Abbreviations and Acronyms

CAA	Clean Air Act
CAAA	1990 Clean Air Act Amendments
CIRA	Cooperative Institute for Research in the Atmosphere, Colorado State University
EPA	United States Environmental Protection Agency
FACA	Federal Advisory Committee Act Subcommittee for Ozone, Particulate Matter, and Regional Haze Implementation Programs
f(RH)	Relative humidity adjustment factor
GCVTC	Grand Canyon Visibility Transport Commission
H_2S	Hydrogen sulfide
IMPROVE	Interagency Monitoring of PROtected Visual Environments
NAAQS	National Ambient Air Quality Standards
NAS	National Academy of Sciences
NDVI	Normalized Difference Vegetation Index
NESCAUM	Northeast States for Coordinated Air Use Management
NH_3	Ammonia
NM	National Monument
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NP	National Park
NPS	United States Department of the Interior, National Park Service
PM	Particulate matter
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 microns
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 microns
SCR	Selective catalytic reduction
SIP	State Implementation Plan
SO_2	Sulfur dioxide
STAPPA	State and Territorial Air Pollution Program Association
USDA	United States Department of Agriculture
VR	Visual range
WESTAR	Western States Air Resources Council

Glossary of Terms

Aerosols. Tiny liquid and/or solid particles dispersed in the air.

Coarse mass. Mass of particulate matter with an aerodynamic diameter greater than 2.5 microns but less than 10 microns.

Crustal material. Solid particulate matter represented by the sum of the soil mass and coarse mass.

Deciview haze index *(dv)*. Derived from calculated light extinction measurements so that uniform changes in haziness correspond to uniform incremental changes in perception across the entire range of conditions, from pristine to highly impaired. The deciview haze index is calculated directly from the total light extinction coefficient, b_{ext}, expressed in inverse megameters [Mm^{-1}]:

$$dv = 10 \ln (b_{ext} / 10\ Mm^{-1})$$

Elemental carbon. Often referred to as soot or light-absorbing carbon. Ambient elemental carbon measurements represent the carbon that was not converted to carbon dioxide or carbon monoxide during complete combustion processes.

Fine particulate matter. Particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$).

IMPROVE particulate sampler. A series of four samplers which concurrently collect two 24-hour particulate samples weekly on special teflon, nylon, and quartz filters for further physical and chemical analyses. The light extinction coefficients calculated from the aerosol mass concentrations measured by these filters are the basis for the visibility data discussions of this report (Appendix C).

Least-impaired days. Data representing a subset of the annual measurements that correspond to the clearest, or least hazy, days of the year (Appendix B).

Light extinction coefficient. Sometimes referred to in this report as light extinction, the light extinction coefficient is a measure of how much light is absorbed or scattered as it passes through a medium, such as the atmosphere. The aerosol light extinction coefficient refers to the absorption and scattering by aerosols, and the total light extinction coefficient (in this report) refers to the sum of the aerosol light extinction coefficient and the atmospheric light extinction coefficient (Rayleigh scattering).

Mandatory Federal Class I area. Certain national parks (over 6,000 acres), wilderness areas (over 5,000 acres), national memorial parks (over 5,000 acres), and international parks that were in existence as of August 7, 1977. Appendix A lists the Mandatory Federal Class I areas where visibility is an important value.

Mid-range. Data representing a subset of the annual measurements that correspond to the days of the year on which ambient particulate matter concentrations are near median levels (Appendix B).

Most-impaired days. Data representing a subset of the annual measurements that correspond to the dirtiest, or haziest, days of the year (Appendix B).

Nitrate. Solid or liquid particulate matter composed of nitric acid [HNO_3] or ammonium nitrate [NH_4NO_3]. Atmospheric nitrate aerosols are often formed from the atmospheric oxidation of oxides of nitrogen (NO_x) and are generally less than 2.5 microns in aerodynamic diameter.

Organic carbon. Aerosols composed of organic compounds, which may result from incomplete combustion processes, solvent evaporation followed by atmospheric condensation, or the oxidation of some vegetative emissions.

Particulate matter. Any substance, except pure water, that exists as a liquid or solid in the atmosphere under normal conditions and has an aerodynamic diameter less than 10 microns (in the discussions of this report).

Rayleigh scattering. Light scattering of the natural gases in the atmosphere. At an elevation of 1.8 kilometers, the light extinction from Rayleigh scattering is approximately 10 inverse megameters (Mm^{-1}).

Relative humidity. Partial pressure of water vapor at the atmospheric temperature divided by the vapor pressure of water at that temperature, expressed as a percentage.

Soil mass. Particulate matter composed of pollutants from the earth's soil, with an aerodynamic diameter less than 2.5 microns. The soil mass is calculated from chemical mass measurements of aluminum, silicon, calcium, iron, and titanium as well as their associated oxides.

Statistically significant trend. In this report, an observed trend is statistically significant when the probability that the trend is random is less than 5 percent. Using an example, Appendix D explains the Theil method for determining statistically significant trends.

Sulfate. Solid or liquid particulate matter composed of sulfuric acid [H_2SO_4], ammonium bisulfate [NH_4HSO_4], or ammonium sulfate [$(NH_4)_2SO_4$]. Atmospheric sulfate aerosols are often formed from the atmospheric oxidation of sulfur dioxide and are generally less than 2.5 microns in aerodynamic diameter.

Total carbon. Sum of the elemental carbon and organic carbon measurements.

Visibility impairment. Any humanly perceptible change in visibility (light extinction, visual range, deciview, contrast, coloration) from a previous cleaner condition.

Visual range (VR). Greatest distance that a large dark object can just be seen by a human observer, under uniform lighting conditions, against the background sky.