PM2.5 & PM10 Filter Based Local Conditions Data Review Table

Criteria	Frequency	Acceptable Range	Review Comments
CRITICAL CRITERIA – PM2.5/PM10 Filter Based Local Conditions			
Field Activities			
Sampler/Monitor	*NA*	*Meets requirements listed in FRM/FEM/ARM designation*	40 CFR Part 58 App C 40 CFR Part 53 & FRM/FEM method list
Sampling Period			
Sampling Period (including multiple power failures)	*All Filters*	*1380 – 1500 minutes, or if value <1380 and exceedance of NAAQS; midnight to midnight local std time*	40 CFR Part 50 App L (throughout)
Filter Holding Times			
Sample Recovery	*All Filters*	*≤ 7 days 9 hours from sample end time*	
Pre-sampling	*All filters*	*≤ 30 days before sampling*	
Sampling Instrument			
Average Flow Rate	*Every 24 hours of operation*	*Average within 5% of 16.67 liters/minute*	
Variability in Flow Rate	*Every 24 hours of operation*	*CV ≤ 2%; No flow rate excursions > ± 5% for > 5 minutes*	
One-point Flow Rate Verification	*Every 30 days each separated by at least 14 days*	*± 4.1% of transfer standard ± 5.1% of flow rate design value*	
Design Flow Rate Adjustment	*After 1-pt or multi-point verification/calibration*	*< ± 2.1 % of design flow rate*	
External Leak Check	*Before each flow rate verification/calibration and before and after PM2.5 separator maintenance*	*≤ 8.5" Hg in 30 sec (2000H) ≤ 25 mm Hg in 60 sec (2000i)*	
Internal Leak Check	*If failure of external leak check*	*≤ 8.5" Hg in 30 sec (2000H) ≤ 140 mm Hg in 60 sec (2000i)*	
Filter Temp Sensor	*Every 24 hrs of operation*	*No excursions > 5° C lasting longer than 30 minutes*	
Laboratory Activities			

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Post Sampling Weighing	*All filters*	*Kept < 25˚ C from sample retrieval to conditioning; ≤ 10 days from sample end date if shipped at ambient temperature, or ≤ 30 days if shipped below avg. ambient (or < 4° C or below for avg. sampling temps < 4 °C) from sample end date*	
Filter Visual Defect Check (unexposed)	*All filters*	*Correct type & size and for pinholes, particles or imperfections*	
Filter Conditioning Environment			
Equilibration	*All filters*	*24 hours minimum*	
Temp. Range	*All filters*	*24-hr mean 20.0-23.0° C*	
Temp. Control	*All filters*	*< 2.1° C Std Dev over 24 hours*	
Relative Humidity	*All filters*	*24-hr mean 30.0 – 40.0% RH or ≤ 5.0% sampling RH but ≥ 20.0% RH*	
Humidity Control	*All filters*	*< 5.1% Std Dev over 24 hours*	
Pre/Post Sampling RH	*All filters*	*Diff in 24-hr means < ± 5.1% RH*	
Balance	*All filters*	*Located in filter conditioning environment*	
Balance auto-calibration	*Prior to each weighing session*	*Manufacturer's specs*	
OPERATIONAL EVALUATIONS TABLE - PM2.5/PM10 Filter Based Local Conditions			
Field Activities			
Routine Verifications			
1-point Temp. Verification	*Every 30 days*	*< ± 2.1° C*	
Press. Verification	*Every 30 days*	*< ± 10.1 mm Hg*	
Annual Multi-point Verifications/Calibrations			
Temp. multi-point verifications/calibrations	*Upon installation, then 1/yr.*	*< ± 2.1° C*	
Pressure verification/ calibration	*Upon installation, and upon 1-pt verification failure*	*< ± 10.1 mm Hg*	

PM2.5 & PM10 Filter Based Local Conditions Data Review Table

Criteria	Frequency	Acceptable Range	Review Comments
Flow rate multi-point verification/calibration	*Upon installation, maintenance or transport, then 1/yr.*	*< ± 2.1% of transfer standard*	
Other Monitor Calibrations	*Per manufacturer's operation manual*	*Per manufacturer's operation manual*	
Precision			
Collocated Samples SLAMS	*Every 12 days for 15% of sites by designation*	*CV < 10.1% of samples ≥ 3.0 µg/m3*	
Collocated Samples PSD	*Every 6 days for 15% of sites by designation*	*CV < 10.1% of samples ≥ 3.0 µg/m3*	
Accuracy	***Note: All equipment and transfer standards used for QA audits must be independent of the equipment used for routine QC activities such as 1-point and multi-point verifications and calibrations***		
Temp. Audit	*SLAMS every 180 days PSD Quarterly.*	*< ± 2.1 °C*	
Press. Audit	*SLAMS every 180 days PSD Quarterly*	*< ± 10.1 mm Hg*	
Flow Rate Audit	*SLAMS every 5-7 months PSD Quarterly*	*< ± 4.1% of audit standard < ± 5.1% of design flow rate*	
Monitor Maintenance			
Very Sharp Cut Cyclone	*Every 30 days*	*Cleaned/changed*	
Inlet/downtube cleaning	*Every 90 days*	*Cleaned*	
Filter chamber cleaning	*1/mo.*	*Cleaned*	
Circulating fan/filter	*1/mo.*	*Cleaned/changed*	
Manufacturer's Recommended Maintenance	*Per manufacturer's operations manual*	*Per manufacturer's operations manual*	
Laboratory Activities			
Filter Checks			
Lot Blanks	*9 filters per lot*	*< ± 15.1 µg change between weighings*	
Exposure Lot Blanks	*3 filters per lot*	*< ± 15.1 µg change between weighings*	
Filter Integrity (exposed)	*Each filter*	*No visual defects*	
Lab QC Checks			
Field Filter Blanks	*10% or 1 per weighing session*	*< ± 30.1 µg change between weighings*	

PM2.5 & PM10 Filter Based Local Conditions Data Review Table

Criteria	Frequency	Acceptable Range	Review Comments
Lab Filter Blanks	*10% or 1 per weighing session*	*< ± 15.1 µg change between weighings*	
Balance Check (working standards)	*Beginning, 10th sample, end*	*< ± 3.1 µg*	
Duplicate Filter Weighing	*1 per weighing session*	*< ± 15.1 µg change between weighings*	
Microbalance Audit	*1/yr.*	*< ± 0.003 mg or manufacturer's specs, whichever is tighter*	
Verification/Calibrations			
Lab Temperature	*Every 90 days*	*< ± 2.1 °C*	
Lab Humidity	*Every 90 days*	*< ± 2.1 %*	
Microbalance Calibration	*At Installation & 1/yr.*	*Manufacturer's specifications*	
Calibrations & Check Standards			
Working Mass Standards (compared to primary standards) *Primary Standards*	*Every 90 days* *1/yr.*	*< ± 2.1 µg* *0.025 mg*	
SYSTEMATIC CRITERIA – PM2.5/PM10 Filter Based Local Conditions			
Siting	*1/yr.*	*SLAMS Meets siting criteria or waiver documented PSD as per approved QAPP*	
Data Completeness SLAMS (3-year averaging period to calculate NAAQS compliance)	*Annual Standard* *24-hour Standard*	*≥ 75% scheduled sampling days per quarter* *≥ 75% scheduled sampling days per quarter*	
Data Completeness PSD (typically a 1-year monitoring period)	*Annual Standard* *24-hour Standard*	*≥ 80% of scheduled sampling days per quarter* *≥ 80% of scheduled sampling days per quarter*	
Reporting Units	*All filters*	*µg/m3 at ambient temp/press (PM2.5)*	
Rounding convention for DV calculation and data reported to AQS	*All filters*	*To one decimal, with additional digits to the right being truncated*	

PM2.5 & PM10 Filter Based Local Conditions Data Review Table

Criteria	Frequency	Acceptable Range	Review Comments
Annual 3-yr average	*All concentrations*	*Nearest 0.1 µg/m3 (≥0.05 round up)*	
24-hour, 3-yr average	*All concentrations*	*Nearest 1 µg/m3 (≥0.5 round up)*	
Detection Limit			
Lower detection limit	*All filters*	*≤ 2 µg/m3*	
Upper concentration limit	*All filters*	*≥ 200 µg/m3*	
Precision			
Single analyzer (collocated monitors)	*Every 90 days*	*Coefficient of variation (CV) < 10.1% for values ≥ 3.0 µg/m3*	
Primary Quality Assurance Organization (PQAO)	*Annual and 3 year estimates*	*90% confidence level (CL) of CV < 10.1% for values ≥ 3.0 µg/m3*	
Bias			
Performance Evaluation Program (PEP) SLAMS	*5 audits for PQAOs with ≤ 5 sites* *8 audits for PQAOs with > 5 sites*	*< ± 10.1% for values ≥ 3.0 µg/m3*	
Performance Evaluation Program (PEP) PSD	*1/yr.*	*< ± 10.1% for values ≥ 3.0 µg/m3*	
Technical Systems Audit SLAMS	*1/3 yr.*	*Review of entire field, lab, and data reporting process for comparison to QC/QA requirements*	
Technical Systems Audit PSD	*1/project, if extended 1/yr.*	*Review of entire field, lab, and data reporting process for comparison to QC/QA requirements*	
Field Activities			
Verification/Calibration Standards Recertification – All standards should have multi-point certifications against NIST traceable standards			
Flow Rate Transfer Standard	*Every 365 days*	*< ± 2.1% of NIST Traceable Standard*	
Field thermometer	*Every 365 days*	*± 0.1° C resolution* *± 0.5° C accuracy*	
Field barometer	*Every 365 days*	*± 1 mm Hg resolution* *± 5 mm Hg accuracy*	
Clock/timer verification	*Every 30 days*	*± 1 min NIST AST*	
Laboratory Activities			
Microbalance Readability	*At purchase*	*1µg*	
Microbalance Repeatability	*At purchase*	*1µg*	

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Criteria	Frequency	Acceptable Range	Review Comments
Primary mass/Working mass Verification/Calibration Standards Recertification	*1/yr*	*0.025 mg tolerance*	