AGENDA: 4

Bay Area Air District

Change Approach to Air Quality Management: New Clean Air Plan

Stationary Source Committee

April 8, 2026

Philip M. Fine, Executive Officer

Alesia Lau, Principal Environmental Planner,
Planning and Climate Protection Division

Abbreviations

$PM_{2.5}$: Fine Particulate Matter

PM: Particulate Matter

O_3 : Ozone

TAC: Toxic Air Contaminant

NOx: Nitrogen Oxides

ROG: Reactive Organic Gases

VOC: Volatile Organic Compounds

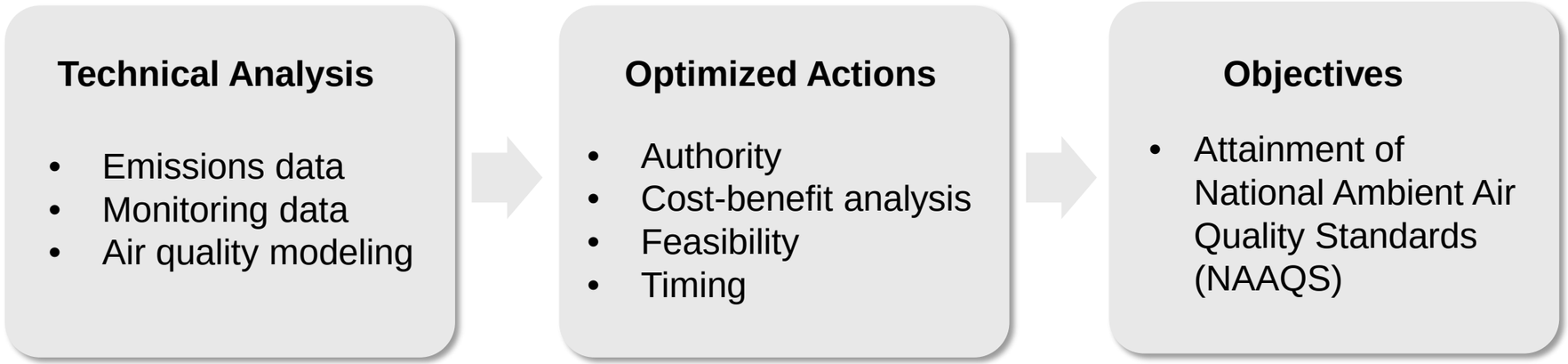
NAAQS: National Ambient Air Quality Standards

US EPA: United States Environmental Protection Agency

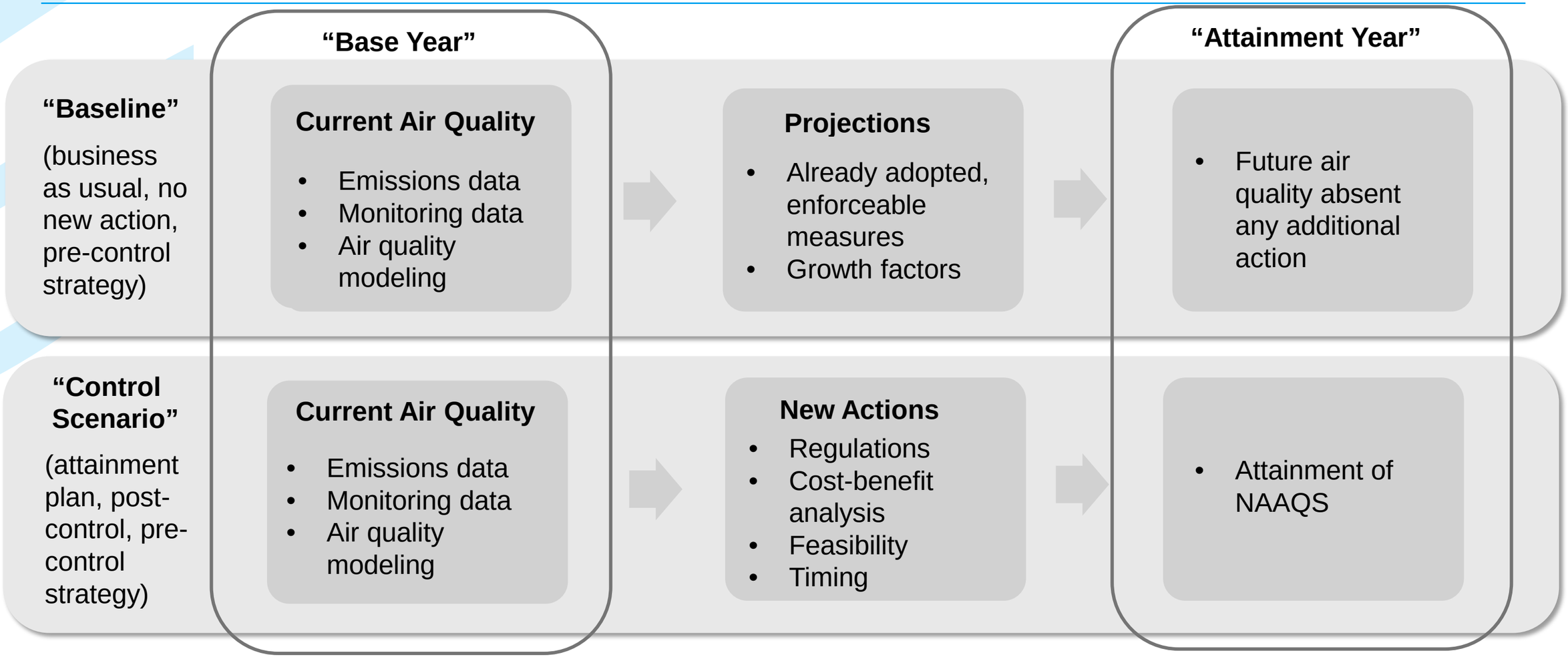
SIP: State Implementation Plan

What is a Clean Air Plan?

- A clean air plan uses **technical analysis** to identify a set of **optimized actions** to achieve clean air **objectives**
- Traditional air quality planning is driven by federal Clean Air Act requirements through a State Implementation Plan (SIP)



Traditional SIP



SIP vs. Community Emissions Reduction Plan

SIP Technical Analysis

- Emissions data
- Monitoring data
- Air quality modeling

SIP Optimized Actions

- Authority
- Cost-benefit analysis
- Feasibility
- Timing

SIP Objectives

- Attainment of NAAQS

CERP Community-Driven Analysis

- Emissions data
- Monitoring data
- Air quality modeling
- Community knowledge
- Uncertainties

CERP Community-Driven Actions

- Regulations
- Incentives
- Partnerships
- Education
- Enforcement

CERP Community-Driven Objectives

- Community-specific

New Approach to Regional Clean Air Planning

Technical Analysis

- Emissions data
- Monitoring data
- Air quality modeling
- **Community knowledge**
- **Acknowledge uncertainties**
- **Focus on air toxics and localized impacts**
- **BREATHE study**
- **Cumulative Impacts**

Optimized Actions

- Regulations
- Cost-benefit analysis
- **Incentives**
- **Partnerships**
- **Education**
- **Enforcement**
- **New research**

Objectives

- Attainment of NAAQS
- **Reduce regionwide and localized negative health outcomes**
- **Reduce disparities in negative health outcomes**
- **Maximize climate co-benefits**

2017 Clean Air Plan

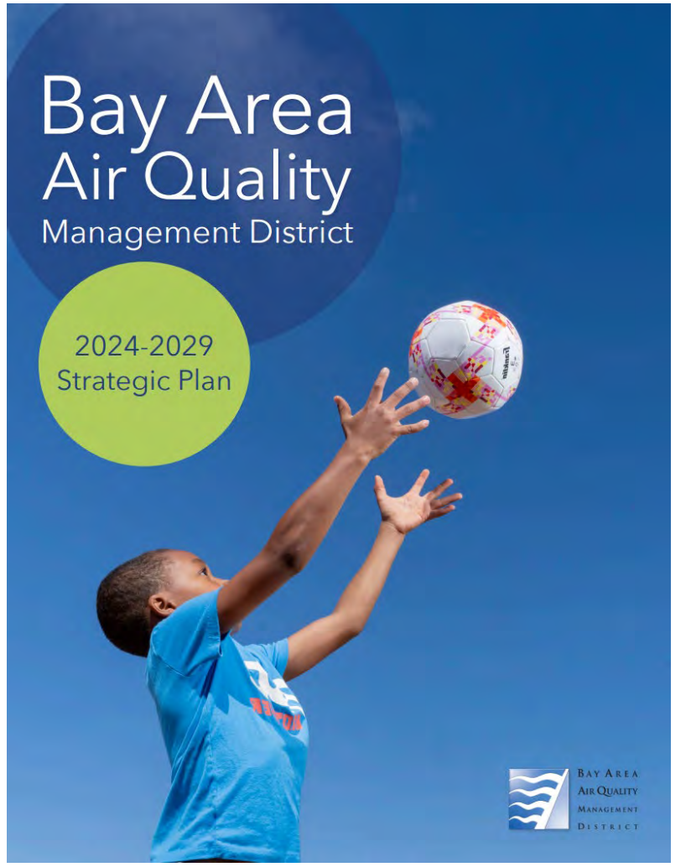
Air District's 2017 Clean Air Plan: Spare the Air, Cool the Climate

- A multi-pollutant plan that focused on:
  - $PM_{2.5}$ and O_3 reductions in the region
  - Air toxics reductions in impacted communities
  - Greenhouse gases reductions to meet long-range targets
- Substantial implementation progress has been made since 2017
- Lessons learned: future plans should set clear and measurable success metrics; focus where Air District authority is strongest; and strategically set priorities with equity guiding decisions

Strategic Plan Commitment – New Clean Air Plan

Strategy 1.1 Change Approach to Air Quality

- Guides the New Clean Air Plan
- Traditional air quality planning approach has primarily focused on addressing state and federal air quality standards – however, this is not the whole story
- In the Bay Area, while regional air quality has been improving, there remain disparities in local exposures and health risks



Air District's 2024-2029 Strategic Plan

Overview of the New Clean Air Plan

Continue to address $PM_{2.5}$, O_3, and TAC

Continue to address state and federal air quality standards

Improve assessment of community-scale air quality and advance environmental justice best practices **(New)**

Overview of the New Clean Air Plan (cont.)

- In addition to reducing exposures overall, focus on reducing disparities in negative health outcomes among communities disproportionately burdened by higher exposure to $PM_{2.5}$ and TACs

- Address local sources of community concern, such as facilities that generate dust, backup generators, and businesses that attract frequent truck traffic

A material handling facility and a construction site.

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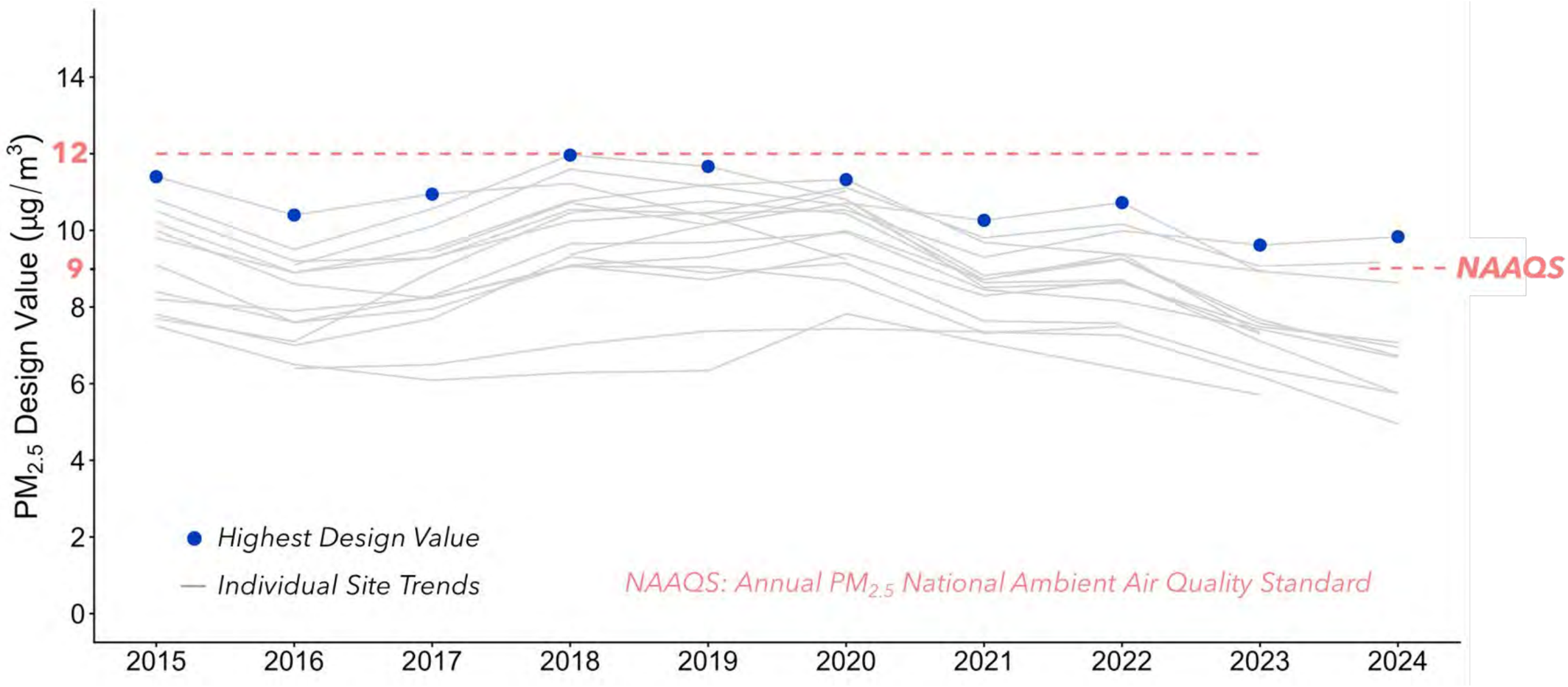
Current Air Quality (Ambient Monitoring)

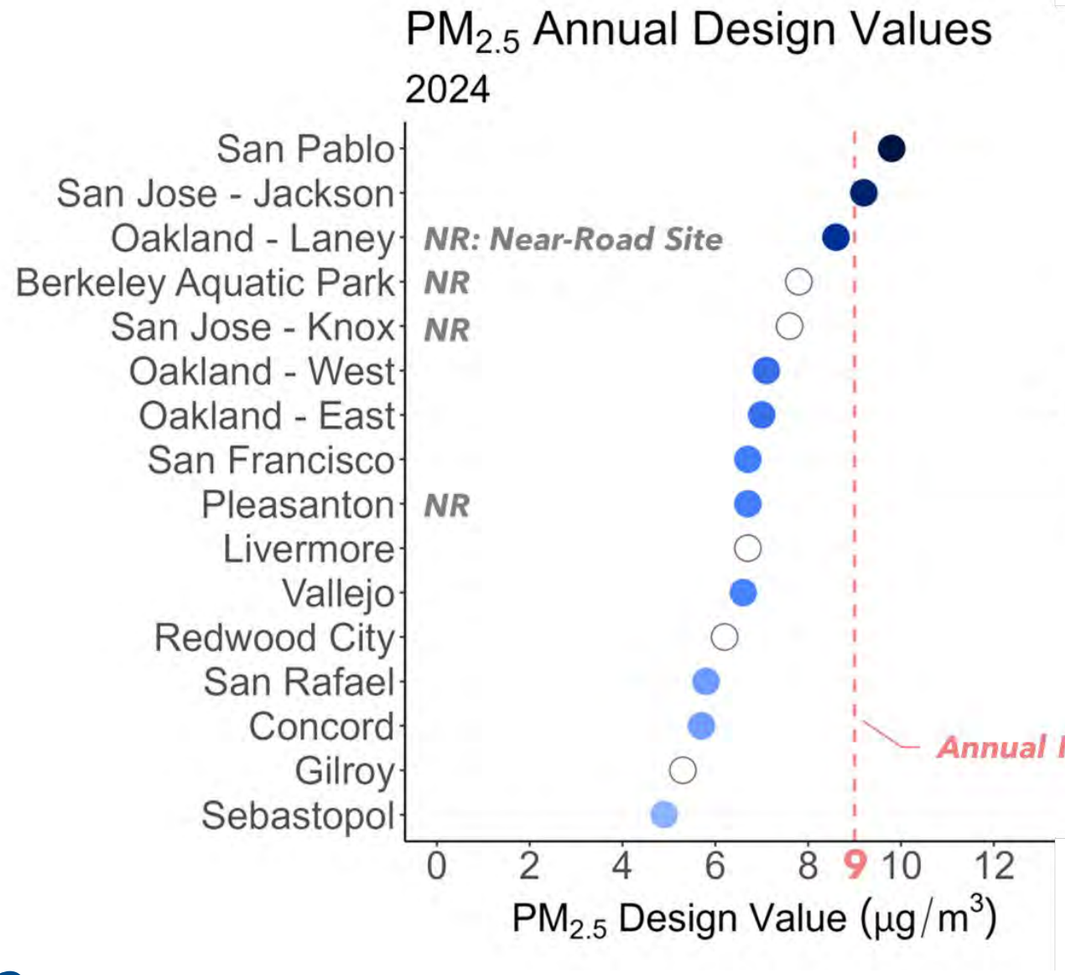
Air Quality Summary

- After years of progress, annual $PM_{2.5}$ and ozone levels were at or below state and federal standards - but annual $PM_{2.5}$ levels are slightly above the more stringent 2024 revised federal standard
- Population growth and climate change continue to drive the need for continued emissions reductions just to maintain current levels
- Striving for reductions below current standards is supported by evidence demonstrating health benefits of additional air quality improvements
- Shorter-duration impacts from near-source emissions of PM are not captured by either state or federal standards

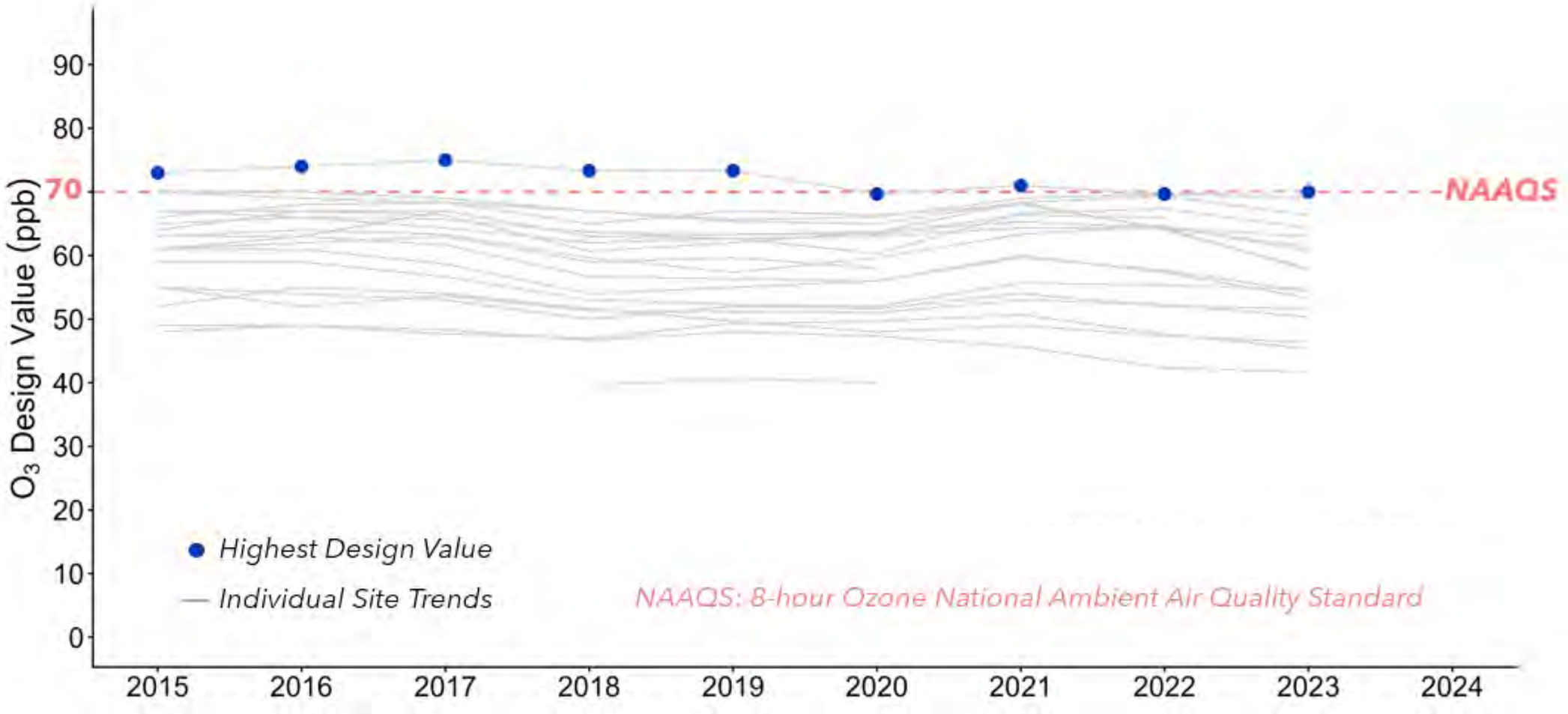
Annual Average $PM_{2.5}$ Trends



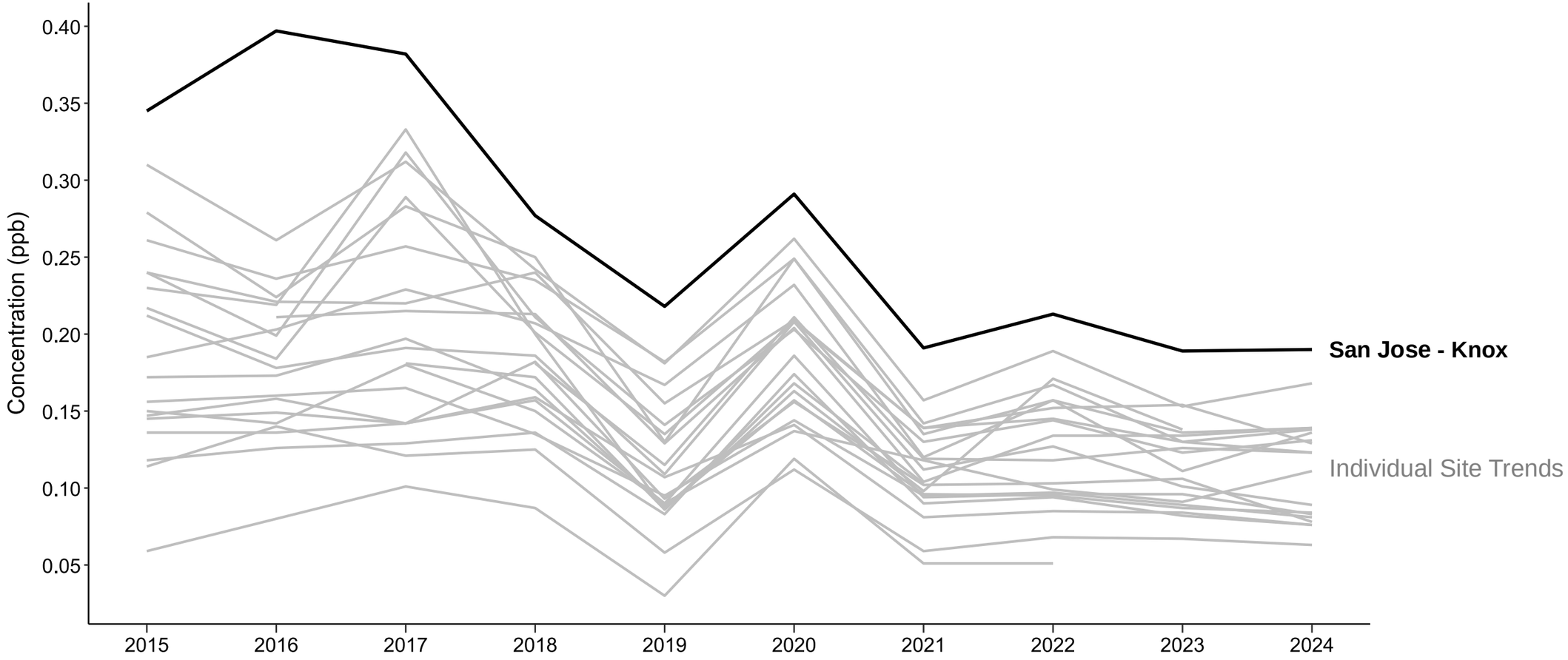
Disparities in Annual Average $PM_{2.5}$



8-Hour Ozone Trends



Annual Average Benzene Trends



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Regional Emissions Overview (Emissions Inventory)

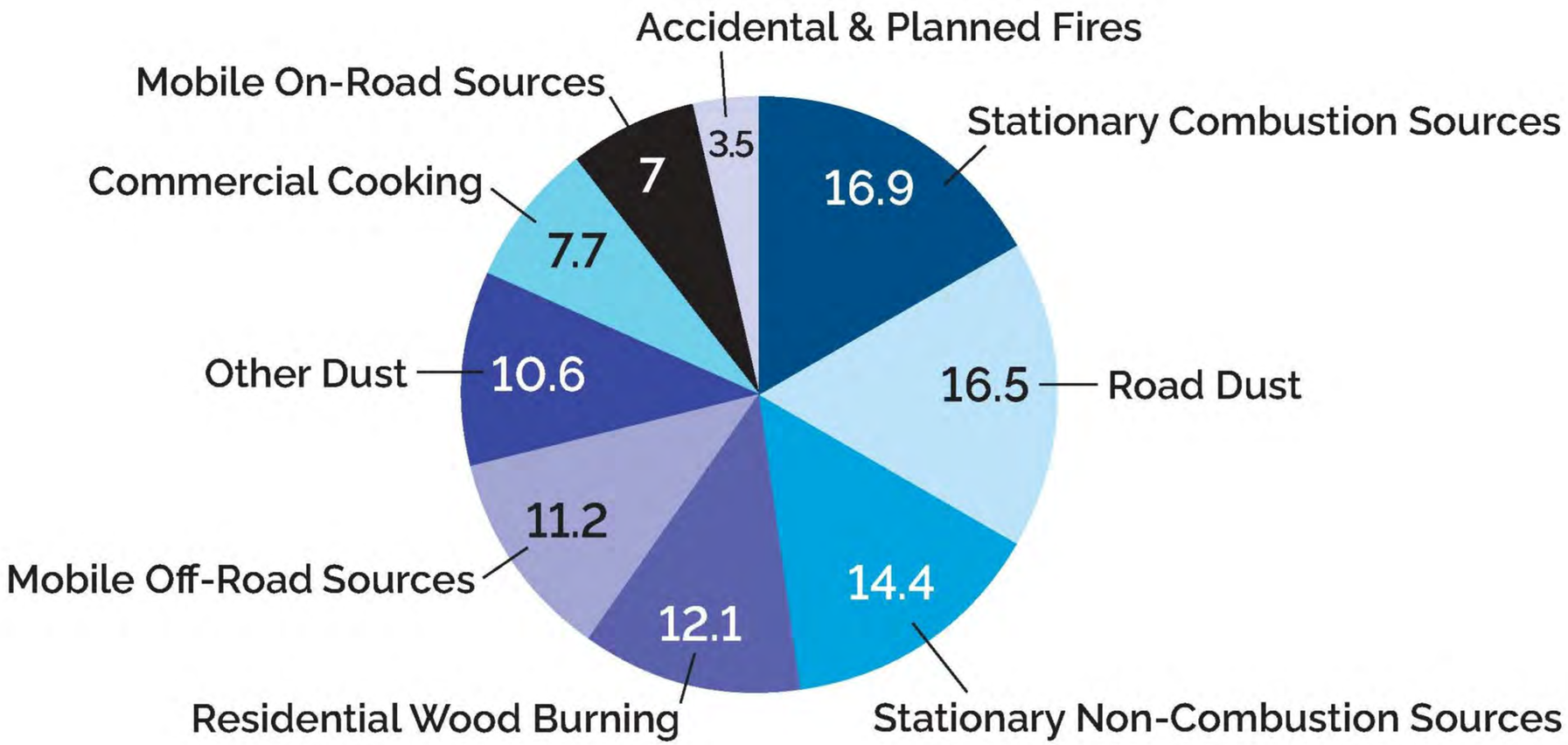
Regional Emissions Summary

- Major emission sources vary for different pollutants

- **$PM_{2.5}$ key sources of concern** are dust and residential wood burning

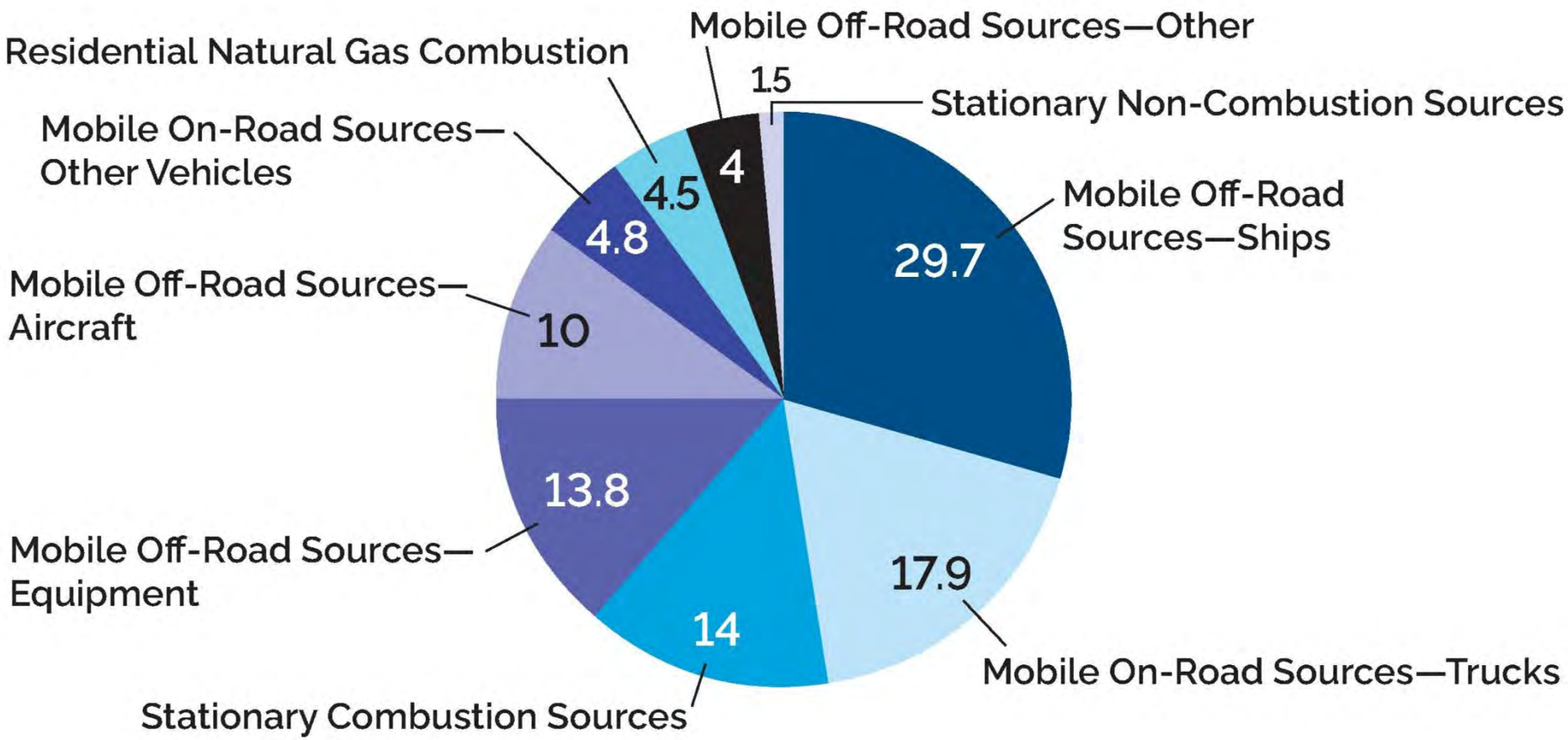
- **Ozone precursors -** NOx and ROG (also known as volatile organic compounds, VOC)
  - **NOx key sources of concern** are combustion sources
  - **ROG key sources of concern** are evaporative sources
  - Largest contributor to ozone is mobile sources

Regional Emission Sources of $PM_{2.5}$



Values shown as percentages

Regional Emission Sources of NO_x



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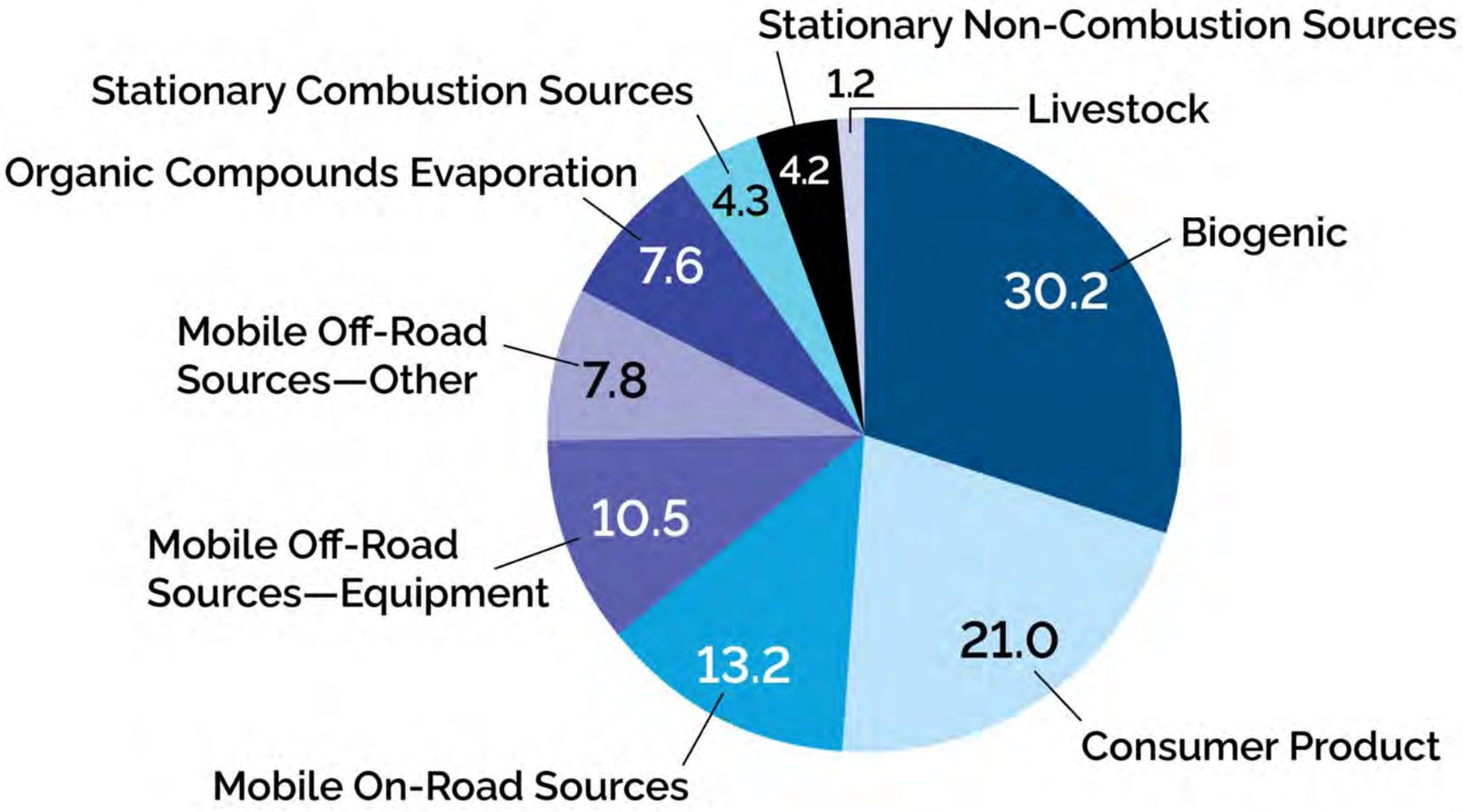
Regional Emission Sources of ROG



Values shown as percentages

Bay Area Air District

Toxic Air Contaminants Overview

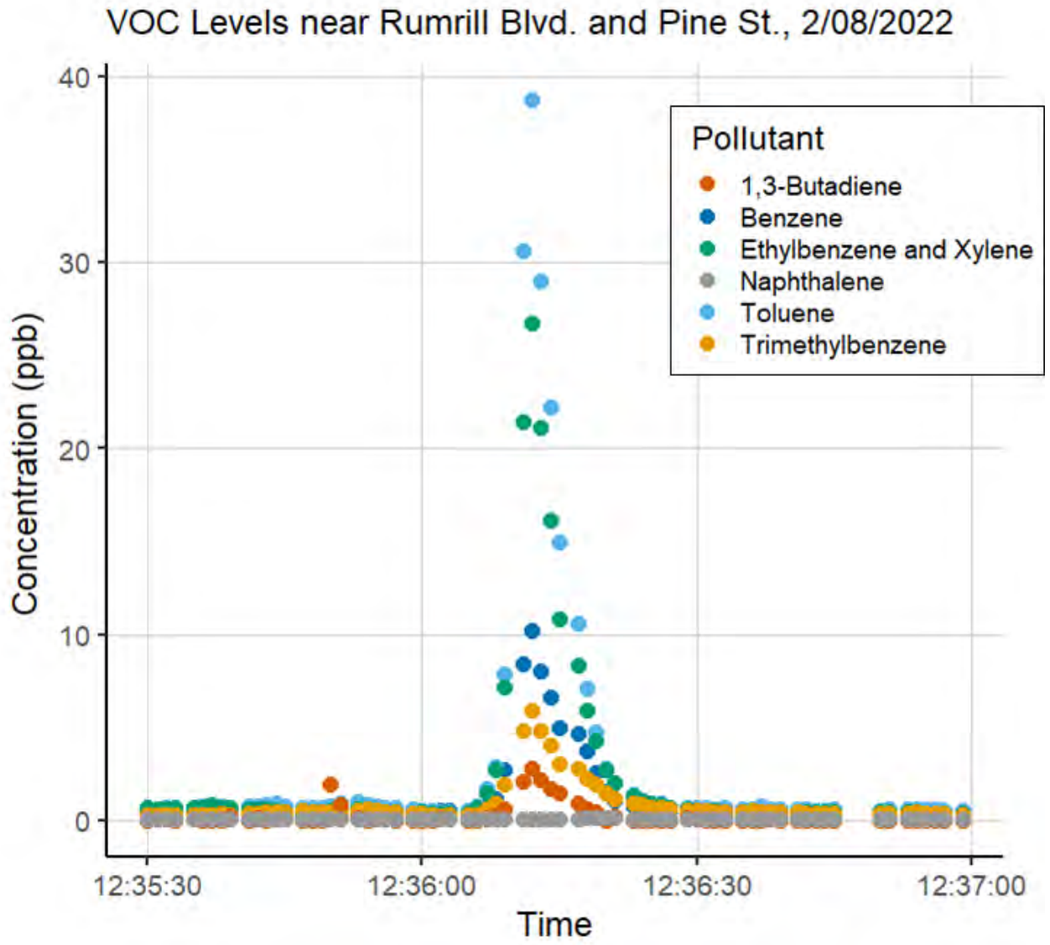
Toxic Air Contaminants (TACs)

- California Air Resources Board has identified over 200 air pollutants that cause cancer or other serious health affects as TACs
- TACs include VOCs, particulate metals, and diesel particulate matter
- TACs are emitted by stationary, mobile, and natural sources
- Processes that emit TACs include burning fuel, evaporating fuel or solvents, or other industrial operations
- Many TACs are short-lived, leading to localized higher levels near sources compared to farther away, which contributes to local disparities

Characterizing Exposure to TACs

- Air District has historically measured region-wide trends of VOC and $PM_{2.5}$ metals across multiple Bay Area locations
- Recently, staff conducted mobile monitoring of air toxics in overburdened communities to better understand the potential impact of local sources
- Moving forward, staff will:
  - Expand our community air monitoring investigations
  - Conduct multi-pollutant air monitoring in communities near refineries
  - Develop and implement the Bay Area Regional Evaluation of Air Toxics and Health Effects (BaREATHE) study

Localized Benzene Impacts



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Federal Particulate Matter Planning

Status of the Primary Annual $PM_{2.5}$ NAAQS

- Primary Annual $PM_{2.5}$ NAAQS was revised from 12 µg/m^3 to 9.0 µg/m^3 effective May 6, 2024
- State recommendations for area designations were submitted to the US EPA on January 28, 2025
- **Expected Actions:**
  - Clean Air Act Section 107(d)(1)(B) required US EPA to issue designations by February 7, 2026
  - To date, US EPA has not made any designations
  - Without a designation, there is no deadline to submit a Nonattainment SIP

Federal Administration Actions

- US EPA announced intent to reconsider the Primary Annual $PM_{2.5}$ NAAQS (Rule, March 6, 2024) on March 12, 2025
- US EPA Motion to Vacate the Rule (*Kentucky v. EPA*) was filed on November 24, 2025
  - If rule is vacated, the standard reverts to 12 $\mu g/m^3$
  - If rule is not vacated, final area designations may occur in February 2027 with Nonattainment SIPs due in November 2028, or continued delay and lack of final designations

New Clean Air Plan Next Steps

Air District staff will complete scoping for the New Clean Air Plan:

- Planning the approach to the technical analyses
- Developing a robust engagement and communications plan
- Completing a framework for developing and selecting control measures and optimized actions
- Creating a Project Management Plan to ensure the New Clean Air Plan addresses clean air goals and requirements

New Clean Air Plan Milestones

- **Spring 2026:** Complete New Clean Air Plan internal scoping
- **Fall 2026:** Launch multi-year stakeholder engagement and communications plan
- **Fall 2027:** Complete technical analyses and draft control measures
- **Winter 2027:** Initiate California Environmental Quality Act environmental review
- **Fall 2028:** Board of Directors consideration of New Clean Air Plan

Questions & Discussion

For more information:

Philip M. Fine | Executive Officer | pfine@baaqmd.gov

Alesia Lau | Principal Environmental Planner | alau@baaqmd.gov

AGENDA: 5

Bay Area Air District

Overview of Refinery Flaring, Flaring Minimization Efforts and the Development of "Flaring 101"

Stationary Source Committee

April 8, 2026

Katie Gong
Senior Air Quality Engineer
Regulatory Development Division

Abbreviations / Acronyms

AB: Assembly Bill

PTCA: Path to Clean Air

RTWG: Refinery Technical Working Group

CSC: Community Steering Committee

FMP: Flare Minimization Plan

DAHS: Data acquisition and handling system

US EPA: United States Environmental Protection Agency

NO_X: Nitrogen Oxide

SO_2: Sulfur Dioxide

VOC: Volatile Organic Compound

PM: Particulate Matter

CO_2: Carbon Dioxide

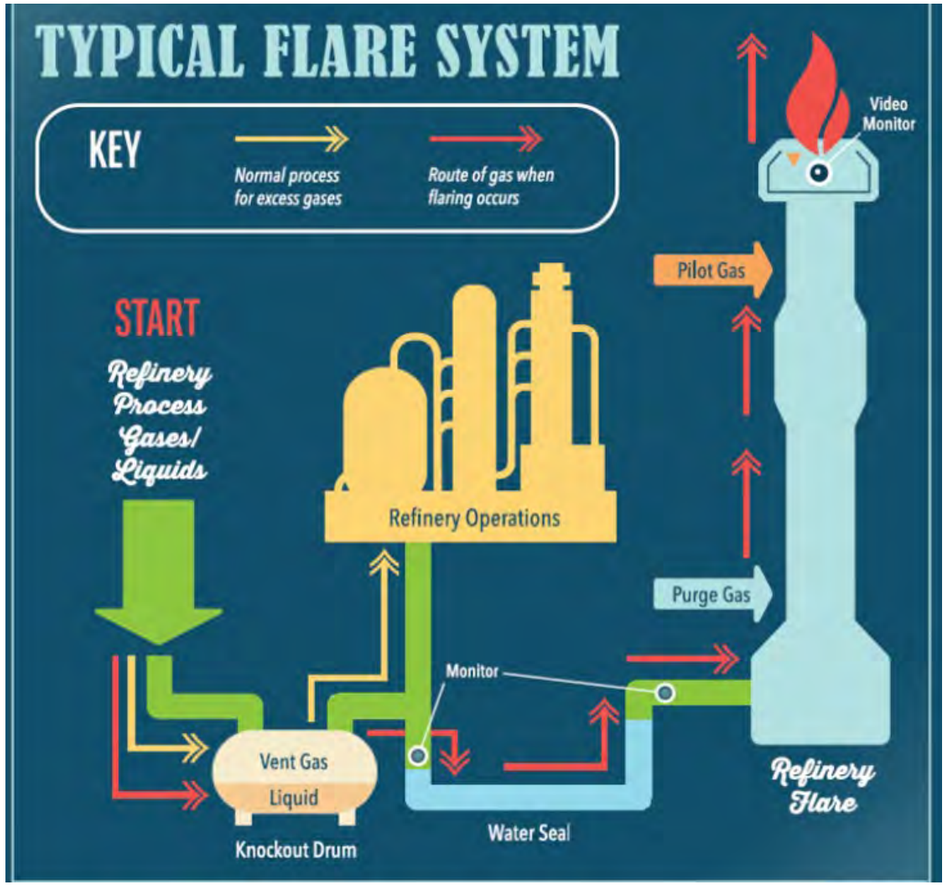
MRC: Martinez Refining Company

Presentation Outline

- Introduction to Flaring
- Impetus and Status of Rule Development Efforts
- Refinery Technical Working Group
- “Flaring 101” Update
- “Flaring 101” Next Steps
- Potential Rule Amendment Concepts
- Concept Paper Next Steps

Introduction – What is a flare system?

- Flare systems are safety devices that burn hydrocarbon gases that would otherwise be released
- Flares prevent the buildup of pressure and may prevent a more catastrophic event
- Flaring may occur from startup and shutdown of refinery processes



Introduction – When does flaring occur?

Planned operational activities

- Such as idling and planned maintenance

Preventable process upsets

- Not emergency, such as operator error or poor maintenance

Emergency

- Condition beyond reasonable control

Introduction – Flare Types

Flare Type	Typical Process Units Served	Gas Routed to Flare	Primary Pollutants	Typical Visual Cues
Non-hydrogen	Refinery process units	Hydrocarbons, including heavier and more complex ones	SO_2, PM, VOC	Proper operation: large and bright flame Improper operation: flame with black smoke
Hydrogen	Hydrogen production units	Hydrogen with a small amount of methane	NO_X, VOC	Blue or translucent flame

Visual Cues of Properly Operated Non-Hydrogen Flare

Potentially Higher Emissions

Potentially Lower Emissions

Increasing Combustion Efficiency

Larger and brighter the flames

- Higher the combustion efficiency
- Higher conversion rate of VOCs to CO_2 → Lower VOC emissions

Introduction – Current Rule Requirements

Regulation 12, Rule 11: Flare Monitoring at Refineries

Monthly reporting:

1. Vent, pilot and purge gas flow
2. Vent gas composition

Regulation 12, Rule 12: Flares at Refineries

1. Requires an Air District-approved flare minimization plan updated annually
2. Causal reports for reportable flaring events

Introduction – Other Regulations

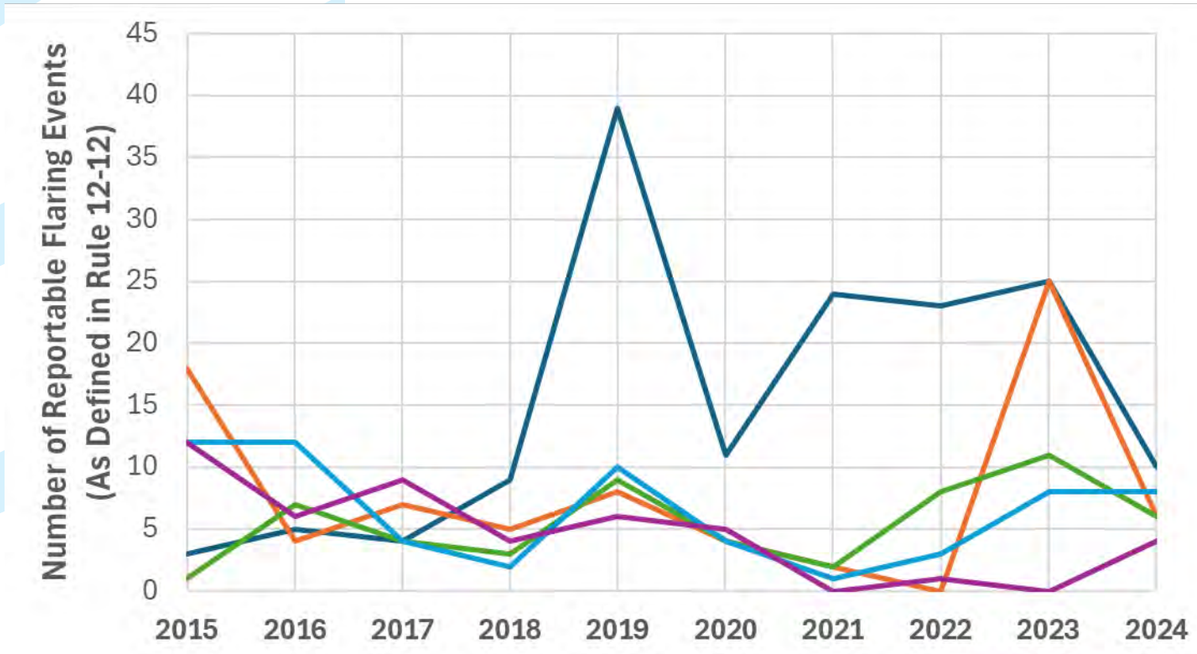
United States Environmental Protection Agency

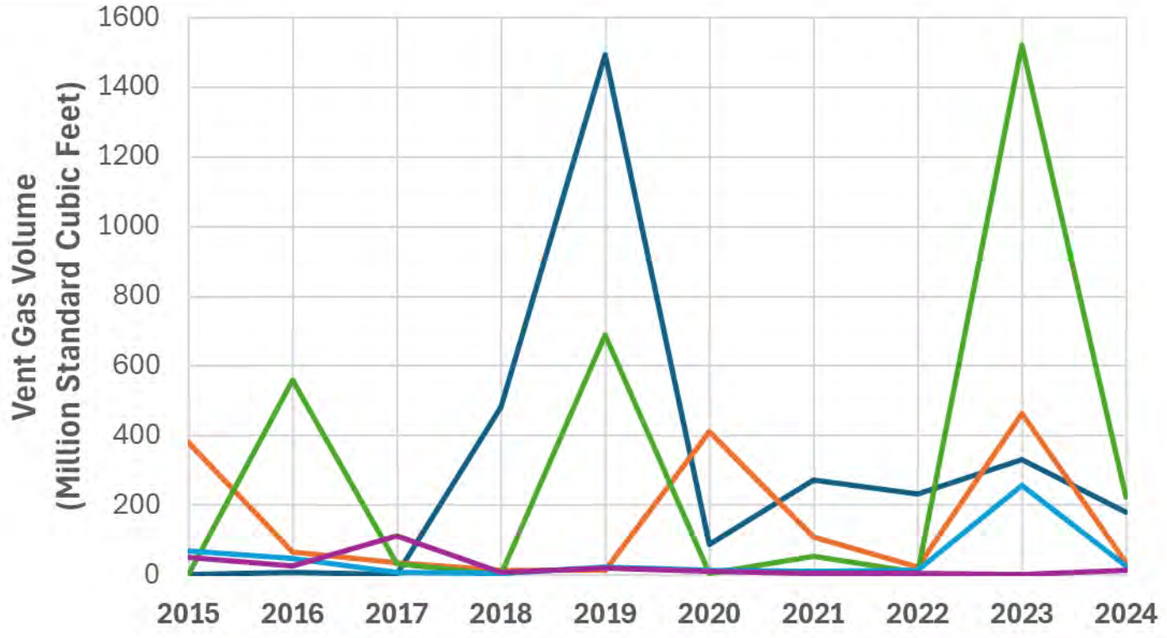
- New Source Performance Standards
- National Emissions Standards for Hazardous Air Pollutants

South Coast Air Quality Management District

- Rule 1118: Control of Emissions from Refinery Flares
- Rule 1118.1: Control of Emissions from Non-Refinery Flares

Bay Area Flaring Trends





Chevron Marathon Martinez Refining Company Phillips 66 Valero

Impetus of Rule Development Efforts

Strategic Plan
Strategy 1.3 Minimize Flaring

- Explore ways to minimize flaring
- Increase public engagement on flaring
- Share timely, accessible information
- Increase inspections and air pollution monitoring

AB 617 Path to Clean Air - Richmond, North Richmond & San Pablo - Community Emissions Reduction Plan - Fuel Refining 2.6

Evaluate potential updates to Rules 12-11 and 12-12 incorporating health impact analyses, enhanced enforceability, and more stringent limits

Current Status of Rule Development Efforts

- RTWG convened
- Gathering input from community and labor on "Flaring 101" materials
- Flaring concept paper to be published mid-2026
- Public engagement on concept paper

RTWG (Refinery Technical Working Group)

- Membership includes refinery representatives, community members, local government staff, advocacy group representatives, and other members
- Live public viewing and meetings recorded
- Convened in June 2025
- Topics:
  - “Flaring 101”
  - Rule 12-15 fenceline air monitoring (concept paper recently released)
  - Early flare rule amendments concepts

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“Flaring 101”

What is “Flaring 101”

“Flaring 101” is being developed to provide informational and educational materials that will assist the residents in communities close to refineries in understanding the root causes of flaring events and their health impacts

Impetus for "Flaring 101" Development

1. Air District Strategic Plan; and
2. AB 617 PTCA – Richmond-North Richmond-San Pablo – Community Emissions Reduction Plan

Next Steps – “Flaring 101”

- Meet with the PTCA CSC, other community groups, and labor to receive input
- Incorporate comments and develop an educational resource:
  1. Infographic/landing page explaining what flaring is and why it occurs
  2. More detailed Frequently Asked Questions
- Plan is to publish / go live prior to flaring concept paper publication

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Potential Rule Amendment Concepts

Goals for Potential Amendment Concepts

Goal #1

Streamline the Flare Minimization Plan Update Process and Improve the Reporting and Monitoring Requirements

Goal #2

Reduce Flaring Emissions and Frequency

Goal #1 - Flare Minimization Plans (FMPs) and Reporting and Monitoring Requirements

1.1. Strengthen Flare Minimization Plan Updates

1.2. Standardize Reporting Requirements

1.3. Expand Definitions and Categories for Reporting Causes of Flaring

1.4. Strengthen Monitoring and Reporting Requirements

1.1. Strengthen FMP Updates

Potential Concept Description:

- Submission contents:
  - Technology review and updated cost analyses of installing or implementing measures to reduce flaring
  - Mitigation measures implemented to address rule violations
  - Redlined copies of FMP and process drawings
- Frequency of updates of FMP elements

Impacts:

- Increase enforceability of rule requirements
- Resource savings for the Air District and regulated facilities

1.2. Standardize Reporting Requirements

Potential Concept Description:

- Report templates
- Causal categorization system
- Emissions calculation methodologies

Impacts:

- Increase data consistency and accessibility
- Resource savings for the Air District and regulated facilities

1.3. Expand Definitions and Categories for Reporting Causes of Flaring

Types of Flaring under Current Rule 12-12

Emergency Flaring	Non-emergency Flaring
Flaring due to condition at a refinery beyond reasonable control.	Flaring due to condition that does not meet the definition of Emergency – including both Unplanned and Planned Flaring

Emergency Flaring Definition from Rule 12-12

A condition at a refinery beyond the reasonable control of the owner or operator requiring immediate corrective action to restore normal operation that is caused by a sudden, infrequent and not reasonably preventable equipment failure, natural disaster, act of war or terrorism or external power curtailment, excluding power curtailment due to an interruptible power service agreement from a utility.

1.3. Expand Definitions and Categories for Reporting Causes of Flaring (cont.)

Potential Concept Description:

- Clarify: Emergency to align with federal Malfunction definition
- New: Planned and Unplanned

Impacts:

- Improve clarity and consistency in defining the causes of flaring
- Stronger enforceability with clearer interpretation of requirements
- Minimize flaring that is preventable

1.4. Strengthen Monitoring and Reporting Requirements

Potential Concept Description:

- Continuous monitoring for total sulfur and flow downstream of water seal
- Data acquisition and handling system (DAHS)
- Video monitoring: Air District access to real-time data, online submittal
- Infrared camera monitoring

1.4. Strengthen Monitoring and Reporting Requirements (cont.)

Potential Concept Description:

- Notification system to alert the community of planned and unplanned flaring
- Review and approval process for causal reports and flare monitoring systems

Impacts:

- Increase accuracy and integrity of emissions data
- Support stronger compliance assurance and enforcement
- Provide community more information on flaring to supplement the Community Warning System

Goal #2 - Reduce Flaring Emissions and Frequency

2.1. Incorporate Key Requirements From the US EPA Refinery Sector Rule

2.2. Establish New Annual Flare Limits

2.3. Require Mitigation Measures for Violations

2.4. Require Submittal of Causal Reports Based on Additional Triggers

2.5. Require Third-Party Audits for Facilities

2.1. Incorporate Key Requirements from US EPA Refinery Sector Rule for Flares

Potential Concept Description:

- Incorporate key operating requirements related to efficient combustion from the Refinery Sector Rule, which applies to petroleum refineries

Impacts:

- Increase enforceability of federal regulation
- Apply these requirements to all Bay Area refineries

2.2. Establish New Annual Flare Limits

Potential Concept Description:

- Annual limits under consideration:
  - SO_2 for non-hydrogen flares
  - NO_X for hydrogen flares
  - Vent gas volume
- Declining annual limit over time
- Application of the limit to emergency and non-emergency flaring

Impacts:

- Reduce emissions and decreased frequency of flaring

2.3. Require Mitigation Measures for Violations

Potential Concept Description:

- Measures under consideration:
  - Emission reduction measures for violations, including annual limit
    - Detailed evaluation of potential emission reduction measures
  - Fee similar to South Coast Rule 1118
- More stringent measures greater the exceedances

Impacts:

- Reduce emissions and decreased frequency of flaring

2.4. Require Submittal of Causal Reports based on Additional Triggers

Potential Concept Description:

- Additional triggers under evaluation:
  - Violations of the key operating parameters from US EPA Refinery Sector Rule
  - Other scenarios where causal reports may be warranted

Impacts:

- Decrease the frequency of specific flaring events related to triggers
- Expand the existing reporting requirements

2.5. Require Third-Party Audits for Facilities

Potential Concept Description:

- Audit triggers under evaluation:
  - Recurrent flaring from the same source/process area within a specified timeframe
  - Emergency flaring that exceeds certain emission or vent gas volume thresholds
  - Air District determination that internal audits are insufficient

Impacts:

- Reduce emissions and decreased frequency of flaring

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Concept Paper – Next Steps

Next Steps – Concept Paper

- Concept paper release mid-2026
- Refinery community workshops
  - Richmond – hybrid
  - Martinez – hybrid
- Focused community and labor meetings

Questions & Discussion

For more information:

Katie Gong | Senior Air Quality Engineer | Regulatory Development Division

ruledevelopment@baaqmd.gov

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BACKUP SLIDES

Bay Area Flaring Trends (cont.)