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|  |
| Maintenance Calibration Certification Operations and Firmware Schedules |
| *SOP Reference* |
| Revision Number 5  *1/4/16* |

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# [Maintenance Schedule for Gaseous Instruments](#TOC)

## [TAPI 100 Series SO2 Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **RE-CAL** |
| Particulate Filter | Change particle filter | Weekly or As Needed | No |
| Verify Test Functions | Review and evaluate | Weekly | No |
| Perform Flow Check | Check flow | Quarterly | No |
| Perform Pneumatic Leak Check | Verify leak tight | Annually or after repairs involving pneumatics | Yes |
| Pump | Rebuild head | Annually or as needed | Yes |
| Calibrate UV Lamp Output | Perform **LAMP CAL** | Prior to calibration or PMT hardware calibration | Yes |
| [[1]](#footnote-1)PMT Sensor Hardware Calibration | Low-level hardware calibration | On PMT/pre-amp changes if  0.7<**SLOPE** or **SLOPE**>1.3 | Yes |
| Sample Chamber Optics | Clean chamber, windows and filters | As needed | Yes |
| Critical Flow Orifice & Sintered Filters | Replace | As needed | Yes |

## [TAPI 200 Series NOX Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **RE-CAL** |
| Particulate Filter | Change particle filter | Weekly or as needed | No |
| Verify Test Functions | Review and evaluate | Weekly | No |
| Perform Flow Check | Check flow | Quarterly | No |
| Perform Pneumatic Leak Check | Verify leak tight | Annually or after repairs involving pneumatics | Yes |
| Pump | Rebuild head | Annually or as needed | Yes |
| Critical Flow Orifice and Sintered Filters | Replace | As needed | Yes |
| Ozone Filter | Change chemical | Annually | Yes |
| Reaction Cell Window | Clean | Annually or as necessary | Yes |
| Reaction Cell O-Rings & Sintered Filters | Replace | Annually | Yes |
| DFU Filters | Change particle filter | Annually | No |
| PMT Sensor Hardware Calibration | Low-level hardware calibration | On PMT/pre-amp changes or if slope is outside of 1.0±0.3 | Yes |

## [TAPI 200 Series NOX Maintenance Schedule (cont)](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **RE-CAL** |
| Inline Exhaust Scrubber  (on pump assembly) | Replace | Annually | No |
| NO2 Converter | Replace converter | Every 3 years or if conversion efficiency drops below 96% | Yes |

## [TAPI 300 Series CO Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **RE-CAL** |
| Particulate Filter | Change particle filter | Weekly or as needed | No |
| Verify Test Functions | Review and evaluate | Weekly | No |
| Perform Flow Check | Check flow | Quarterly | No |
| Perform Pneumatic Leak Check | Verify leak tight | Annually or after repairs involving pneumatics | Yes |
| Pump | Rebuild head | Annually or as needed | Yes |
| Critical Flow Orifice and Sintered Filters | Replace | As needed | Yes |
| GFC Assembly | Inspect GFC parts/assembly | Annually or as needed | No |
| IR Source | Inspect IR source | Annually or as needed | Yes |
| Pneumatic Lines and Chassis Cleaning | Examine and clean | As needed | If internal cleaning |

## [TAPI 400 Series O3 Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **RE-CAL** |
| Particulate Filter | Change particle filter | Weekly or as needed | No |
| Verify Test Functions | Review and evaluate | Weekly | No |
| Perform Flow Check | Check flow | Quarterly | No |
| Perform Pneumatic Leak Check | Verify leak tight | Annually or after repairs involving pneumatics | Yes |
| Pump | Rebuild head | Annually or as needed | Yes |
| Critical Flow Orifice and Sintered Filters | Replace | As needed | Yes |
| O3 Scrubber | Replace | 2-5 years | Yes |
| Absorption Tube | Inspect/clean | Annually or as needed | Yes |
| Pneumatic Lines | Examine and clean | As needed | Yes, if cleaned |

## [TAPI 700 Calibrator (multi-gas and photometer) Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |  |
| --- | --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** | **CAL-CHECK** |
| Verify Test Functions | Review and evaluate | Weekly | No |
| Perform flow check | Check flow | Semi-Annually | Yes |
| Perform Pneumatic Leak Check | Verify leak tight | Semi-Annually or after repairs involving pneumatics | Yes |
| Pumps | Rebuild heads or replace | Annually or as needed | Yes |
| Absorption Tube | Inspect/Clean | Annually or as needed | Yes |
| Pneumatic Lines | Examine and clean | As needed | Yes, if cleaned |
| MFC | Inspect/verify operation | 6 months and as needed | Yes |
| Photometer/Generator | Inspect/Verify Operation | 6 months and as needed | Yes |

## [TAPI 701 Zero Air Maintenance Schedule](#TOC)

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Charcoal Scrubber | Change charcoal scrubber | Annually |
| Purafil | Change Purafil | Annually |
| CO Scrubber | Evaluate through verification | When contaminated |
| HC Scrubber | Evaluate for contamination | When contaminated |
| Regenerative Dryer | Evaluate for contamination | When contaminated |
| Particulate Filter (“Air In” on Rear Panel) | Change particulate filter | Annually |
| Leak Check | Check instrument for leaks | Annually or as needed |
| Verification | Verify against a standard | Annually and upon installation |

# Maintenance Schedule for Particulate Matter Instruments

## Thermo 5014i Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Quarterly and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Quarterly and as needed |
| Flow Rate Calibration | Calibrate flow rate | Quarterly and as needed |
| Flow Temperature Calibration | Calibrate flow temperature | Quarterly and as needed |
| Relative Humidity Calibration | Calibrate relative humidity | Quarterly and as needed |
| Vacuum Pressure Calibration | Calibrate vacuum pressure | Quarterly and as needed |
| Mass Calibration | Calibrate mass | Quarterly and as needed |
| Leak Check | Conduct leak check | Quarterly and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification | Verify flow rate | Monthly and as needed |
| Date and Time Verification | Verify date and time; adjust if necessary | Monthly and as needed |
| Down Tube Cleaning | Clean down tube | Annually and as needed |

## Thermo 2025i Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Annually and as needed |
| Filter Temperature Calibration | Calibrate filter temperature | Annually and as needed |
| Filter Compartment Temperature Calibration | Calibrate filter compartment temperature | Annually and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Annually and as needed |
| Filter Pressure Calibration | Calibrate filter pressure | Annually and as needed |
| Flow Rate Calibration | Calibrate flow rate | Annually and as needed |
| External Leak Check | Conduct external leak check | Monthly and as needed |
| Internal Leak Check | Conduct internal leak check | Monthly and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Filter Temperature Verification | Verify filter temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification | Verify flow rate | Monthly and as needed |

## MetOne BAM 1020 Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Quarterly and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Quarterly and as needed |
| Flow Rate Calibration | Calibrate flow rate | Quarterly and as needed |
| Nozzle Cleaning | Clean nozzle | Monthly and as needed |
| Leak Check | Check for leaks | Monthly and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification | Verify flow rate | Monthly and as needed |
| Down Tube Cleaning | Clean down tube | Annually and as needed |

## MetOne SASS Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Annually and as needed |
| Filter Temperature Calibration | Calibrate filter temperature | Annually and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Annually and as needed |
| Flow Rate Calibration (all channels in use) | Calibrate flow rate (all channels in use) | Annually and as needed |
| Leak Check (all channels in use) | Conduct leak check (all channels in use) | Monthly and as needed |
| Date and Time Verification | Verify date and time; adjust if necessary | Monthly and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Filter Temperature Verification | Verify filter temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification (all channels in use) | Verify flow rate (all channels in use) | Monthly and as needed |

## URG 3000N Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Annually and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Annually and as needed |
| Flow Rate Calibration | Calibrate flow rate | Annually and as needed |
| Leak Check | Conduct leak check | Monthly and as needed |
| Date and Time Verification | Verify date and time; adjust if necessary | Monthly and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification | Verify flow rate | Monthly and as needed |

## American Ecotech High-Vol TSP Maintenance Schedule

**See associated manuals for “how to” directions**

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Ambient Temperature Calibration | Calibrate ambient temperature | Annually and as needed |
| Barometric Pressure Calibration | Calibrate barometric pressure | Annually and as needed |
| Flow Rate Calibration | Calibrate flow rate | Annually and as needed |
| Ambient Temperature Verification | Verify ambient temperature | Monthly and as needed |
| Barometric Pressure Verification | Verify barometric pressure | Monthly and as needed |
| Flow Rate Verification | Verify flow rate | Monthly and as needed |

# [Maintenance Schedule for Site Operations](#TOC)

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Sample Line and Residence Time | Ensure sample line replacement and residence time checks are completed | Annually |
| Zero Air Source | Ensure zero air sources are verified | Annually |
| Met QC | Ensure Met QC is up to date | Annually |
| Station Temperature Calibration | Ensure station temperature calibration is up to date | Annually |
| Standards | Ensure all standards are current and operating correctly. In site logbook enter: expiration dates, cylinder numbers, concentrations, and pressures. | Each site visit |
| Air Conditioner | Check air conditioner status | Each site visit |
| PM Inlet Cleaning | Clean 1st stage and 2nd stage inlet | Monthly |
| Instrument Clocks | Ensure instrument clocks are set to correct time | Monthly |
| Logbooks | Make entry into site log per each site visit, and make entry into instrument log any time an instrument is moved or maintenance is done. | Each site visit |
| Weed and Grass Control | Ensure all weeds and grass are neatly trimmed, under control, and exterior of site looks professional | Monthly |
| Instrument Manuals | Ensure copies of latest instrument manuals | Quarterly |

# [Maintenance and Operations Schedule for the Grav Lab](#TOC)

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Standards | Ensure all standards are current and operating correctly | Each visit |
| Environmental Controls | Ensure temperature and RH within spec. Ensure anti-static environment | Each visit |
| Gravimetric Logbook | Make log entry | Each visit |
| Sticky Mat | Change Sticky Mat | Every two weeks or as needed |
| QC Lab Blank Filters | Blank Filter Weighing | Every Tenth Weighing |
| Field Blank Filters | Field Blank Weighing | Every Tenth Run |
| Mass Standard Weights | Check balance with 100 and 200 mg NIST-traceable mass standards | Every Tenth Weighing |
| Environmental Controls | Check lab environmental controls is performed using a NIST-traceable standards | Quarterly |

# [Calibration and Verification Schedule](#TOC)

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| All Gaseous Analyzers: Zero/Span Sensitivity Adjustment and Calibration | Hard calibration at Zero and Span. Include adjustment of instrument parameters; e.g., analog output calibration, flow calibration, reference and measure voltages, dark cal, etc. | Quarterly and as needed |
| Span/Zero (2-point) | Evaluate response | Daily |
| Zero/Precision/Span (3-Point) | Evaluate linearity and precision | Weekly |
| Zero/Span Sensitivity Adjustment | Hard calibration | Quarterly |
| All Gaseous Analyzers: LEADS Cal (5-point) | Calibrate on DAS | Quarterly and as needed |
| PM Filter-Based Sampler Calibrations | Calibrate temperature, pressure, flow, other operational parameters, and conduct leak check | Annually and as needed |
| PM Filter-Based Sampler Verifications | Verify temperature, pressure, flow, other operational parameters, and conduct leak check | Monthly and as needed |
| PM Continuous Monitor Calibrations | Calibrate temperature, pressure, flow, detector, other operational parameters, and conduct leak check | Quarterly and as needed |
| PM Continuous Monitor Verifications | Verify temperature, pressure, flow, other operational parameters, and conduct leak check where applicable | Monthly and as needed |

# [Calibration and Verification Schedule (cont.)](#TOC)

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Meteorological Sensor Field Calibration and Verification | Calibrate and/or verify all meteorological sensors, to include: wind, ambient temperature, barometric pressure, relative humidity, and precipitation | Annually and every 6 months at NCore |
| Internal Standards: e.g. MFCs and Photometer | Calibrate/certify again primary | Every 6 months |
| External Standards: e.g. Delta & Tetra Cals, 045B Met, CME & Alicat, Meriam Pressure and Vacuum, Rotronics RH, Primary O3 | Send to vendor or (CARB) for recertification/calibration | Annually (or sooner if problem is suspected) |

# [Instruments and Devices Requiring Calibration and Certifications](#TOC)

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Acceptable Range** | **40 CFR Reference** |
| ***Verification/Calibration of devices in sampler/analyzer/laboratory against an authoritative standard*** | | |
| Barometric Pressure | ± 10 mm Hg | Part 50, App.L, Sec 9.3 |
| Temperature | ± 2°C of standard | Part 50, App.L, Sec 9.3 |
| Flow Rate | ± 2% of transfer standard | Part 50, App.L, Sec 9.2 |
| Clock/timer Verification | 1 min/mo | Part 50, App.L, Sec 7.4 |
| *Verification/Calibration of devices in shelter or lab against an authoritative standard* | | |
| Shelter Temperature | ±2°C |  |
| Lab Temperature | ±2°C |  |
| Lab Humidity | ± 2% |  |
| Microbalance | Readability ± 1 µg  Repeatability ± 1µg | Part 50, App.L, Sec 8.1 |
| *Verification/Calibration standards requiring certification annually* | | |
| Standard Reference  Photometer (SRP) | "4% or "4 ppb (whichever greater) |  |
| SRP recertification to local  primary standard | RSD of six slopes ± 3.7%  Std. Dev. of 6 intercepts ± 1.5  New slope = ± 0.05% of previous | Transfer Standard Doc EPA 600/4-79-056 Section  6.6 |
| Flow rate | ± 2% of NIST –Traceable Standard | Part 50, App.L Sec 9.1 & 9.2 |
| Pressure | ± 1 mm Hg resolution  ± 5 mm Hg accuracy | Part 50 , App.B Sec 7.6 |
| Temperature | ±0.1°C of resolution  ± 0.5°C accuracy | Part 50 , App.B Sec 7.5 |
| Gravimetric Standards | ± 25 µg | Method 2.12 Sec 4.3 & 7.3 |

# [Criteria Pollutant Certification Standards](#TOC)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Device** | **Instrument** | **Frequency** | **Acceptance Criteria** | **Information/**  **Action** |
| **Lead** |  |  |  |  |  |
|  | Flow Rate Transfer Standard | Hi-Vol  Manometer | 1/yr | 0.02 std m3/min over the range 1.0 to 1.8 std m3/min | Part 50 , App.B Sec 7.4, & 9.2 |
|  | Field Thermometer | DeltaCal | 1/yr | 2°C resolution | Part 50 , App.B Sec 7.5 |
|  | Field Barometer | DeltaCal | 1/yr | ± 5mm Hg resolution | Part 50 , App.B Sec 7.6 |
| **PM2.5 Filter -Based** |  |  |  |  |  |
| *Field* | Flow Rate Transfer Standard | DeltaCal | 1/yr | ± 2% of NIST-traceable Std | Part 50, App.L Sec 9.1 & 9.2 |
|  | Field Thermometer | DeltaCal | 1/yr | ± 0.1° C resolution, ± 0.5° C accuracy | Method 2.12 Sec 4.2 & 6.4 |
|  | Field Barometer | DeltaCal | 1/yr | ± 1 mm Hg resolution, ± 5 mm Hg accuracy | Method 2.12 Sec 4.2 & 6.5 |
| *Laboratory* |  |  |  |  |  |
|  | Working Mass Standards | ASTM Class 1  Mass Standard | 1/3 months | NIST traceable  ± 25µg | Method 2.12 Sec 4.3 & 7.3 |
|  | Primary Mass Standards | ASTM Class 1  Mass Standard | 1/yr | NIST traceable  ± 25µg | Method 2.12 Sec 4.3 & 7.3 |
|  | Micro-balance | Sartorious MC-5 | 1/yr | ± 1 µg  repeatability | Part 50, App.L Sec 8.1 |
| **PM 2.5 Continuous** |  |  |  |  |  |
|  | Flow Rate Transfer Standard | DeltaCal | 1/yr | ± 2% of NIST-traceable Std | Part 50, App.L Sec 9.1 & 9.2 |
|  | Field Thermometer | DeltaCal | 1/yr | ± 0.1° C resolution, ± 0.5° C accuracy | Method 2.12 Sec 4.2.2 |
|  | Field Barometer | DeltaCal | 1/yr | ± 1 mm Hg resolution, ± 5 mm Hg accuracy | Method 2.12 Sec 4.2.2 |
|  | Manometer | M 202 | 1/yr | 0.02% FS. |  |

# [Criteria Pollutant Certification Standards (cont.](#TOC))

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Device** | **Instrument** | **Frequency** | **Acceptance Criteria** | **Information/**  **Action** |
| **PM 2.5**  **Speciated** |  |  |  |  |  |
|  | Flow Rate Transfer Standard | DeltaCal (SASS)  TetraCal-(URG) | 1/yr | ± 2% of NIST-traceable Std | Part 50, App.L Sec 9.1 & 9.2 |
|  | Field Thermometer | DeltaCal | 1/yr | ± 0.1° C resolution, ± 0.5° C accuracy | Method 2.12 Sec 4.2.2 |
|  | Field Barometer | DeltaCal | 1/yr | ± 1 mm Hg resolution, ± 5 mm Hg accuracy | Method 2.12 Sec 4.2.2 |
| **PM 10**  **Continuous** |  |  |  |  |  |
|  | Flow Rate Transfer Standard | DeltaCal | 1/yr | ± 2% of NIST-traceable Std | Part 50, App.J Sec 7.3 |
|  | Field Thermometer | DeltaCal | 1/yr | ± 0.1° C resolution, ± 0.5° C accuracy | recommendation |
|  | Field Barometer | DeltaCal | 1/yr | ± 1 mm Hg resolution, ± 5 mm Hg accuracy | recommendation |
|  | Manometer | M 202 | 1/yr | 0.02 % FS |  |
| **Ozone** |  |  |  |  |  |
|  | Zero Air | TAPI Model 701 Zero Air Module | 1/Yr | Concentrations below LDL <.001ppm | QA Handbook Vol II, Section 11.1.2 |
|  | Local Level II Ozone Standard | TAPI Model 400E | 1/Yr | Regression slopes = 1.00 ±0.03 and true intercepts are 0 ± 3ppb |  |

# [Criteria Pollutant Certification Standards (cont.)](#TOC)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Device** | **Instrument** | **Frequency** | **Acceptance Criteria** | **Information/**  **Action** |
| **Ozone** |  |  |  |  |  |
|  | Ozone Transfer standard | TAPI T700,  TAPI T700U,  TAPI T703 | 1/6 months | RSD of six slopes # 3.7%  Std. Dev. of 6 intercepts 1.5  New slope = + 0.05 of previous and  RSD of six slopes # 3.7%  Std. Dev. of 6 intercepts 1.5 | Transfer Standard Doc EPA 600/4-79-056 Section  6.6 |
| **Carbon Monoxide** |  |  |  |  |  |
|  | Zero Air | TAPI Model 701 Zero Air Module | 1/Yr | Concentrations below LDL <.1ppm | QA Handbook Vol II, Section 11.1.2 |
|  | Gaseous Standards | EPA Protocol Gas Blends |  | NIST Traceable –EPA Protocol | Vendor must participate in EPA Protocol Gas  Verification Program 40 CFR Part 58 App A sec  2.6.1 |
|  | Gas Dilution System | TAPI T700U | 1/6months | Accuracy ± 2% |  |
| **Nitrogen**  **Dioxide** |  |  |  |  |  |
|  | Zero Air | TAPI Model 701 Zero Air Module | 1/Yr | Concentrations below LDL <.001ppm | QA Handbook Vol II, Section 11.1.2 |

# [Criteria Pollutant Certification Standards (cont.)](#TOC)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Device** | **Instrument** | **Frequency** | **Acceptance Criteria** | **Information/**  **Action** |
| **Nitrogen**  **Dioxide** |  |  |  |  |  |
|  | Gaseous Standards | EPA Protocol Gas Blends |  | NIST Traceable –EPA Protocol | Vendor must participate in EPA Protocol Gas  Verification Program 40 CFR Part 58 App A sec  2.6.1 |
|  | Gas Dilution System | TAPI T700U | 1/6months | Accuracy ± 2% |  |
| **Sulfur**  **Dioxide** |  |  |  |  |  |
|  | Zero Air | TAPI Model 701 Zero Air Module | 1/Yr | Concentrations below LDL <.001ppm | QA Handbook Vol II, Section 11.1.2 |
|  | Gaseous Standards | EPA Protocol Gas Blends |  | NIST Traceable –EPA Protocol | Vendor must participate in EPA Protocol Gas  Verification Program 40 CFR Part 58 App A sec  2.6.1 |
|  | Gas Dilution System | TAPI T700U | 1/6months | Accuracy ± 2% |  |

# [QA Audit Schedule](#TOC)

|  |  |  |
| --- | --- | --- |
| **ITEM** | **ACTION** | **FREQUENCY** |
| Gaseous Instrument Audit | QA audit of gaseous monitoring instrument | At least once per calendar year, and upon request |
| Particulate Matter Instrument Audit | QA audit of particulate matter monitoring instrument | At least twice per calendar year (between 5-7 months apart), and upon request |
| Meteorological Sensor Audit | Audit of field site meteorological stations | At least once per calendar year, and upon request; NCore is audited twice per year |
| Gravimetric Lab Audit | Audit of gravimetric lab balance, weights, standards, environmental controls, and processes | At least once per calendar year, and upon request |
| Data Audit | Audit of criterial pollutant monitoring data | Monthly |
| Management Checks of Data | Document Management checks of data and logbook in LEADS | Monthly |

# [Firmware Update Schedule](#TOC)

|  |  |  |  |
| --- | --- | --- | --- |
| **Instruments** | **Action** | **Frequency** | **Notes** |
| Teledyne Gaseous Instrumentation | Firmware check/upgrade | Annually | Only certain firmware versions work with Sutron. Verify compatibility prior to updating. |
| Thermo Particulate Instrumentation (2025i and 5014i) | Firmware check/upgrade | Annually | Must test prior to network deployment |
| MetOne Particulate Instrumentation (BAM 1020 and SASS) | Firmware check/upgrade | Annually | Must test prior to deployment |
| MetOne Sonic (50.5 wind) | Firmware check/upgrade | Annually | Must test prior to network deployment |

# [Data Validation and AQS Upload](\\\\ccentnas2\\AirQuality-Public\\Air Monitoring\\Quality Management\\SOPs Guides and Schedules\\Working Drafts\\Maintenance, Calibration, Certification, Firmware Schedules rev5.docx)

|  |  |  |
| --- | --- | --- |
| **Action** | **Frequency** | **Notes** |
| Data Validation and AQS Upload | 30 days | Data validation and data upload to AQS Database |

1. Replace desiccant bags each time the inspection plate for the sensor assembly is removed. [↑](#footnote-ref-1)