# GLOSSARY OF TERMS

**Air Basin** -- A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined along political boundary lines and include both pollution source and receptor areas. California is currently divided into 15 air basins.

**Air Quality Standard** -- The prescribed concentration of a pollutant in the ambient (outside) air that should not be exceeded during a specific time period to protect public health. Air quality standards are established by both federal and state governments to protect public health and welfare.

**ARB** -- Air Resources Board. The State of California's Air Resources Board (CARB) is the lead air quality management agency consisting of an eleven-member board and its staff. The ARB is responsible for the attainment and maintenance of the state and federal ambient air quality standards, and is fully responsible for controlling pollution from mobile sources. It oversees county and regional air pollution management programs.

**Carryover** -- The term "carryover" is used in a couple of contexts in this report. In a general sense, "carryover" refers to the temporal persistence of ozone precursors or ozone from one day to the next day or days when these pollutants continue to participate in ozone photochemistry. "Carryover" in the atmosphere near ground level refers to pollutants that have been emitted into stable air at the earth's surface during the late evening and night-time hours and that persist into the morning. Thus, fresh emissions during the next day are added into already polluted air, causing ambient concentrations to be higher than otherwise. "Carryover aloft" refers to pollutants that were mixed, injected, advected into, or formed within, an air mass a few tens to hundreds of meters above ground level. If this polluted mass of air aloft is not dispersed, it can be incorporated into the surface layer of air during the day when sunlight increases vertical mixing of the atmosphere and the polluted air mass is mixed into the surface layer of air rich in fresh emissions of pollutants.

**CO** -- carbon monoxide is a colorless, odorless gas that occurs naturally in the earth's atmosphere but significant quantities are also emitted during combustion of fossil fuels.

**Criteria air pollutant** -- A criteria pollutant is an air pollutant for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set (e.g., CO, $NO_2$, $O_3$, $SO_2$, PM, lead, sulfate).

**Dichot** -- Dichotomous particulate matter sampler. A sampler that splits the air being sampled into two components such that fine PM (PM2.5 or particulate matter less than 2.5 microns in aerodynamic diameter) and coarse PM (particulate matter

between 2.5 and 10 microns in diameter) are collected on separate filters. The sum of the fine and coarse PM is a measure of PM10.

**EKMA** -- Empirical Kinetic Modeling Approach. A relatively simple model with various potential levels of complexity that predicts the peak ozone concentrations anticipated from a variety of initial conditions of ozone precursors, VOCs and $NO_X$. A diagram of the relationship between VOCs, $NO_X$, and $O_3$ constitutes an EKMA diagram, which is often used to characterize the ozone formation potential.

**Exceedance** -- A measured concentration of an air pollutant greater than a national or state ambient air quality standard or episode level for that pollutant.

**Hydrocarbons** -- Compounds containing various combinations of hydrogen and carbon atoms. They may be emitted into the air by natural sources (e.g., trees, oil or gas seeps), and as a result of fossil and vegetative fuel combustion, fuel volatilization, and solvent use. Hydrocarbons are a major contributor to smog.

**Inversion layer** -- A layer of warm air in the atmosphere that prevents the rising of air beneath it and so traps pollutants beneath it.

**Isopleth** -- A line connecting points on a graph or map that have equal values with regard to other variables. For example, an EKMA diagram shows lines of equal ozone concentrations as a function of VOC and $NO_X$ concentrations.

**Light Duty Vehicle** -- Any motor vehicle with a gross vehicle weight of 6000 pounds or less.

**Mobile sources** -- Sources of air pollution such as automobiles, motorcycles, trucks. off-road vehicles, boats, and airplanes.

**NO (nitric oxide)** -- Nitric oxide is usually emitted from combustion processes and is a precursor of other pollutants. NO is converted to nitrogen dioxide in the atmosphere and then becomes involved in photochemical processes forming ozone, nitric acid, particulate nitrates, etc.

**$NO_X$ (oxides of nitrogen)** -- The $NO_X$ data used in this report do not represent total reactive oxides of nitrogen ($NO_Y$) because the analyzers do not have converters very near the probe inlet. Thus, some "sticky" compounds may be lost in the sampling line before reaching the analyzer.

**$NO_2$ (nitrogen dioxide)** -- The $NO_2$ data used in this report are derived by subtracting nitric oxide (NO) concentrations from the $NO_X$ concentrations. Thus, the $NO_2$ data represent not only nitrogen dioxide but also some unknown and variable but not total amounts of other oxidized nitrogen species such as nitric acid, and peroxyacetyl nitrates.

**$HNO_3$** – Nitric acid.

**Non-Methane Hydrocarbons (NMHCs)** -- The sum of all hydrocarbon species in the air except methane. NMHCs are precursors to ozone formation.

**Non-Methane Organic Gases (NMOGs)** -- The sum of non-methane hydrocarbons and other partially oxidized organic gases such as aldehydes, ketones, and ethers.

**Ozone ($O_3$)** -- A strong smelling, pale blue, reactive toxic gas consisting of three oxygen atoms. It is a product of photochemical reactions involving sunlight and ozone precursors (NMOG and $NO_X$) and is a major component of smog. Ozone causes numerous adverse health effects and is a criteria pollutant (i.e., has ambient air quality standards).

**Ozone Precursors** -- Chemicals such as NMOGs and $NO_X$, occurring naturally or as a result of human activities, which contribute to the formation of ozone.

**Ozone Weekend Effect** -- A term used to describe a tendency for ozone concentrations in some areas to be higher on the weekend than during the work week.

**PAMS (Photochemical Assessment Monitoring Station)** -- A monitoring site with enhanced monitoring (especially VOC species, but also $NO_Y$, meteorological conditions aloft) to better describe ozone formation processes.

**Photochemical Reaction** -- A term referring to chemical reactions enabled by the light energy of the sun.

**Photolysis** -- Chemical decomposition induced by light energy. For example, some wavelengths of solar energy break $NO_2$ molecules into a NO molecule and an O atom.

**PM (Particulate Matter)** -- Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of PM can vary from coarse wind-blown dust particles to fine particle combustion products.

**PM2.5 =** Particulate matter 2.5 microns or less in aerodynamic diameter.

**PM10 =** Particulate matter 10 microns or less in aerodynamic diameter.

**PTEP** -- PM10 Technical Enhancement Program PM sampler.

**Reactivity** -- A term used to describe a hydrocarbon's ability to participate in photochemical reactions to form ozone in the atmosphere. Different hydrocarbons react at different rates. The more reactive a hydrocarbon, the greater potential it has to form ozone.

**ROGs (Reactive Organic Gases)** -- Photochemically reactive gases, composed of non-methane hydrocarbons, that may contribute to the formation of smog.

**SCOS97** -- 1997 Southern California Ozone Study.

**Secondary Particle** -- Particles that form in the atmosphere as products of chemical reactions between gases such as oxides of nitrogen and sulfur, organic compounds, and ammonia.

**Soot** -- Very fine carbon particles that have a black appearance when emitted into the air.

**$SO_X$** -- Oxides of sulfur are pungent, colorless gases formed primarily by the combustion of sulfur-containing fossil fuels, especially coal and oil.

**SSI** -- Size Selective Inlet PM sampler.

**Stationary Sources** -- Non-mobile sources of pollutants such as power plants, refineries, and manufacturing facilities.

**Sunday Effect** -- A term used to describe a subset of the Weekend Effect in which ozone concentrations tend to be higher on Sunday than on Saturday.

**TACs (Toxic Air Contaminants)** -- Air pollutants, identified in regulation by ARB, which may cause or contribute to an increase in deaths or serious illness, or which may pose a present or potential hazard to human health. Health effects of TACs may occur at extremely low concentrations and it is typically difficult to identify levels of exposure which do not produce adverse health effects.

**THC (total hydrocarbons)**

**TNMOC (total non-methane organic carbon)**

**U.S. EPA** -- U.S. Environmental Protection Agency

**VOC (volatile organic compounds)** Carbon-containing compounds that evaporate into the air. VOCs contribute to the formation of smog.

**Weekend Effect** -- A term used to describe a tendency for a pollutant to have different concentrations on the weekend than during the work week. Also see Ozone Weekend Effect.