



Network Design and Network Modifications

EPA Requirements

2024 CARB PQA Training

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Jennifer Williams, EPA Region 9

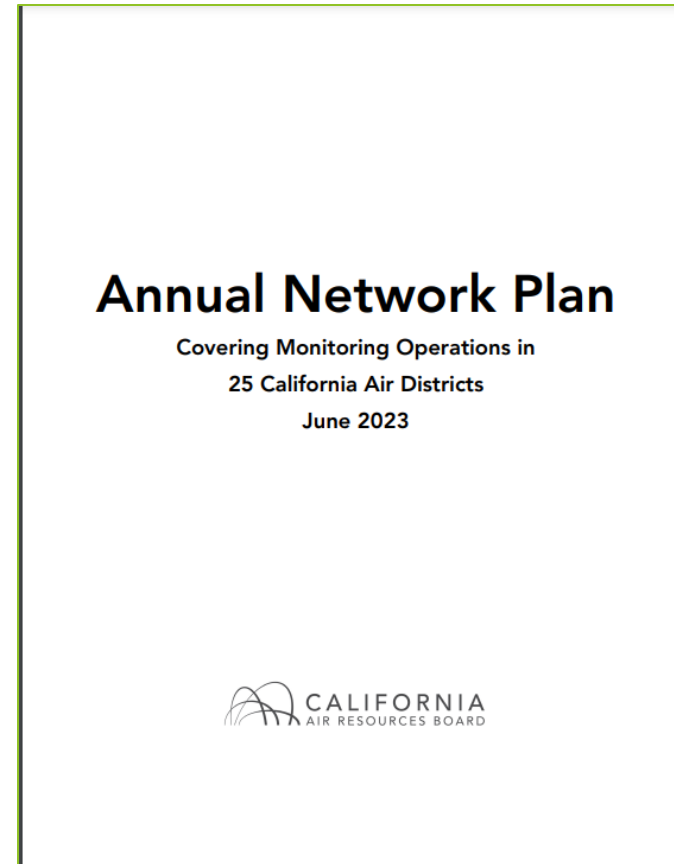
Outline

- ▶ Annual Monitoring Network Plan and Periodic Network Assessment
- ▶ ***New CFR Language for Network Assessments***
- ▶ Monitoring Objectives and Spatial Scales
- ▶ Specific Network Design Criteria for O₃, PM_{2.5}, and PM₁₀
- ▶ ***New CFR Language for PM_{2.5} Network Design Criteria***
- ▶ General Network Design Criteria for CO, NO₂, SO₂, and Pb (specific criteria included in Appendix)
- ▶ System Modifications

Monitoring Network

Annual monitoring network plan and periodic network assessment

- ▶ Annual Network Plan
 - ▶ Due July 1 of each year
 - ▶ Describes the current network and includes proposed changes
- ▶ Network Assessment
 - ▶ Due every five years on July 1 (next submission due July 1, 2025)
 - ▶ Overarching review of network



Monitoring Network

NEW CFR LANGUAGE: NETWORK ASSESSMENT

- ▶ 40 CFR 58.10 (d) The state, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma) **and other at-risk populations**, and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby states and tribes or health effects studies. The state, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The assessments are due every five years beginning July 1, 2010.

Network Design Criteria for Ambient Air Quality Monitoring

Monitoring Objectives and Spatial Scales

- ▶ 3 monitoring objectives:
 - ▶ Provide air pollution data to the general public in a timely manner
 - ▶ Support compliance with ambient air quality standards and emissions strategy development
 - ▶ Support for air pollution research studies
- ▶ 6 general site types
- ▶ 6 spatial scales



Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: O₃

▶ Minimum Monitoring Requirements:

- ▶ MSA population/concentration-based
- ▶ At least one maximum concentration site within MSA

MSA Population	Most recent 3-year design value concentrations ≥85% of any O ₃ NAAQS	Most recent 3-year design value concentrations <85% of any O ₃ NAAQS
> 10 million	4	2
4 - 10 million	3	1
350,000 - <4 million	2	1
50,000 - <350,000	1	0

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: PM₁₀

- ▶ Minimum Monitoring Requirements:
 - ▶ MSA population/ concentration-based

Population Category	High Concentration	Medium Concentration	Low Concentration
> 1,000,000	6-10	4-8	2-4
500,000 - 1,000,000	4-8	2-4	1-2
250,000 - 500,000	3-4	1-2	0-1
100,000 - 250,000	1-2	0-1	0

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: PM_{2.5}

▶ Minimum Monitoring Requirements:

- ▶ MSA population/concentration-based
- ▶ At least one site in area of expected maximum concentration (neighborhood scale or larger)
- ▶ CBSA population ≥ 1,000,000: one PM_{2.5} site collocated with near-road NO₂ site
- ▶ If additional SLAMS required, one in area of poor air quality / “For areas with additional required SLAMS, a monitoring station is to be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area (e.g., a major industrial area, point source(s), port, rail yard, airport, or other transportation facility or corridor).”

MSA Population	Most recent 3-year design value ≥85% of any PM _{2.5} NAAQS	Most recent 3-year design value <85% of any PM _{2.5} NAAQS
> 1,000,000	3	2
500,000 - 1,000,000	2	1
50,000 - <500,000	1	0

- ▶ Continuous monitoring
- ▶ Background/Transport sites
- ▶ CSN sites

Network Design Criteria for Ambient Air Quality Monitoring

NEW CFR LANGUAGE: PM_{2.5}

- ▶ 40 CFR 58 Appendix D 4.7.1(a) State, and where applicable local, agencies must operate the minimum number of required PM_{2.5} SLAMS sites listed in table D-5 to this appendix. The NCore sites are expected to complement the PM_{2.5} data collection that takes place at non-NCore SLAMS sites, and both types of sites can be used to meet the minimum PM_{2.5} network requirements. For many State and local networks, the total number of PM_{2.5} sites needed to support the basic monitoring objectives of providing air pollution data to the general public in a timely manner, support compliance with ambient air quality standards and emission strategy development, and support for air pollution research studies will include more sites than the minimum numbers required in table D-5 to this appendix. Deviations from these PM_{2.5} monitoring requirements must be approved by the EPA Regional Administrator.
- ▶ 40 CFR 58 Appendix D 4.7.1(b)(3) For areas with additional required SLAMS, a monitoring station is to be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area (e.g., a major industrial area, point source(s), port, rail yard, airport, or other transportation facility or corridor).

Network Design Criteria for Ambient Air Quality Monitoring

NEW CFR LANGUAGE: PM_{2.5}

- ▶ 40 CFR 58.10(14) The identification of any site(s) intended to address being sited in an at-risk community where there are anticipated effects from sources in the area as required in section 4.7.1(b)(3) of appendix D to this part. An initial approach to the question of whether any new or moved sites are needed and to identify the communities in which they intend to add monitoring for meeting the requirement in this paragraph (b)(14), if applicable, shall be submitted in accordance with the requirements of section 4.7.1(b)(3) of appendix D to this part, which includes submission to the EPA Regional Administrator no later than July 1, 2024. Specifics on the resulting proposed new or moved sites for PM_{2.5} network design to address at-risk communities, if applicable, would need to be detailed in annual monitoring network plans due to each applicable EPA Regional office no later than July 1, 2025. The plan shall provide for any required sites to be operational no later than 24 months from date of approval of a plan or January 1, 2027, whichever comes first.

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: NO₂, CO, SO₂, Pb

- ▶ Generally, minimum monitoring requirements include near-road requirements, emissions-based requirements, and regional administrator required monitoring (not an inclusive list)
- ▶ See Appendix for slides on the specific requirements



U.S. Environmental Protection Agency



System Modifications

Process

- ▶ Inform PQAO liaison and EPA as soon as possible
- ▶ Draft Letter (PQAO liaison and EPA review if possible)
- ▶ Submit formal letter or include in annual network plan
- ▶ Include in next year's annual network plan for public comment if it was a stand-alone letter



System Modifications

Closures

► 40 CFR Part 58.14

► Closure citation options (c)(1)-(c)(5) or (c) case-by-case

	CO	NO ₂	O ₃	Pb	PM _{2.5}	PM ₁₀	SO ₂
(c)(1)	X	X	X	X	X	X	X
(c)(2)	X	X				X	X
(c)(3)	X	X	X	X	X	X	X
(c)(4)					X		
(c)(5)		X	X		X		
(c) case-by-case	X	X	X	X	X	X	X

System Modifications

Relocations



- ▶ 40 CFR Part 58.14
 - ▶ (c)(6) and (b)
 - ▶ “nearby location with the same scale of representation”



CONTACT INFO:

Jennifer Williams

Williams.Jennifer@epa.gov



Appendices:

Slide 17: Network Design Criteria for CO

Slide 18: Network Design Criteria for NO₂

Slide 19: Network Design Criteria for SO₂

Slide 20: Network Design Criteria for Pb

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: CO

- ▶ Minimum Monitoring Requirements:
 - ▶ CBSA population > 1,000,000: one CO near-road monitor collocated with near-road NO₂ monitor (if CBSA is required to operate two NO₂ monitors, only one CO monitor is required)
 - ▶ Regional Administrator Required Monitoring

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: NO₂

- ▶ Minimum Monitoring Requirements:
 - ▶ CBSA population > 1,000,000: one NO₂ site
 - ▶ CBSA population >2,500,000 OR CBSA population >1,000,000 and has one or more roadway segments with AADT > 250,000: second NO₂ site
 - ▶ CBSA population >1,000,000: one area-wide monitor in area of expected highest concentrations
 - ▶ Regional Administrator Required Monitoring “RA 40”

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: SO₂

- ▶ Minimum Monitoring Requirements:
 - ▶ Each CBSA: Population Weighted Emissions Index (PWEI)
 - ▶ Regional Administrator Required Monitoring

Network Design Criteria for Ambient Air Quality Monitoring

Pollutant-Specific Design Criteria for SLAMS Sites: Pb

- ▶ Minimum Monitoring Requirements:
 - ▶ Non-airport Pb source emits > 0.5 tons or more a year: one Pb monitor sited to measure maximum Pb concentration (based on NEI)
 - ▶ Airport Pb source emits >1.0 tons or more a year: one Pb monitor sited to measure maximum Pb concentration (based on NEI)
 - ▶ EPA Regional Administrator additional required monitoring