



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

# ***Rule Development Workshop***

***Regulation 12, Rule 16***

***Regulation 13, Rule 1***

***Regulation 11, Rule 18***

**Victor Douglas**

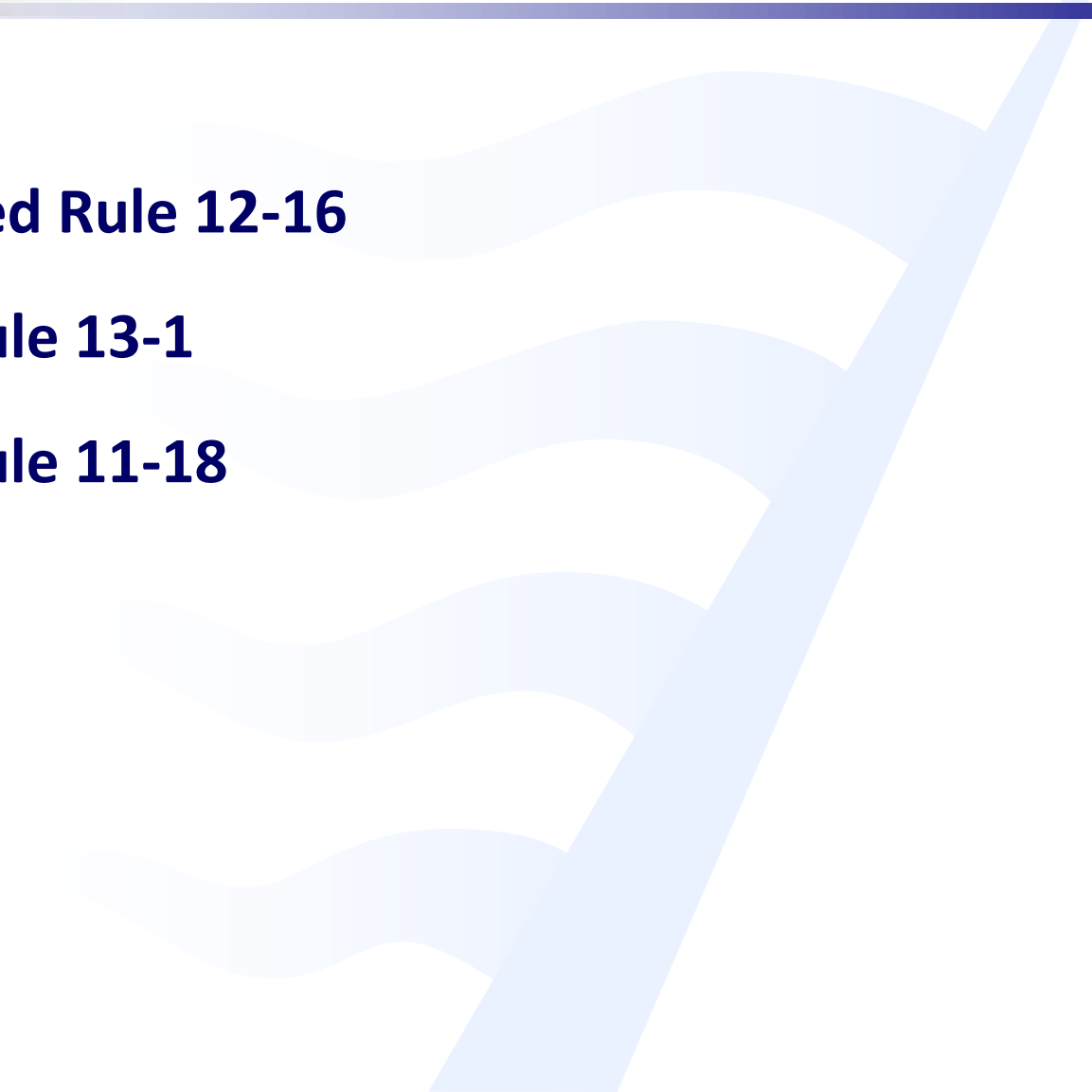
Principal Air Quality Engineer

Rule Development

March 27-30, 2017

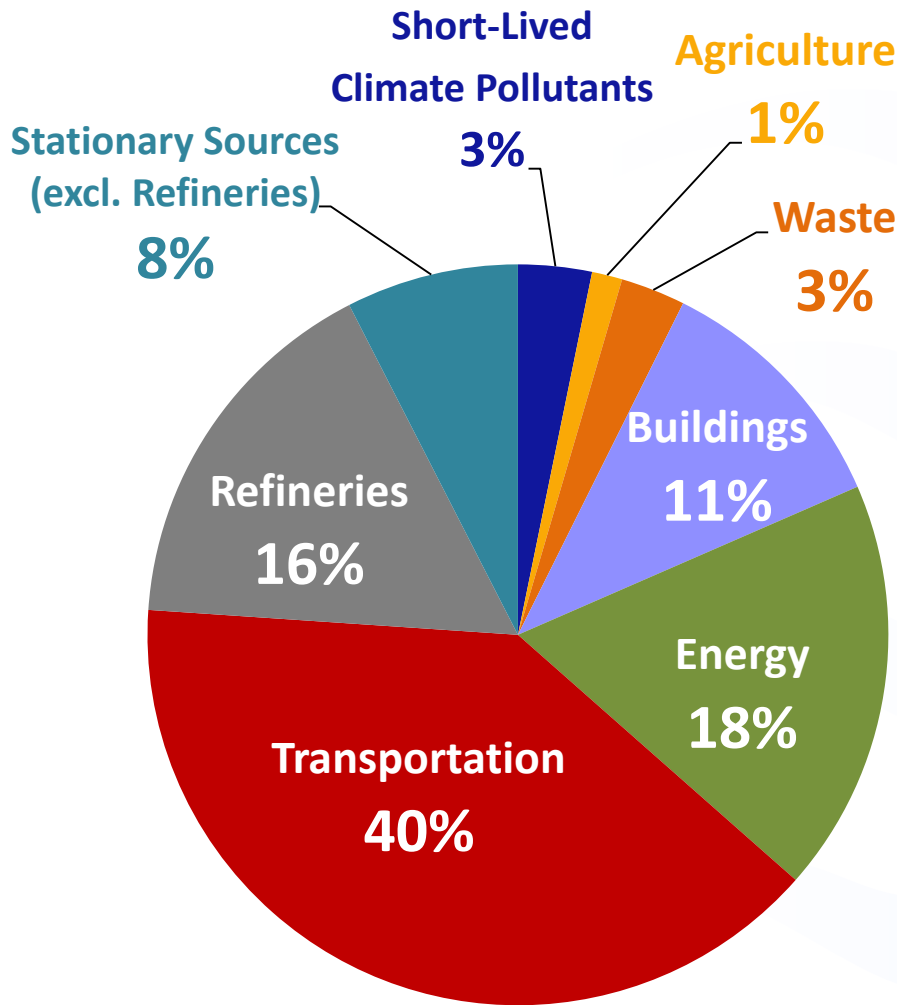


# Overview

- **Background**
  - **Overview of Proposed Rule 12-16**
  - **Overview of Draft Rule 13-1**
  - **Overview of Draft Rule 11-18**
  - **Summary**
  - **Next Steps**
  - **Q & A**
- 



# Bay Area Emissions *Greenhouse Gases (GHG)*



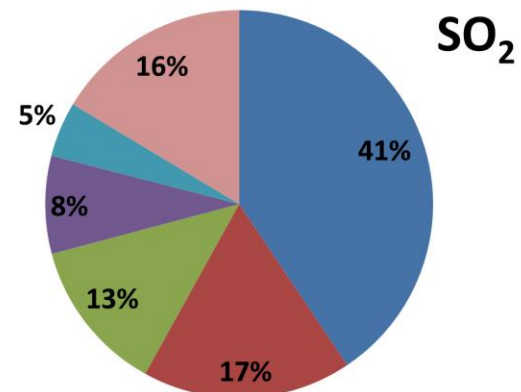
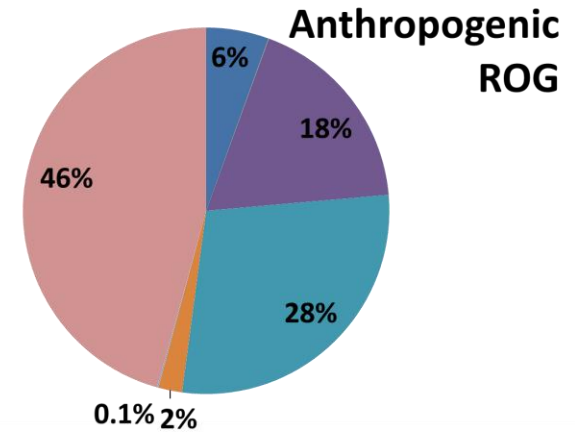
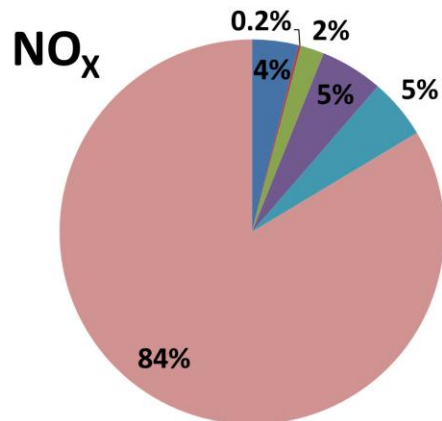
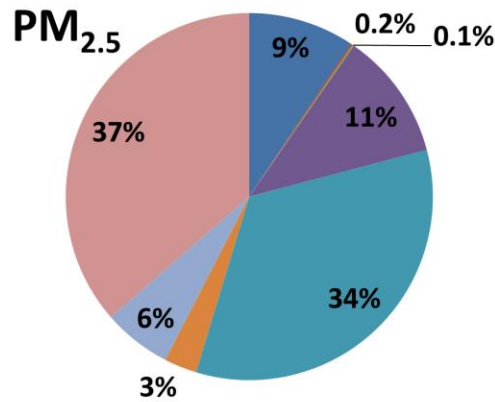
Refineries account for approximately 16% of Bay Area GHG emissions.

Calendar year 2014 = 89 MMT CO<sub>2</sub>e

# Bay Area Emissions

## Criteria Air Pollutants

Refineries are a major source of ozone precursor pollutants (ROG,  $\text{NO}_x$ ), directly emitted  $\text{PM}_{2.5}$ , and  $\text{PM}_{2.5}$  precursor pollutants ( $\text{SO}_2$ ).

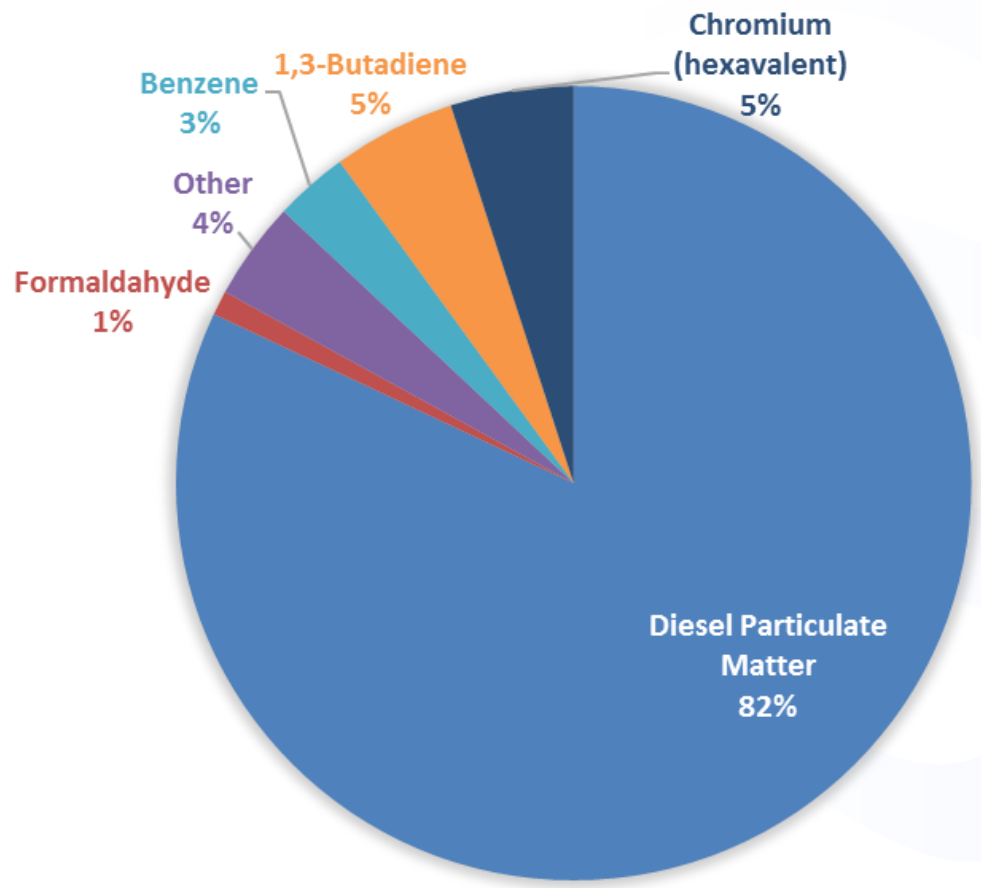


Calendar year 2012



# Bay Area Emissions *Toxic Air Contaminants (TAC)*

## Cancer-Risk Weighted Emissions Estimates by TAC



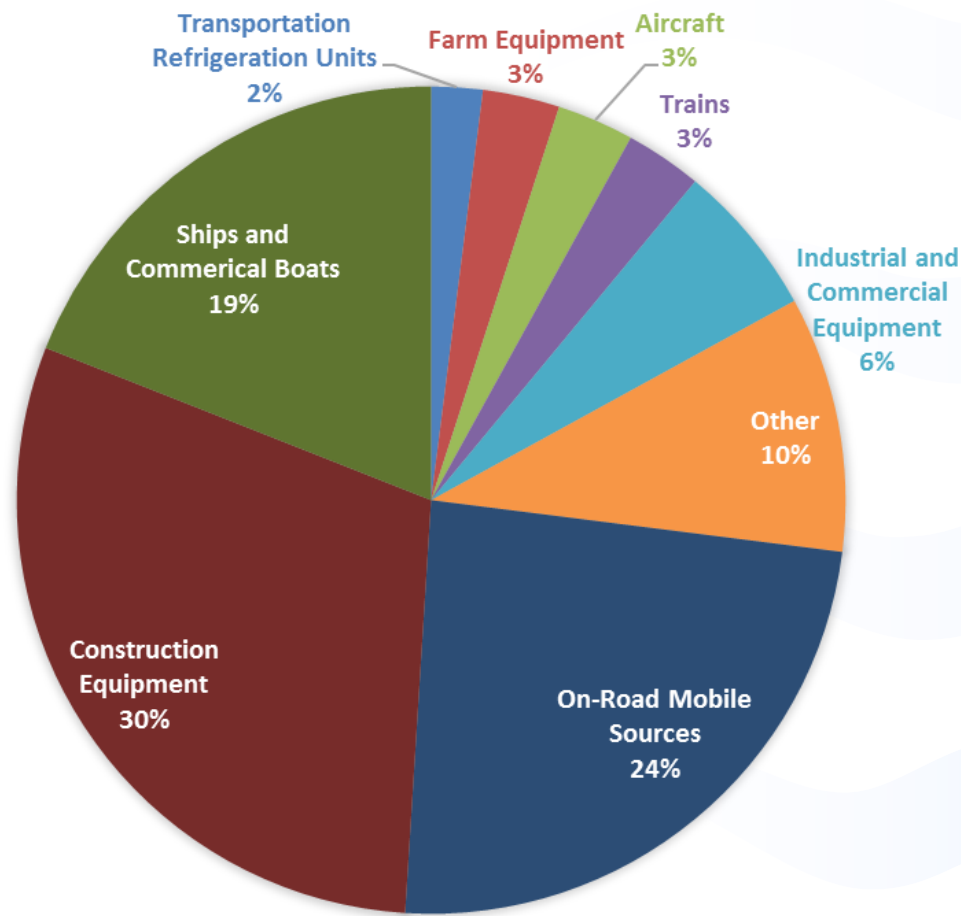
Diesel PM accounts for the vast majority of cancer risk from TAC emissions

Calendar year 2014



# Bay Area Emissions *Toxic Air Contaminants (TAC)*

## Cancer-Risk Weighted Emissions Estimates by TAC



Industrial sources (including refineries) account for 16% of these emissions

Calendar year 2014



# Refinery Strategy Progress







*On track toward goal of 20% emissions reduction by 2020*

Rule	Purpose	Adoption Date
6-5	Reduces PM from fluid catalytic cracking units (FCCUs)	Dec. 2015 ✓
8-18	Reduces VOC from equipment leaks	
11-10	Reduces VOC and toxics from cooling towers	
9-14	Reduces SO <sub>2</sub> from coke calcining operations	Apr. 2016 ✓
12-15	Tracks crude slate changes and emissions	
2-5	Latest statewide guidance into New Source Review for Toxics	Dec. 2016 ✓
9-9	Reduces NO <sub>x</sub> from gas turbines	2018
TBD	Further reduces refinery SO <sub>2</sub> emissions	2018
6-5	Condensable PM and SO <sub>2</sub> reductions from FCCUs (Ph. 2)	2018

*Total refinery criteria pollutant emissions reductions from adopted rules: 17%*



# Refinery Strategy Summary

- Improve understanding and monitoring of refinery emissions and feedstocks: **Rule 12-15** 
- Direct regulation of criteria pollutant emissions
  - **Rules 6-5, 8-18, 11-10 and 9-14** 
  - Upcoming rules 
- Address health risk from toxic emissions from
  - New sources: **Rule 2-5** 
  - Existing sources: **Rule 11-18** 
- Prevent GHG increases: **Rules 12-16; 13-1** 



# Proposed Rule 12-16



## Petroleum Refining Facility-Wide Emissions Limits



# Proposed Rule 12-16

## *Basics*

### ***Caps each facility's annual GHG and criteria pollutant emissions***

- Affects five refineries and three associated facilities
- Caps GHG and criteria (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub>) emissions

### **Annual emissions limits**

- Based on Air District and CARB emissions data for most recent five-year period available
- Set at 7% above each refinery's five-year max to provide operating flexibility and allow normal year-to-year variations



# Proposed Rule 12-16

## *Potential Issues*

### **Staff has identified significant issues**

- May be beyond the Air District's authority
- Sets more restrictive permitting rules for refineries without scientific basis
- Limits production which may interfere with transportation fuels market if
  - Fuel consumption continues to increase
  - Overall refining capacity decreases due to accidents, outages, or refineries closing

# Draft Rule 13-1



**Petroleum Refinery Carbon Intensity Limits  
or Facility-Wide GHG Emission Limits**

# Draft Rule 13-1

## *Purpose*

### **Addresses community concerns about GHG emissions increases from operational changes at refineries**

- Complements State climate efforts, anticipated to require a 20% reduction in GHG emissions by 2020
- Allows production increases under certain circumstances, thus minimizes interference with the transportation fuel market
- Promotes energy efficiency improvement at refineries
- Consistent with Air District's authority and permitting process

# Draft Rule 13-1

## *First Rule of Combustion Strategy*

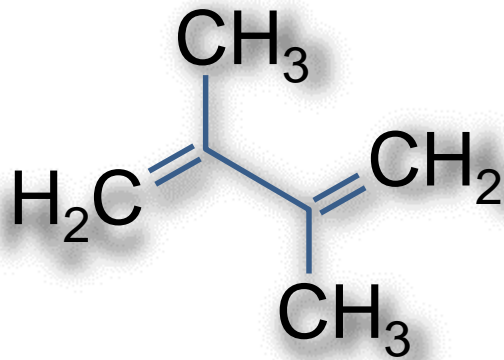
**Caps each refinery's *carbon intensity* at a level consistent with current operations**

- Defines carbon intensity on a simple barrel basis

$$\text{Carbon Intensity} = \frac{\text{Annual GHG Emissions (MT CO}_2\text{e)}}{\text{Annual Feedstock Volume (barrels)}}$$

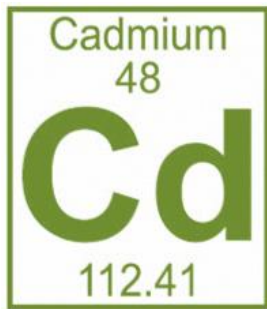
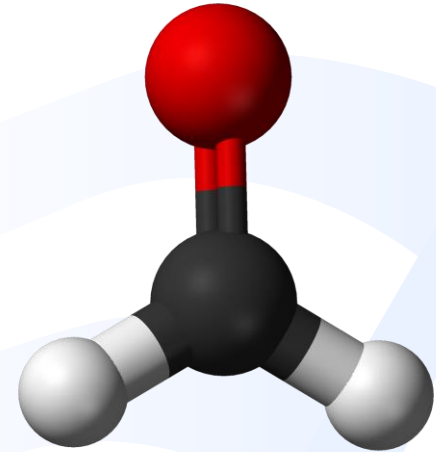
- Accounts for GHG from all power, steam and hydrogen inputs
- Requires implementation of energy efficiency projects with simple payback of 10 years or less
- Provides an annual GHG mass emissions limit as an alternate compliance option

# Draft Rule 11-18



**RPM**

**Cr<sup>6</sup>**

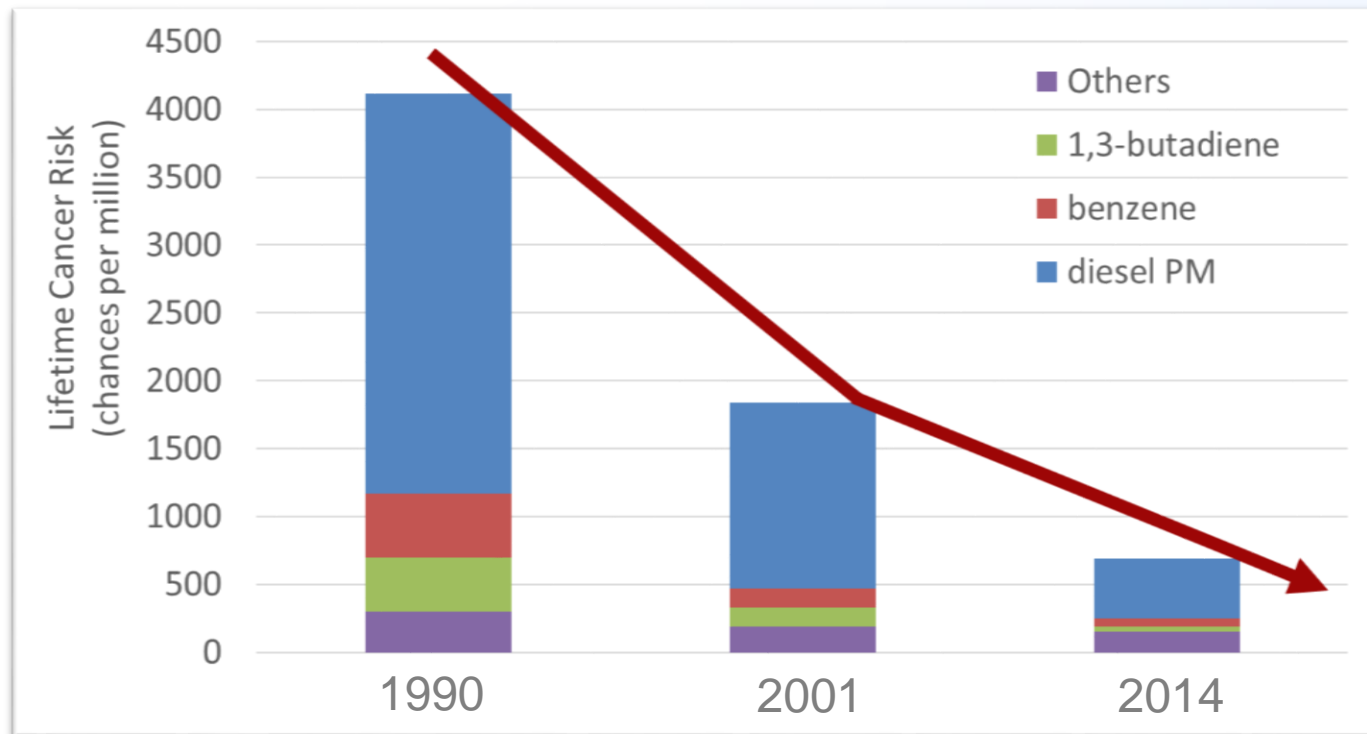


Reduction of Risk from Air Toxic  
Emissions at Existing Facilities

# Draft Rule 11-18

## Background

### Bay Area risk levels have declined since 1990



*However, there are still high risk levels in several areas*

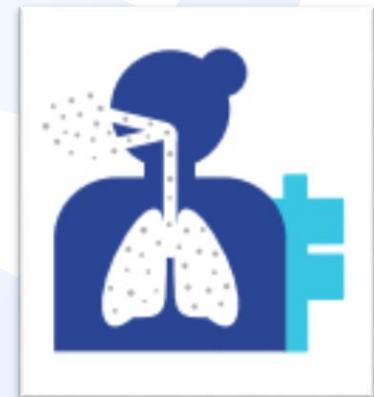


# Draft Rule 11-18

## *Purpose*

### **Reduces health risks to lowest achievable levels**

- Provides greater benefits to impacted areas
- Incorporates latest health risk methodologies
- Promotes continuous improvement
- Ensures public transparency
- Provides greater flexibility





# Draft Rule 11-18

## *Basics*

### **Reduces facility-wide health risks from existing sources**

- Hundreds of facilities will be evaluated, including
  - Refineries • Power Plants • Gas Stations • Hospitals • Foundries
  - Military Facilities • Landfills • Chemical Plants • Data Centers
  - Schools/Universities • Crematoria • Sewage Treatment
- Health Risk Assessments (HRAs) conducted by Air District staff using latest statewide guidelines
  - Refineries have among highest priority for HRAs, due to high emission levels
- Establishes a lower risk action level
  - 100 in a million → 10 in a million



# Draft Rule 11-18

## *Reducing Health Risks*

### **Facilities above risk action level (10 in a million) must**

- Develop a risk reduction plan for Air District approval
- Execute plan according to plan schedule

### **Risk reduction measures include**

- Installation of Best Available Retrofit Control Technologies for Toxics (TBARCT)
- Modification of operating hours and activity levels
- Modification of emissions point characteristics



# Schedule / Next Steps

## **Final steps for Draft Rules 12-16 and 11-18**

- MAY 17, 2017 – Board hearing for Draft Rule 12-16
- JULY 2017 – Board hearing for Draft Rule 11-18

## **Proposed schedule for Draft Rule 13-1**

- JUL 2017 – Hearing package published
- SEP 2017 – Board hearing



# Summary

Criteria	Draft Rule 12-16	Draft Rule 13-1	Draft Rule 11-18
Reduces Toxic Emissions and Health Risks	✘	✘	✓
Prevents Significant GHG Emissions Increases	✓	✓	✘
Reduces GHG Emissions	✘	✓	⚠
Allows Refinery Production Increases / Avoids Statewide Economic Impacts	✘	✓	✓
Harmony with State's climate programs	⚠	✓	✓
Consistent with Air District's authority and permitting process	✘	✓	✓

# Contact Information | Q&A

## **Victor Douglas**

Principal Air Quality Engineer

Rule Development Section

[vdouglas@baaqmd.gov](mailto:vdouglas@baaqmd.gov)

(415) 749-4752