

On-Site Meteorological Data Collection

The use of representative meteorological data plays a crucial role in the air quality model's ability to accurately predict ambient pollutant concentrations. The accurate depiction of spatial and geographic influences near a facility site is often achieved through the collection of site-specific meteorological data. This is particularly true in regions where National Weather Service data may not be available due to natural features such as complex terrain, forests, river bluffs, etc. Typically, the Environmental Protection Agency prefers the collection of site-specific meteorological data provided the collection criteria established in the document entitled "[Meteorological Monitoring Guidance for Regulatory Modeling Applications](#)" are followed.

A minimum of one-year of site-specific data is required for ambient air quality impact assessments. Site-specific measurements must include temperature, wind speed, wind direction, relative humidity, barometric pressure, total solar radiation and precipitation totals. Additional parameters that must be reported include the scalar average wind speed, vector average wind speed, wind speed standard deviation, scalar average wind direction, vector average wind direction, wind direction standard deviation (σ_{θ}) and the temperature difference between two and ten meters.

When siting meteorological instruments, particular attention must be paid to proper placement because a poorly sited instrument can result in biased data that does not accurately characterize local weather conditions. The primary objective of meteorological tower placement is the acquisition of precise atmospheric measurements that are not influenced by natural or man-made obstacles.

The siting, exposure, data acquisition procedures, data processing, data completeness and reporting requirements should be summarized and submitted via a Quality Assurance Project Plan to the Air Quality Monitoring Unit for approval prior to the start of any monitoring study.

In order to prevent delays in permit issuance, applicants that are required to collect on-site meteorological data should allow ample time for site approval. Again, a minimum of one-year of meteorological data is required for on-site air quality assessments without consideration of the review process and the time necessary to review site selection and collection procedures.