**Critical Criteria – NO2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement (NO2)** | **Frequency** | **Acceptable Range** | **Review Comments** |
| **Sampler/Monitor** | *NA* | *Meets requirements listed in FRM/FEM designation* |  |
| **One-Point QC Check****Single analyzer** | *Every 14 days* | *< ± 15.1% (percent difference) or < ± 1.5 ppb difference whichever is greater* |  |
| **Zero/Span Check** | *Every 14 days* | *Zero drift < ± 3.1 ppb (24-hr),**< ± 5.1 ppb (>24hr-14 days)**Span drift < ± 10.1%* |  |
| **Converter Efficiency** | *During multi-point calibrations, spans, and audits**Every 14 days* | *96% - 104.1%*  |  |

**Operational Criteria – NO2**

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| --- | --- | --- | --- |
| **Requirement (NO2)** | **Frequency** | **Acceptable Range** | **Review Comments** |
| **Shelter Temperature Range** | *Daily**(hourly values)* | *20 to 30° C (hourly avg.)**or**per manufacturers specification if designated to a wider temp. range* |  |
| **Shelter Temperature Control** | *Daily (hourly values)* | *< 2.1° C SD over 24 hours* |  |
| **Shelter Temperature Device Check** | *Every 182 days and 2/calendar year* | *< ± 2.1° C of standard* |  |
| **Annual Performance Evaluation Single Analyzer (SLAMS/NCORE)** | *Every site every 365 days and 1/calendar year* | *Percent difference of audit levels 3-10 < ± 15.1%, Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1%* |  |
| **Annual Performance Evaluation Single Analyzer (PSD)** | *Quarterly* | *Percent difference of audit levels 3-10 < ± 15.1%, Audit levels 1&2 < ± 1.5 ppb difference or < ±15.1%* |  |
| **Federal Audit (NPAP)** **(SLAMS/NCORE)** | *20% of sites audited in calendar year* | *Audit levels 1&2 < ± 1.5 ppb difference all other levels percent difference < ± 15.1%* |  |
| **Verification / Calibration** | *Upon**receipt/adjustment/repair/ installation/moving**Every 182 days and 2/calendar year if manual biweekly zero/span checks**Every 365 days and 1/calendar year if continuous daily zero/span checks* | *Instrument residence time ≤ 2 minutes Dynamic parameter ≥ 2.75 ppm-min**All points < ± 2.1% or < ± 1.5 ppb difference of best-fit straight line, whichever is greater**and Slope 1 ± .05* |  |
| **Gaseous Standards** | *All gas cylinders* | *NIST Traceable**(e.g. EPA Protocol Gas)**50-100 ppm of NO in Nitrogen with < 1 ppm NO2* |  |
|  **Zero Air / Zero Air Check** | *Every 365 days and 1/calendar year* | *Concentration below LDL* |  |
| **Gas Dilution Systems** | *1 / year or after failure of 1-point QC check or performance evaluation* | *Accuracy < ± 2.1%* |  |
| **Detection (FEM/FRMs)** |  |  |  |
| **Noise** | *Every 365 days and 1/calendar year* | *≤ 0.005 ppm* |  |
| **Lower detectable level** | *Every 365 days and 1/calendar year* | *≤ 0.01 ppm* |  |

**SYSTEMATIC CRITERIA – NO2**

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| --- | --- | --- | --- |
| **Requirement (NO2)** | **Frequency** | **Acceptable Range** | **Review Comments** |
| **Standard Reporting Units** | *All data* | *ppb (final units in AQS)* |  |
| **Rounding convention for data reported to AQS** | *All data* | *1 place after decimal with digits to right truncated* |  |
| **Completeness****(SLAMS/NCORE/PSD)** | *Annual standard* | *≥ 75% of hours in year* |  |
| **Completeness (SLAMS/NCORE)** | *1-hour standard* | *Hour: ≥ 75% of hour**Day: ≥ 75% of hours in a day**Quarter: ≥ 75% sampling days in quarter**Year: 4 quarters complete in each year**3 consecutive calendar years of complete data* |  |
| **Completeness (PSD)** | *1-hour standard* | *Hour: ≥ 75% of hour**Day: ≥ 75% of hours in a day**Quarter: ≥ 80% of complete days**Year: 4 consecutive quarters* |  |
| **Sample Residence Time Verification** | *Every 365 days and 1/calendar year* | *≤ 20 seconds* |  |
| **Sample Probe, Inlet, Sampling train** | *All sites* | *Borosilicate glass,(e.g. Pyrex®) or Teflon® (FEP/TFE)* |  |
| **Pneumatic fittings** | *All tubing connections/valves* | *Teflon® (FEP/TFE), 316 stainless steel* |  |
| **Gas Regulators** | *All gas cylinders* | *2-stage 316 stainless steel* |  |
| **Data Acquisition Systems** | *Digital or analog recording devices* | *Collection of continuous data(minimum of 1-minute values)* |  |
| **System Clock Verification** | *1 / month* | *≤ ± 1 minute* |  |
| **Siting** | *1 / year* | *Meeting siting criteria or waiver documented, (PSD per approved QAPP)* |  |
| **Precision (using 1-point QC Checks) (SLAMS/NCORE)** | *Calculated Annually and as appropriate for design value estimates* | *90% CL CV < 15.1%* |  |
| **Precision (using 1-point QC Checks) (PSD)** | *Calculated Quarterly* | *90% CL CV < 15.1%* |  |
| **Bias (using 1-point QC Checks) (SLAMS/NCORE)** | *Calculated Annually and as appropriate for design value estimates* | *95% CL < ± 15.1%* |  |
| **Bias (using 1-point QC Checks) (PSD)** | *Calculated Quarterly* | *95% CL < ± 15.1%* |  |
| **Technical Systems Audits****(SLAMS/NCORE)** | *1 / 3 years* | *Confirmation of adherence to FRM/FEM, SOPs, and QAPP or documented waiver* |  |
| **Technical Systems Audits****(PSD)** | *Annually**(within 1 month of startup and annually thereafter)* | *Confirmation of adherence to FRM/FEM, SOPs, and QAPP or documented waiver* |  |
| **Annual PE Primary QA organization (PQAO) Evaluation** | 1 / year | 95% of audit percent difference fall within the 1-point QC check 95% probability intervals at PQAO level of aggregation |  |