Field Standard Operating Procedures for the EPA Through-the-Probe National Performance Audit Program

Introduction

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Introduction

The purpose of this section is to provide the Environmental Services Assistance Team (ESAT) Field Scientists (FSs) with background information on the EPA's Through-The-Probe (TTP) method of delivering single-blind audit samples of EPA Criteria Pollutant gases under the National Performance Audit Program (NPAP) as an introduction to standard operating procedures (SOPs) for field personnel involved in the NPAP.

Criteria Pollutant Gases Program

In general, the measurement goal of the Ambient Air Quality Monitoring Program is to estimate the concentration, in parts per million (ppm), of EPA Criteria Pollutant gases (SO_2, NO_2, O_3, and CO). The NPAP's goal is to provide audit materials and devices that will enable the EPA to assess the proficiency of monitoring organizations that are operating monitors in the SLAMS/PSD network. One major objective for the collection of the audit data is to assess gas analyzer bias near the concentrations in the National Ambient Air Quality Standard (NAAQS) as required by 40 CFR Part 58, Appendix A.

The National Performance Audit Program

Because data from State and Local Ambient Monitoring Stations (SLAMS) and Prevention of Significant Deterioration (PSD) multi-pollutant monitoring stations are used for NAAQS comparisons, the quality of these data is very important. A quality system has been developed to control and evaluate the data quality to assure that NAAQS determinations are within an acceptable level of confidence. During the development of the NAAQS, the U.S. Environmental Protection Agency (EPA) used the Data Quality Objective (DQO) process to determine the allowable measurement system imprecision and bias that would not significantly affect a decision maker's ability to compare pollutant concentrations to the NAAQS.

The NPAP is a quality assurance (QA) activity that will be used to evaluate measurement system bias of the gaseous criteria pollutant monitoring network. The pertinent regulations are found in 40 CFR Part 58, Appendix A, Section 3.2.2. The strategy is to supply the SLAMS/PSD instrument with an audit gas generated on-site at concentration ranges specified in 40 CFR Part 58, Appendix A, Section 3.2.2.1.

Initially, the NPAP was implemented by mailing standards and gases to monitoring organizations for analysis. In 2003, OAQPS instituted a through-the-probe audit system where audit laboratories travel to monitoring sites and generate audit gases for immediate delivery through the inlet probe of the analyzers. The goals of the NPAP are:

- Performing audits at 20 percent of monitoring sites per year, and 100 percent in 5 to 7 years.
- Data submission to AQS.
- Development of a delivery system that will allow for the audit concentration gases to be introduced into the probe inlet where logistically feasible
- Use of audit gases that are NIST certified and validated at least once a year for SO_2, NO_2, and CO.

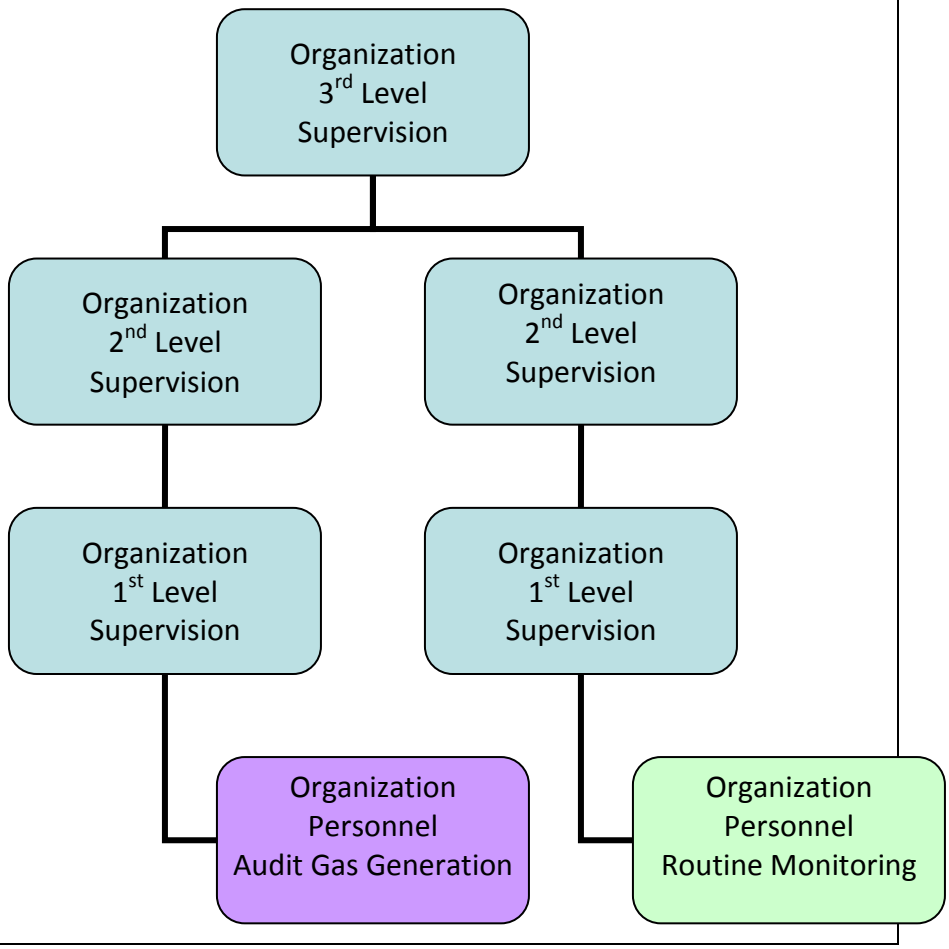
- Validation/certification with the EPA NPAP through collocation auditing at an acceptable number of sites each year. The comparison tests would have to be no greater than 5 percent different from the EPA NPAP results.
- Incorporation of NPAP in the monitoring organization's quality assurance project plan (if self implementing).

In general terms, a performance audit consists of presenting audit gas mixtures containing known concentrations to the measurement system to evaluate the proficiency of the analyst or laboratory. The difference between the known concentrations and the system responses is obtained, and an estimate of accuracy is determined. In the case of the NPAP, the goal is to assess the proficiency of monitoring organizations that are operating monitors in the SLAMS/PSD networks.

The implementation of a program of independent and adequate audits is a State, local and Tribal (SLT) responsibility; however, a QAPP which provides for monitoring organization participation in the NPAP meets this requirement. Monitoring organizations may self-implement the NPAP with demonstrated independence of the audit gas generating personnel and the monitoring system operator. Independent assessment (Figure 1) was defined by the $PM_{2.5}$ QA Workgroup to ensure that the appropriate level of independence is maintained during SLT implementation of the PEP. This definition has been adopted by the NPAP for consistency within the programs.

Independent assessment—an assessment performed by a qualified individual, group, or organization that is not part of the organization that is directly performing and accountable for the work being assessed. This auditing organization must not be involved with generating the routine ambient air monitoring data. An independent organization could be another unit of the same agency, which is sufficiently separated in terms of organizational reporting and can provide through-the-probe audit gases.

An organization can conduct the NPAP if it can meet the above definition and has a management structure that, at a minimum, allows for the separation of its routine monitoring personnel from its auditing personnel by two levels of management as illustrated in the figure below. Audit gas generation personnel would be required to meet the NPAP training and certification requirements.



Organizations planning to implement the NPAP must submit a plan that demonstrates independence to the EPA Regional Office responsible for overseeing QA-related activities for the ambient air monitoring network.

Figure 1. Definition of independent assessment.

In 2003, when EPA moved to through-the-probe delivery of audit gases, the agency investigated potential contracting mechanisms to help implement this activity. Based on the success of the Environmental Services Assistance Team (ESAT) contracts currently in place in each EPA Region in providing the necessary field and laboratory activities for the FRM/FEM PEP, additional tasks covering the TTP activities were added to the contracts. Although all EPA Regions implement the NPAP, resources, including audit laboratories and analyzers, are shared between Regions to reduce capital costs.

Field Activities

The NPAP audit laboratories are designed to verify and deliver audit gases through the probe inlet of ambient air monitoring stations. The laboratories, gas generation system, and analyzers have been selected and approved by EPA and are designed to be durable, rugged, and capable of frequent transport. Although the systems have been specifically designed to perform these audits, precautions must be taken to ensure the quality of the data. Specific and detailed instructions can be found in the Quality Assurance Project Plan (QAPP) for the Audit Support Program and throughout these SOPs. A brief summary of the field activities follows:

- One fully trained FS will drive the audit laboratory to the monitoring station, which shall be located at any of the SLAMS/PDS stations within each EPA Region.
- The FS will verify the operation of the audit gas generation system.
- The FS will coordinate the delivery of the audit gas through the station inlet probe, verify the concentration delivered, and obtain the station reading from the station operator.
- A Draft Audit Report will be provided to the station operator, or the monitoring organization's representative, prior to departure from the monitoring station.
- The Draft Audit Report will be provided to the ESAT Work Assignment Manager/Task Order Project Officer/Delivery Order Project Officer/Task Order Manager (WAM/TOPO/DOPO/TOM) and Regional QA Office for final review and ultimate delivery to the monitoring organization.
- The FS will properly maintain and operate the audit laboratory following manufacturer recommended procedures for gas analyzers, zero-air generators, on-board electric generators, vehicles, and other equipment as described in these SOPs.

Purpose of this Document

The purpose of the NPAP TTP SOPs is to provide detailed procedures to follow when performing the following activities:

- Overview
- Planning/preparation
- Calibration Checks (Verifications) and Procedures
- Audit Laboratory Start-up Procedures
- Site Set-up
- Through-the-Probe (TTP) Performance Audit (PE)
- Post Performance Audit Procedures

- Shut-down Procedures
- Maintenance Checks and Procedures
- Quality Assurance/Quality Control
- Information Retention

All procedures are to be followed completely. Any deviation must be reported in writing and submitted to the ESAT Work Assignment Manager/Task Order Project Officer/Delivery Order Project Officer/Task Order Manager (WAM/TOPO/DOPO/TOM).

NOTE: If any deviation or modification offers a more efficient method or technique or serves to maintain or improve data quality, these proposed changes shall be made in writing to the ESAT WAM/TOPO/DOPO.

Each SOP section is written as a stand-alone procedure to assist in training and certification activities and can be removed from the document and made readily available at the station where the activity takes place. The SOP sections are labeled for reference as NPAP TTP-X, where NPAP TTP indicates the NPAP Through-the-Probe SOPs and X indicates the section number. The SOPs follow the format for technical SOPs outlined in EPA's *Guidance for the Preparation of Standard Operating Procedures (SOPs) EPA QA/G-6*. The *QA/G-6* requirements include the following topics:

A. Scope and Applicability
B. Summary of Method
C. Definitions (acronyms, abbreviations, and specialized forms used in the SOPs)
D. Health and Safety Warnings
E. Cautions
F. Interferences
G. Personnel Qualifications
H. Apparatus and Materials
I. Instrument or Method Calibration
J. Sample Collection
K. Handling and Preservation
L. Sample Preparation and Analysis
M. Troubleshooting
N. Data Acquisition, Calculations, and Data Reduction
O. Computer Hardware and Software
P. Data Management and Records Management.

Prerequisites

Training and Certification

All field scientists funded by the OAQPS NPAP Work Assignment must be trained and certified to perform the activities. Training and recommendation for certification can be provided by the Regional WAM/TOPO/DOPO or by OAQPS.

Background Reading

Prior to implementing field activities, field personnel are expected to be familiar with the documents listed in Table 1. The knowledge level is rated from 1, having in-depth knowledge, to 5, having a basic understanding.

Table 1. Required Reading for the National Performance Audit Program

Document	Knowledge Level
NPAP TTP SOPs	1
Quality Assurance Project Plan (QAPP) for the Audit Support Program	1
Operating Manuals for analyzers and instrumentation in audit laboratory	1
QA Guidance Document 2.12*	3
NAAQS Criteria Pollutant gases DQO Process	3
QA Handbook Vol. II Part 1	3
40 CFR Part 50, Appendices A, C, D and F	4
40 CFR Part 58, Appendix A	4

* The 2006 revisions to monitoring regulations supersede specific requirements of *QA Guidance Document 2.12*.

Definitions

Appendix A contains a glossary of the terms used in the NPAP. Acronyms and abbreviations can be found in the front of this compendium.

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 1
Overview of Performance Evaluation Field Activities

SOP: NPAP-1

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1.1 Overview of NPAP TTP Field Activities

1.1.1 Scope and Applicability

This SOP applies to performing NPAP TTP field operations and provides an overview of the detailed SOPs that follow. Regulations related to these procedures are found in 40 CFR Part 58 Appendix A Section 2.4.

1.1.2 Summary of Method

A PE is used for determining total bias for National Ambient Air Quality Standard (NAAQS) Criteria Pollutant gases. The performance evaluation gas samples are dynamically generated and independently verified by EPA funded personnel onsite. The test gas samples are delivered to and through the entire ambient air monitoring sampling system of the organization being evaluated, starting with entry into the monitoring station's sampling inlet, or "probe". The concentrations measured by the station instruments and NPAP audit lab are then compared to assess bias. NPAP TTP PEs will be conducted as follows:

- Primary QA organizations are required to complete audits of 20% of stations each year.
- 100% completeness (whatever it takes to report valid audits for 20% of stations each year)
- All stations subject to an audit within 5 years.

Special priority will be given to those stations documented or expected to have concentrations near the annual NAAQS for Criteria Pollutant gases (40 CFR Part 58, Appendix D).

The basic operations involved with conducting the field portion of the PE are described in the SOP sections contained in this document.

1.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

1.1.4 Health and Safety Warnings

To prevent personal injury, all personnel must heed any warnings associated with the transport and operation of the NPAP audit trailer and any supporting equipment and supplies. Specific health and safety warnings will generally be found at the point in the operating manual or troubleshooting guide where they are most applicable. The following issues are of particular concern:

- Adhere to all warnings associated with operation of the TTP tow vehicle, hitch, and trailer. Assure the readiness of hitch brake emergency disconnects prior to moving the vehicle and trailer.

- State and local law governs the placarding of vehicles carrying compressed gases. Field scientists must be aware of the location of cylinder hazard placards and the requirements for use in all jurisdictions included in the audit trailer schedule.

1.1.5 Cautions

- Because the mobile audit lab and components will be moved from site to site, it is of critical importance that it be maintained and calibrated as required and that all aspects of its operation be checked and verified after it is set up at each site. To function as a reliable standard of comparison, its operational parameters must be kept within tight control limits.

- Caution must be taken to install and maintain the TTP system components properly to prevent damage. Be particularly attentive to maintenance of the auxiliary generators, air conditioners, API 701, Environics 9100, analyzers (CO and ozone) and computer. Ensure the soundness of electrical and pneumatic connections that will be assembled and disassembled and to cleaning the interior and exterior surfaces of the manifolds, connecting tubing, and delivery hose lines. Establish and always use individual instrument logs for recording purpose; keep the logs with the instruments at all times. All necessary corrective actions must be taken before PE can begin with the TTP system.

- Equipment that must be checked prior to and during each trip to ensure that it is operating correctly: tow vehicle and trailer tires for air, auxiliary generators for oil leaks, roof A/C units for Freon (or EPA -approved-substitute), generator fuel tank leaks (use dip stick), brake fluid leaks(remove rubber seal cap on each wheel hub center); roof platform guard rail lockdown mechanism; interior cabinet and drawer latches, storage tie downs, cylinder rack tie downs, cylinder fitting tightness, presence and use of regular and yellow clamshell safety cylinder caps; emergency and all other lights; exterior trailer door, port, and fuel tank locks; inflation pressure of each of the instrument rack pneumatic, floor-mounted shock absorbers; test switch for battery indicator of CO monitor/alarm; status of fire extinguisher and safety kit; status of exterior trailer tongue and loading jacks.

- The TTP system components used for PE are potentially vulnerable to contamination and damaged. Exercise care in handling new components. Avoid touching the flow path component interior surfaces; normally handle the components only by touching the exterior surfaces. If details concerning component labeling and connection are not followed precisely, errors will result. Rough handling of used components during packaging or transport should be avoided.

- Protect the cylinder pressure gauges any from mechanical shock and sudden changes in pressure.

- It is possible to damage station instrumentation if it is pressurized during the audit gas delivery. Always examine the station inlet, determine necessary gas delivery rates to obtain a valid audit while protecting the station. Review instrument pressure before and during the audit to verify appropriate flows. Communication with the station operator regarding these issues is critical to a successful audit.

1.1.6 Interferences

The interferences associated with this method are factors that can cause alterations to concentration of the audit gases. Such changes in concentration can be the result of loss (through leak or reactivity) or contamination. Interferences can be minimized by following these guidelines:

- Take precautions to prevent the introduction of dirt or debris into the gas flow path. Visually examine the path, including the manifold, regularly to detect any material that has been introduced – clean as appropriate prior to attempting an audit. Do not jeopardize the integrity of the flow path by opening connections unnecessarily or leaving fittings open and uncapped.

- Take all steps to minimize sampling and analysis residence times, including tubing and other flow path component lengths and diameters, dead spaces, leaks, unnecessary path resistance (due to sharp bends, kinks, etc.).

- To avoid any contamination of the flow path and analytical devices; ensure that the PE test gas flow path's interior surfaces are clean, including manifolds, tubing, fittings, delivery /presentation hose pipe connections and liner. Use required leak checks to identify and correct any leaks found within the flow system.

- Follow procedures for purging the cylinder pressure gauges to remove interference caused by either bleeding from the regulators or reaction of the gases in the gauges and lines.

- Water vapor can result in false positive analyzer readings and inaccurate dynamic dilution concentrations. To minimize this interference, use only well-dried zero air.

1.1.7 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs. The training programs will be conducted as required at locations throughout the U.S. to ensure all FS are trained and an adequate number of PE FSs are available in each EPA Region. Contact the Regional EPA Office or OAQPS for more information about training schedules and locations. Supplemental courses such as those offered by Air Pollution Training Institute (APTI) may be useful in providing general background to personnel with limited experience with air monitoring and/or quality assurance.

The TTP Audit Labs are either truck or trailer-mounted (see subsection 7 for detailed description). The FS shall be prepared to drive the TTP Audit Lab from the home base to various ambient air monitoring stations which may be difficult to access or located in distant rural settings. The TTP Audit Lab should be legally parked within 150 feet of the air monitoring station inlet (probe), which is frequently located

atop a building or platform. The FS will have to maneuver the lab in forward and reverse gears, and on various roads at speeds up to the posted limit without damaging the TTP system. EPA has begun providing a training program for towing boat trailers, which has been modified, to some extent, for towing mobile labs and may be appropriate for FS assigned trailer-mounted labs.

1.1.8 Equipment and Supplies

Each organization responsible for performing the TTP PE has a TTP Audit Lab made available by OAQPS. The truck- or trailer-mounted labs are designed to be self-contained with onboard generators, UPS, and other features designed to ensure a stable and safe environment for the FS and audit equipment. A plumbing schematic of the components in the TTP Audit Lab used to generate, verify, and deliver the audit gas is provided in Figure 1-1.

Each organization responsible for performing the TTP PE will develop a standard "kit" of equipment, materials, and supplies suitable for the make(s) and model(s) of TTP Audit Lab components to be used. The contents of this "kit" will also be determined by the different requirements of the sites to be visited for TTP PEs. A critical component of the “kit” is a variety of fittings and tubing (made of non-reactive materials) for use in connecting the delivery hose to the station inlet (probe).

SOP NPAP TTP-2.01 contains a complete field inventory list and discusses the procedures for field equipment and supply. That list of generic equipment and supplies must be translated into a specific checklist of equipment and materials that can be customized as necessary. Communications between the FS and site personnel prior to the visit are essential and assist greatly in knowing what will be required at each site.

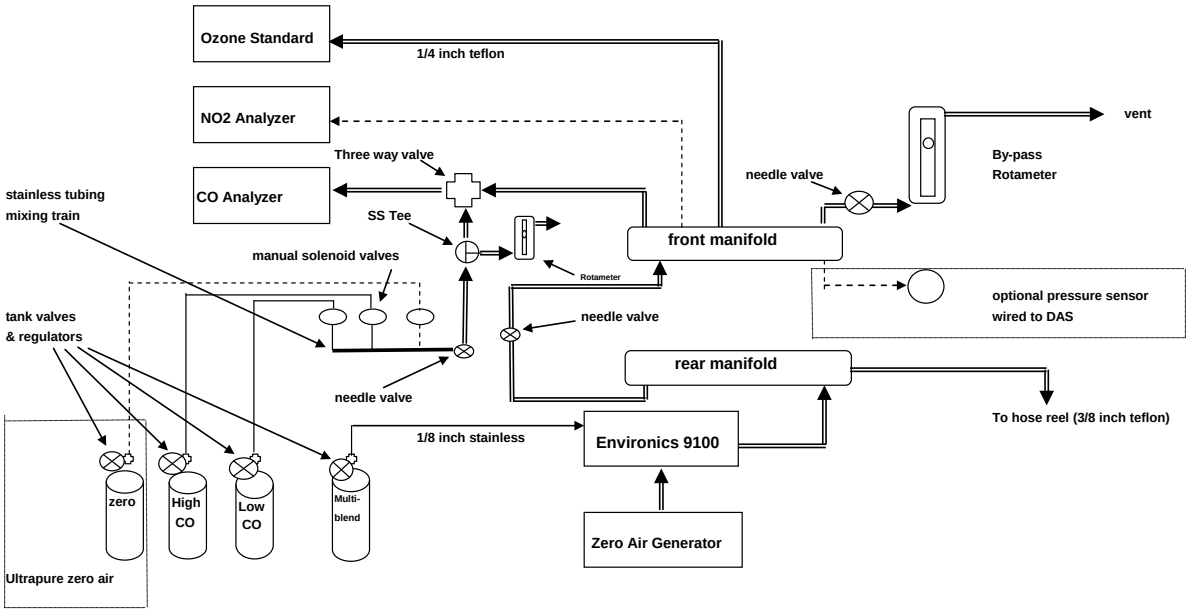

Figure 1-1. TTP Audit Lab Plumbing Schematic

1.1.9 Procedure

The FS will perform the following activities as illustrated in Figure 1-2:

- The FS will receive equipment and consumables, inventory each item and ensure supplies are adequate to perform field activities.

- The FS will maintain the TTP Audit Lab standards and equipment as required:
  - Ozone standard devices will be compared to a NIST-manufactured SRP quarterly.
  - The compressed gas standards will be certified against independent NIST-traceable compressed gas standards annually. The multi-blend cylinder and CO calibration gas cylinders pressure should remain above 325 PSI to allow for recertification at the completion of an audit trip to verify stability.
  - The ozone line loss factor of the TTP PE delivery hose will be verified quarterly.

- The FS will assist in developing a plan for the implementation of field activities and gather pertinent information for each site on a Site Data Sheet. Communication regarding the location of the station inlet, required connecting equipment for the delivery hose, and other logistics should be completed prior to departing on an audit trip.

- The FS will drive the EPA TTP Audit Lab from the home base (or intermediate scheduled PEP sites) to the scheduled PE site. The FS will complete warm-up and pre-arrival conditioning and stabilization procedures to minimize time needed at the PE site.

- Upon arrival at the scheduled PE site, the FS will park the TTP Audit Lab in a legal location. The lab must be located to facilitate connection of the delivery hose to the station inlet. The FS will obtain all necessary information for the TTP spreadsheet from the station operator. After communicating with the station operator to determine required flow and to assure that the station analyzers are off-line, the FS will connect the delivery hose to the station inlet.

- The FS will calibrate the onboard CO analyzer to make sure that they are operating correctly, in comparison to pre-PE trip performance tests. The FS will then make and record the results of the zero and upscale settings that should result in the flows and concentrations that his/her calculation has indicated. The FS will check that the PE gas being generated by the TTP Audit Lab is within acceptable limits using the ozone and/or CO analyzers. The EMC data strip charting and PC-based recording and ~~HP~~ printout are used to track, record, and document the stabilization profile of the process.

- Once the FS has verified that the TTP Audit Lab values are correct and stable, the FS asks the station operator to provide the station values, following any and all procedures they normally follow to get their own field monitoring results. The station and TTP Audit Lab results are recorded by the FS on the ozone and/or blended gas PE result forms.

- The FS provides the station operator with a Preliminary PE Data Form, and conducts shutdown tasks according to the TTP SOP and associated checklists.
- If scheduling and resources allow, the FS may complete other assignments during the TTP stabilizing steps. For example, the FS may:

- leave this TTP site to set up a PEP sample at another sampling locations.
- perform any required maintenance or repair of the mobile TTP lab components.
- return to a PEP site after the 24-hour PEP sampling period, remove and properly store the PEP filter for transport, download the stored electronic monitoring data, enter additional information as required, and disassemble and pack the sampler.

- The FS, if a contractor, shall participate in or assist with scheduled quality assurance activities of the NPAP TTP, if and as required by contract Task Order and TDF.

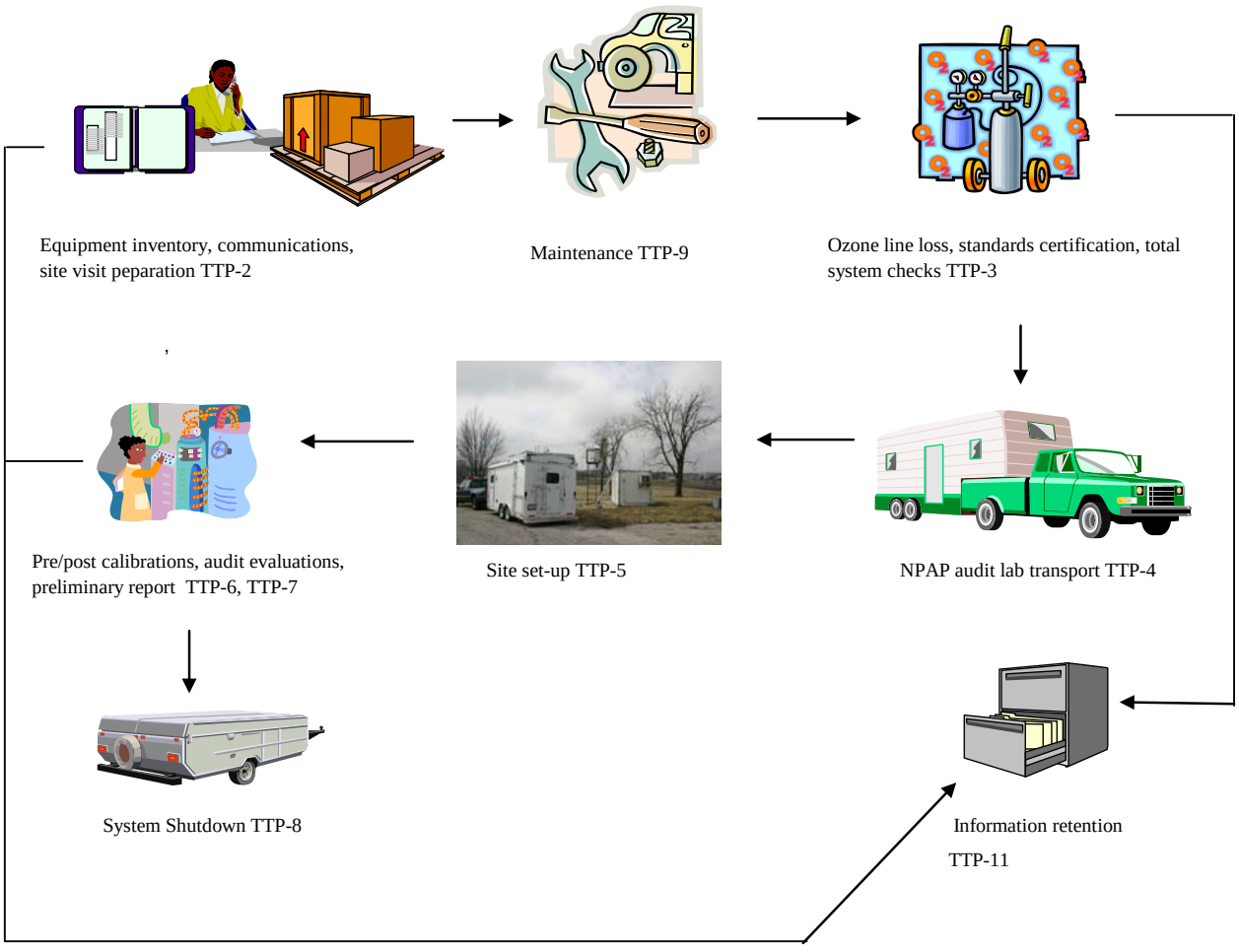

Figure 1-2. NPAP TTP PE SOP Tasks

1.1.10 References

1. 40 CFR Parts 50 and 58.
2. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.
3. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.
4. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.
5. Environics Series 9100 Operating Manual.
6. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.
7. Powerware 9125, User's Guide.
8. ONAN Commercial Mobile Power, Operator's Manual (Models HGJAD, HGJAE, HGJAF).
9. Duo-Therm 579, Series BRISK AIR.
10. WELLS CARGO Owner's Manual .
11. DEXTER AXLE, Operation Maintenance Service Manual.
12. Atwood Battery Operated Carbon Monoxide Alarm User's Guide.

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 2
Planning and Preparing for NPAP Site Visit
SOP: NPAP-2

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2.1 Equipment Inventory and Storage

2.1.1 Scope and Applicability

This SOP explains the activities involved in inventorying existing laboratory equipment, receiving new equipment and consumables, and maintaining the equipment.

2.1.2 Definitions

Appendix A contains a glossary of the terms that used in the NPAP TTP.

2.1.3 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

2.1.4 Equipment and Supplies

The FS will use the following apparatus and materials to perform the procedures in this section:

- Table 2-1 providing a listing of the equipment and consumables needed for the field.
- Field Inventory Form INV-01
- Field Procurement Log PRO-01
- Field Receiving Report Form REC-01

2.1.5 Procedure

2.1.5.1 Equipment Inventory

A list of the required capital equipment and consumables is provided in Table 2-1. The FS will follow the procedure below:

- Select Field Inventory Form INV-01.
- Take a complete inventory of all equipment and supplies.
- Keep an original copy and file under AIRP/486. Provide a copy of the inventory to the regional TOPO/WAM.

The FS should maintain a 2-months' supply of consumables. During the first weeks of implementation, the FS will determine how quickly he/she is using consumable equipment and develop a purchasing schedule to ensure an adequate supply is maintained.

Table 2-1 must be translated into a specific checklist of equipment and materials that can be customized as necessary. Communications between the FS and site personnel prior to the visit are essential and assist greatly in knowing what will be required at each site.

Table 2-1. Equipment and Supplies

Qty.	NPAP Field Equipment and Supplies	Vendor/Catalog #	Make/Model #	
	Monitoring Equipment and Supplies			
	Item Number: 15655WT Spare wheel and tire for mobile audit trailer			
	Transport cases for loose equipment/consumables	Forestry Suppliers/31113	Collapsible crate	
1	Cylinder Hand-Transport Carts	Fisher Scientific	23-1200 air products	
	Operations manual(s)			
	Field notebook(s)			
	Clipboard (8 x 14")	Forestry Suppliers /53283	Cruiser mate	
	Grip Binders	Office Depot/501-627	Presstex	
	NPAP TTP Field SOPs (this document)			
	Documentation forms or data sheets, preprinted			
1	Computer with audit workbook/spreadsheet and printer			
1	Data logging system	EMC Station Manager	Data Logger/PC Platform	
	Magnetic compass or other means of determining site orientation (optional)	Forestry Suppliers/ 37177	Suunto Partner II	
	Tape Measure (metric)	Forestry Suppliers/ 39651	Lufkin/ W 9210ME	
	Cellular phone			
	Mechanical Pencils Markers (indelible)	Skilcraft Sharpees	9mm Ultrafine	
	Connecting(Mounting)Equipment/Manifold System (See Calibration/Verification Standards and Related Equipment)			
	FEP Teflon Tubing - 1/4" O.D. - 1/8 I.D. - 1/16" Wall thickness	Cole-Parmer Instr Co 1-800-323-4340		
16	FEP Teflon 1/4" plug	Georgia Valve and Fitting	Swagelok Part No. NY-400-P	
16	FEP Teflon reducing unions, 5/16:x1/4"	Georgia Valve and Fitting	Swagelok Part No. NY-500-6-4	
1	FEP Teflon reducing unions, ½" x 3/8"	Georgia Valve and Fitting	Swagelok Part No. NY-810-06-06	
1	FEP Teflon reducing unions, ½"x1/4"	Georgia Valve and Fitting	Swagelok Part No. NY-810-6	
1	FEP Teflon 3/8" plug	Georgia Valve and Fitting	Swagelok Part No. NY-600-P	
4	Part No.3190T6 - vibration and noise control strut mount clamp for 3/4" tube OD	MCMASTER-CARR SUPPLY CO		
2	13/16" single channel strut, 24" long	MCMASTER-CARR SUPPLY CO	Part No.3310T612	
4	strut channel end cap, frame style, for 13/16"single channel (15/8" x 13/16")	MCMASTER-CARR SUPPLY CO	Part No. 3312T41	
1	Glass (Annealed Borosilicate) Inlet Connector T's-	Research & Dev. Glass Product & Equipment		
1	Needle Valve	Cross Instruments	Model 4Z-V4LN-SS, (sharp stem)	
1	½" by 100' stainless steel-braided line	Cross Instruments Parker-Hannifin		
1	Line-loss test apparatus: stainless steel tee with 2' of Teflon line			
1	Rotameter (flow meter)	Dwyer Instruments	Model VFA-21	

Qty.	NPAP Field Equipment and Supplies	Vendor/Catalog #	Make/Model #	
3;1	Two-way 24 VDC solenoid valve; three-way manual valve to actuate the zero air supply and gas cylinders (Trailer Contractor purchase)		ASCO Red Hat	
1	Rack Mount Kit (4 post rack support kit for 19" racks for #9125-4 post UPS	Major Power		
2	Instrument Racks (Pioneer Series) Lab Contractor Purchase)		APW	
	Masking tape	GSA-7510-00-283-0612		
	Packaging tape	GSA-7510-00-079-7906		
	Strapping tape	GSA-7510-00-159-4450		
	Tool box with basic tools			
	Rope for hoisting equipment			
	16 foot - Type 1A- Articulated Ladder			
	Flashlight with spare batteries			
	Heavy-duty, grounded, weatherproof electrical extension cord with multiple outlets (25 ft. length)	Unicor	Style3 Class2 Series2	
	Heavy-duty, grounded, weatherproof electrical extension cord with multiple outlets (12 ft. length)	Unicor	Style3 Class2 Series2	
	Land line: electrical receptacles and extension cable(cord) with matching plugs (Regions 6 and 9; made in Las Vegas)	Leviton 3-wire 30 to50 amp, 125V	CS63-70	
Calibration/Verification Standards and Related Equipment (See Manifold System above)				
1	UPS + Power Line Conditioner	Major Power	POWERWARE 9125-2000	
1	Audit Hose Assembly, Braided Stainless Steel(SS), Teflon Lined, 150ft long, ½" O D	Parker-Hannifin	P919TUTU80808C	
1	S S Hose Connector	Georgia Valve and Fitting	Swagelok , Part No. SS-810-1-8	
1	S S Hose Connector	Georgia Valve and Fitting	Swagelok, Part No. SS-810-5-6	
1	Continuous Zero Air Generator	API	API Model 701	
1	Computerized Ambient Calibrator (with ozone generator)	Environics	Environics 9100	
1	CO Analyzer	TECO	TECO 48C	
1	Ozone Analyzer (with Generator)	TECO	TECO 49C-PS	
1	Combined UPS and PLC	Major Power	Major Power PowerWare 9125-2000	
2	KW Auxiliary Gasoline Generator(Mfr: Onan)	Cummins	ONAN CMM	
1	Ultra Pure Air	Scott-Marin, Inc		
1	Regulator for Blended CO, SO2 and NO	National Welders/	CONCOA 442-2301-660	
2	Regulators for Ambient CO	National Welders	CONCOA 422-2301-590	
4	Clam shell covers for cylinders with regulators	Griftan Inc. PO Box 1296 Georgetown, SC 29442 www.griftaninc.com		
1	Compressed gas cylinder - CO, High Ambient, approx 40 ppm, NIST Traceable EPA Protocol Gas	Scott-Marrin, Inc	Size 150	
1	Compressed gas cylinder - CO Low Ambient, approx. 6-8 ppm, NIST Traceable EPA Protocol Gas	Scott-Marrin, Inc		
1	Compressed gas cylinder, Size 150, Blended Gas (approx. CO=10000ppm, NO=110ppm, SO2=100ppm) , NIST Traceable EPA Protocol Gas	Scott-Marrin, Inc		

Qty.	NPAP Field Equipment and Supplies	Vendor/Catalog #	Make/Model #	
1	20 ft 316 SS tubing	GA Valve & Fitting	Swagelok Part No. SS-T4 S-035RL	
1	Male Connector, SS, ¼" pipe to 1/8" tube	GA Valve & Fitting	Swagelok SS-200-2-4	
3	SS Plug, ¼" O.D.	GA Valve & Fitting	Swagelok SS-400-P	
	Hand calculator (scientific)			
	JD-22-5995 Pair of Motorola T5920 talk about FM Radios	Cabela's 1-800-237-4444		
	147-0860 Fuel filter for Onan generator	Cummings Mid-America 1-816-414-8200		
	140-3116 Element air cleaner for Onan generator	Cummings Mid-America		
	122-0836 Oil filter for Onan generator	Cummings Mid-America		
	167-1638 Spark Plugs for Onan generator	Cummings Mid-America		
	326-5336 Onamax 15@40 oil for Onan generator	Cummings Mid-America		
	Air Compressor to inflate tires			
	TOW VEHICLE			
	Spare Parts and Optional Equipment			
	Spare Teflon tubing and fittings			
	Spare Batteries (for all battery-powered equipment)			
	Fuses, as required by all equipment used			
	Spare in-line filters (if required by the..			
	Voltmeter/ammeter for troubleshooting			
	No contaminating Dipstick for Aux. Gen.Fuel Tank			
	Cleaning Supplies and Equipment			
	Low-lint laboratory wipes for cleaning TTP equipment	Daigger/AX5661	Kay-Pees Disposable paper towels	
	Large locking plastic bag for cleanup of debris, wipes, etc			
	Soft brush,			
	Supply of deionized water for cleaning and rinsing equipment			
	Isopropyl alcohol to aid in removal of grease and dirt			
	Penetrating oil			
	Lint-free pipe cleaners			
	Lint-free cotton-tipped swabs			
	wooden dowel, and cloth wads to clean down tube			
	Spray Bottle			
	Garbage can			
	Place to put broom			
	Cleaning supplies; rags to clean counter tops			
	Additional Equipment and other Items			
1	Office chair			
1	Spare tire & jack - and a place to store			
	Maintenance Schedule Tables; Trailer checklist			

2.1.5.2 Procurement

As consumables run low or new equipment purchases are necessary, the FS will be responsible for assisting in the procurement of these items following the policy and requirements described in the ESAT scope of work. The FS should continue purchasing consumable equipment with the same model numbers as initially procured unless the TOPO/WAM suggests a different item due to improved quality, reduced contamination, ease of use, or lower cost (without sacrificing quality). The following procedures will be required.

- The FS will develop procurement requests as per EPA requirements.
- Upon order, add items to the Field Procurement Log PRO-01.
- Once a month provide a copy of Form PRO-01 to the TOPO/WAM.
- File Form PRO-01 in file AIRP/486.

2.1.5.3 Equipment Consumable Receipt

Upon receiving equipment and consumables, the FS will perform the following activities:

- Pull the appropriate purchase order for the incoming items from the files.
- Fill out a Field Receiving Report Form REC-01 comparing the items and quantity against the purchase order and inspecting the condition of each item.
- If the items received match the purchase order and the condition of the equipment or consumables is acceptable, signify this on the form and file it in AIRP/486.
- If the quantity, items, or condition are not acceptable, complete REC-01 with appropriate remarks and send a copy of the form to the TOPO/WAM.
- Add receipt information to the Field Procurement Log Form PRO-01

2.1.5.4 Audit Lab Storage

When equipment is not in use, store it in a clean, dry, and safe location. After completion of a field trip and return to the field office, the audit lab should be cleaned, maintained as scheduled, and stored for the next trip. All equipment should be clearly identified, and readily available for the next scheduled field trip.

2.1.5.5 Shipping Government Equipment

In the course of the NPAP it is frequently necessary to ship items around the country. Proper shipping accounts and forms assure proper billing and prevent overcharges. Always obtain the current account number before shipping. When shipping cylinders for recertification, the hazardous goods forms must be completed. When using Federal Express, do not provide a “Declared Value” on the form as this will result in insurance charges (the federal government is self-insured against loss).

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Section 2.1: Equipment Inventory and Storage

Field Data Forms

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Field Inventory Form					
Item	**Vendor**	**Model Number**	**Quantity**	**Purchase Date**	**Warranty**
					Form INV-01

Field Equipment/Consumable Receiving Report

Date: _____

Received From:

Shipped From:

Shipped Via:

Shipping Charge:	Prepaid:	Collect:	Freight Bill Number:

Purchase Order Number		

Quantity	Description of Item	Condition

Remarks: Accept Shipment _____ Problem _____

Notes:

Form REC-01

Procurement Log									
Item	Model Number	Quantity	PO Number	Vendor	Date		Cost	Initials	Accept/ Reject
					Ordered	Received			
Form PRO-01									

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2.2 Communications

2.2.1 Scope and Applicability

This procedure describes the required activities for TTP FS to communicate technical information to organizations intimately involved in the NPAP and includes:

- ESAT TOPO/WAM for the FS
- OAQPS

This SOP does not describe additional ESAT communication obligations described in the ESAT Scope of Work. Communications will include reports, e-mail messages and phone calls.

2.2.2 Summary of Method

An organized communications framework is needed to facilitate the flow of information among the participating organizations as well as among other users of the information produced by the ambient air monitoring network. The principal communications pathways are represented in Figure 2.2.1. In general, ESAT contractors will be responsible for informing Regions and Project Officers (POs) about technical progress, issues, and contractual obligations. On the technical side, the EPA Regional TOPO/WAMs will be responsible for communicating with Tribal, State and local agencies and informing OAQPS on issues that require technical attention. Contractual issues will be conveyed from the ESAT contractor through POs to the ESAT Contracts Office and, if necessary, to OAQPS. Table 2-2 at the end of this SOP lists the important EPA ESAT contacts.

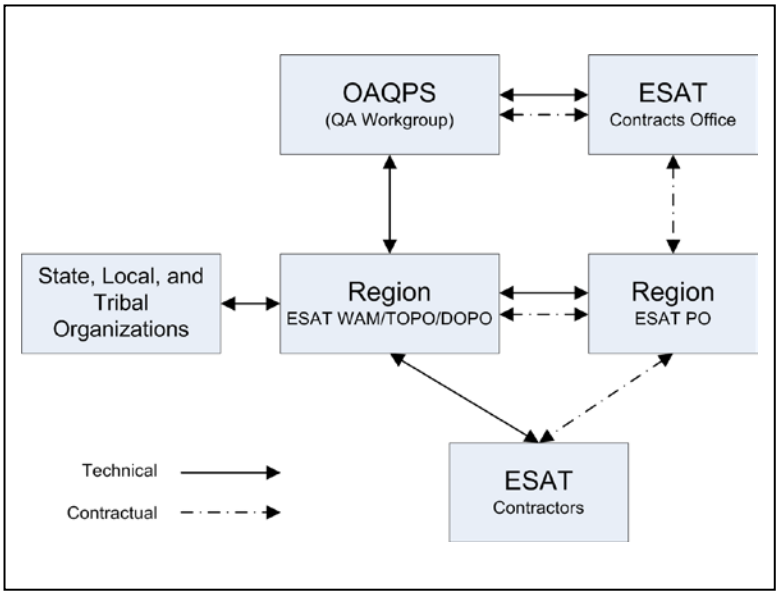

Figure 2-1. Line of communication.

The ESAT contractors will have frequent communication with the Regional TOPO/WAMs about the progress of their activities and any problems/issues associated with them. Resolution of these issues should take place in the Regions unless the issue could affect the implementation of the program at a national level, where it should be discussed and resolved through an ESAT Workgroup conference call.

2.2.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

2.2.4 Equipment and Supplies

The following capital and consumable equipment will be required for communications:

- Telephone
- Laboratory PC - with Internet and EPA e-mail capabilities
- Printer
- Field Communication Notebook
- Writing utensils
- Appropriate Forms
  - COM-1 - Phone Communication Form
  - COM-2 - Monthly Progress Report

2.2.5 Phone and E-mail Communications

2.2.5.1 Issue-Related Calls

A call may be initiated by the TOPO/WAM(s) or the FS at any time during implementation. During the conversation, the phone communication form (COM-1), in the field communications notebook, will be used by the FS to record the highlights of the conversation. Notes will include the following:

- Date
- Time
- Personnel involved
- Issue(s)
- Decision(s)
- Follow-up action(s)
- Follow-up action responsibility
- Follow-up action completed by (date)

If follow-up action is required by the FS, these actions will be included in the monthly progress reports (see Section 5.2). At a minimum, the FS will keep the original hardcopy in the field communications notebook. The FS may also choose to keep an electronic record of this information on a PC.

2.2.5.2 Field Communications

Field communications can take place either by phone or e-mail. Phone messages or conversations will be recorded in the field communications notebook. E-mail messages should be printed and stored in the field communications notebook.

NOTE: The FS must document communications; however, there is some flexibility in exactly how it can be done. The COM forms are a guide, and may be used and archived as described above or as the FS sees fit. The FS is not required to have a separate notebook just for logging communications, but it must be logged in some fashion.

2.2.5.3 ESAT Conference Calls

The FS may be asked to participate in ESAT Workgroup conference calls to discuss progress or resolution of issues. The TOPO/WAM will inform the FS of information that needs to be prepared for the call at least 3 days prior to the call. During the call, the FS will use the Phone Communication Form (COM-1) to record issues and action items that pertain to his or her activities. These items will be included in the next monthly progress report.

2.2.5.4 Communicating with Reporting Organizations and Site Operators

Dates for the PE visits should be coordinated with the site's normal operating schedule. This coordination must be done in advance so that both the FS and the site operator have ample advance notice and time to prepare for the on-site visit. The procedure for such communications follows:

The FS will contact each site operator (by telephone) no less than 1 month prior to the site visit. Points to be covered include the following:

- field implementation schedule; select a location and time to meet.
- assistance in setting up the Audit Lab and delivery connection to station instruments and other assistance.
- brief the operator on what will occur during the evaluation.
- discuss the tasks that the site operator will be requested to do to assist with the evaluation.
- additional information needed for the Site Data Sheet.
- answer the site operator’s questions.
- emphasize that the site’s equipment will not be adjusted in any way and that the operator should do nothing out of the ordinary routine to prepare for the PE.
- ensure that all clearances have been obtained so that the site can be accessed as necessary. A site representative must be present during the PE. If a representative other than the site operator plans on being at the site, the name and number of this representative must be identified and recorded.
- verify that sufficient electric power is available for powering the TTP Audit Laboratory, if necessary.
- determine if special logistic concerns exist (training, equipment, etc.).

If problems are identified in the preliminary discussions with the site operator, arrangements will be made to take corrective actions. Below are some suggested corrective actions for various commonly encountered problems:

- Climbing or other special safety equipment required:
  - buy or rent appropriate equipment prior to the site visit
  - borrow the necessary equipment from the site operator or the operator's organization
  - postpone visit until the situation requiring special safety equipment is remedied (if feasible)
- Insufficient power at the site to operate the TTP Audit Laboratory (and other site monitors and equipment) simultaneously:
  - obtain permission to run an extension power cord from a nearby outlet

- Special restrictions on site access are in force, such as a requirement for a lengthy background check at certain high-security Federal installations. (Note: FS are required to observe laws, rules, regulations, and policies regarding access to restricted sites on public or private land. The Performance Evaluator shall not "borrow" the operator's key or access card without the knowledge and permission of the site owner.) Options for dealing with this type of situation include:
  - obtain necessary permissions, keycards, etc. in advance
  - request that the reporting organization or the EPA Regional Office to secure the necessary permissions to access the site on behalf of the FS
  - make arrangements for a "cleared" escort to accompany the Evaluator at all times (if this is acceptable at the particular site)

About one week prior to the actual evaluation, the FS will call the site operator to confirm that the PE visit remains on schedule and to confirm meeting arrangements.

2.2.6 Monthly Progress Reports

The FS will provide to the TOPO/WAM a progress report in writing at the end of each month. The monthly progress report Form COM-2 will be used to convey the following information:

- Reporting Date - beginning and end date that report covers
- Reporter - person writing report
- Progress - progress on field activities
- Evaluations scheduled within reporting date
- Evaluations conducted within reporting date
- Issues
  - Old issues- issues reported in earlier reports that have not been resolved
  - New issues- arising within reporting date
- Actions- Action necessary to resolve issues including: the person(s) responsible for resolving them and the anticipated dates when they will be resolved.

2.2.7 Records Management

Monthly progress reports will be archived in the field reporting package file under AIRP/484. Phone communications will be archived in the field reporting package file under SAMP/502/COM. See Section 11 for details.

Table 2-2 ESAT Contacts

Name	Address	Phone Number	Electronic Mail
ESAT			

Name	Address	Phone Number	Electronic Mail
Headquarters ESAT Program Manager Colleen Walling	U.S. Environmental Protection Agency (EPA) Headquarters Ariel Rios Building 1200 Pennsylvania Ave., NW Mail Code: 5203P Washington, DC 20460	(703) 603-8814	walling.colleen@epa.gov
Contracting Officers:	** Same as above **		
Charlie Hurt	(Mail Code: 3805R)	(202) 564-6780	hurt.charlie@epa.gov
Lynette Gallion	(Mail Code: 3805R)	(202) 564-4463	gallion.lynette@epa.gov
Deborah Hoover	U.S. EPA–Region 4 61 Forsyth Street, S.W. Atlanta, GA 30303-8960	(404) 562-8373	hoover.deborah@epa.gov
OAQPS			
TOPO/WAM, National NPAP Project Leader Mark Shanis	U.S. EPA Office of Air Quality Planning and Standards MQAG (C304-06) Research Triangle Park, NC 27711	(919) 541-1323	shanis.mark@epa.gov
	** Same as above **		
Michael Papp		(919) 541-2408	papp.michael@epa.gov
REGIONS			
Region 1 TOPO Mary Jane Cuzzupe **Regional Project Officer (RPO)** Pat Svetaka	U.S. EPA–Region 1 New England Regional Laboratory Office of Environmental Measurement and Evaluation 11 Technology Dr. (ECA) North Chelmsford, MA 01863	(617) 918-8397 (617) 918-8396	cuzzupe.maryjane@epa.gov svetaka.pat@epa.gov
Region 2 TOPO Mark Winter **RPO** Yolanda Guess	U.S EPA–Region 2 Raritan Depot (220MS220) 2890 Woodbridge Ave. Edison, NJ 08837-3679 ** Same as above ** (Mail Code: 215MS215)	(732) 321-4360 (732) 906-6875	winter.mark@epa.gov guess.yolanda@epa.gov

Name	Address	Phone Number	Electronic Mail
Region 3 **TOPO** Cathleen Kennedy	U.S. EPA–Region 3 1650 Arch. St. (3AP22) Philadelphia, PA 19103-2029	(215) 814-2746	kennedy.cathleen@epa.gov
RPO Khin-Cho Thaung	U.S. EPA–Region 3 Environmental Science Center 701 Mapes Rd. (3ES20) Fort Meade, MD 20755-5350	(410) 305-2743	thaung.khin-cho@epa.gov
Region 4 **TOPO** Greg Noah	U.S. EPA–Region 4 Science and Ecosystem Support Division 980 College Station Rd. Athens, GA 30605-2720	(706) 355-8635	noah.greg@epa.gov
RPO Sandra Sims	U.S. EPA–Region 4 Atlanta Federal Center 61 Forsyth St., SW Atlanta, GA 30303-8960	(706) 355-8772	sims.sandra@epa.gov
Region 5 **TOPO** Basim Dihu	U.S. EPA–Region 5 77 West Jackson Blvd. (AT-18J) Chicago, IL 60604-3507	(312) 886-6242	dihu.basim@epa.gov
RPO Steven Peterson	** Same as above ** (Mail Code: SRT-4J)	(312) 353-1422	peterson.steven@epa.gov
Region 6 **TOPO** John Lay	U.S. EPA–Region 6 Laboratory Houston Branch (6PDQ) 10625 Fallstone Rd. Houston, TX 77099	(281) 983-2155	lay.john@epa.gov
RPO Marvelyn Humphrey	** Same as above ** (Mail Code: 6MDHL)	(281) 983-2140	humphrey.marvelyn@epa.gov
Region 7 **TOPO** Thien Bui	U.S. EPA–Region 7 901 North Fifth St. (ENSV/CARB) Kansas City, KS 66101	(913) 551-5062	bui.thien@epa.gov
RPO Barry Evans	** Same as above ** (Mail Code: ENSV/CARB)	(913) 551-5144	evans.barry@epa.gov
Region 8 **TOPO** Michael Copeland	U.S. EPA–Region 8 999 18th Street (8P-AR) Suite 300 Denver, CO 80202-2466	(303) 312-6010	copeland.michael@epa.gov
RPO Marty McComb	** Same as above ** (Mail Code: 8EPR-PS)	(303) 312-6963	mccomb.martin@epa.gov

Name	Address	Phone Number	Electronic Mail
Region 9 **TOPO** Mathew Plate **RPO** Rose Fong	U.S. EPA–Region 9 75 Hawthorne St. (MTS-3) San Francisco, CA 94105 ** Same as above ** (Mail Code: MTS-3)	 (415) 972-3799 (415) 972-3812	 plate.mathew@epa.gov fong.rose@epa.gov
Region 10 **TOPO** Chris Hall **RPO** Christopher Pace	U.S. EPA–Region 10 1200 Sixth Ave. Seattle, WA 98101 U.S. EPA–Region 10 Manchester Laboratory 7411 Beach Dr. East Port Orchard, WA 98366	 (206) 553-0521 (360) 871-8703	 hall.christopher@epa.gov pace.christopher@epa.gov

Section 2.2: Communications

Field Data Forms

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FORM COM-1

Phone Communication Form		
Date:	**Time:**	**Recorder:**
		Personnel on Call:
Issue(s):		
Decisions(s):		
Follow-up Action(s):		
Follow-up Responsibilities:		
Completion Dates for Follow-up Actions:		

FORM COM-2

Monthly Progress Report	
Reporting Date: Start: **End:**	**Reporter:**
Progress	
Sites Scheduled for Month:	**Sites Evaluated During Month:**
Issues	
Old:	**New:**
Actions:	**Actions:**
Free-form Notes:	

2.3 Preparation for NPAP Site Visits

2.3.1 Scope and Applicability

This SOP applies to preparing for an NPAP TTP PE.

2.3.2 Summary of Method

Preparation for site visits in the NPAP TTP requires attention to many details and interaction among several different organizations. This SOP outlines the planning steps necessary to successfully conduct PEs at one or more sites.

2.3.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

2.3.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

2.3.5 Cautions

- The FS must obey all laws, ordinances, and policies regarding access to monitoring sites and use of the property of others.
- The FS shall not represent himself or herself as an employee of EPA or of the Federal Government.
- The FS may not gain access to a monitoring site without the knowledge and permission of the site owner or site operator.
- In transporting equipment and supplies, the FS must comply with all applicable laws and regulations, including those of the FAA and DOT.
- The FS must comply with licensing requirements and "union shop" agreements, where applicable. In general, the FS is expected to perform the tasks necessary to operate the TTP Audit Laboratory during a PE. However, electrical rewiring or other modifications to monitoring site equipment must be done by qualified and properly licensed tradesmen

2.3.6 Equipment and Supplies

- Implementation Schedule
- Site Data Sheet(s) (SD-01)
- Reporting Organization contact information

2.3.7 Procedure

2.3.7.1 Development of Implementation Schedule

State, Local, Tribal and Quality Assurance organizations will work with the EPA Regions to select and develop a list of sites for the evaluations conducted in each calendar year on or before December 1 of the previous year. The Regional TOPO/WAMS, with the assistance of the ESAT contractors, will attempt to determine the most efficient site visit schedule. This schedule should be based upon the following:

- the criteria in CFR
- the sites that are closest in proximity to each other (can be visited within the same day or week)

Once this site schedule is developed, it must be sent to all affected reporting organizations. Based upon this schedule, the FS will make appropriate travel arrangements.

2.3.7.2 Development of the Site Data Sheet

For each site, the NPAP-TTP FS contractor will develop a Site Data Sheet (Form SD-01) that contains information such as:

AQS Monitor Site ID	Monitor ID
Method Designations	Monitor Make and Model
Site Coordinates	Site Type (NAMS/SLAMS)
Reporting Organization	Reporting Organization Contact
Street address	Directions to the site (from Regional Office)
Directions to the site from major thoroughfare	Safety concerns
Additional equipment (ropes, ladders etc.)	Closest Hospital (address)
Closest Express Mail Facility	Closest Hardware Store
Recommended Hotel (address/phone)	Important free form notes
Closest site	2nd closest site
Availability of electrical hookup	Gas analyzer ranges
Inlet manifold type	Blower flow rate
Monitor flow rate	

Note: If any of the criteria pollutant gas analyzers are not in a typical TTP acceptable range, consult the WAM/TOPO/DOPO. For example, trace level or greater than 1.0 ppm full scale range will require adjusting the audit levels.

The information listed above will be kept in a site file (filed by AQS Site ID) and included in a site notebook for each FS. Software such as MapQuest™ (Internet accessible) can help provide information on directions to sites. In addition, maps for each State and city where a monitor is located will be acquired. Site locations can be placed on these maps along with the site IDs.

Preparation for one or more PE trips will involve communication among various organizations including the FS's organization (ESAT), the monitoring reporting organization, and the site operator. A schedule will need to be set; operators notified; travel arrangements made, and all equipment and supplies gathered, packed, inventoried, and readied for shipping. The following sections discuss the necessary steps.

2.3.7.3 Site Visit Preparation

It is difficult to give a general procedure for scheduling site visits because of the number of variables such as the number of sites, the number of analyzers at each site, the distance between sites, and site access restrictions.

The scheduling approach should attempt to minimize travel costs and maximize the number of sites visited. Some suggestions for efficient scheduling include the following:

- prioritizing sites that are expected to be near or above the NAAQS
- selecting the sites to be evaluated by geographic area so that travel between sites is minimized.
- building in "downtime" for weather, sickness, or other unplanned delays.

NOTE: See SOP NPAP-TTP-2.02 for procedures on communicating with reporting organization site operators prior to a site visit.

2.3.7.4 Travel Arrangements for NPAP TTP PE

The FS and/or the contractor administrative staff are responsible for making travel arrangements, which should be made early enough to provide a convenient location for the TTP Audit Laboratory to park prior to and upon arrival at the site, with access to the site(s) ambient air monitors that he/she will visit. Step-by-step procedures for making travel arrangements are beyond the scope of this SOP. Here are some suggestions:

- Make arrangements well in advance to ensure the availability of hotel rooms, and vehicles parking and servicing provisions.
- For trips involving multiple sites, leave some flexibility in the schedule in case of bad weather and other unexpected delays; plan adequate time at each site to perform the PE.
- Approximately one week prior to the NPAP TTP PE the FS will call the site operator to confirm that the PE audit remains on schedule and to confirm meeting arrangements.

2.3.7.5 Equipment Preparation for NPAP TTP PE

Prior to an evaluation excursion and based upon the number of sites to be visited, the following will occur:

- TTP PE equipment and consumables will be inspected to ensure proper operation and adequate supplies.
- TTP PE equipment should be on hand.
- TTP PE equipment will be selected and stored appropriately (per SOPs) for transport to the sites.
- TTP PE calibrated equipment and certified standards should be checked to ensure they have not gone past their acceptable use periods.
- Site Data Sheets will be available for each site. For initial visits some of the information on the Site Data Sheets may be blank and must be completed during the first visit.
- the FS will review the site schedule to be sure that they understand which tasks will be implemented at the sites they are visiting that week.

Upon completion of preparation activities, the Regional WAM/TOPO/DOPO should be contacted or a

meeting scheduled to review the preparation activities.

2.3.8 References

1. U.S. EPA (Environmental Protection Agency). 1997. Part 58 promulgated as 50 FR62138 amendments to Title 58.

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Section 2.3: Site Visit Preparation

Field Data Forms

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FORM SD-01

Site Data Sheet	
AQS Monitor Site ID: Site Name:	Monitor ID: Site Address:
Monitor(s) Make/Model: Manifold Type: Blower Flow Rate:	AQS Method Designation Monitor Flow Rate:
Site Coordinates Latitude: Longitude:	Site Type (circle one): SLAMS, SLAMS/NCore, Tribal, Special Purpose, Other _____
Reporting Organization Address:	Reporting Organization Contact: Name: Phone Number: E-mail:
Directions to Site from Field Office: Direction from Major Thoroughfare:	
Safety Concerns:	Additional Equipment Needed:
Closest Hospital Address and Directions from Site:	Closet Federal Express Facility:
Closest Hardware Store:	Recommended Hotel (Address/Phone Number):
Closest Monitoring Site:	Second Closest Monitoring Site:
Free-form Notes:	

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 3
QA Checks Procedures

SOP: NPAP-3

Name: Printed	Signature	Date

Contents

Section **Page**

Figures

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3.1 QA Checks Procedures

3.1.1 Scope and Applicability

This SOP applies to performing the QA activities necessary to be completed within specified frequency and acceptable values. These QA activities are required before the Regional EPA TTP Mobile can proficiently audit any ambient air monitoring analyzer. These activities include periodic independent recertification of PE gas delivery standards, delivery system components (ozone line loss factor for the150 ft PE gas delivery hose), and certification of the entire delivery system.

3.1.2 Summary of Method

This SOP summarizes the important QA procedures that must be accomplished as part of the NPAP TTP Program. The NPAP TTP delivery hose ozone line loss test should be performed quarterly. An annual multi-point calibration should be performed on the mobile audit lab CO instrument to check for linearity. Calibration gas standards should be certified on an annual basis and a cross check of the entire audit system should be check on annual basis using independent NIST traceable standards.

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3.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

3.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

3.1.5 Cautions

The TTP system components used for PE are potentially vulnerable to contamination and damaged. Exercise care in handling new components. Avoid touching the flow path component interior surfaces; normally handle the components only by touching the exterior surfaces. If details concerning component labeling and connection are not followed precisely, errors will result. Rough handling of used components during packaging or transport should be avoided.

3.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP SOP Section 2.

3.1.7 Procedure

3.1.7.1 Quarterly “Ozone Line Loss” Set up

The "Ozone Line Loss" test is conducted quarterly to determine the actual ozone concentration being delivered to the station's inlet probe. By analyzing the ozone concentration before and after the presentation line, it is possible to determine the actual amount of ozone loss attributed to the presentation line. This loss percentage is used to correct for "true" ozone, so as not to bias audit results.

1. Plug in the audit Mobile PE Lab "Land" line or start the generator.

2. Make certain the Land Line/Generator switch is in the correct position.

3. Turn on the power to the Major Power Powerware, API 701, Environics 9100, TEI 49C -PS, computer and printer. Allow the API 701, TEI 49C -PS, and the Environics 9100 calibrator to warm up for at least one hour prior to conducting the "Ozone Line Loss" test.

4. Uncap the audit Mobile Lab presentation line. Attach the line loss apparatus (Figure 3.1) to the end of the presentation line.

5. EMC: Make certain that the EMC is logging data. This means that the 'rx/tx' lights are flashing. If not, hit the reset button on the interface unit of the EMC located on the rear of the instrument rack. If that does not work, shutdown and restart the Station Manager P.C.

6. Record the instrument model number, serial number, date, quarter, and the previous quarter line loss on the Ozone Line Loss Test Form.

7. Make certain the temperature in the mobile audit lab is between 68F - 84F (20C-30C) and record this temperature on the Ozone Line Loss Test Form.

8. Allow the system to condition with approximately 0.450 ppm of ozone for one hour.

3.1.7.2 Performing the Quarterly "Ozone Line Loss" Test

Two lines are used during the quarterly "Ozone Line Loss" test. These will be referred to as the "Inside" and "Outside" lines.

INSIDE: ¼" Teflon line from the 3-way manual switch valve to the front manifold.

OUTSIDE: ½" by 150' stainless steel braided line with a needle valve, stainless steel tee, and 2' of 1/4" Teflon line (this is the presentation line connected to the ozone line loss apparatus).

NOTE: The Mobile PE Lab uses two glass manifolds for gas distribution to the Mobile PE Lab and station instruments. The "rear" manifold supplies audit gas concentrations to the station and a portion of the sample is supplied to the "front" manifold through a three-way manual valve which supplies the Ozone and CO instruments.

1. Switch the 3-way manual valve on the control panel to the Rear Manifold position. With the

Environics 9100 calibrator in the "READY" mode ("CONC MODE" displayed on the lower left button), press "CONC MODE" on the front panel of the calibrator. Using the arrow keys, cursor to "TOTAL FLOW" and enter "16.0". Cursor to "TARGET GAS" CO and enter "0.0" if not displayed. Cursor to "O3" and enter "0.000" if not displayed. Press the "START" button on the front panel of the calibrator to deliver zero air to the front manifold and to the presentation line.

2. With the "Inside" line connected to the front manifold, adjust the needle valve that regulates the air flow going from the rear manifold to the front manifold until a by-pass flow of 0.3-0.4 lpm is indicated on the Rotameter. After a stable response has been achieved, and recorded on the EMC, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another SRP -traceable ozone transfer standard) and record this response under the Inside Line column for the Pre-Zero Test Point on the Ozone Line Loss Form (Figure 3.2).

3. Disconnect the "Inside" line from the front manifold and connect the "Outside" line to this same port. Make sure the by-pass tubing on the line loss apparatus is vented outside. Using the needle valve on the line loss test apparatus, adjust the flow until a 0.3-0.4 lpm by-pass flow is indicated on the Rotameter. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Outside Line column for the Pre-Zero Point on the Ozone Line Loss Form.

4. Cursor down to “O3" on the Environics, enter “0.150" and press “UPDATE”. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Outside Line column for the 0.150 Test Point on the Ozone Line Loss Form.

5. Disconnect the "Outside" line and reconnect the "Inside" line to the front manifold. Readjust the by-pass flow if necessary. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Inside Line column for the 0.150 Test Point on the Ozone Line Loss Form.

6. Cursor down to “O3" on the Environics, enter “0.080" and press “UPDATE”. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Inside Line column for the 0.080 Test Point on the Ozone Line Loss Form.

7. Disconnect the "Inside" line and reconnect the "Outside" line to the front manifold. Readjust the by-pass flow on the line loss apparatus if necessary. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Inside Line column for the 0.080 test point on the Ozone Line Loss Form.

8. Cursor down to “O3" on the Environics, enter “0.050" and press “UPDATE”. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Outside Line column for the 0.050 Test Point on the ozone line loss form.

9. Disconnect the "Outside" line and reconnect the "Inside" line to the front manifold. Readjust the by-pass flow if necessary. After a stable response has been achieved, take 5 minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Inside Line column for the 0.050 Test Point on the Ozone Line Loss Form.

10. Cursor down to “O3" on the Environics, enter “0.000" and press “UPDATE”. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Inside Line column for the Post-Zero Test Point on the Ozone Line Loss Form.

11. Disconnect the "Inside" line and reconnect the "Outside" line to the front manifold. Readjust the by-pass flow on the line loss apparatus if necessary. After a stable response has been achieved, take 5 one-minute average readings from the EMC Data Logging System for the TEI 49C-PS (or another ozone standard) and record this response under the Outside Line column for the Post-Zero Test Point on the Ozone Line Loss Form.

12. Disconnect the “Outside” line and reconnect the inside line to the front manifold. Turn off the API 701. After the pressure gauge on the API 701 reaches zero, press stop on the Environics and turn it off. Turn off the TEI 49C-PS.

13. Calculate the Quarterly Ozone Line Loss using the following formulae:

$$\%D = \frac{(\text{Outside Line - Ave. Zero}) - (\text{Inside Line - Ave. Zero}) \times 100}{(\text{Inside Line - Ave. Zero})}$$

$$\text{Average \% Difference} = (\%D@\text{Test Point } 0.150 + \%D@\text{Test Point } 0.080 + \%D@\text{Test Point } 0.050)/3$$

$$\text{Current Quarter Line Loss} = (\text{Previous Quarter Line Loss} + \text{Average \%Difference}) / 2$$

$$\text{Current Line Loss Factor} = 1 + \text{Current Quarter Line Loss}$$

NOTE: The Average % Difference of the three points should be within +2.5%. *(Should be less than or equal to 2.5%)* If not, corrective action should be performed to identify and correct the problem and the line loss test redone.

14. Remove the ozone line loss apparatus from the presentation line, cap it, and wind it back on the hose reel.

3.1.7.3 Quarterly Ozone Standard Verification

The NPAP mobile audit lab ozone standard should be verified against a Standard Reference Photometer (SRP) on a quarterly basis. The slope must be within +-3% and the intercept within +- 3ppb. If not, recalibrate the ozone standard against the SRP and verify again.

3.1.7.4 Annual Gas Cylinder Certification

NPAP mobile audit lab compressed gas standards should be certified annually using the EPA Calibration Gas Traceability Protocol. This could be done through any of the gas vendors, EPA Region 2, 7 or OAQPS support contractor.

3.1.7.5 Annual CO Analyzer Calibration

A multi-point calibration should be performed on the NPAP mobile lab CO analyzer annually to verify the linearity of the instrument. A multi-point calibration consists of a zero point, a point approximately 80% of the range, and three more points between the previous two points. All non-zero points must be within +-2%.

3.1.7.6 Annual NPAP Mobile Lab Certification with Independent Standards

On an annual basis, a certification of the NPAP mobile audit lab is performed by comparison to a set of independent analyzers calibrated against independent NIST traceable standards. The purpose of this certification is to verify the actual concentrations of the diluted gases at the end of the audit Mobile PE Lab's presentation line. This certification is conducted using the same auditing procedures outlined in this document and should be within +-5%. If a difference of greater than 5% is observed, corrective action should be done and a follow up cross check performed. Cross-Regional Mobile Lab certification will be acceptable only if the certifying mobile lab has been certified within the annual period. The following guidelines for the independents analyzers should be followed for a mobile lab certification:

1. The ozone analyzer must be calibrated against a certified ozone photometer within 3 months. A level 1 span and zero checks should be performed within a week of the mobile lab certification process.

2. The CO, SO2, NO2 analyzers must be calibrated within 3 months of the mobile lab certification process. A level 1 span and zero checks should be done on the day of the certification and the span point within +-1%. If not, adjust and perform level 1 check. For a cross-regional mobile lab certification, a level 1 on the same day of the certification is not necessary.

3. All calibration gas must be traceable to NIST.

4. All flow meters used must be traceable to a NIST standard within +-2%.

3.1.8 References

1. 40 CFR Parts 50 and 58.

2. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

3. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

4. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

5. Environics Series 9100 Operating Manual.

6. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

7. Powerware 9125, User's Guide.

8. EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, EPA-600/R-97/121, September, 1997.

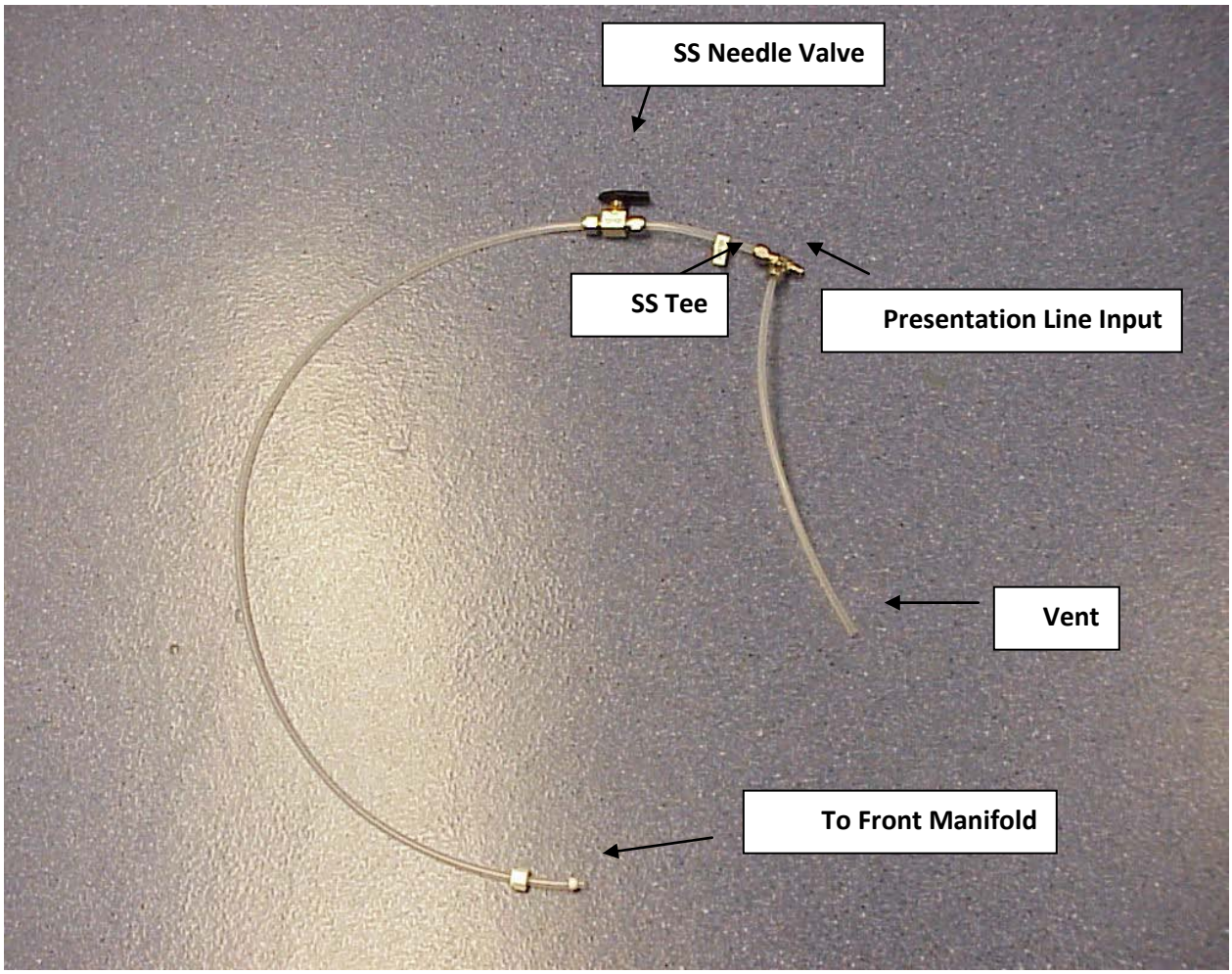

Figure 3.1 Line Loss Apparatus

Instrument TEI49C-PS SN# 60482320 Date 3/2/2008 Temp. 23C

Quarter 1

Previous Quarter Line Loss -0.4

Test Point	Inside Line	Outside Line	%D corrected for zero
Pre-Zero	0	0	
0.175	0.17	0.1698	-0.12
0.07	0.071	0.0708	-0.28
0.04	0.041	0.0409	-0.25
Post-Zero	0.001	0.001	
Ave. Zero	0.0005	0.0005	

Average % Difference -0.22

Current Quarter Line Loss -0.31

Current Line Loss Factor 0.9969

$$\%D = \frac{(\text{Outside Line} - \text{Ave. Zero}) - (\text{Inside Line} - \text{Ave. Zero})}{(\text{Inside Line} - \text{Ave. Zero})}$$

Average % Difference = (%D Test Point 0.400 + %D Test Point 0.175 + %D Test Point 0.070)/3

Current Quarter Line Loss = (Previous Quarter Line Loss + Average % Difference)/2

Current Line Loss Factor = 1+ Current Quarter Line Loss

Figure 3.2 Line Loss Form

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Field Standard Operating Procedures for the EPA TTP National Performance Program

Section 4
Mobile Audit Lab Start-up Procedures

SOP: NPAP-4

Name: Printed	Signature	Date

Contents

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4.1 Mobile Audit Lab Start-up Procedures

4.1.1 Scope and Applicability

This SOP specifically describes required, sequential, pre-travel inspection checks and startup procedures that must be performed at home base and at interim locations prior to traveling to a site. They are used to verify that the tow vehicle, hitch and mobile audit lab safety equipment are present and in working condition. Any problems should be identified and correct, or communicated to the WAM,TOPO, or other operator oversight/funding manager for resolution, so that the problems do not jeopardize the TTP PE personnel and equipment.

4.1.2 Summary of Method

TTP PE staff carries out the safety and pre-trip performance checks and procedures, using the checklists in the order of their occurrence in the SOP. First, the exterior safety equipment condition and performance are checked. Then the interior mobile TTP lab operational safety and support features are checked. Finally, if all checks and conditions are acceptable, the critical support and TTP warm up and conditioning procedures are initiated so that the TTP system will be as close to ready to start the PE upon arrival at the PE site as practical.

4.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

4.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

4.1.5 Cautions

- Caution must be taken to maintain the TTP system components properly to prevent damage. Be particularly attentive to maintenance of the auxiliary generators, air conditioners, API 701, Environics 9100, analyzers (CO and ozone) and computer. Ensure the soundness of electrical and pneumatic connections that will be assembled and disassembled and to cleaning exterior surfaces of the manifolds, connecting tubing, and delivery hose lines. Establish and always use individual instrument logs for recording purpose; keep the logs with the instruments at all times. All corrective actions must be taken before PE can begin with the TTP system, or the situation communicated to the WAM,TOPO, or other operator oversight/funding manager for resolution. Canceling and rescheduling the PE may be required if the TTP system or critical support equipment is not functioning within parameters.
- The following equipment must be checked prior to and during each trip to ensure that it is operating correctly: tow vehicle and trailer tires for air, auxiliary generators for oil leaks, roof A/C units for Freon (or EPA -approved-substitute), generator fuel tank leaks (use dip stick), brake

fluid leaks(remove rubber seal cap on each wheel hub center); roof platform guard rail lockdown mechanism; interior cabinet and drawer latches, storage tie downs, cylinder rack tie downs, cylinder fitting tightness, presence and use of regular and yellow clamshell safety cylinder caps; emergency and all other lights; exterior trailer door, port, and fuel tank locks; inflation pressure of each of the instrument rack pneumatic, floor-mounted shock absorbers; test switch for battery indicator of CO monitor/alarm; status of fire extinguisher and safety kit; status of exterior trailer tongue and loading jacks.

4.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP SOP Section 2.

4.1.7 Procedures

4.1.7.1 Mobile Audit Lab Exterior

Before the Mobile Audit Lab is transported to a site for a PE, there are pre-trip safety inspections and road and functionality tests that must be perform. The Pre-Trip Safety Inspection List (figure 4.7.1) and the Road and Functionality Test List (Figure 4.7.2) must be filled out and any deficiencies corrected before the Mobile Audit Lab can be transported. In addition to the items on the forms, the following functions are also required:

- Open the generators compartment doors and verify that the oil is in the “safe” operating range.
- Maintenance of the generators and genset should follow the Onan operator’s manual.
- For trailers equipped with rooftop platforms, rails should be locked down with pins.
- Be aware that some states may require the use of placards regarding compressed gas cylinders inside the trailer. Some states may require a commercial driver’s license if there is a placard on the outside of the vehicle. Make sure you know and comply with whatever the EPA Regional Safety Office and states requires.

  (Exam question # 20, Sect.4,multiple choice is not specified in SOP: The DOT hazard placard for the compressed gas cylinders in the NPAP mobile audit lab indicates the following hazard:)

  d) non-flammable

- The auxiliary generators compartment doors should be unlock during travel. **This is a safety requirement.**

4.1.7.2 Mobile Audit Lab Interior

There are a number to steps needed to perform prior to a PE. The functions related to the interior of the Mobile Audit Lab are as follow:

- Remove the cap from the end of the 150 foot audit gas presentation line.
- Start generator(s) as needed. After the generator speed is stable, switch the genset to the correct generator setting.
- Check to make certain that all circuit breakers are on.

Note: The CFR requirement for the operating ambient air monitoring analyzers is 68-84 degrees F / 20-30 degrees C. To achieve this requirement when conditions include cold wet or very hot moist outside air, first vent the air out of the trailer, then heat or cool as needed. This will expedite reaching the required temperature range.

- Turn "ON" the power to the Powerware line voltage and frequency conditioner.
- Turn "ON" the power to the API 701 zero air module.
- Visually inspect the Borosilicate glass manifold and connecting tubes of the flow path for any discoloration, particulate or other debris.
- Turn "ON" the Environics 9100, TEI 49C-PS and TEI 48C. Allow the 49C-PS to warm up for a minimum of 1 hour and the TEI 48C to warm up for a minimum of 3.5 hours.
- If not done already, install the clam shell covers for the cylinders with regulators. Griftan, yellow metal clam shell caps are a safety requirement for moving the mobile audit lab when the compressed gas cylinders have regulators, fitting and tubing attached. Keep the regular cylinder caps belonging to the cylinder in the lab in case you need to move it from the lab unexpectedly.

4.1.8 References

13. 40 CFR Parts 50 and 58.

14. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

15. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

16. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

17. Environics Series 9100 Operating Manual.

18. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

19. Powerware 9125, User's Guide.

20. ONAN Commercial Mobile Power, Operator's Manual (Models HGJAD, HGJAE, HGJAF).

21. Duo-Therm 579, Series BRISK AIR.

22. WELLS CARGO Owner's Manual .

23. DEXTER AXLE, Operation Maintenance Service Manual.

24. Atwood Battery Operated Carbon Monoxide Alarm User's Guide.

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US EPA Mobile Audit Laboratory

Tow Vehicle-Trailer Pre-Trip Safety Inspection Checklist for Region _____

Date:_____ Reviewer_____

Review the following checklist and indicate whether each item is satisfactory (SAT.), unsatisfactory (UNSAT.), while including applicable notes. All unsatisfactory issues must be properly addressed before the trailer can be towed.

	SAT.	UNSAT.	NOTES LEGEND
I. Tow Vehicle			
1. The tow vehicle has enough power to safely tow the trailer load.			
2. The tow vehicle has received regular preventative maintenance work.			
3. The tow vehicle has adequate fuel, battery power, oil, and engine coolant.			
4. The tow vehicle tires are properly inflated and balanced; tires do not show excessive wear or damage.			
5. The wheel fasteners (lug nuts) are present, tight, and free of rust.			
6. Wheel rims are free from damage.			
7. Tow vehicle is level when attached to the loaded trailer.			
8. All lights (dash lights, head lights, tail lights, clearance lights, brake lights, directional signals, hazard light, high beams, reflectors) are in proper working order.			
9. Weight is properly distributed between the trailer and the tow vehicle.			
10. All brakes are in proper working order.			
11. Side view mirrors provide an unobstructed rear view on both sides of the vehicle.			
II. Hitching Apparatus			
1. The receiver is properly mounted to the tow vehicle.			
2. The receiver, draw bar, hitch ball, coupler, sway control device, spring bars, safety chains, and power connection wiring are all functional and compatible with the tow vehicle and trailer.			

	SAT.	UNSAT.	NOTES LEGEND
3. The power and brake control connections between the trailer and tow vehicle are compatible, provide enough slack for turning, are in good working order and are of proper length for brake to be activated if the trailer separates from the hitch.			
4. The landing gear (trailer jack) is functional.			
5. The hitch ball and coupler are the same size. When attached, the ball is firmly seated in the coupler, and the latching mechanism is locked.			

Figure 4.1. **Pre-Trip Safety Inspection List**

US EPA Mobile Audit Laboratory

Road Test and Functionality Test for Region _____

Date:_____

Road Test

Description	Test Parameter	Results
Running lights	Illuminate with tow vehicle	
Brake lights	Illuminate with tow vehicle	
Turning signal	Illuminate with tow vehicle	
Electrical braking system	Engages with tow vehicle braking	
Stowing of internal equipment	Internal components stable during road test	
Trailer tongue jack	Jack operates properly to raise or lower trailer tongue	
Trailer leveling jacks (4)	Each jacks operate properly to level trailer	
Trailer electrical connector	Sufficient length to connect to tow vehicle and lights/braking system is operational.	
Roof Mounted Platform	Platform folds and stores in secure manner; safely assembles upon set up.	

Functionality Test

Description	Test Parameter	Results
Shore line electrical cable	Shore line electrical services to main breaker	
	Each secondary breaker supplies power to the respective outlets	
	All rack mounted instruments are powered	
	EMC data logger and computer are powered	
	Interior wall outlets have 120V electrical service	
	Exterior lightning is functional	
	Exterior outlets have 120V electrical service	
	Air Conditioner/Heating functional	
	Internal lightning functional	
	Roof mount platform exterior	

	outlets have 120V electrical service	
UPS System	Energizes upon shore line, generator one or generator two power interruption	
ONAN Generator One	Electrical service to main breaker after setting power selector switch	
	Each secondary breaker supplies power to the respective outlets	
	All rack mounted instruments are powered	
	EMC data logger and computer are powered	
	Interior wall outlets have 120V electrical service	
	Exterior lightning is functional	
	Exterior outlets have 120V electrical service	
	Air Conditioner/Heater functional	
	Internal lightning is functional	
	Roof mount platform exterior outlets have 120V electrical service	
ONAN Generator Two	Electrical service to main breaker after setting power selector switch	
	All rack mounted instruments are powered	
	EMC data logger and computer are powered	
	Interior wall outlets have 120V electrical service	
	Exterior lightning is functional	
	Exterior outlets have 120V electrical service	
	Air Conditioner/Heater functional	
	Internal lightning functional	
	Roof mounted platform exterior outlets have 120V electrical service	

Figure 4.2 Road and Functionality Test Check List

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 5
Site Set-Up

SOP: NPAP-5

Name: Printed	Signature	Date

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5.1 Site Set-Up

5.1.1 Scope and Applicability

This SOP applies to the use of information, normally recorded by the TTP staff, from contacts with PE site agency or organization personnel, prior to the trip to the state, local, private, or tribal monitoring station. The activities described occur at the intended site of the PE, following adequate preparation activities that have occurred prior to arrival at the site.

5.1.2 Summary of Method

Ozone analyzer should have been on for an hour or more, warming up. Check instrument operational parameters to insure proper performance. Procedure describes options for connecting TTP Audit Lab Delivery Hose ("line") to station inlet, depending on the particulars of the station inlet and flow.

5.1.3 Definitions

Appendix A contains a glossary of terms used in the NPEP TTP.

5.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as having attended a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must also complete at least three (3) audit trips (where an audit trip may, and often does, involve 2or 3 different audit sites in one week, and may involve more than one week of auditing sites), supervised by an experience operator, approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs, and in the year that the new operator may be expected to do TTP audits.

5.1.5 Cautions

- The TTP system components used for PE are vulnerable to contamination and damaged. Exercise care in handling new components. Avoid touching the flow path component interior surfaces; handle the components only by touching the exterior surfaces. If details concerning component labeling and connection are not followed precisely, errors will result. Rough handling of used components during packaging or transport should be avoided.

- It is possible to damage station instrumentation if it is pressurized during the audit gas delivery. Always examine the station inlet, determine necessary gas delivery rates to obtain a valid audit while protecting the station. Review instrument pressure before and during the audit to verify appropriate flows. Communication with the station operator regarding these issues is critical to a successful audit.

- Be careful when rolling out the presentation line to the inlet. Wear gloves to prevent injuries from fraying material from the presentation line.

5.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP SOP Section 2. *A diagram of the required configuration for the current TTTP audit system is provided in Figure __of Section__ (?probably in section 1 or 2?)*

[If this SOP will have to stand alone, which, at times, it may, We will have to add: "The specific equipment and materials used in this section are:"

5.1.7 Procedure

5.1.7.1 Mobile PE Lab Ozone and CO Instrument Operational Check

After warm-up, make sure there are no alarms on the front panel of the Ozone Standard and the CO analyzer. Resolve any alarms before continuing. Consult the operation manuals for troubleshooting help.

5.1.7.2 Initial Site TTP PE Set-Up: Connection Preparation

1. Attach a 2-foot section of ¼" OD Teflon tubing to the end of the 150 ft audit presentation line.

2. Record all the necessary information on the "TTP Audit Site Information" page of the audit spreadsheet.

3. Enter the beginning audit time, and the auditors' names, in the station logbook or computer.

4. Determine the flow demand through the inlet of the monitoring station. This is determined by totaling the flow of all instruments and adding the pull from any auxiliary pump. The flow output from the end of the presentation line should be greater than 11 LPM. This is determined by using a Mass Flow Meter or a Rotameter. The presentation line output flow must *also* be at least 2 LPM greater than the station's inlet flow. If the presentation line output flow is not within this range, disable (or reduce the flow) to the auxiliary pump on the station's instrument manifold. If this is not done, dilution of the PE gases will occur, and the PE will be invalid.

   (Exam question # 22 is not in Section 5: Minimum required excess flow, measured on rack mounted control pane by-pass rotameter is: Ans: d) 0.3lpm)

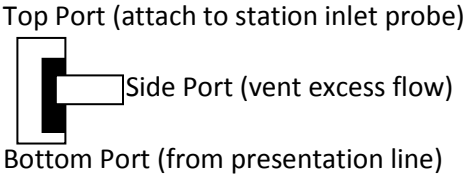
5. Record the pressure off of any instrument being audited on a scratch paper. This will serve as the ambient pressure reading of analyzer.

5.1.7.3 Final Site Set-Up: Presentation Line Connection

1. Unlock the hose reel and pull out enough presentation line to reach the inlet.

2. Connect the presentation line to the station's inlet probe, venting the excess flow to the atmosphere. At all monitoring stations with ¼" to ½" outside diameter Teflon inlet probes, the top port of the glass or stainless steel *[SS is not a good idea: the CFR does not allow SS in the*

station flow path.; and the TTP audit delivery hose T connects directly into the sampling station's inlet- the beginning of its flow path; in 40CFR Part 58App. E, section 9.0] tee should be connected to the probe inlet. Connect the ¼" Teflon tubing to the bottom port of the tee. Allow the excess flow to vent out the side port.



NOTE: Keep an array of Teflon tubing and reducer unions to connect to the station inlet probe. In cases where the inlet is greater than ½ inch, a silicone stopper with the ¼ Teflon tubing inserted in the middle could be use to connect to the inlet. For a system with a fan blower motor and manifold of 1 inch or less, no vent excess is necessary. The fan blower motor acts as the excess port. If a station manifold system demand is more than the TTP audit lab can produce, the blower motor can be turn*ed* off for the audit.

NOTE: On very windy days, attach an equal diameter tubing, at least 10" in length, to the open port of the glass tee to prevent ambient air from diluting the audit gases.

3. After connection to the inlet, check the pressure of the same analyzer as in step 5 of 5.1.7.2. If this pressure has increased by more than 1%, as a result of the connection process, the system is being pressurized. Use a bigger sized tee or a manifold to decrease the pressure.

5.1.8 References

25. 40 CFR Parts 50 and 58.

26. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

27. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

28. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

29. Environics Series 9100 Operating Manual.

30. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

31. Powerware 9125, User's Guide.

Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 6
Operation: Through-the-Probe (TTP) or Back-of-the-Analyzer Performance Evaluation (PE)

SOP NPAP TTP-6

Name: Printed	Signature	Date

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Section **Page**

Figures **Page**

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6.1 Overview of NPAP TTP Field Activities

6.1.1 Scope and Applicability

This SOP describes the procedure for the performance of Through-The-Probe (TTP) Performance Evaluations (PEs) of the Ozone, CO, SO2, and NO2 ambient air instruments operated by:

- State, Local or Tribal agencies as part of the NAMS/SLAMS Network (proposed for future as NCORE).
- Permitted private organizations in Prevention of Significant Deterioration (PSD) networks.

The PEs are conducted by trained and certified EPA or EPA contractor field staff, using the standard configuration of the EPA TTP Audit Laboratory.

6.1.2 Summary of Method

This SOP describes the steps for generating, verifying, and delivering test atmospheres of ozone or a CO/SO2/NO/NOx gas blend, at the CFR-specified concentrations required for a PE. A dedicated spreadsheet for this audit, TTP spreadsheet, is used for recording, calculating, determining, and reporting audit performance of the instruments tested.

Test atmospheres are generated by the EPA TTP Audit Lab through dilution of gas standards, using an Environics 9100 gas phase titration calibrator and an API 701 continuous zero air generator. Gases are delivered to the instruments under test through the TTP Audit Lab dual glass manifold and a 150 foot long, 2 inch diameter, Teflon lined, braided stainless steel gas delivery hose or presentation line.

Delivered gas concentrations are verified by the TECO 49CPS Ozone calibrator and a TECO 48 CO analyzer in the TTP laboratory.

A summary of the sequence of events at a TTP PE audit is as follows:

- The presentation line is conditioned with ozone prior to arrival at the audit site.
- The TTP CO and Ozone analyzers are warmed up prior to arrival at the audit site.
- The TTP TECO 48 CO analyzer is calibrated.
- The presentation line is connected to the station manifold.
- An ozone audit is performed using all the appropriate CFR audit levels.
- A multi gas audit is performed using all the appropriate CFR audit levels.
- A post audit calibration is performed on the CO analyzer.
- A preliminary report is given to the station operator.
- The presentation line is disconnected.
- The shutdown procedure is completed.

In this SOP, reference is made to specific instruments, i.e., TECO 49CPS, API 701, etc. as they are the instruments that are present in most of the TTP Audit Labs. Configurations may differ in some TTP Audit Labs. The use of other instruments is acceptable, provided that the replacement instruments are designated as EPA reference or equivalent standards for the pollutant of interest. All modifications to a TTP Audit Lab must be documented and communicated to OAQPS; such modifications to the platform or

instrumentation cannot change, or be perceived to change, the delivered audit gas concentrations under any operating conditions.

6.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

6.1.4 Health and Safety Warnings

- To prevent personal injury, all personnel must heed any warnings associated with the transport and operation of the NPAP TTP Audit Lab and any supporting equipment and supplies. Specific health and safety warnings will generally be found at the point in the operating manual or troubleshooting guide where they are most applicable. The following issues are of particular concern:

- Adhere to all warnings associated with operation of the TTP tow vehicle, hitch, and trailer. Assure the readiness of hitch brake emergency disconnects prior to moving the vehicle and trailer.

- State and local law governs the placement of placards on vehicles carrying compressed gases and must be adhered to at all times. Field scientists must be aware of the location of cylinder hazard placards and the requirements for use in all jurisdictions included in the audit schedule.

6.1.5 Cautions

- Because the TTP Audit Lab and components will be moved from site to site, it is of critical importance that it be maintained and calibrated as required and that all aspects of its operation be checked and verified after it is set up at each site. To function as a reliable standard of comparison, its operational parameters must be kept within tight control limits.

- Caution must be taken to install and maintain the TTP system components properly to prevent damage. Be particularly attentive to maintenance of the auxiliary generators, air conditioners, API 701, Environics 9100, analyzers (CO and ozone) and computer. Ensure the soundness of electrical and pneumatic connections that will be assembled and disassembled and to cleaning the interior and exterior surfaces of the manifolds, connecting tubing, and delivery hose lines. Establish and always use individual instrument logs for recording purpose; keep the logs with the instruments at all times. All necessary corrective actions must be taken before PE can begin with the TTP system.

- Equipment that must be checked prior to and during each trip to ensure that it is operating correctly: tow vehicle and trailer tires for air, auxiliary generators for oil leaks, roof A/C units for Freon (or EPA -approved-substitute), generator fuel tank leaks (use dip stick), brake fluid leaks(remove rubber seal cap on each wheel hub center); roof platform guard rail lockdown mechanism; interior cabinet and drawer latches, storage tie downs, cylinder rack tie downs, cylinder fitting tightness, presence and use of regular and yellow clamshell safety cylinder caps;

emergency and all other lights; exterior trailer door, port, and fuel tank locks; inflation pressure of each of the instrument rack pneumatic, floor-mounted shock absorbers; test switch for battery indicator of CO monitor/alarm; status of fire extinguisher and safety kit; status of exterior trailer tongue and loading jacks.

- The TTP system components used for the PE are vulnerable to contamination and damage. Exercise care in handling new components. Avoid touching the flow path component interior surfaces; normally handle the components only by touching the exterior surfaces. If details concerning component labeling and connection are not followed precisely, errors will result. Rough handling of used components during packaging or transport should be avoided.

- Protect the cylinder pressure gauges from any mechanical shock and sudden changes in pressure.

- It is possible to damage station instrumentation if it is pressurized during the audit gas delivery. Always examine the station inlet to determine necessary gas delivery rates to obtain a valid audit while protecting the station. Review instrument pressure before and during the audit to verify appropriate flows. Communication with the station operator regarding these issues is critical to a successful audit.

6.1.6 Interferences

The interferences associated with this method are factors that can cause alterations to the concentration of the audit gases. Such changes in concentration can be the result of loss (through leak or reactivity) or contamination. Interferences can be minimized by following these guidelines:

- Take precautions to prevent the introduction of dirt or debris into the gas flow path. Visually examine the path, including the manifold, regularly to detect any material that has been introduced – clean as appropriate prior to attempting an audit. Do not jeopardize the integrity of the flow path by opening connections unnecessarily or leaving fittings open and uncapped.

- Take all steps to minimize sampling and analysis residence times, including tubing and other flow path component lengths and diameters, dead spaces, leaks, unnecessary path resistance (due to sharp bends, kinks, etc.). Poorly placed switches and valves have created issues in the past.

- To avoid any contamination of the flow path and analytical devices; ensure that the PE test gas flow path's interior surfaces are clean, including manifolds, tubing, fittings, delivery /presentation hose pipe connections and liner. Use required leak checks to identify and correct any leaks found within the flow system.

- Follow procedures for purging the cylinder pressure gauges to remove interference caused by either bleeding from the regulators or reaction of the gases in the gauges and lines.

- Water vapor can result in false positive analyzer readings and inaccurate dynamic dilution

concentrations. To minimize this interference, use only well-dried zero air.

6.1.7 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audit trips supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs. The training programs will be conducted as required at locations throughout the U.S. to ensure all FS are trained and an adequate number of PE FSs are available in each EPA Region. Contact the Regional EPA Office or OAQPS for more information about training schedules and locations. Supplemental courses such as those offered by Air Pollution Training Institute (APTI) may be useful in providing general background to personnel with limited experience with air monitoring and/or quality assurance.

6.1.8 Equipment and Supplies

Each organization responsible for performing the TTP PE has a TTP Audit Lab made available by OAQPS. The truck- or trailer-mounted labs are designed to be self-contained with onboard generators, UPS, and other features designed to ensure a stable and safe environment for the FS and audit equipment.

Each organization responsible for performing the TTP PE will develop a standard "kit" of equipment, materials, and supplies suitable for the make(s) and model(s) of TTP Audit Lab components to be used. The contents of this "kit" will also be determined by the different requirements of the sites to be visited for TTP PEs. A critical component of the “kit” is a variety of fittings and tubing (made of non-reactive materials) for use in connecting the delivery hose to the station inlet (probe).

SOP NPAP TTP-2.01 contains a complete field inventory list and discusses the procedures for field equipment and supply. That list of generic equipment and supplies must be translated into a specific checklist of equipment and materials that can be customized as necessary. Communications between the FS and site personnel prior to the visit are essential and assist greatly in knowing what will be required at each site.

6.1.9 Procedure: Through-the-Probe (TTP) Performance Evaluation (PE)

6.1.9.1 Mobile Lab/Station Data Retrieval /Recording

The station instrument responses for each pollutant are taken from the data acquisition system used at the site for data-of-record. This data acquisition system may be a strip chart recorder, data logger, computer, or telemetry. The audited station instrument responses are read or interpreted by the

station operator, and reported to the auditor. The auditor records these responses on the TTP spreadsheet for calculation of the final results.

With current technology, many monitoring stations are using electronic data loggers that store data at the site until collected on a set schedule. The data from the electronic data logger is handled in the same manner as the strip chart data, except that it is read directly from an electronic display at each audit level.

Some remote stations use a telemetry system. The telemetry system is updated every few minutes on dedicated phone lines. The data are averaged and stored in a centrally located computer. The station instrument responses are generally obtained by the site operator/technician calling for the analyzer responses. In some monitoring stations this is accomplished by dialing the computer directly through a telephone modem. **In all cases, the audited station responses are interpreted by the station operator or audited agency personnel, and then reported to the TTP Audit Lab operator.** The TTP Audit Lab operator then records this information in the TTP Lab Spreadsheet Program.

Data points from the TTP Audit Lab instruments are collected using the EMC or other comparable data software package, which is loaded into the TTP Audit Lab computer. **The data logger program is the TTP Audit Lab's Data of Record.** All TTP Audit Lab instrument data to be recorded must be tabular data averages display.

NOTE: The TTP Lab Spreadsheet program references calibration information (such as the ozone line loss factor and gas certification data) to calculate the TTP Audit Lab's true responses at each audit point. After data has been entered into the TTP Audit Lab software program for each audit level, percent differences between the TTP Audit Lab and the audited station are calculated automatically.

Activate the "Instrument Information" worksheet in the TTP Lab Spreadsheet Program. Fill in all relevant parameters for the TTP Audit Lab and monitoring station instruments for the audits to be performed. This information will include:

- Station analyzers manufacturer/model #
- Property Number
- Slope/Intercept
- Indicated Flow
- Date when the In-Line Filter was changed
- Manifold type
- Manufacturer, Model # and Serial # of the photometer standard
- Certification expiration date of the photometer standard
- Any unusual events outside or inside the shelter

After all data is entered in the "Instrument Information" worksheet, save the worksheet.

NOTE: If not all parameters are to be audited, i.e., only SO2 and CO instruments are being evaluated, only fill out the data for the audited instruments. Leave the other data fields in the spreadsheet blank. This applies for station data as well as the individual data points that will be entered later in the course of the audit.

NOTE: During the course of the audit, data points for the TTP Audit Lab will be obtained using a stable average of 5 one-minute averages from the EMC software.

6.1.9.2 Ozone PE Procedure

NOTE: True Ozone is calculated by multiplying the TTP Audit Lab TECO 49CPS readings (as shown on the EMC Data program) by the ozone line loss correction factor according to the following formula:

True Ozone (ppm) = TECO 49CPS Response (ppm) x TECO 49CPS Ozone Line Loss Correction Factor

This is done automatically in the TTP Lab Spreadsheet Program.

NOTE: TTP Audit Lab data should be read from the on board computer using the EMC data logger software.

1. Activate the “Ozone Audit” worksheet, in TTP Lab Spreadsheet Program.

NOTE: Make sure the most recent ozone line loss data is recorded on the worksheet.

2. After a 1-hour warm-up, press the "CONC" mode button on the front panel of the ENVIRONICS 9100 Calibrator. Cursor to "TOTAL FLOW" and enter "16.0" if it is not indicated. Cursor to "TARGET GAS" CO and enter "0.0" if it is not indicated. Switch the 3-way valve to the Rear Manifold position.
3. Audit Point 1: Cursor to "O3" on the front panel of the calibrator and enter a "Level 5" concentration of 0.31-0.90 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages from the EMC data logger and record the data in the “Ozone Audit” Worksheet, as follows:

   Cell E19 = Environics ozone setting
   Cell F19 = TTP Audit Lab response from the EMC data logger
   Cell H19 = Station response obtained from site operator

NOTE: **If level 5 is not necessary then proceed to Audit Point 2, level 4.** Make certain the calibrator updates after pressing the "UPDATE" button. Observe the "TARGET" and "ACTUAL" ozone values on the front panel display of the calibrator. These values should be identical. If they are not, press "UPDATE" again.

4. Annotate the EMC strip chart to indicate Audit Point 1.

5. Audit Point 2: Cursor to "O3" on the front panel of the calibrator and enter a "Level 4" concentration of 0.21 – 0.30 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages from the EMC data logger and record the data in the "Ozone Audit" Worksheet, as follows:

Cell E20 = Environics ozone setting
Cell F20 = TTP Audit Lab response from the EMC data logger
Cell H20 = Station response obtained from site operator

6. Annotate the EMC strip chart to indicate Audit Point 2.

NOTE: If level 4 is not necessary then proceed to Audit Point 3, level 3.

7. Audit point 3: Cursor to "O3" on the front panel of the calibrator and enter a "Level 3" concentration of 0.11 – 0.20 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages from the EMC data logger and record the data in the "Ozone Audit" Worksheet, as follows:

Cell E21 = Environics ozone setting
Cell F21 = TTP Audit Lab response from the EMC data logger
Cell H21 = Station response obtained from site operator

8. Annotate the EMC strip chart to indicate Audit Point 3.

9.Audit Point 4: Cursor to "O3" on the front panel of the calibrator and enter a "Level 2" concentration of 0.06 – 0.10 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages and record the data in the "Ozone Audit" Worksheet as follows:

Cell E22 = Environics 9100 ozone setting
Cell F22 = TTP Audit Lab response from the EMC data logger
Cell H22 = Station response obtained from site operator

10. Annotate the EMC strip chart to indicate Audit Point 4.

11. Audit Point 5: Cursor to "O3" on the front panel of the calibrator and enter a "Level 1" concentration of 0.02 – 0.05 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages and record the data in the "Ozone Audit" Worksheet as follows:

Cell E23 = Environics ozone setting
Cell F23 = TTP Audit Lab response from the EMC data logger
Cell H23 = Station response obtained from site operator

12. Annotate the EMC strip chart to indicate Audit Point 5.

13. Audit Point 6: Cursor to "O3" on the front panel of the calibrator and enter 0.000 ppm. Press "UPDATE". When the TTP Audit Lab and station analyzer are stable, take an average of 5 one-minute averages and record the data in the “Ozone Audit” Worksheet as follows:

Cell E24 = Environics ozone setting
Cell F24 = TTP Audit Lab response from the EMC data logger
Cell H24 = Station response obtained from site operator

14. Annotate the EMC strip chart to indicate Audit Point 6.

15. Press "STOP" on the front panel of the ENVIRONICS.

16. Save the “Ozone Audit” Worksheet.

6.1.9.3 Carbon Monoxide Analyzer Pre-Calibration Procedure

The TECO 48C is used during a performance audit to analyze the amount of CO present in a diluted gas sample. Prior to each audit (pre-), the TECO 48C CO analyzer is calibrated using Ultrapure Air and NIST traceable CO gases at concentrations of approximately 7 ppm and 40 ppm. The TECO 48C is rechecked following the performance audit (post-), using Ultrapure Air and NIST traceable CO gas at approximately 40 ppm. The pre- and post- TECO 48c analyzer responses are used to calculate true CO concentrations.

Two multi-port glass manifolds are used during a performance audit. The “Rear Manifold” accepts gas from the Environics 9100 and delivers it to the presentation line. An additional tap from the rear manifold is attached to the front panel 3-way valve.

The “Front Manifold” is connected to the front panel 3-way valve, which acts as the master control for input to this manifold. Taps from the front manifold direct output to the TTP CO and Ozone instruments and the bypass rotameter. The front panel 3-way valve directs various input streams into the front manifold according to which position is selected. The positions are labeled as follows: “Tank Gas”, “Off” and "Rear Manifold Deliver”. The flow path for each of these positions is as follows:

Tank Gas Position - Routes flow from the three TTP Audit Lab Gas Cylinders (Ultra Pure Air, High CO, and Low CO) to the front manifold via three solenoid valves and a front panel pressure regulator. The solenoid valves, one for each gas cylinder, are used to turn the gas on/off from each gas cylinder to the 3-way valve. The front manifold then feeds the TTP Ozone and CO instruments as well as the bypass rotameter. When in this position, gas from the Environics 9100 still flows to the presentation line via the rear manifold, but the front manifold is cut off from this gas stream.

Off Position - Cuts all flow to the front manifold.

Rear Manifold Deliver - Routes a portion of gas from the rear manifold to the front manifold. Input from the gas cylinders is blocked from reaching the front manifold. The taps from the front manifold delivers gas to the TTP Audit Lab Ozone and CO instruments and the bypass rotameter.

NOTE: TTP Audit Lab results should be read from the on board computer using the EMC data logger software.

(Correction: Sect. 6 states 32hours)

1. Allow the TECO 48C to warm-up for at least 3*.5* hour*s*. If an ozone audit was conducted prior to the TECO 48C calibration and another ozone audit is not schedule for that day, turn the power to the TECO 49CPS "OFF".

2. Activate the "Multi-blend Audits" Worksheet. Record the certificate concentration of the gas cylinders as follows:

Cell F22 = Ultrapure cylinder certificate concentration,
Cell F23 = High CO cylinder certificate concentration
Cell F24 = Low CO cylinder certificate concentration
Cell F27 = Ultrapure cylinder certificate concentration
Cell F28 = High CO cylinder certificate concentration

3. Switch the 3-way manual valve to the Tank Gas Position.

4. Open the valve on the regulator for the high CO, low CO and Ultrapure cylinders. Adjust the pressure to 20psi. If a stop valve is installed on the regulator, open it fully at this time.

NOTE: Some TTP Audit Lab FSs have reported that there has been leakage of gas across the solenoid valves and/or the pressure regulator on the front panel resulting in a blending of the gas standards. If this is suspected, an alternative procedure is recommended, which is outlined at the end of this method (Page 33).

5. Toggle valve 1 up (ON) the front control panel. This would allow ultrapure air to flow into the front manifold then to the TECO 48C CO analyzer.

6. Adjust bypass flow until 0.3-0.4 lpm is indicated on the rotameter.

NOTE: If all the pressure on all the regulators is adjusted to 20 psi, the by-pass flow should not need to be adjusted after it has been set the first time.

7. Once the TECO 48C response is stable and reads ±0.1 ppm, take an average of 5 one-minute averages from the EMC data software and enter the response in the Multi-blend worksheet as follows:

Cell E22 = TECO 48C response to Pre Audit Ultrapure Zero Air

If the TECO 48C response is not within <0.1 ppm, do the following to calibrate the zero:

NOTE: Make sure the TECO 48C is in "LOCAL" mode. If not, press "ENTER" once to toggle to "LOCAL" mode.

a. Press the "MENU" button on the TECO 48C.

b. Scroll down to “CALIBRATION” and press “ENTER”.

c. Scroll down to “CALIBRATE ZERO” and press “ENTER” twice. The TECO 48C will force the reading to zero.

d. Press “RUN” on the TECO 48C to return the regular sampling mode.

e. Once the TECO 48C response is stable and it reads <0.1 ppm, take an average of 5 one-minute averages from the EMC data software and enter the response in the Multi-blend Audit worksheet as follows:

Cell E22 = TECO 48C response to Pre Audit Ultrapure Zero Air
If the TECO 48C response is not <0.1 ppm, go back to step a.

9. Annotate the EMC strip chart to indicate the pre-zero point calibration of the TECO 48C.

10. Toggle valve 1 down (OFF) and valve 2 up (ON). This will allow the High CO gas to enter the front manifold and into the TECO 48C. Adjust the by-pass flow to 0.3-0.4 lpm if necessary.

11. Once the CO response is stable and within <0.1 ppm of the concentration of the High CO tank, take an average of 5 one-minute averages from the EMC data software and record this value on the Multi-blend Audit worksheet as follows:

Cell E23 = TECO 48C response to Pre Audit High CO cylinder

12. If the TECO 48C response does not match the High CO tank within <0.1 ppm, do the following to calibrate the span of the TECO 48C:

a. Press the “MENU” button on the TECO 48C.

b. Using the down arrow, scroll down until “CALIBRATION” is displayed, then press “ENTER”.

c. Scroll down to “CALIBRATE CO” and press “ENTER”. If the correct span value is displayed, press “ENTER”. The span value should be the concentration of the high CO tank. If the correct span value is not displayed, use the arrow keys to input the correct HIGH CO tank concentrations under “SET TO”. When the correct span value is displayed, press “ENTER”. The TECO 48C will reset its reading to the span value of the High CO tank concentration. Press the “RUN” button to return to sampling mode.

d. Allow the TECO 48C to stabilize. When the CO response is stable and reads within <0.1 ppm of the High CO tank concentration, take an average of 5 one-minute averages from the EMC data software and record this value in the Multi-blend Audit worksheet as follows:

Cell E23 = TECO 48C response to Pre Audit High CO cylinder

If the instrument response is not within <0.1 ppm as the High CO tank, go back to step a.

13. Annotate the EMC strip chart to indicate the pre audit span point calibration of the TECO 48C.

14. Toggle valve 2 down (OFF) and valve 3 up (ON). This will allow the low CO gas to enter the front manifold and to the TECO 48C. Adjust the by-pass flow to 0.3-0.4 lpm if necessary.

15. Allow the TECO 48C to stabilize and take an average of 5 one-minute averages reading from the EMC software. Enter this value on the Multi-blend Audit worksheet as follows:

Cell E24 = TECO 48C response to Pre Audit Low CO cylinder.

16. Annotate the EMC strip chart to indicate the pre audit Low CO calibration point of the TECO 48C.

17. Toggle valve 3 down (OFF).

6.1.9.4. CO, SO2, NO/NOx/NO2 PE Procedure

NOTE: In cases where all three parameters (CO, SO2, NO/NOx) are not being audited, leave the data fields in the Multi Blend audit worksheet blank for those data fields that do not apply.

1. Calibrate the TECO 48C as outlined in Section 7.3.

2. Turn on the API 701 if it is not already on.

3. Toggle the 3-way manual valve to the Rear Manifold position.

4. With the calibrator in the "READY MODE" ("CONC MODE" displayed on the lower left button), press the "MAINTAIN PORTS" button. Press "2". Enter the multi-blend concentrations for CO, NO, SO2. Enter the cylinder identification number if needed. If these parameters were previously entered, check them against the current certification values to make certain that they were entered correctly. Press the "EXIT" button twice to return to the "READY" mode.

NOTE: The superblend concentration should be entered into the ENVIRONICS the first time the instrument is set up. The data will be saved in the instrument for subsequent runs. New concentrations have to be entered when a new tank (or an old tank with new certified concentrations) is installed.

5. Activate the Multi blend Audits worksheet and enter the concentrations of CO, SO2, NO, and NOx in the superblend tank in cells D16, E16, F16, and G16 respectively.

6. In the Multi blend Audits worksheet, highlight cells D39 to K48, right click the mouse, and select "clear contents." This will reset the spreadsheet.

7. Press the "CONC MODE" button on the front panel of the calibrator to enter the concentration mode. Check to see if MFC1 is at 16.0 LPM. If this is not the case, consult the ENVIRONICS Manual for the appropriate procedure. Cursor to "TARGET GAS" NO and enter "0.0" unless it is already displayed. Cursor to "O3" and enter "0.000" unless it is already displayed.

8. Press "START" on the front panel of the calibrator to deliver zero air to the TTP Audit Lab and station instruments. Adjust the flow to the by-pass rotameter until a flow of 0.3-0.4 lpm is indicated.

9. Audit Point 1: When the TTP Audit Lab and station responses are stable, take an average of 5 one-minute averages from the EMC software, and record the following on the Multi-blend Audit worksheet:

Cell D39 = ENVIRONICS MFC2 actual flow reading
Cell F39 = TTP Lab TECO 48C reading
Cell G39 = Station SO2 reading
Cell H39 = Station CO reading
Cell I39 = Station NO reading
Cell J39 = Station NO2 reading
Cell K39 = Station NOx reading

NOTE: If there is a difference of more than (<) 0.5ppm in the readings between the Ultrapure and the API zero air, investigate any potential problems before continuing with the audit. Replace the charcoal and/or Purafil in the API 701 if necessary.

10. Annotate the EMC strip chart to indicate the data collection for multi blend audit point 1.

11. **Purge the regulator on the superblend cylinder as follows:**

a. Close the regulator valve if it's not already closed.
b. Disconnect the gas line from the back of the calibrator and vent this line to the outside.
c. Open and quickly close the cylinder valve.
d. Adjust the regulator pressure to 20 psi.
e. Open the regulator outlet valve to bleed off the regulator pressure until both gauges read zero.
f. Close the regulator output valve.
g. Repeat step a through e 4 times.
h. Reattach the gas line to the back of the calibrator.

12. Audit Point 2: Open the superblend gas cylinder and the regulator valve. Adjust the pressure regulator to 20 psi. Cursor to "TARGET GAS" on the front panel of the calibrator and enter a "NO" concentration of approximately 0.450 ppm. This point is used for the "Level 5" concentrations for CO (20-50 ppm) and SO2 (0.41-0.90 ppm). Press the "UPDATE" button on the front panel of the calibrator.

When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D40 = ENVIRONICS MFC2 actual flow reading
Cell F40 = TTP Lab TECO 48C reading
Cell G40 = Station SO2 reading
Cell H40 = Station CO reading
Cell I40 = Station NO reading
Cell J40 = Station NO2 reading
Cell K40 = Station NOx reading

NOTE: During most performance audits, NO values are entered to achieve audit level concentrations of NO/NOX, CO, and SO2. If NO/NOX instruments are not present, CO values are entered to achieve audit level concentrations of CO and SO2.

13**.** Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 2.

14. Audit Point 3: Audit point for NO2 only. Without changing the ENVIRONICS concentrations, cursor to "Ozone" on the front panel of the calibrator and enter a "Level 5" titration point of 0.325. Press "UPDATE". Make any necessary ozone adjustments to get the nominal NO2 within the range of 0.31 – 0.60 ppm. The nominal NO2 concentration can be found in Cell I76 of the multi blend audit worksheet. The value for Cell I76 will be calculated when the instrument responses for this point are entered into the spreadsheet as delineated below (in cells D41, E41, etc.) When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D41 = ENVIRONICS MFC2 actual flow reading
Cell E41 = ENVIRONICS Ozone setting
Cell F41 = TTP Lab TECO 48C reading
Cell I41 = Station NO reading
Cell J41 = Station NO2 reading
Cell K41 = Station NOx reading

NOTE: During a combination audit (NOx and SO2/CO), when using the multi blend gas cylinder supplied as standard equipment with the TTP Audit Lab, a nominal NO2 concentration of 0.310-0.325 ppm should be generated, since this would allow for approximately 0.100 ppm of NO to remain.

NOTE: The nominal NO2 concentration is an estimation of the true NO2 concentration. The final true NO2 calculation will be calculated after all points are recorded using the final regression curve of the NO responses. An alternate method of calculating the nominal NO2 concentration is: [Site NO Response (audit point 2) - Site NO Response (audit point 3)] x [1 + True NO (audit point 2) - Site NO Response (audit point 2)].

15. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 3.

16. Audit Point 4: Audit point for NO/NOx only. Cursor to “Ozone” on the front panel of the calibrator and enter 0.000. Cursor to "TARGET GAS" NO and enter a "Level 2" NO value of 0.275. Press "UPDATE”. When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit Worksheet as follows:

Cell D42 = ENVIRONICS low flow mass flow controller reading
Cell F42 = TTP Lab TECO 48C reading
Cell I42 = Station NO reading
Cell J42 = Station NO2 reading
Cell K42 = Station NOx reading

17. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 4.

18. Audit Point 5: Audit point for NO2 only. Without changing the concentrations, cursor to "Ozone" on the front panel of the calibrator and enter a "Level 4" titration point of 0.175. Press "UPDATE". Make any necessary ozone adjustments to get the nominal NO2 within the range of 0.11 – 0.30 ppm. The nominal NO2 concentration can be found in Cell I77 of the multi blend audit worksheet. The value for Cell I77 will be calculated when the instrument responses for this point are entered into the spreadsheet as delineated below (in cells D43, E43, etc.). When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D43 = ENVIRONICS MFC2 actual flow reading
Cell E43 = ENVIRONICS Ozone setting
Cell F43 = TTP Lab TECO 48C reading
Cell I43 = Station NO reading
Cell J43 = Station NO2 reading
Cell K43 = Station NOx reading

NOTE: An alternate calculation for nominal NO2 is: [Site NO Response (audit point 4) - Site NO Response (audit point 5)] x [1 + True NO (audit point 4) - Site NO Response (audit point 4)].

19. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 5.

20. Audit Point 6: Cursor to “Ozone” on the front panel of the calibrator and enter 0.000. Cursor to "TARGET GAS" NO and enter a concentration of 0.160. This is also used for "Level 4" concentrations for CO (5 - 15 ppm), and SO2 (0.11 – 0.40 ppm). Press "UPDATE". When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit Worksheet as follows:

Cell D44 = ENVIRONICS MFC2 actual flow reading
Cell F44 = TTP Lab TECO 48C reading
Cell G44 = Station SO2 reading
Cell H44 = Station CO reading

Cell I44 = Station NO reading
Cell J44 = Station NO2 reading
Cell K44 = Station NOx reading

NOTE: Make sure the CO audit point is within the level 4 audit range of 5 – 15 ppm.

21. Annotate the EMC spreadsheet to indicate the end of data collection for multi blend audit point 6.

22. Audit Point 7: Audit point for NO2 only. Without changing the concentrations, cursor to "Ozone" on the front panel of the calibrator and enter a "Level 3" titration point 0.070. Press "UPDATE". Make any necessary ozone adjustments to get the nominal NO2 within the range of 0.006 – 0.10 ppm. The nominal NO2 concentration can be found in Cell I78 of the multi blend audit worksheet. The value for Cell I78 will be calculated when the instrument responses for this point are entered into the spreadsheet as shown delineated below (in cells D45, E45, etc.). When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D45 = ENVIRONICS low flow mass flow controller reading
Cell E45 = ENVIRONICS Ozone setting
Cell F45 = TTP Lab TECO 48C reading
Cell I45 = Station NO reading
Cell J45 = Station NO2 reading
Cell K45 = Station NOx reading

NOTE: An alternative calculation for the nominal NO2 concentration is: [Site NO Response (audit point 6) - Site NO Response (audit point 7)] x [1 + True NO (audit point 6) - Site NO Response (audit point 6)].

23. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 7.

24. Audit Point 8: Cursor to “Ozone” on the front of the calibrator and enter 0.000. Cursor to "TARGET GAS" NO and enter a concentration of 0.070. This point is also used for the “Level 3" concentration for SO2 (0.02 – 0.10 ppm). Press "UPDATE". When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D46 = ENVIRONICS low MFC2 actual flow reading
Cell F46 = TTP Lab TECO 48C reading
Cell G46 = Station SO2 reading
Cell H46 = Station CO reading
Cell I46 = Station NO reading
Cell J46 = Station NO2 reading
Cell K46 = Station NOx reading

25. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 8.

26. Audit Point 9: Cursor to “Target Gas” NO on the front of the calibrator and enter 0.045. This point is use for a “level 3” concentration for CO (1.50 – 4.00 ppm). When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D47 = ENVIRONICS MFC2 actual flow reading
Cell F47 = TTP Lab TECO 48C reading
Cell H47 = Station CO reading

27. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 9.

28. Audit Point 10: Cursor to "TARGET GAS" NO and enter a concentration of 0.000. Press "UPDATE". When the TTP Audit Lab and station readings are stable, take an average of 5 one-minute averages from the EMC data software and record the responses on the Multiblend Audit worksheet as follows:

Cell D48 = ENVIRONICS low MFC2 actual flow reading
Cell F48 = TTP Lab TECO 48C reading
Cell G48 = Station SO2 reading
Cell H48 = Station CO reading
Cell I48 = Station NO reading
Cell J48 = Station NO2 reading
Cell K48 = Station NOx reading

29. Annotate the EMC spreadsheet to indicate the data collection for multi blend audit point 10.

30. Switch the API zero air unit off. Allow the pressure on the API zero air regulator to decrease to zero. Press “STOP” on the front panel of the calibrator. Switch off the calibrator.

6.1.9.5 Carbon Monoxide Analyzer Post-Calibration Procedure CO, SO2, NO2 PE Procedure

NOTE: If leaking or cross contamination of the CO tank gas standards is suspected, use the 7.5 alternate procedure found at the end of this SOP on Page 33.

1. Switch the 3-way manual valve to the Tank Gas position.

2. Toggle valve 1 up (ON) on the front control panel. This would allow ultrapure air to flow into the front manifold then to the TECO 48C CO analyzer.

3. Adjust system flow until a by-pass of 0.3-0.4 lpm is indicated on the rotameter.

4. Once the TECO 48C response is stable, take an average of 5 one-minute averages from the EMC data software and enter the response in the Multi-blend Audit worksheet as follows:

Cell E27 = Instrument Response, Post Audit Ultrapure Zero

5. Annotate the EMC spreadsheet to indicate the data collection for the Post Audit Ultrapure Zero point.

6. Toggle valve 1 down (OFF) and valve 2 up (ON) on the front control panel. This would allow High CO gas to enter the front manifold and then to the TECO 48C CO analyzer.

7. Adjust the system flow until a by-pass of 0.3-0.4 lpm is indicated on the rotameter, if necessary.

8. Once the TECO 48C response is stable, take an average of 5 one-minute averages from the EMC data software and enter it in the Multi-blend Audit worksheet as follows:

Cell E28 = Instrument Response, Post Audit High CO

9. Annotate the EMC spreadsheet to indicate the data collection for the Post Audit High CO point.

10 Toggle valve 2 down (OFF) and close off the valves on the regulators of all gas and Ultrapure air cylinders. Close off the cylinder valves of all gas and ultrapure cylinders.

6.1.9.6 Calculations of Converter Efficiency/True Pollutant Concentrations

1. Converter Efficiency: The converted NO2 concentration is used at each point to determine NO/NOX analyzer converter efficiency. The converter efficiency is calculated as follows:

$$\% CE = \frac{\Delta NO \; B \; \Delta NOx}{\Delta NO} * 100$$

Where:

CE = Converter Efficiency
Δ NO = (([NO] original - NO intercept)-([NO] remainder - NO Intercept)) / NO Slope
Δ NOx = (([NOx] original - NOx Intercept) - ([NOx] remainder- NOx Intercept))/ NOX Slope

If the derived converter efficiency falls below 96%, an Air Quality Data Action (AQDA) request will be issued. In the Multi blend Audit worksheet, converter efficiency is calculated automatically and can be seen in cell ranges F90..F94.

2. True Pollutant Concentrations: Ambient level concentrations for each pollutant are determined by multiplying a dilution ratio by the concentration value for each pollutant at each audit level. The dilution ratio and ambient level concentrations are determined using the following formula:

$$\text{True value} = \frac{(\text{PE Lab CO - CO Intercept})}{(\text{CO Slope})} * \frac{(\text{Super blend X concentration value})}{(\text{Super blend CO Concentration Value})}$$

Where:
TTP Audit Lab CO = Value from the TTP Audit Lab CO instrument
X = Values for NO, NOX, SO2,and CO concentration in Super blend cylinder
CO Intercept = From calibration of TTP CO Analyzer (cell H30)
CO Slope = From calibration of TTP CO Analyzer (cell E30)

NOTE: In the AMulti blend Audit worksheet, true pollutant concentrations are calculated automatically and can be seen as follows:

True CO/SO2 values = Cell ranges F55...G60
True NO values = Cell Ranges F65...F70

3. True NO2 Concentrations: True ambient level concentrations for NO2 are calculated using the following formulas:

True NO2 value = $(NO_{[original]} - NO_{[remaining]}) + NO2$ impurity

Where:

Before titration:

$$NO_{[original]} = \frac{\text{(Station NO reading - NO intercept)}}{\text{(NO slope)}}$$

TTP Audit Lab CO is the reading of the TTP CO analyzer when the NO2 point was generated

After titration:

$$NO_{[remaining]} = \frac{\text{(Station NO reading) - (NO intercept)}}{\text{(NO slope)}}$$

Station NO reading is the audited instrument=s NO reading when the NO2 point was generated.

$$\text{NO2 impurity} = \frac{\text{(PE Lab CO - CO intercept)}}{\text{(CO slope)}} * \frac{\text{(Superblend NO2 impurity)}}{\text{(Superblend CO concentration)}}$$

NOTE: In the Multi blend Audit worksheet, the true pollutant concentrations are calculated automatically and can be seen as follows:

True NO2 values = Cell Ranges I75...I78

Audit Level	Ozone	NO2	CO	SO2
1	0.02 – 0.05	0.0002 – 0.002	0.08 – 0.10	0.0003 – 0.005
2	0.06 – 0.10	0.003 – 0.005	0.50 – 1.00	0.006 – 0.01
3	0.11 – 0.20	0.006 – 0.10	1.50 – 4.00	0.02 – 0.10
4	0.21 – 0.30	0.11-0.30	5 - 15	0.11 – 0.40
5	0.31 – 0.90	0.31 – 0.60	20 - 50	0.41 – 0.90

Figure 6.1 Audit Levels (ppm)

Audit	Ozone **OFF**		Ozone **ON**				
Point	NO	NOX	NO	NOX	NO2	CO	SO2
1	Zero	Zero				Zero	Zero
2	0.450	0.450				20 - 50	0.41 – 0.90
3			.100	.450	0.350		
4	0.275	0.275					
5			.100	.275	.175		
6	0.160	0.160				5 - 15	0.11 – 0.30
7			.100	.160	.060		
8	0.070	0.070					0.02 – 0.10
9						1.5 – 4.0	
10	Zero	Zz Zero					

Figure 6.2 Multi-blend Audit Points and the Estimated Concentrations (ppm)

6.1.9.7 PE Failures/Troubleshooting

1. In the event of a failed audit, an investigation is necessary to determine the possible cause of the failure. It may be necessary to inspect everything, beginning with the TTP Audit Lab operation and ending with the station operation.

   NOTE: If the cause for the failure is determined during any point in the investigation, resolve the problem (if possible) and resume the audit. The site operator should be notified of the "As Is" failure. If the cause of the failure is determined to be the TTP Audit Lab set up, the problem should be resolved and the audit restarted. Delete the results of the first audit.

2. Beginning with the TTP Audit Lab, all instruments should be re-checked to verify proper operation. This includes the following steps up until the cause of the failure is discovered and resolved.

   a. TTP Audit Lab Calibrator. If conducting an ozone audit, is the airflow set correctly? What values do the mass flow controllers indicate? Is the correct ozone value selected for the appropriate audit point? Does the display of the TECO 49C -PS indicate the correct ozone level?

   b. If conducting a gaseous audit. Is the airflow set correctly? What value do the mass flow controllers indicate? Does the TECO 48C indicate the correct CO range? Is the correct CO range selected on the Environics 9100 calibrator?

   c. Is the compressor in the API 701 running? Is the pressure of the Environics 9100 calibrator at 30 psi? Is there sufficient pressure in the gas cylinder (at least 200 psig, preferably 325 psig)? Is the by-pass rotameter set for a flow of 0.3-0.4 lpm? Is the correct gas port selected?

   d. Are all lines correctly connected to the manifolds? Are the lines to the instruments connected? Are there any apparent leaks?

3. When these checks have been completed and all instruments checked for proper operation, the next step is to verify that the station is receiving enough flow to the inlet probe. This flow can be easily checked with a mass flow meter. If there is not enough flow to the inlet probe, disconnect any booster pump that the station may be using. The TTP Audit Lab flow needs to be at least 1 lpm greater than the station flow requirement.

4. If the cause for the failure still can not be determined, check the flow path of the audit gas from the station inlet probe to the back of the station instruments. Make certain to check all lines and in-line filters for leaks or breaks.

5. If the cause for the failure can not be determined during this examination, remove the "Line" from the station inlet probe and connect it to the station=s instrument manifold. Recheck the instruments for the proper response.

6. If the instrument still indicates a failure, remove the "Line" from the instrument manifold and check for the response at the back of the instrument using a glass tee and a by-pass.

7. If the cause for the failed condition can not be determined after a thorough investigation, draw a diagram of the audit set-up. The diagram should show how the "Line" is connected to the station=s inlet probe and the sampling system from the inlet probe to the instruments. Include a brief comment on all trouble shooting measures performed.

8. When the investigation is completed, issue an Preliminary Audit Data and Recommended Corrective Action Reports as described in Section 7.2.

6.1.9.8 Alternative Procedure for 6.1.9.3 - CO Pre Calibration

1. Allow the TECO 48C to warm-up for at least 32 hours.

2. If an ozone audit was conducted prior to the TECO 48C calibration and there are no more ozone audits scheduled, turn the power to the TECO 49CPS "OFF".

3. Activate the AMulti-blend Audits Worksheet. Record the certificate concentration of the gas cylinders as follows:

   Cell F22 = Ultrapure Air cylinder certificate concentration,
   Cell F23 = High CO cylinder certificate concentration
   Cell F24 = Low CO cylinder certificate concentration
   Cell F27 = Ultrapure Air cylinder certificate concentration
   Cell F28 = High CO cylinder certificate concentration

4. Switch the 3-way manual valve to the Tank Gas Position.

5. Open the valve on the regulator for the Ultrapure Air cylinder. If a stop valve is installed on the regulator, open it fully at this time. Adjust the pressure to 20psi.

6. Toggle valve 1 up (ON) the front control panel. This will allow ultrapure air to flow into the front manifold and then to the TECO 48C CO analyzer.

7. Adjust bypass flow until 0.3-0.4 lpm is indicated on the rotameter.

8. Once the TECO 48C response is stable and reads ±0.1 ppm, take an average of 5 one-minute averages from the EMC data software enter the response in the Multi-blend worksheet as follows:

9. Cell E22 = TECO 48C response to Pre Audit Ultrapure Zero Air

10. If the TECO 48C response is not within <0.1 ppm, do the following to calibrate the zero:

    NOTE: Make sure the TECO 48C is in “LOCAL” mode. If not, press “ENTER” to toggle it to “LOCAL” mode.

    a. Press the “MENU” button on the TECO 48C.

b. Scroll down to “CALIBRATION” and press “ENTER”.

c. Scroll down to “CALIBRATE ZERO” and press “ENTER” twice. The TECO 48C will force the reading to zero.

d. Press “RUN” on the TECO 48C to return the regular sampling mode.

e. Once the TECO 48C response is stable and it reads <0.1 ppm, take an average of 5 one-minute averages from the EMC data software and enter the response in the Multi-blend Audit worksheet as follows:

Cell E22 = TECO 48C response to Pre Audit Ultrapure Zero Air

If the TECO 48C response is not <0.1 ppm, go back to step a.

9. Annotate the EMC strip chart to indicate the end of data collection for the pre audit zero calibration of the TECO 48C

10. Close the Ultrapure Air cylinder and allow the remainder of the zero gas in the system to bleed out. The amount of gas in the system may be monitored by the by-pass rotameter and the gauges on the cylinder regulator, both of which will go to zero. After the system has been depleted of zero gas toggle valve 1 down to the “OFF” position.

11. Open the high CO cylinder. If a stop valve is installed on the regulator, open it fully at this time. Adjust the pressure to 20psi. Turn valve 2 up to the “ON” position. This will allow the High CO gas to enter the front manifold and to the TECO 48C. Adjust by-pass flow to 0.3-0.4 lpm if necessary.

12. Once the CO response is stable and within <0.1ppm of the High CO tank, take an average of 5 one-minute averages from the EMC data software and record this value on the Multi-blend Audit worksheet as follows:

Cell E23 = TECO 48C Response to Pre Audit High CO cylinder

13. If the instrument response doesn’t match the High CO tank within <0.1 ppm perform the following steps to calibrate the span of the TECO 48C:

a. Press the “MENU” button on the TECO 48C.

b. Using the down arrow, scroll down until ACALIBRATION” is displayed and press “ENTER”.

c. Scroll down to “CALIBRATE CO” and press “ENTER”. If the correct span value is displayed, press “ENTER”. The span value is the concentration of the high CO tank. If the correct span value is not displayed, use the arrow keys to input the correct HIGH CO tank concentration under “SET TO”. When the correct span value is displayed,

press “ENTER”. The TECO 48C will reset its reading to the span value of the High CO tank concentration. Press the “RUN” button to return to sampling mode.

d. Allow the TECO 48C to stabilize. When the CO response is stable and reads within <0.1 ppm of the High CO tank concentration, take an average of 5 one-minute averages from the EMC data software record this value on the Multi-blend Audit worksheet as follows:

Cell E23 = TECO 48C Response to Pre Audit High CO cylinder

If the response is not the same as the High CO tank, go back to step a.

14. Annotate the EMC strip chart to indicate the end of data collection for the Pre Audit span calibration of the TECO 48C.

15. Close the High CO cylinder and allow the remainder of the gas in the system to bleed out. The amount of gas in the system may be monitored by the by-pass rotameter and the gauges on the cylinder regulator, both of which will drop to zero. After the system has been depleted of zero gas, toggle valve 2 down (OFF).

16. Open the Low CO cylinder. Adjust the pressure to 20psi. If a stop valve is installed on the regulator, open it fully at this time. Turn valve 3 up (ON). This will allow the Low CO gas to enter the front manifold and to the TECO 48C. Adjust by-pass flow to 0.3-0.4 lpm if necessary

17. Allow the TECO 48C to stabilize and take an average of 5 one-minute averages from the EMC data software. . Enter this value on the Multi-blend Audit worksheet as follows:

Cell E24 = TECO 48C response to Pre Audit Low CO cylinder

18. Annotate the EMC strip chart to indicate the end of data collection for the Pre-Audit Low CO point calibration of the TECO 48C.

19. Close the Low CO cylinder and allow the remainder of the gas in the system to bleed out. The amount of gas in the system may be monitored by the by-pass rotameter and the gauges on the cylinder regulator, both of which will drop to zero. After the system has been depleted of zero gas, toggle valve 3 down (OFF).

6.1.9.9 Alternate Procedure for 6.1.9.5 – CO Post Calibration

1. Switch the 3-way manual valve to the Tank Gas position.

2. Open the Ultrapure Zero Gas cylinder. If a stop valve is installed on the regulator, open it fully at this time. Adjust the pressure to 20 psi. Toggle valve 1 up (ON) on the front control panel. This will allow ultrapure air to flow into the front manifold then to the TECO 48C CO analyzer.

3. Adjust system flow until a by-pass of 0.3-0.4 lpm is indicated on the front panel rotameter.

4. Once the TECO 48C response is stable, take an average of 5 one-minute averages from the EMC data software and enter it on the Multi-blend Audit worksheet as follows:

   Cell E27 = TECO 48C Response to Post Audit Ultrapure Zero.

5. Annotate the EMC strip chart to indicate the end of data collection for the Post Audit zero point.

6. Close the Ultrapure Air cylinder and allow the remainder of the zero gas in the system to bleed out. The amount of gas in the system may be monitored by the by-pass rotameter and the gauges on the cylinder regulator, both of which will go to zero. After the system has been depleted of zero gas, toggle valve 1 down (OFF).

7. Open the high CO cylinder. If a stop valve is installed on the regulator, open it fully at this time. Adjust the pressure to 20psi. Turn valve 2 up (ON). This will allow the High CO gas to enter the front manifold and to the TECO 48C.

8. Adjust system flow until a by-pass of 0.3-0.4 lpm is indicated on the rotameter, if necessary.

9. Once the TECO 48C response is stable, take an average of 5 one-minute averages from the EMC data software and enter it on the Multi-blend Audit worksheet as follows:

   Cell E28 = TECO 48C response to Post Audit High CO.

10. Annotate the EMC strip chart to indicate the end of data collection for the Post Audit High CO point.

11. Close the High CO cylinder and allow the remainder of the gas in the system to bleed out. The amount of gas in the system may be monitored by the by-pass rotameter and the gauges on the cylinder regulator, both of which will go to zero. After the system has been depleted of zero gas, toggle valve 2 down (OFF).

6.1.10 References

1. 40 CFR Parts 50 and 58.

2. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

3. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

4. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

5. Environics Series 9100 Operating Manual.

6. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

7. Powerware 9125, User's Guide.

8. ONAN Commercial Mobile Power, Operator's Manual (Models HGJAD, HGJAE, HGJAF).

9. Duo-Therm 579, Series BRISK AIR.

10. WELLS CARGO Owner's Manual .

11. DEXTER AXLE, Operation Maintenance Service Manual.

12. Atwood Battery Operated Carbon Monoxide Alarm User's Guide.

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 7
Post PE Results Procedures

SOP: NPAP-7

Name: Printed	Signature	Date

Contents

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7.1 Post PE Results Procedures

7.1.1 Scope and Applicability

This Section describes the content, responsibilities, and procedure for completing and distributing the preliminary and final results of an NPAP TTP PE.

7.1.2 Summary of Method

Upon completion of the NPAP TTP PE, all data and information should be verified and the preliminary report should be given to the station operator. The final report and any corrective action request should be sent to the State/Local/Tribal agency and copied to OAQPS.

7.1.3 Definitions

Appendix A contains a glossary of the terms that used in the NPAP TTP.

7.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audits supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

7.1.5 Equipment and Supplies

The FS will use the following apparatus and materials to perform the procedures in this section:

- Table 2-1 providing a listing of the equipment and consumables needed for the field.
- NPAP TTP Spreadsheet

7.1.6 Procedure

7.1.6.1 Preliminary PE Data Results Report

1. The preliminary report (Figure 7.1 – 7.5) has one form for each pollutant. Each form contains site instrument information, NPAP mobile audit instrument information, site information, and audit results.

2. After the final Ozone point or CO calibration, verify that the site and PE data are updated and correct. If there are two PE FSs in the field this should be done by the PE FS that didn't input this information.

3. If any of the PE criteria were not met, the EPA TOPO/WAM or designee should be contacted and their name should be entered on the PE sheet.

4. If any evaluations beyond the normal scope of the PE, these should be detailed in the comments section of the report. Any other comments should also be included here.

5. The FS should print out and sign 3 copies of the Preliminary Report. One copy is given to the site operator, one copy is provided to the EPA TOPO/WAM, and the final copy is retained in the site file. The preliminary report with all the spreadsheets and strip chart should be delivered to the EPA TOPO/WAM within 2-5 days after returning from an audit trip.

6. Print a copy of the strip chart trace and attach the it along with all the NPAP TTP spreadsheets to the EPA copy of the Preliminary PE results.

7.1.6.2 Final PE Data and Report

1. Upon receiving the preliminary report from the FS, the Regional TOPO/WAM reviews it and prepares the final report (Figure 7.6 – 7.8). The final report is prepared from the preliminary report by electronically saving a copy of the report, and then deleting out the heading word "Preliminary" and the Auditor and EPA information on the bottom of the report.

2. An EPA cover letter (Figure 7.9 – 7.10) is prepared and added to the final report and is sent to the monitoring agency and OAQPS.

3. The NPAP TTP spreadsheet will be sent to OAQPS electronically.

NOTE: If a monitor failed any point on a PE, the Regional EPA TOPO/WAM will request a report of corrective action. This corrective action request will be included in the final report sent out to the monitoring agency and OAQPS. The monitoring agency should report any corrective action taken back to the Regional EPA TOPO/WAM and OAQPS.

7.1.7 References

1. U.S. EPA (Environmental Protection Agency). 1997. Part 58 promulgated as 50 FR62138 amendments to Title 58.

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PRELIMINARY NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY
OZONE REPORT

Site Name: Mine Creek
Auditor: Bui/Regehr/Sena/DeMary
Station Manager: Gary Ficklin

Airs ID: 20-107-0002
Audit Date: 07/09/08

MOBILE PE LAB INSTRUMENTS

Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	5/9/2008
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

Instrument:		Ozone	
Manufacturer/Model #:	Teledyne		400E
Property Number:		314	
Calibration Date:		07/03/08	
Slope/Intercept:	1.0440		-1.0000
Indicated Flow:		850 CCM	
In-Line Filter Change:		04/29/08	
Manifold Type:		glass	

PRELIMINARY OZONE AUDIT RESULTS

NPEP O3 Concentration (ppm)	Site Response (ppm)	Percent Difference
0.419	0.425	1.4
0.230	0.232	0.9
0.178	0.179	0.6
0.076	0.077	1.3
0.046	0.047	2.2
0.000	0.000	

	Pass/Fail	Warning
Ozone Audit Level 5	Pass	
Ozone Audit Level 4	Pass	
Ozone Audit Level 3	Pass	
Ozone Audit Level 2	Pass	
Ozone Audit Level 1	Pass	

Audit Limits

Pass	Less than or equal to ±10%
Fail	Greater than ±10%
Warning	Greater than ±7%

Auditor _____
Print
_____
Signature

EPA person notified in case of audit failure _____

Comments:
0

Figure 7.1 Preliminary Ozone Report

PRELIMINARY NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

CARBON MONOXIDE REPORT

Site Name:	Mine Creek	Airs ID:	20-107-0002
Auditor:	Bui/Regehr/Sena/DeMary	Audit Date:	07/09/08
Station Manager:	Gary Ficklin		

MOBIL PE LAB INSTRUMENTS

	Ozone	CO
Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

		CO	
Instrument:		CO	
Manufacturer/Model #:	TEI		48C
Property Number:		330	
Calibration Date:		07/06/08	
Slope/Intercept:	1.00		2.00
Indicated Flow:		775 CCM	
In-Line Filter Change:		4/29/2008	
Manifold Type:		glass	

PRELIMINARY CARBON MONOXIDE AUDIT RESULTS

NPEP CO Concentration (ppm)	Site Response (ppm)	Percent Difference
0.02	**0.10**	
40.57	**40.20**	**-0.9**
14.97	**14.80**	**-1.1**
3.77	**3.70**	**-1.9**
0.04	**0.20**	

	Pass/Fail	Warning
CO Audit Level 5	**Pass**	
CO Audit Level 4	**Pass**	
CO Audit Level 3	**Pass**	

Audit Limits	
Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Auditor _____
Print _____
Signature _____

EPA person notified in case of audit failure _____

Comments:
0

Figure 7.2 Preliminary CO Report

PRELIMINARY NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

SULFUR DIOXIDE REPORT

Site Name: Mine Creek
Auditor: Bui/Regehr/Sena/DeMary
Station Manager: Gary Ficklin

Airs ID: 20-107-0002
Audit Date: 07/09/08

MOBIL PE LAB INSTRUMENTS

Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

Instrument:	SO2	
Manufacturer/Model #:	TEI	43C
Property Number:	364	
Calibration Date:	07/03/08	
Slope/Intercept:	1.373	14.600
Indicated Flow:	507 LPM	
In-Line Filter Change:	4/29/2008	
Manifold Type:	glass	

PRELIMINARY SULFUR DIOXIDE AUDIT RESULTS

NPEP SO_2 Concentration (ppm)	Site Response (ppm)	Percent Difference
0.000	**0.000**	
0.415	**0.451**	**8.7**
0.153	**0.170**	**11.1**
0.073	**0.081**	**11.0**
0.000	**0.002**	

	Pass/Fail	Warning
SO_2 Audit Level 5	**Pass**	
SO_2 Audit Level 4	**Pass**	**Warning**
SO_2 Audit Level 3	**Pass**	**Warning**

Audit Limits

Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Auditor _____
Print
_____
Signature

EPA person notified in case of audit failure _____

Comments:
0

Figure 7.3 Preliminary SO2 Report

PRELIMINARY NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

NITROGEN OXIDES REPORT

Site Name: Mine Creek
Auditor: Bui/Regehr/Sena/DeMary
Station Manager: Gary Ficklin

Airs ID: 20-107-0002
Audit Date: 07/09/08

MOBIL PE LAB INSTRUMENTS

	Ozone	CO
Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INTRUMENT INFORMATION

Instrument:	NO/NOX
Manufacturer/Model #:	TEI | 42C
Property Number:	332
Calibration Date:	07/03/08
Slope/Intercept:	NO 0.892/3.0 NOX 1.0/3.1
Indicated Flow:	nple 0.592/ Ozonator 0.1 l
In-Line Filter Change:	6/16/2008
Manifold Type:	glass

PRELIMINARY NO AUDIT RESULTS

NPEP NO Concentration (ppm)	Site Response (ppm)	Percent Difference
0.000	0.000	
0.436	0.424	-2.8
0.276	0.268	-2.9
0.161	0.165	2.5
0.077	0.077	0.0
0.000	0.001	

	Pass/Fail	Warning
NO Audit Level 5	Pass	
NO Audit Level 4	Pass	
NO Audit Level 3	Pass	
NO Audit Level 2	Pass	

PRELIMINARY NOx AUDIT RESULTS

NPEP NO_X CONCENTRATION (ppm)	SITE RESPONSE (ppm)	Percent Difference
0.000	0.000	
0.436	0.424	-2.8
0.276	0.268	-2.9
0.161	0.166	3.1
0.077	0.077	0.0
0.000	0.001	

	Pass/Fail	Warning
NOx Audit Level 5	Pass	
NOx Audit Level 4	Pass	
NOx Audit Level 3	Pass	
NOx Audit Level 2	Pass	

PRELIMINARY NO_2 AUDIT RESULTS

NPEP NO_2 Concentration (ppm)	Site Response (ppm)	Percent Difference	Converter Efficiency
0.001	0.000		
0.347	0.340	-2.0	101.5%
0.177	0.173	-2.3	101.8%
0.071	0.076	7.0	100.0%

Audit Limits

Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Converter Efficiency Audit Limits

Pass	Between 96% and 104%
Fail	<96% or >104%
Warning	Between 96%-97% or 103%-104%

	Pass/Fail	Warning
NO_2 Audit Level 5	Pass	
NO_2 Audit Level 4	Pass	
NO_2 Audit Level 3	Pass	
Converter Efficiency Audit Level 5	Pass	
Converter Efficiency Audit Level 4	Pass	
Converter Efficiency Audit Level 2	Pass	

Auditor

Print

Signature

Comments:
0

EPA person notified in case of audit failure

Figure 7.4 Preliminary NO/NO2/NOx Report

PRELIMINARY SUMMARY AUDIT REPORT
AUDIT AGENCY

Site Name: Mine Creek — Audit Date: 7/9/2008

Parameter	NPEP Lab Response (ppm)	Station Response (ppm)	Percent Difference	Pass/Fail	Warning
Ozone					
Ozone Audit level 5*	0.419	0.425	1.4	Pass	
Ozone Audit level 4*	0.230	0.232	0.9	Pass	
Ozone Audit level 3*	0.178	0.179	0.6	Pass	
Ozone Audit level 2*	0.076	0.077	1.3	Pass	
Ozone Audit level 1*	0.046	0.047	2.2	Pass	
Carbon Monoxide					
CO Audit Level 5*	40.6	40.2	-0.9	Pass	
CO Audit Level 4*	15.0	14.8	-1.1	Pass	
CO Audit Level 3*	3.8	3.7	-1.9	Pass	
Oxides of Nitrogen					
NO Audit Level 5	0.436	0.424	-2.8	Pass	
NO Audit Level 4	0.276	0.268	-2.9	Pass	
NO Audit Level 3	0.161	0.165	2.5	Pass	
NO Audit Level 2	0.077	0.077	0.0	Pass	
NOx Audit Level 5	0.436	0.424	-2.8	Pass	
NOx Audit Level 4	0.276	0.268	-2.9	Pass	
NOx Audit Level 3	0.161	0.166	3.1	Pass	
NOx Audit Level 2	0.077	0.077	0.0	Pass	
NO2 Audit Level 5*	0.347	0.340	-2.0	Pass	
NO2 Audit Level 4*	0.177	0.173	-2.3	Pass	
NO2 Audit Level 3*	0.071	0.076	7.0	Pass	
Converter Efficiency NO2 Audit Level 5*	101.5%			Pass	
Converter Efficiency NO2 Audit Level 4*	101.8%			Pass	
Converter Efficiency NO2 Audit Level 3*	100.0%			Pass	
Sulfur Dioxide					
SO2 Audit Level 5*	0.415	0.451	8.7	Pass	
SO2 Audit Level 4*	0.153	0.170	11.1	Pass	Warning
SO2 Audit Level 3*	0.073	0.081	11.0	Pass	Warning

*** = CFR Appendix A Audit Levels**

Figure 7.5 Preliminary Summary Audit Report

NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

OZONE REPORT

Site Name: Mine Creek
Auditor: Bui/Regehr/Sena/DeMary
Station Manager: Gary Ficklin

Airs ID: 20-107-0002
Audit Date: 07/09/08

MOBILE PE LAB INSTRUMENTS

Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	5/9/2008
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

Instrument:	Ozone	
Manufacturer/Model #:	Teledyne	400E
Property Number:	314	
Calibration Date:	07/03/08	
Slope/Intercept:	1.0440	-1.0000
Indicated Flow:	850 CCM	
In-Line Filter Change:	04/29/08	
Manifold Type:	glass	

OZONE AUDIT RESULTS

NPEP O3 Concentration (ppm)	Site Response (ppm)	Percent Difference
0.419	**0.425**	**1.4**
0.230	**0.232**	**0.9**
0.178	**0.179**	**0.6**
0.076	**0.077**	**1.3**
0.046	**0.047**	**2.2**
0.000	**0.000**	

	Pass/Fail	Warning
Ozone Audit Level 5	**Pass**	
Ozone Audit Level 4	**Pass**	
Ozone Audit Level 3	**Pass**	
Ozone Audit Level 2	**Pass**	
Ozone Audit Level 1	**Pass**	

Audit Limits

Pass	Less than or equal to ±10%
Fail	Greater than ±10%
Warning	Greater than ±7%

Comments:
0

Figure 7.6 Final Ozone Report

NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

CARBON MONOXIDE REPORT

Site Name:	Mine Creek	Airs ID:	20-107-0002
Auditor:	Bui/Regehr/Sena/DeMary	Audit Date:	07/09/08
Station Manager:	Gary Ficklin		

MOBIL PE LAB INSTRUMENTS

	Ozone	CO
Instrument:	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

Instrument:		CO	
Manufacturer/Model #:	TEI		48C
Property Number:		330	
Calibration Date:		07/06/08	
Slope/Intercept:	1.00		2.00
Indicated Flow:		775 CCM	
In-Line Filter Change:		4/29/2008	
Manifold Type:		glass	

CARBON MONOXIDE AUDIT RESULTS

NPEP CO Concentration (ppm)	Site Response (ppm)	Percent Difference
0.02	**0.10**	
40.57	**40.20**	**-0.9**
14.97	**14.80**	**-1.1**
3.77	**3.70**	**-1.9**
0.04	**0.20**	

	Pass/Fail	Warning
CO Audit Level 5	**Pass**	
CO Audit Level 4	**Pass**	
CO Audit Level 3	**Pass**	

Audit Limits

Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Comments:
0

Figure 7.7 Final CO Report

NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

SULFUR DIOXIDE REPORT

Site Name:	Mine Creek	Airs ID:	20-107-0002
Auditor:	Bui/Regehr/Sena/DeMary	Audit Date:	07/09/08
Station Manager:	Gary Ficklin		

MOBIL PE LAB INSTRUMENTS

	Ozone	CO
Instrument:		
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INSTRUMENT INFORMATION

Instrument:		SO2	
Manufacturer/Model #:	TEI		43C
Property Number:		364	
Calibration Date:		07/03/08	
Slope/Intercept:	1.373		14.600
Indicated Flow:		507 LPM	
In-Line Filter Change:		4/29/2008	
Manifold Type:		glass	

SULFUR DIOXIDE AUDIT RESULTS

NPEP SO_2 Concentration (ppm)	Site Response (ppm)	Percent Difference
0.000	0.000	
0.415	0.451	8.7
0.153	0.170	11.1
0.073	0.081	11.0
0.000	0.002	

	Pass/Fail	Warning
SO_2 Audit Level 5	Pass	
SO_2 Audit Level 4	Pass	Warning
SO_2 Audit Level 3	Pass	Warning

Audit Limits

Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Comments:
0

Figure 7.8 Final SO2 Report

NPEP THROUGH-THE-PROBE AUDIT REPORT
AUDIT AGENCY

NITROGEN OXIDES REPORT

Site Name: Mine Creek
Auditor: Bui/Regehr/Sena/DeMary
Station Manager: Gary Ficklin

Airs ID: 20-107-0002
Audit Date: 07/09/08

MOBIL PE LAB INSTRUMENTS

	Ozone	CO
Manufacturer:	Thermo	Thermo
Model:	49i-PS	48i
Serial Number:	805027819	631319367
Calibration Date:	04/29/08	39577
Slope	0.9949	1.0012
Intercept	0.03178	0.0324

STATION INTRUMENT INFORMATION

Instrument:	NO/NOX
Manufacturer/Model #:	TEI | 42C
Property Number:	332
Calibration Date:	07/03/08
Slope/Intercept:	NO 0.892/3.0 NOX 1.0/3.1
Indicated Flow:	nple 0.592/ Ozonator 0.1 L
In-Line Filter Change:	6/16/2008
Manifold Type:	glass

NO AUDIT RESULTS

NPEP NO Concentration (ppm)	Site Response (ppm)	Percent Difference
0.000	0.000	
0.436	0.424	-2.8
0.276	0.268	-2.9
0.161	0.165	2.5
0.077	0.077	0.0
0.000	0.001	

	Pass/Fail	Warning
NO Audit Level 5	Pass	
NO Audit Level 4	Pass	
NO Audit Level 3	Pass	
NO Audit Level 2	Pass	

NOx AUDIT RESULTS

NPEP NO_X CONCENTRATION (ppm)	SITE RESPONSE (ppm)	Percent Difference
0.000	0.000	
0.436	0.424	-2.8
0.276	0.268	-2.9
0.161	0.166	3.1
0.077	0.077	0.0
0.000	0.001	

	Pass/Fail	Warning
NOx Audit Level 5	Pass	
NOx Audit Level 4	Pass	
NOx Audit Level 3	Pass	
NOx Audit Level 2	Pass	

NO_2 AUDIT RESULTS

NPEP NO_2 Concentration (ppm)	Site Response (ppm)	Percent Difference	Converter Efficiency
0.001	0.000		
0.347	0.340	-2.0	101.5%
0.177	0.173	-2.3	101.8%
0.071	0.076	7.0	100.0%

Audit Limits

Pass	Less than or equal to ±15%
Fail	Greater than ±15%
Warning	Greater than ±10%

Converter Efficiency Audit Limits

Pass	Between 96% and 104%
Fail	<96% or >104%
Warning	Between 96%-97% or 103%-104%

	Pass/Fail	Warning
NO_2 Audit Level 5	Pass	
NO_2 Audit Level 4	Pass	
NO_2 Audit Level 3	Pass	
Converter Efficiency Audit Level 5	Pass	
Converter Efficiency Audit Level 4	Pass	
Converter Efficiency Audit Level 2	Pass	

Comments:
0

Figure 7.9 Final NO/NO2/NOx Report

NATIONAL PERFORMANCE EVALUATION PROGRAM
U. S. ENVIRONMENTAL PROTECTION AGENCY

Performance Evaluated State, Local, or Tribal Agency

Region _____
Date: _____

Agency _____
_____
_____

Dear

One or more of the PE point results for your agency's (O_3, SO_2, CO, or NO/NO_2) monitor for _____, _____ (month, year) _____ (did /did not) exceed the PE acceptance limit for each of the individual or average absolute percent difference(s). The final data report is attached. The PE limits are included on each of the individual reports.

When a % difference is greater than the acceptance limit for a performance evaluation, we recommend that the cause for the exceedance be identified so corrective action can be taken. The EPA NPEP Regional Office Contact for your agency may have already contacted appropriate staff in your agency.

Comments, Recommendations: (Use, or put N/A) _____
_____
Follow-up will be at the discretion of the Region.
If you have any questions, please call me at _____.

Sincerely yours,

EPA NPEP Regional Contact: _____
Regional Group: _____
Regional Office: _____
City, State: _____, _____

Enclosure
cc: name
Region
OAQPS

Figure 7.2.1 Cover Letter for Final PE Report

NATIONAL PERFORMANCE EVALUATION PROGRAM
U. S. ENVIRONMENTAL PROTECTION AGENCY

Request for Corrective Action

Date: _____

Agency: _____
_____
Site(s) evaluated: _____
_____

Dear Mr.

One or more of the performance evaluation (PE) point results for your agency's (O3, SO2, CO, or NO/NO2) monitor, for date: _____, exceeded 15% for the individual or average absolute percent difference(s). The final data report is attached.

When a % difference is greater than ± 15% for a performance evaluation, we recommend that the cause for the exceedance be identified so corrective action can be taken.

Comments, Recommendations: _____
_____

Follow-up will be at the discretion of the EPA Region. If you have any questions, please call me at: _____.

Sincerely,

EPA NPEP Regional Contact: _____
Regional Office: _____
EPA Region: _____
City, State: _____

Attachment:

cc:

Figure 7.2.2 Cover Letter for Exceedence

NATIONAL PERFORMANCE EVALUATION PROGRAM
Performance Evaluated State, Local, or Tribal Agency

Date: _____

Agency: _____
_____
_____
Site(s) evaluated: _____
_____

Dear Mr.

Performance Evaluation (PE) Audits were performed in _____ (month, year) on _____ sites of your air monitoring network. The results for the audited monitors (O3, SO2, CO, or NO/NO2) did not exceed the PE acceptance limit for each of the individual or average absolute percent difference(s). The final data report is attached including the PE limits on each of the individual reports.

Please feel free to call me at _____with any questions or comments.

Sincerely,

EPA NPEP Regional Contact: _____
Regional Group: _____
Regional Office: _____
EPA Region: _____
City, State: _____

Attachment:

cc:

Figure 7.2.3 Cover Letter for Non-Exceedence

State, Local, or Tribal Agency

Dr. Robert Nicolotti
Air Monitoring Supervisor
St. Louis County Health Department
111 South Meramac
Clayton, MO 63105

Dear Dr. Nicolotti:

Performance Evaluation (PE) Audits were performed in August 2007 on three sites of your air monitoring network. The results for the audited monitors meet all applicable PE acceptance limits. The final data report is attached including the PE limits on each of the individual reports.

Please feel free to call with any questions or comments (913) 551-5062.

Sincerely,

Thien Bui
Environmental Scientist
Environmental Assessment & Monitoring Branch
Environmental Services Division

Enclosure

cc: Don Gourley, MDNR
Mark Shanis, OAQPS

Example Region 7 letter.

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 8
TTP Audit Lab Shutdown Procedures

SOP: NPAP-8

Name: Printed	Signature	Date

Contents

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8.1 TTP Audit Lab Shutdown Procedures

8.1.1 Scope and Applicability

This SOP specifically describes the shutdown procedures of the TTP Audit Lab.

8.1.2 Summary of Method

The method for shutdown of the TTP Audit Lab is essentially the reverse of startup. Shutting down the TTP Audit Lab involves powering off all the instruments, disconnecting from the station inlet and making sure the inlet probe is in the same condition as before the audit.

8.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP.

8.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audit trips supervised by an experienced operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

8.1.5 Cautions

- Caution must be taken to maintain the TTP system components properly to prevent damage. Be particularly attentive to maintenance of the auxiliary generators, air conditioners, API 701, Environics 9100, analyzers (CO and ozone) and computer. Establish and always use individual instrument logs for recording purpose; keep the logs with the instruments at all times. All necessary corrective actions must be taken and recorded in the logbooks/records kept with the instruments before PE can begin with the TTP system.
- Equipment that must be checked prior to and during each trip to ensure that it is operating correctly: tow vehicle and trailer tires for air, auxiliary generators for oil leaks, roof A/C units for Freon (or EPA -approved-substitute), generator fuel tank leaks (use dip stick), brake fluid leaks(remove rubber seal cap on each wheel hub center); roof platform guard rail lockdown mechanism; interior cabinet and drawer latches, storage tie downs, cylinder rack tie downs, cylinder fitting tightness, presence and use of regular and yellow clamshell safety cylinder caps; emergency and all other lights; exterior trailer door, port, and fuel tank locks; inflation pressure of each of the instrument rack pneumatic, floor-mounted shock absorbers; test switch for battery indicator of CO monitor/alarm; status of fire extinguisher and safety kit; status of exterior trailer tongue and loading jacks.
- Be careful when rolling in the presentation line to the hose reel. Wear gloves to prevent injuries from fraying material from the presentation line.

8.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP SOP Section 2.

8.1.7 Procedures

8.1.7.1 TTP Audit Lab Interior

- *After printing the audit report, make a backup of the files on a USB drive or other external storage device, exit the computer program and shut down the computer.*
- Turn off the power to the printer.
- Turn off the power to the API 701 zero air unit. Allow the pressure to go to zero and then power off the Environics 9100 calibrator.
- Turn off the ozone photometer standard and the CO analyzer.
- Make sure that you have recorded the final cylinder pressures and that all the gas cylinders valves are closed. Close and lock the Griftan yellow metal clam shells.
- Turn off the power to the Powerware UPS/ voltage and line conditioner.
- Turn off the air conditioning units.
- After shutting off all overhead lighting, turn off the generator(s).
- *For truck-based Region 4 TTP Audit Lab <u>only</u>, turn off the DC power switch by driver's seat in truck cab.*

8.1.7.2 TTP Audit Lab Exterior

- Remove the "presentation line" from the station's inlet probe.
- Make sure the inlet probe is back in the same condition as before the audit.
- Reel the "presentation line" into the TTP Audit Lab and cap the end. Lock the hose reel.
- Secure the ladder and (any) safety cones.
- Remove the wheel chocks. Crank the 4 exterior jacks back up.
- Close the generator doors but leave them **unlocked,** per DOT safety rules.

8.1.8 References

32. 40 CFR Parts 50 and 58.

33. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

34. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

35. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

36. Environics Series 9100 Operating Manual.

37. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

38. Powerware 9125, User's Guide.

39. ONAN Commercial Mobile Power, Operator's Manual (Models HGJAD, HGJAE, HGJAF).

40. Duo-Therm 579, Series BRISK AIR.

41. WELLS CARGO Owner's Manual .

42. DEXTER AXLE, Operation Maintenance Service Manual.

43. Atwood Battery Operated Carbon Monoxide Alarm User's Guide.

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Field Standard Operating Procedures for the EPA TTP National Performance Audit Program

Section 9
TTP Audit Lab Maintenance
SOP: NPAP-9

Name: Printed	Signature	Date

Contents

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9.1 Audit Lab Maintenance

9.1.1 Scope and Applicability

This SOP specifically describes maintenance involves for the TTP Audit Lab.

9.1.2 Summary of Method

This section list the preventive and corrective maintenance recommended by the manufacturer. This section contains tables to reference the manufacturers' manuals for most common preventive maintenance and corrective maintenance tasks. At the end of this section is also a list of spare parts for the major component of the TTP Audit Lab.

9.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP.

9.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audit trips supervised by an experienced operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

9.1.5 Cautions

- Caution must be taken to maintain the TTP system components properly to prevent damage. Be particularly attentive to maintenance of the auxiliary generators, air conditioners, API 701, Environics 9100, analyzers (CO and ozone) and computer. Establish and always use individual instrument logs for recording purpose; keep the logs with the instruments at all times. All necessary corrective actions must be taken before PE can begin with the TTP system.
- Follow all cautions provided in the equipment manuals to prevent injuries.

9.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP TTP SOP Section 2.

9.1.7 Procedures

9.1.7.1 Preventive Maintenance

Preventive maintenance should be done to keep the equipment and the TTP Audit Lab in working conditions. Follow the guidance for pm in the equipment manuals. Table 9.1 – 9.5 show preventive maintenance references for the TEI 48C, TEI 49C-PS, API 701 Zero Air Module, Powerware 9125 UPS, Onan Generator, Duo-Therm Roof Top Air Conditioner, Wells Cargo Express Wagon, and Dexter Axle.

9.1.7.1.1 Initial Cleaning of Presentation Line

The new 150 foot NPAP TTP Presentation Line may arrive with fluid or viscous oil inside. Before installation of the 150 foot line, clean as follow:

- Pour enough alcohol into the line to allow complete washing of the inside of the line.
- Cap both ends and allow the alcohol to stay in the line overnight.
- Empty the alcohol out of the line.
- Shoot 10 alcohol soak cotton balls through the line with pressurized air to remove any contaminates.
- Shoot 10 cotton balls soak in deionized or ultrapure water.
- Run clean dry air through the line for at least an hour.
- Install the Presentation Line, generate 500 ppb of ozone and condition for 24 hours.
- Perform ozone line loss and verify it is less than 1.5%. If ozone line loss is more than 1.5%, condition the line for 24 hours and repeat ozone line loss.

Table 9.1 TEI 48C Preventive Maintenance

ITEM	**ACTION**		**PROCEDURE REFERENCE**
Sample Pump	Check		Chapter 5, p.5-2 to 5-3 Instruction Manual
Solenoid Valves	Check		Chapter 5, p.5-2 to 5-3 Instruction Manual
IR Source	Check		Chapter 5, p.5-2 Instruction Manual
Optics	Check/Clean		Chapter 5, p.5-1 to 5-2 Instruction Manual
P/T transducers	Check/Calibrate		Chapter 3, p. 3-35 to 3-36, p.3-47 to 3-52 Instruction Manual

Table 9.2 TEI 49 C-PS Preventive Maintenance

ITEM	ACTION		PROCEDURE REFERENCE
Sample Pump	Check/Replace		Chapter 4, p. 4-3 Operator's Manual
Solenoid Valve	Check/Replace		Chapter 4, p 4-3 Operator's Manual
Lamp	Check/Replace		Chapter 4, p 4-2 Operator's Manual
Optical Bench	Clean		Chapter 4, p 4-2 Operator's Manual
P/T transducers	Calibration check		Chapter 5, p 5- 4; Chapter 6, p 6-12 to 6-13 Operator's Manual

Tabel 9.3 API 701 Preventive Maintenance

ITEM	ACTION		PROCEDURE REFERENCE
Charcoal	Check/Replace		p 5-13, 5-14 Operator's Manual
Purafil	Check/Replace		p 5-13, 5-14 Operator's Manual
HC Scrubber	Clean/Check		p 5-13,5-14 Operator's Manual
CO Scrubber	Clean/Check		p 5-13,5-14 Operator's Manual
Regen. Drier	Clean/Check		p 5-13,5-14 Operator's Manual

Table 9.3 Powerware 9125 UPS

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
UPS	Keep the area around the UPS clean and dust-free.	If the atmosphere is very dusty, clean the outside of the system with a vacuum cleaner	User's Guide, p45
Battery	For full battery life, keep UPS at ambient temperature (25° C or 77° F).		User's Guide, p45

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
Storing	If you store the UPS for a long period, recharge the battery by plugging the UPS into a power outlet.	Every 12 months. Recommend that batteries charge 24 hrs after a long-term storage.	User's Guide, p45
Replace battery	Conduct a self-test by pressing and holding the Test/Alarm Reset button for three seconds. If the battery indicator stays on, contact your service rep to order. **Consider all warnings, cautions, and notes before replacing batteries.**	When battery indicator illuminates	Ref: Figure 15, p 27, User's Guide

Table 9.4 Onan Generator

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
General Inspections	Check	Every day or every 8 hrs	p 16 Operator's Manual
Engine Oil Level	Check	Every day or 8 hrs	p 17 Operator's Manual
Battery	Clean/Check	Every month	p 19 Operator's Manual
Spark Arrestor	Clean	Every 50 hrs	p 21 Operator's Manual
Engine Oil & Filter	Change	After first 20 hrs Every 150 hrs	p 18 Operator's Manual
Air Filter Element	Replace	Every 150 hrs	p 19 Operator's Manual
Spark Plugs	Replace	Every 450 hrs	p 20 Operator's Manual
Engine Cooling Fins	Clean	Every 450 hrs	
Fuel Filter	Replace	every 450 hrs	
Valve Lash	Adjust	Every 450 hrs	
Cylinder Heads	Clean/Replace	Every 450 hrs	

Table 9.5 Duo-Therm Roof Top Air Conditioner

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
Air Filter	Remove the return Air Filter. Wash with soap and warm water. Dry and reinstall.	Periodically	p 9, Duo-Therm Installation & Operating Instructions
Air Box Housing	Clean air box housing and control panel with a soft cloth dampened with a mild detergent. Never use furniture polish or scouring powders	Periodically	p 9, Duo-Therm Installation & Operating Instructions
Fan Motor	Factory lubricated and requires no service under normal use.		p 9, Duo-Therm Installation & Operating Instructions
Frost Formation on Cooling Coil	If frost forms on the evaporator coil, inspect the filter and clean if dirty. Make sure air louvers are not obstructed. (Air conditioners have a greater tendency to frost when outside temperature is relatively low. This may be prevented by adjusting the thermostat control knob to warmer setting).		p 9, Duo-Therm Installation & Operating Instructions

Table 9.6 Wells Cargo Express Wagon

CHECK:	WHAT TO DO:	Every Trip	Every 3000 Miles	Every 6000 Miles	See p.# for details
Tire Air Pressure	Inflate to Proper Pressure Indicated on Sidewall	**			p.14 Owner's Manual

CHECK:	WHAT TO DO:	Every Trip	Every 3000 Miles	Every 6000 Miles	See p.# for details
Wheel Lugs Bolts & Nuts	Tighten to Proper Torque Specifications		**		p. 14 Owner's Manual
Wheels	Check for Damage and /or Out of Round			**	p. 14 Owner's Manual
Coupler Ball or 5th Wheel & Pin	Check for Sufficient Lube. Check Lock Mechanism. Check for Unusual Wear.	**			p. 15 Owner's Manual
Safety Chains at Hitch Ball	Check for abrasion, distortion and general integrity of links	**			p. 16 Owner's Manual
Coupler	Check for proper fastening & Hitch Pin in position and secure	**			p. 15 Owner's Manual
Brakes	Check for proper adjustment & operation	**			p. 16 Owner's Manual
Breakaway Switch	Test Switch Operation and Connections	**			p. 17 Owner's Manual
Breakaway Battery	Pull Switch Pin, Check Charge Indicator Light	**			p. 17 Owner's Manual
Doors, Windows & Roof Vents	Check all Windows/Doors/Roof Vents. Make sure all are closed & locked.	**			p. 18 Owner's Manual
Load Distribution	Check load Distribution & Security	**			p. 18 Owner's Manual
Leveling Jacks	Check Fastenings. Lube	**			p. 18 Owner's Manual

CHECK:	WHAT TO DO:	Every Trip	Every 3000 Miles	Every 6000 Miles	See p.# for details
Welds	Check All Weld Beads for Cracks or Separations.			**	p. 19 Owner's Manual
Hinges	Grease zerks with a Lithium complex grease.		**		p. 19 Owner's Manual
Tie-Down Devices	Check for fracturing, distortion and improper anchoring.		**		p. 19 Owner's Manual
Electrical: Lights & Signals	Check to make sure all are working properly. Replace burned out bulbs.	**			p. 21 Owner's Manual

Table 9.7 Dexter Axle

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
Brakes	Test that they are operational	At every use	p 5, 22 Operator's Manual
Brake Adjustment	Adjust to proper operating clearance	3 months or 3000 miles	p 12 Operator's Manual
Brake Magnets	Inspect for wear and current draw	6 months or 6000 miles	p 14 Operator's Manual
Brake Linings	Inspect for wear or contamination	12 months or 12000 miles	p 15, 31 Operator's Manual
Brake Controller	Check for correct amperage & modulation	6 months or 6000 miles	p 11 Operator's Manual
Brake Cylinders	Check for leaks, sticking	12 months or 12000 miles	p 26, 31 Operator's Manual
Brake Lines	Inspect for cracks, leaks, kinks	12 months or 12000 miles	p 31 Operator's Manual

ITEM	ACTION	FREQUENCY	PROCEDURE REFERENCE
Trailer Brake Wiring	Inspect wiring for bare spots, fray, etc.	12 months or 12000 miles	p 8 Operator's Manual
Breakaway System	Check battery charge and switch operation.	At every use	p 7 Operator's Manual
Hub/Drum	Inspect for abnormal wear or scoring	12 months or 12000 miles	p 32 Operator's Manual
Wheel Bearings & Cups	Inspect for corrosion or wear. Clean & repack.	12 months or 12000 miles	p 34 Operator's Manual
Seals	Inspect for leakage. Replace if removed.	12 months or 12000 miles	p 38 Operator's Manual
Springs	Inspect for wear, loss of arch.	12 months or 12000 miles	p 41 Operator's Manual
Suspension Parts	Inspect for bending, loose fasteners, wear.	6 months or 6000 miles	p 41 Operator's Manual
Hangers	Inspect Welds	12 months or 12000 miles	p 41 Operator's Manual
Wheel Nuts and Bolts	Tighten to specified torque values.	3 months or 3000 miles	p 47 Operator's Manual
Wheels	Inspect for cracks, dents, or distortion.	6 months or 6000 miles	p 46 Operator's Manual
Tire Inflation Pressure	Inflate tires to mfg=s specifications.	Weekly	p 48 Operator's Manual
Tire Condition	Inspect for cuts, wear, bulging, etc.	3 months or 3000 miles	p 49 Operator's Manual

9.1.7.2 Corrective Maintenance

Corrective maintenance should be done per equipment manuals in the reference section. Spare parts for the Environics 9100 Calibrator, TEI 48C, TEI 49C-PS, and API 701 Zero Air Module are listed in Tables 9.8 – 9.11.

Table 9.8 Spare Parts for Environics 9100

Parts #	Description

PC201	Transputer Board
PC202	Analog Board
PC203	Rom Board
PC204	**Comm/Driver Board (1 at Region 7)**
PC208	**Motherboard (1 at RTP)**
PC210	**Ozone Board (1 at RTP; 1 at Region 7)**
PC216	Status I/O Board
PC224	Pressure Transducer
Ozone Module (Lamp replacement) (1 at RTP; 1 at Region 7)	
Display Power Supplies and Power Entry Module	

Table 9.9 Spare Parts for TEI 48C

Part #	Description
9831	Motherboard
9837	Processor Board
9849	Analog/Digital Board
9839	Digital/Analog Board
8931	Power Supply Board
8938	Detector Assembly (Preamplifier Board 7363)
9989	Input Board
8933	Bias Power Supply Board
8935	Temperature Control Board
9835	Clock Board
9936	Pressure Transducer
9934	Flow sensor
4735	**Chopper Motor (1 at RTP; 1 at Region 7)**
7336	Capillary - 18mil
8606	**Pump Rebuild Kit (2 at RTP; 2 at Region 7)**
8550	Pump 110V (Chuck suggested that since the pump is the same in both the CO and Ozone instrument that maybe one pump (part number 8550) can be used for both instruments))
8550	**Sample pump(1 at RTP;1 at Region7)**
7361	**IR Source (1 at RTP; 1 at Region 7)**
7336	**Capillary (1 at RTP; 1 at Region 7)**
4510	**Fuse -** T, 3A, 250V (115V) **(1 at RTP; 2 at Region 7)**
14009	Fuse - T, 25A, 250V (220V)
8606	Pump Rebuild Kit (KNF)
7368	**Solenoid Valve (3 way) (1 at RTP)**

Table 9.10 Spare Parts for TEI 49C-PS

Part #	Description
9837	Processor Board
10761	Analog to Digital Board
9839	Digital to Analog Board
9956	Optional I/O Board
9843	C-Link Board
9833	Motherboard
9847 **(#8595)**	**Power Supply Board (1 #8595 at RTP; 1 at Region 7)**
10758	Lamp Power Supply Board
8592	Detector System
10763	Lamp Block Heater
8540	Source Lamp (ozone free)
4124	Capillary - 15 mil (short purple)
9877 **(8511)**	**Pressure Transducer (#8511- 1 at RTP; 1 at Region 7)**
9934	Flow Sensor
4509	**Fuse -** 2 amp slo-blo **(1 at RTP)**
8573	**Solenoid Valve (1 at RTP)**
8606	Pump Rebuild Kit
8550	Pump 110V
8540	**Photometer Lamp (1 at RTP;1 at Region 7)**
8573	**Solenoid Valve (1 at RTP)**
4124	Capillary - 15 mil
4111	Capillary - 28 mil
8606	Pump Rebuild Kit
4509	Fuse - 115V T, 2A, 250V
14009	Fuse - 220V T, 1.25A, 250V
8645	**Ozonator Lamp (1 at RTP;1 at Region 7)**
9994	Model 49C Primary Standard Instruction Manual

Table 9.11 Spare Parts for API 701 Zero Air Module

Parts #	**DESCRIPTION**
005960000	Activated Charcoal, 6 lbs.
005970000	Purafil, 6 lbs., IZS or Valve VER.
006900000	Charcoal Retainer Pads M100/M200
006900100	Charcoal Retainer Pads M400
014340000	Valve, Shuttle, Drier
015450000	Assembly, Pressure Switch M701
015980000	**M701 Expendables Kit**
016880000	M701 Level 1 Spare Parts Kit (for 10 units)
016880100	**M701 Spares Kit for 1 Unit**
016920000	Mole Sieve, 11 ozs (CH033)
018490000	Pressure Gauge
017320000	HC Scrubber
021660000	PCA. Control Board
Parts #	**DESCRIPTION**

024710000 Tubing: 6', 1/8" CLR
024780000 Tubing: 6', 1/4" OD 5/32" ID CLR
FA0000006 Fan, 115Vac
FL0000007 Filter, Coalescing
FL0000015 Filter, Air 150LPM, M701
FL0000016 Filter Element Paper for FL015
HW0000101 Shock Isolator (Pump)
KIT000040 Retrofit, HC Scrubber, M701
KIT000049 Retrofit, M701 CO Scrubber
KIT000060 Leak Checker for M701
OR0000030 O-Ring, 2-141V
OR0000035 O-Ring Drier Column
OR0000059 O-Ring, Scrubber
PU0000018 Pump, 115V/60Hz
PU0000021 Pump, 220V/50Hz
PU0000023 Pump Rebuild Kit
SW0000017 Pressure Switch
VA0000011 Valve, 4-way, Drier
VA0000012 Valve, Pressure Relief
VA0000014 Pressure Regulator
VA0000016 Valve, CHECK
VA0000017 Valve, 2-way (Water Drain)

015980000 M701 Expendables Kit
(2 kits at RTP; 2 kits at Reg 7)
005960000 **Activated Charcoal, 6 lbs.**
005970000 **Purafil, 6 lbs, IZS or Valve VER**.
006900000 **Charcoal Retainer Pads M100/M200**
006900100 Charcoal Retainer Pads M400
016920000 Mole Sieve, 11 ozs (CH033)
FL0000016 **Filter Element Paper for FLO15**
OR0000035 **O-Ring, Drier Column**
OR0000059 **O-Ring, Scrubber**

016880000 M701 Level 1 Spare parts Kit (For 10 UNITS) INCLUDES:
014340000 Valve, Shuttle, Drier
FA0000006 Fan, 115Vac
FL0000007 Filter, Coalescing
OR0000030 O-Ring, 2-141V
VA0000011 Valve, 4-Way, Drier
VA0000017 Valve, 2-Way (Water Drain)

016880100 M701 Spares Kit for 1 Unit
(Non-Expendable 1 kit at RTP; 1 kit at Region 7)
INCLUDES:
FL0000007 **Filter, Coalescing**
VA0000014 **Pressure Regulator**
VA0000016 **Valve, CHECK**
VA0000017 **Valve, 2-Way (Water Drain)**

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 10
Quality Assurance / Quality Control

SOP: NPAP-10

Name: Printed	Signature	Date

Contents

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10.1 Quality Assurance / Quality Control

10.1.1 Scope and Applicability

This SOP summarizes the Quality Assurance (QA) procedures and list Quality Control (QC) tasks that will be implemented at prescribed frequencies during routine NPAP TTP activities.

10.1.2 Summary of Method

This SOP summarizes the Quality Assurance (QA) procedures and lists Quality Control (QC) tasks that will be implemented at prescribed frequencies during routine NPAP TTP activities. For more information see the QAPP for NPAP, including TTP, on-line at the EPA TTN AMTIC website (http://www.epa.gov/ttn/amtic/npaplist.html).

10.1.3 Definitions

Appendix A contains a glossary of terms used in the NPAP TTP.

10.1.4 Personnel Qualifications

All personnel responsible for conducting EPA TTP PEs at field sites must be certified once per year by the U.S. EPA as completing required training to be eligible to conduct TTP PEs. All operators (those new to the program as well as experienced TTP Audit Lab operators) must be certified as attending a training program. During the training program, operators of the TTP Audit Lab must successfully complete an extensive, hands-on training session specified by EPA/OAQPS and pass both written and performance tests. A new operator must complete three (3) audit trips supervised by an experience operator approved by the regional TOPO/WAM before he or she is eligible to conduct TTP PEs.

10.1.5 Cautions

The TTP system components used for PE are potentially vulnerable to contamination and damaged. Exercise care in handling new components. Avoid touching the flow path component interior surfaces; normally handle the components only by touching the exterior surfaces. If details concerning component labeling and connection are not followed precisely, errors will result. Rough handling of used components during packaging or transport should be avoided.

10.1.6 Equipment and Supplies

A list of the required capital equipment and consumables is provided in Table 2-1 of NPAP TTP SOP Section 2.

10.1.7 Procedure

10.1.7.1 QA/QC Tables

Two tables are included in this procedure. These tables summarize QA/QC performed to ensure NPAP TTP data quality meets program objectives. These tables also reflect how data should be evaluated in the validation process.

Table 10-1 Critical Quality Control Checks summarizes the QC criteria that must be met to produce valid NPAP TTP audit data. These quality checks must be accomplished and verified prior to issuance of a preliminary audit report. If any of these criteria are not met, NPAP TTP audits should not proceed or a field report should not be issued.

Table 10-2 Systematic Quality Control Checks summarizes QC evaluations completed to determine the effectiveness of the audit program. The result of these evaluations will be used to identify areas for program improvement and will be summarized in EPA Regional or National reports.

10.1.7.2 Completeness

Completeness requirements for the NPAP TTP are as follow:

1 Primary QA organizations are required to complete audits of 20% of stations each year.

2 100% completeness (whatever it takes to report valid audits for 20% of stations each year)

3 All stations subject to an audit within 5 years.

10.1.7.3 Manifold Delivery System

The ozone line loss test (NPAP TTP-3, Section 3.1.7.2) is performed quarterly to test the performance of the manifold delivery system.

The presentation line shall be cleaned initially upon receipt and as needed thereafter according to procedure for cleaning the hose. (NPAP TTP-9, Section 9.1.7.1.1)

10.1.7.4 Field QC Checks

Field QC checks are detailed in the relevant SOP sections. In general, these checks include: visual inspection of all regulators and meters for correct pressures and flows; examination of tubing and manifolds for visible contamination; check for hand-tightness of all connections; inspection of flowpath for any sign of crimping in the tubing; and confirmation of correct numerical values and expected position of all switches, readouts, valves, needle dial, and rotameter settings. Since all of the system should be under positive pressure, there should be no PE concentration problems from leaks. However, standard gases are too valuable to be wasted, and so a leak check using Snoop or equivalent may be done to confirm that no leaks have developed. The pressure remaining in the cylinders should be checked at the end of each audit to monitor for leaks.

10.1.7.5 CO Analyzer and Ozone Photometer Calibrations

The NPAP TTP Audit Lab ozone standard should be verified against a Standard Reference Photometer (SRP) on a quarterly basis (NPAP TTP-3, Section 3.7.1.3).

A three-point calibration is performed on-site at the beginning of every audit. A multi-point calibration should be performed on the NPAP TTP Audit Lab CO analyzer annually to verify the linearity of the instrument (NPAP TTP-3, Section 3.7.1.5).

10.1.7.6 Gas Cylinder Certification

NPAP TTP Audit Lab compressed gas standards should be certified annually using the EPA Calibration Gas Traceability Protocol (NPAP TTP-3, Section 3.7.1.4).

10.7.1.7 Annual NPAP TTP Audit Lab Certification with Independent Standards

On an annual basis, a certification of the NPAP TTP Audit Lab is performed by comparison to a set of independent analyzers calibrated against independent NIST traceable standards.

10.7.1.8 Data Validation Process

This procedure describes the QA procedures that will be implemented to verify and validate field data Verification concerns the process of examining a result of a given activity to determine conformance to the stated requirements. Validation refers to examining a result to determine conformance to user needs.

10.7.1.8.1 Field Validation

Prior to issuance of the preliminary report, field PE data should be verified (NPAP TTP-7, Section 7.1.6.1).

10.7.1.8.2 Final Validation

EPA TOPO/WAM cross-check all primary and supporting data before finalizing the preliminary report (NPAP TTP-7, Section 7.1.6.2).

10.7.1.9 Annual Report

On an annual basis, OAQPS will issue a report which summarizes the audits performed and effectiveness of the NPAP TTP program.

Table 10.1 Critical Quality Control Checks

Requirement	Frequency	Acceptance Criteria	SOP Reference
Manifold Delivery System			
Visual defect check	each audit	See reference	NPAP TTP-4
Field QC Checks			
Zero Air Verification	each audit	0.5 ppm	NPAP TTP-6
CO Calibration	each audit	± 0.1ppm	NPAP TTP-6
Flow	each audit	Rotameter 0.3-0.4 LPM	NPAP TTP-6
Manifold Pressure	each audit	Rotameter 0.3-0.4 LPM	NPAP TTP-6
Leak checks	each audit	Visible inspections	NPAP TTP-6
TTP CO/ O3 Instrument Stability	each audit	5 to 10 min. per point	NPAP TTP-4 NPAP TTP-6
Calibration/Verification of Sampler			
Ozone Line Loss Test	quarterly	<2.5% Average Loss	NPAP TTP-3
Ozone standard calibration	quarterly prior to audit	< 3% slope from SRP	NPAP TTP-3
CO Calibration	annually	±2% each point	NPAP TTP-3
Standards Recertifications			
CO (High & Low) and Multi-blend	annually	New concentration	NPAP TTP-3

Table 10.2 Systematic Quality Control Checks

Requirement	Frequency	Acceptance Criteria	SOP Reference
Data Completeness	20% of each PQAO sites All sites in 5 years	100%	NPAP TTP-10
Collocated Accuracy			
NPAP TTP Audit Lab Certification	once per year	All points ±5%	NPAP TTP-3
Field Scientist Re-Certification	once per year	Aware of proper NPAP TTP procedures Pass written (hands on tests)	NPAP TTP-1

10.1.8 References

1. 40 CFR Parts 50 and 58.

2. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II Ambient Air Quality Monitoring Program, EPA-454/B-08-003, December, 2008.

3. Thermo Environmental Instruments, Inc. Instruction Manual for Model 48C.

4. Thermo Environmental Instruments, Inc. Instruction Manual for Model 49C-PS.

5. Environics Series 9100 Operating Manual.

6. Advanced Pollution Instrumentation, Inc. Instruction Manual for Model 701.

7. Powerware 9125, User's Guide.

8. EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards, EPA-600/R-97/121, September, 1997.

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Field Standard Operating Procedures for the EPA Through The Probe National Performance Audit Program

Section 11
Information Retention

SOP: NPAP-11

Name: Printed	Signature	Date

Contents

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11.1 Information Retention

11.1.1 Scope and Applicability

The Federal Records Act (44 U.S.C. 31) and other statutes require all federal agencies to create records that document their activities, file records for safe storage and efficient retrieval, and dispose of records according to Agency schedules. This SOP defines which records are critical to the project, what information needs to be included in reports, and which data reporting format and document control procedures should be used.

The following information describes the document and records procedures for the NPAP TTP field activities. In EPA's QAPP regulation and guidance, EPA uses the term "reporting package." This term is defined herein as all the information required to support the concentration data reported to EPA, which includes all of the required data, as well as any data deemed important by the NPAP. Table 11-1 identifies these documents and records by the Agency File Code (AFC) function and schedule numbers. It would be acceptable to have an overarching file called "NPAP TTP" for the purposes of locally delineating these files from other programs.

Table 11-1. NPAP Reporting Package Information

Agency File Code		Category	Record/Document Types
Function	**Number**		
301-093	**006**		**Program Management Files**
	006.1	Management and organization	• Organizational structure for EPA and how the Regions and ESAT contractors fit into running the NPAP TTP • Organizational structure for the support contractors • NPAP Project Plans, and subsequent revisions • QMP
	006.2	Monitoring site information	• Site characterization file (Site Data Sheets) • Site maps • Site pictures • SLT site contact information
	006.3	Field operations and data acquisition (by EPA Regional staff or contractors on behalf of EPA)	• QAPPs • SOPs • Field logbooks and communications
	006.4	Communications (contractor technical project activity)	• Telephone records and e-mails between ESAT contractor and SLT agencies • Telephone records and e-mails between ESAT contractor and the WAM/TOPO/DOPO

Agency File Code		Category	Record/Document Types
Function	**Number**		
301-093	006.5	Communications (EPA project activity)	• Telephone records and e-mails between EPA Regional or Headquarters staff and SLT agencies and vice versa • Telephone records and e-mails between EPA Regional and other EPA personnel (Headquarters to Regions and vice versa)
	006.6	Equipment and instruments used by contractors in the NPAP (records about charged time to the support of the program would reference AFC 405-202)	• Procurement logs • Inventories of capital equipment, operating supplies and consumables • Repair and maintenance (e.g., vendor service records, calibration records) • Retirement or scrapping
405	**202**	**Contract Management Records**	
	202.1	Contract administration	• Work Assignments, task orders, delivery orders, and Work Plans • Contractor monthly reports • Technical directives from the COR to the contractor • Invoices for consumables • Requisite qualifications of FSs for NPAP TTP-related, contractor-implemented activities • Training records and certificates of ESAT contractors conducted and issued by the EPA Regional ESAT COR
404-142-01	**179**	**Special Purpose Programs**	
	179.1	Data administration and integration	• Data management plans and flowcharts • Raw data: any original data (routine and QC data), including data entry forms • Data algorithms • Documentation of NPAP database (national/Regional level) • NPAP data
404-142-01	**173**	**Data Files Consisting of Summarized Information**	
	173.1	Data summaries, special reports, and progress reports	• Data, summary, and monthly field activity reports • Journal articles, papers, and presentations • Data validation summaries

Agency File Code		Category	Record/Document Types
Function	**Number**		
108-025-01-01	**237**		**State and Local Agency Air Monitoring File**
	237.1	QA/QC Reports	• 3-year NPAP QA reports • NPAP Data Quality Assessments • QA reports • Response and corrective action reports • Site audits
405	**036**		**Routine Procurement**
	036.1	Acquisition of capital equipment and supplies by EPA (either Headquarters or Regional office)	• Needs assessments and reports • Program copies of purchase requests • Requests for bids or proposals • Proposals, bids, or quotations • Bills of lading • Warranties and certificates of performance • Evaluations of proposals, bids, quotations, or trial installations
403-256	**122**		**Supervisors' Personnel Files and Duplicate Official Personnel Folder Documentation**
	122.1	Personnel qualifications, training, and certifications	• WAM/TOPO/DOPO training certifications • Certification as an NPAP FS • Certification as an NPAP FS trainer

11.1.2 Information Included in the Reporting Package

11.1.2.1 Data Reporting Package Format and Document Control

The NPAP has structured its records management system according to EPA's File Plan Guide (see http://www.epa.gov/records/tools/toolkits/filecode). A File Plan lists the records in your office and describes how they are organized and maintained. A good File Plan is one of the essential components of a recordkeeping system and is key to a successful records management program. It can help you:

- Effectively document activities
- Consistently identify records
- Quickly retrieve records
- Conduct disposition of records no longer needed
- Meet statutory and regulatory requirements.

The NPAP Records Management System uses the AFCs to facilitate the easy retrieval of information during EPA TSAs and reviews. The NPAP Records Management System also follows EPA records schedules, which constitute EPA's official policy on how long to keep Agency records (retention) and what to do with them afterwards (disposition). For more information on EPA records schedules, see

http://www.epa.gov/records/policy/schedule (the Web site is searchable by AFC function and schedule numbers).

Table 11-1 lists the documents and records that will be filed according to the statute of limitations referenced in Section 11.1.4. To archive the information as a cohesive unit, all the NPAP information will be filed under the major code "NPAP," followed by the AFC function and schedule numbers listed in Table 11-1. For example, NPAP Project Plans would be filed under the heading "NPAP/301-093-006.1."

11.1.2.2 Field Notebooks

The NPAP will issue field notebooks to each FS. Each field notebook will be uniquely numbered and associated with the individual FS and the NPAP. Although data entry forms are associated with all routine environmental data operations, the field notebooks should be used to record additional information about these operations.

11.1.2.3 Field Binders

Three-ring field binders will be issued to each FS and will contain the inspection and maintenance forms, the appropriate data forms for routine operations, and the SOPs.

11.1.2.4 Communications

In addition to the Phone Communication Forms (COM-1) and the Monthly Progress Reports (COM-2), significant NPAP e-mail communications should be printed and filed according to the records schedule outlined in Table 11-1.

11.1.2.5 Electronic Data Collection

In addition to paper-based documents (e.g., notebooks, forms, binders), the NPAP also gathers much of its data electronically (e.g., strip chart data). Various printouts are made from these electronic systems, such as the audit spreadsheets used by the FS and others. Printouts that are determined to be permanent record (e.g., data which leads to significant findings or conclusions) should be filed as a data reporting package to ensure that all NPAP data are properly archived.

11.1.3 Data Retention/Archive

The information listed in Table 11-1 will be retained by the ESAT contractor for 4 calendar years (e.g., all data from calendar year 2002 will be archived through 12/31/2005). Upon reaching the 4-year archival date, the ESAT contractor will inform OAQPS that the material has met the archive limit and will ask for a decision on whether to continue archiving or to dispose of the material.

11.1.4 References

1. U.S. EPA (Environmental Protection Agency). Implementation Plan: Through The Probe National Performance Audit Program.

2. U.S. EPA (Environmental Protection Agency). Quality Assurance Project Plan for the Through The Probe National Performance Audit Program.

3. 40 CFR Part 50.

4. U.S. EPA (Environmental Protection Agency). 2006. File Plan Guide. Available at: http://www.epa.gov/records/tools/toolkits/filecode.

5. U.S. EPA (Environmental Protection Agency). 2006. EPA Records Schedules. Available at: http://www.epa.gov/records/policy/schedule.

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