Georgia Department of Natural Resources
Environmental Protection Division • Air Protection Branch
4244 International Parkway • Suite 120 • Atlanta • Georgia 30354
404/363-7000 • Fax: 404/363-7100
Judson H. Turner, Director

OCT 31 2012

Lynorae Benjamin, Chief
Regulatory Development Section
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

Re: Georgia Environmental Protection Division Emission Inventory QAPPs

Dear Ms. Benjamin:

Attached you will find Georgia EPD's emission inventory Quality Assurance Project Plan (QAPP). The QAPP is divided into two documents. The first document is titled "Quality Assurance Project Plan for use in the Preparation of Air Emission Inventories" and covers emission inventories for large industrial stationary point sources. The second document is titled "Quality Assurance Project Plan for Georgia's Emission Inventories for Sources Other Than Large Industrial Stationary Point Sources" and covers emission inventories for nonpoint (area), on-road mobile, non-road mobile, fires, and marine/aircraft/rail (MAR). EPA previously submitted comments on the document titled "Quality Assurance Project Plan for Georgia's Emission Inventories for Sources Other Than Large Industrial Stationary Point Sources". EPD has reviewed and addressed all EPA comments.

If you have any questions or need more information, please contact me at (404) 363-7016 or via email at james.capp@dnr.state.ga.us.

Sincerely,

James A. Capp

James A. Capp
Chief
Air Protection Branch

JAC:JPJ:JWB:klc

Enclosures

QUALITY ASSURANCE PROJECT PLAN FOR USE IN THE PREPARATION OF AIR EMISSION INVENTORIES

Georgia Air Protection Branch

SECTION A1 TITLE AND APPROVAL SHEET

James A. Capp, Branch Chief
Georgia DNR, Air Protection Branch
Date: 10/31/2012

Ross Winne, Program Manager 2
Georgia DNR, Air Protection Branch
Date: 10/30/12

Brian Gregory, Program Manager 1
Georgia DNR, Air Protection Branch
Date: 10/30/2012

Noel DoHarris, Web Developer
Georgia DNR, Air Protection Branch
Date: 10/30/2012

Jing Wang, Web Developer
Georgia DNR, Air Protection Branch
Date: 10/30/2012

Ronald Moore, Database Administrator
Georgia DNR, Air Protection Branch
Date: 10-30-12

Brenda Johnson, EPA Technical Project Officer
U.S. EPA, Region 4
Date: _____

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EPA provides multiple documents to assist Quality Assurance Project Plan development according to the nature of data for projects. This project will utilize existing data sources to compile emissions inventories of sources other than large industrial stationary point sources. Therefore, this QAPP will address all elements required by "QAPP Requirements for Secondary Data Research Projects" (EPA, 1999).

Although many of the required QAPP elements do not apply for this project, this document is organized using the format specified in the U.S. Environmental Protection Agency's (EPA) overall QAPP guidance documents – "EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5" (EPA, 2001), and "EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5" (EPA, 2002). Georgia EPD has determined that a QAPP element does not apply to this project where a section heading is followed by the statement "This element is not applicable to this project."

1.0 PROJECT MANAGEMENT

1.1 Title and Approval Page (EPA QA/R-5 A1)

See page 1.

1.2 Table of Contents (EPA QA/R-5 A2)

See page 2.

1.3 Distribution List (EPA QA/R-5 A3)

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johnson.brenda@epa.gov

1.4 Project Organization (EPA QA/R-5 A4)

Figure 1-1 identifies the individuals participating in the project. Their specific roles and responsibilities are described below.

- Chief, Air Protection Branch - Jac Capp will supervise the overall organizational and managerial aspects of the project.
- Project Manager – Ross Winne will oversee and review all work products submitted as the Project Manager. He will also oversee and monitor technical activities performed by the team members.
- Unit Manager – Brian Gregory will oversee and review the statutory requirements of this project.
- Task Leader, Point Stationary Source Collection – Noel DoHarris will be responsible for the collection and preparation of the point stationary source inventory. He will identify and implement effective QA/QC procedures for the point stationary sources inventory within the online collection tools.
- QA/QC Team, Point Stationary Source Submittal – Ronald Moore and Jing Wang will be responsible for the submission of the point stationary source inventory. They will identify and implement effective QA/QC procedures for the submittal process of the point stationary source inventory.

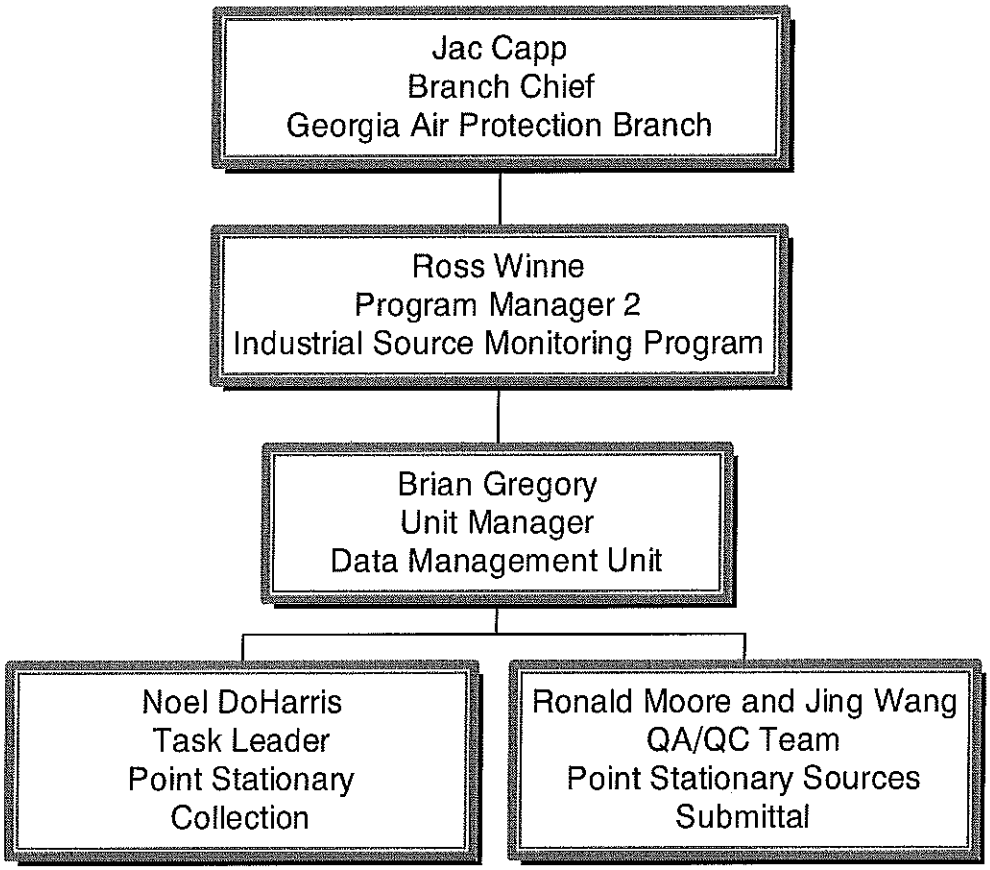

Figure 1-1. Project Organization Chart

1.5 Problem Definition/Background (EPA QA/R-5 A5)

The Clean Air Act of 1970 and the associated Amendments of 1990 provide statutory requirements for improving air quality in the United States. Quantification of air quality necessitates the gathering, storage, retrieval and analysis of air pollution data. These data, stored in the computer-based National Emission Inventory (NEI) database system, provide information essential to inquiry, investigation and decision-making. For example, analysis of the data may lead to a more thorough consideration of certain industries or certain emissions sources, it may provide the basis for the development or evaluation of control strategies, and it may serve as the basis for an evaluation of the effectiveness of regulations.

The State of Georgia, through the Air Protection Branch collects data pertaining to the emissions of air pollutants and reports this data in turn to the Environmental Protection Agency Administrator using Version 3.0 of the NEI format. The reported data are drawn from the Air Protection Branch's computer-based GECO online application for point source data.

An emissions inventory is a tabulation of all sources of air pollutant emissions, complete with the emissions from these sources, in a given area. Emission inventories are the fundamental building blocks used to develop air quality control strategies and maintenance strategies on a local, state, regional, and national level.

The Air Emissions Reporting Rule (AERR) (73 FR 76539, December 17, 2008) specifies the regulatory requirements for reporting emissions inventories. The reporting requirements also dictate the requirements for emission inventory data collection and quality assurance. The purpose of the AERR is to simplify reporting, offer options for data collection and exchange, and unifying reporting dates for various categories of inventories.

The AERR establishes requirements for S/L reporting of Sulfur oxides, VOC, Nitrogen oxides, Carbon monoxide, Lead and lead compounds, Primary PM2.5, Primary PM10, and NH3. It establishes the reporting requirements for all types of sources (Point, Area, Onroad mobile, Nonroad mobile, and Biogenic). It established reporting on an annual cycle for selected point sources and a 3-Year cycle for all other sources.

Data is provided to EPA's National Emissions Inventory (NEI) database using Exchange Network Emission Inventory System (EIS) dataflow.

Applications for the use of emission inventory data are numerous. In addition to use as a building block in developing an air quality control strategies and maintenance strategies, other specific uses of this data include:

- $ State oversight of point sources
- $ Public Requests and Websites
- $ Use in the EPA National Annual Trends Report
- $ Used to develop new methodologies and techniques to estimate emissions (emission factors)
- $ Document regulatory impact assessments

$ Permit Modeling
$ Air Quality Assessments & Modeling

1.6 Project/Task Description and Schedule (EPA QA/R-5 A6)

1.6.1 Purpose/Background

For AERR reporting (annual and base year):

As required by the AERR, the S/Ls conduct an annual inventory to document air emissions and provide information to the EPA. Air Protection Branch regulations of Georgia Rule 391-3-1-.02(6)(b)1.(i) require the reporting of annual and 3-Year cycle inventories by December 31.

Point Sources: The Air Protection Branch collects emission inventory data via an electronic reporting process that starts with the annual inventory survey sent to all point sources.

Once received, Air Protection Branch Data Management Unit QA/QC Team will do quality assurance of NEI data. Air Protection Branch personnel identify industry sources and prepare NEI mail out list. Once facilities receive their NEI request letters, they get on GECO to enter the data into our NEI online application.

When all inventory information is complete, the programmers will QA the NEI data individually and as whole, and then the programmers extract data for the appropriate reporting cycle in the requested Version of the NEI data format for point sources.

1.6.2 DESCRIPTION OF THE WORK TO BE PERFORMED

1. Measurements Expected: NEI GECO online application data submittal will provide actual annual emissions with 3-Year cycle data (seasonal emissions) for nonattainment areas.

2. Special Personnel and Equipment Requirements: Staff designing NEI online application and quality insurance of NEI data are programmers and engineers who have sufficient education/experience to perform emission inventory related work.

3. Assessment Techniques: The following activities will be utilized for review of data:
   - Validation of certain NEI data submitted through GECO NEI online application
   - Validate of Coordinates by using county coordinates
   - Using EPA Exchange Network QA environment to quality assure the NEI data.

4. Schedule of Work:
   - Generating NEI mailout list

- Finalizing the production GECO online application
- Sending out NEI request letter
- Receiving NEI data from facilities
- Quality assurance of submitted NEI data per facility
- Making corrections to NEI data as required by the EPA QA reports
- Final submittal of NEI data per facility to the EPA production environment

1.7 Quality Objectives and Criteria for Measurement Data (EPA QA/R-5 A7)

The primary goal of the Data Management Unit is to confirm the participation and submittal of applicable sources emission inventories. To ensure this occurs, the DMU prepares the annual emission inventory universe at the end of the calendar year, ensuring that all operating sources are captured. The first data quality objective (DQO1) is to ensure that all facilities identified are correctly captured. A review of the permitting log is performed to confirm that no new facilities that are not yet permitted are in the emission inventory universe for the calendar year.

Once all sources have been identified and confirmed, they are enrolled in the annual emission inventory collection. Through the GECO emission inventory application, each facility must indicate if they need to participate in the annual submittal based on the AERR potential emissions thresholds. The second data quality objective (DQO2), confirms that all facilities that choose to not participate in the annual emission inventory are valid non-participants.

DQO2 requires a DMU staff member to confirm the information presented by the company through a file review. The staff member confirms the facility potential emission and facility operating status and if the facility has improperly chosen to not participate then the facility is notified and participates in the annual data submittal.

The final data quality objective (DQO3) is to confirm that all the submitted facilities pass the EPA QA exchange network tool. Once the facility passes the EPA QA tool, then the facility is submitted to the EPA production environment.

1.8 Special Training Requirements/Certification (EPA QA/R-5 A8)

All quality assurance staff shall have a minimum of a bachelor's degree in engineering or related scientific discipline. The staff are trained in standard emissions estimation methods. Current training requirement is "in house" or on-the-job training. Memberships in environmental organizations are voluntary.

1.9 Documents and Records (EPA QA/R-5 A9)

1.9.1 Purpose/Background

The completed electronic point source NEI data, area source, non-road mobile source, and on-road mobile source data will be stored in oracle database by Air Protection Branch. The quality assurance related data

is also stored in oracle database by Air Protection Branch. No hard copy files are stored at this moment.

1.9.2 Information Included in the Reporting Packages

AERR-Related Electronic Submission to EPA: e-mail with files to the Emission Factor and Inventory Group as indicated by instructions on the Data Submittal Procedures and Submittal Form website (currently http://www.epa.gov/ttn/chief/ei/eisubmit.html).

1.9.3 References

List any references used to compile the inventory. Examples:

EPA Emission Inventories
http://www.epa.gov/ttn/chief/eiinformation.html

EPA 2008 NEI/EIS Implementation Plan
http://www.epa.gov/ttnchie1/net/neip/index.html

EPA December 2002 *Guidance for Quality Assurance Project Plans*, EPA QA/G-5

EPA March 2001 Requirements for Quality Assurance Project Plans, EPA QA/R-5

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Design (Experimental Design) (EPA QA/R-5 B1)

This element is not applicable to this project.

2.2 Sampling Methods (EPA QA/R-5 B2)

This element is not applicable to this project.

2.3 Sample Handling and Custody (EPA QA/R-5 B3)

This element is not applicable to this project.

2.4 Analytical Methods (EPA QA/R-5 B4)

This element is not applicable to this project.

2.5 Quality Control Requirements (EPA QA/R-5 B5)

This element is not applicable to this project.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance (EPA QA/R-5 B6)

This element is not applicable to this project.

2.7 Instrument/Equipment Calibration and Frequency (EPA QA/R-5 B7)

This element is not applicable to this project.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables (EPA QA/R-5 B8)

This element is not applicable to this project.

2.9 Data Acquisition Requirements (Non-Direct Measurements) (EPA QA/R-5 B9)

Point Sources: All point-source data is acquired directly from reporting facilities.

Users of the emission inventory web application that collects emission inventory data are allowed to pre-populate the current year's data with a previous year's emission inventory data. This increases the efficiency of collecting the emission inventory data as users do not have to enter all their data anew. It is realized that this may allow missing or incorrect data being imported into the current emission inventory, but this is taken care of by the error and verification checks described in Section 4.2.

To ensure that certain data are not outdated, those items are assigned null values during the data pre-population procedures. Then, during the required submittal procedure those items are checked and verified according to the procedures described in Section 4.2.

During the collection of the emissions inventory data some elements may be collected to greater precision than is required by the NEI EIS Implementation Plan. The tool that we use to create the XML for data submission to EPA formats those data elements to the precision required by the EIS Implementation Plan upon creating the XML formatted data.

Data such as facility and release point geographical position data may be acquired by the facility using GPS acquisition instruments. In some cases, where a facility may not be able to acquire the GPS data using their own device, the emission inventory web application provides a mapping tool (using Google Maps API) that can be used to acquire the facility and release point geographic position data. On saving this data, the emission inventory web application's Compare Validator is used to validate the geographical position data.

2.10 Data Management (EPA QA/R-5 B10)

The DMU developed the Georgia Environmental Connections Online using a Microsoft ASP.NET front end application with an Oracle database backend. The data management is handled by the GECO online system and the Integrated Air Information Platform (IAIP) internally. The final submittal to EPA occurs across the Exchange Network through a series of staging tables and node transmission to the CDX development and final production environments.

Once the QA process begins for a set of facility information, the facility can no longer access their information for editing. This prevents any changes to the data without the knowledge of the DMU. The DMU has created tracking and statistics tools in order to manage progress of the submitted facility information within the IAIP. Once the facility has passed the QA process, then the facility information is permanently stored within the Oracle database.

All access within GECO and IAIP is account managed and only select staff members have access to the Oracle data tables.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments/Oversight and Response Actions (EPA QA/R-5 C1)

- The annual emission inventory has a submission deadline for the facilities in August. As this deadline is not mandated by any regulation, the DMU has some flexibility to work with each facility to provide additional time as needed.

- Submittal progress is monitored through the EIS Statistics tools and notifications sent to those facilities that have not completed the submittal process.

- For submitted facilities, QA/QC progress is monitored through the IAIP emission inventory report tool. If it becomes necessary to perform an all facilities submittal, management will make that decision. An all-facilities submittal allows the data to be corrected faster, but quality may be sacrificed to meet the December 31st deadline.

3.2 Reports to Management (EPA QA/R-5 C2)

Upon final submission, the Program Manager is notified of the final submission and the information is made available to Data Modeling Unit.

4.0 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements (EPA QA/R-5 D1)

The emission inventory web application makes use of the requirements (data ranges, data precision and data format) in EPA's 2008 NEI EIS Implementation Plan (Sections 6 and 7) to create validators and error checkers as described in Section 4.2. This ensures that the data collected meets those requirements before the user can submit the data to our systems.

4.2 Verification and Validation Methods (EPA QA/R-5 D2)

The Emission Inventory data is collected using a web based application based on the latest version of the Microsoft.Net framework with code written using Visual Basic programming language in Microsoft's ASP.Net.

Data validation is achieved using Microsoft ASP.Net validators. All validation is performed prior to the data being transmitted and saved to the database. Types of validators used include the following:

Range Validator – verifies that the entered numeric data is within the required range
Required Field Validator – used to verify that a required field is not left blank by the user.
Regular Expression Validator – verifies that entered strings match required formats (e.g. email addresses)
Compare Validator – compares entered value against another value

In instances where one of the existing ASP.Net validators cannot be used to accomplish validation, custom validators are written to handle those situations.

Users of the emission inventory web application are allowed to import data from a previous emission inventory year and because of this it is possible they may not visit that data during the current data collection process. In some cases this may result in incorrect data or missing data values for the current emission inventory year. In order to catch such errors, the user must go through the required submission procedure. During the submission procedure the data being submitted go through a number of separate checks to verify that data has been updated for the current emission inventory year and that the submitted

data is in accordance with the requirements of EPA's 2008 NEI EIS Implementation Plan (Sections 6 and 7) and any updates to those requirements. Additional checks are added, as needed, to the submission procedure.

Any discovered issues with data checks are handled by revising the web application's code. This is done by the Web Developer.

4.3 Reconciliation with User Requirements (EPA QA/R-5 D3)

Once the QA has been completed, the QA results are examined for any critical errors or warnings. If the report indicates a critical error, then the reviewing engineer will determine the best course of action to correct the error.

In some situations, that may require the engineer to contact the facility and have them correct the information. However, if the facility does not need to be involved in the change, then the engineer does not contact them and corrects the information promptly and reruns the QA check. After the correction has been made, the engineer will inform the facility that a change was made to their submittal.

The QA engineer maintains a log of all EPA submittals for a given facility and keeps track of the errors and warnings. When all facilities have been successfully submitted to EPA, a review is performed and changes proposed to the GECO developer to determine if any new validators or submittal checks need to be implemented.

5.0 REFERENCES

EPA, 1999: U.S. Environmental Protection Agency, National Risk Management Research Laboratory, "QAPP Requirements for Secondary Data Research Projects," Washington, DC, July 1, 1999.

EPA, 2001: U.S. Environmental Protection Agency, Office of Environmental Information, "EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5," EPA/240/B-01/003, Washington, DC, March 2001 (Reissued May 2006).

EPA, 2002: U.S. Environmental Protection Agency, Office of Environmental Information, "Guidance for Quality Assurance Project Plans, EPA QA/G-5," EPA/240/R-02/009, Washington, DC, December 2002.

QUALITY ASSURANCE PROJECT PLAN FOR GEORGIA'S EMISSION INVENTORIES FOR SOURCES OTHER THAN LARGE INDUSTRIAL STATIONARY POINT SOURCES

Georgia Air Protection Branch

Approvals Signature:

James A. Capp

Date: 10/31/2012

James A. Capp, Branch Chief
Georgia DNR, Air Protection Branch

Date: 10/30/2012

James P. Johnston, P.E., Program Manager 2
Georgia DNR, Air Protection Branch

Date: 10/30/12

James Boylan, Ph.D., Program Manager 1
Georgia DNR, Air Protection Branch

Date: 10/30/2012

Byeong-Uk Kim, Ph.D., Environmental Modeler
Georgia DNR, Air Protection Branch

Date: 10/30/2012

Di Tian, Ph.D., Environmental Modeler
Georgia DNR, Air Protection Branch

Date: 10/30/2012

Gil Grodzinsky, Ph.D., Environmental Modeler
Georgia DNR, Air Protection Branch

Date: _____

Danny France, QA Manager
U.S. EPA, Region 4

Date: _____

Brenda Johnson, EPA Technical Project Officer
U.S. EPA, Region 4

Date: _____

Michele Notarianni , EPA Technical Project Officer,
U.S. EPA, Region 4

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1.4 Project Organization (EPA QA/R-5 A4)

Figure 1-1 identifies the individuals participating in the project. Their specific roles and responsibilities are described below.

- Chief, Air Protection Branch - Jac Capp will supervise the overall organizational and managerial aspects of the project.
- Manager, Planning and Support Program - Jimmy Johnston will oversee and review all work products submitted by the Project Manager. Also, he will oversee the statutory requirements of this project.
- Project Manager - James Boylan will oversee and monitor technical activities performed by the project task leaders.
- Task Leader, Non-Point Stationary Sources - Byeong-Uk Kim will be responsible for the preparation and submission of the non-point stationary sources inventory. He will identify and

implement effective QA/QC procedures for the non-point stationary sources inventory. These QA/QC procedures will be described in detail in Section 1.6 of this document.

- Task Leader, Fire and MAR Sources – Di Tian will be responsible for the preparation and submission of the fire (wildfires, prescribed burning, agriculture burning, and land clearing) and Marine/Aircraft/Rail (MAR) inventories. She will identify and implement effective QA/QC procedures for the fire and MAR sources. These QA/QC procedures will be described in detail in Section 1.6 of this document.
- Task Leader, On-Road/Non-Road Mobile Sources – Gil Grodzinsky will be responsible for the preparation and submission of the on-road and non-road mobile source inventories. He will identify and implement effective QA/QC procedures for the on-road and non-road mobile source inventories. These QA/QC procedures will be described in detail in Section 1.6 of this document.

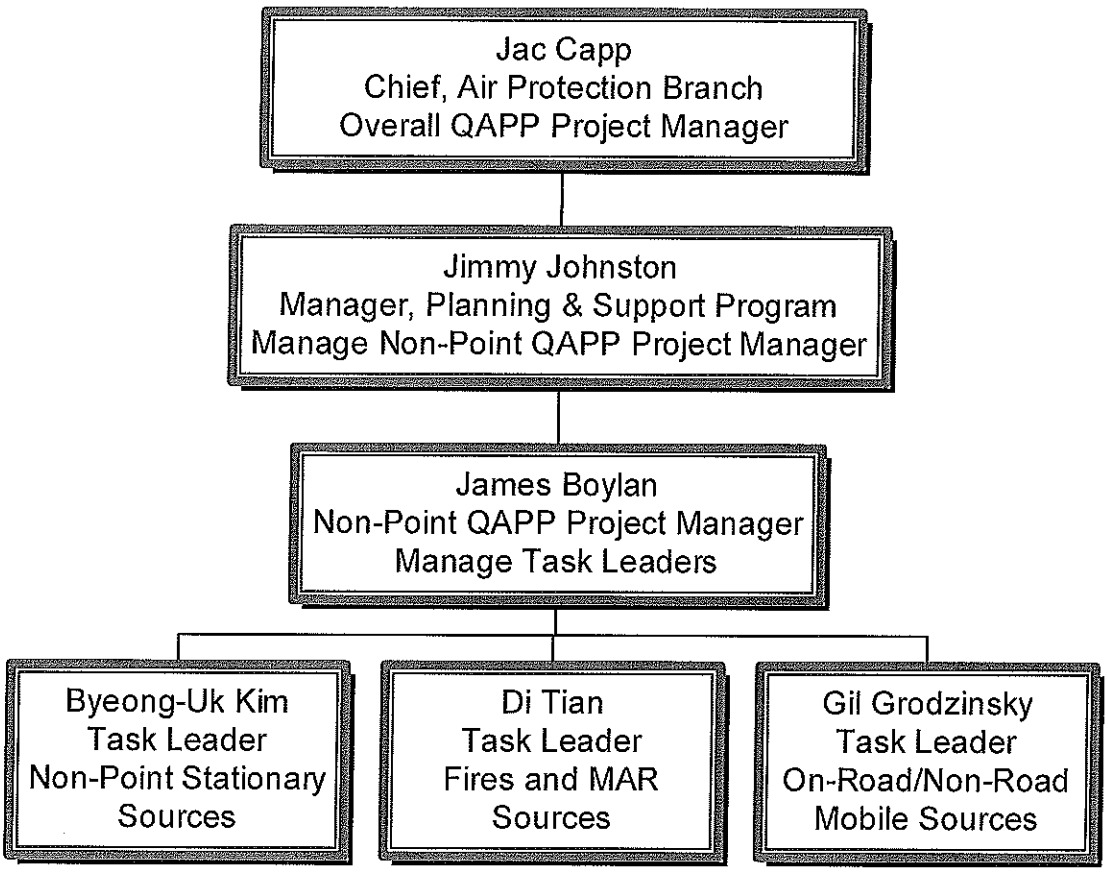

Figure 1-1. Project Organization Chart

1.5 Problem Definition/Background (EPA QA/R-5 A5)

In 2008, EPA promulgated the Air Emissions Reporting Requirements (AERR) Rule (73 FR 76539 – 76558, December 17, 2008) to collect emission data from states. The AERR requires the state of Georgia to submit annual emission inventories for all source sectors every three years and large point sources every year. The pollutants that are required to be included in the emissions inventory are nitrogen oxides (NOx), sulfur dioxide (SO2), ammonia (NH3), lead (Pb), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM2.5 and PM10 must include both filterable and condensable emissions). In addition, AERR requires the state of Georgia to report summer day emissions for NOx and VOC from all source sectors (except biogenic sources) in ozone nonattainment counties.

In the Georgia APB, two groups are responsible for emission inventory submittals. The Data Management Unit is responsible for collecting and reporting emission from large industrial stationary point sources. The Data and Modeling Unit is responsible for all other source sectors that are not covered by Data Management Unit (nonpoint, on-road mobile, non-road mobile, fires, and marine/aircraft/rail). This QAPP describes the QA/QC procedures related to Georgia's emission inventories for all sources other than large stationary point sources. The QA/QC procedures for emission for large stationary point sources can be found in another document titled "Quality Assurance Project Plan for Use in the Preparation of Air Emission Inventories".

1.6 Project/Task Description and Schedule (EPA QA/R-5 A6)

The objective of this project is to estimate county-level or point-level emission inventories for all emission sources (except large industrial stationary point sources) in the state of Georgia. The inventory will be developed consistent with EPA's criteria for emission reporting. The QAPP addresses the following tasks: data collection and compilation from the various sources, inventory review, revisions and corrections, documentation, and data submittal.

The development of the inventory will be based on available data sources including EPA's latest available NEI. Georgia APB will document the inventory data sources, methods, results, and any special tasks performed to develop the inventory. The details of each task that will be performed for each source sector are described below. Initial inventory work will begin six months prior to the EPA due date. All tasks will be completed by December 31 of the year following the required inventory year (e.g. 2011 inventory will be submitted by December 31, 2012). However, there may be an opportunity to provide updates to the EPA through the Emission Inventory System (EIS) after that date.

Non-Point Stationary Sources

1. Download and review non-point stationary source emissions and throughput/activity data used to estimate non-point stationary source emissions from EPA's draft NEI for the applicable year. This task also includes acquiring and utilizing available emission estimate tools (e.g. residential wood combustion tool).
2. Download and review other available inventories (e.g. SESARM inventories) for categories not covered by EPA's draft NEI.

3. Perform point source subtraction for non-point source categories of which emission estimates are based on throughput/activity data that are directly related to point source categories (e.g. industrial/commercial/institutional boilers). This will prevent double counting point source emissions in both the non-point and point categories.
4. Merge inventories from Task 1, 2, and 3 above. This task includes converting NIF/EIS-XML format data into StagingTable format.
5. Review and conduct QA/QC on the merged inventory from Task 4. QA/QC will focus on detecting duplicate records, range checks, and comparing county level summary between this emission inventory to the previously submitted final NEI inventory.
6. Convert StagingTable format data into XML with EPA's BridgeTool.
7. Submit XML format data to EIS QA Environment; repeat any necessary step from Task 1 to Task 7 until QA Environment submission does not give any errors.
8. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Wildfires

1. Collect wildfires records from Georgia Forestry Commission (GFC).
2. QA/QC fire location information - obtain county information from Lat/Lon of each fire using ArcGIS; compare with county information in the GFC records; assign county centroid Lat/Lon to a fire if its Lat/Lon falls outside the corresponding county boundary.
3. QA/QC the start/end and date/time - calculate the length of burning and compare with the burning area; identify discrepancies and correct errors.
4. Compare burning records with historical records.
5. Calculate emissions using the best available fuel consumption and emission factors in an Excel spreadsheet.
6. Convert emissions estimates from Excel into StagingTable format.
7. Convert emissions estimates in StagingTable format into XML format with EPA's Bridge Tool.
8. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 8 until QA Environment submission does not give any errors.
9. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Prescribed Burning

1. Collect prescribed burning records from GFC.
2. Collect prescribed burning records from military bases.
3. QA/QC fire location information – calculate Lat/Lon of each fire with ArcGIS using fire physical address, zip code, city, or county information, and ask forest rangers at GFC to verify the calculated Lat/Lon information.
4. QA/QC the start/end and date/time - calculate the length of burning and compare with the burning area; identify discrepancies and correct errors.
5. Combine records from GFC and military bases.
6. Compare burning records with historical records.
7. Calculate emissions using the best available fuel consumption and emission factors in an Excel spreadsheet.
8. Convert emissions estimates from Excel into StagingTable format.

9. Convert emissions estimates in StagingTable format into XML format with EPA's Bridge Tool.
10. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 10 until QA Environment submission does not give any error.
11. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Agriculture Burning and Land Clearing

1. Collect agriculture burning and land clearing records from Georgia Forestry Commission (GFC).
2. Compare burning records with historical records.
3. Calculate emissions using the best available fuel consumption and emission factors in an Excel spreadsheet.
4. Convert emissions estimates from Excel into StagingTable format.
5. Convert emissions estimates in StagingTable format into XML format with EPA's Bridge Tool.
6. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 6 until QA Environment submission does not give any error.
7. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

Marine, Aircraft, and Rail Sources

1. Download and review the emissions estimates for marine, aircraft, and rail sources from EPA's draft NEI for the applicable year.
2. Collect activity and emissions estimates for Hartsfield Jackson Atlanta International Airport (ATL) from City of Atlanta/Department of Aviation (DOA).
    a. Compare activity and emissions estimates with EPA's draft NEI estimates.
    b. Submit DOA activity and emission estimates if different than draft NEI estimates.
3. Contact Department of Defense (DOD) military bases to collect activity and emissions estimates for military aircrafts.
    a. For military bases where activity and emissions estimates are available, compare those estimates with EPA's draft NEI estimates as well as with historical emissions estimates for corresponding SCCs in each county.
    b. Submit DOD emission estimates if different than draft NEI estimates.
4. Convert emissions estimates from Excel into StagingTable format.
5. Convert emissions estimates in StagingTable format into XML format with EPA's Bridge Tool
6. Submit emissions estimates in XML format to EIS QA Environment; repeat any necessary steps from Task 1 to Task 6 until QA Environment submission does not give any error.
7. Submit XML format data to EIS Production Environment; fix errors that occur, and resubmit data to Production Environment.

On-Road/Non-Road Mobile Sources

1. Download the relevant NMIM default county-level database tables in CSV format for Georgia from EPA's EIS gateway (https://eis.epa.gov/eis-system-web/ncd/state/list.html, then click "EPA Defaults" and then "Download YYYY State NCD Data".
2. Review these CSV files and update one table:
    a. Countynrfile.csv: update allocation files pertaining to Georgia by using same data sources as before but with newer data.

3. Export updated NCD data to EPA required formats
4. Submit updated NCD data to EIS QA Environment; repeat any necessary steps from Task 1 to Task 4 until QA Environment submission does not give any error.
5. Submit updated NCD data to EIS Production Environment; fix errors that occur and resubmit data to the Production Environment.
6. Download the relevant MOVES default county-level database tables in CSV format for Georgia from EPA's EIS gateway (https://eis.epa.gov/eis-system-web/cdb/state/list.html, then click "EPA Defaults" and then "Download YYYY State CDB Data Set".
7. Review these CSV files and update eleven tables:
    a. Avgspeeddistribution: Applies to counties which have travel demand models (TDMs) which include the original 13-county Atlanta NAA, the additional 7-county ring of counties added with the 1997 ozone and PM2.5 NAAQS for Atlanta, Bibb, and Floyd counties. Remaining counties just use defaults. Avgspeeddistribution data was provided for years closest to the NEI year if not the same year. Input data was compiled from SIP and conformity work with avgspeeddistribution assumed to not vary significantly by year (no variation more than 2 years recommended though).
    b. DayVMTFraction: For all 159 counties in Georgia: GDOT provided, based on the Georgia Department of Transportation (GDOT)'s Georgia Roadway Mileage and Characteristics Reports (400 Reports) data series, a breakdown of VMT by weekend/weekday. The data processed by GDOT provides day VMT fractions (weekend versus weekday) by sourcetype, month and roadtype. Due to data limitations, these fractions are not for every county, but by regions (3 regions are "Northern District", "Central District", and "Southern District"). Counties in each region will have the same day VMT fractions.
    c. HourVMTFraction: Applies to counties which have TDMs which include the original 13-county Atlanta NAA, the later added 7-county ring of counties around Atlanta, Macon and Floyd counties. Remaining counties just use defaults. HourVMTFraction data was based on TDM network years closest if not identical to the NEI year. The input data was compiled from SIP and conformity work with HourVMTFraction assumed to not vary significantly by year (no variation more than 2 years recommended though).
    d. HPMSVtypeYear: Applies to all counties. HourVMTFraction data was obtained from TDM model output which was then split into the required 6 HPMS sourcetypes using GDOT's HPMS data and MOVES default splits for passenger cars and light duty trucks in the case of the Atlanta 20 county nonattainment area, Bibb, and Floyd counties. TDM networks closest if not exactly identical to the NEI year need to be available. If not identical, two closest years (one before and one after the NEI year) will be employed with linear interpolation used to obtain the NEI year value. Input data was compiled from SIP and conformity work. For remaining counties, annual average VMT was compiled using data from GDOT's *Mileage By Route Type and Functional Classification Reports (445 Reports)* for the NEI year.
    e. IMcoverage: The original 13 county Atlanta non-attainment area for the 1-hour ozone NAAQS has an ongoing I/M program. Included in the submission is an "imcoverage" table which includes the EPA/MOVES default data set to "useIMyn=N". The replacement Georgia local data is provided as well with "useIMyn=Y" in those cases. This local I/M data is provided from the Georgia EPD Mobile & Area Sources program's I/M unit.

f. MonthVMTFraction: For all 159 counties in Georgia, GDOT provided, based on the Georgia Department of Transportation (GDOT)'s *Georgia Roadway Mileage and Characteristics Reports* (400 Reports) data series, a breakdown of VMT by weekend/weekday as well as month. Due to data limitations, these fractions are not for every county, but by regions (3 regions are "Northern District", "Central District", and "Southern District"). Counties in each region will have the same month VMT fractions.

g. RoadType: Applies to counties which have TDMs which include the original 13-county Atlanta NAA, the later added 7-county ring of counties around Atlanta, Macon and Floyd counties. Remaining counties just use defaults. Roadtype data consists of ramp fractions calculated by the TDM for network years identical to the NEI year or the closest years available. If not identical, two closest years (one before and one after the NEI year) will be employed with linear interpolation used to obtain the NEI year value. . The input data was compiled from SIP and conformity work.

h. Roadtypedistribution: Applies to all counties. Roadtypedistribution data was obtained directly from TDM model output combined with MOVES default splits by sourcetype for TDM modeled areas like the Atlanta 20 county nonattainment area, Bibb, and Floyd counties. TDM network years, if not identical to the NEI year, need to be the two closest years (one before and one after the NEI year) with linear interpolation employed to obtain the NEI year value. Input data was compiled from SIP and conformity work. For remaining counties, roadtypedistribution was compiled using data from GDOT's *Mileage By Route Type and Functional Classification Reports* (445 Reports) for the NEI year.

i. Sourcetypeagedistribution: Applies to all counties, but grouped into the original 13-county Atlanta NAA, the additional 7-county ring of counties added with the 1997 ozone and PM2.5 NAAQS, and the rest of the state. Counties in each of these regions will have the same sourcetypedistribution. Age distribution data has been developed from registration data from R.L. Polk & Co.'s National Vehicle Population Profile and R.L Polk and Co's TIPNet and assumed not to vary by year so applied to the NEI year. The same assumption of lack of variation by year is applied when conducting SIP and conformity work.

j. SourceTypeYear: Applies to all counties. Source type population data has been developed from registration data from R.L. Polk & Co.'s National Vehicle Population Profile and R.L Polk and Co's TIPNet. This data through the help of EPA converters was modified from being sorted by MOBILE 6 vehicle types into being based on MOVES based vehicle types. This data is "grown" from the original data set to values for use in the NEI year following the same procedures that were used in the transportation conformity analyses and SIP revisions. The data can be grown either based on human population growth trends over the time period or growth trends in vehicle population from the Georgia vehicle registration database (only trends can be used not exact numbers due to difficulty of matching vehicle types in the Georgia motor vehicle registration data to the vehicle types used in R.L Polk and Co's data). Long-haul combination trucks use annual average VMT for combination trucks and national MOVES defaults to determine population since they travel across the country.

k. SCCRoadTypeDistribution: Same techniques as for RoadTypeDistribution except splitting VMT by SCC road type classification instead of MOVES classifications.

8. Export updated CDB data to EPA required formats.

9. Submit updated CDB data to EIS QA Environment; repeat any necessary steps from Task 6 to Task 8 until QA Environment submission does not give any error.
10. Submit updated CDB data to EIS Production Environment; fix errors that occur and resubmit data to the Production Environment.

1.7 Quality Objectives and Criteria for Measurement Data (EPA QA/R-5 A7)

As noted in EPA's QAPP guidance, "*when a study is to be based either entirely or in part on secondary data (data that was previously collected for a different intended use)...this section of the QA Project Plan is used to explain the criteria for determining which sources of data are sufficient to support the goals of the current project.*" (EPA, 2002 at page 19). Therefore, the following discussion presents the criteria that we will use to determine which data sources will be utilized to meet project objectives.

The main data quality objectives that Georgia APB will evaluate to ensure that data meet project objectives are:

- Completeness – As part of the emissions data review by Georgia APB, we will seek to determine whether the source provides complete data.

- Representativeness – Quality assurance checks on data content will be used to identify data that exceed typical ranges. Emissions from various source sectors will be compared to other source sectors to make sure that the relative distribution meets our conceptual model. Any atypical data will be examined for further quality assurance.

- Comparability – Georgia APB will compare the new emissions to other available emission inventories (e.g., the most recent final NEI emissions or SESARM inventory). Any differences of more than a factor of two (100% higher or 50% lower) will be identified and examined for further quality assurance.

- Accuracy – Georgia APB will ensure that all of the procedures/calculations that Georgia APB staff member develop and apply to correct existing data or to supplement existing data will be checked for accuracy.

1.8 Special Training Requirements/Certification (EPA QA/R-5 A8)

There are no special training or certification requirements associated with this project.

1.9 Documents and Records (EPA QA/R-5 A9)

Georgia APB will distribute copies of QAPP, once approved, for use in this project to all project team members. We will document each of the data sources that are used in this project. These documents will include descriptions of each data source, and all manipulations that are performed on the data. We will maintain back-ups to allow for version control as original data are manipulated during the course of the project so that we always have a backup of the original data to identify where problems originated. All final records and reports will be saved on the Air Protection Branch server with a back-up copy on an

external hard drive located at 4244 International Parkway, Suite 120, Atlanta, GA 30354. Retention time will be seven years from the original EPA deadline.

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Design (Experimental Design) (EPA QA/R-5 B1)

This element is not applicable to this project.

2.2 Sampling Methods (EPA QA/R-5 B2)

This element is not applicable to this project.

2.3 Sample Handling and Custody (EPA QA/R-5 B3)

This element is not applicable to this project.

2.4 Analytical Methods (EPA QA/R-5 B4)

This element is not applicable to this project.

2.5 Quality Control Requirements (EPA QA/R-5 B5)

This element is not applicable to this project.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance (EPA QA/R-5 B6)

This element is not applicable to this project.

2.7 Instrument/Equipment Calibration and Frequency (EPA QA/R-5 B7)

This element is not applicable to this project.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables (EPA QA/R-5 B8)

This element is not applicable to this project.

2.9 Data Acquisition Requirements (Non-Direct Measurements) (EPA QA/R-5 B9)

Georgia APB will utilize six main data sources in developing emission inventory for sources other than large stationary point sources:

1. EPA's latest final NEI (from a previous year) and draft NEI (for current year)
2. SESARM emission inventories
3. Georgia Forestry Commission (GFC) fire records

4. National County Database for on-road and non-road emission inventories
5. ERTAC databases
6. Other reports and information that is available

The QA/QC procedures associated with each data source listed above will be reviewed by Georgia APB before the data is accepted for use. Georgia APB staff members have been actively involved in ERTAC and SESARM projects to ensure that the methodologies and QA/QC procedures are suitable for Georgia's emission inventory.

The Georgia APB will review EPA's draft NEI (for current year) before accepting estimates as Georgia submittal. One issue with EPA's draft NEI is that it does not cover all emission source categories. Therefore, Georgia APB will use the SESARM emissions inventory to perform gap-filling. In most cases, the SESARM emissions inventory has followed identical methodologies used for EPA's draft NEI. Some sectors may have more than one source of data. For examples, airport emissions for Hartsfield Jackson International Airport may come from the DOA directly while other airport emissions may be adopted from the latest SESARM inventory.

2.10 Data Management (EPA QA/R-5 B10)

Georgia APB will manage the data used in this project to preclude introducing errors that would result in an inaccurate emissions inventory. It is expected that all data inputs will be available from electronic data sets. After obtaining the necessary data, Georgia APB will convert the original data into the necessary formats, which include EPA's Consolidated Emissions Reporting Schema (CERS). Georgia EPD will ensure that the conversion of the original data is performed correctly via quality assurance checks that the total values reported in both data sets match. Georgia APB will run all data through available EPA quality assurance software to check for format and content errors. Byeong-Uk Kim, Di Tian, and Gil Grodzinsky will perform all manipulations of the data, at the direction of the Project Manager (Jim Boylan).

All final records and reports will be saved on the Air Protection Branch server with a back-up copy on an external hard drive located at 4244 International Parkway, Suite 120, Atlanta, GA 30354. Retention time will be seven years from the original EPA deadline.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments/Oversight and Response Actions (EPA QA/R-5 C1)

As part of the process, Georgia APB will perform its own internal review to ensure that all data are acceptable for use and that all necessary steps have been performed as planned. Byeong-Uk Kim, Di Tian, and Gil Grodzinsky will ensure QA via spot checks of each data transformation/calculation step. In addition, Georgia APB staff will review the resulting emission estimates and identify any potential anomalies. Project staff will prepare multiple emission summaries (e.g., state-level by pollutant, state-level by pollutant and source category) comparing the new emission estimates with previous inventories. If there are significant differences in the emissions (more than a factor of two), Georgia APB staff will review the data to determine if the differences are caused by methodologies and/or data sources. Georgia APB staff will also use available EPA inventory quality assurance tools on the emissions

inventory to identify any format, duplicate record, referential integrity, or data content issues that do not comply with EPA specifications. Finally, Georgia APB will create emission density spatial plots for each source sector and pollutant to visually compare emissions across counties. Georgia APB will correct any errors identified by these QA procedures.

3.2 Reports to Management (EPA QA/R-5 C2)

This element is not applicable to this project.

4.0 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements (EPA QA/R-5 D1)

Georgia APB will review all data before it is compiled into the final inventory. This review will ensure that the data has been downloaded correctly, and internally processed correctly. These reviews will include comparisons of pre-processed emissions with post-processed emissions. In addition, this project's emissions estimates will be evaluated for accuracy by comparing them with previous inventories. If there are significant differences in the emissions (more than a factor of two), Georgia APB staff will review the data to determine if the differences are caused by methodologies and/or data sources.

4.2 Verification and Validation Methods (EPA QA/R-5 D2)

Georgia APB will utilize EPA's EIS QA Environment to assist in data verification and validation.

4.3 Reconciliation with User Requirements (EPA QA/R-5 D3)

Georgia APB will compile potentially suspect entries identified from the methods described above for review by EPA.

5.0 REFERENCES

EPA, 1999: U.S. Environmental Protection Agency, National Risk Management Research Laboratory, "QAPP Requirements for Secondary Data Research Projects," Washington, DC, July 1, 1999.

EPA, 2001: U.S. Environmental Protection Agency, Office of Environmental Information, "EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5," EPA/240/B-01/003, Washington, DC, March 2001 (Reissued May 2006).

EPA, 2002: U.S. Environmental Protection Agency, Office of Environmental Information, "Guidance for Quality Assurance Project Plans, EPA QA/G-5," EPA/240/R-02/009, Washington, DC, December 2002.

EPA, 2006: U.S. Environmental Protection Agency, Office of Environmental Information, "Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4", EPA/240/B-06/001, Washington, DC, February 2006.