

## **Appendix C**

Draft Quality Assurance Project Plan (QAPP) for the AQMP



# **QUALITY ASSURANCE PROJECT PLAN FOR ST. LOUIS AIR QUALITY MANAGEMENT PLAN PROJECT**

**October 2008 – September 2012**

**Prepared by the  
Missouri Department of Natural Resources  
Division of Environmental Quality  
Air Pollution Control Program**

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**Distribution List**

- Jeffrey D. Bennett – Project Manager, Air Pollution Control Program
- Rob Kaleel – Illinois Environmental Protection Agency
- Adel Alsharafi – Technical Staff, Air Pollution Control Program
- Assem Abdul – Technical Staff, Air Pollution Control Program
- Bern Johnson – Technical Staff, Air Pollution Control Program
- Calvin Ku – Chief, Air Quality Analysis Section, Air Pollution Control Program
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- Jim Kavanaugh – Staff Director, Air Pollution Control Program
- John Madras – Quality Assurance (QA) Manager, Division Level



**QUALITY ASSURANCE APPROVALS**

QA Manager \_\_\_\_\_  
Signature Date

**PROGRAM APPROVALS**

Director, APCP \_\_\_\_\_  
Signature Date

Project Manager, APCP \_\_\_\_\_  
Signature Date

**A. Project Management**

**1. Project/Task Organization**

Personnel involved in the St. Louis Air Quality Management Plan development implementation are listed in Table 1. Since the AQMP project is a combined effort between the Missouri DNR and the Illinois Environmental Protection Agency, there is significant overlap between the organizations in the plan development and ultimately in the use of the plan. This grant is funding a portion of the Missouri efforts including plan development, technical contracting, and community outreach for the project.

TABLE 1: St. Louis Air Quality Management Plan Personnel

Individual	Role in Project	Organizational Affiliation
Jeffrey D. Bennett	Grant Project Manager	MDNR/DEQ/APCP
John Madras	Division of Environmental Quality QA Manager	MDNR/DEQ
Assem Abdul	Emissions and Photochemical Modeling	MDNR/DEQ/APCP
Adel Alsharafi	Emissions and Photochemical Modeling	MDNR/DEQ/APCP
Rebecca Birke Scheuler	Community Outreach	MDNR/DEQ/APCP
Gilberto Alvarez	Partner, Overall AQMP Coordination	EPA Region V
Gwen Yoshimura	Partner, MO SIG Project Officer	EPA Region 7
Mike Coulson	Partner, Community Outreach	East West Gateway Coordinating Council
Rob Kaleel	Partner, Illinois Technical Lead, Inter-state Coordination	Illinois EPA
Contractor	Independent QA for Air Toxics Emission Data or Development of Air Toxics Emission Data	To be determined

Project manager is responsible for submission of EPA quarterly reports, development of final AQMP, development of request for proposal for contract effort, supervision of emission and photochemical modeling activities within MDNR, inter-state and outreach coordination.

Internal modeling staff will be primarily responsible for creation of the databases and information to make control decisions along with evaluation of the results using the new AQMP paradigm (human health and risk assessments).

Community outreach personnel from MDNR and East West Gateway will be primarily responsible for coordination of stakeholder meetings (Coulson) and media and other specific outreach for the community (Birke Scheuler).

Other outside agency staff will continue to be involved in the development of the AQMP and coordination of the effort (Alvarez) along with on-going coordination and shared responsibilities for the technical efforts required under the AQMP (Kaleel).

## **2. Problem Definition/Background and Objectives**

The AQMP project began in summer 2007 for three distinct pilot areas in the country: the states of New York and North Carolina along with St. Louis (Missouri and Illinois). These three pilot areas were asked to consider a multi-pollutant approach to air quality management. This new approach stemmed from a Clean Air Act Advisory Committee recommendation to EPA that a new approach to air quality planning was needed.

The St. Louis AQMP project is designed to develop and implement a new air quality management paradigm for the St. Louis area. In the past, State Implementation Plans (SIPs) in St. Louis were developed for each individual pollutant with limited evaluation of other on-going air quality issues. The new AQMP is designed to provide a multi-pollutant evaluation framework that will allow for the development of control strategies for multiple criteria pollutants with a portion of the control evaluation designated to reduction of air toxics exposure. The current problems are: (1) air quality that does not meet air quality standards in St. Louis, (2) inefficient regulatory actions resulting from several different air quality goals/requirements, (3) uncertainty for the regulated community (e.g. are the controls for ozone sufficient for PM<sub>2.5</sub>), (4) limited community and stakeholder involvement in the air quality management process, and (5) substantial air toxics exposure in the St. Louis community. The development and implementation of the AQMP will allow these issues to be addressed using this new planning construct. The AQMP will allow for multiple pollutants to be evaluated simultaneously with a focus on the human health impacts for each pollutant and the combination of all pollutants including air toxics. During this evaluation, decision makers and the community will identify priorities for air quality in St. Louis that will be used during the development of necessary controls. The AQMP will also attempt to consider a myriad of ancillary air quality issues in the development of the SIP including smart growth/transportation planning, environmental justice, and climate change. The overall objective of the AQMP project is to develop and utilize this new plan for the submittal of required plan(s) to EPA while conducting outreach to the community.

## **3. Project/Task Description**

The St. Louis AQMP project has been on-going since late 2007 with the development of intermediate products focused on completing the AQMP by December 2009. The development of the AQMP is just the first step in the process and will lead to its use in the development of a SIP for each state (Missouri and Illinois) that will meet the requirement of the Clean Air Act. Table 2 is included to provide a summary of all tasks dedicated to the development and implementation of the AQMP. This table along with a detailed explanation of the tasks is included in the workplan for the State Innovation Grant funding along with the overall objectives and goals of the project. The workplan is attached for reference. Many of the tasks in the early phase of AQMP development and implementation are designed to provide training on the relevant tools to be utilized in the project. Nearly all the tasks do not require the creation or collection of primary data (emissions, air quality concentrations, etc.). Most tasks take existing data from other sources and utilize it in a computer modeling construct. The training of staff on these "new" modeling tools is of critical importance to the AQMP effort. All the models utilized in the AQMP project will be EPA-approved and have gone through a sizable amount of peer review and evaluation. This project is not designed to create a new model or modeling construct for use

by the states.

REF

Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
1	Development of AQMP work plan including input from both states, Regional Offices, OAQPS, and stakeholders	Submit workplan to USEPA (submitted on 1/15/08 - attached)	10/07	1/08
2	Development of AQMP document that provides the current status of St. Louis with respect to current air quality, planning activities, problems, outreach efforts, SIP history	Submit summary to USEPA (final draft summary was submitted on 5/22/08 - attached)	1/08	6/08
3	Development of AQMP document that provides the conceptual model for the project including discussion of individual pollutant formation, planning activities/outreach	Submit conceptual model to USEPA (submitted in January 2009)	5/08	9/08
3B1	Development and submittal of draft QAPP for creation and implementation of the St. Louis AQMP	Submittal of draft QAPP for the project to USEPA (this document)	10/08	1/09
3B2	Development and submittal of final QAPP for creation and implementation of the St. Louis AQMP	Submittal of final QAPP for project to USEPA	1/09	2/09(?)
4	Development of the tools necessary to begin the AQMP technical work including air toxics inventory creation, quality assurance, and subsequent analyses, emission model training and construct/data transfer, and photochemical model training/transfer (including air toxics)	Detailed under each sub-task	7/08	10/12



Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
4.1 Air Toxics Inventory	Obtain and process for use air toxics inventory information from Missouri/Illinois sources along with EPA National Toxics Inventory database for point, area, and mobile sources as a template for AQMP use	Template to develop air toxics inventory for use in photochemical modeling and inventory analyses	7/08	10/09
4.1.1 Emission Model Construct Transfer/Training*	EPA-OAQPS has developed an emission modeling construct to process air toxics inventory information from a wide variety of sources that is critical for use in this project; transfer of this construct from OAQPS along with guidance and support for its use in St. Louis	Transfer of information from EPA-OAQPS and trained technical staff (with guidance from EPA)	7-8/08	1-3/09
4.1.2 Upgrade Missouri Inventory System for Air Toxics**	Change in coding necessary to support air toxics inventory improvement for stationary sources in Missouri's current Emission Inventory System (MIEIS); will require contract (\$10,000); output will be a modified system that will track VOC, HAPs, and PM emission units independently instead of VOC/HAP and PM/HAP as currently done	Improved inventory system for ease of facility entry of emission information, improved quality assurance of plant-provided toxic data, and data analyses/storage capability	10/08	10/09
4.2 Photochemical Modeling Transfer/Training**	EPA-OAQPS has developed (is developing) an air quality (photochemical) model to evaluate ozone, PM, and air toxics using the same model/inputs; transfer of this model to allow for a comprehensive evaluation of all relevant pollutants in St. Louis	Transfer of information from EPA-OAQPS and trained technical staff (with EPA guidance)	10/08	4-6/09

\* Portion of task funded by SIG \*\* All task funded by SIG

Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
5	Development of the plan entails considerable public outreach, incorporation of technical information, policy discussions between the relevant agencies and stakeholders, and ultimately decisions about what are air quality priorities in St. Louis (how can we reach them)	The AQMP submitted to USEPA	12/07	12/09
5.1	Meetings with local community to begin the education process about AQMPs; meetings with AQMP team, stakeholders and internal management to discuss technical policy issues related to the AQMP; formal public comments/hearing on the plan	Several meetings have been conducted to inform the community about the AQMP; meeting summaries; documented revisions to the AQMP; Missouri Air Conservation Commission adoption of the AQMP	12/07	12/09
5.2	Incorporate experience with model constructs and processes from Task 4 into the AQMP structure	Discussion within the AQMP about problems/solutions, concepts to be included, start of documentation regarding transfer of data to others	4-6/09	10/09
5.3	Decisions by the agencies with substantive stakeholder input regarding the prioritization of air quality problems within the area, resource allocation, staffing, etc.	Discussion within the AQMP about resources, air quality priorities, funding issues, etc.	8/09	10/09

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Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
6	The AQMP will dictate that the area will continue to address air quality problems and the methodology utilized for environmental control decisions (including technical products that will be considered)	Technical outcomes (reports, memoranda, etc.) designed to inform decision-making on environmental controls in St. Louis	12/08	10/12
6.1	After the modeling constructs are implemented, the next step is the generation of new SIP technical products including criteria pollutant and toxics inventory creation, processing of emissions and other input data for use in the air quality modeling system (meteorological, air quality, etc.)	Detailed in each subtask	12/08	10/12
6.1.1	After the "new" modeling constructs have been transferred, an RFP will be created for assistance in the development of the emission inventory and modeling databases for the AQMP process; the contract will be for \$100,000 (this amount will not fund the whole effort, assistance only)	Completed RFP for modeling assistance	12/08	3-5/09
6.1.2	Evaluation of the RFP and completion of the contractor selection culminating in the negotiation and finalization of the contract	Documentation of contract process and selection of contractor for this project and final contract for use	7/09	9/09

\* Portions of the task funded by SIG      \*\* All task funded by SIG

Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
6.1.3 Selection of Modeling Database (year, domain, etc.)*	Selection of the new modeling inventory year and database including domain size(s) for evaluation of criteria pollutants and air toxics (the outcome of this task will drive the remainder of the process and will need to be thoroughly discussed with EPA OAQPS and the Regional Offices and will be based on available EPA guidance for the new NAAQS)	Technical document detailing decision and rationale	9-10/09	
6.1.4 Development of Baseyear Emission Inventory**	Obtain available emission inventory data from states, regional planning organizations, and EPA for criteria and air toxics pollutants (e.g. National Toxics Inventory); develop Missouri/St. Louis information then, process these data to develop the model-ready inventory database for this project (majority of contract funding will be expended here)	Model-ready emission inventory database	Early 2010	Mid-2011
6.1.5 Development of Other Baseyear Inputs	Development of air quality, meteorological, and other photochemical modeling inputs	Model-ready database	Early 2010	Mid-2011
6.1.6 Baseyear Air Quality Modeling*	Development of air quality model that sufficiently predicts the monitored concentrations to be used in control strategy development (iterative process with inventory and other input development)	Air quality model ready for consideration of control strategy development	Mid-2010	Mid-2011

\* Portions of the task funded by SIG      \*\* All task funded by SIG

Table 2 - Schedule of Major Project Tasks

Task Name	Task Description	Outputs Expected	Start Date	End Date
6.1.7 Development of "Attainment" Year Emission Inventory	Obtain available growth and control projection information from sources in 6.1.4; develop Missouri/St. Louis information; process data for inclusion in photochemical model	Model-ready future year (base) emission inventory database	Mid-2011	Late 2011
6.1.8 Control Strategy Sensitivities*	Evaluate control strategies designed to achieve air quality goals in the photochemical model	Data used to support control decisions	Late 2011	10/12
6.1.9 Air Toxics Reporting**	Detailed evaluation of air toxics exposure to the citizens of the St. Louis area based on the findings of 6.1.7 and 6.1.8.	Separate technical memorandum evaluating air toxics exposure in St. Louis	Late 2011	10/12
6.2 Monitoring Data Evaluation	On-going evaluations of ambient monitoring data in the St. Louis area utilized to identify problems and potential source contributions for all pollutants, including air toxics in 6.1.9	Reports regarding monitoring data	10/08	10/12
7 Transfer of AQMP Data/Procedures to Other Agencies**	Task is designed to allow other regulatory agencies to evaluate the benefits/problems of the multi-pollutant AQMP approach through the plan itself and a narrative regarding issues associated with this approach compared to the current approach	Report on the efficacy of the project including problems and solutions	7/12	10/12
8 Project Reports	Task is designed to provide quarterly and project completion reporting	Quarterly status reports to Region VII and final report documenting activities supported under the grant	1/09	10/12

\* Portions of the task funded by SIG

\*\* All task funded by SIG

#### 4. Quality Objectives and Criteria

The data quality objectives for the modeling portion of the AQMP project will be defined by the relevant modeling guidance from EPA. This guidance is pollutant-specific and identifies several criteria to use when determining the acceptability of the modeling results to pursue control strategy development. As one example, the current modeling guidance for ozone requires the evaluation of the model predictions compared to monitoring data within the region. These predictions are evaluated for bias, gross error, and peak accuracy. The criteria used to accept the results are as follows: peak accuracy +/-15 percent, bias +/-15%, and gross error 30 percent. The modeling outputs will be evaluated by the air quality modeling team for the project to decide if the model is “ready” for control development. This model performance evaluation process is iterative and traditionally requires different versions of the underlying inventory and meteorological modeling to be developed. Many different sensitivity analyses are likely to be conducted for the St. Louis area including toxics, PM2.5, and ozone analyses. The ultimate objective for any modeling exercise used to inform public policy is a confidence in the results that is driven by the technical validity of the study. This confidence must be sufficient to withstand substantial scrutiny by stakeholders and the public.

The other portions of the study including the development of the inventories utilized in the modeling analysis will be governed by quality assurance procedures for that portion of the work. Inventory development will rely on EPA policy/guidance for data collection and the department’s internal QA measures for those data.

#### 5. Special Training Requirements/Certification

No specific certification will be necessary for the completion of the project.

Training for technical staff will be conducted throughout the project and will focus on the use of existing modeling tools that will include the “new” air toxics information.

#### 6. Documentation and Records

The data and input files for the modeling portion of the project will be maintained on the Linux modeling system within the department. Copies of this information will be provided to Illinois EPA and the two distinct EPA Regions (V and VII) as necessary. The data generated from this project will be extremely large (10s terabytes). The volume of the information will likely preclude sharing all the data, but the files utilized in the final model performance evaluation along with the necessary documentation regarding models, input data, and sensitivity analysis will be provided as the project progresses. The technical staff will be responsible for the retention of the data and the documentation. The final modeling products (including human exposure) will be shared with the stakeholders and community along with a detailed explanation of the procedures utilized for their development.

### B. Measurement/Data Acquisition

#### 1. Sampling Process Design

The sampling utilized in this project is already governed by a separate set of QAPP documents. The

department has monitoring QAPP for ozone, PM2.5, and air toxics in place. These documents will be utilized for QA of the sampling data.

2. **Sampling Methods Requirements**

N/A

3. **Sample Custody Requirements**

N/A

4. **Analytical Methods Requirements**

N/A

5. **Quality Control Requirements**

N/A

6. **Instrument/Equipment Maintenance and Calibration Requirements**

N/A

7. **Inspection/Acceptance Requirements for Supplies and Consumables**

N/A

8. **Data Acquisition Requirements**

All data utilized in the project from external sources (meteorological and emission data) will be obtained from either EPA-approved national databases or more specific information from the appropriate state or regional governing bodies that collect and analyze such information. The emission inventory data is typically provided to the regional planning organizations from each state agency. The use of this data is necessary and is generally regarded as the best available information for air quality planning activities.

9. **Data Management**

C. **Assessment/Oversight**

1. **Assessment and Response Actions**

Assessment of the modeling data for the AQMP project will be an on-going activity. Each pollutant will be assessed for performance and adjustments will be made to the modeling input files by the modeling team for the project. The outcomes of these assessments are extremely important to move the AQMP implementation forward. The response to the findings of each assessment will depend on the nature of the problems or issues with the data. There is no way to predict the outcome before the analysis is

conducted.

**2. Reports to Management**

The department's management will be briefed on a quarterly basis with respect to the AQMP process and the on-going efforts for its implementation. Management will need to make the ultimate control decisions in concert with the stakeholders and IEPA management to achieve the regulatory goals.

**D. Data Validation and Usability**

**1. Data Review, Validation and Verification Requirements**

**2. Validation and Verification Methods**

**3. Reconciliation with Data Quality Objectives**



**Appendix A**  
**Acronym Listing**

APCP	Air Pollution Control Program
AQMP	Air Quality Management Plan
DEQ	Division of Environmental Quality
EPA	U.S. Environmental Protection Agency
MDNR	Missouri Department of Natural Resources
QA	Quality Assurance
QAPP	Quality Assurance Project Plan

A

D

Department of Natural Resources/Division of Environmental Quality  
Organizational Structure and Other Project Links



