Quality Assurance Project Plan
For The
Audit Support program

(NPAP-*Mailed &TTP*; and NATTS)

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A.2.1 Document Control List – Updated *8/07/2006*

1. Converted to R-5 format
   (A) See Table of Contents

2. Change from NERL to OAQPS in 1998
   (A) Coordinator to Manager
      (1) Shifted some coordinator's duties to contractor
         (a) Move procedures from the QA Plan and SOP 001 to the contractor
      (2) NERL laboratory to EPA Region 7 laboratory

3. Modified to include NATTs Proficiency Testing Program in 2005

4. *Modified 2006 to include Through-the–Probe (TTP) (vs. Mailed) NPAP Audit Delivery for Gaseous Criteria Pollutants*

A.2.2 Abbreviations:

NERL: National Environmental Research Laboratory. Part of EPA ORD (Office of Research and Development)

OAQPS: Office of Air Quality Planning and Standards

EMAD: Emissions, Monitoring, and Analysis Division

NPAP: National Performance Audit Program

AMTIC: Ambient Monitoring Technology Information Center, Website on EPA's TTN

TTN: Technology Transfer Network

NATTS: National Air Toxics Trends Stations

NIST: National Institute of Standards and Technology

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VOC
Carbonyl
Metals

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A3 – Distribution List

Person	**Organization**
Manager *Margaret Dougherty*	Support Contractor EPA, OAQPS-OD, COR Contracts(Project Officer)
Mark Shanis	EPA, Work Assignment Manager (NPAP)
Candace Sorrell	EPA, Work Assignment Manager (NATTS)
Michael Papp; Dennis Mikel	EPA, Group QA Team Leader
Joe Elkins	EPA, OAQPS QA Manager

A4 – Project/Task Organization

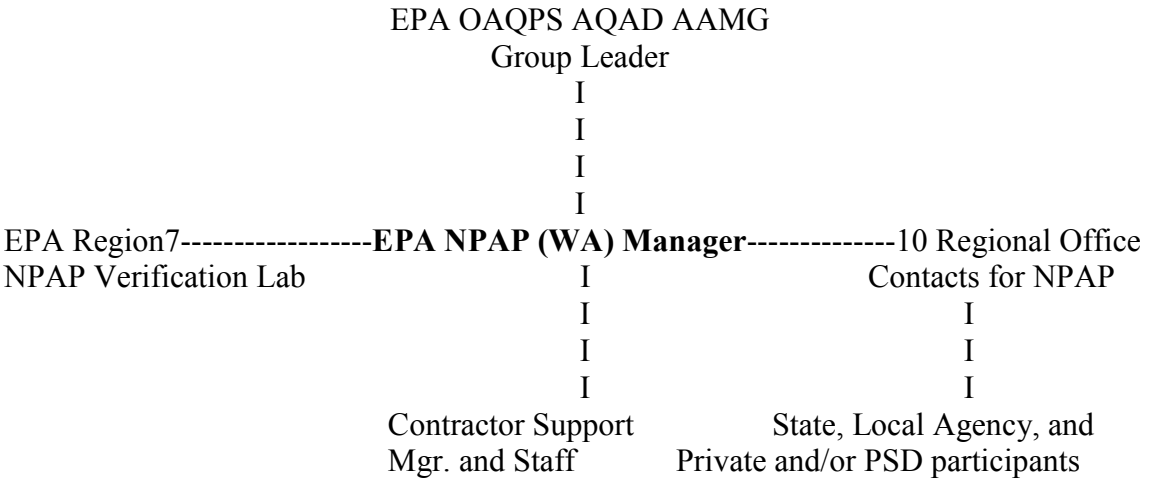
The Audit Support Program is conducted by EPA OAQPS and their contractor, with 3rd party, independent verification support provided as needed through an MOU with EPA region 7 (NPAP) and a contractor-issued Purchase Order with NIST (NATTS)

The EPA Work Assignment Managers(WAMs) are Mark Shanis (NPAP) and Candace Sorrell (NATTS). They report to Phil Lorang, Group Leader, OAQPS/AQAD/AAMG, and Conniesue Oldham, AQAD/____,...respectively. The EPA Work Assignment Manager is responsible for overseeing the activities of the contractor relative to the program. EPA also performs systems and performance audits on the contractor. The

NPAP OAQPS WAM works with the ten EPA Regional Contacts for NPAP to ensure the participation of the state, local, private, and tribal agency participants in their respective Regions. The EPA NATTS Manager identifies/approves the agencies participating in the Proficiency Testing Program.

The contractor personnel consist of the Contractor's Program Manager and staff. The contractor's responsibilities are listed in section A6

The EPA Region 7 Laboratory conducts performance evaluations on a sampling of the audit devices and materials provided to NPAP participants by the contractor. The details for responsibility of the Region 7 NPAP laboratory are provided in the QAPP for that laboratory. See Appendix B.



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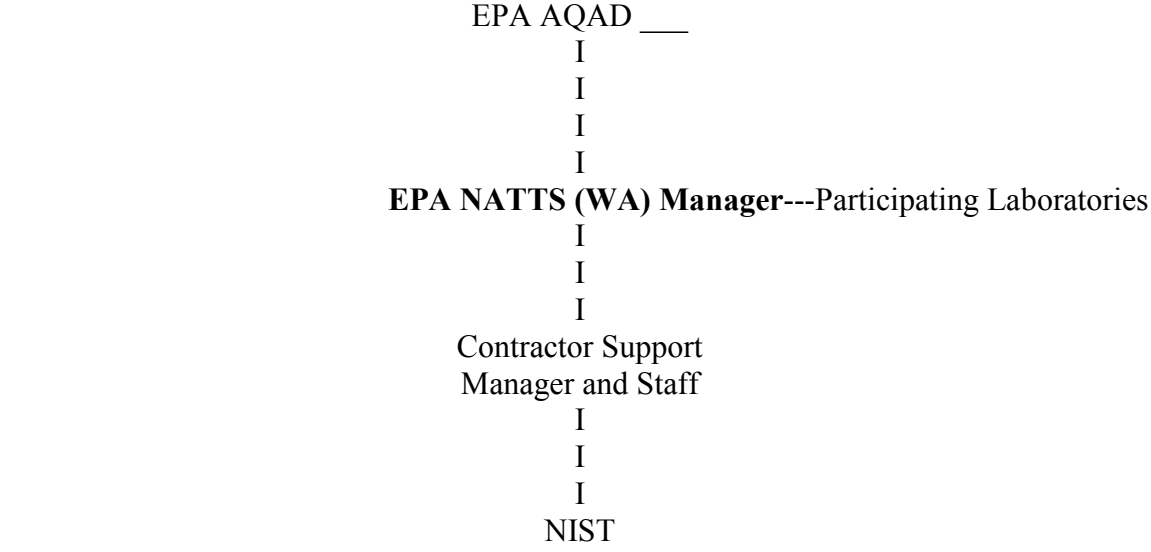

Figure A4-1 Project Structure

A5 – Problem Definition/Background

A5.1 NPAP

The National Performance Audit Program (NPAP) provides EPA a means to assess the proficiency of agencies that are operating monitors in the State and Local Air Monitoring System (SLAMS) network under the Prevention of Significant Deterioration (PSD) permits program and the CASTNET. *The NPAP is a quality assurance audit* program required under Section 2.4 of 40 Code of Federal Regulations Part 58, Appendix A (SLAMS and PSD, now combined in the October 2006 promulgated revision). The *monitoring* data *from these networks are* of utmost importance in protecting the public health. They are used to determine if an area is in attainment or non-attainment of the National Ambient Air Quality Standards (NAAQS), *and for trends assessment and modeling projections*. If the area is determined to be in non-attainment by this data then the State and Local agencies must develop a control strategy (State Implementation Plan – SIP) to come into attainment. The economic impact of this decision can be in the millions of dollars and the integrity of the data to make this decision is essential.

The NPAP is a key regulatory requirement in maintaining *and ensuring* the integrity of this data, *especially as regards comparability of data sets (sufficiently or acceptably low amount of systematic variability) in monitoring data across cities, states, air sheds, Regions, and nationally; and of traceability of measurement standardization to NIST*.

The NPAP has 2 forms of delivery of the Performance Evaluation/audit gas samples to the ambient air monitors, and a program to provide each form of delivery. The first program was started in the mid-1970's by ORD, and is called the mailed program. It is centrally operated. The second program was started in 2003 by OAQPS, and is called the Through-the-Probe (TTP) program, which is operated Regionally. The 2nd program was developed, based on a model operated for 20 years by the state of California, to address limitations of the mailed program, and was made possible by the prior development of the PM2.5 Performance Evaluation Program, developed by OAQPS for the new PM2.5 standard in 1998.

A5.2 NATTS

Current Government Performance Results Act (GPRA) commitments specify a goal of reducing air toxics emissions by 75% from 1993 to significantly reduce the risk to Americans of cancer and other serious adverse health effects caused by airborne toxics. As an aid in meeting the GPRA goals a National Air Toxics Trends Station network has been established within the contiguous 48 states. The NATTS network consists of 22 stations. In order to ensure that the data collected is of sufficient quality and to provide a broad overall understanding of the error that is inherent with the data collected for the network, EPA has established a Quality System (QS) for the NATTS. One important aspect of the QS are the proficiency Testing samples that are delivered by mail to the 18 laboratories that are participating in the program.

A5.3 NPAP MAILED & NPAP TTP

The mailed program devices for gaseous audits only generate proficiency test samples of NAAQS (National Ambient Air Quality Standards) gases- Ozone, CO2, SO2, and NO2) . Settings are provided to the agency's station calibrator or operator, who actually performs the audit. EPA values for the blind settings, used by the operator per provided instructions, are only given to the agency after the agency's results and the audit devices are returned to the central contractor's lab in RTP. This requirement can lead to significant time delays of a month or more in an agency's learning the results of the audit. These delays are of concern even if the results are within the EPA acceptance limit (15%); but especially if the acceptance limit is approached or exceeded. However, the cost – that is, the number of audits that can be done for the same amount of funds- is much lower than if the devices were delivered and the audits done by an independent qualified person.

In the TTP program, 6 Regionally based Mobile TTP laboratories are operated and audits delivered by Regionally-based, EPA trained and certified EPA and/or contractor audit personnel. The mobile labs contain a carefully assembled system of both high quality and, as is especially important, high capacity (volume/flow) of audit gas support, generation, and analysis equipment. The concentrations are independently, NIST traceably certified by the on-board analyzers as being stable and within the EPA required audit ranges. Then the station staff are told that they can start monitoring the audit gas sample. The results are automatically calculated upon entry into the EPA data entry forms and the audit reports generated automatically. Copies are provided to the station operator that day, before the TTP auditor leave the site.

A6 Project Description and Schedule

The NPAP audits all of the pollutants for which there is the NAAQS, as well as the precursors for the formation of ozone. Specifically, the following criteria air pollutants will be audit under the NPAP during the period of this contract: high-volume (HV)/PM-10 (fraction of total particulate matter approximately at or below 10 microns in diameter), SSI (Size Selected Inlet)/dichot flow rate, $PM_{2.5}$ (fraction of total particulate size distribution approximately at or below 2.5 microns in diameter, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), lead (Pb – analysis and flow are audited separately), as well as aldehydes and volatile organic compounds (VOC's) which are precursors for the formation of ozone.

*In the past, t*here *have been as many as,* ~~are~~ approximately, 5000 air pollution monitors in the ambient air network comprised of the SLAMS and PSD sites. In 1997, the monitors were distributed as follows: SO_2 (645); CO (540); NO_2 (373); O_3 (943); Pb (418); PM-10 (1584); and high-volume TSP (653). *In 2004, there were 733 sites reporting ozone monitor results, 339 reporting SO2 monitor results, 284 reporting CO monitor results, and 213 reporting NO2 monitor results.* The SLAMS monitors are operated by approximately 170 state and local agencies, all of whom are eligible to be audited in the NPAP. Also included in the NPAP are approximately 135 organizations (both governmental and private) that operate air monitors at PSD sites (for a grand total of approximately 305 participating organizations).

As a result of changes in the law regulating lead monitoring requirements, the number of required monitors is now less than half of the 1997 network. Many agencies and organizations still operate the monitors that are no longer required by law.

Additionally, there are 22 local agencies that operate Photochemical Assessment Monitoring Systems (PAMS) monitoring stations using Gas Chromatograph/Flame Ionization Detector (GC/FID) for volatile organics and Dinitrophenol Hydrazine (DNPH) tubes for aldehydes.

A 6.1 Mailed NPAP

The NPAP *mailed* audits are accomplished using a variety of mailed audit systems. The participants *(the personnel of the monitoring organization being audited)* use these audit systems to generate pollutant concentrations and flowing air streams, which they introduce into their sampling system. The pollutant concentrations are unknown to the audit participants. The outputs from the sampler that result from the use of the audit systems are recorded on a data form, returned to EPA, and compared to the concentration or flow rate that should have been generated by the audit system under the environmental conditions at the site where it was used. The differences between the EPA expected (certified) values and the NPAP participants reported values are calculated and returned to the participant, *within 2 to 4 weeks of the audit*. Summaries of the results that are within the NPAP acceptable limits *of 15%*, and all the results that are not within these limits, as well as corrective action responses, are also reported monthly to the WAM and designated NPAP contacts in the 10 EPA Regional Offices.

A 6.2 TTP NPAP

The NPAP TTP audits, currently only provided for the gaseous Criteria pollutants (O3, CO, SO2, and NO2) are accomplished using 6 mobile laboratories, containing the best (most accurate, travelable, safest, most reliable, and generally most cost-effective) gas generating, analysis, and support instrumentation available. The Mobile labs are based in 6 EPA Regions (2, 4, 5, 6, 7, & 9). To provide exposure for all Regions, and lacking the resources to put a mobile lab in each Region, the 3 of the 6 are shared with one or 2 adjacent Regions. Region 9 shares for about a month with 10, Region 7 shared for the first time in Region 8 for 2 weeks, and Region 2 shares with 2 and 3 (last year and for the last time this year) for about 4 and 6 weeks respectively.

Three of the mobile labs, in Regions 5, 6, and 9, are based in trailers that must be towed by a tow vehicle. Two of the mobile labs, in Regions 4 and 7, are based on truck-type vehicles, and require no towing. The same support, generation and analysis equipment have been mounted in a case-based system in Region 2, and shared in the past with Regions 1 and 3. The Region 2 sharing with Region 3 will continue, at least for the time being. Region 1 may be providing its own TTP system in the future.

Personnel who are independent of the monitoring organizations being audited use these audit systems to generate pollutant concentrations and flowing air streams, which they *analyze onsite using independent analyzers calibrated onsite using NIST- traceable*

standards. Only if the on board analysis and recording systems provide documentation of the stability and correct concentration of the generated gases does the TTP operator tell the site operator to start analyzing the TTP gases using the site's monitors and procedures. Critical to the TTP audit is the introduction of the TTP audit gases into the inlet of the monitoring station's sampling system (TTP) rather than into the inlet at the back of the sampling station's analyzer(s) (BOA). Unlike the mailed program, the Regionally based TTP program has started in 3 Regions with 3 EPA–only audit teams of Regional auditors (2,5, and 7), and in 3 Regions (4, 6, &9) with EPA overseen Regionally based ESAT contractors. In 2006, this ratio will reduce to 1 full time EPA audit team, in Region 2, and low EPA level of auditors in Region 5 and 7. In 2007, Region 1 will go TTP, EPA operated. The change here is from EPA BOA to EPA TTP.

*Exactly like the mailed NPAP program, t*he pollutant concentrations are unknown to the audit participants. The outputs from the sampler that result from the use of the audit systems are recorded on a data form, returned to EPA, and compared to the concentration or flow rate that should have been generated by the audit system under the environmental conditions at the site where it was used.

Unlike the mailed BOA program, 1) there are many variations that can be made to the concentrations onsite, as needed; 2) the audit data are recorded in an EPA spreadsheet-type workbook of individual audit worksheets, and which automatically generate a preliminary audit report for each pollutant, and a summary for the site visit. The workbook and /or the summary report, which is reviewed by both site operator and TTP operator and given to the site operator before the TTP operator leave the audit site, the same day as the audits. The workbooks and TTP operator's electronic log notes are emailed to EPA (Region and OAQPS) within 2 work days of the completion of the audit. Summaries of the results that are within the NPAP acceptable limits *of 15%*, and all the results that are not within these limits, as well as corrective action responses, are also reported monthly to the WAM and designated NPAP contacts in the 10 EPA Regional Offices.

A 6.3 NATTS

The NATTS Proficiency Testing program consists of quarterly studies in each of the three categories: VOC, Carbonyl and Metals). The VOC samples consist of 15 Volatile Organic Compounds in a passivated stainless steel canister. A clean canister is supplied by each participating laboratory and the contractor fills it with a humidified gas mixture. The carbonyl proficiency test sample consists of three aldehydes compounds that are spiked onto a 2,4-dinitrophenylhydrazine coated cartridge. The Metals Test is conducted using a 47 mm filter (Teflon or quartz) impregnated with an aliquot containing eight metals. (The filter media used is determined by the WAM and is based on information supplied by the participants regarding the type of filter routinely used).

The concentrations of the individual pollutants must vary from quarter to quarter and the actual compounds included may vary as well.

A.6.4 The Mailed Program's Audit Support Contractor's responsibilities are listed below:

1.0 <u>Preparation, calibration of Audit Systems and Execution of Technical Systems Audits</u>

The contractor shall provide support for the preparation, calibration of audit systems and the execution of technical systems audits as described below:

1.1 <u>Preparation and calibration of Audit Systems</u>.
Mailed program Gas Audit: The contractor shall prepare/calibrate the audit systems/materials according to the NPAP *mailed or TTP* Standard Operating Procedures (SOPs) Compendia, both of which (the mailed Program's compendium and the newer TTP Program's compendium) are posted on the EPA's Technical (Information) Transfer network(or TTN) accessible to the public through the internet (the world wide web, or www). The contractor shall check each audit device for cleanliness, operational fitness and calibration prior to its use in the NPAP. The specific internal quality control guidelines are located in "A7, Quality Objectives and Criteria for Measurement Data" of this document.

The *EPA* shall select, *and the EPA or contractor operator shall use* the system selected for a NPAP audit based on the types of monitors to be audited and the cost-effectiveness and involved and audit quality needed in calibrating, *delivering (by* shipping, *driving, or carrying), connecting,* and using the system. For example, the *mailed program* contractor shall use three gaseous pollutant dilution systems: the gas dilution system (GDS), the TECO 165, and the TECO 175. The TECO 165 is used when only O_3 monitors are to be audited; the GDS is used when only SO_2 and/or CO monitors are to be audited; and the TECO 175 is used when NO_2 and/or O_3 monitors are to be audited along with SO_2 and/or CO monitors. The contractor shall follow procedures in EPA SOP's for these monitors.

Starting in 2007, EPA provides TTP audits for gas monitors at the sites for which an agency is required by EPA to report data to AQS, within the limit of the number of sites that the resources allow, taken from the state's grant funds for that particular year. The allowed exceptions are when access or other logistical practicality makes TTP cost ineffective or inapprpriate. In that case, mailed devices, and. if absolutely necessary, Back-of-the-Analyzer (BOA) audits will be allowed, as they provide more data than no audits at all. Access to the NPAP TTP SOPS that must be used by the national program auditors is available at EPA's AMTIC website, along with the mailed program SOPS. The SOPS are updated with improvements as time and other resources allow.

Similarly, for the PAMs network participants, the contractor shall provide, for the PAMS season shipment of Volatile Organic Compound (VOC) Audits, mixtures that will contain between 15 and 35 PAMS analytes at concentrations from 5 to 60 ppbv as carbon. For the scheduled shipment of PAMS Carbonyl Audits, the contractor shall provide mailable spiked samples containing from 0.2 to 10 micrograms of acetone, formaldehyde and acetaldehyde.

1.2 Lead Audits The EPA Work Assignment Manager (WAM) will notify the contractor in writing of the concentration and number of filters needed for the next calendar year's lead audit. The concentrations will range from 100-300 and from 600-1000 ug of lead per strip. The number of samples requested will be based on the present year's participation plus extra filters for EPA acceptance testing. The contractor shall submit to the EPA NPAP manager twenty sets of filter strips for each batch of NPAP audit samples for acceptance testing by EPA. The EPA NPAP manager gives half of the filters to the EPA Region 7 NPAP Verification Laboratory and the other half to an independent contractor for acceptance testing. Filters shall be considered acceptable if within +/- 5 percent relative standard deviation from the average of the determined values. Any filters not meeting this criteria shall be rejected and the NPAP contractor shall be directed to remake the rejected level. The remade filters will be sent out for acceptance testing as above. After the acceptance testing is complete, the EPA Work Assignment Manager will send the contractor a memo confirming the EPA determined values to be used in the lead audit. (See table B5-1 and NPAP-Sop-015)

1.3 NPAP Flow Calibration Services The contractor shall provide State and Local Agencies and EPA Regional laboratories with a National Institute of Standards and Technology (NIST) traceable certification services for NPAP related flow calibration devices.

1.4 Technical System Audits (TSA) On request of the EPA Work Assignment manager, the contractor shall perform technical systems audits for State and Local Agencies as required in 40 CFR 58 Appendix A in accordance with the guidance in Quality Assurance Handbook for Air Pollution Measurement Systems Volume II; Part 1, Ambient Air Quality Monitoring Program Quality system Development Section 13.

If requested, the contractor shall accompany the EPA Work Assignment on a TSA of the Region 7 NPAP Verification Laboratory. Prior to the Region 7 audit trip, the contractor shall provide any recommendations for modifications to the Technical Systems Audit checklist in the NPAP QA Plan. Within 1 week following the trip, the contractor shall provide written recommendations to the EPA Work

Assignment Manager for the Manager to use in preparing the Audit Report, and comments on the NPAP Program manager's draft report.

2.0 Registration, Scheduling and Shipment of Audit Systems.

2.1 NPAP Registration The EPA NPAP Manager will determine eligibility of any potential new participant in the NPAP, *based on discussions with and priorities of the EPA Regional Office Contacts for NPAP*. If a new participant is determined by the NPAP manager, the Manager will then assign the new participant a unique NPAP identification number, *for unique tracking for participation in the mailed program*. The contractor *for the mailed program* shall handle all other issues associated with each year's registration in the NPAP mailed program. ***For TTP audits, correct AQS identification will be sufficient.*** *Codes are needed primarily when the results are not provided the same day that the audits are done, and/or if they are done by the audited agency's own staff instead of independent qualified personnel.*

2.1.1 Registration of New Participants.

Any agency that participates in the *mailed* NPAP must have an NPAP identification (ID) number assigned to it by the NPAP Manager before registration is possible. The ID number is 6 digits long and consists of the following components:

X XX XXX

Where **X** = one digit code indicating type of agency.

1 = Federal Agency
2 = Regional Office
3 = State Agency
4 = City/County Agency
5 = Private Company
7 = Foreign Agency

XX = Two digit state code that is located in the FIPS (Federal Information Processing standards.

XXX = Three digit agency code. This is determined by checking the master list of agencies and selecting the next available number. The new number and agency name and address are then added to the master listing.

2.1.2 Registration of participants from Prior Years.

The NPAP manager approves all changes, (including but not limited to additions, deletions, corrections) prior to the NPAP contractor implementing the changes.

2.2 NATTS Registration EPA has identified the laboratories authorized to participate in the NATTS proficiency testing program. These are the laboratories that analyze samples collected in the NATTS network. Any additional participants must be approved by the EPA Work Assignment Manager.

Each laboratory has been assigned a five digit lab code in the format

XXYY-L

Where XX is the Region that the sampling agency is located in, YY is a sequential number assigned that laboratory and L is a letter indicating the type of samples being analyzed by that particular laboratory. (V = VOC, C = Carbonyl and M = metals)

2.3 Installation/support of a Toll-free Number. In the past, the contractor hasl installed/supported a toll-free number for the NPAP participants and wasl expected to answer this phone during the hours of 8am to 6 pm (East Coast Time Zone) on normal working days (Monday-Friday except Federal Holidays). The contractor was required to identify himself as EPA's contractor when answering the phone. The NPAP participants were asked to use this number to receive clarification of the audit instructions and use of audit equipment and/or to report problems with the equipment. Any questions received from NPAP participants that did not relate to the aforementioned items were to be referred to the EPA NPAP Program Manager. The contractor was required to maintain a record of incoming calls including questions asked and responses given. This information was transmitted to the EPA Program manager via the monthly progress reports.

Currently the level of funding and use of the mailed program is so low that all communications from NPAP participants either go through the Regions, if the audits are TTPs, or through the EPA OAQPS NPAP Program Manager for either program. The annual letter inviting past audit requestors or communicate their contact information and annual audit needs now comes from the EPA NPAP Manager, and is accumulated into an annually updated contact list and distributed as needed to the contractor and the Regional *NPAP contacts.*

2.4 Required Sites (NPAP only)

As early as circumstances allow in each calendar year, the EPA manager for NPAP proposes lists of selected agencies and required sites for each pollutant. The EPA Manager uses the criteria and process described in Appendix A to prepare these proposed lists.

These lists are organized by EPA Region, state or local agency, and site. The list is limited to the number of agencies that anticipated EPA funds will allow to be sent audits or materials in the next calendar year. Each selected agency gets only one audit device or set of materials that year. Each device or set of materials can be used to audit more than one site. *TTP cost estimating and funding will be based only on the number of sites, since the major determinant of the cost for site delivery of the mobile lab is the cost of the trip time and associated travel expenses used by the personnel time ingoing to, staying at, and traveling back to base from the site.*

*For the mailed program, t*he list contains few enough sites for each selected agency so that the agency can also perform audits on sites that they wish to audit, in addition to the EPA required sites. *For the TTP program selections of sites, the EPA required site list must be completed as is, and allows for no other sites, except as determined by the EPA Region, the funding by the state grants, at times supplemented by other resources, and by circumstances of site operation (such as equipment failure or sudden closure decision- such as due top power failure)*. The Regional proposed lists of agencies and required sites are sent to each region with a request that the Region get feedback from the state and local agencies and provide OAQPS with any resulting corrections for errors and/or recommendations for switches of sites or selected agencies.

The proposed required lists are amended based on the feedback from the regions. Since the limit of the number of agencies we can fund in one year is always way below what is requested, in the next 4 years after an agency is not audited for a pollutant, we raise the priority of those agencies for selection.
The revised proposed lists are sent to *the EPA Region for the TTP program and, for the mailed program, to* the mailed program contractor for incorporation into the requested schedule for the year. Late in each CY prior to the next audit CY, *EPA* sends out invitations *for NPAP participation* to the registered organizations that have participated during that *or the previous* year, inviting them to participate in the next years audits, as required by 40 CFR part 58, Appendix A, by completing and returning the enclosed forms for each audit of each criteria pollutant that they should audit.

Starting in 2006, all states are required to decide, by the middle of the CY, if they rather than the national program would do the TTP audits at their sites in the next CY. If they chose to do the audits, the Region in which they are located will be required to review the state's TTP audit program and determine if it could meet the adequacy criteria set up for the national program, so that the state audits could be demonstrated to be equivalent

to the national audits. This review and certification has to include at least one annual side-by-side comparison of the two systems, and at least 1 or more others, depending on the size of the network. The difference between the two sets of results are required to be within an agreed upon acceptance limit.

The goal for this annual decision is currently set at 20% each CY, with an expected 100% evaluation of all of a network's sites reporting to AQS within 5 years. Exceptions are allowed for high priority repeat audits, for those that exceed the acceptance limits, and especially for excedances at sites near to the NAAQS or where the state audits are found to exceed the state's own acceptance limits.

2.5 Scheduling Audits

2.5.1 NPAP The contractor shall develop a shipping schedule and have it approved by the EPA NPAP Program Manager. The registered "required" NPAP agencies combined with sites and their "requested schedule shall be submitted electronically to the EPA Program manager no later than December 15 for the upcoming year. The required agencies are indicated on the Requested Schedule by the placement of an "R" beside the number of samplers/monitors that they anticipate needing to audit.

2.5.2 NATTS The National Air Toxics Trends Stations Proficiency Test program has been designed so that one of each type of test takes place during each calendar quarter. Though not always possible, every effort is made to conduct one test per month in order not to overload the individual laboratories.

2.6 Shipping

2.6.1 NPAP The contractor shall ship the audit equipment to and from the NPAP participants. With each audit system, the contractor shall include a package that contains: a cover letter from the contractor, instructions for the audit, including a list of special sites for each pollutant to be audited, data reporting form(s), a self-addressed return envelope, and, if applicable return shipping instructions.

2.6.2 NATTS All of the NATTS samples are shipped to participants by the contractor. The package contains the sample, a cover letter indicating the closing date of the test and a data sheet. (all NATTS data is returned by fax)

The metal test samples are shipped via U.S. Mail, in padded envelopes. Both the VOC samples and the carbonyl samples are shipped via FedEx Air due to stability concerns. The carbonyl samples are packaged in thermal boxes with cold paks and the participating laboratories are notified by phone when to expect them.

3.0 **Data Base Maintenance, Processing, Analysis and Distribution**

3.1 NPAP Database Background: *The NPAP data are currently contained in 2 paper and 2 electronic data bases. The data from the mailed program have been kept by the EPA contractor for the mailed program since EPA requested the contractor to establish an electronic data base, complementing the much older and much more unwieldy mailed program paper data base, approximately in 1989. As resources allow, this mailed electronic data will be added to the 2nd electronic data base. The electronic mailed data base was created in FOXPRO, and then operated and maintained by one employee of the one mailed program contractor. The 2nd paper and electronic data base, which contain the initial NPAP TTP audit and certification data, was initially created in 2003-2004 by several EPA Regional personnel, in EXCEL, and then tested, used, improved, and revised by a network of Regional EPA and contractor personnel. A central, OAQPS-developed, operated, and maintained intermediate database for the critical audit and certification data was created in ACCESS by an AQS staff member. Then the critical audit and certification data were moved from the central OAQPS CD of individual EXCEL workbooks and associated certification files into the intermediate data base. In 2007, after screening QC procedures were used to ensure that the intermediate audit data were acceptable for entry into AQS. The acceptable data- about 75%- were entered into AQS. The EXCEL field data entry software is being recreated by EPA OAQPS AQS personnel in ACCESS.*

3.1.1 The TTP field data are collected by some Regional EPA personnel, but mostly by EPA Regional ESAT contractor personnel. The EXCEL workbooks have been printed out and provided on site, at least as Preliminary Reports, to the station operator staff, on the day of the audit, prior to the TTP operator's leaving the site. They are then provided to the EPA Regional NPAP TTP contact staff, who are responsible for sending the final reports, with requests for any follow-up action. to the appropriate audited agency lead personnel; and to OAQPS, for entry into the central data OAQPS databases, including AQS. The procedures addressing these activities are included in the EPA TTP SOP Compendium, which is posted on a website accessible through the EPA Technology Transfer Network, on the Ambient Monitoring Technology Information Center, at www.epa.gov/ttn/amtic.

3.1.2 For t*he NPAP mailed program data, t*he contractor shall provide support for data base maintenance that includes the following:

a) Data Base maintenance. The contractor shall maintain all NPAP information in a data base that is accessible by all NPAP participants, EPA Headquarters and EPA regional contacts. The contractor shall maintain the NPAP data base as described in NPAP-SOP-005, NPAP-SOP-006 and NPAP-SOP-007. The appropriate NPAP information shall be entered into the EPA AIRS Air Quality Subsystem (AQS)

   Access to the NPAP data base shall be appropriately secured and include passwords. Complete access shall be limited to those persons actually working with the NPAP. The EPA NPAP Program Manager shall have full and unlimited access to the NPAP data base via a modem hook-up between the EPA NPAP Program Manager's computer and the contractor's computer(s).

b) Data Receipt and Entry. The NPAP participants shall mail, fax or electronically submit the audit results directly to the contractor. The contractor shall enter the data exactly as received according to NPAP-SOP-005.

c) Incorrectly Completed Data Sheets. Data sheets that are completed in correctly (e.g., wrong units of measurement; forms incomplete; resistance plates used with flow-controlled PM-10 samplers) shall be stamped by the contractor with the date received. The contractor shall contact the participant and give him/her the opportunity to correct the data sheets. The contractor shall then enter the changed results from the corrected data sheets into the NPAP data base.

d) Data Distribution. The contractor shall provide electronic access to the audit results and related information. If for any reason a NPAP participant is not able to access the electronic data, the data shall be mailed along with a cover letter to audit participants. The contractor shall provide access or mail the audit results for all audits (except lead or one of the PAMS audits) to the audit participants within 5 days after the NPAP participant has returned the audit equipment to the contractor. The contractor shall not provide access or mail data, under any circumstances, to the audit participants until the audit equipment has been returned. The contractor shall provide access or mail lead and/or PAMS audit results to participants within 5 days after the closing date of the audit.

e) Corrections to Data: Corrections to data that have been sent to the audit participant shall be done as described in NPAP-SOP-007.

f) Data Analysis As the audit schedule allows, in preparation for the submission of the Annual Data Summary, the contractor shall provide data analysis, if requested, of any SLAMS/national Air Monitoring

System (NAMS)/PAMS or other data that is on AIRS. These analyses shall include summary statistics and explanatory analyses that are pollutant specific and aggregated by reporting agency and method code.

3.2 NATTS The contractor shall provide support for NATTS data base (PTNATTS) maintenance that includes the following:

a) Data Base maintenance. The contractor shall maintain all NATTS information in a web-based data system. Access to the data base shall be appropriately secured and include passwords. Access shall be limited to those persons actually working with the NATTS data.

b) Data Receipt and Entry. The NATTS participants shall fax or electronically submit the audit results directly to the contractor. The contractor shall enter the data exactly as received

c) Incorrectly Completed Data Sheets. Data sheets that are completed in correctly (e.g., wrong units of measurement) shall be stamped by the contractor with the date received. The contractor shall contact the participant and give him/her the opportunity to correct the data sheets. The contractor shall then enter the changed results from the corrected data sheets into the NATTS data base.

d) Data Distribution. On the closing date of the study, the contractor shall submit a summary of the results, as well as individual results, to the NATTS Work Assignment Manager for his/her review and approval. Upon receipt of this approval, the contractor shall e-mail each participant a report showing there performance as well as a series of graphs showing the results submitted by all participants. (The individual laboratories are not identified on these graphs).

e) Corrections to Data Changes to data that have been distributed to participants may only be done with approval of the WAM.

f) Data Analysis The contractor shall provide the EPA NATTS Manager with graphs showing a comparison between per cent differences for all data submitted, as well as graphs showing laboratory performance as compared to the mean value for reported results.

A7 Quality Objectives and Criteria For Measurement

The quality objectives and criteria for measurement are to provide audit materials and devices that will enable EPA to assess the proficiency of agencies that are operating monitors in the SLAMS/NAMS/PAMS/PSD/NATTS networks. To accomplish this, EPA, based on criteria for each of the audit materials and devices provided in the programs, has established acceptable limits or criteria for each of the audit materials and devices provided in the programs. Each material or device is tested following established SOP's (see Appendix). Quality criteria for each audited parameter are discussed in Section "B5 Quality Control requirements" below and in referenced SOP's. Any device or material not meeting these pre-determined criteria are not used in the programs.

A7.1 Audit Devices/Materials

All audit devices and materials used in NPAP and/or NATTS will be certified as to their true value and that certification will be traceable to a NIST standards material or device where ever possible. Accuracy and precision will be dependent on the NIST material or device but in all cases will be known. Control charts showing the trends of critical parameters will be maintained. SOP's for the calibration of all instruments, devices, and the analysis of performance audit/proficiency test samples will be maintained and kept up to date.

The materials used in the NPAP and/or the NATTS will be as representative and comparable as possible to the calibration materials and actual air samples used/collected by the SLAMS/NAMS/PAMS/PSD/NATTS networks.

A7.2 Audits The objectives for the NPAP/NATTS audits are two-fold: (1) to complete at least 95 percent of the scheduled audits by the end of the year and (2) to determine if the participant's performance exceeds the limits shown in Table A7 Accepted Limits.

A7.3 Data Base

A7.3.1 NPAP

a) *All NPAP TTP program results will be entered into the OAQPS intermediate data base by OAQPS personnel as received from the Regional EPA NPAP contact staff or contractor field operators. Screening QC checks that catch entry errors are built into the intermediate ACCESS data base. They are also being incorporated into the new ACCESS field data entry and reporting software. The errors or systematic program problems that are identified by these checks are used in a process of continual program process quality improvement.*

b) All *mailed program* results will be entered into the NPAP *mailed program* data base as received from the participants. In order to assess data entry accuracy, a data summary will be calculated for each audit and quarter to be reviewed. This summary will consist of the mean percent differences and the standard deviations for each audit concentration level in each EPA region. If any mean or standard deviation is 20% or more, all data sets will be included in that

calculation will be checked by comparing the data sheets to the values stored in the NPAP data base. SOP's (See Appendix A) for data entry and report production will be maintained and kept up to date.

A7.3.2 NATTS All results will be entered into the NATTS data base as received from the participants. Prior to any reports being submitted to the EPA Work Assignment Manager, all individual laboratory results reports will be checked against the original data sheets by an member of the contractor staff not involved in the data entry. Any errors will be noted and fixed immediately.

A8. Special Training Requirements/Certification

Training may involve both self-training and seminars/classes, as available. On-the job training will occur as an audit is performed and experience gained. In-house training will be conducted by personnel with the application of the principles and techniques used in similar audits.

As resources allow, EPA provides TTP personnel and system training and certification at least annually, for both new and trained personnel. All find the recertification to be invaluable, as an auditor on his or her won is not nearly as able to address the problems that come up (knowledgeable) in the real world- in the field- as a network of more and less experienced auditors. EPA is now using phone and PC (and where resources allow, WEBEX) to provide the non-hands-on initial, new trainee sessions. For cost and training effectiveness, certification and recertification trainees, still need to take the written exam session and the hands-on sessions together. However, as travel resources may become tighter, and to the extent that the Regional EPA NPAP contact staff are able, some of these latter sessions may be done by the Regional staff, or at least at the Regional locations. Training materials are available and have been improved each year of the program.

A9 Documentation and Records

A9.1 NPAP Participants will be sent a data report package consisting of a report showing their results compared to EPA values and a cover letter showing where their results fall in a distribution based on the cumulative results of the audit from the previous year.

Data and records from participants are maintained on site for one year by the contractor. The data is then turned over to EPA where it is maintained for one year, it is then archived by EPA.

A9.2 NATTS Participants are sent an e-mail showing their results compared to the actual concentrations of the target compounds. They are also sent a set of bar-graphs

showing the responses of all participating laboratories. Copies of these reports are also sent to EPA contacts in which the particular site is located.

Data files are maintained on sit by the contractor.

GROUP B. MEASUREMENT/DATA ACQUISITION

B1 Sampling Process Design (Experimental Design

There are no field sampling activities within the Mailed Audit Support Program. *For the TTP audit program, the sampling design requirement is for stability, accuracy, completeness, representativeness, and comparability of the test gas provided to the station's analyzer. The sampling quality controls related to these issues are incorporated into the required EPA TTP SOPS. The reasons for these control choices are in some cases in the SOPs, and in others are available by contacting the EPA Regional NPAP contacts, or the EPA OAQPS TTP network manager.*

B2 Sampling Methods Requirements

The term "critical" or "non-critical" can be applied to data received from the field audits as well as the calibration/verification data for audit devices and analyzers. Whether data is critical varies from audit to audit. For example, the barometric pressure is requested during the CO audit, but it is not critical since data is not affected by this entry. However, barometric pressure is critical to the ozone audit since it is used in the calculations.

The specific sampling design issues are addressed and documented in the *SOPs, Implementation Plans, and* Quality Assurance documents developed for each of the sampling networks served by NPAP and NATTS. *For the test gas genration and analysis sampling, for NPAP TTP audits, requirements for flow path materials, flow rates, residence times, temperature, pressure, etc., are addressed in 40 CFR part 50 in the method appendices and in 40 CFR part 58 in Appendices A and E; and inappropriate parts of the TTP SOP Compendium.*

B3 Sampling Handling and Custody Requirements

B3.1 Data Custody

Data custody follows standard QA procedures to ensure all data generated or received is trackable. This includes the tracking of results from shipment of audit materials/devices to the audit participants; receiving data results from participants; validating data results; and storing the results in the appropriate data base. Records are also kept on acceptance testing of audit materials and calibration of audit devices. These records allow the tracking of an audit material/device from it's initial acceptance through to the storage of the audit results in the NPAP and NATTS data bases.

B3.2 Sample Custody and Handling

Since both the NPAP and NATTS support are auditing programs and not sampling projects, there are no sampling handling and custody requirements.

In the sense that the Criteria Pollutant gas auditors generate dynamic reactive samples, and continuously analyze them, rather than manually collecting stable static samples in a specified period of time, the TTP equipment and standards are items requiring some custody and control. Procedures and equipment needed to keep them and the test samples technically and legally intact, safe, and secure are detailed in the SOPs. Documentation of the process is also required and addressed in the SOPs. The critical TTP parameter for sample handling is stability of the generated test sample, which is determined first for the generating system by the TTP auditor and then for the sampling station systems by the station operator.

B4 Analytical Methods

Since this is an auditing program and not a sampling project, there will be no analytical procedures for the analysis of samples other than those used to certify the quality of the audit materials or devices, *and of the test samples they are used to generate*. These analytical and certification procedures are discussed in "Section B7. Instrument Calibration and Frequency."

B5. QUALITY CONTROL REQUIREMENTS

The adequacy of the internal SOPs and adherence to these SOPs will be annually reviewed by the contractor's Quality Assurance officer and the *EPA* Work Assignment Manager/*COR***.** All audit devices or materials will be checked prior to each use for cleanliness, operational fitness, and calibration. *For the mailed program, o*ne point verifications may be used. If the device fails the preliminary test, a 5-point calibration will be done prior to the audit device's use in the NPAP. Checks on calibrations will be performed using alternative materials from a different manufacturer or lot number. Control charts will be prepared for each critical NPAP parameter. Initial values will be assigned
according to the individual SOPs. Changes in the acceptable range will be documented with the reason for the change in the appropriate laboratory notebook. Specific internal QC guidelines follow in Table B5-1.

B5-1. NPAP Table Internal Quality Control Acceptance Values

Device/Material	Frequency of Checks	QC Check
Compressed Gas cylinders (with the exception of VOC	Prior to shipping	± 3% of certified value

cylinders)		
Laminar flow element (LFE)	Yearly	Certified vs. NIST-certified LFE
Dichot	Prior to shipping	± 2oC NIST-traceable thermometer ± 2% NIST-traceable LFE flows ± 1% NIST-traceable barometer Maintain fluid level in manometer
Gas dilution system	Prior to shipping	± 3% of the calculated value for valves 1 & 3 ± 5% of the calculated value for valves 2 & 3 ± 7% of the calculated value for valve 3
ReF	Prior to shipping	± 2 % of a slope determined from 6 years of flow data
Lead (Pb)	Yearly	± 5 % RSD from the average of the determined values and a coefficient of variation # 2%
Ozone (O3) TECO 165	Prior to shipping	± 4% or 4 ppb of the calculated concentration Rotameter reading logged initially and traced for repeatability
VOC	Prior to preparing samples	2 cylinders *or canisters* and 2 regulators are checked using GC/FID. Total carbon must be <10 ppbC and no individual target compound can be > 0.2 ppbV.
Carbonyls	Prior to shipping	Exposure blanks, solvent blanks, and spiked cartridges are analyzed using HPLC. Analytical values are compared to "theoretical" values and must be within the EPA NPAP Manager's determined limits.

B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

B6.1 All instrumentation used to calibrate or analyze audit devices or materials will be maintained in accordance with the manufacturer's guidelines for routine maintenance of that instrument. Instrument/equipment testing and inspection for each audit is performed as per each SOP. See Appendix B. Quality control limits for each audit device are

included in each SOP and in "Table B5-1. NPAP Table Internal Quality Control Acceptance Values" above.

B6.2 Preventive maintenance is performed as in Table B6-1.

Table B6-1. Preventive Maintenance Procedures

NPAP Audit Devices	PM
Hi-Vol/PM-10	Clean manometers after each use Plastic storage bags/gaskets, RAN*
GDS	Clean case as needed Check threads on fittings for excessive wear after each audit
Zero air systems	Replace silica gel after any color change is noted Replace Moleculite®, annually Replace Purafil® when entire cartridge is brown Check pump output with dummy scrubber train prior to each audit Check tubing for cracks and worn threads prior to each audit
Model 42 (NO/NOx)	Replace silica gel in ozonator air feed drying column, as needed. Check Teflon® Sample filter quarterly, RAN.* Inspect and clean capillaries, annually. Inspect and clean thermoelectric cooler fins, yearly. Perform digital to analog converter test, quarterly.
Model 43H (SO2)	Inspect and clean capillaries, annually Check Teflon® Sample filter quarterly, RAN.*
Model 48H (CO)	Clean optics, annually Source replacement, annually. Check detector frequencies, annually. Perform digital to analog converter test, annually. Check Teflon® Sample filter quarterly, RAN.*
Model 43A (SO2)	Check Teflon® Sample filter quarterly, RAN." Inspect and clean capillaries, annually.

	Scrubber replaced (49), annually. UV photometer lamp replaced, annually. Photometer bench assembly completely disassembled and cleaned (tubes, mirrors, etc.), annually. UV ozonator lamp replaced (49PS), annually. Solenoid valves disassembled and cleaned, annually.
	Internal tubing cleaned (blown out) or replaced, annually. Temperature transducer calibrated, annually. Pressure reducer calibrated, annually. Sample pump diaphragm and flapper valve replaced, annually. Sample pump head cleaned, annually. Capillaries cleaned (2 in 49, 4 in 49PS), annually. Blow out ozonator manifold (49PS), annually. Blow dust out of cabinet, annually. Check Teflon® sample filter quarterly (49), RAN.*
House Zero Air System (Scrubbers)	Charcoal replaced, annually. Silica gel replaced, annually. Particulate filters cleaned, annually. Oil separator filter replaced, annually. Water separator filter replaced, annually.
Compressor	Change oil, quarterly. Air filter replaced, quarterly. Belt replaced (as needed). Leak check, quarterly. Call AirMac, when required.
Compressor (In-house personnel)	Drain water from tank, as needed. Drain water from lines, as needed. Check oil level, daily.
GC/MS	Call Hewlett Packard when service is required.

* RAN - replace as needed

B7. INSTRUMENT CALIBRATION AND FREQUENCY

B7.1 Calibration Procedures

The calibration procedures for audit devices/materials used in the NPAP are detailed in the SOPs in Appendix C, *for the mailed program and in the EPA's TTN under NPAP, accessible from the AMTIC website, for both the mailed and TTP programs.*.

B7.2 Sample Materials

Lead. See Section A6, Lead Audits.

Sulfur Dioxide, Oxides of Nitrogen (NO and NO2), Carbon Monoxide, and Ozone. Audits of these analyzers are performed using dilution devices (SO2, CO and NO), an ozone generation system (O3), and gas phase titration (NO2), The sulfur dioxide, nitric oxide and carbon monoxide audits additionally use a compressed gas cylinder.

High Volume/SSIPM-10/and Dichot/PM Particulate Collectors. Currently, due to resource limitations, EPA only funds a limited number of PM 10 audits per year, primarily based on the attainment/ non-attainment issues in each organization. Before the resource reductions occurring in 2000, audits of particulate collectors were offered quarterly and participants selected a maximum of two nonconsecutive quarters.

Volatile Organic Compound (VOC) Audit. This audit uses stock mixtures that have been certified by the gas vendor and NIST. The gas from the cylinder is diluted, humidified and placed into a p participant-provided, passivated canister. The filled canisters contain between 15 and 35 analytes at concentrations from 5 to 60 ppbv as carbon.

Carbonyl Compound Audit. This audit utilizes a cartridges which is spiked with a solution containing from 0.2 to 10 micrograms of acetone, formaldehyde and acetaldehyde.

B7.3 Frequency
The frequency of calibrations and acceptance testing is detailed in the SOPS.

B8. INSPECTION/ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES

The inspection or acceptance requirements for supplies and consumables are specified in the relative SOP (See Appendix C, *or accessible through the NPAP website on the EPA TTN AMTIC website*) or are listed in "Table B6-1. Instrument/Equipment Testing, Inspection, and Maintenance Requirements" above.

B9. DATA ACQUISITION REQUIREMENTS (NON-DIRECT MEASUREMENTS)

No data needed for project implementation is obtained from non-measurement sources.

B10. DATA MANAGEMENT

B10.1 Overview of Data Management. Registration requests are mailed to all participants who return the NPAP invitation forms with their names, addresses, phone numbers, and requested audits. These are entered in the data system. When all requests are received, or the first of the year, a schedule is printed of all participants requesting audits. Audit materials are prepared and their "actual values" entered in the data system.

Audit materials are shipped *(mailed program) or directly delivered (TTP Program) to participa*nts.

For the mailed program the shipment *is* recorded in the computer which associates the "actual values" with the participant. The participants perform the audits and send back their reported values which will be entered into the appropriate computer data base as received from the participants. T*he computer program compares these* values with the "actual values" previously stored, computes the results, and prints a report, which is sent to the participant. Changes to the data base will be made only upon written approval from the contractor's Program Manager. Documentation of the change will be made in a change control logbook.

In order to assess data entry accuracy, a data summary will be calculated for each audit and quarter to be reviewed. This summary will consist of the mean percent differences and the standard deviations for each audit concentration level in each U.S.EPA Region. If any mean or standard deviation is 20% or more, all data sets included in that result will be checked by comparing the original data sheets to the values stored in the NPAP data base. Errors found will be corrected and will be noted in the change control logbook. SOPs for data entry and report production will be maintained and kept up to date.

For the gaseous TTP program, the critical, certified audit standard and delivery values are entered into the TTP field data entry software by the TTP audit operator. This step is done at least at the beginning of the audit quarter, and always before leaving the home base for the audit trip. The TTP field operator performs the audit and enters the TTP and station data into the TTP data entry software. The software calculates the results and prepares a report, which is provided to the station operator by the TTP operator before leaving the station at the end of the audit. The station operator confirms the station data by signature before the audit operator leaves.

B10.2 *For the mailed program, t*he contractor will maintain in the database the proper location and code for each participant. This data will be obtained from the participant's data form.

B10.3 Data management is controlled *for the mailed program* by procedures in NPAP-SOP-005, Computer Data Entry, Report Printing and Maintenance for the NPAP, NPAP-SOP-006, Data Validation for Data Bases of the National Performance Audit Program, NPAP-SOP-007, Editing NPAP Data Bases. Six "Non-Routine Protocols for EPA NPAP Data Bases, June 5, 1998" supplement the above SOPs. See Appendix D.

B10.4 Data processing and reporting.

1. Data Receipt and Entry. See "A6 - Project Description and Schedule; Data Base Maintenance, Processing, Analysis and Distribution, #2." Data entry will be performed following NPAP-SOP-005.

2. Incorrectly Completed Data Sheets. See "A6. Project Description and Schedule; 3. Data Base Maintenance, Processing, Analysis and Distribution, #3."

3. Correction to Data. See "A6 - Project Description and Schedule; 3. Data Base Maintenance, Processing, Analysis and Distribution, #5."

4. Data Distribution. See "A6 - Project Description and Schedule; 3. Data Base Maintenance, Processing, Analysis and Distribution, #4."

5.Final Closing Date. The current year's audits close on December 31.

B10.5 Unacceptable Results

Audit data results that exceed the EPA determined limits (see below) are considered unacceptable and follow-up measures are instituted. In the past, ORD had all unacceptable results entered into a "poor performance" logbook. Currently, the EPA Regional Office contacts for NPAP are responsible for reviewing the monthly audits result and corrective action summaries for their Region and following up on potential problems identified by the audit results outside of the acceptance limits. As need indicates, follow-up calls are made by OAQPS. to the Point of Contact for each EPA Regional Office that has sites with audit results that are outside the acceptance limits. The NPAP Manager prints out a list from the NPAP data base of Audit Data Excedance Results. Data issues not resolved after a 30 day period can be identified and then follow-up calls made using this list.

Audit	EPA Determined Acceptance Limits
High Volume/PM 10 (SSI)	% Difference > ± 15% for 1 or more flows
Dicot (PM/10)	% Difference > ±15% for one or more flows
Lead - Analysis	% Difference > ±15% for one or more levels
Sulfur Dioxide	Mean Absolute % difference > 15% *
Nitrogen Dioxide	Mean Absolute % difference > 15% *
Ozone	Mean Absolute % difference > 15% *
Carbon Monoxide	Mean Absolute % difference > 15% *

Volatile Organic Compounds	Individual compound percent difference within 30%. Exceptions: acetylene, undecane, styrene, and isoprene percent difference within 40%.
Carbonyls	The acceptance limits are -23 to +22 formaldehyde, acetaldehyde, and the low level acetone spike and -29 to +16 for the high level acetone spike. The concentration cut off for what constitutes a high level acetone spike is a judgment call.*

Note: EPA has made reductions in some of the acceptance limits listed in the DQOs in the QA regulations in the revision of 40CFR part 58, Appendix A, promulgated in October of 2006. EPA is reviewing the acceptance limits for the NPAP TTP audit results, with a view toward reducing the gaseous acceptance limits.

B10.6 Data Reports

*As indicated above, the provider of the audit distributes the data results to teh participants. If a contractor is the provider, t*he contractor distributes the data results to the audit participants and the results and/*or* data summaries to the *Contract* Work Assignment Manager *or Contract Office Representative (COR), who may be* the EPA Regional NPAP points of contact. Audit results that are unacceptable are handled as described in B10.5 of this plan.

GROUP C - ASSESSMENT/OVERSIGHT

C1. ASSESSMENTS AND RESPONSE ACTIONS

C1.1 Performance Audits

The objective of this *QA activity* is to provide an independent Government assessment of the *mailed and /or TTP* audit *support* contractor*s and any EPA staff that are performing TTP audits*. *For the mailed program audits, t*he EPA NPAP Manager will randomly select an audit device prepared for shipment to a NPAP participant from the contractor's facility. The device will be relabeled for shipment to the EPA Region 7 NPAP Verification Laboratory. The NPAP Manager will notify the EPA R7 NPAP Verification Laboratory lead analyst and team leader via e-mail when the selected audit device has been shipped. The EPA NPAP Manager will supply with each audit device the applicable data reporting form(s) that R7 NPAP Laboratory will need to complete and return. R7 NPAP Laboratory will perform the audit and return via FAX the data reporting form(s) within 3-5 business days of receipt of the equipment to the EPA NPAP Manager for comparison with the NPAP contractor's determined values. The report to the EPA NPAP Manager will also contain an assessment of the condition of the equipment (i.e., external appearance).

The audit device will be considered acceptable if an agreement of ±5 percent is achieved between the NPAP contractor's determined values and the R7 NPAP Laboratory determined values. If the results are unacceptable, the R7 NPAP Laboratory will run the audit a second time to confirm the initial results. The EPA NPAP Manager will notify R7 NPAP Laboratory whether to return the equipment or to re-audit within 1 business day. *For the mailed program nonexpendable audit equipment, t*he audit equipment will be returned to the NPAP contractor in accordance with the prepaid shipping instructions enclosed with each audit device.

Currently, so few audits are done for the funded mailed program per year that the verification audits are done less frequently. The following are audits that were to be performed in accordance with the schedule contained in Table C1.1, based on the full schedule of *mailed* audits accomplished prior to the 4th calendar quarter of 1999:

Sulfur Dioxide Nitrogen Dioxide/Carbon Monoxide and Ozone. Four to six audit devices of each type (GDS, TECO 165 and TECO 175) will be selected each quarter (one device of each type every two weeks for a total of twelve to eighteen audit devices per quarter) to verify The contractor's determined values. The EPA Program Manager will select the audit devices by requesting that the contractor pull the next device that is ready for shipment to the field. The quality assurance audits will be conducted by the R7 NPAP laboratory. The audit will consist of running one zero point and three upscale points following the procedures in the appropriated SOPs referenced below.*

High Volume/PM-10 (SSI). Six ReF devices will be selected at the beginning of each quarter. The quality assurance audits will be conducted by the R7 NPAP Laboratory. The

audit will consist of verifying The contractor's calibration of the ReF device by using an NIST-certified roots meter and following the procedures in the NPAP-SOP-014.*

Dichot (PM-10). One system consisting of an inclined manometer, an altimeter, a small dial thermometer, and a laminar flow element (LFE) will be selected each quarter. The audit will be conducted by the R7 NPAP Laboratory personnel using a primary standard NIST traceable BIOS frictionless piston type flow measurement device. The accuracy of the NPAP barometer and thermometer will be verified by the R7 NPAP laboratory using NIST traceable temperature and pressure standards. The NPAP audit system is considered acceptable if the two air flow measurements determined by the audit system and the EPA R7 NPAP laboratory system agree within +/- 5 percent. Procedures in NPAP-SOP-013 will be followed.*

Lead Filter Strips. In July of each year the EPA NPAP Manager will deliver 10 sets of filters from each audit for the upcoming calendar year (a total of 80 filter strips) for acceptance testing. Within three weeks of receipt of the samples, the R7 NPAP laboratory will analyze all filter strips and provide the EPA NPAP Manager with the results and appropriate associated statistics (i.e., mean, standard deviation, % relative standard deviation). *

***PAMS Audits*- Volatile Organic Compounds and Carbonyls**. Region 1, Region 2, and the California Air Resources Board have acted as reference laboratories for NPAP audits and NIST is to be used for NATTS audits. The reference laboratories' analysis results serve as bench mark for data comparisons, not true values. Currently, the theoretical values are used to evaluate the laboratories being audited. The reference laboratory results are used to show consistency and agreement with the theoretical values. Each year each laboratory receives audit canisters for analyses and performs a minimum of 2 analyses per canister. The reference laboratories will adhere to the equilibration, sample introduction and analysis procedures as stipulated by the EPA. The reference laboratories will report an average
concentration and standard deviation for each identified compound: and an average reference concentration and standard deviation will be calculated for each identified compound.
Note: If one laboratory's result(s) are not in agreement, then that result(s) would not be included in the average reference concentration (acceptable range to be determined by working group).
Note: If all of the reference laboratories are in disagreement, then than particular compound(s) would not be included in the audit.

If there are discrepancies/concerns between the laboratories being audited and the theoretical values, we could use the reference laboratory results. If further analysis is recommended, an EPA laboratory should be considered the main contact. One concern expressed by CARB is that the laboratory did not want to lose the flexibility for investigating new technological/procedures. As a reference laboratory, they would feel required to maintain one particular method.

***Since 2000, the EPA NPAP Manager has sent a reduced number of *mailed* audit devices to the Region 7 Verification Laboratory, due to the reduced number of audits funded , and due to the limitation of devices to do the scheduled audits, let alone verification evaluations, in that reduced support environment**.

However, since 2004, the Region 7 Mobile TTP laboratory and additional Region 7 Criteria Gas Pollutant support standards and equipment have been brought to the annual TTP training and certification meetings. This Region 7equipment has been used for both training and certification of the second Mobile TTP labs that have been brought for the hands-on training at these meetings.

As of May 2007, the Region 7 support laboratory has independently certified all but one of the TTP Regional Mobile labs at least once. A lab just certified in March 2007 will be used to certify that remaining Regional TTP system in July 2007. In additional shipments of standards, or of trips to Region 7, some of the Regional TTP mobile labs and associated and/or standards have been certified by Region 7 at other times of the year.

Table C1.1-1 NPAP Shipping Schedule for Performance Audits

Pollutant	Frequency	Device Type/No.	Responsible Party
SO2	Quarterly	GDS/4-6	R7 Lab
CO	Quarterly	GDS/4-6	R7 Lab
NO2	Quarterly	TECO 1-5/4-6	R7 Lab
O3	Quarterly	TECO 1-5/4-6	R7 Lab
PM-10 (HiVol)	Quarterly	ReF/6	R7 Lab
PM-10 (Dichot)	Quarterly	System(4)/1	R7 Lab
Lead	Annually	Strips/80	R7 Lab
VOCs	Annually	Canisters(2/lab)	Reference Lab
Carbonyls	Annually	Cartridges(1set/lab)	Reference Lab

C1.2 Systems Audit of NPAP Contractor

Once a year, *as resources allow and frequency of NPAP audits require,* a systems audit will be performed by the EPA Manager and appropriate EPA technical staff member to ensure that the contractor is adhering to the SOPs that cover conducting audits, entering data, distributing data, and maintaining files. The systems audit will follow a set format based on the information contained in NPAP SOPs. The systems audit will be coordinated with the contractor Manager. The results of the systems audit will be forwarded in writing within 5 working days to the contractor Manager for review. The

contractor will determine the cause of deficiencies, if any, and report to the EPA Manager within 5 working days the cause and corrective action taken.

Table C1.2-1 Verification Procedure for Systems Audit

Pollutant	Responsible Party	SOP #
SO2	R7 Laboratory	009
CO	R7 Laboratory	008
NO2	R7 Laboratory	011
O3	R7 Laboratory	012
PM-10 (HiVol)	R7 Laboratory	014
PM-10 (Dichot)	R7 Laboratory	013
Lead	R7 Laboratory	015
VOCs	Reference Laboratory	017
Cos	Reference Laboratory	018

C1.3 Audit of NPAP

The EPA NPAP Manager will arrange an independent management systems review of the total NPAP program once every two years (odd years).

C1.4 Corrective Action

When results of the internal quality control checks or the external quality assurance audits exceed the limits specified in the Quality Assurance Project Plan or in the individual SOPs, appropriate action will be instituted by the EPA NPAP Manager and/or the contractor Manager. This corrective action will be documented in the summary reports. In an appropriate amount of time after a corrective action plan has been implemented, a follow up audit should be done. Perform a follow up audit after completing corrective action required by an initial audit using contractor plan and SOPs for the new contract. For corrective action of questionable results, see B10.5.

C1.5 Reports

The NPAP Manager will receive copies of the reports of all systems and performance audits, MSR's, and follow-up activities, if any.

C2. REPORTS TO MANAGEMENT

The EPA NPAP Manager and the EPA NPAP Contractor will prepare a comprehensive yearly quality assurance summary report by March 15 for the previous calendar year, *depending on the size of the program and the resources available*. The report will include the internal quality control reviews and assessments and will incorporate any independent (non-contractor) quality audit reports of the latest independently performed audits on the entire NPAP system.

The contractor *?for the NATTS program?* shall prepare quarterly reports showing the results of the NATTS Proficiency tests, NIST results and results used to determine the "True Value".

Table C2-1. List of Reports Required of Contractor *

Types of Reports	Frequency	Authors / Recipients	Due Date
Progress Report	Monthly	Contractor/EPA	**3/15/200_**
QA Summary Report	Annually	Contractor/EPA NPAP Manager	3/15/200_
NPAP Data Summary	Annually	OAQPS / EPA Regional NPAP Contacts	4or5/200_
PAMS Audit (VOC/CO)	Annually	Contractor/NPAP participants/EPA Regions/NPAP points of contact/NPAP Manager	10/31/200_
AIRS Sites Report	Annually	Contractor/NPAP participants/EPA Regions/NPAP points of contact/NPAP Manager	8/31/200_

* *The size of the mailed program has gotten so small, as well as the supporting resources, that only the monthly report has been required for several years. At the same time annual summaries have been prepared and presented by EPA and EPA has been working internally to develop a database that can also generate most of the tables for an annual as well as more frequent tracking and assessment reports.*

If requested, the contractor will prepare and submit:

Prior to a Region 7 audit trip, the contractor shall provide any recommendations for modifications to the Technical Systems Audit checklist in this plan. Within 1 week following the trip, the contractor shall provide written recommendations to the EPA Manager for the Manager to use in preparing the Audit report, and comments on the NPAP Program Manager's draft report.

An Annual Update of the AIRS Sites Report for EPA's National Performance Audit Program 1989-Present. The contractor shall prepare and distribute this report to all NPAP participants, EPA Regional NPAP points of contact, and the EPA NPAP Work Assignment Manager.

An annual summary of the NPAP VOC and Carbonyl audit data and distribute to all NPAP VOC and Carbonyl NPAP participants no later than the middle of the month after the season ends. The contractor shall incorporate this into a summary of all the NPAP data from that data collection year.

Three copies of the combined monthly technical and financial progress report on or before the 15th of each month, following the first complete reporting period of the contract, to EPA Administrative Contract Specialist, EPA Project Officer, and the EPA Work Assignment Manager.

An annual NPAP Data Summary Report of all the NPAP data to all NPAP participants, EPA Regional NPAP points of contact, and the NPAP Manager by May 31 or each year. The contractor shall present the NPAP Data Summary Report at the Annual Air & Waste Management Association Meeting.

Schedule for the calendar year incorporating participant requests with Agency and Site Prioritization list from EPA, based on when last audited and approved Criteria queries from AIRS.

In addition, the contractor and the EPA Work Assignment Manager shall also communicate by phone and/or in person on an as needed basis.

GROUP D - DATA VALIDATION AND USABILITY

D1. DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS

The criteria used to review and validate *mailed program* data is detailed in NPAP-SOP-006 Data Validation for Data Bases of the National Performance Audit Program. *The criteria used to validate the data entered into the initial ECXE NPAP TTP data forms is listed in the EPA NPAP TTP SOP Compendium section addressing data validation. The criteria used to validate data for the NPAP TTP database (EPA developed, tested, operated and maintained) have been in development along with the database, and are being incorporated into the new combined ACCESS field data entry form and database.*

D2. VALIDATION AND VERIFICATION METHODS

The process used for validating and verifying *mailed program NPAP* data is found in NPAP-SOP-006 Data Validation for Data Bases of the National Performance Audit Program. *The process for the NPAP TTP program is found in the NPAP TTP SOP Compendium. These SOPs are accessible through the Ambient Air QA menu choices at the EPA's Technology Transfer Network website at* http://www.epa.gov/ttn/amtic/QA/ page. Audit Support data custody follows standard QA procedures to ensure all data generated or received can be tracked *and retrieved as needed*. This includes the tracking of data results from shipment of audit materials/devices to the audit participants; receiving data results from the participants, *or from Regional EPA or contractor lab or field audit support staff. It also includes the* validating *of data* results, and storing results in the data base. Records are also kept on acceptance testing of audit materials and calibration of audit devices. These records allow the tracking of an audit material/device from its acceptance testing or calibration through to the storage of the audit results in the data base. Additional details on tracking audit results data, acceptance test data and calibration results are contained in the SOPs for each audit procedure.

Verification of participant's data sheets occurs during data entry. The data on the reporting data sheet is checked for completeness and that it is in the proper units. However, data validation, which is a formally defined process, involves checking the accuracy of the data entry and is conducted following NPAP-SOP-006 Data Validation for Data Bases of the National Performance Audit Program*, or from the section in the NPAP TTP SOP Compendium that addresses data validation.*

D3. RECONCILIATION WITH USER REQUIREMENTS

The contractor *or EPA field and/or lab audit staff* will examine all data prior to submitting it to EPA *data reviewers and managers* to ensure that the requirements defined are met. Procedures in NPAP-SOP-006 Data Validation for Data Bases of the

National Performance Audit Program *or from the section in the NPAP TTP SOP Compendium that addresses data validation* will be followed. Where anomalies do occur, NPAP-SOP-007 Editing NPAP Data Bases and "Non-Routine Protocols for EPA NPAP Data Bases, June 5, 1998", *or the appropriate parts of the section(s) in the NPAP TTP SOP Compendium and/or QA and Implementation Plans* will be followed.

APPENDIX A

PROCEDURE FOR EPA SELECTION AND PRIORITIZATION OF REGISTERED AGENCIES REQUIRED TO PERFORM NPAP AUDITS AT SPECIFIED SITES OR LABORATORIES IN THE NEXT CALENDAR YEAR- "REQUIRED AGENCIES AND SITES'

A) Based on $ available, prepare and use the following summary table numbers as maximums:

TABLE 1. SUMMARY TABLE- CY 200_ MAXIMUM NUMBER NPAP DEVICES

Cost Basis	O3		PM-10 CO	PB	SO2	NOx	VOC	CARB	
# Devices-RE	45		7	10	6	9	9	22	22
# Devices-RA	5		4	1	10	1	1	0	0
Total # Devices 50		11	11	16	10	10	22	22	

Where RE = Required Audits and RA = Random audits. For comparison (cf) note the number of non attainment areas (#NA) for each pollutant in the latest 3 trends reports:

cf Sum #NA Areas=98	32		77	20	8	31	0	Not in Trends Report	
cf Sum #NA Areas=97	38		77	20	10	34	0	"	" " "
cf Sum #NA Areas=96	59		79	29	10	38	1	"	" " "

B. Follow this prioritization and selection process:

1. Within the limits of Table 1, above, select the [number of the highest priority] organizations and/or sites that have "design" or related values that are near (for O3 = within + or - 2.5% of; for CO, SO2, PM10, or NO/NO2 = within + or - 10% of) the NAAQS- and therefore increase the risk of managers and other decision makers making an incorrect attainment or other decision- but are not included in the lists. After the selection of sites for each pollutant, check the EPA AIR Data website to be certain that each site is currently open. (www.epa.gov/aqspubl1/air_quality_tables.htm) Click on Sampling Period. Use the Sample Period Table Query to get current information.

2) Select that number of the highest priority organizations and/or sites that are no longer active and should be deleted or are new and are/will be operating/reporting data soon and should be added; or

3) have bad precision or accuracy data reported in AIRS;

4) Meet these criteria but were not audited in the current calendar year (CY); assign a higher priority if they were also not audited in the previous year;

5) Meet these criteria and have never been audited; or

6) for PAMS, are on OAQPS' list of active "Type 2" sites.

Example: Regarding PM10, prepare or obtain the list of the agencies and associated sites, ranked from the highest to the lowest design-related value (24hr Max, for 1999). Those agencies with sites that have 24hr MAX1 values within + or - 10% of the NAAQS, and were not audited last year (2000) are put into a new list organized by Region, then state, and then by AIRS Monitoring ID#. Add sites for agencies with P&A data greater than 5% over the P&A acceptance criteria. Then select the ~ 10 agencies (PM10 Column in summary table attachment) with the sites closest to the NAAQS.

C. Regarding the proposed table of required agencies and sites selected to receive NPAP NO/NO2 audits in the coming year, being planned:

To make the selections, first list the agencies from which audits are scheduled in the year still being completed, but due to the limit of available devices will or may not be able to be shipped as planned Do notyet use the design value ranking criteria for selecting agencies and required sites for NO/NO2 audits if the following reasons apply:
1) Very few/no agencies were anywhere **near** a significant % **below** the NAAQS last year and this year;
2) a significant number of agencies were selected for 2000 but were not audited- no blame to either participants or contractor;
3) The only agency-by- agency P&A data I have were used in making last year's selections.
4) The maximum number of devices allocated for NO/NO2 was dropped. There are no longer any areas in the country with ambient air NO2 levels above the NAAQS. See the FYI numbers from the last 3 trends reports that are cited for NO/NO2 in the 1st draft table, sent to the EPA NPAP Regional Office Contacts(ROCs), and shown above, at the beginning of this text, in Table 1. The # of non attainment areas for NO/NO2 in '96 was 1, in '97 was 0, and in '98 was 0.

D. REVISED AND EXPANDED PROPOSED OZONE SELECTIONS:

If additional resources allow, *either from EPA directly or by buy-ins from other US Federal agencies, such as the Park Service, etc, tribes, states local agencies, or private organizations,* an expansion form an original list may be possible. The following considerations may be used to prepare an expansion:

The table of agencies and associated required sites selected for NPAP ozone audits for the coming year, being planned, and shown in the 1st draft may only list the

approximately 35 agencies that were **not** audited in the year before but **were** within the +or-2.5% interval around the NAAQS in the ozone sites ranked by the '01 ozone design value(DV) parameter. As needed, for example, to add additional agencies (15 to 2nd draft for CY2001, for ozone) that are allowed by the ozone column in the file CY'01MAX#SUMRY.wpd," use the list of agencies that were in the interval outside of the +or -2.5% but within the +or - 10% interval around the NAAQS in that same '01 DV ranking.

If ozone audit results from the year before the year in planning are still coming in, use that information to add or delete agencies and/or sites, as the data indicate. Delete or question sites that have been audited recently (revise table to reflect results showing date in "as of").

E. When participant receives the audit device:

The audit device is shipped to each participating organization with instructions and the list of required sites and alternates. If any of the sites listed are no longer active- based on sources starting with Regional, State and/or local comments from review of the tables generated from the selection process- then just go on the larger table to the agencies with sites that have design-related values a little greater or less than the ones first selected. That is how this adjustable system is used.

F. Recommended Changes: The state and local agencies, through their designated EPA Region, can specify some other criteria (and data/information to be evaluated by that criteria). OAQPS has to agree that the proposed criteria have an equal or higher priority vs the criteria given here. If you want to add a site, or especially an agency, the Regional staff must recommend a trade off to remove from the list already , since the number of agencies devices, that can be sent in year , in the mailable program , is currently limited by the reducing budget resources for the program.

APPENDIX B

QA Project Plan FOR EPA REGION 7 VERIFICATION LAB Support for NPAP

Will be Posted on AMTIC; until then, request from EPA NPAP Manager.

Appendix C

NPAP-SOP-008: Carbon Monoxide (CO) Audit
NPAP-SOP-009: Sulfur Dioxide (SO2) Audit
NPAP-SOP-010: Nitric Oxide (NO) Audit
NPAP-SOP-011: Nitrogen Dioxide (NO2) Audit
NPAP-SOP-012: Ozone (O3) Audit
NPAP-SOP-013: Dichot Audit
NPAP-SOP-014: Hi-Vol Audit
NPAP-SOP-015: Lead (Pb) Audit
NPAP-SOP-016: Analysis of Cylinders Containing CO, SO2, and NO
NPAP-SOP-017: VOC Audit
NPAP-SOP-018: Carbonyl Audit

Appendix D

NPAP-SOP-005: Computer Data Entry, Report Printing and Maintenance for the NPAP

NPAP-SOP-006: Data Validation for Data Bases of the National Performance Audit Program

NPAP-SOP-007: Editing NPAP Data Bases

Six Non-Routine Protocols for EPA NPAP Data Bases (June 5, 1998)

1 - Edit address, edit number of samplers to be audited, or change the audit quarter within the year
2 - Change date from late one year to early the next year
3 - Re-Audit due to NPAP equipment failure
4 - Remove an agency from one or more audits
5 - Add an organization after the start of the audit year
6 - Audit data outside the specified limits

Appendix E:

Instructions for Operating NPAP Audit Devices at Field Audit Site Locations - These will be posted on AMTIC:

Field Instructions for Conducting an Ozone Audit Using TECO 165 (3 pages).

Field Instructions for the TECO 175 Multi-pollutant Audit Device (11 pages)

Instructions for Auditing PM-10 (SSI) Samplers Using the (ReF) Flow Device
(7 Pages)

Field Instructions for the Gas Dilution (GDS) System Multi-Pollutant (7 pages)

Appendix F:

Appendix G:

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