

Ozone Overview

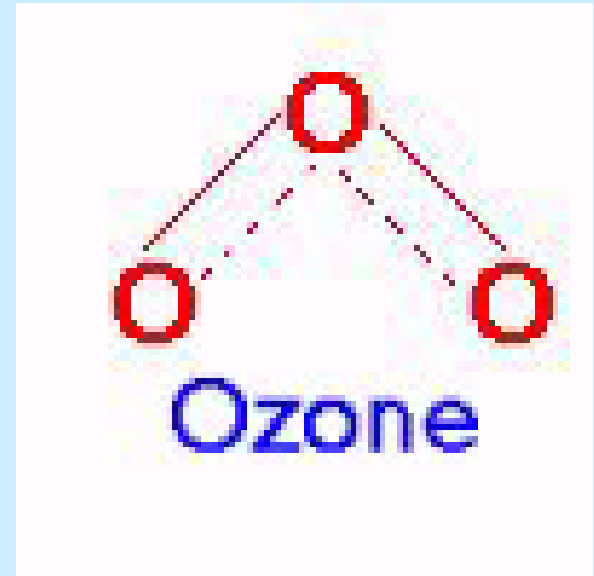
***2003 Ozone Plan
Technical Issues Workshop
July 23, 2003***

Don Hunsaker

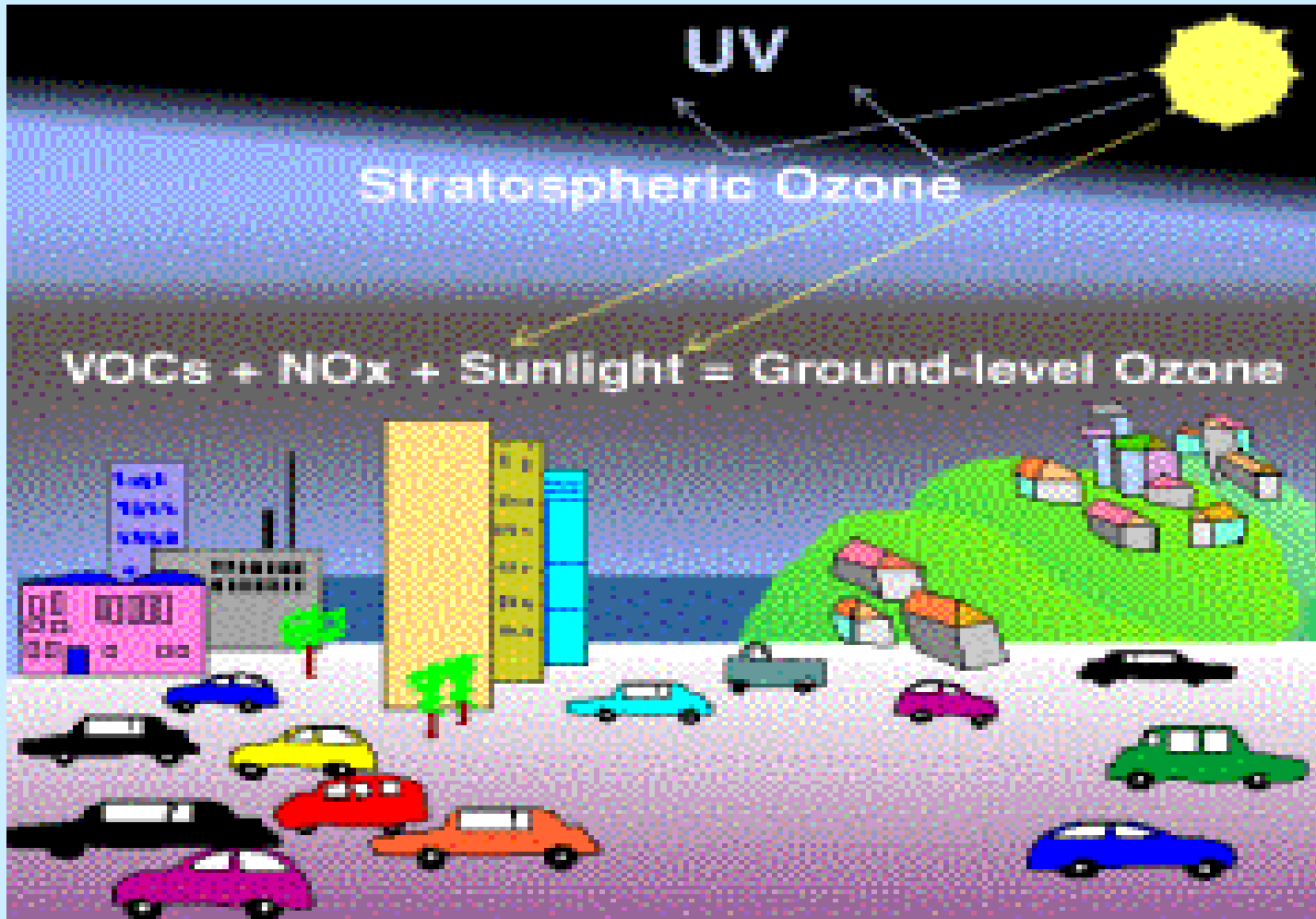


What is Ozone (O₃)?

- Molecule consisting of three oxygen atoms bound together
- Strong oxidizing agent—damages tissue and materials
- Forms naturally and from anthropogenic sources



O₃ Exists @ 2 Levels in Atmosphere



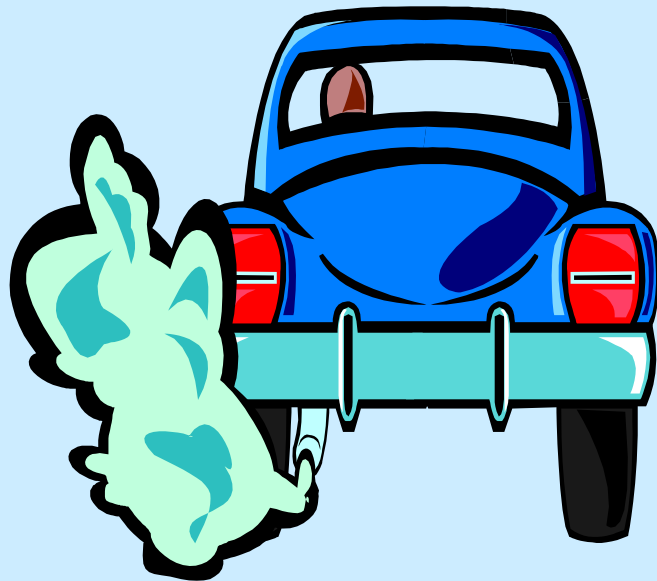
Ground-level O₃ Pollution



- Formed by complex series of chemical reactions in the atmosphere
- Precursors = chemicals that react to form ozone
 - Nitrogen Oxides (NO_x)
 - Volatile Organic Compounds (VOC)
- Light winds, high temperature & sunlight needed for reaction



Precursor Sources



- **Societal and natural sources**
- **Most NO_x comes from fuel combustion**
- **Most VOC comes from transportation, industry, consumers & natural sources**

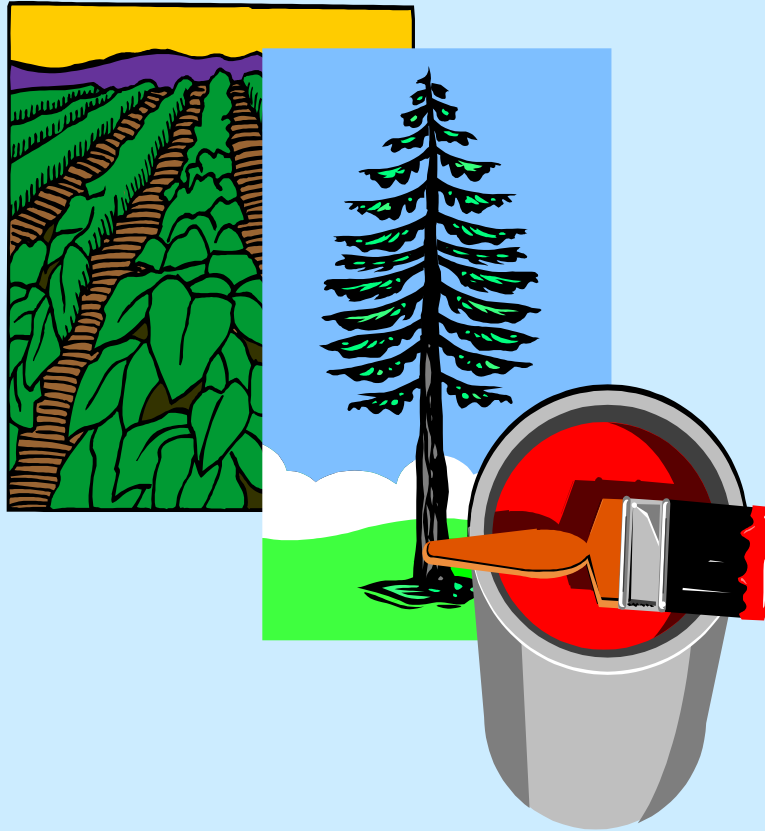


Ozone Health Effects

- Damages lungs
- Causes chest pain, coughing, shortness of breath and throat irritation
- Worsens respiratory diseases such as asthma
- Compromises the ability of the body to fight respiratory infections



Other Ozone Effects



- Damages plants
 - Crops
 - Landscaping
- Damages forests
- Damages materials
 - Rubber
 - Plastic
 - Vinyl



O₃ Air Quality Standards



- **0.12 ppm for federal 1-hour ozone**
- **0.08 ppm for federal 8-hour ozone**
- **0.09 ppm for state 1-hour ozone**



Federal Standards

- **Primary standards protect public health**
- **Secondary standards protect welfare (prevent materials damage, protect crops and forests, etc.)**
- **Averaging times represent time over which air sample taken (1-hr vs 8-hr)**



SJVAB 1-hr Ozone Trends

- Exceedances of federal 1-hr standard decreased from 74 days (1988) to 31 days (2002)
- Maximum O₃ value decreased from 0.200 ppm (1987) to 0.164 in 2002
- But can only have 3 days over 3 yr period with 1-hr levels > 0.124 ppm @ given monitor



Attainment Classification

- EPA uses measured pollutant levels to classify areas as attainment or nonattainment, and to characterize magnitude of nonattainment
 - Pollutant levels above standard
 - Number of days @ given monitor
- Nonattainment classes: marginal ⇨ moderate ⇨ serious ⇨ severe ⇨ extreme
- Nonattainment planning requirements vary with classification



Planning Requirements

- **SJVAB previously designated *serious* nonattainment for federal 1-hour ozone, with attainment required by November 15, 1999**
- **SJVAB failed to reach attainment on schedule; in Nov. 2001, EPA bumped SJVAB up to *severe* status (attainment 11/15/05)**
- **EPA also requested**
 - **6 RACT rules adopted by 11/15/02; sanctions on June 11, 2003 if not**
 - **Other rule revisions, rate of progress demonstration, and attainment demonstration (all due 5/31/02)**

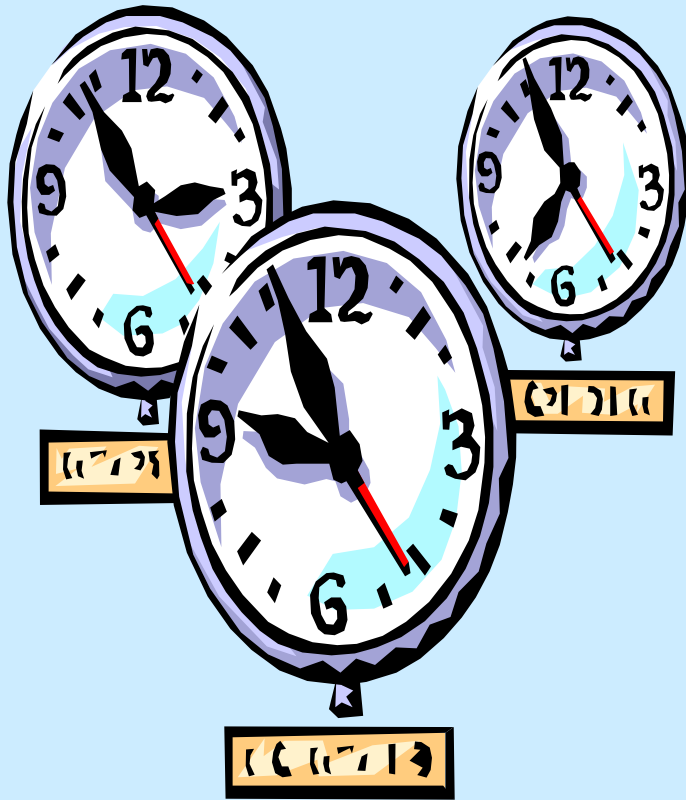


Planning Requirements (cont.)

- District submitted RACT rules, severe area permit rule amendments, and *2002-2005 Rate of Progress (ROP) Plan* on time
- But District and ARB unable to identify sufficient controls for 2005 attainment
- EPA issued *Federal Register* notice with Finding of Failure to Submit attainment demonstration & additional severe status items, effective September 18, 2002 (Federal clocks start)



Severe Plan Federal Clocks



- **September 18, 2002—**Sanction clocks and FIP clock start (EPA *Federal Register* notice)
- **March 18, 2004—**offset sanctions begin
- **September 18, 2004—**highway \$ sanctions begin and FIP promulgated



How to Stop the Clocks?

- EPA completeness finding of submittal stops sanctions:
 - OADP w/ 11/15/05 goal
 - ROP demonstration
 - RACT rule--lime kilns
 - Emissions inventory
 - Contingency measures
- EPA final approval of submittal stops FIP
- All items constitute submittal—no “partial credit”



O₃ Attainment Demonstration



- Previous modeling showed emission reduction shortfall of 300-400 tpd for SJVAB attainment (2005 VOC+NOx)
- District unable to identify reductions of this magnitude under our control
- Need additional emission reductions (state, federal & other District measures)
- State & federal measures are post-2005 & arrive too late for *severe* federal deadline



Voluntarily Change Attainment Status

- **The District can voluntarily request a change in our designation to allow time for more emission reductions to be achieved**
- **Self-designation to *extreme* status, and subsequent EPA approval, would eliminate *severe* area requirements and institute more stringent ones**
- **Attainment date changes from 11/15/05 to 11/15/10**

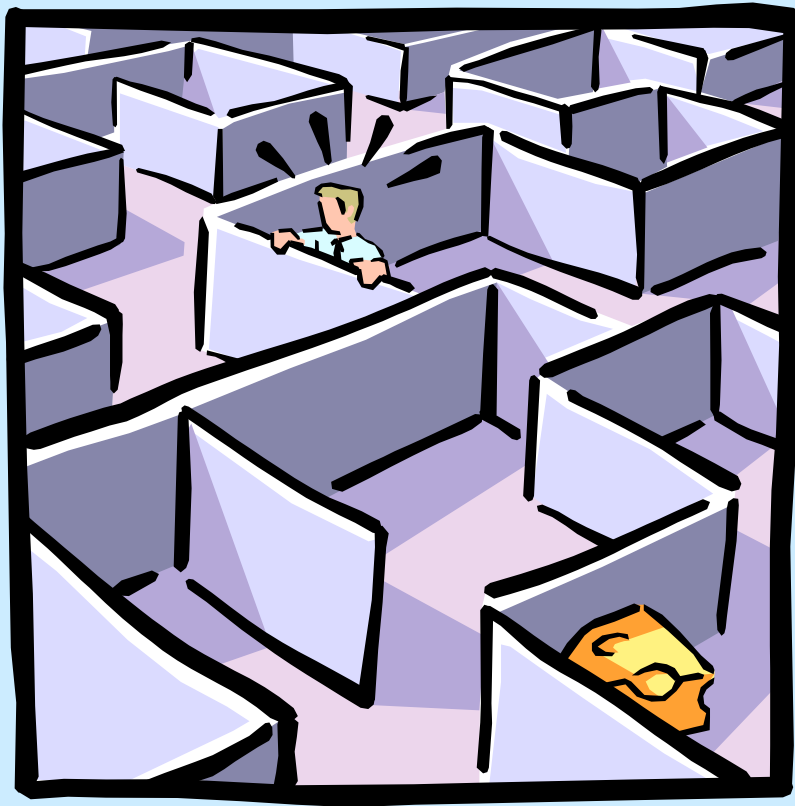


Extreme Nonattainment

- In June 2002 Board directed staff to
 - Develop expeditious rule schedule for all feasible control measures under District's control
 - Prepare plan for 2010 attainment & bring to Board no later than 12/03
 - Prepare resolution requesting reclassification to *extreme* & bring to Board no later than 9/03
- Changing attainment status from *severe* to *extreme* allows time for additional controls to be implemented (especially for critical mobile source NOx controls)



Complicating Factors

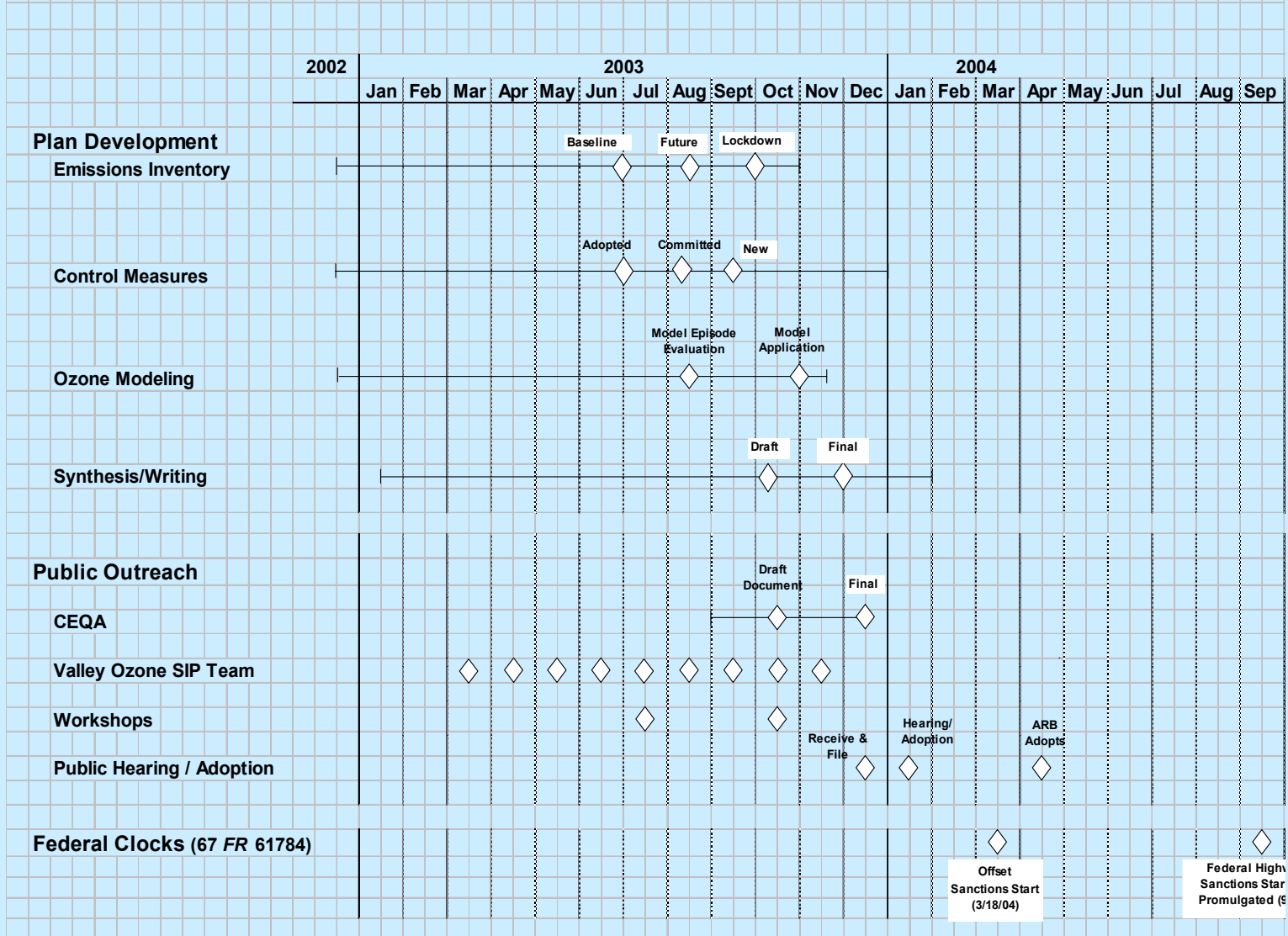


- EPA implementation of 8-hr O₃ standard proposes revocation of 1-hr standard
- EPA proposed rule for implementing 8-hr O₃ standard contains many options—no clear path



Ozone Attainment Demonstration Plan - Draft Schedule

San Joaquin Valley Air Basin--1-hr Federal Ozone Standard



Summary

- **Ozone is formed in the atmosphere by chemical reaction among pollutants emitted by society and by natural sources**
- **Ozone air pollution causes adverse health effects and crop and material damage**
- **Attaining the 1-hr ozone standard requires emission controls outside District authority**
- **Planning requirements complicated by changing standards**

