MONITORING OBJECTIVES AND SPATIAL SCALES

As listed by the U.S. Environmental Protection Agency, the monitoring objectives that the monitors in a monitoring network are to achieve include the following: (1) the highest pollutant concentrations; (2) the representative concentrations in areas of high population density; (3) the impact of major pollution emissions sources; (4) the general background concentration levels; (5) the extent of pollutant transport, and (6) impacts on visibility, vegetation, and other welfare-based impacts.

The physical siting of an air monitoring station must achieve a spatial scale of representativeness that is consistent with the monitoring objective of the monitor. The spatial scale results from the physical location of the site with respect to the pollutant sources. It estimates the size of the area surrounding the monitoring site that experiences uniform pollutant concentrations.

The categories of spatial scale are:

- Microscale - An area of uniform pollutant concentrations ranging from several meters up to 100 meters.
- Middle Scale - Uniform pollutant concentrations in an area of about 100 meters to 0.5 kilometer.
- Neighborhood Scale - An area with dimensions in the 0.5 to 4.0 kilometer range.
- Urban Scale - Citywide pollutant conditions with dimensions ranging from 4 to 50 kilometers.
- Regional Scale – A large area, usually rural, of the same general geography and without large sources that extends from tens to hundreds of kilometers.

Monitoring objectives and associated spatial scales are summarized in the table below.

Monitoring Objective	**Appropriate Spatial Scale**
Highest concentration or source impact	Micro, Middle, Neighborhood, or Urban*
High population densities	Neighborhood or Urban
Background levels, regional transport, or impacts on visibility, vegetation, and other welfare-based impacts.	Urban or Regional

***** Less frequently