Multiple Air Toxics Exposure Study (MATES-II) in the South Coast Air Basin

Presentation by Mel Zeldin
South Coast Air Quality Management District
at the 6th Diesel Engine Emissions Reduction Workshop
San Diego, CA
August 22, 2000
MATES II
Components

• Ambient Toxics Monitoring

• Toxics Emissions Inventory

• Modeling/Risk Assessment
MATES-II

Background

• One Year Toxics Monitoring at 10 Sites
• Complementary One-Month Sampling
  - 3 Mobile Platform
  - 14 Communities
• Over 30 Toxic Pollutants Measured
  - Gaseous
  - Particulates
MATES II Monitoring Network

Fixed Sites

Microscale Sites
MATES-II
Background (Continued)

• Program Review by Panel of Experts
  - Academia
  - Environmental Groups
  - Industry & Private Sector
  - Federal, State, Local Agencies

• Sampling Period: April, 1998 to March, 1999
Comparison of Cancer Risks

MATES - I vs MATES - II

Risk (in one million)

Study/Site

LA  LB  RU  I-Ave.

LA  LB  RU  II-Ave.
Cancer Risks
(Excluding Diesel)

Risk (in one million)

Site
AN  BK  LA  CP  FT  HP  LB  PR  RU  WI

Mobile
Stationary
Diesel Mobile Stationary Cancer Risks

( Including Diesel )

Cancer Risks

Risk (in one million)

Site

AN   BK   LA   CP   FT   HP   LB   PR   RU   WI

Diesel  Mobile  Stationary
Cancer Risks
(Stationary Sources Only)
Basinwide Cancer Risks* ~ 1400 in a Million

*Based on average concentrations at 8 sites.
Model Estimated Risk
Excluding Diesel Sources
Model Estimated Risk From All Emission Sources
MATES-II Results (Fixed Sites)

- Risk Levels Consistent with Downward Trends
- Mobile Sources are Dominant Contributors to Risk
- Diesel Particulates Account for ~70% of Total Risk
MATES-II Results (Fixed Sites Continued)

- Generally Higher Risk in Urban Core Areas Due to Greater Mobile Source Influence
- Risk from Stationary Sources Rather Homogeneous Across Basin
MATES-II Results
(Fixed Sites Continued)

• Modeling Consistent with Measurement
  - Risk Estimates Close
  - Diesel is Major Contributor to Risk
Seasonal Risk Levels
(Stationary Sources Only)
MATES-II Results (Fixed Sites Continued)

- Strong Seasonal Variations in Toxic Risk Attributed Mostly to Mobile Sources
- Toxic Emissions from Stationary Sources Do Not Show Large Seasonal Variability
Microscale Study
MATES-II Results
Microscale Study

- Models Show Facility Risks Greatest Near “Fencelines”
- Locally Higher Levels Shown by Models, but Difficult to Detect with Limited Monitoring
MATES-II Results
Microscale Study

• Only One High Concentration Situation Measured (for Styrene in Anaheim)

• Finding Confirmed by Local Inventories
Uncertainties

(1) Indirect Measurement of Diesel Particulates
(2) Determination of Risk Values (URF’s)
(3) Laboratory/Measurement Processes
(4) Model Inputs
(5) Model Computational Algorithms
Summary

- Diesel Particulate Most Significant Contributor to Cancer Risk
- Mobile Sources Account for ~90% of Cancer Risks
- Strong Seasonality for Mobile Source TAC’s
- Arrays of Monitors Needed for Local “Hot Spot” Monitoring