quality standards
- Concentrations of air pollutants change over time and place, and different areas can be higher for different pollutants on different days

Technical Assessment Insights:
Air Quality Overview

- Both local and non-local sources impact air quality in the Path to Clean Air Project Area; on average local sources contribute more to TAC impacts than to $PM_{2.5}$ impacts
- Local source contributions to the Path to Clean Air Project Area community emissions inventory vary by pollutant
    - *For $PM_{2.5}$, permitted sources are the largest contributor*
    - *For cancer TWE, offroad mobile sources are the largest contributor*
- Modeled pollutant concentrations and exposures may tell different stories

Questions?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Community Concern:
Fuel refining, support facilities, storage, and distribution

Community Concern: Fuel refining, support facilities, storage, and distribution

- We shared some initial technical insights around Chevron at the January CSC meeting
- Different types of monitoring systems in place
  - Emissions monitoring
  - Ambient monitoring
- How emissions data are estimated and categorized
- Modeled annual average $PM_{2.5}$ levels from individual facilities or sources

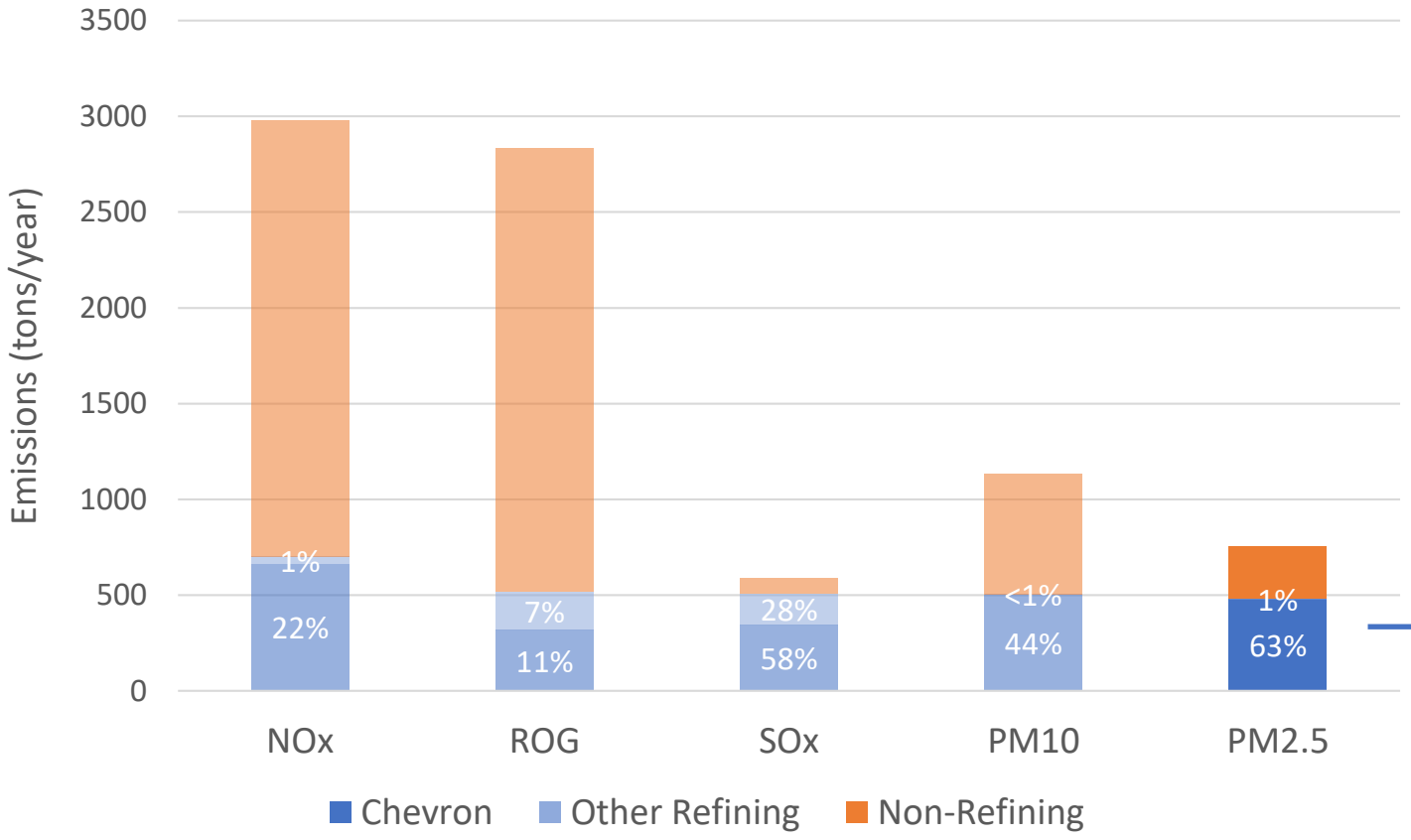
Fuel Refining: What is included?

Permitted Facility	Mobile Sources
Chevron	OGV at-berth
Chemtrade	
Kinder Morgan	
Phillips 66	OGV at-berth; trucks
Transmontaigne	
IMTT	OGV at-berth
Richmond Products Terminal	
Qualawash Holdings LLC	
Gas Stations	

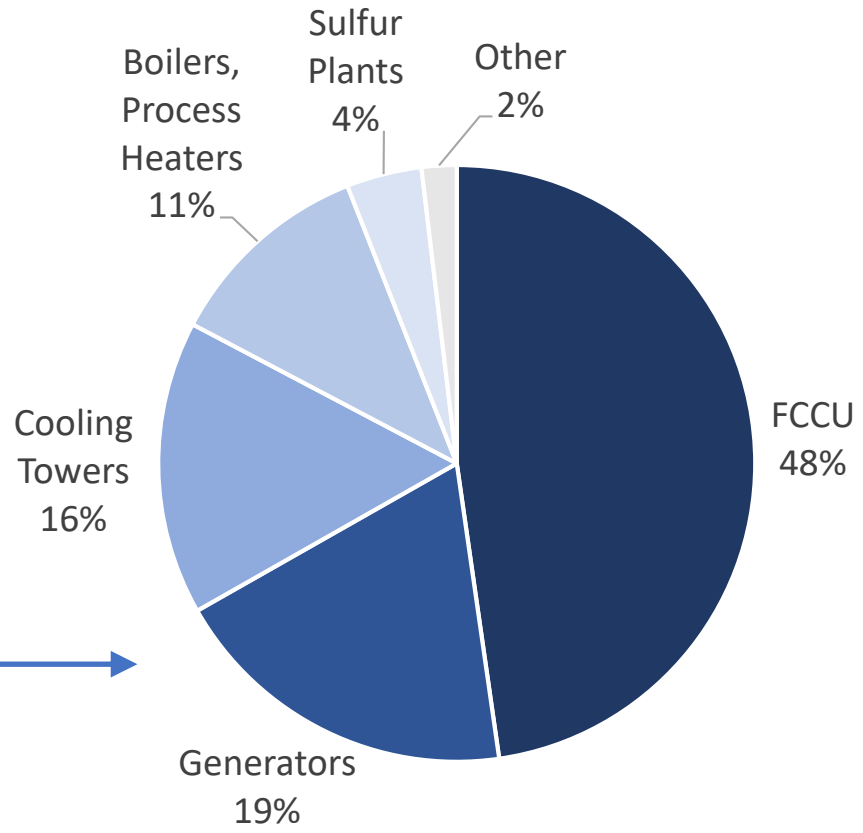
Emissions from mobile source activities at each facility were quantified where data were available

Fuel Refining Emissions: Criteria Pollutants

2019 Criteria Pollutant Emissions for the Path to Clean Air Project Area (tons/year)

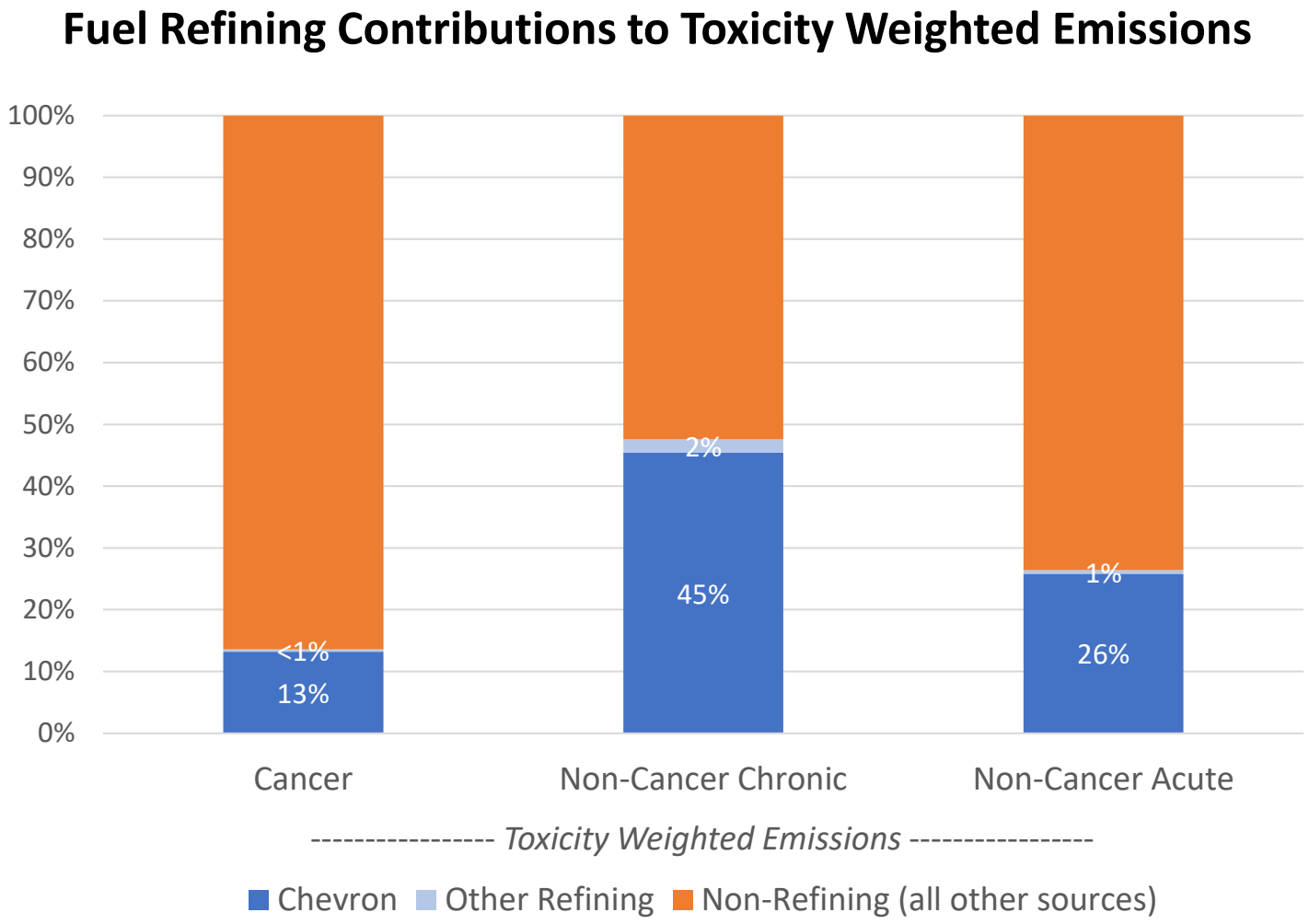


Chevron $PM_{2.5}$ (479 tons/year*)

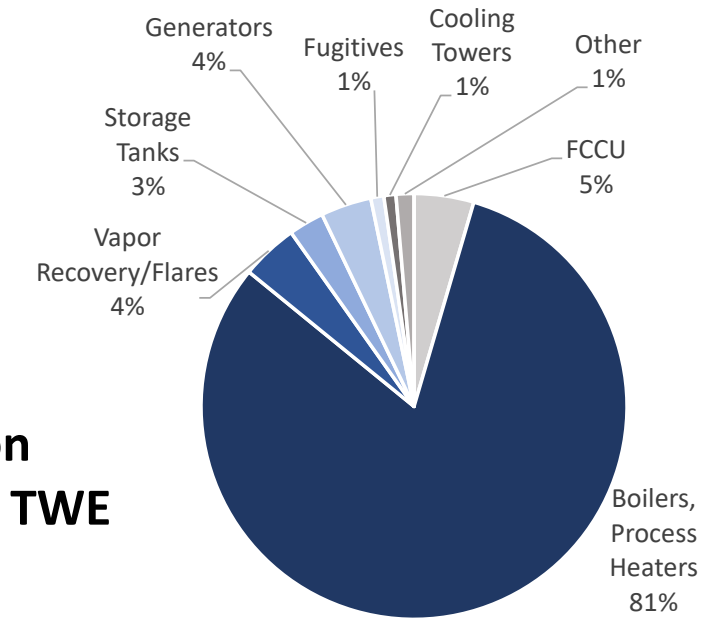


*Includes OGV berthing emissions

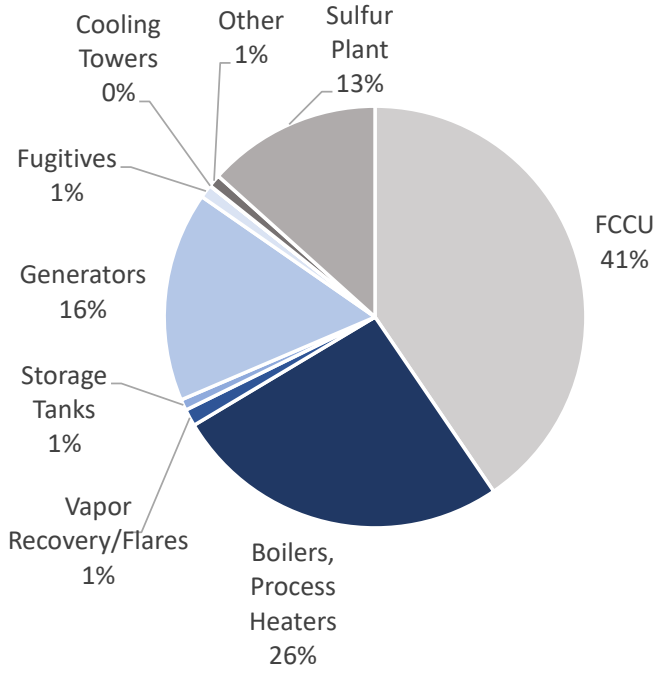
Fuel Refining Emissions: TACs



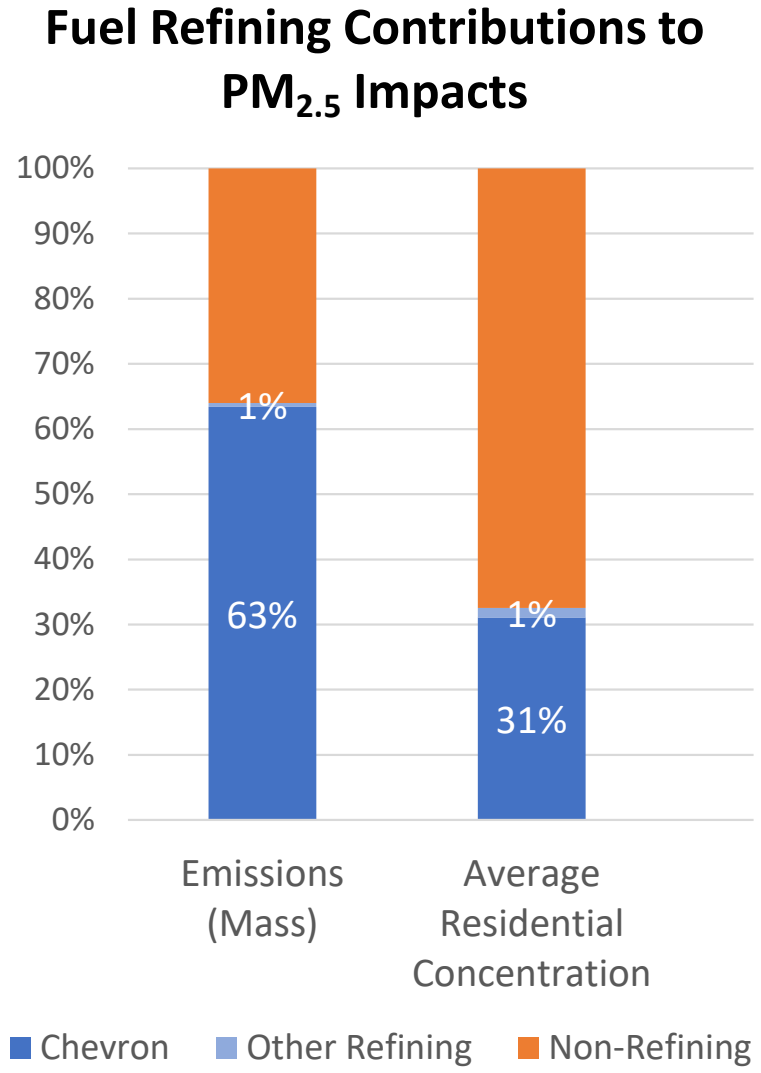
Chevron Cancer TWE



Chevron Chronic TWE



Fuel Refining: Emissions vs. Exposure

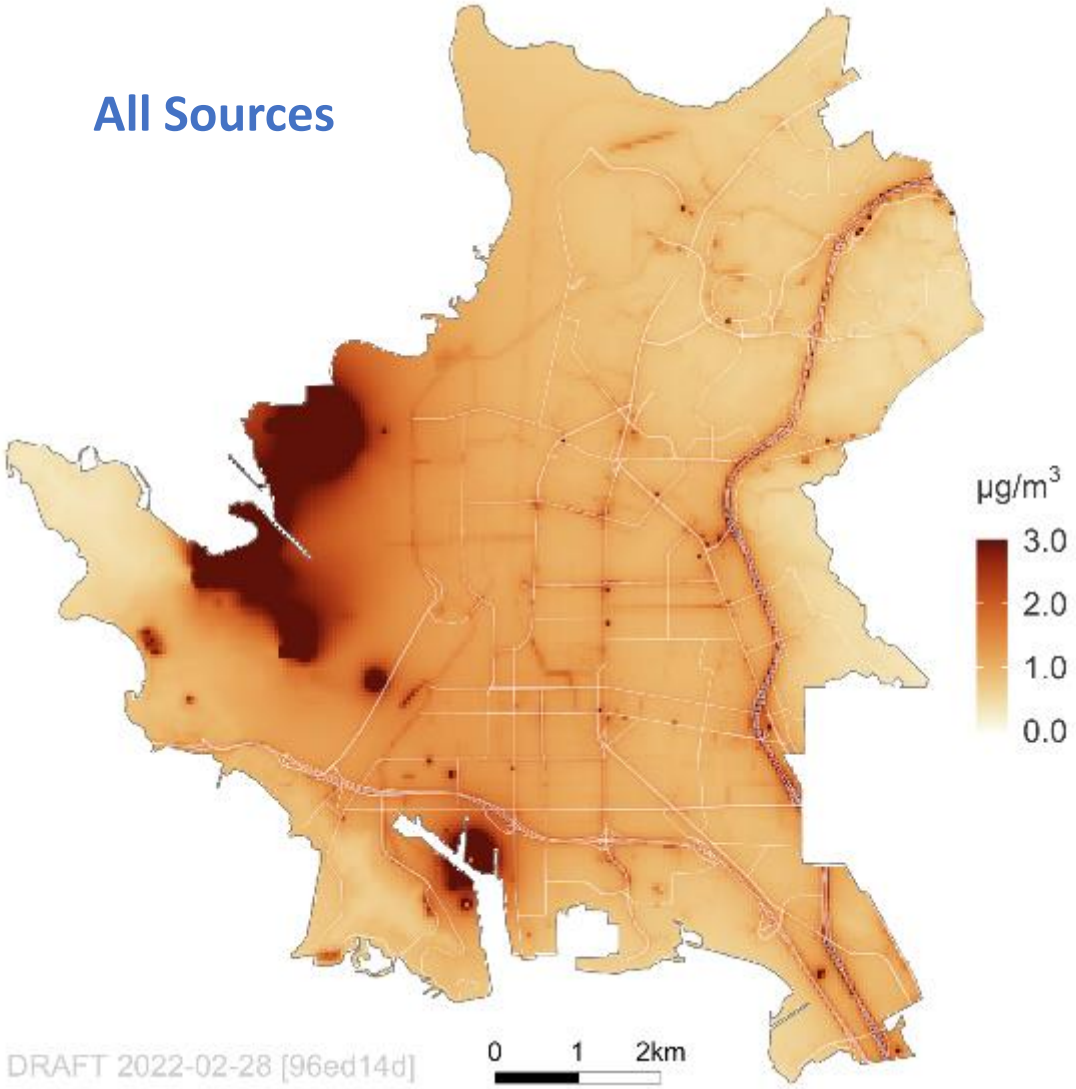


- Source contributions to emissions and exposures often vary
- For example, *Fuel Refining* accounts for **64%** of local $PM_{2.5}$ emissions and **32%** of average residential $PM_{2.5}$ concentrations*
- Similarly, *Fuel Refining* accounts for **14%** of local cancer TWE and **6%** of average residential cancer risk*

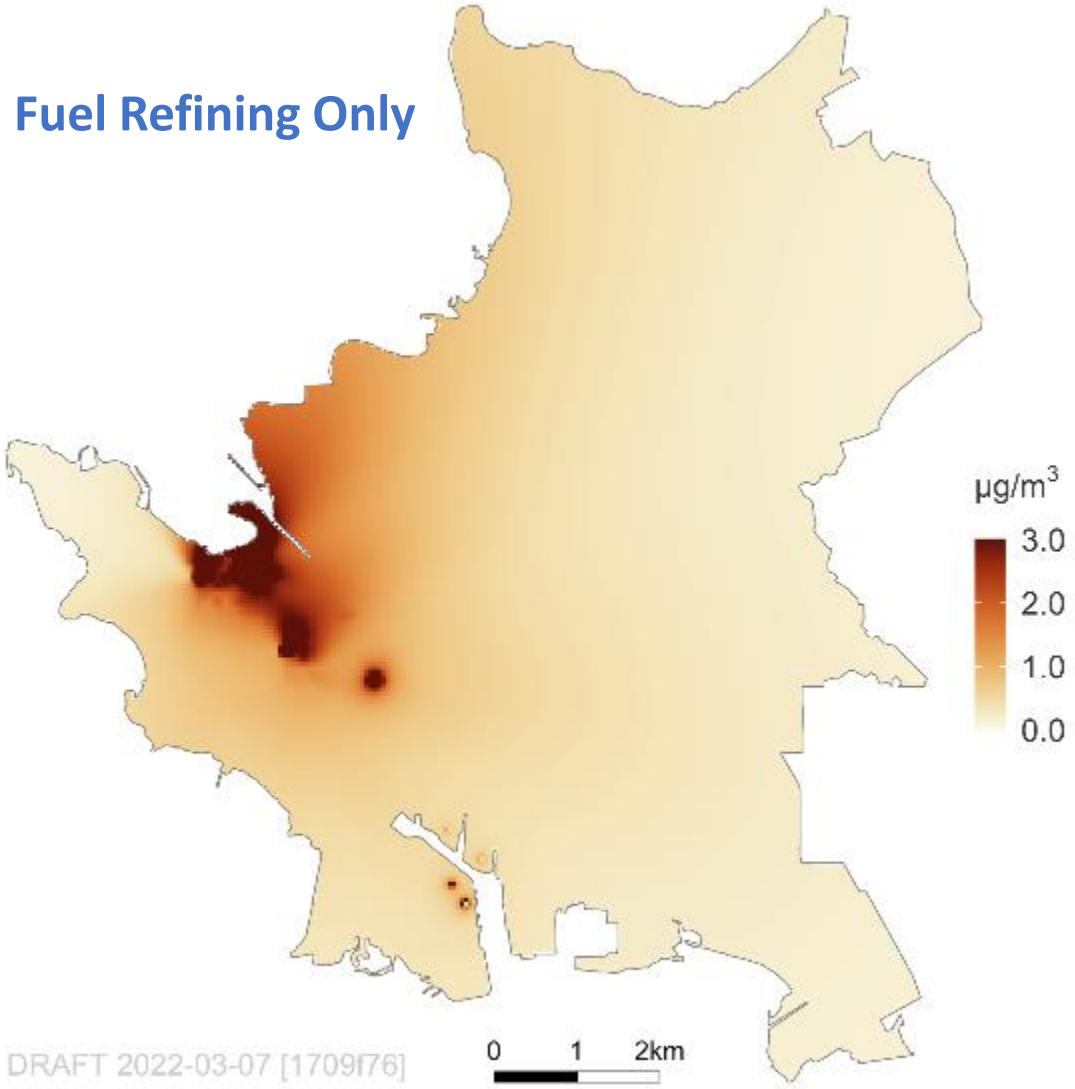
*These average values are based on impacts from local sources only

Fuel Refining: Modeled $PM_{2.5}$ Concentrations

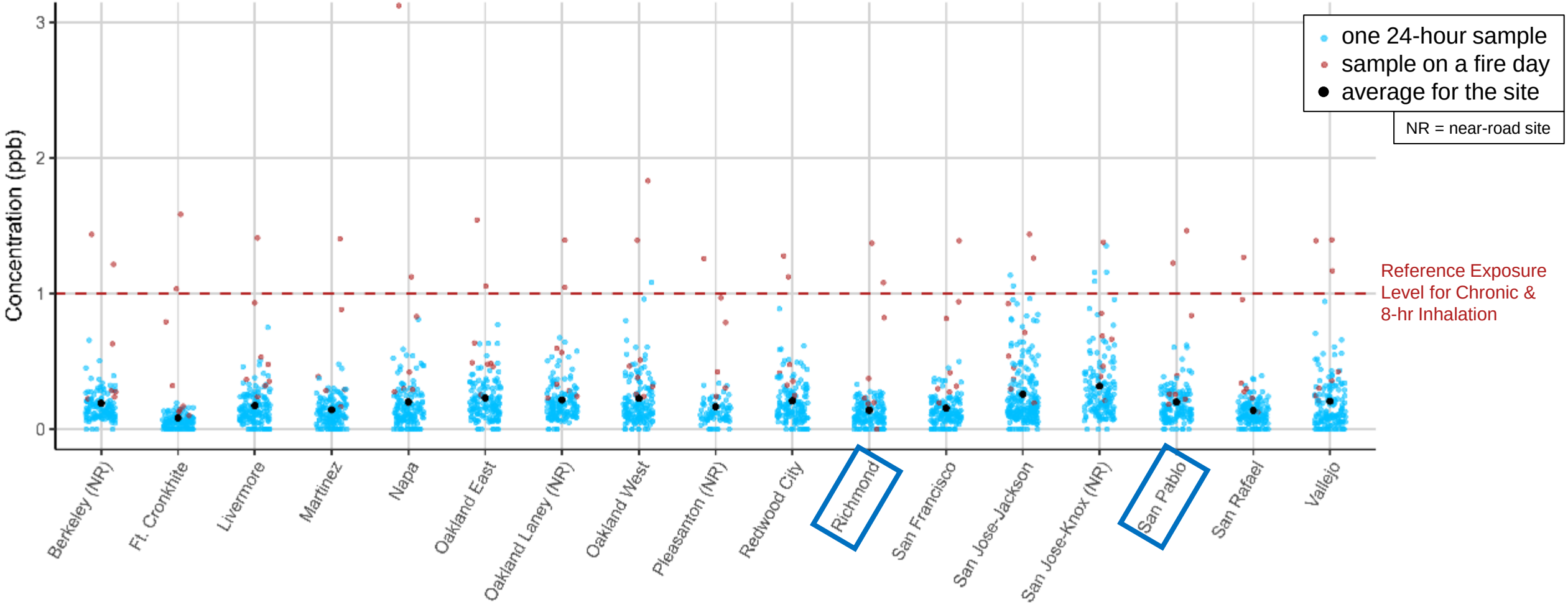
All Sources



Fuel Refining Only

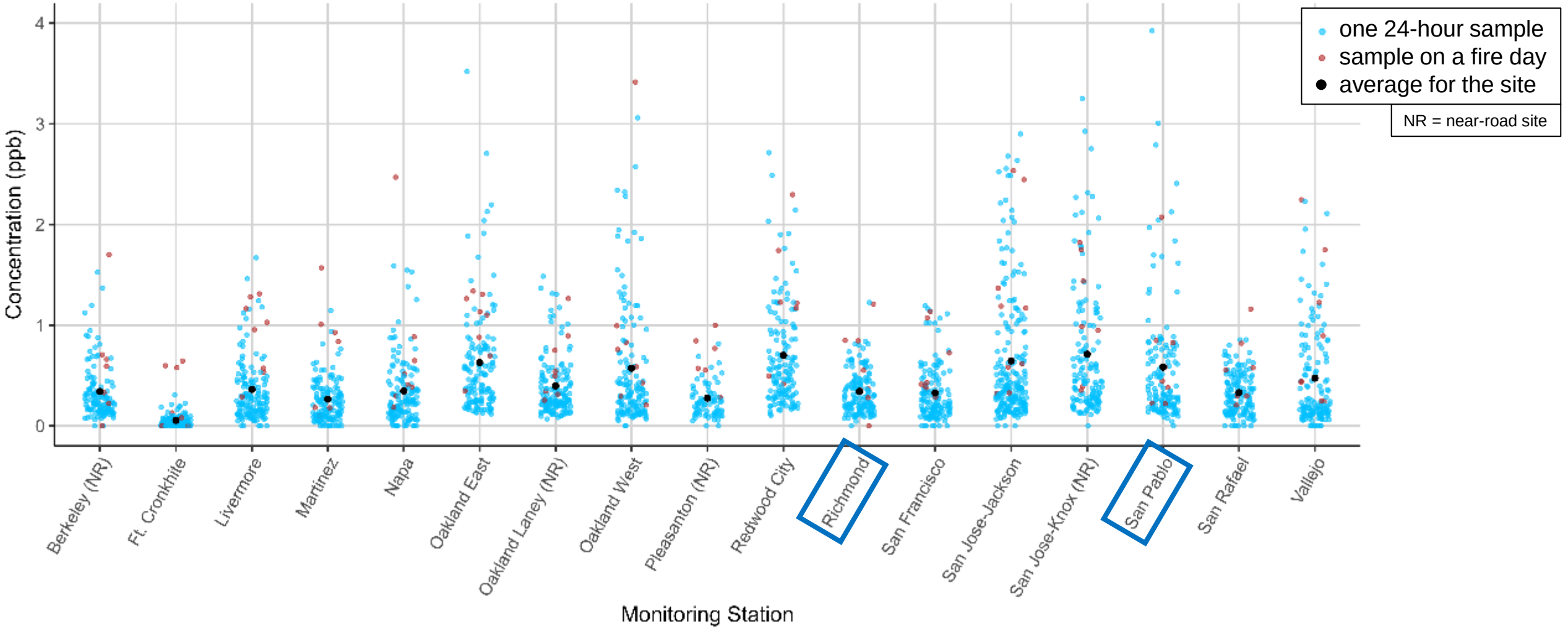


24-hr Integrated Benzene Levels, 2016-2020



- **Benzene has many sources**, including fossil fuel burning, wildfires and other biomass burning, oil and gas processing and refining, and evaporation of gasoline, solvents, and paints
- While most measurements are below reference exposure levels for chronic impacts, benzene is the most toxic of the BTEX compounds

24-hr Integrated Toluene Levels, 2016-2020



- Some occurrences of higher levels at San Pablo compared to other locations, including on non-fire days, **possibly indicating local sources of toluene**
- Reference exposure level for chronic health impacts is 110 ppb

Air Toxics Monitoring Project

- Community Air Monitoring Plan project to collect data to inform on several areas with community concerns
- Data collected over the past several months
- Data review and analysis are underway
- Report and insights expected mid-2022

Technical Assessment Insights: Fuel refining, support facilities, storage, and distribution

- Many of the highest measured benzene levels were during wildfire periods, but other occurrences may be attributable to local sources, in addition to occurrences of higher levels of other TACs such as toluene
- Exposures are influenced not only by emission levels, but by release characteristics and other factors
- Process-level contributions to emissions and exposure levels are available to help develop strategies

Next Steps for the Technical Assessment

- The TA Ad Hoc will continue to work to refine analyses and communication to inform key issues and support action to reduce pollution emissions and exposure
- In April and May, we will bring insights for additional categories of community concerns
- We can send out additional materials for air quality concepts and expanded information on what was presented today

Public Comment

Steering Committee Questions and Discussions

Compliance & Enforcement Data Findings from 2019 - 2021

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Linda Duca, Supervising AQ Specialist
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Types of Compliance & Enforcement Activities

Compliance Inspections and Investigations	• Review site/facility operations for compliance. • Investigate Reportable Compliance Activities (RCAs), flaring events, and Title V deviations. • Identify source specific issues/concerns.
Air Quality Complaints	• Investigate complaints to identify source of emissions. • Determine magnitude of impact.
Enforcement Actions (Notice of Violation or Notice to Comply)	• Ensure corrective actions are taken. • Resolve violation.

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Summary of Inspections and Investigations (Jan 2019 – Dec 2021)

- **Number of permitted facilities**: approx. 303

- **Types of facilities**: oil refinery, bulk terminals, gas stations, landfills, wastewater treatment facilities, metal recycling, food manufacturers, transfer stations, autobody shops, coating operations, and others

- **Number of source inspections conducted**: 878

- **Number of Title V Deviations**: 621
  - Chevron Refinery: 592
  - West Contra Costa County Landfill: 22
  - Chemtrade: 6
  - Kinder Morgan Terminal: 1

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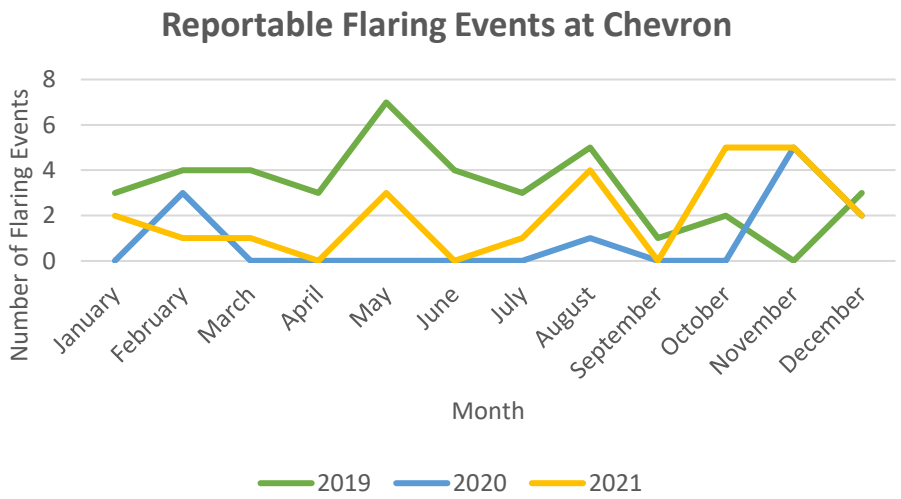
Summary of Inspections and Investigations (cont'd, Jan 2019 – Dec 2021)

Reportable Compliance Activities (RCA) Data

Type	2019	2020	2021	Total
Excess	115	162	166	**443**
Breakdown	12	10	15	**37**
Inoperative Monitor	98	108	117	**323**
Pressure Relief Valve	1	0	1	**2**
Total	**226**	**280**	**299**	**805**

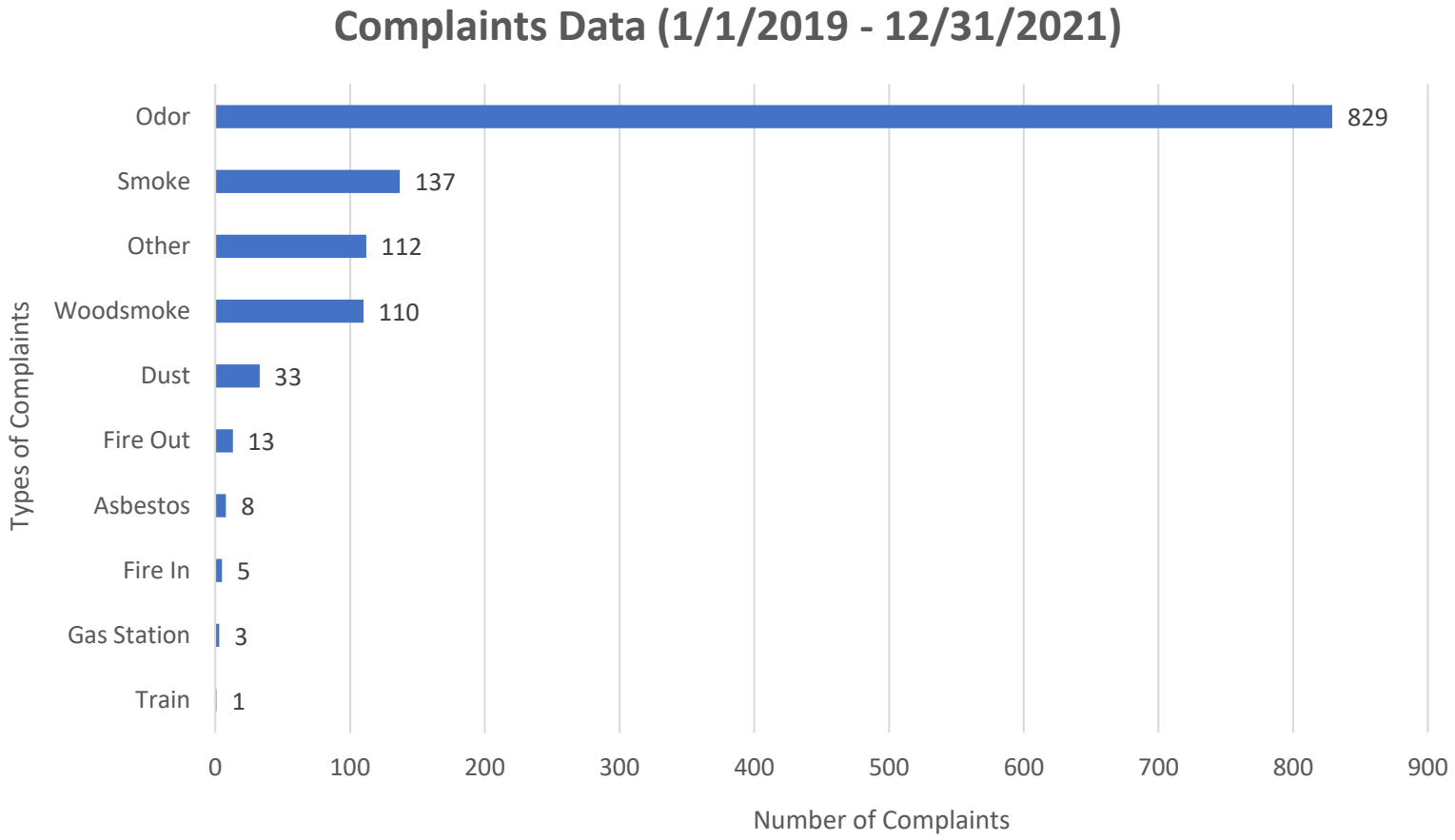


Reportable Flaring Events Data

Month/Year	2019	2020	2021
January	3	-	2
February	4	3	1
March	4	-	1
April	3	-	-
May	7	-	3
June	4	-	-
July	3	-	1
August	5	1	4
September	1	-	-
October	2	-	5
November	-	5	5
December	3	2	2
Total	**39**	**11**	**24**

Reportable Flaring Event: >500,000 scf /day or >500 lbs of SO_2/day

Air Quality Complaints Summary



Calendar Year	Number of Complaints
2019	449
2020	410
2021	392
Total	**1251**

Complaint Confirmation Rate: 19.2%

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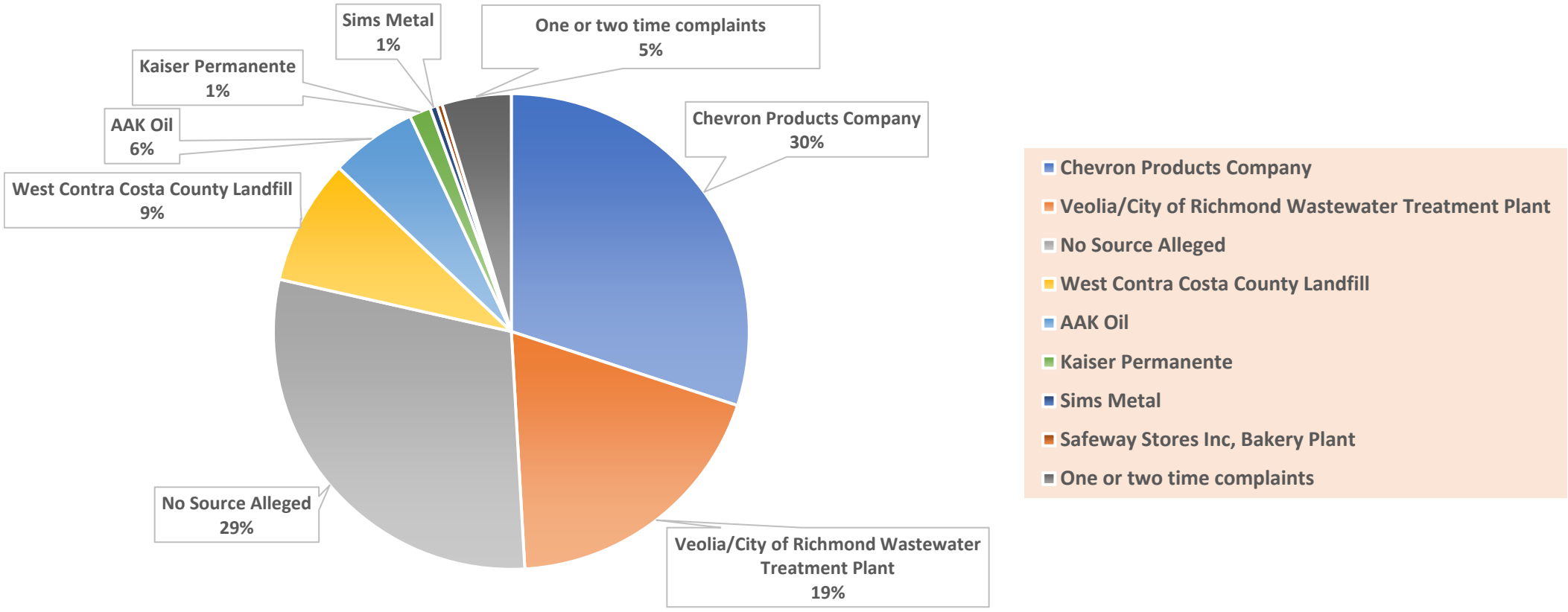
Alleged Sites of Odor Complaints in Richmond/San Pablo



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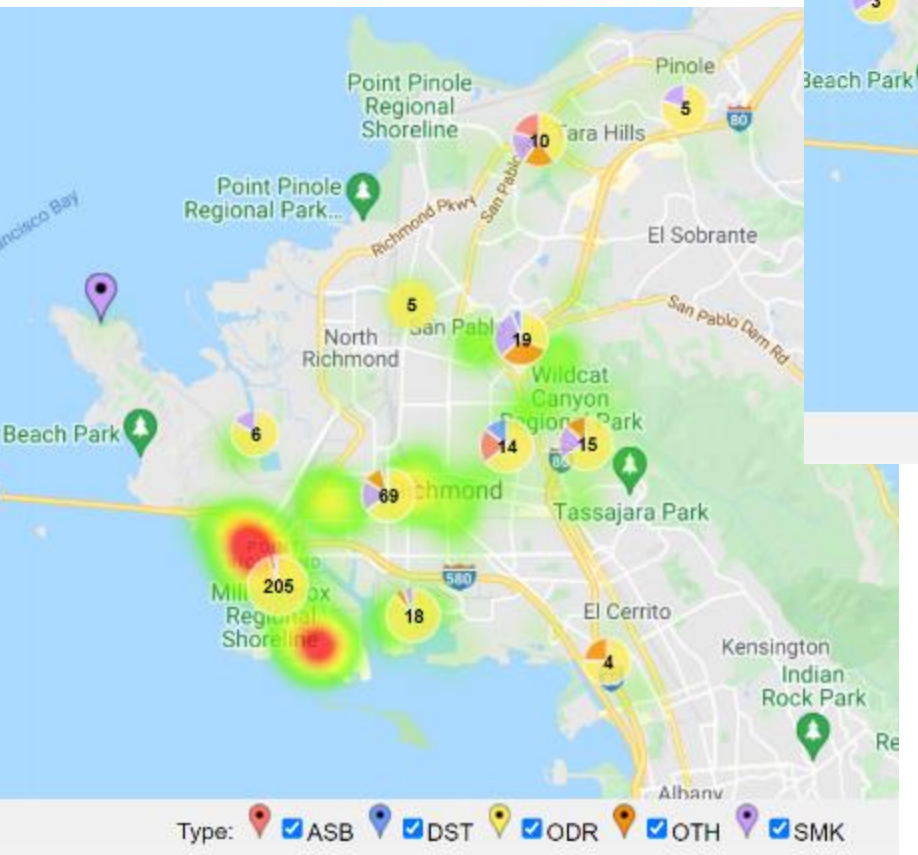
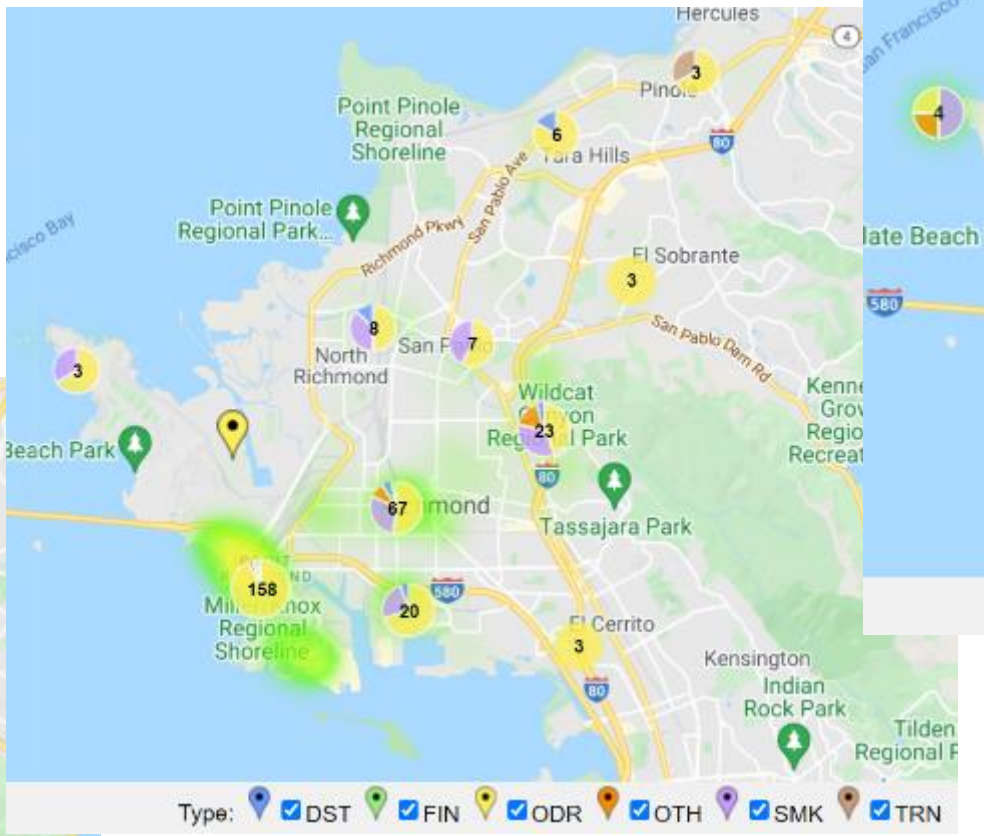
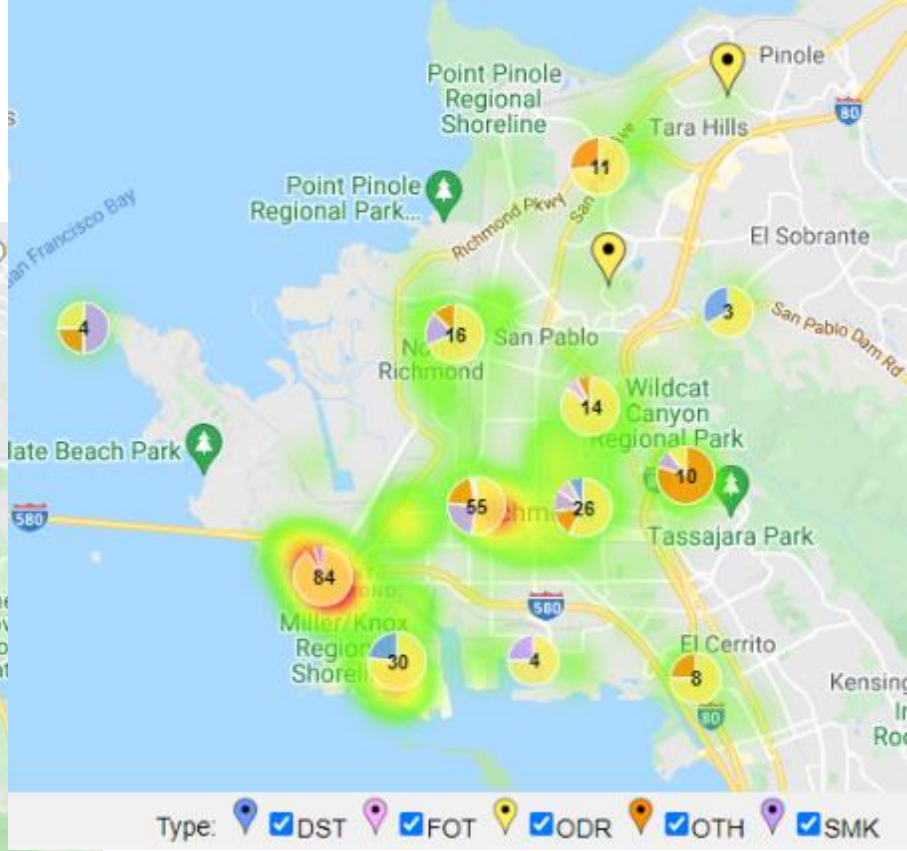
Complainants' Locations

Left: (2019)
Total Complaints: 449
Anonymous Complaints: 29







Middle: (2020)
Total Complaints: 410
Anonymous Complaints: 44

Right: (2021)
Total Complaints: 392
Anonymous Complaints: 51

**Anonymous complaints and woodsmoke complaints are not shown on maps.*

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Chevron Refinery

841 Chevron Way, Richmond, CA 94801

Facility Overview

- Petroleum refinery processing approximately 240,000 barrels a day of oil

- Flaring (with or without visible emissions), Fluid Catalytic Cracker (FCC) visible emissions and sulfur dioxide emissions, Bioreactor wastewater treatment pond odors

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Gold Bond Building Products

1040 Canal Blvd, Richmond, CA 94804

Facility Overview

- Wallboard manufacturing facility
- Particulate emissions from vessel offloading of raw gypsum, manufacturing and storage stockpiles, nitrogen oxide and carbon monoxide emissions from combustion sources

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City of Richmond Water Pollution Control District

601 Canal Blvd, Richmond, CA 94804

Facility Overview

- Municipal wastewater treatment plant serving about 2/3 of Richmond, owned by City of Richmond and operated by Veolia under long-term contract with the city.
- Periodic H_2S emissions and odor complaints

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West Contra Costa County Landfill

1 Parr Blvd, Richmond, CA 94804

Facility Overview

- Closed landfill with active transfer station and composting operation, accepting green waste and food waste from surrounding communities.
- Compost odors and operations, landfill gas collection system downtime

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Chemtrade West US LLC

525 Castro St, Richmond, CA 94801

Facility Overview

- A sulfuric acid production facility that supports the Chevron Refinery
- An audit of the Continuous Emissions Monitoring System (CEMS) at the facility in March 2021 led to discovery of multiple violations and a more in-depth investigation of the CEMS
- ~350 lb/day of under reported SO2
- Air District will bring Chemtrade violations to the Hearing Board on 4/12/22 - Materials associated with the case with be posted online and public participation is welcomed
- Facility will be required to come into compliance by 4/15/22 and conduct source testing by 5/2/22

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AAK Oil

1145 Harbor Way South, Richmond, CA 94804

Facility Overview

- Plant oil refining to supply the food and health & beauty industries
- Odors, combustion sources

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Summary of Enforcement Actions

- **Notice of Violation:**

Type	2019	2020	2021	Total	Percentage
Permits	9	0	0	9	2.8%
Administrative	10	7	25	42	13.3%
Operational	73	51	141	265	83.9%
Total	**92**	**58**	**166**	**316**	**100%**

- **Notice to Comply:**
  - Total number issued for the 3-year period: 24
    - Chevron Products Company: 8
    - Gas Stations: 5
    - Others: 11

Calendar Year	Number of NTCs
2019	18
2020	0
2021	6

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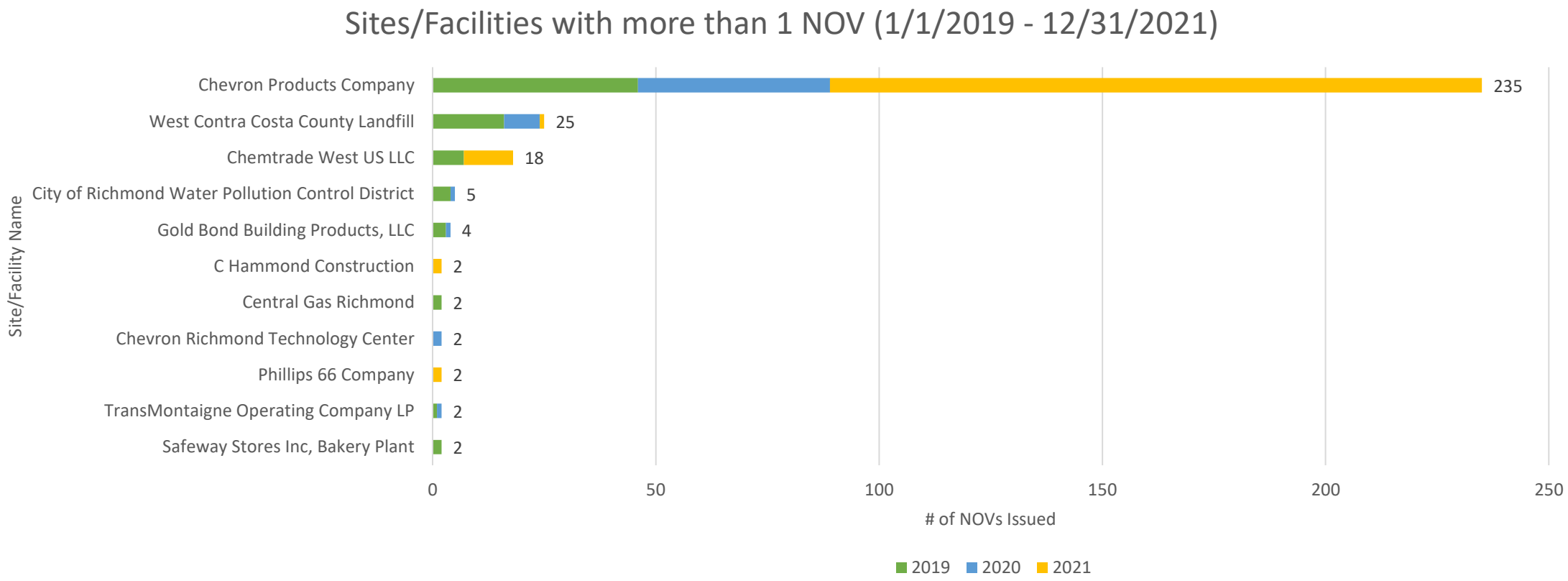
Notice of Violation Summary



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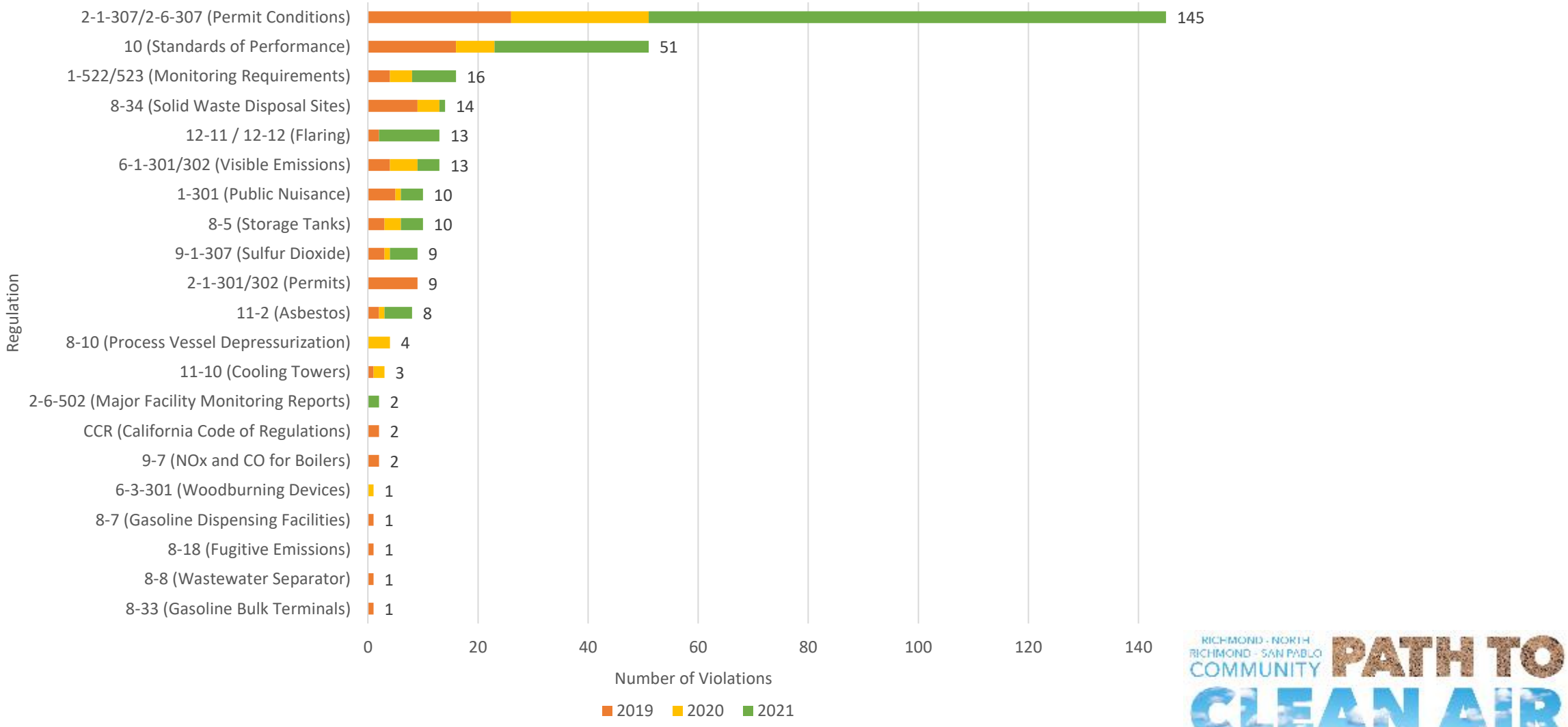
Notices of Violation based on Regulations



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Public Comment

Steering Committee Questions and Discussions

Standing Environmental Justice Updates Item

Public Comment

Next Meeting

- Our next Steering Committee meeting will be on Monday, April 25, 2022 from 5:30 p.m. to 8:00 p.m. Agenda topics will include:
  - The Technical Assessment findings presentation #2

Public Comment on Non-Agenda Matters