



**EMISSION DATA COLLECTION
FOR
2002 REGIONAL HAZE INVENTORY
AREA AND POINT SOURCES**

**DRAFT
QUALITY ASSURANCE
PROJECT PLAN**

Effective Date: January 2003

**VISIBILITY IMPROVEMENT
STATE AND TRIBAL ASSOCIATION OF THE SOUTHEAST**

VISTAS

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FOR
2002 REGIONAL HAZE INVENTORY
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APPROVED BY

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1.0 PROJECT MANAGEMENT

1.1 Problem Definition/Background

The Southeastern States Air Resource Managers (SESARM) has been designated by the United States Environmental Protection Agency (EPA) as the entity responsible for coordinating and implementing regional planning for the eight SESARM states (Alabama, Florida, Kentucky, Georgia, Mississippi, North Carolina, South Carolina and Tennessee) plus Virginia, West Virginia, and Tribes. Through a memorandum of understanding, these parties have agreed to collaborate in the initiation and coordination of planning activities associated with the management of regional haze, visibility, and other air quality issues. This collaboration is known as Visibility Improvement - State and Tribal Association of the Southeast (VISTAS).

The Technical Analysis Workgroup (TAWG) of VISTAS is charged with overseeing the regional haze and fine particulate modeling that will be required for developing State Implementation Plans (SIPs). This workgroup provides both emissions inventory and modeling technical support to VISTAS. Emissions inventory efforts include the development of emissions inventories and forecasts to be utilized in VISTAS modeling efforts.

The objective of this project is to compile a comprehensive 2002 base year emissions inventory for point and area sources for the VISTAS region (mobile and nonroad sources are part of a separate project). This project has the following overall design specifications:

- Pollutant Coverage - primary and precursor annual and seasonal emissions necessary to accurately model Regional Haze, including primary PM_{2.5} and PM₁₀, ammonia (NH₃), oxides of sulfur (SO_x), volatile organic compounds (VOCs), oxides of nitrogen (NO_x) and carbon monoxide (CO)
- Source Coverage – all point and area source categories.
- Geographic Areas – the VISTAS states (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia)

This inventory will be used in creating a modeling inventory under other VISTAS work tasks to support chemical transport modeling of regional haze in the southeastern U.S.

The purpose of this Quality Assurance Project Plan (QAPP) is to outline and guide the process for quality assuring the base year inventory to ensure the development of a complete, accurate, and consistent emission inventory. The QAPP is consistent with the recommendations in the EPA quality assurance requirements¹ and the Emission Inventory Improvement Program's QA guidance². The QAPP includes tasks associated with obtaining State data, merging and augmenting State submittals with available EPA databases, improving the activity data and emission factors for important source categories, obtaining State and stakeholder review of the emission inventory, and providing documentation of the maintenance (revisions, updates, corrections) of the inventory. This QAPP addresses only the area and point source components of the inventory. A separate QAPP is being prepared for the other source categories.

1.2 Project/Task Description

EPA³ has specified that calendar year 2002 be used as the base year for emission inventories to support planning efforts under the 8-hour ozone, PM_{2.5}, and Regional Haze programs. VISTAS has planned an iterative process to develop the 2002 base inventory that incorporates improved information as it becomes available. This process calls for the development of three distinct versions of the 2002 VISTAS inventory:

- Preliminary 2002 Inventory (available Summer 2003). This inventory will be created using the 1999 National Emission Inventory (Version 2 Final) as the starting point. We will incorporate State submittals (calendar year 1999, 2000 or 2001 data), project the inventory to a common year of 2002, augment with available 2002 data (preliminary CEM data for electric utilities, wild/prescribed fire data, agricultural activity), incorporate improved estimates of ammonia emissions, and incorporate corrections to missing/erroneous data needed for modeling (stack characteristics, temporal adjustments, spatial distributions, etc.). This preliminary inventory will be used to test the emissions/atmospheric modeling system and possibly to conduct initial modeling of regional haze episodes.
- Draft Final 2002 Inventory (available Summer 2004). This inventory will incorporate State inventories for 2002 that are required under the Consolidated Emission Reporting Rule and will include further improvements to ammonia and PM_{2.5} emission estimates as new emission factors and activity data become available.
- Final 2002 Inventory (available Summer 2005). This inventory will incorporate EPA's final 2003 NEI, undergo extensive stakeholder scrutiny, and be used in developing the SIPs in 2007-8 with the emission reduction strategies needed to meet regional haze planning goals.

This QAPP focuses on the tasks associated with developing the preliminary 2002 inventory. It will be amended later to address the development of the draft final and final 2002 inventories.

Area Source Activities. The effort includes the following area source activities:

1. Obtain updated activity data related to fugitive dust sources, primarily paved and unpaved roads, livestock activities and agricultural activity (tilling). Updating the agricultural activity will also assist in the development of ammonia emissions. In addition, these source categories are not as amenable to using growth factors as some other less important categories so the improvement from obtaining activity data would have a greater impact. Finally, the emission factors for these categories in the NEI tends to change less dramatically from year to year so changes in activity data will provide the greatest impact on estimating emissions in 2002.
2. Obtain updated activity data for fire sources. In particular, activity data (and fuel data if available) will provide for updated estimates for wildfires, prescribed burns, residential combustion, and land clearing operations. Each of these sources is important for fine particulate. None of these sources is easily projected using growth factors.

3. Obtain updated activity data for animal operations. Use that data with the CMU ammonia model to provide updated estimates of ammonia from animal operations. Determine (in conjunction with VISTAS) if any of the State supplied data for ammonia emissions should be used to replace ammonia emissions calculated with the CMU model.
4. Conduct QA/QC of State/local agency area source submittals. Review area source submittals to determine how much information submitted matches with the current NEI and to determine if there are significant missing sources. Evaluate the pollutants that are missing that will need to be estimated using alternative means. Evaluate whether or not the State/local submittals provide any new information related to temporal profiles. Work with the point source inventory to assess potential double counting of sources.
5. Provide State/local agencies with the comparison of emissions reported in the 1999 NEI Version 2 Final and the State/local supplied data. Identify gaps and logical inconsistencies. Ask States/local agencies to provide feedback on large scale inconsistencies and on missing sources. Update database with State/local supplied revisions.
6. Review speciation information to determine if there are gaps in the data required to develop a speciated emission inventory. In addition, review older version of NEI to determine speciation factors used to prepare elemental and organic carbon estimates (never published).
7. Convert preliminary 2002 VISTAS inventory from NIF format to format required by the selected emission modeling system.

Point Source Activities. For point sources, the following tasks will be performed:

1. Obtain post-1999 point source inventories from State/local agencies to better represent episodes in the 2000-2002 time frame. Replace 1999 NEI data with more recent State data for PM10, SO₂, NO_x, VOC, and CO. Augment State data with PM_{2.5} and ammonia from 1999 NEI. "Grow" the 1999/2000/2001 to 2002.
2. Conduct QA/QC of State/local agency point source submittals. Review point source physical parameters, temporal profiles, and locations needed for modeling. Focus on large sources and provide States/local agencies with parameters to review and possibly correct. Incorporate State/local agency corrections and updates. Supplement with default stack characteristics and county-level locations.
3. Compare facility-level emissions in 1999 NEI to State/local submittals to identify potentially missing or new sources and to flag facilities with large emission changes. Ask States to verify whether any large emitters have closed, whether new sources began operation in 2002, and whether any large emission changes are reasonable.
4. Provide State/local agencies with the comparison of ammonia emissions reported in the 1999 NEI Version 2 Final and the 1999/2000 Toxics Release Inventory. Identify gaps and logical inconsistencies. Ask States/local agencies to target largest emitters to obtain information on emissions, stack characteristics, seasonal variations, etc. Update database with State/local updates.

5. Obtain and incorporate “preliminary” annual 2002 CEM data for utilities from EPA’s Clean Air Markets Division.
6. Help States/local agencies conduct surveys of selected point sources to obtain any missing information identified in the above tasks. Coordinate with State/local agency in developing information request, and if deemed appropriate by the State/local agency, contact the facility to attempt to obtain the requested information. Augment database with the collected survey data.
7. Apply existing speciation factors to create estimates of elemental carbon, organic carbon, and other species required for modeling.
8. Convert preliminary 2002 VISTAS inventory from NIF format to format required by the selected emission modeling system.

1.3 Project Organization

Figure 1 and Table 1 identify the individuals and organizations participating in the project. Their specific roles and responsibilities include:

- Ms. Pat Brewer, VISTAS Technical Director, will plan, conduct, and supervise technical and managerial aspects of the project. She will facilitate communications among State/local agencies, the VISTAS Technical Analysis Workgroup, MACTEC, and the VISTAS Executive Director.
- Ms. Sheila Holman, VISTAS Technical Analysis Workgroup Chair, will work with the VISTAS Technical Director to define the emission inventory development activities needed to support regional haze modeling and planning activities.
- State/local Agency Coordinators will compile and submit data to MACTEC, participate in QA/QC reviews, and help revise, update, and correct the inventory.
- Robert Norton, MACTEC Program Manager, will direct and monitor technical and financial performance throughout the project and will serve as a senior primary contact with VISTAS on contract and project management issues.
- Edward Sabo, MACTEC Point Source Task Leader, will plan and manage all point source activities. He will plan and conduct the technical aspects of the development of the point source inventory, supervise daily activities, identify effective QC procedures and make recommendations on needed QC procedures.
- William Barnard, MACTEC Area Source Task Leader, will plan and manage all area source activities. He will plan and conduct the technical aspects of the development of the area source inventory, supervise daily activities, identify effective QC procedures and make recommendations on needed QC procedures.
- Douglas Toothman, MACTEC QA Coordinator, will help ensure that adequate QA/QC procedures are incorporated into the inventory development process. He will work independent of the inventory development Task Leaders to assist in the conduct of project QA/QC assessments.

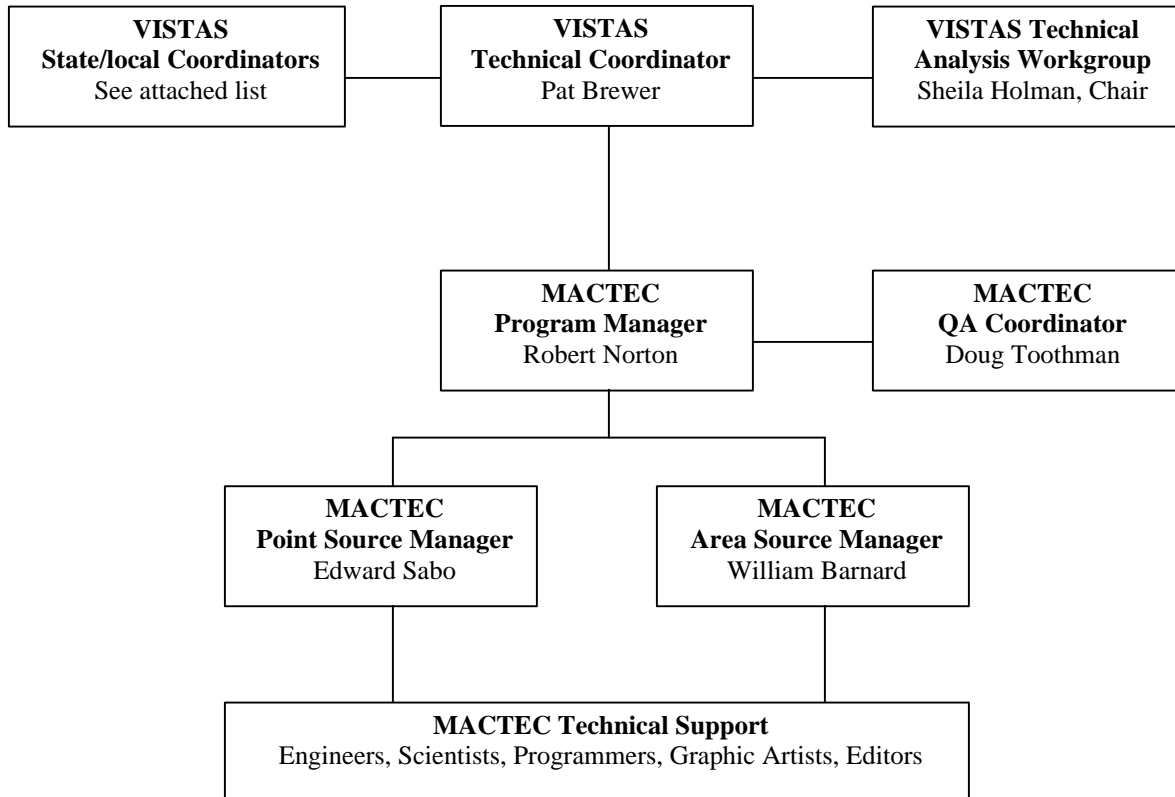


FIGURE 1 – PROJECT ORGANIZATION CHART

TABLE 1 – STATE/LOCAL AGENCY COORDINATORS

Agency	Point Source Coordinator	Area Source Coordinator
Alabama DEM	Cala J. Obenauf	Wendy Moeshlin
City of Huntsville	Danny Shea	Gloria Mims
Jefferson County	Sam Bell	Wendy Noeshlin (AL DEM)
Florida DEP	Yi Zhu	Yi Zhu
Broward County	Daniella Banu	Daniella Banu
City of Jacksonville	Lori Tilley	Lori Tilley
Hillsborough County	Diana Lee	Leroy Shelton
Miami-Dade County	Mallika Multhiah	Bruce Crawford
Palm Beach County	Selva Selvendran	James Stormer
Pinellas County	Gary Robbins	Gary Robbins
Georgia DNR	Scott Southwick	Scott Southwick
Kentucky DEP	Andrea Wilson	Martin Luther
Jefferson County	Paul Lanka	Paul Lanka
Mississippi DEQ	Elliot Bickerstaff	Elliot Bickerstaff
North Carolina DENR	Bob Wooten	Laura Boothe
Forsyth County	Steve Lyda	Laura Boothe (NC DENR)
Mecklenburg County	David Ross	David Ross
Western North Carolina	Ashley Featherstone	Ashley Featherstone
South Carolina DHEC	Lynn Barnes	Angel Thompson
Tennessee DEC	Ron Redus	Ron Redus
Chattanooga Hamilton County	Errol Reksten	Errol Reksten
Knox County	Steve McDaniel	Steve McDaniel
Memphis Shelby County	Denis Fritchie/Chris Boyd	Denis Fritchie/Chris Boyd
Nashville Metro	Fred Huggins/Laura Artates	Fred Huggins/Laura Artates
Virginia DEQ	Tom Ballou	Tom Ballou
West Virginia DEP	Dale Farley/Dave Porter	Dale Farley/Kristin Abraham

1.4 Quality Objectives and Criteria

The goal of the inventory process is to provide the best possible inventory under given resource constraints. Data Quality Objectives (DQO) are statements about the level of acceptable uncertainty or error. Their purpose is to ensure that the final data will be sufficient for the intended use of the inventory. A well developed and implemented quality assurance program fosters confidence in the inventory and any resulting regulatory program. It also gives the end user important information about the limitations of the emission estimates in order to avoid misuse of data.

Table 2 summarizes the Data Quality Objectives for the 2002 VISTAS inventory. The first column of Table 2 defines four data quality objectives: accuracy, completeness, comparability and representativeness. The second column identifies the procedures that will be used to achieve each objective. The third column identifies Data Quality Indicators (DQI), which are qualitative and quantitative descriptors used in interpreting the degree of acceptability or utility of data.

1.5 Special Training/Certification

All staff performing data review and analysis are air quality professionals and have sufficient education/experience to perform emission estimation calculations and work with emission inventory databases. Most staff have received specific emission inventory training through conferences, workshops, self-study programs, and on-the-job work experiences. There are no specifically mandated training requirements for work performed on this project.

1.6 Documents and Records

QAPP Control. Any changes to this QAPP will be initiated either by the Program Manager, the Task Leaders, or the QA coordinator. Each change will be given a revision number and date in the document control block in the upper corner of the affected pages. It will be the responsibility of the initiating person to distribute copies of the changed pages to all the persons on the Distribution List and to the appropriate project team members.

Data Collection Records. Clear documentation of the data collected from the State/local agencies, EPA, and other agencies is integral to the quality analysis review. Records will be maintained containing a description of the data received, the name of the person and agency submitting the data, the date of the submission, and other relevant information about the data submission. The following types of data will be collected during this project:

- EPA's 1999 National Emission Inventory (Version 2 Final)
- State/local agency point source data submittals in NIF 2.0 format
- State/local agency area source data submittals in NIF 2.0 or spreadsheet format

TABLE 2
DATA QUALITY OBJECTIVES, PROCEDURES, AND INDICATORS

Data Quality Objective	Procedures	Indicators
<p>Accuracy - reduce uncertainty in emission estimates where possible, validate that data elements needed for modeling are within accepted parameters, and verify that emission estimates agree with accepted reference values.</p>	<ol style="list-style-type: none"> 1. Identify weaknesses in existing inventories, identify new methods/data to reduce uncertainty, and obtain new activity/emission factor data where available. 2. Use EPA's NIF QA tool and ad-hoc reports to perform computerized checks of valid codes/data ranges and to identify outliers. 3. Conduct senior technical review of pollutant totals by facility, source category, state, and region. Compare to other published data. 	<ol style="list-style-type: none"> 1. Qualitative assessment of the inventory's strengths and weaknesses. 2. 100% of stack data and temporal factors in valid ranges for > 100 tpy sources. 3. 100% of sources have valid geographic coordinates. 4. 100% correction of significant outliers. 5. Agreement of VISTAS emissions and EPA CEM data and EPA TRI data.
<p>Completeness – include all major point sources, include emission estimates for PM2.5 and ammonia, verify that all important areas source categories are included for all counties.</p>	<ol style="list-style-type: none"> 1. Compare VISTAS utility data to EPA CEM data. 2. Compare VISTAS point source ammonia data to EPA TRI data. 3. State/local agencies compare facility list to their Title V permit lists. 4. Compare small point source emissions to area source emissions. 5. Compare PM10 and PM2.5 emissions. 6. Plot area source spatial distributions by source category and county. 	<ol style="list-style-type: none"> 1. 100% of all utilities accounted for in database. 2. 100% of large ammonia sources in TRI accounted for in database. 3. 100% of Title V sources accounted for in database 4. Small point sources included as either small point sources or as area sources. 5. PM2.5 and ammonia emissions included in inventory 6. Area source emissions for important source categories for all counties in region. 7. Explanation of any missing data or sources.
<p>Comparability – verify that emission estimates are similar to other peer-reviewed inventories and that any major deviations are explained.</p>	<ol style="list-style-type: none"> 1. Compare emission totals by source category, pollutant, geographic region, and year with previous emission inventories. 	<ol style="list-style-type: none"> 1. Explanation for large discrepancies in emissions
<p>Representativeness – use emission estimation methods that reflect local conditions and the time period of interest (calendar year 2002).</p>	<ol style="list-style-type: none"> 1. Identify where national defaults used instead of local activity data. 2. Identify where emissions were grown when 2002 data were not available. 	<ol style="list-style-type: none"> 1. Explanation for use of national defaults or non-2002 data.

- EPA's Preliminary Summary Emission Reports for 2002 with CEM information for electric utilities regulated by the Acid Rain Program
- EPA's Toxic Release Inventory for 1999/2000 with ammonia emissions data
- Point source surveys for target facilities to obtain missing information
- State/local agency submittals of updated activity data related to fugitive dust sources, primarily paved and unpaved roads, livestock activities and agricultural activity (tilling).
- State agency submittals of information necessary to calculate fire emissions and geographically locate where these fires occurred in 2002.
- State agency submittals of updated activity data for animal operations for use with the Carnegie Mellon University ammonia model.
- State/local agency revisions, updates, corrections in response to various QA/QC checks. These may be provided in a variety of formats depending on the nature of the response.

Data Handling Records. Another key element of the QA program is maintaining written documentation of calculations, assumptions, and all other activities associated with incorporating the State/local agency submittals and other data with the EPA's National Emission Inventory. Nearly all data being developed and/or compiled will use computerized databases or other electronic files. We will maintain a log of activities to document how the data described above were incorporated to create the 2002 VISTAS inventory. The log will include complete descriptions of the data sources used, the procedures used to incorporate the data, the approach used to determine the completeness, and any contacts made with data submitters to resolve questions. A file will be maintained to ensure that the data handling records are retained and easily located.

QA/QC Records. We will perform a variety of quality control reviews of the inventory. For example, we will check stack parameters, source classification codes, and geographic coordinates for point sources that emit at least 100 tons of any pollutant per year. Reports containing the results of these checks will be transmitted to the State/local agencies for investigation and correction. Documentation of each finding will include a description of the action or data reviewed that led to the quality concern and will provide recommendations for corrective actions.

Corrective Action Records. Records of corrective and follow-up actions identified during the quality review process will be maintained. Both the corrective action identified and the results of the actions taken in response will be documented for inclusion in the final report. If no corrective action can be made, we will document the implications on the overall quality of the inventory.

Data Reporting Package. The final data reporting package will contain four elements:

- An emission summary report that describes the emissions inventory by pollutant and source category, summarizes the methods and data used to compile the inventory, assesses the limitations and appropriate uses of the inventory data, and contains any other information pertinent to the inventory;
- A quality assurance summary report that describes the quality assurance efforts completed, summarizes the corrective actions taken, and provides suggestions for further inventory improvement based on the results of the quality assurance process;
- Electronic data files containing the 2002 VISTAS inventory in NIF 2.0 format as well as EMS-2001 or SMOKE format; and
- Electronic and paper files containing all original data submittals and all backup documentation will be stored on file at MACTEC for a period of no less than three years.

2.0 DATA ACQUISITION

The 2002 VISTAS inventory will rely primarily on air emission information from existing databases. The data collection, handling, and management process is described below, along with the associated quality control procedures and methods. The QC system is designed to:

- Provide routine and consistent checks and documentation points in the inventory development process to verify data integrity, correctness, and completeness;
- Identify and reduce errors and omissions;
- Maximize consistency within the inventory preparation and documentation process;
- Facilitate internal and external inventory review processes.

The data acquisition process should be viewed as an iterative process. As decisions are made, new questions will surface that require solutions, until the iterations are complete.

2.1 Point Source Procedures

For point sources, the following procedures will be used to compile and quality assure the Preliminary 2002 VISTAS emission inventory:

1. Obtain 1999 National Emission Inventory (Version 2 Final)
 - a. Download State files from EPA ftp site [point on ftp.epa.gov](http://point.on.ftp.epa.gov)
 - b. Prepare and review emission summaries at the SCC level to verify that emissions by source category, geographic region, and pollutant are complete and reasonable.
2. Obtain most recent State/local agency point source inventory
 - a. Maintain log of data received and identify format, year of inventory, and point/area source emission cutoff level
 - b. If data not in NIF 2.0 format, coordinate with State to reformat data into NIF 2.0 format
 - c. Use the NIF 2.0 QA/QC software to identify format errors, missing data in required fields, duplicate records, and other referential integrity problems
 - d. Compare facility level emissions from State/local agency submittal with NEI Version 2 Final, identify significant discrepancies in emissions (especially PM_{2.5} and ammonia), identify potentially missing facilities, and identify difference in point/area source cutoff levels
 - e. Provide State/local agencies with results of 2(b) and 2(c) and ask for State/local agency assistance in resolving any problems/issues that have been identified
 - f. Obtain and process State/local agency corrections/updates as required
3. Use State/local agency data to replace 1999 NEI Version 2 Final data
 - a. Replace NEI data with State/local agency data
 - b. Augment with PM_{2.5} data if State/local submittal did not include PM_{2.5} using EPA NEI augmentation methodology

- c. Augment with ammonia emissions data if State/local submittal did not include ammonia using EPA NEI augmentation methodology
 - d. Possibly augment with ammonia emission data from the EPA TRI database
 - e. Assess the procedures used to evaluate point and area sources and to account for potential double counting
4. Project State/local agency point source inventory to common year of 2002
 - a. Use EPA's Economic Growth Analysis System (EGAS) Version 4.0 to project emissions to 2002
 - b. Compare 2002 emissions to the emissions reported in the State/local agency submittals
 - c. Augment with preliminary 2002 NOx and SO2 emissions data collected by ETS/CEM procedures by EPA's Clean Air Market Division
 - d. Obtain and process any 2002-specific data supplied by State/local agencies (see Item 5 below)
 - e. Identify and resolve any errors/discrepancies from the use of EGAS, preliminary 2002 CEM data, or 2002-specific data supplied by State/local agencies
 - f. Track comments/concerns received and corrective actions taken
5. Fill data gaps identified during review of inventory in proceeding steps
 - a. Identify facilities to be surveyed (may include large ammonia facilities; large facilities with missing coordinates, stack data, or temporal data; new facilities that operated in 2002 but are not included in either the existing State/local or EPA NEI inventory).
 - b. Coordinate with State/local agency on appropriate mechanism for contacting the facility (telephone, mail survey, etc.) and appropriate contact person (State/local agency representative, VISTAS representative, contractor)
 - c. Incorporate survey responses into inventory database
 - d. If data gaps cannot be filled via survey, fill data gaps with default data (i.e., stack parameters by SCC, default seasonal/diurnal operating schedules, county centroid coordinates, etc.)
 - e. Track comments/concerns received and corrective actions taken
6. Provide inventory for review by stakeholders
 - a. Prepare an emission summary report that describes the emissions inventory by pollutant and source category, summarizes the methods and data used to compile the inventory, assesses the limitations and appropriate uses of the inventory data, and contains any other information pertinent to the inventory
 - b. Prepare a QA/QC summary report that describes the efforts completed, summarizes the corrective actions taken, and provides suggestions for further inventory improvement based on the results of the quality assurance process
 - c. Provide data files containing the 2002 VISTAS inventory in NIF 2.0 format
 - d. Provide electron data files in either EMS-2001 or SMOKE format
 - e. Track comments/concerns received and corrective actions taken
7. Incorporate feedback from stakeholders and prepare final reports and electronic files

2.2 Area Source Procedures

For area sources, the following procedures will be used to compile and quality assure the Preliminary 2002 VISTAS emission inventory:

1. Obtain 1999 National Emission Inventory (Version 2 Final)
 - a. Download State files from EPA ftp site [area on ftp.epa.gov](http://area.on.ftp.epa.gov)
 - b. Prepare and review emission summary reports at the SCC level to verify that emissions by source category, geographic region, and pollutant are complete and reasonable.
2. Obtain most recent State/local agency point source inventory
 - a. Maintain log of data received and identify format, year of inventory, and point/area source emission cutoff level
 - b. If data not in NIF 2.0 format, coordinate with State to reformat data into NIF 2.0 format
 - c. Use the NIF 2.0 QA/QC software to identify format errors, missing data in required fields, duplicate records, and other referential integrity problems
 - d. Compare SCC/Tier 3 level emissions from State/local agency submittal with NEI Version 2 Final, identify significant discrepancies in emissions (especially PM2.5 and ammonia), identify potentially missing source categories, and identify difference in point/area source cutoff levels
 - e. Provide State/local agencies with results of 2(b) and 2(c) and ask for State/local agency assistance in resolving any problems/issues that have been identified
 - f. Obtain and process State/local agency corrections/updates as required
3. Use State/local agency data to replace 1999 NEI Version 2 Final data
 - a. Replace NEI data with State/local agency data
 - b. Augment with PM2.5 data if State/local submittal did not include PM2.5 using EPA NEI augmentation methodology
 - c. Augment with ammonia emissions data if State/local submittal did not include ammonia using EPA NEI augmentation methodology for non-agricultural sources
 - d. Assess the procedures used to evaluate point and area sources and to account for potential double counting
4. Project State/local agency point source inventory to common year of 2002
 - a. Use EPA's Economic Growth Analysis System (EGAS) Version 4.0 to project emissions to 2002
 - b. Compare 2002 emissions to the emissions reported in the State/local agency submittals
 - c. Augment with updated activity data related to fugitive dust sources, primarily paved and unpaved roads, livestock activities and agricultural activity (tilling).
 - d. Augment with 2002 activity data for fire sources. In particular, activity (and fuel data if available) will provide for updated estimates for wildfires, prescribed burns, residential combustion, and land clearing operations.

- e. Augment with updated activity data for animal operations. Use that data with the CMU ammonia model to provide updated estimates of ammonia from animal operations. Determine (in conjunction with VISTAS) if any of the State supplied data for ammonia emissions should be used to replace ammonia emissions calculated with the CMU model
 - f. Identify and resolve any errors/discrepancies from the use of EGAS growth factors or updated fugitive dust, fire, or animal activity data
 - g. Track comments/concerns received and corrective actions taken
5. Conduct QA/QC to identify errors and inconsistencies
 - a. Prepare emission density maps and ad-hoc reports to identify gaps and logical inconsistencies.
 - b. Ask States/local agencies to provide feedback on large scale inconsistencies and on missing sources.
 - c. Update database with State/local supplied revisions.
 - d. Track comments/concerns received and corrective actions taken
 6. Provide inventory for review by stakeholders
 - a. Prepare an emission summary report that describes the emissions inventory by pollutant and source category, summarizes the methods and data used to compile the inventory, assesses the limitations and appropriate uses of the inventory data, and contains any other information pertinent to the inventory
 - b. Prepare a quality assurance summary report that describes the quality assurance efforts completed, summarizes the corrective actions taken, and provides suggestions for further inventory improvement based on the results of the quality assurance process
 - c. Provide electronic data files containing the 2002 VISTAS inventory in NIF 2.0 format
 - d. Provide electronic data files in either EMS-2001 or SMOKE format
 - e. Track comments/concerns received and corrective actions taken
 7. Incorporate feedback from stakeholders and prepare final reports and electronic files

3.0 ASSESSMENT AND OVERSIGHT

The subsections in this group address the activities for assessing the effectiveness of project implementation and associated QA and QC activities. The purpose of the assessment is to ensure that the QA Project Plan is implemented as prescribed. The assessment consists of external activities that include a planned system of review and audit procedures by personnel not actively involved in the inventory development process. The key concept of this component is independent objective review by a third party to assess the effectiveness of the internal Quality Control program and the quality of the inventory, and to reduce or eliminate any inherent bias in the inventory process.

3.1 Assessments and Response Actions

The MACTEC Quality Assurance Coordinator will conduct technical systems audits throughout the project. Audits are managerial tools used to evaluate how effectively the emission inventory team complies with predetermined specifications for developing an accurate and complete inventory. The MACTEC QAC will conduct audits at the initiation of each project to review the Work Plan and QAPP, at the 50% complete and 75% complete levels to review the technical aspects of each project and at the 95% completion level to review the data submittal package. This provides assessment of the project during the planning stage, the data collection stage, the emissions calculations stage, and the report preparation stage. An example audit checklist is presented in Figure 2.

3.2 Reports to Management

Audit reports will be distributed within two weeks of the conduct of each audit to the persons interviewed and the MACTEC Task Leaders. A summary of the types of quality concerns found will be periodically forwarded to the MACTEC Program Manager to keep him informed of the quality issues found and actions being taken to resolve them. Audit reports will be retained in a file and used to conduct subsequent audits and plan follow-up activities. When an audit team finds items that require immediate action, they will inform the MACTEC Program Manager of the necessary corrective actions.

AUDIT CHECKLIST

Auditor: _____

Date: _____

Data/Procedure Reviewed: _____

Project Personnel Involved in Work: _____

Instructions: Select a facility or source category with high emissions and evaluate the quality of the data and adequacy of the data handling procedures. Record the findings and recommendations for corrective actions, if any, on this checklist and comment sheet. If recommendations for corrective actions are made, discuss them with the Project Manager immediately following the audit. Conduct follow-up activities to determine if the actions taken in response to the recommendations appropriately resolved the quality issues identified.

I. DATA

- A. Identify the source category evaluated: _____
- B. Describe the data included in the master file for the facility or source category.

- C. Are the data documented in a manner that will not have the potential to be misinterpreted? Y/N
Were the instructions for documenting the data followed? Y/N
- D. Are there missing data fields? Y/N
What procedures are taken by the Task Leaders to ascertain missing?

At what point in the inventory process are requests for missing data made?

How is the receipt of the missing data handled?

- E. Is the procedure followed to ascertain missing data efficient and adequate? Y/N
How do emissions compare to other inventories?
1999 NEI Version 2 Final _____
2000 TRI _____
2002 ETS/CEM _____
Are differences in emissions understandable and explainable? Y/N
If any of the values are incorrect, explain how the emissions data were corrected.

Figure 2 Audit Check Form

II. EMISSIONS DATABASE

- A. Who provided the data for incorporation into the database? _____

- B. Was there evidence that the data were reviewed for accuracy and completeness prior to incorporation in the database? Y/N
- C. Were data logs maintained to describe how the data was incorporated? Y/N
- D. Ask the data incorporation personnel to explain the QC procedures followed to ensure data quality. Do they agree with the procedures described in the QAPP? Y/N
- E. Does the computer system appear to be adequate for its intended use? (Ask the data processing personnel about the problems they have experienced with the system.) Y/N
- F. Is the data entry progressing as expected and are the procedures followed adequate to ensure data quality? Y/N

III. RECOMMENDATIONS FOR CORRECTIVE ACTIONS

IV. COMMENTS

V. SIGNATURES

(QA Auditor)

(QA Coordinator)

(Program Manager)

(Task Manager)

(Project Participant)

(Project Participant)

Figure 2 Audit Check Form (Concluded)

4.0 DATA VALIDATION AND USABILITY

Section 4 addresses the QA activities that occur after the data collection phase of the project is completed. Implementation of these subsections determines whether or not the data conform to the specified criteria, thus satisfying the project objectives.

4.1 Accuracy Assessment

A qualitative discussion of accuracy will include an assessment of the extent to which the initially identified weaknesses in the inventory have been remedied through the use of improved activity data, emission factors, or other sources of information. Remaining weaknesses will be assessed.

The accuracy assessment will include a summary of whether any data identified as outside of its valid range remained outside of the valid range in the final inventory. If any data remained outside of its valid range, an explanation will be given. The qualitative discussion will also include a summary of errors or discrepancies identified in the QA/QC process.

A final semi-quantitative discussion of accuracy will consist of pollutant summaries for individual facilities, industry types, source categories, and statewide totals. The VISTAS inventory will be compared to other peer-reviewed inventories, and where major discrepancies exist, we will provide an assessment of the reasons for the differences in emission estimates.

4.2 Completeness Assessment

A statement will be prepared assessing whether all required facilities, source categories, pollutants, and data elements were included in the inventory. If any facilities or source categories were not included, an explanation of the omission will be provided. If any individual data elements were not provided, we will discuss the elements, frequency of omissions, and overall impact on the quality of the inventory.

4.3 Comparability Assessment

Several summations of emissions data will be made to address comparability. Overall percentage differences for individual facilities (current year to prior year), industry types, processes, and statewide inventory will be calculated. Explanations of any large differences will be made.

4.4 Representativeness Assessment

A statement will be prepared describing where national defaults have been used instead of local activity data. Also, where data for calendar year 2002 were not available, we will assess whether the data used is representative of 2002. The impact of the use of national defaults or non-2002 will be assessed.

5.0 REFERENCES

1. U.S. Environmental Protection Agency. March 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA/240/B-01/003). <http://www.epa.gov/quality/qs-docs/r5-final.pdf>
2. Emission Inventory Improvement Program (EIIP) Document Series - Volume VI Quality Assurance Procedures and DARS Software. [EPA | TTN CHIEF | EIIP | Technical Reports | Volume VI Quality Assurance Procedures](#)
3. U.S. Environmental Protection Agency. November 18, 2002. 2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM2.5 and Regional Haze Programs. <http://www.4cleanair.org/members/committee/criteria/EPA200211181.pdf>