



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 5

Air Monitoring during Incidents: Programs at the South Coast Air Quality Management District

**Stationary Source and Climate Impacts Committee Meeting
November 21, 2022**

**Ranyee Chiang, Ph.D.
Director**

**Meteorology and Measurement Division
rchiang@baaqmd.gov**

**Jason C. Low, Ph.D.
Deputy Executive Officer**

Monitoring and Analysis Division

Presentation for Information Only



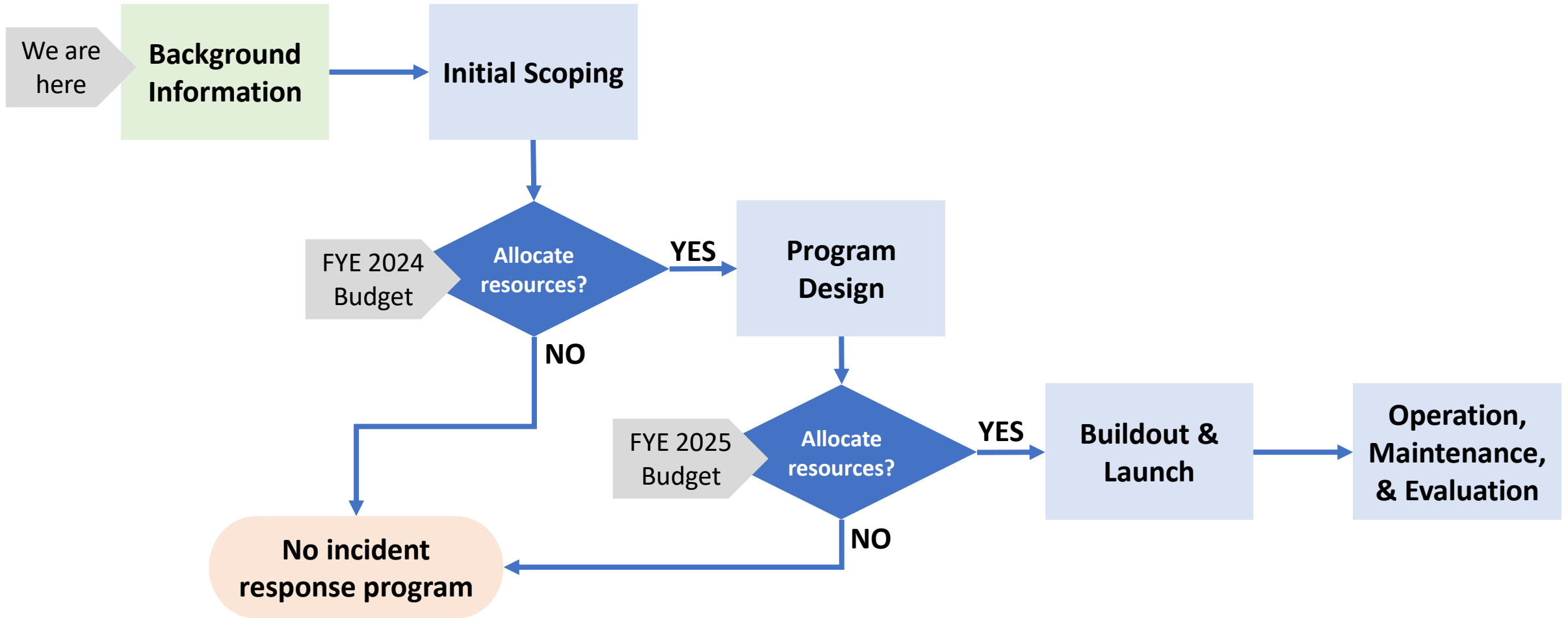
- None. Informational only.

Current Measurement Capabilities are Insufficient for Incidents



- During incidents, Air District often gets requests for air monitoring from the public
- Air District does not have a comprehensive incident monitoring program
- Consider an incident monitoring program?
 - Understand community concerns and current capabilities
 - Evaluate the costs and benefits of an incident monitoring program, including relative to current backlogged work and other priorities
 - Decide whether to dedicate resources to plan and build out a program

Proposed Discussion Plan: Considering an Incident Monitoring Program



Approaches and Tools for Incident Response and Community Air Monitoring

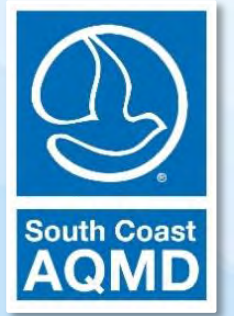


Jason Low, Ph.D.

Deputy Executive Officer

Monitoring and Analysis Division

South Coast AQMD



- Local air pollution control agency

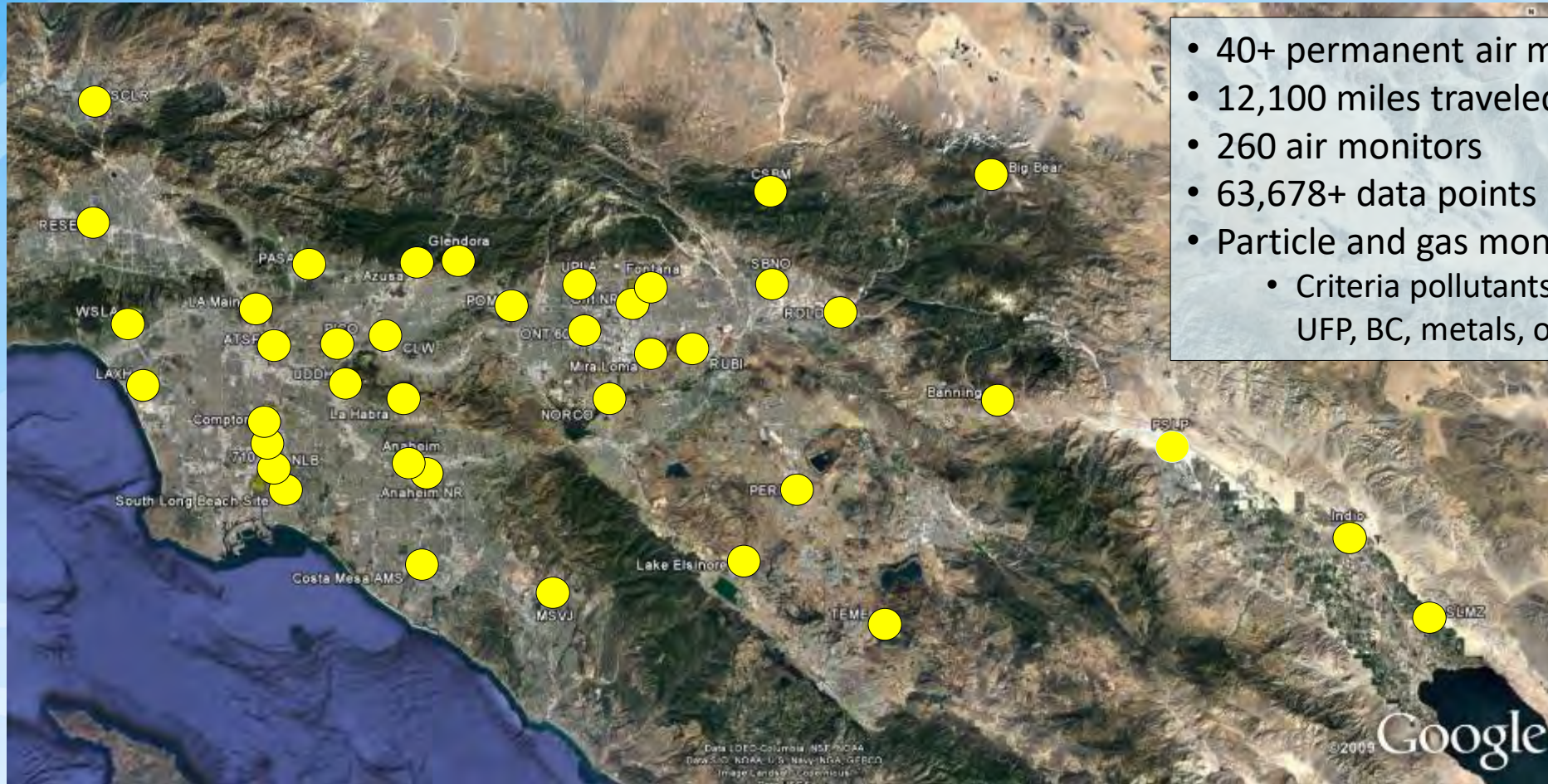
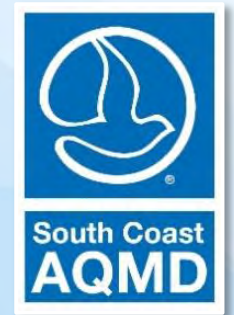
- Largest of the 35 local air agencies in California
- 10,743 square miles
- 17 million residents

- Responsibilities

- Regulate emissions from stationary sources
- Develop and implement plans to meet national air quality standards
- Permit and inspect 28,400 affected businesses
- Provide air quality information



Ambient Air Monitoring Network



- 40+ permanent air monitoring sites
- 12,100 miles traveled per week
- 260 air monitors
- 63,678+ data points per week
- Particle and gas monitoring
 - Criteria pollutants, VOCs, carbonyls, UFP, BC, metals, other air toxics

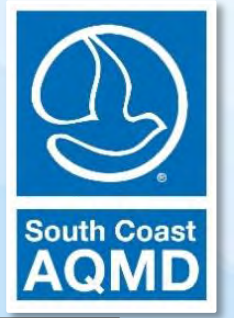
Incident Response and Community Air Monitoring Comparison

INCIDENT RESPONSE

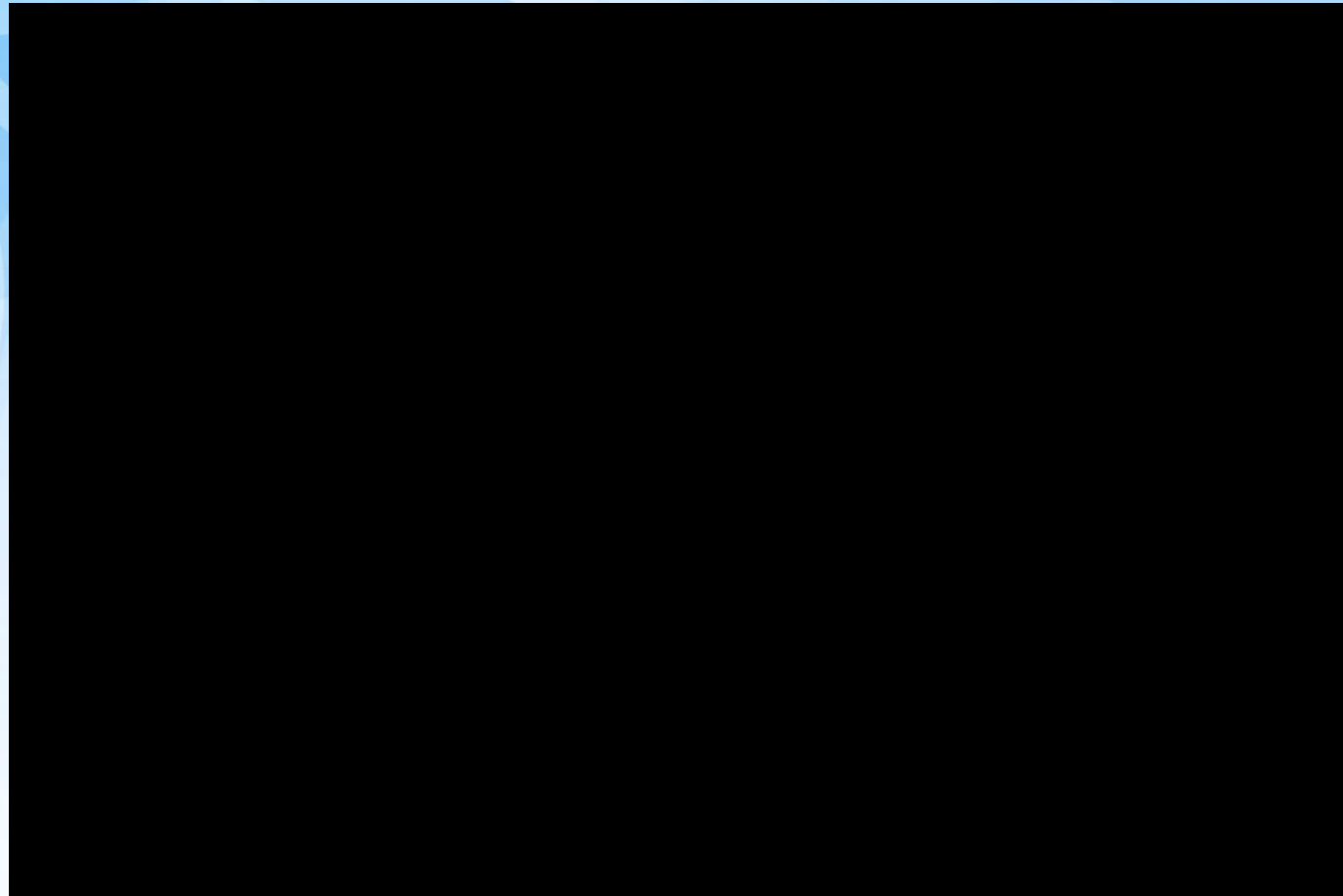
- Initiated by request from emergency response agency and/or incident of concern
- Immediate response needed
- Support of an incident command system (if established) for evaluating acute public health concerns

COMMUNITY AIR MONITORING

- Proactive to address existing air quality concerns from the community or agency
- Can be developed and implemented as part of an immediate or longer-term effort
- Air measurements that provide information about the air quality concern and may lead towards emissions reductions



Air Quality Incidents

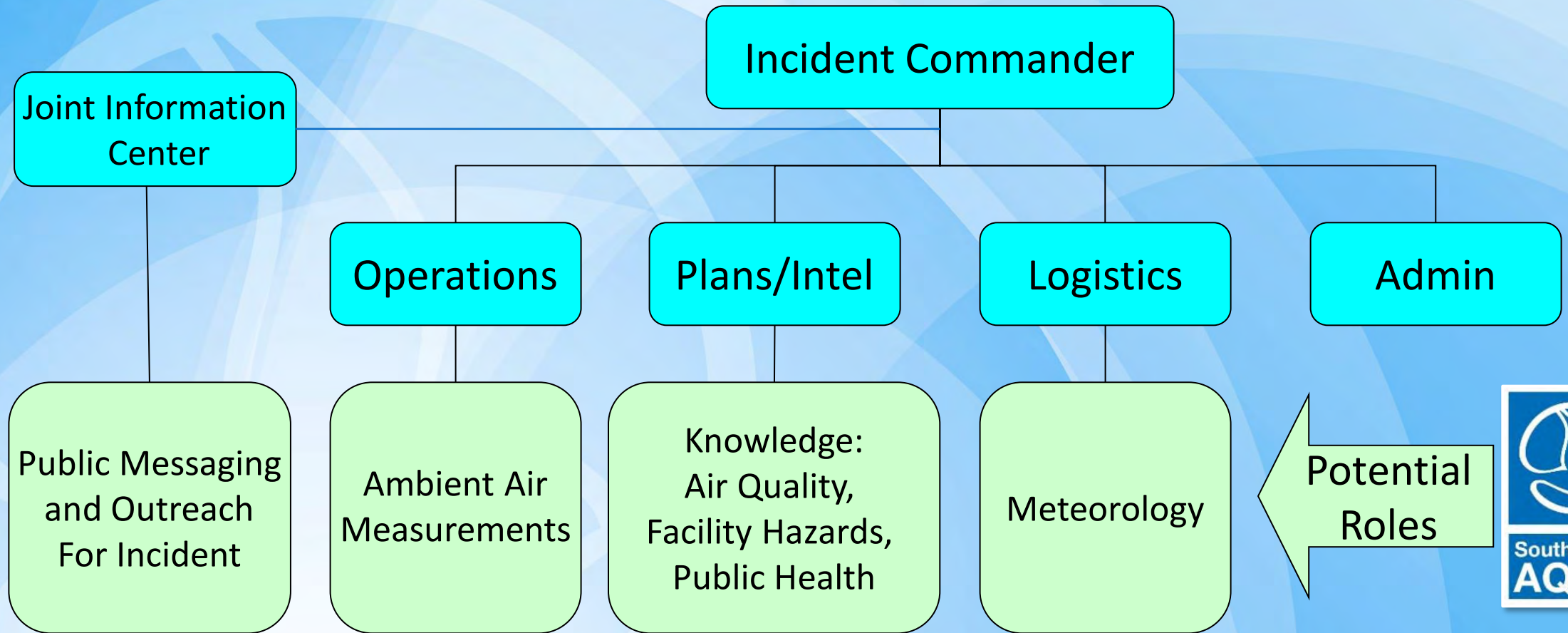


Incident Response Program



- Activated by emergency response agency request and/or air quality incident
- Ready 24 hours a day / seven days a week
- Focus is on acute air quality issues
- Integrate into incident command system (if established)
 - Provide specialized technical support
 - Coordinate outreach communication with Unified Command through Joint Information Center

Incident Command System



Incident Response Operation

Standby

Training

Awareness of Incidents

Assess/ Deploy

Evaluate Incident

Interface with Incident Command

Deploy inspector on-scene

Determine if air monitoring can provide actionable data

Coordinate with senior leadership on resources

Monitoring

Deploy appropriate technology

Review data in context

Provide updates to senior leadership

Messaging

Provide summary of efforts including air monitoring data to Joint Information Center (JIC)

Coordinate Communication with JIC to public and stakeholders



Variety of Air Measurement Methods

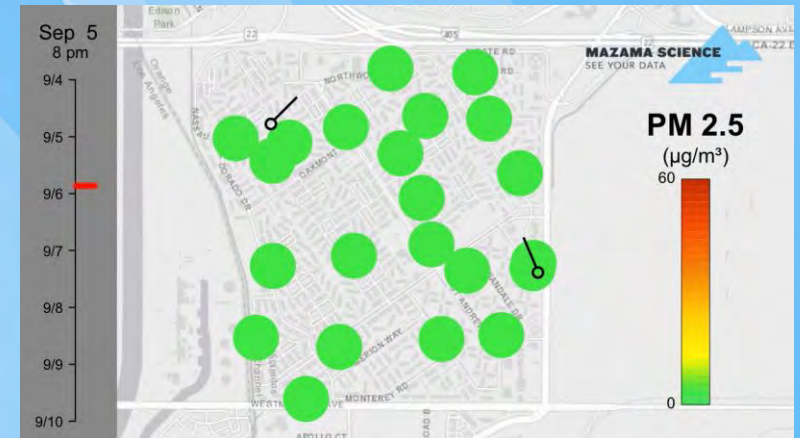
**Field Sampling
with Laboratory Analysis**



**Portable and Mobile
Instrumentation**



Low-Cost Sensors



How to Select the Right Tools for Air Monitoring

Purpose of
Air
Monitoring

Air
Pollutants of
Interest

Available Air
Monitoring
Tools

Air
Monitoring
Capabilities &
Limitations

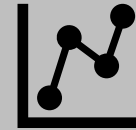
Characteristics of Different Measurement Methods

Pollutants



Measurement methods are typically good for single pollutant or a category of compounds

Detection
Capability



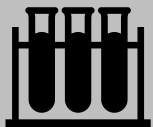
How well the instrument can identify and quantify the compound (MDL, precision, accuracy, interferences)

Time
Resolution



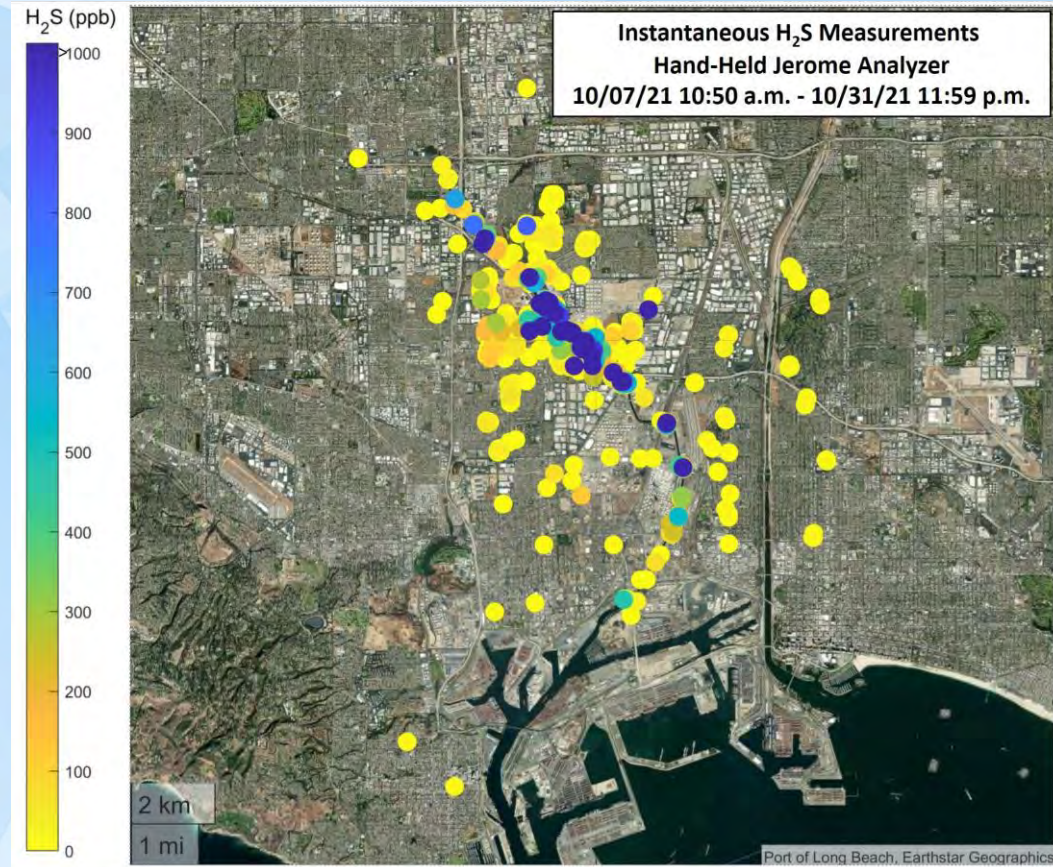
How quickly a result is obtained

Quality
Assurance

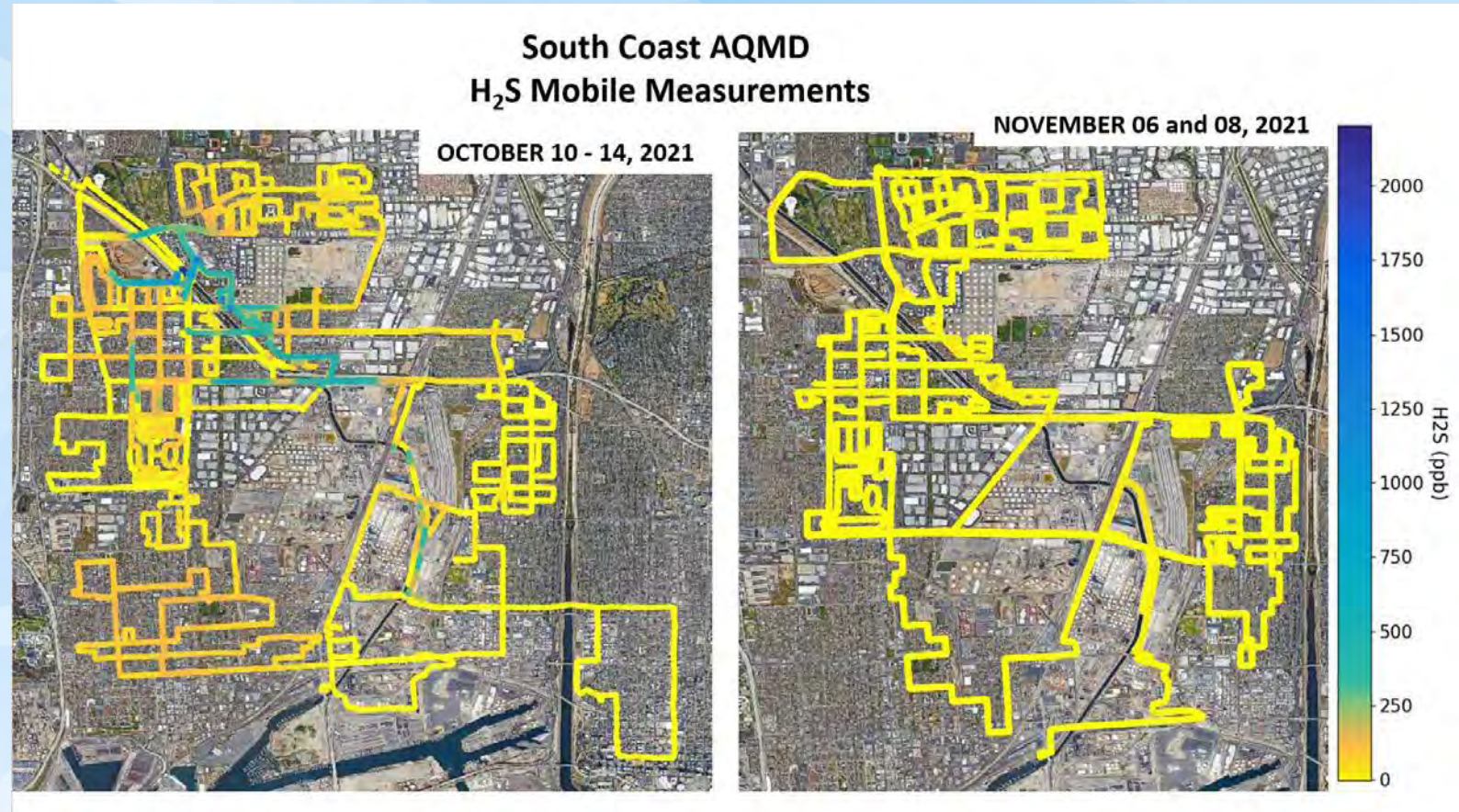


How well the measurement is connected to a certified value (NIST), documentation, and training requirements

Dominguez Channel Odor Event (Portable Monitor-H2S)



Dominguez Channel Odor Event (Mobile Platform-H2S)



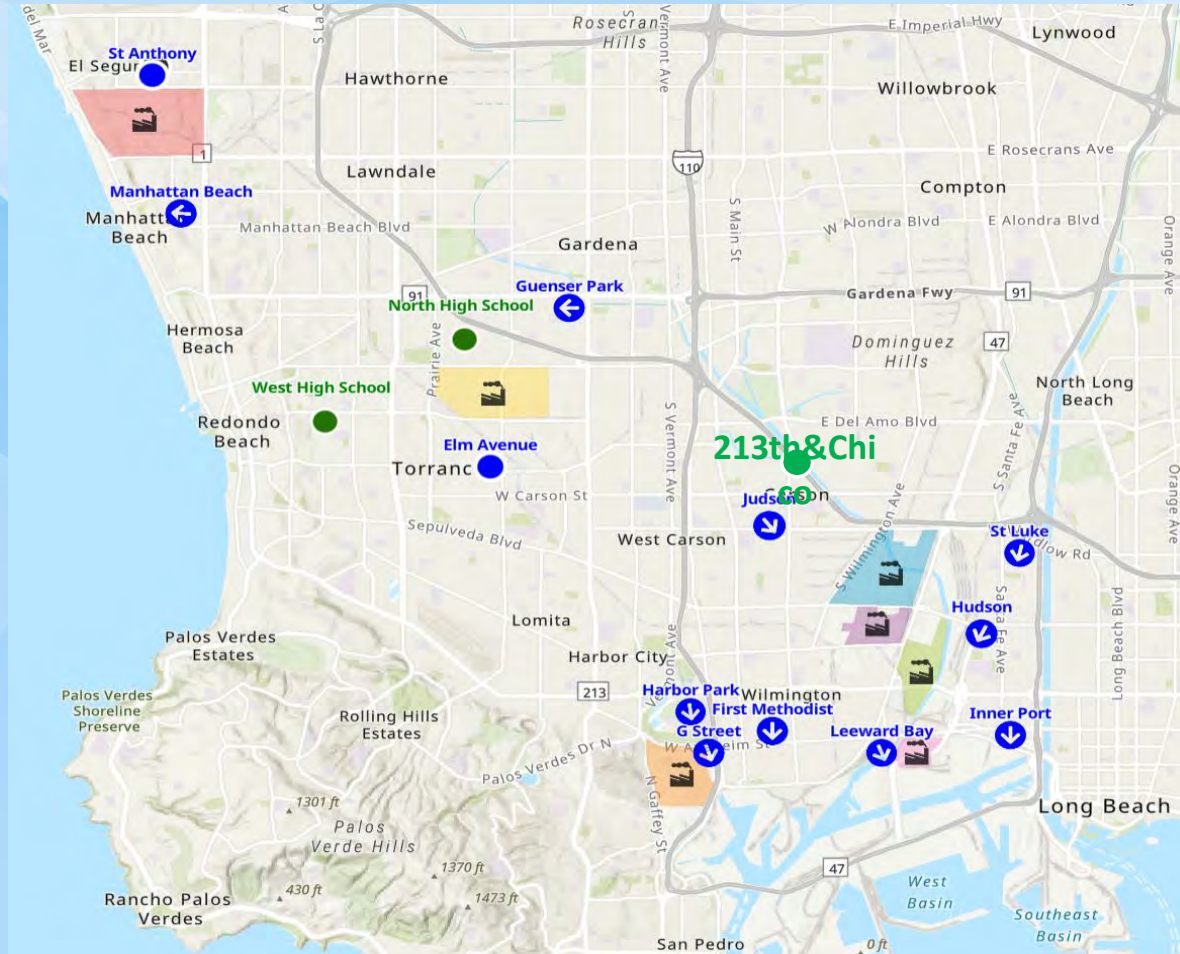
Dominguez Channel Odor Event (Stationary Sites)

Rule 1180 Fenceline and Community Air Monitoring Locations

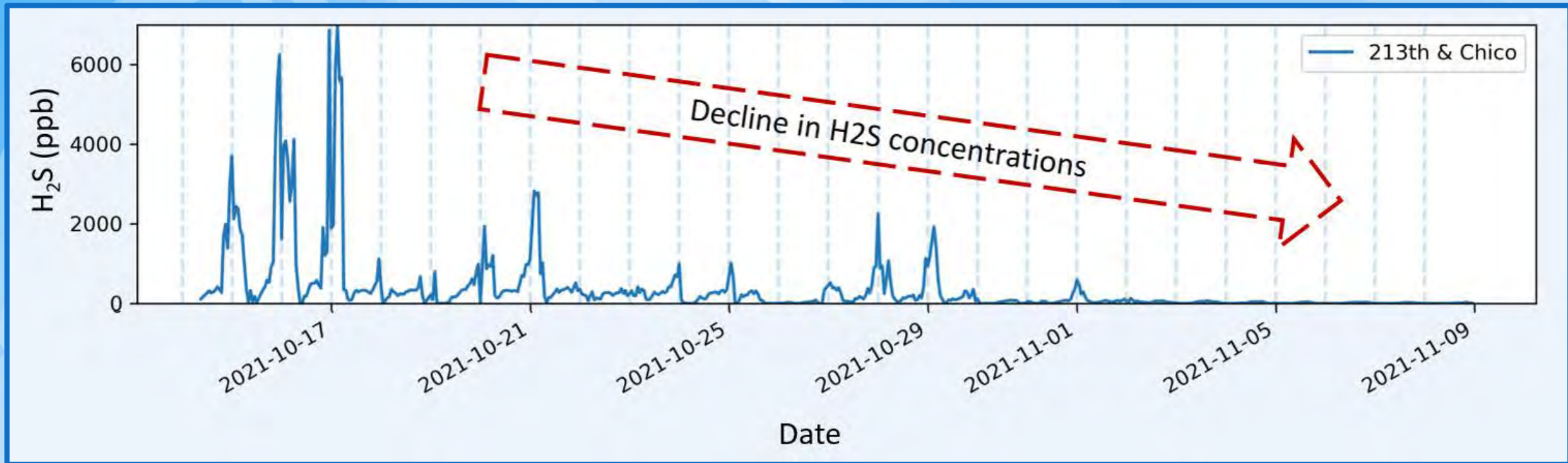
- Continuous real-time measurements of VOCs, H2S and other air pollutants
- Automatic email notifications in case of increased air pollution levels
- <https://xappprod.aqmd.gov/Rule1180CommunityAirMonitoring/>

New Air Monitoring Site (213th & Chico)

- Located near E 213th Street and the Dominguez channel
- Continuous real-time measurements of H2S
- Measurements started on October 14, 2021



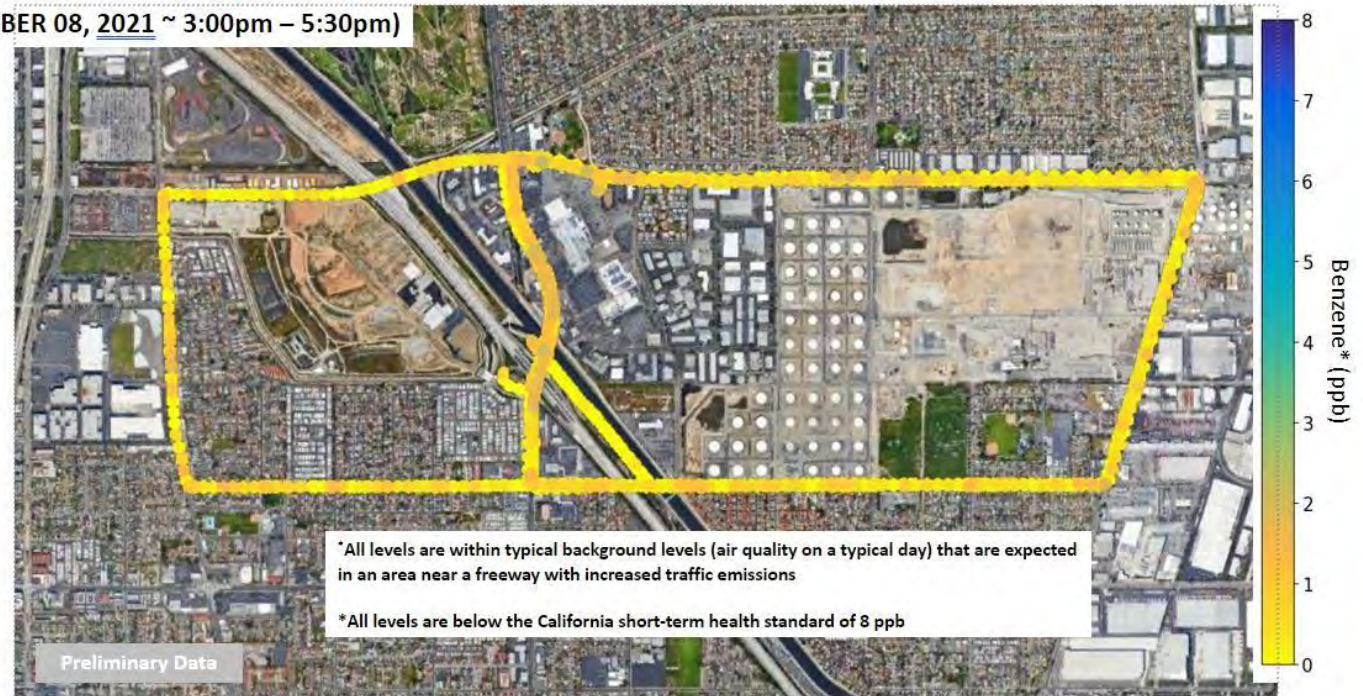
Dominguez Channel Odor Event (Temporary Site-H2S)



Dominguez Channel Odor Event (Mobile Platform-Benzene)



South Coast AQMD
Benzene Mobile Measurements
(OCTOBER 08, 2021 ~ 3:00pm – 5:30pm)

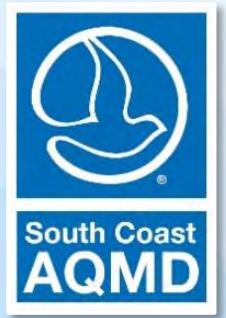


Public Communication

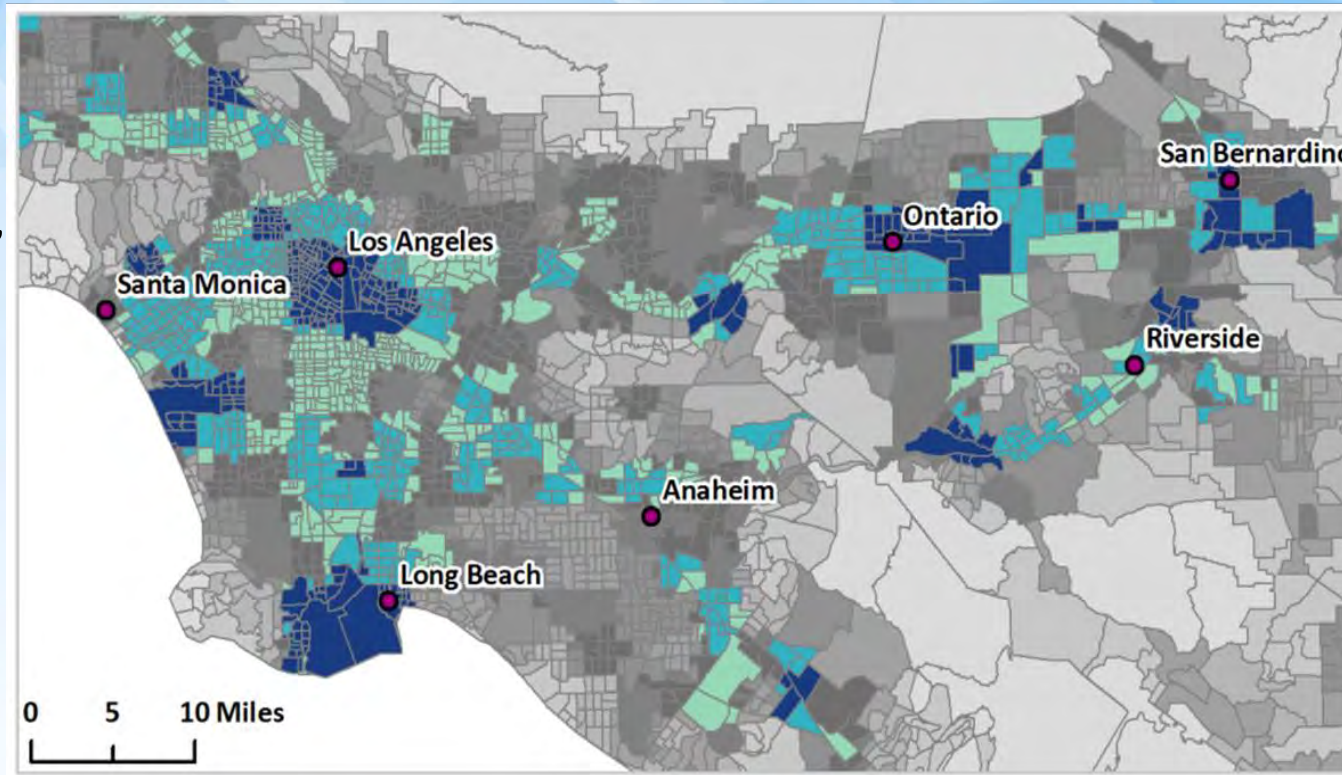
- Joint Information Center
- Webpage
 - Summary of Activities
 - Monitoring Data
 - Updated Advisories
- Outreach
 - Public Health Agencies
 - Elected Officials
 - AB 617 CSC
 - Press Releases
 - Media Interviews
 - Timely Social Media

The screenshot displays the South Coast AQMD website. At the top, there is a navigation bar with links for Language, F.I.N.D., About, Contact, Grants & Bids, Online Services, I'm Looking For, and Sign Up. A search bar is also present. Below the navigation bar, a red banner reads: "During this difficult time, South Coast AQMD is committed to protecting air quality and public health. Please visit our COVID-19 page for the operational updates and latest information. Learn more." The main navigation menu includes AIR QUALITY, INCENTIVE PROGRAMS, RULES & COMPLIANCE, PERMITS, NEWS, WEBCASTS, & CALENDAR (highlighted in blue), TECHNOLOGY ADVANCEMENT, RESOURCES, and MEETING AGENDAS & MINUTES. The South Coast AQMD logo is visible on the left. The breadcrumb trail shows: Home / News, Webcasts, & Calendar / Community Investigations / Dominguez Channel Odor Event. The article title is "Dominguez Channel Odor Event". The "Background" section states: "The South Coast Air Quality Management District (South Coast AQMD) conducted an investigation into odors from the Dominguez Channel beginning in October 2021. The agency responded to over 4,700 odor complaints from residents in Carson, as well Gardena, Long Beach, Redondo Beach, Torrance and Wilmington and other parts of L.A. County. A map showing general areas where complaints were recorded can be found [here](#)." The text continues: "Air monitoring efforts in the impacted areas included a variety of technologies and strategies such as handheld monitors that provided instant readings at specific locations, grab samples for laboratory analysis, mobile monitoring to assess which areas were the most impacted by this odor event, and more than a dozen fixed air monitors at specific locations throughout the community." The final sentence reads: "Overall, results showed elevated levels of hydrogen sulfide (H2S) that can cause strong odors and be a public nuisance. H2S is a colorless and odorous gas that smells like rotten eggs. Most individuals can smell the odor at very low levels, and some may generally experience symptoms such as headaches and nausea. People experiencing symptoms are encouraged to contact their health care providers."

Motivation for Community-Level Efforts

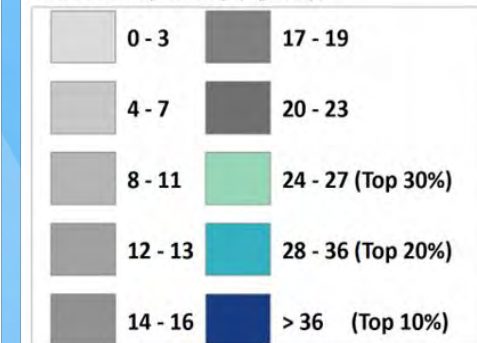


- Historical focus on regional air quality
- Significant improvement, but disproportionate burdens remain
- Need for community-level focus
- Evaluate acute and chronic air quality issues



Diesel PM

Diesel PM emissions from on-road and non-road sources for a 2012 summer day in July (kg/day)



Source: CalEnviroScreen 3.0

California State Assembly Bill (AB 617)

- ▶ Statewide program enacted in 2017 to reduce air pollution in communities that are disproportionately impacted by air pollution
- ▶ Community partnerships and leadership are central to the program



Community Air
Quality
Monitoring



Community
Emissions
Reduction
Plans



Clean
Technology
Investments



Best Available
Retrofit Control
Technology
(BARCT) Rules



Easier
Access to
Data

Air Quality Concerns and Priorities

Diesel Exhaust



Truck Traffic

Air Toxics



Refineries



Metal Processing
Facilities

Odorous Compounds



Rendering
Facilities

Criteria Pollutants



Cement Batch
Plants



Railyards



Sensitive Receptors



Oil Wells



Auto Body Shops



Waste Transfer
Stations



Dust

...and more!

Community Air Monitoring Objectives

01

Better understand emission sources, pollutants of interest and their levels and establish baseline

02

Look at levels of pollution at the community level for providing information on further action

03

Support development and implementation of emissions reduction strategies

04

Provide air pollution data to the general public

General Air Monitoring Approach

Mobile Monitoring

- Survey large areas
- Identify hotspots and unknown sources
- Support inspections and enforcement actions
- Inform emission reduction efforts

Fixed Monitoring

- Provide more information about possible sources
- Assess levels in community
- Support emission reduction strategies
- Track progress

Sensors

- Provide more information about how levels vary within the community
- Complement other monitoring strategies
- Engage the community in air pollution measurement

Comprehensive
and Purposeful
Air Monitoring



Community Air Monitoring Plans

**AB 617 COMMUNITY AIR
MONITORING PLAN (CAMP)
FOR THE EASTERN
COACHELLA VALLEY
COMMUNITY**



South Coast Air Quality Management District
November 2020
Version 1

**Quality Assurance Project
Plan (QAPP)
for AB 617 Community Air
Monitoring Program**

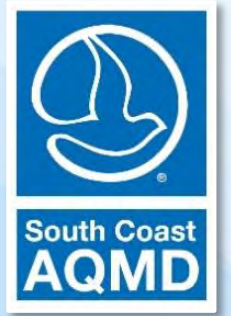


South Coast Air Quality Management District
September 2020
Version 1

<http://www.aqmd.gov/nav/about/initiatives/environmental-justice/ab617-134/ab-617-community-air-monitoring>

Community Air Monitoring Example: Oil Wells

Wilmington, Carson, West Long Beach Community



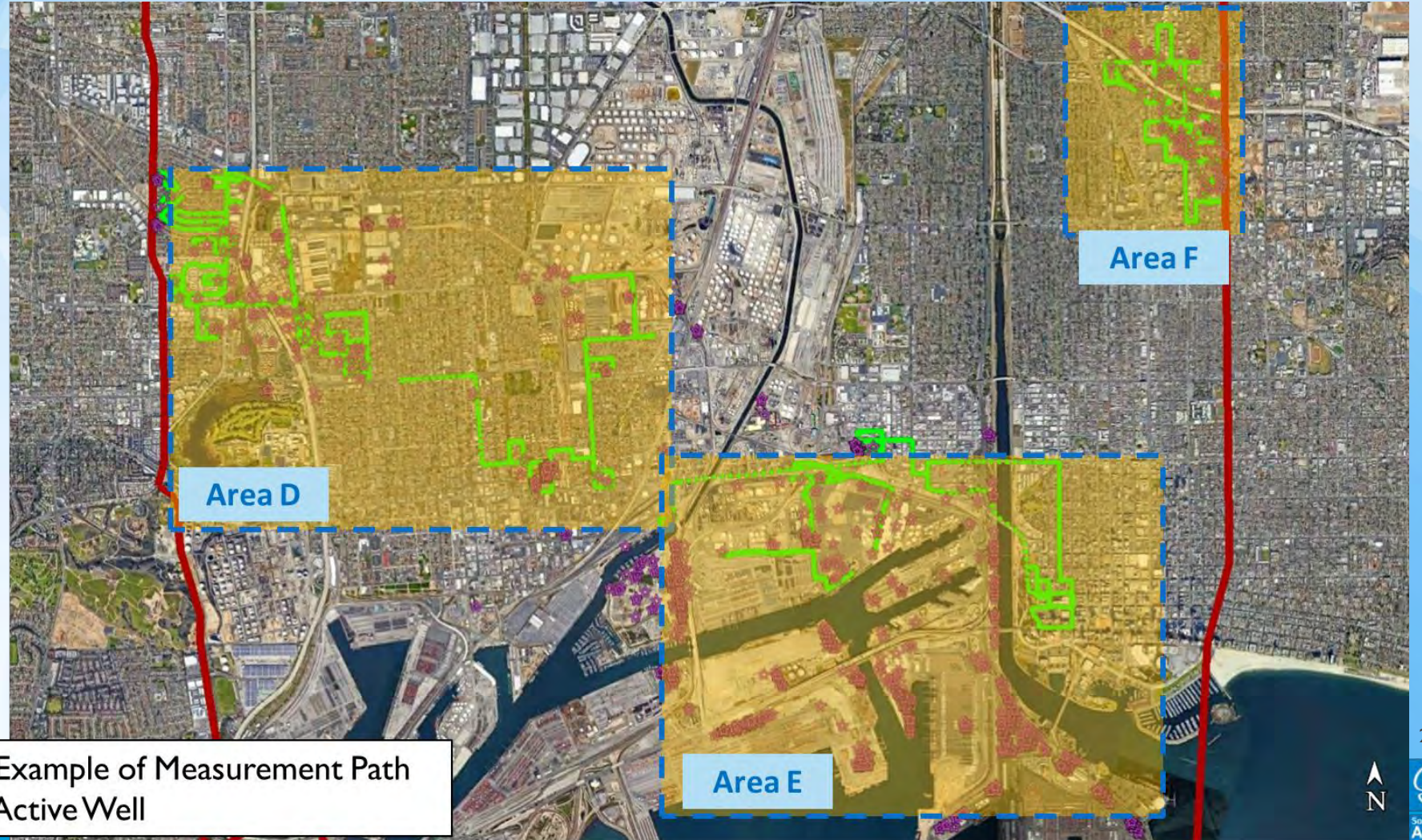
- Purpose of Air Monitoring
 - Identify Leaks and High Emitting Oil Wells
 - Support Enforcement Actions
 - Assess Community Impact
- Target Air Pollutants
 - Methane, VOCs, Alkanes
- Air Monitoring Solution
 - Optical Remote Sensing Van
 - Optical Gas Imaging Camera





Oil Wells

Wilmington, Carson, West Long Beach Community



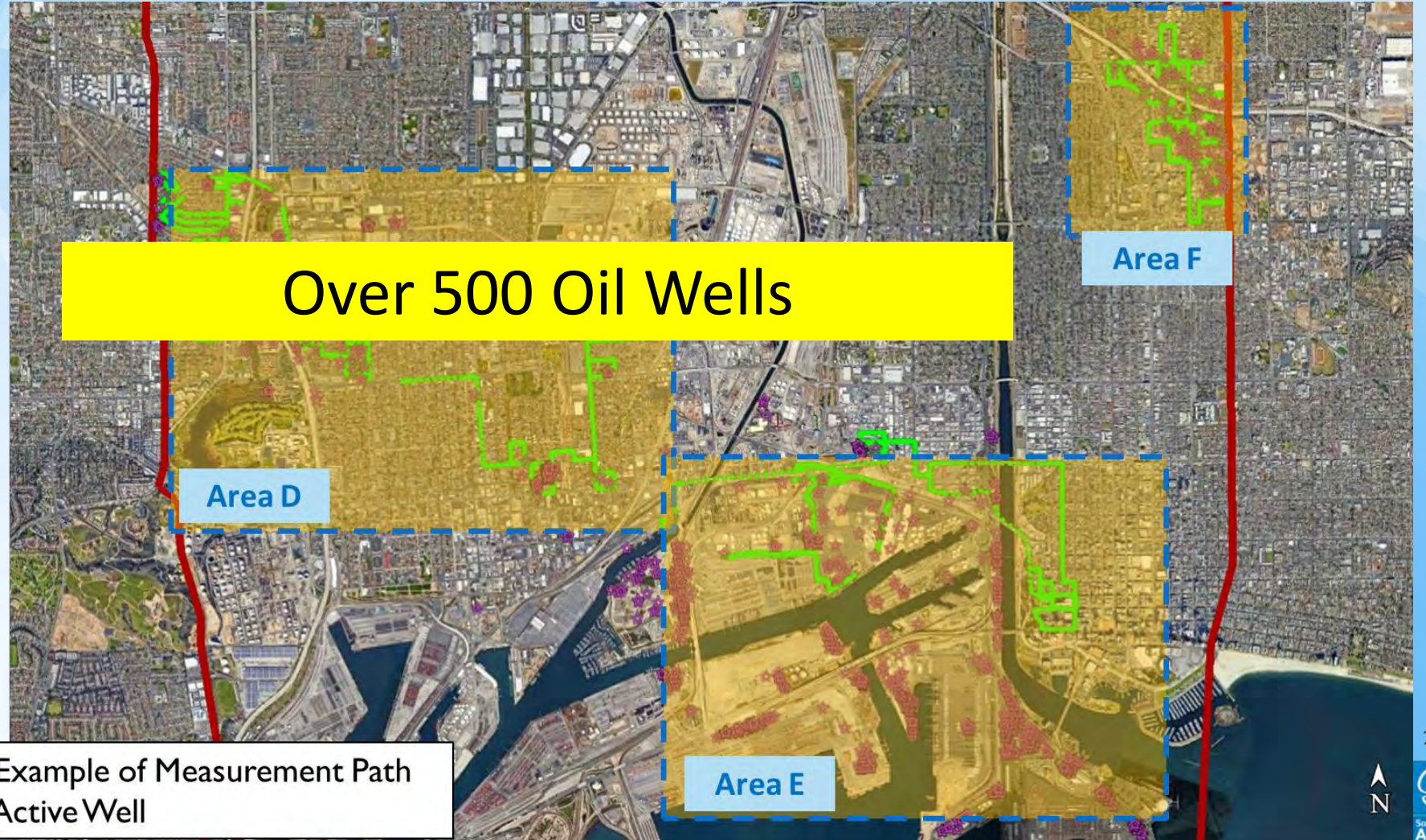
- Example of Measurement Path
- Active Well





Oil Wells

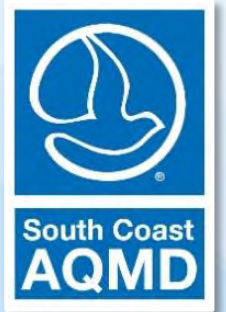
Wilmington, Carson, West Long Beach Community





Oil Wells

Wilmington, Carson, West Long Beach Community



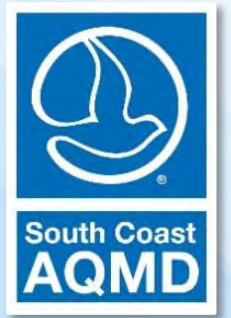
Area D - May 3, 2022





Oil Wells

Wilmington, Carson, West Long Beach Community



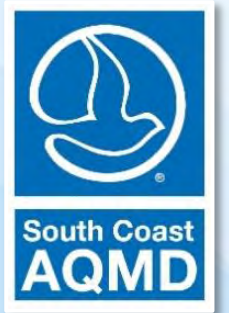
09/19/2019
11:32 am



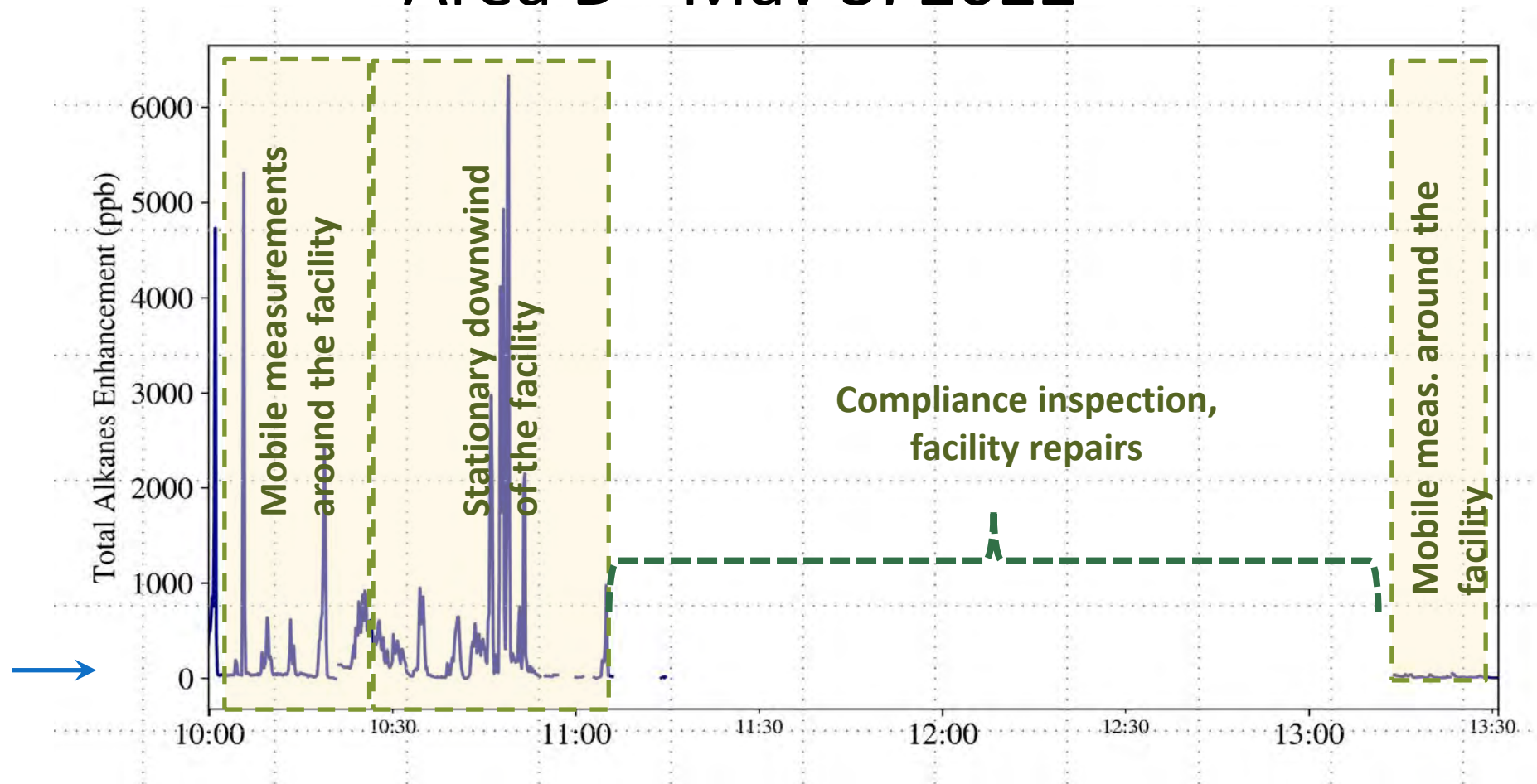


Oil Wells

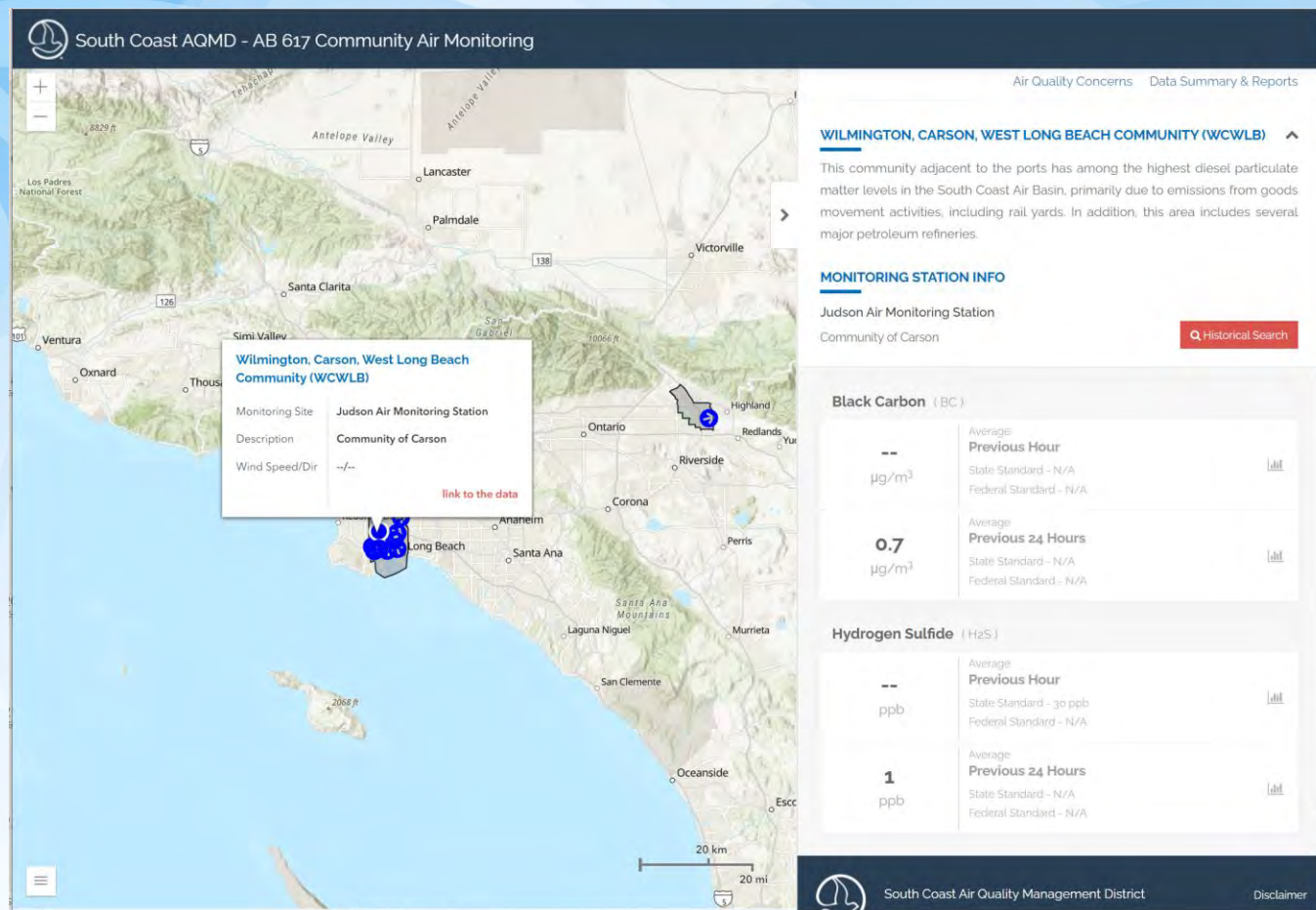
Wilmington, Carson, West Long Beach Community



Area D - May 3, 2022



Community Air Monitoring Dashboard



South Coast AQMD - AB 617 Community Air Monitoring

Air Quality Concerns Data Summary & Reports

WILMINGTON, CARSON, WEST LONG BEACH COMMUNITY (WCWLB)

This community adjacent to the ports has among the highest diesel particulate matter levels in the South Coast Air Basin, primarily due to emissions from goods movement activities, including rail yards. In addition, this area includes several major petroleum refineries.

MONITORING STATION INFO

Judson Air Monitoring Station
Community of Carson

[Historical Search](#)

Black Carbon (BC)

--	Average	Previous Hour	Link
$\mu\text{g}/\text{m}^3$	State Standard - N/A	Federal Standard - N/A	
0.7	Average	Previous 24 Hours	Link
$\mu\text{g}/\text{m}^3$	State Standard - N/A	Federal Standard - N/A	

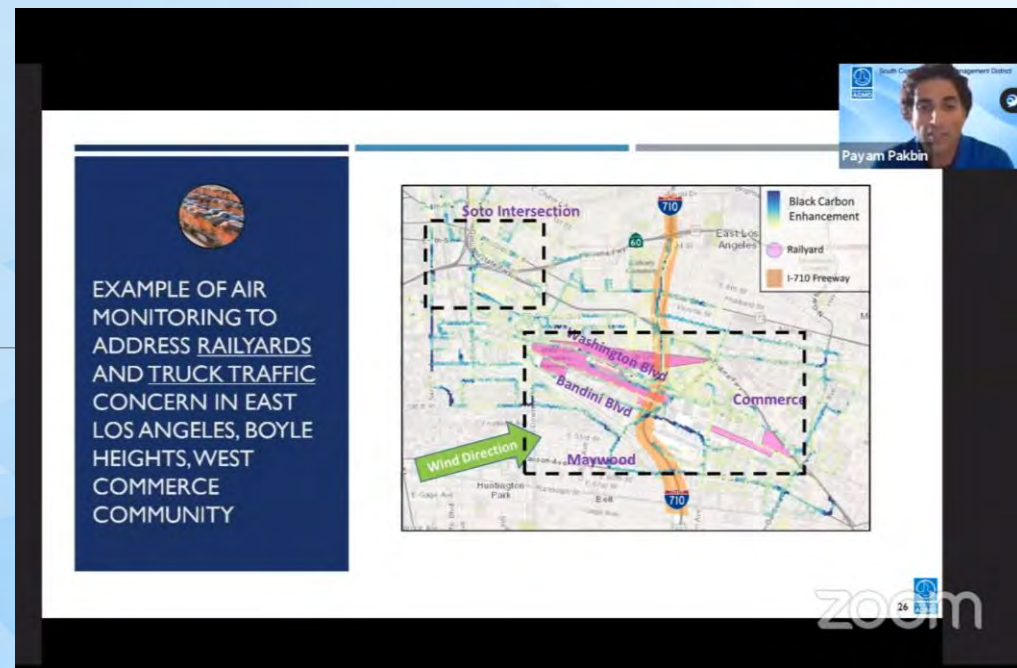
Hydrogen Sulfide (H₂S)

--	Average	Previous Hour	Link
ppb	State Standard - 30 ppb	Federal Standard - N/A	
1	Average	Previous 24 Hours	Link
ppb	State Standard - N/A	Federal Standard - N/A	

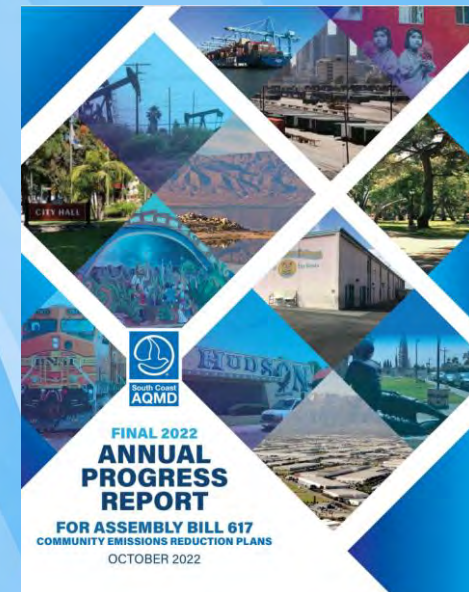
South Coast Air Quality Management District [Disclaimer](#)

Additional Communication

- Community Steering Committee meetings
- Air monitoring working group meetings
- Progress reports



The screenshot shows a Zoom meeting interface. In the top right corner, there is a video thumbnail of a man named Payam Pakbin. The main content is a slide with a dark blue background on the left and a map on the right. The text on the slide reads: "EXAMPLE OF AIR MONITORING TO ADDRESS RAILYARDS AND TRUCK TRAFFIC CONCERN IN EAST LOS ANGELES, BOYLE HEIGHTS, WEST COMMERCE COMMUNITY". The map on the right shows a geographic area with labels for "Soto Intersection", "Washington Blvd", "Bandini Blvd", "Maywood", and "Commerca". A legend indicates "Black Carbon Enhancement" (blue), "Railyard" (pink), and "I-710 Freeway" (orange). A green arrow labeled "Wind Direction" points towards the right. The Zoom logo is visible in the bottom right corner of the screenshot.



Summary

- Incident Response and Community Air Monitoring may provide valuable public health information and also identify potential issues that lead to reducing pollution emissions
- Resource intensive
 - Expansive toolbox
 - Specialized technologies and knowledge
 - Communication of efforts

For Additional Information

Email: jlow@aqmd.gov

AB 617 website: www.aqmd.gov/AB617

Follow us @SouthCoastAQMD





BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 6

Fugitive Dust Emissions Overview

**Stationary Source and Climate Impacts Committee
November 21, 2022**

Song Bai, PhD, PE
Air Quality Engineering Manager
Assessment, Inventory, & Modeling Division
sbai@baaqmd.gov

Presentation Outcome



- Provide an overview of fugitive dust emissions, focusing on major sources and potential health impacts.

Presentation Outline



- Key technical concepts
- Sources of fugitive dust emissions
- Exposure and health impacts

Presentation for Information Only



- No action required.

Fugitive Dust – Key Concepts



- Fugitive dust is particulate matter generated by open air operations and does not pass through a stack or vent
- Dust becomes fugitive when suspended in the air by wind currents or mechanical forces (e.g., earth moving)
- Fugitive dust emissions are often episodic and influenced by weather (e.g., wind speed and precipitation)
- Emissions from fugitive dust sources are not as well-characterized as emissions from combustion sources

Fugitive Dust – Key Concepts (cont'd)



- Fugitive dust includes coarse and fine particulate matter
- Particles are defined by their diameter for regulatory purposes
 - PM₁₀: diameter of 10 micrometers or less
 - PM_{2.5}: diameter of 2.5 micrometers or less (fine particulate matter)
- Both PM₁₀ and PM_{2.5} can cause a wide range of health impacts
- PM_{2.5} is typically characterized as more potent, gram for gram
- Controls on fugitive dust can reduce both fine and coarse dust

Sources of Fugitive Dust

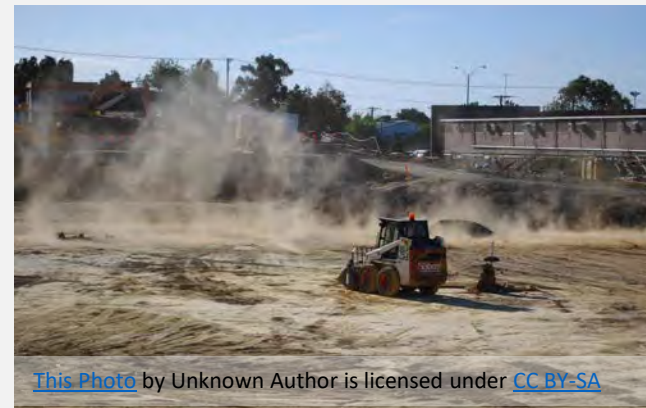


Industrial Facilities



Road Dust

Earth Moving Operations & Construction Sites

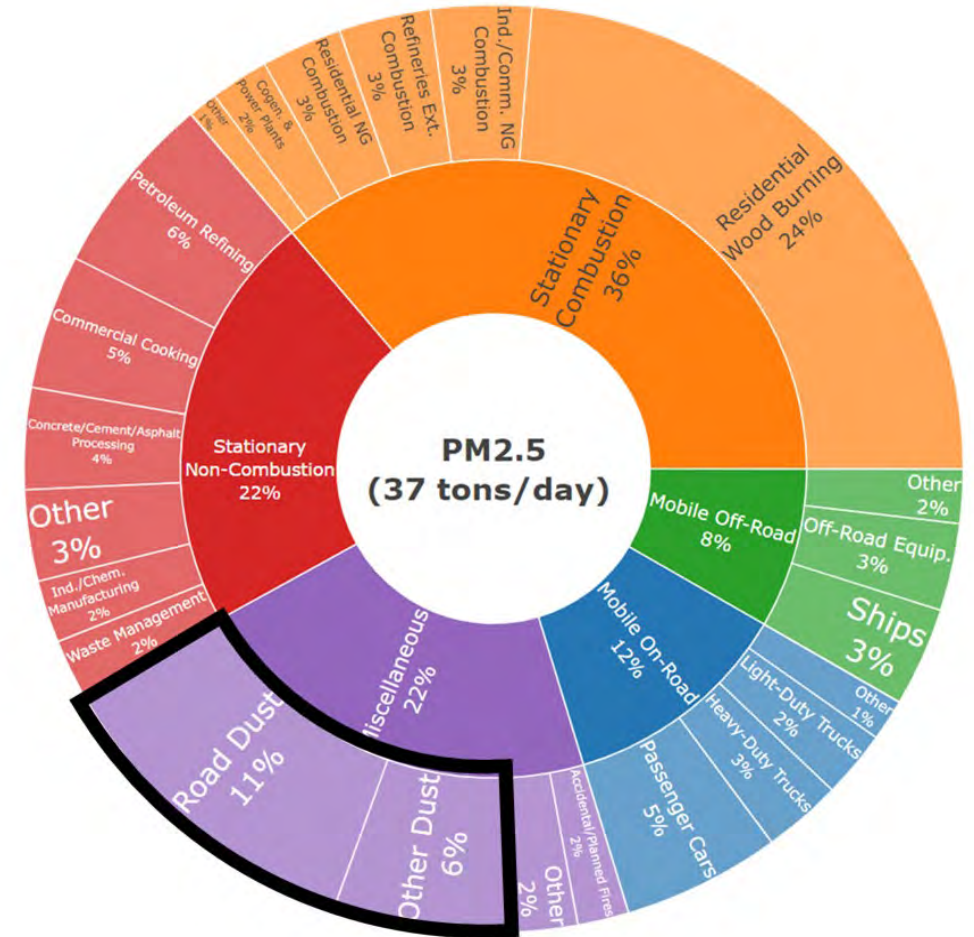
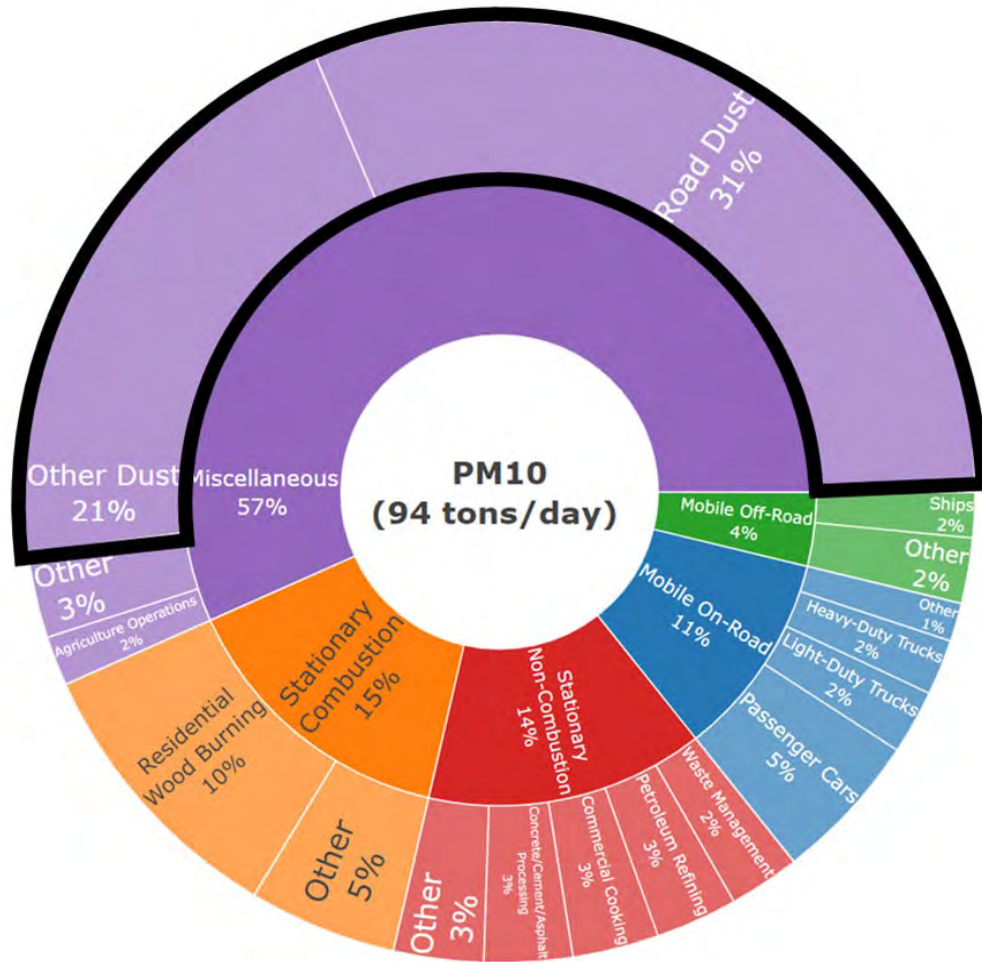


[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

Bay Area Emissions Inventory (year 2021): PM₁₀ and PM_{2.5}



Road Dust (paved and unpaved roads) and **Other Dust** (e.g., construction and wind blown)





Industrial Emissions



Fugitive Dust Emissions for Sample Industrial Facilities in Bay Area AB 617 Communities

- Storage and transfer of bulk materials (coal, aggregate, food products) are a leading source of dust emissions
- Earth moving occurs at some facilities (daily cover applied at landfills)
- Emissions vary with daily activity levels (materials being moved or disturbed) and with weather

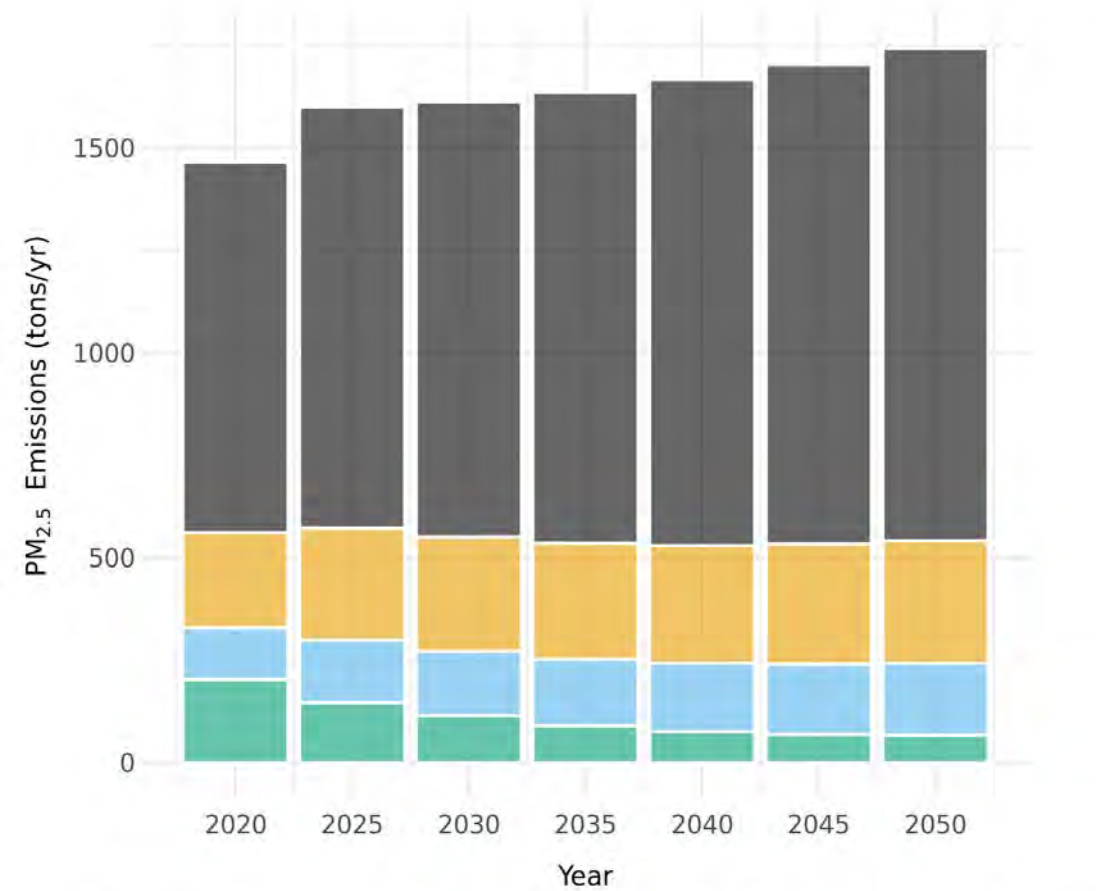
Facility Description	PM _{2.5} Emissions (pounds/day)
West Oakland Ready-Mix Concrete Supplier	5.0
West Oakland Grain Processing and Shipping Operation	8.1
Richmond Coal and Petcoke Handling Terminal	42.8
Richmond Landfill	53.2

Note: Emissions for these West Oakland and Richmond facilities are for 2017 and 2019, respectively.

Bay Area On-Road Mobile Source PM_{2.5} Emissions



- Road dust is the largest contributor to on-road PM_{2.5} emissions (more than 60%)
- Emissions depend on silt loading, traffic levels, vehicle weight, and the amount of moisture
- Road dust emissions are forecasted to increase due to increased driving (miles traveled), but uncertainties could be high



Process ■ Road Dust ■ Brake Wear ■ Tire Wear ■ Running Exhaust

Note: Year 2020 data reflect reduced travel activity due to the COVID pandemic.

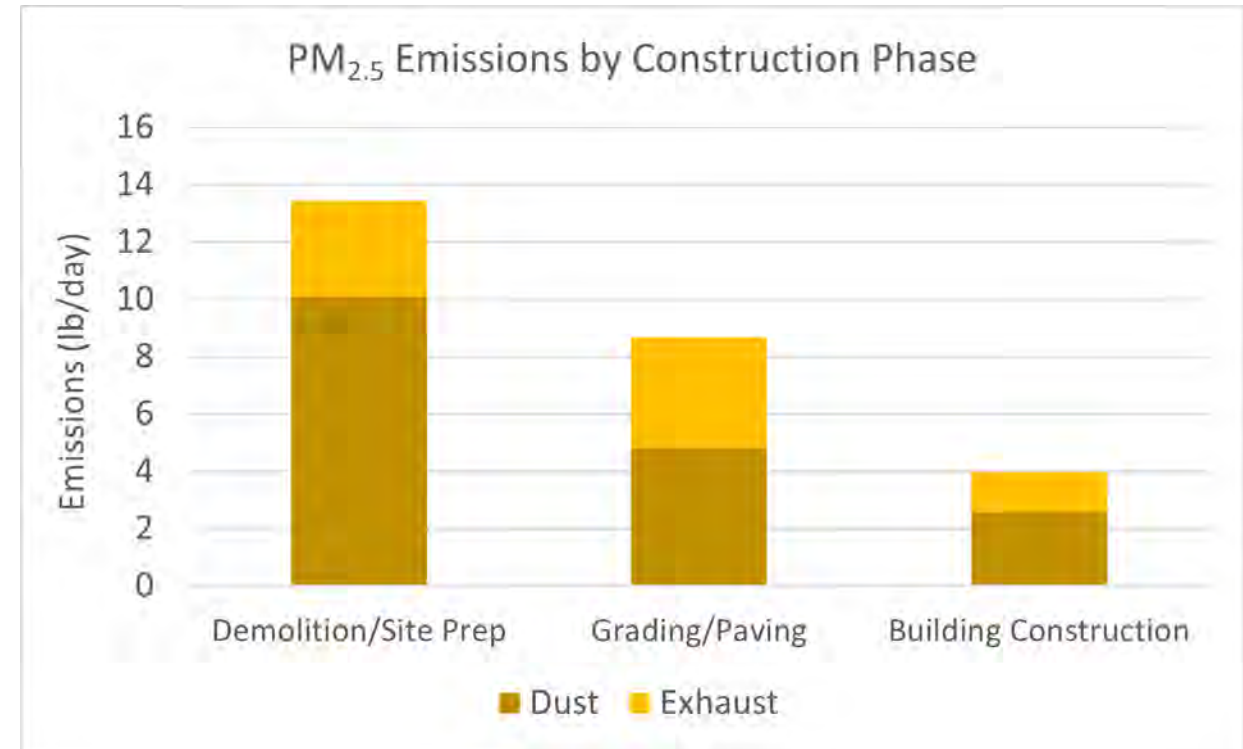


Construction Emissions



Emissions Estimates for a Proposed Mixed-Use Construction Project in the Path to Clean Air AB 617 Community

- Daily emissions vary depending on project type, construction phase, activity levels, and meteorology
- Operations involving excavation and earth moving generally produce the highest emissions
- Track out from construction projects can increase silt on adjacent streets and increase road dust emissions



Note: the estimates shown above represent unmitigated PM_{2.5} emissions taken from environmental documents for the project.

Evaluating Exposures



- PM_{2.5} concentrations from fugitive dust tend to decrease rapidly with distance from the source
- But many dust sources are close to homes and schools
- Recent analysis of an infill construction project showed high levels of added PM_{2.5} exposure (more than +1 $\mu\text{g}/\text{m}^3$) at the most impacted location (unmitigated emissions)

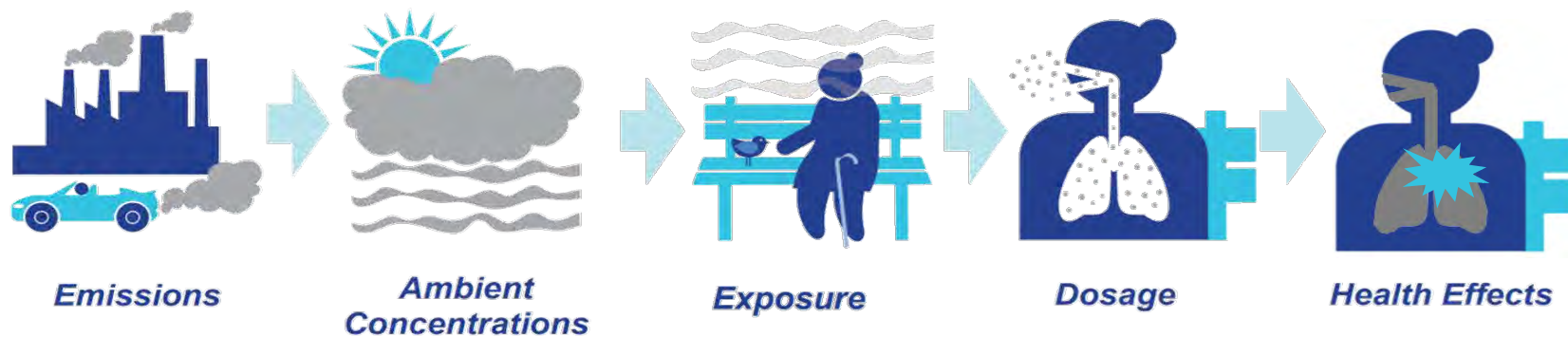
Infill construction projects can create dust near existing schools and residences



Health Impacts



- Coarse PM is more associated with respiratory impacts; fine PM can penetrate deeper into the lungs and enter the bloodstream
- PM exposure has been linked with increased hospital admissions, asthma attacks, and premature deaths
- Children, the elderly, and people with existing health conditions are especially sensitive
- US EPA has determined that all sources of PM_{2.5} are “causal” for serious health impacts



Fugitive Dust – A Growing Concern



- As other sources are increasingly controlled, dust sources are growing contributors
- We have a better understanding of health impacts of all sources of particulate matter
- Dust in urban settings can contain toxic contamination from historical uses
- While there is uncertainty in some estimates of dust emissions, there is enough certainty for action and attention

Feedback Requested/Prompt



- Questions and Comments



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 7

Fugitive Dust Controls and Programs Overview

**Stationary Source and Climate Impacts Committee
November 21, 2022**

Mark Tang
Principal Environmental Planner
Planning & Climate Protection
mtang@baaqmd.gov

Eric Lara
Senior Air Quality Specialist
Rules & Strategic Policy
elara@baaqmd.gov

Presentation Outcome



- Provide an overview of fugitive dust controls and programs to mitigate these emissions and reduce exposure

Presentation Outline



- Background and fugitive dust control measures
- Air District fugitive dust activities and programs
- Other fugitive dust reduction strategies
- Rule Development efforts

Presentation for Information Only



- No action required.

Background



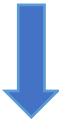
Community Perspectives

- Community Advisory Council
- Community Stakeholders
- AB617 Committees

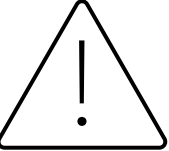


Scientific & Regulatory Perspectives

- Advisory Council
- Clean Air Act



Dust Concerns – Exposures and Health Impacts



Unpermitted facilities (construction sites and illegal operations)
Stationary and mobile sources in overburdened communities

Fugitive Dust Control Measures



Industrial Facilities



Construction Sites



Road Dust

Watering exposed surfaces and transfer points

Maintain moisture content of exposed surfaces

Covering haul trucks & inactive storage piles

Enclosures of storage material & conveyers

Paving

Installation of wind screens

Wheel washers & gravel pads

Wet sweeping and vacuuming paved surfaces

Operational limitations during wind events and poor AQI

Reduce vehicle miles traveled (VMT)

Air District Fugitive Dust Activities & Programs



CEQA

LEAD, RESPONSIBLE, COMMENTING



Industrial Facilities



Construction Sites



Road Dust

- Permitting
- Enforcement
- Rule Development

- Incentives
- Rule Development
- Commuter Benefits Program
- Flex Your Commute

Other Fugitive Dust Reduction Strategies



This Photo by Unknown Author is licensed under CC BY-SA



**Fugitive
Dust**

Plan Bay Area 2050 / VMT Reductions

Evaluate and mitigate dust impacts through CEQA project review

Local, Regional, State & Federal Ordinances, programs & partnerships

Evaluating Opportunities for Program Improvements



RULE DEVELOPMENT OPPORTUNITIES

Challenges with addressing fugitive dust

- Number of sources
- Permitted and unpermitted sources
- Variety of sources
- Episodic nature of events
- Emissions characterization
- Efficacy of controls

Evaluate potential opportunities through the white paper process

Fugitive Dust White Paper Process



Explore potential strategies

- Conduct gap analysis
- Review regulations and programs from other jurisdictions
- Review advancements in technologies (monitoring and controls)

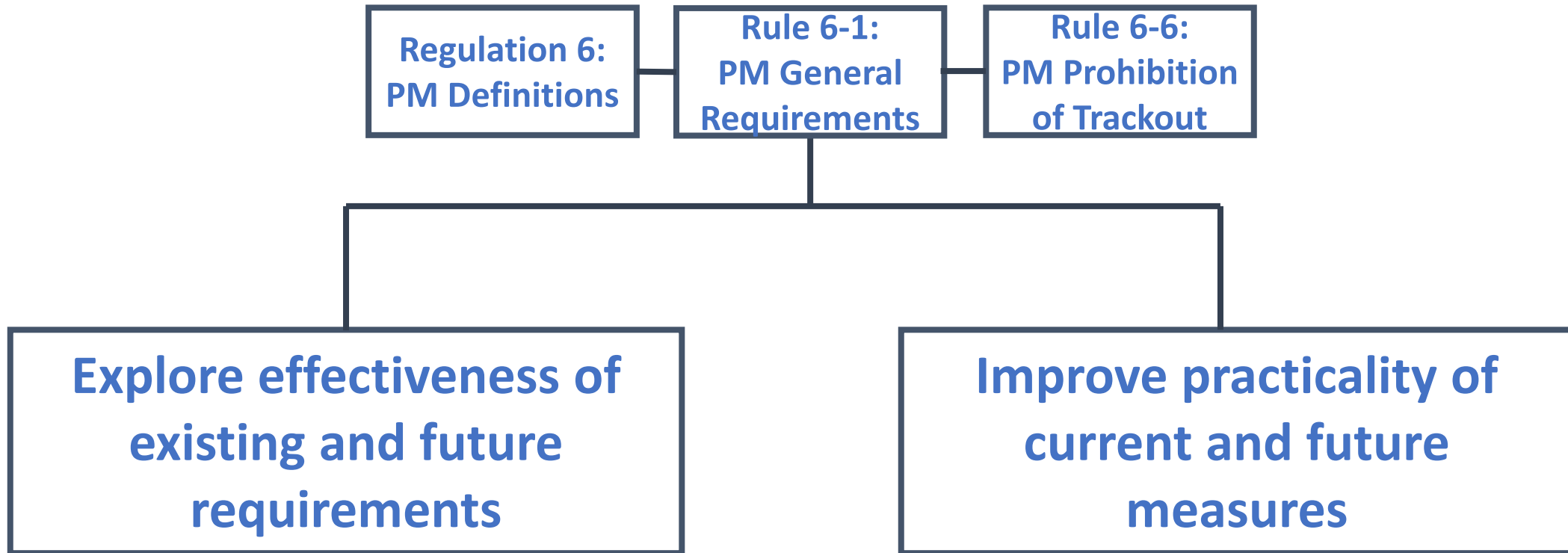
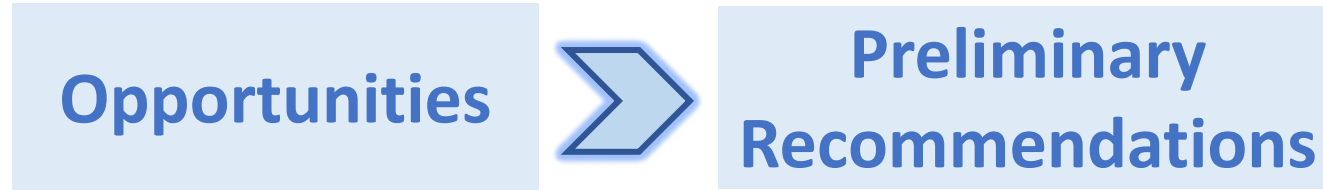
Develop recommendations for further action

- Potential regulatory amendments
- Implementation improvements
- New programs

Engagement with stakeholders

- Community representatives
- Community Advisory Council
- Scientific Advisory Council


Fugitive Dust White Paper Process (Cont'd)



Evaluating Potential Opportunities



Industrial Facilities



Construction Sites

[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

- Best management practices
- Adequately wetted
- Wind speed monitoring
- Covers and enclosures
- Dust control plans
- Fenceline monitoring
- Property line requirements
- Notification requirements

Evaluating Potential Opportunities (Part 2)



Regarding Trackout:

Property exit controls

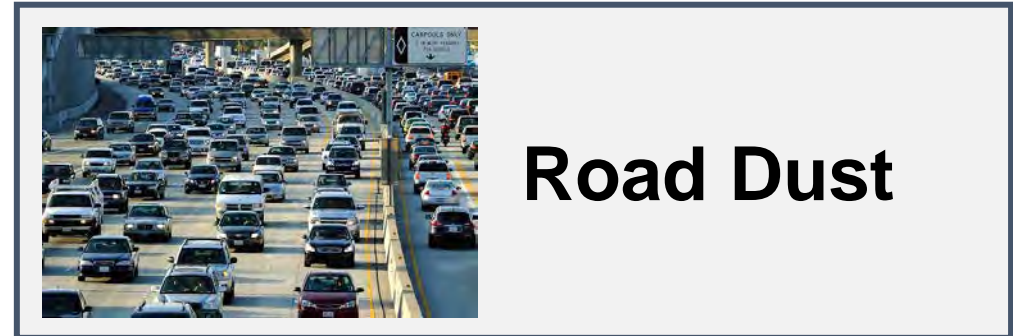
Wet vacuum trucks

Clean truck routes

Immediate clean up

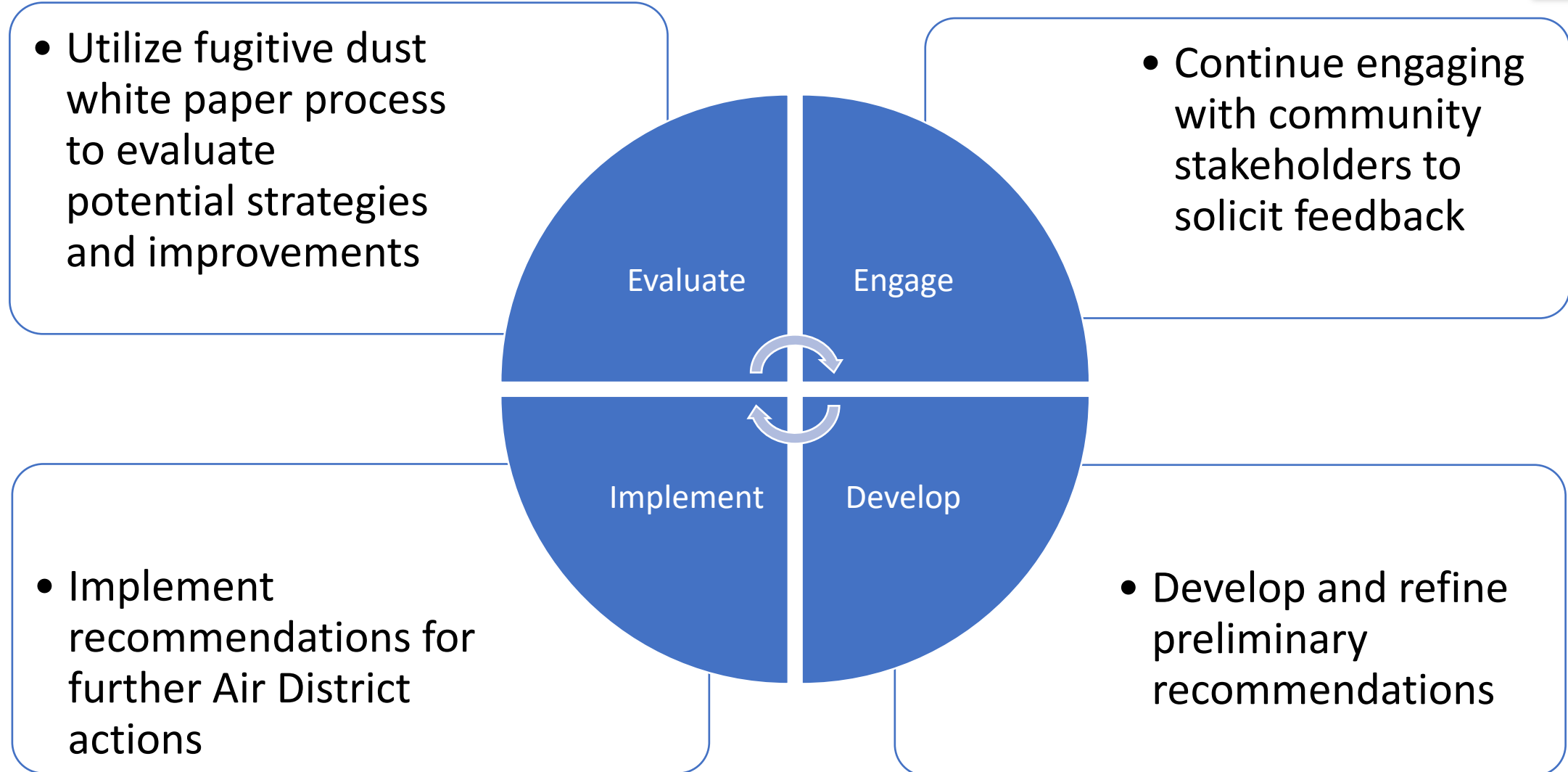
Signage and speed limits

Dust supervisors



Road Dust

Fugitive Dust White Paper Next Steps



Feedback Requested/Prompt



- Questions and Comments