

# 2016 Air Quality Management Plan

## Appendix I – Health Effects



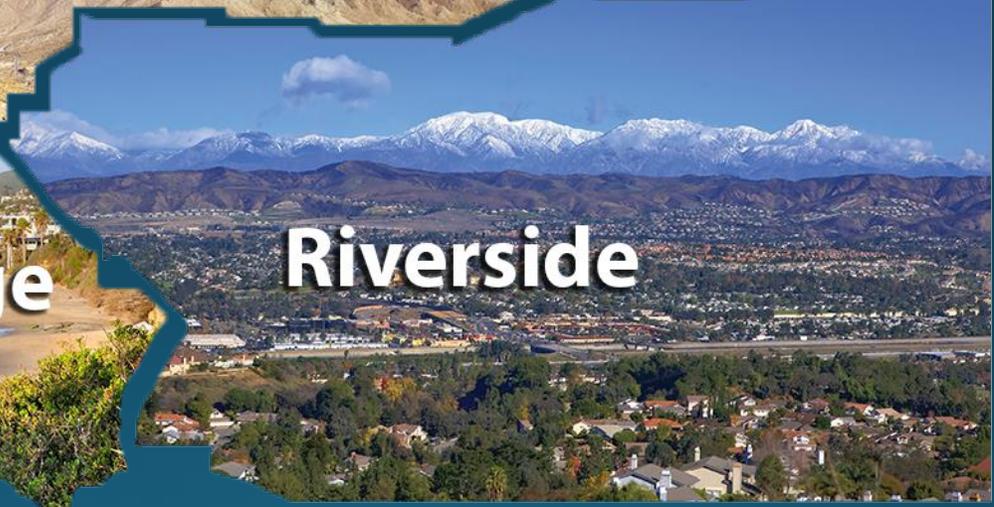
Los Angeles



San Bernardino



Orange



Riverside

2016 AQMP  
Public Hearings

November 15-17, 2016



# Appendix I – Health Effects

- **Content**

- ✓ Criteria pollutants

- Ozone, PM, CO, NO<sub>2</sub>, SO<sub>2</sub>, lead

- ✓ Toxic air contaminants

- ✓ Summary of health effects

- ✓ Draws from scientific assessments and reviews by U.S. EPA and other agencies, with a supplemental literature review to search for scientific articles published since the latest U.S. EPA review

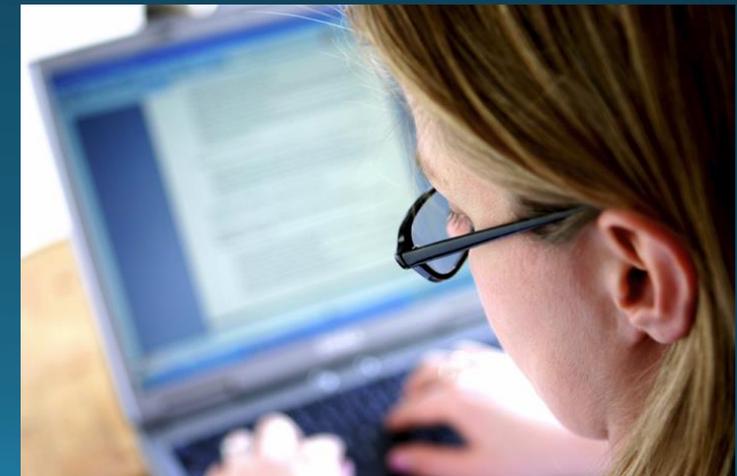


# Report on PM in South Coast

- Prepared in conjunction with a public health agency\* (OEHHA)
  - ✓ Also prepared in consultation with CARB
- Advisory Council†
  - ✓ Formed late 2015: 15 members chosen by Governing Board and Advisory Groups
  - ✓ Convened August 2016: reviewed and discussed Appendix I draft document
- Report included within Appendix I of 2016 AQMP
  - ✓ Report modified to reflect Advisory Council and health agency comments received
  - ✓ Circulated with Draft 2016 AQMP since July 2016

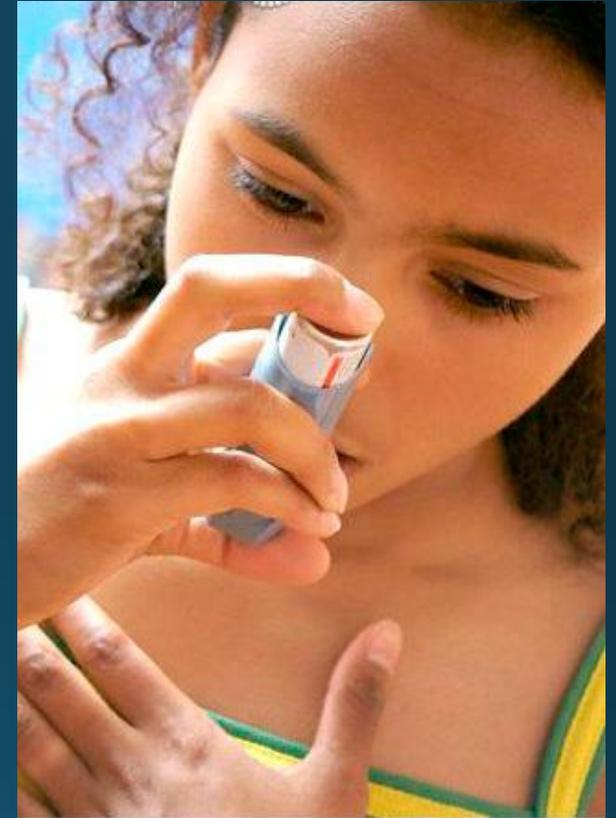
\* California Health & Safety Code §40471

† California Health & Safety Code §40471 and §40428



# Summary of Appendix I

- Purpose: provide a brief overview of the effects observed and attributed to various air pollutants, and describe the health impacts of PM
- Greater focus on Ozone and PM
- Large body of scientific evidence shows adverse impacts of air pollution on human health
  - ✓ Toxicological studies
  - ✓ Epidemiological studies
  - ✓ Human experimental studies
- Some populations more sensitive to the effects of air pollution, e.g. based on age, genetic factors, health conditions, SES



# PM Effects

## EPA Causal Determinations of PM<sub>2.5</sub> Based on 2009 Integrated Science Assessment

Health Outcome	Short-Term Exposure	Long-Term Exposure
Cardiovascular effects	Causal relationship	Causal relationship
Respiratory effects	Likely to be a causal relationship	Likely to be a causal relationship
Mortality	Causal relationship	Causal relationship
Reproductive and Developmental	---	Suggestive of a causal relationship
Cancer, Mutagenicity, Genotoxicity	---	Suggestive of a causal relationship

# Ozone Effects

## EPA Causal Determinations of Ozone Based on 2013 Integrated Science Assessment

Health Outcome	Short-Term Exposure	Long-Term Exposure
Respiratory effects	Causal relationship	Likely to be a causal relationship
Cardiovascular effects	Likely to be a causal relationship	Suggestive of a causal relationship
Mortality	Likely to be a causal relationship	Suggestive of a causal relationship
Reproductive and Developmental	---	Suggestive of a causal relationship

# Response to Comments on Appendix I

Topic	Action Taken
Purpose of Appendix I	<ul style="list-style-type: none"> <li>Clarified the purpose of this document, and the role of the different agencies in the assessment of the science and the implementation of plans to meet the standards.</li> </ul>
Toxics	<ul style="list-style-type: none"> <li>Added brief discussion of VOCs</li> <li>Added discussion of Advanced Collaborative Emissions Study (ACES) study in diesel PM section</li> </ul>
Ozone	<ul style="list-style-type: none"> <li>Reorganized section and focused on health endpoints that were determined to have a “causal” or “likely causal” relationship.</li> <li>Expanded the discussion of sensitive populations.</li> </ul>
PM	<ul style="list-style-type: none"> <li>Reorganized section and focused on health endpoints that were determined to have a “causal” or “likely causal” relationship. All health endpoints that were lower on the causal determination scale were grouped into an “emerging areas of interest” section.</li> <li>Expanded UFP section and moved it to be within the PM section.</li> <li>Expanded the discussion of sensitive populations</li> <li>Reworked summary to focus on the main points of the section. A section for “Estimates of the Health Burden of PM in the SCAB” has been added as well as mortality and morbidity numbers from the socioeconomic analysis.</li> </ul>

# Response to Comments on Appendix I

Topic	Action Taken
No health risk associated with PM in California	U.S. EPA's causal determinations were summarized. A large body of scientific evidence, including studies conducted in California, associate air pollution to health risks.
Potential confounding by smoking not addressed in studies of PM health effects	The majority of the studies discussed adjusted for the potential confounding effect of smoking. Text was added to the Appendix I to clarify when studies adjusted for smoking, particularly the studies of PM and mortality.
Health effects of odors not discussed	Staff will provide a brief discussion of health effects of odors, per request.

# Contact Information

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