

# AIRBORNE TOXIC CONTROL MEASURE FOR DIESEL-FUELED PORTABLE ENGINES $\geq$ 50HP



February 26, 2004



California Environmental Protection Agency

Air Resources Board

# Overview

- Background
- Existing Regulations
- Proposed ATCM
- Environmental and Economic Impacts
- Proposed 15-Day Changes
- Future Activities

# Overview

- **Background**
- Existing Regulations
- Proposed ATCM
- Environmental and Economic Impacts
- Proposed 15-Day Changes
- Future Activities

# What are Portable Engines?

- Moved from one location to another
- Power a variety of equipment
- Range from 50 to 3,000 horsepower
- Wide range of operating hours
- Used by public agencies and businesses
- Used in rural and urban locations

# Examples of Uses of Portable Engines

# Pumps



# Power Generators



# Compressors



# Oil-Well Drilling and Workover Rigs



# Dredging Equipment



# Specialized Equipment



# Estimated Portable Engine Emissions in California

- Statewide Inventory: 33,000 engines
- Emissions, tons per day

	<u>PM</u>	<u>NOx</u>
2000	4.2	67.1
2010	2.8	45.3
2020	1.8	34.1

# Why Control Portable Engine Emissions?

- Portable engines contribute 5% of emissions and associated health risk
- Many engines operate in urban locations
- Significant emission reductions possible
- Cost-effective

# Overview

- Background
- **Existing Regulations**
- Proposed ATCM
- Environmental and Economic Impacts
- Proposed 15-Day Changes
- Future Activities

# Existing Regulations Affecting Portable Engines

- Federal Preemption
- New off-road engine emission standards
- ARB's Statewide Portable Equipment Registration Program
- Local Air District Rules



# New Off-Road Engine Emission Standards

- New off-road engines subject to progressively more stringent standards
- Tier 1, 2, or 3 standards phased in from 1996 to 2008
- U.S. EPA's proposed Tier 4 off-road engine standards

# ARB's Portable Equipment Registration Program

- Established in 1997
- Roughly 15,000 engines registered
- Engines certified to Tier 1, 2, or 3 off-road engine standards by 2010
- Will achieve a 30 percent reduction in PM and NOx by 2010

# Overview

- Background
- Existing Regulations
- **Proposed ATCM**
- Environmental and Economic Impacts
- Proposed 15-Day Changes
- Future Activities

# Development of ATCM

- Six public portable engine workgroup meetings
- Four public workshops
- Meetings/Calls with portable engine owners, industry associations, and Districts
- Survey of government agencies

# Concepts Underlying Staff's Proposal

- Accelerate engine replacement
- Provide flexibility to engine owners
- Provide incentives to promote cleaner technologies/engines

# Applicability

- All diesel-fueled portable engines  $\geq 50$  horsepower including:
  - Engines registered with the Statewide Program
  - Engines subject to district permitting requirements
  - Engines which have been previously exempt from permits

# Key Elements of ATCM

- All portable engines be certified to Tier 1, 2, or 3 emission standards by 2010
- Fleet weighted PM standards for 2013, 2017, and 2020
- Final requirements in place in 2020

# Requirements for 2010

- Expands reductions beyond those achieved through Statewide Program
- Takes advantage of availability of Tier 1, 2, and 3 engines



# Fleet Approach

- 2013, 2017, 2020 Standards
- Purpose is to transition fleets to proposed Tier 4 engines or equivalent



# Fleet PM Standards (g/bhp-hr)

Year	<175 hp	175-749 hp	≥750 hp
2013	0.3	0.15	0.25
2017	0.18	0.08	0.08
2020	0.04	0.02	0.02

# Practical Impact of Proposed Standards

2013: Tier 2 or later engines

2017: Half engines proposed Tier 4 engines or equivalent

2020: All engines proposed Tier 4 engines or equivalent

# Fleet Exclusions

- Engines operated in OCS only
- SCR equipped engines
- Engines dedicated to emergency use only
- Low-Use engines

# Emergency/Low-Use Engines

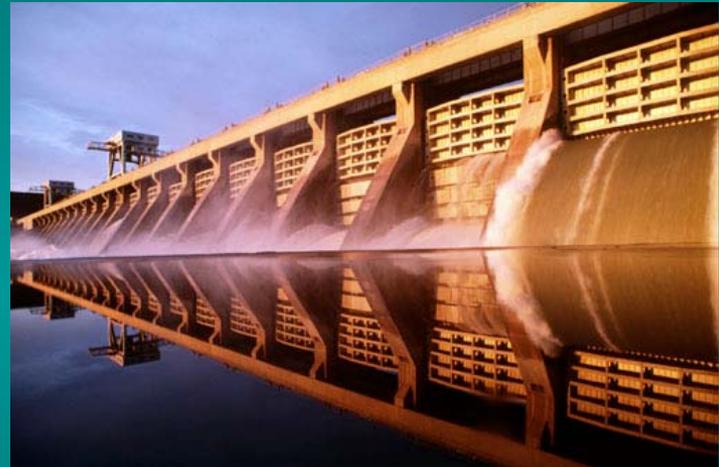
- Emergency
  - Loss of electrical power
  - Pumping water for flood control or fire suppression
  - Prevent sewage overflow
- Low-Use
  - 80 hours or less a year

# Emergency/Low-Use Engine Requirements

- Subject to 2010 engine replacement or Tier 4 option
- By 2020 engines must be:
  - Tier 4 engines, or
  - Retrofitted with verified control technology that achieves an 85% reduction

# Incentives

- Grid Power
- Alternative engines
- Early purchase of Tier 4 engines



# Recordkeeping

- Engines affected
  - Alternative-fueled engines
  - Engines affected by electrification
  - Low-Use engines
  - Emergency engines
- Requirements
  - Equipped with hour meter
  - Track annual hours of operation

# Reporting

- Status report due 2011
- Compliance report due 2013, 2017, and 2020



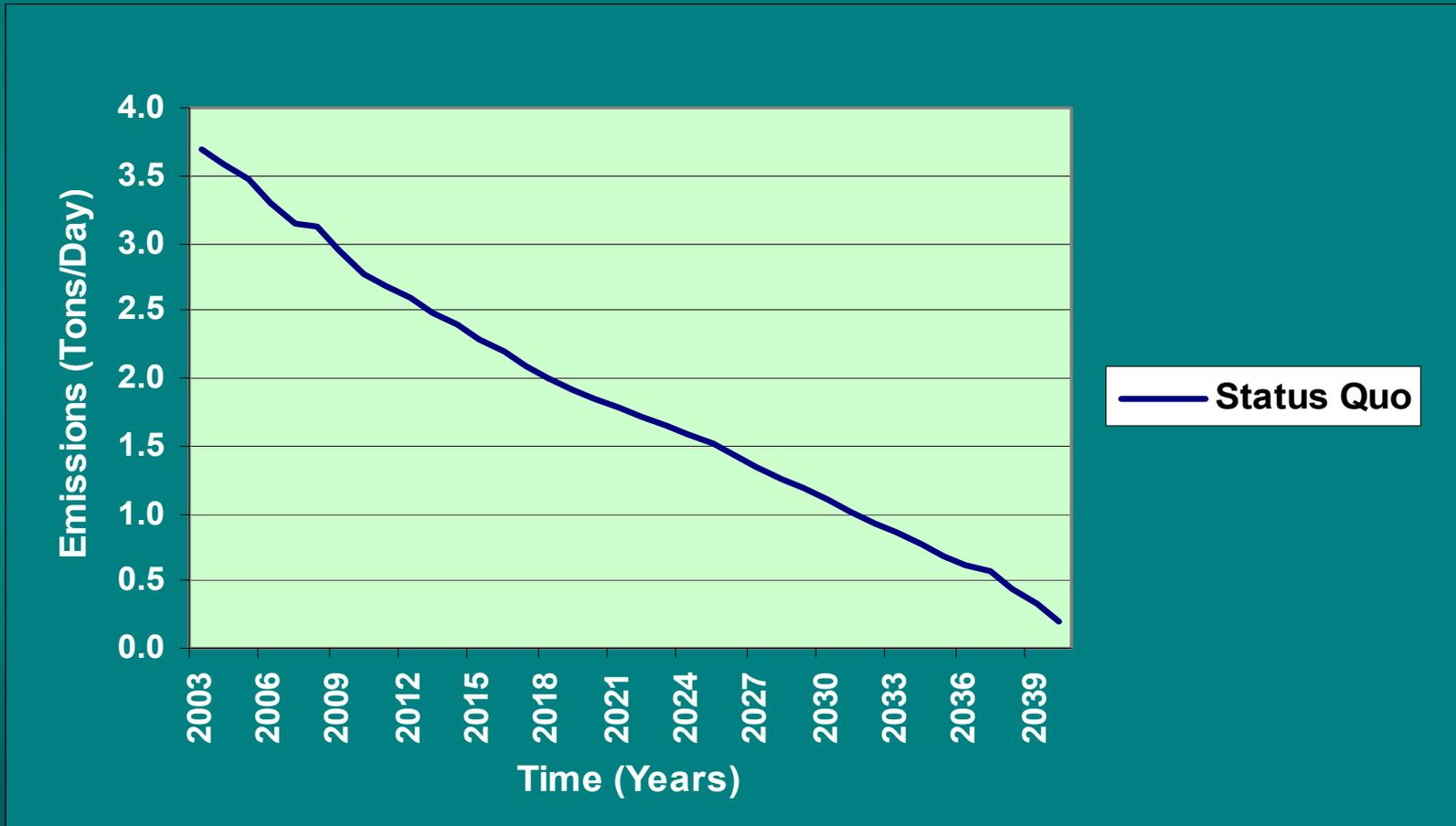
# Overview

- Background
- Existing Regulations
- Proposed ATCM
- **Environmental and Economic Impacts**
- Proposed 15-Day Changes
- Future Activities

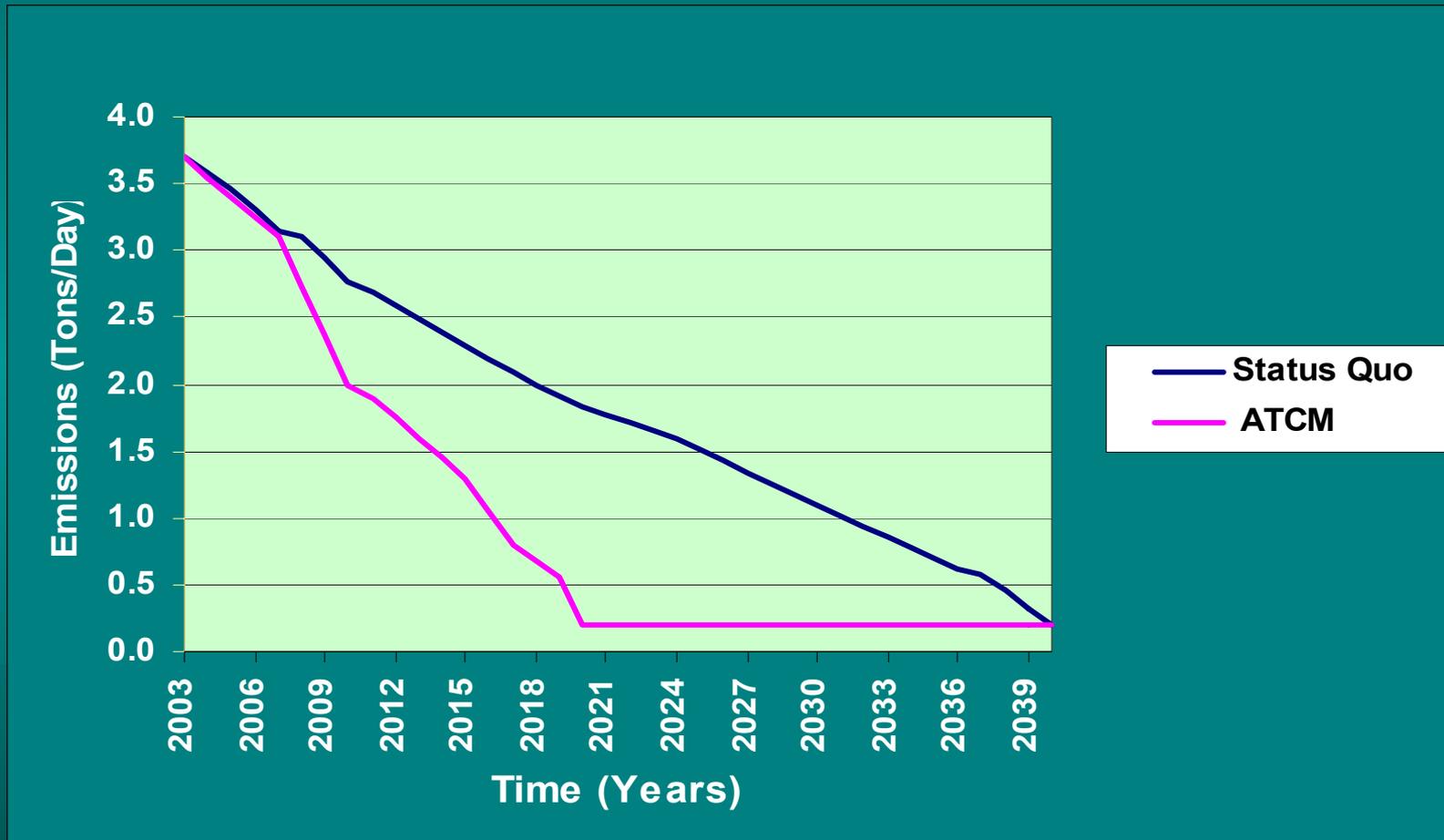


# **Air Quality Benefits of ATCM**

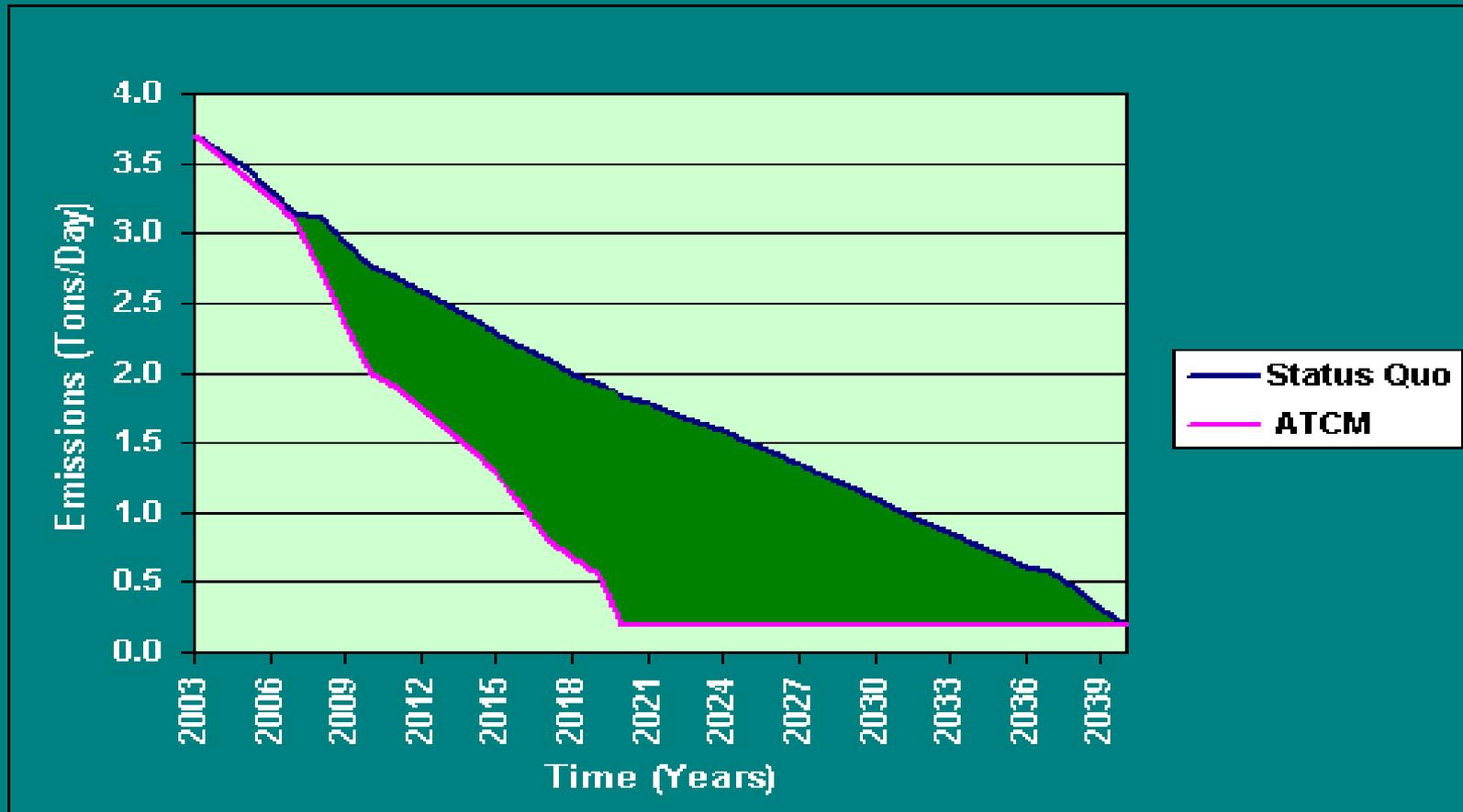
# Diesel PM Emission Reductions without ATCM



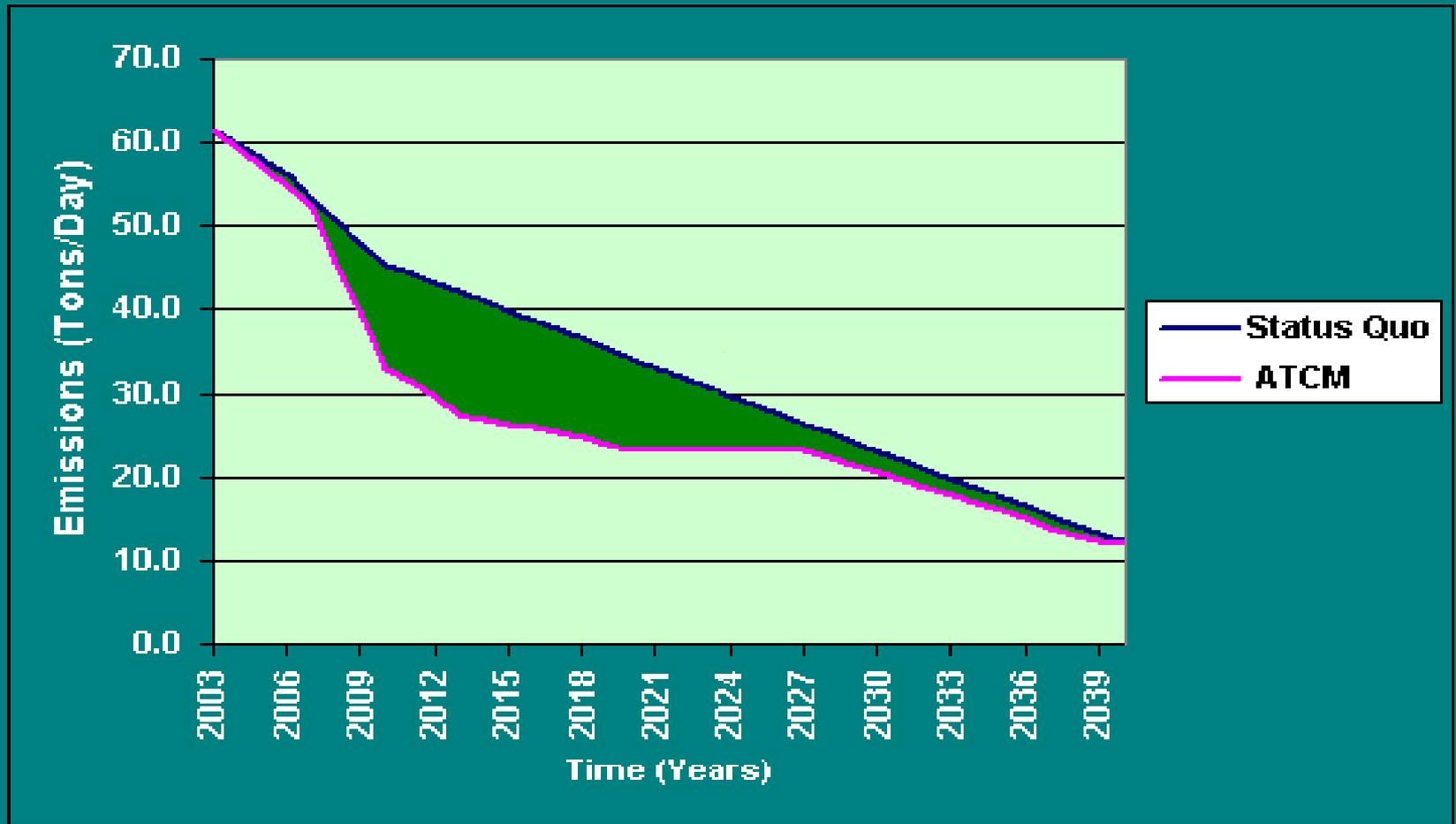
# Diesel PM Emission Reductions with and without ATCM



# Cumulative Diesel PM Emission Reductions with ATCM



# NOx Emission Reductions with and without ATCM



# Health Benefits

- Exposure and associated risk to all receptors reduced
- Estimated avoided premature deaths:
  - 50 by 2010
  - 340 by 2020



# Estimated Costs

Total Cost      \$350 to \$420 million

Annual Cost      \$2,000 to \$8,000

# Cost-Effectiveness

- Considering only diesel PM reductions
- \$16 to \$19 per pound of diesel PM reduced
- Other ATCM ranges:
  - Stationary engines \$15 per pound
  - TRUs \$10-20 per pound

# Overview

- Background
- Existing Regulations
- Proposed ATCM
- Environmental and Economic Impacts
- **Proposed 15-Day Changes**
- Future Activities

# Summary of Proposed Changes

- Flex Engines
  - consistent with federal and ARB engine requirements
- Lattice Boom Crane Engines
- Other Clarifications

# Overview

- Background
- Existing Regulations
- Proposed ATCM
- Environmental and Economic Impacts
- Proposed 15-Day Changes
- **Future Activities**

# Future Activities

- Seek Section 209(e) waiver from U.S. EPA
- Develop outreach program
- Monitor development of emission control technologies
- Report to the Board no later than 2008 on feasibility of the fleet PM standards compliance dates
- Schools

# Staff's Recommendation

- Approve the proposed ATCM with modifications