ADEC Meteorological Monitoring Site Approval Plan Checklist

Project Title: _____ **Date:** _____

Reviewed By: _____ **Date:** _____

ELEMENT	STATUS	COMMENTS
A. Simple Terrain		Any site where terrain effects on meteorological measurements are non-significant. Ref. EPA-454/R-99-005, Section 3.2 Simple Terrain Locations
1. Representative of conditions in "area of interest"		
Focus on the meteorological conditions at the release height of the source or sources		
Representativeness of the data will almost always be adversely affected (degraded) by increasing the distance between the sources and receptors (increasing the size of the area-of-interest)		
2. Obstructions		
Document all buildings, trees, towers and surface roughness		
Site maps (local project area and topographic) and photos (4 cardinal directions) will be require when submitting QAPP		
3. Wind Speed and Wind Direction		
Standard exposure height of wind instruments over level, open terrain is 10 m above the ground		
The slope of the terrain in the vicinity of the site should be taken into account when determining the relative height of the obstruction		
The sensor height, its height above obstructions, and the height/character of nearby obstructions should be documented.		
If the source emission point is substantially above 10 m, then additional wind measurements should be made at stack top or 100 m, whichever is lower		
Vertical wind velocity is critical component in understanding vertical turbulence in transport of aerosol particles/pollutants. Placement of vertical wind velocity measurements should be made at stack height. **Note: Not required, but aids AERMOD in vertical turbulence calculations**		
4. Temperature, Temperature Difference, and Humidity		
Temperature and humidity sensors should be located over an open, level area at least 9 m in diameter		
Sensors should be located at a distance of at least four times the height of any nearby obstruction and at least 30 m from large paved areas		
Other situations to avoid include: large industrial heat sources, rooftops, steep slopes, sheltered hollows, high vegetation, shaded areas, swamps, areas where frequent snow drifts occur, low places that hold standing water after rains, and the vicinity of air exhausts (e.g., from a tunnel or subway)		
In siting temperature sensors, care must be taken to preserve the characteristics of the local environment, especially the surface		
The surface should be covered by short grass, or, where grass does not grow, the natural earth surface		
Temperature and humidity sensors on towers should be mounted on booms at a distance of about one diameter/diagonal of the tower (from the nearest point on the tower)		
5. Pressure		

ELEMENT	STATUS	COMMENTS
Sensor model type may be determined by the modeling applications, check model users guide for specific requirements		
6. Radiation/Pyranometer		
Located with an unrestricted view of the sky in all directions during all seasons, with the lowest solar elevation angle possible		
A tall platform or rooftop is a desirable location		
Net radiometers should be mounted about 1 m above the ground and located to avoid obstructions to the field of view both upward and downward. Ground cover under a net radiometer should be representative of the general site area		
Should be located to avoid obstructions casting a shadow on the sensor at any time, also light colored walls and artificial sources of radiation should be avoided		
B. Complex Terrain		Any site where terrain effects on meteorological measurements may be significant. Ref. EPA-454/R-99-005, Section 3.3 Complex Terrain Locations
Objectives for Siting		
Representativeness has been defined as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application		
Meteorological data should be representative of conditions affecting the transport and dispersion of pollutants in the “area of interest” as determined by the locations of the sources and receptors being modeled.		
In steady-state modeling applications, one typically focuses on the meteorological conditions at the release height of the source or sources, or the **plume height in the case of buoyant sources.**		
Site maps (local project area and topographic) and photos (4 cardinal directions) will be require when submitting QAPP		
1. Representative of conditions in “area of interest”		
Multiple monitoring sites may be required to adequately represent spatial variations in meteorological conditions.		
Focus on the meteorological conditions at the release height or plume height of the source or sources		
Representativeness of the data will almost always be adversely affected (degraded) by increasing the distance between the sources and receptors (increasing the size of the area-of-interest)		
Factors that should be considered in selecting a monitoring site in complex terrain include: the aspect ratio and slope of the terrain, the ratios of terrain height to stack height and plume height, the distance of the source from the terrain feature, and the effects of terrain features on meteorological conditions, especially wind speed and wind direction.		
2. Obstructions		
Meteorological sensors should be sited at a distance which is beyond the influence of obstructions such as buildings and trees		
3. Wind Speed and Wind Direction		
For use in plume rise calculations, wind speed should be measured at stack top or 100 m, whichever is lower. Ideally, the wind speed sensor should be mounted on a tower located near stack base elevation; however, a tower located on nearby elevated terrain may		

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be used in some circumstances. In this latter case, the higher the tower above terrain the better (i.e. less compression effect); a 10-meter tower generally will not be sufficient. The measurement location should be evaluated for representativeness of both the dilution process and plume rise.		
Great care should be taken to ensure that the tower is not sheltered in a closed valley (this would tend to over-estimate the occurrence of stable conditions) or placed in a location that is subject to streamline compression effects (this would tend to underestimate the occurrence of stable conditions). It is not possible to completely avoid both of these concerns. If a single suitable location cannot be found, then alternative approaches, such as multiple towers or a single tall tower supplemented by one or more remote sensing platforms should be considered.		
Vertical wind velocity is critical component in understanding vertical turbulence in transport of aerosol particles/pollutants. Placement of vertical wind velocity measurements should be made at stack height. **Note: Not required, but aids AERMOD in vertical turbulence calculations**		
4. Temperature, Temperature Difference, and Humidity		
The height ranges of interest are from stack top to plume height for the former and from plume height to the top of the terrain feature for the latter. The direct measurement of the complete temperature profile is often desirable but not always practical.		
Temperature and humidity sensors on towers should be mounted on booms at a distance of about one diameter/diagonal of the tower (from the nearest point on the tower)		
5. Pressure		
Sensor model type may be determined by the modeling applications, check model users guide for specific requirements		
5. Radiation/Pyranometer		
Located with an unrestricted view of the sky in all directions during all seasons, with the lowest solar elevation angle possible		
A tall platform or rooftop is a desirable location		
Net radiometers should be mounted about 1 m above the ground and located to avoid obstructions to the field of view both upward and downward. Ground cover under a net radiometer should be representative of the general site area		
Should be located to avoid obstructions casting a shadow on the sensor at any time, also light colored walls and artificial sources of radiation should be avoided		
C. Coastal Locations		
Objectives for Siting		
The unique meteorological conditions associated with local scale land-sea breeze circulations necessitate special considerations		
In coastline areas of complex terrain also refer to B. Complex Terrain, Objective to Siting and 1. Representative of conditions in "area of interest"		
Site maps (local project area and topographic) and photos (4 cardinal directions) will be require when submitting QAPP		
1. Representative of conditions in "area of interest"		

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To provide representative measurements for the entire area of interest, multiple sites would be needed to estimate the thermal internal boundary layer (TIBL): One site at a shoreline location (to provide 10 m and stack height/plume height wind speed), Additional inland sites perpendicular to the orientation of the shoreline to provide wind speed within the thermal internal boundary Layer (TIBL)		
Where terrain in the vicinity of the shoreline is complex, measurements at additional locations, such as bluff tops, may also be necessary.		
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Meteorological sensors should be sited at a distance which is beyond the influence of obstructions such as buildings and trees		
3. Wind Speed and Wind Direction		
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The slope of the terrain in the vicinity of the site should be taken into account when determining the relative height of the obstruction		
The sensor height, its height above obstructions, and the height/character of nearby obstructions should be documented.		
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These elements, when adequately completed, meet the State Met siting requirements.
For further guidance see EPA-454/R-99-005 (https://www3.epa.gov/ttn/scram/guidance/met/mmgrma.pdf)

✔ Acceptable- no other information needed.

🛠 Information must be changed or fixed.

✘ Not acceptable: major additions or changes required.

ⓘ Information is provided for benefit of applicant.

? Information is incomplete: some clarification is necessary.