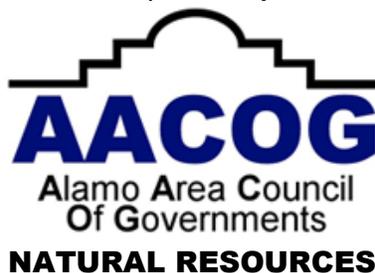


Commercial Fuel Combustion Emission Inventory in San Antonio-New Braunfels MSA

QUALITY ASSURANCE PLAN CATEGORY LEVEL III: SECONDARY DATA

November 13, 2015

Prepared by:



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The content, findings, opinions and conclusions are the work of the author(s) and
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APPROVAL SHEET

This document is a Quality Assurance Project Plan (QAPP) for the Area Source Commercial Fuel Combustion Emission Inventory for the San Antonio-New Braunfels MSA. AACOG has prepared this QAPP for the Texas Commission on Environmental Quality (TCEQ) in accordance with the EPA's National Risk Management Research Laboratory (NRMRL) Category III QAPP requirements for secondary data projects. This QAPP is in effect for the duration of this project.

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During the course of the project, any revision to the QAPP will be circulated to everyone on the distribution list. Paper copies need not be provided to individuals if equivalent electronic information systems can be used.

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1. PROJECT DESCRIPTION AND OBJECTIVES

1.1. Area Source Commercial Emission Inventory

This study will involve calculating an emission inventory for the non-point (area) businesses and organizations in the commercial sector, sometimes referred to as “commercial/institutional,” as defined by the EIA.

According to the EIA, the commercial sector “consists of service-providing facilities and equipment of businesses” to include government, public and private organizations (religious, social, or fraternal groups), institutional living quarters, and sewage treatment facilities. Common uses of energy associated with the commercial sector include “space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment.” In addition, “this sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.”¹

“Non-point” or “area” refers to stationary businesses and organizations that are not self-reporting as a result of federal mandate, so this inventory supplements the point (self-reporting) emission inventory.

1.2. Purpose of Study and Project Objectives

The Clean Air Act is the comprehensive federal law that regulates airborne emissions across the United States. The Clean Air Act charged the U.S. Environmental Protection Agency (EPA) with establishing National Ambient Air Quality Standards (NAAQS) to protect public health. In response, the EPA has set standards for six common air pollutants that are known to cause adverse effects on human health. The six pollutants are known as “criteria pollutants.” Criteria pollutants include ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead. Select air monitors in Texas are calibrated to measure concentrations of ozone, and in Bexar County (San Antonio), ozone has been recorded in concentrations above the 2008 75 part per billion (ppb) national standard. However, the timing of the violations in recent years was late enough in the NAAQS review cycle that the region was not designated as a nonattainment area. Since the EPA announced a more stringent ozone standard of 70 ppb on October 1, 2015, local ozone concentrations will continue to present a challenge to state and local governments that, collectively, represent the air quality planning body for the San Antonio area.

The purpose of this study is to provide local, current air quality information suitable for analysis, forecasting, and decision making. Local and state air quality planners need an accurate account of ozone pre-cursor emissions to conduct analysis that determines the emission reductions required to bring the area into compliance with the National Ambient Air Quality Standards. The

¹ EIA. (n.d.). Glossary. Available: <http://www.eia.gov/tools/glossary/index.cfm>.

compilation of the commercial emission inventory will provide updates to the regional and state inventory, providing a greater understanding of the impact on local air quality. By understanding the various sources of ozone precursor pollutants, planners, political leaders, and citizens can work together to protect health and the environment.

The objectives of this study include:

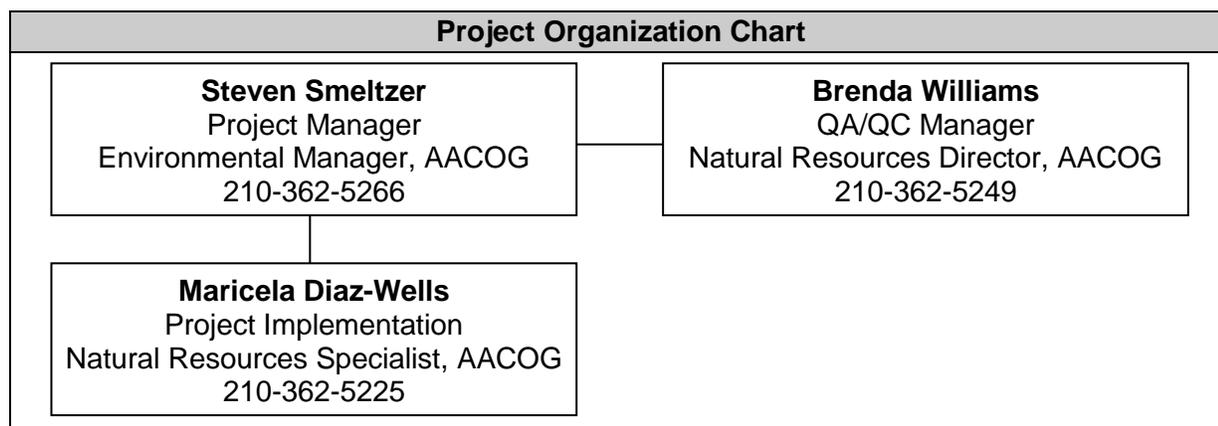
- Developing a 2014 base year and a 2020 or 2023 and 2025 projection year (or any other applicable years) emission inventory for non-point commercial and institutional businesses and organizations for the San Antonio-New Braunfels MSA;
- Documenting data, procedures and emission inventory results in a final technical report; and
- Creating baseline and future year electronic files appropriate for input into TCEQ-selected photochemical modeling episodes.

2. PROJECT RESPONSIBILITIES AND ORGANIZATION

2.1. Project Participants and Responsibilities

Participant	Responsibility
Steven Smeltzer	Project Manager. Ensures the project implementation follows all contract requirements and that project quality standards are met on all deliverables. In addition, the project manager will assist in interactions with TCEQ as required.
Brenda Williams	QA/QC Manager. Responsible for implementing project review and quality assurance
Maricela Diaz-Wells	Project Implementation. Responsible for collecting and analyzing data and writing the technical report.

In addition, TCEQ staff will participate in the review of the technical documentation generated during this project.



2.2. Project Schedule

Work Element	Deliverable Date
Deliverable 3.2.1: QAPP	Unassigned
Deliverable 3.2.2: Final Report and Model Input Files Draft report and draft model input files Final report and final model input files	July 30, 2017 August 31, 2017

3. SCIENTIFIC APPROACH

3.1. Data Needed

The data needed to estimate the commercial emission inventory includes:

- Activity by fuel type
- Emission factors by fuel type
- Point source database(s)
- Spatial and temporal allocation factors
- Growth factors

In addition, a literature review, internet research, and possibly peer outreach will be conducted to determine the best method for calculating the emission inventory and for discovery of any unknown data sources.

3.2. Sources of Data to be Used

The sources of data to be used were selected based on historical methods used in the following studies:

- Area Source Industrial Fuel Combustion Emissions in San Antonio-New Braunfels Metropolitan Statistical Area for 2012 and 2018; Alamo Area Council of Governments (August 20, 2015)
- Area Source Industrial Fuel Combustion in Austin-Round Rock Metropolitan Statistical Area for 2006; Capital Area Council of Governments (July 2013)
- 2012 and 2018 Emissions Updates for CAPCOG Region and Milam Counties; Capital Area Council of Governments (December 2013)
- Area Combustion Source Emissions Inventory Improvement Methodology; prepared for TCEQ by E.H. Pechan and Associates (March 2009)
- A Procedure for Estimating Nonpoint Source Air Pollutant Emissions from Industrial, Commercial, and Institutional Fuel Combustion; Andrew Bollman, Jonathan Dorn, Frank Divita, and Roy Huntley (n.d.)
- CenSARA Area Combustion Emissions Inventory Enhancement Project Final Report; prepared for CenSARA by Eastern Research Group; (October 31, 2012)

3.2.1. Activity by Fuel Type

Since emissions are a product of fuel combustion, the activity used to quantify emissions is fuel consumption. The types and quantity of energy consumed is available through the EIA's State Energy Data System (SEDS). Fuel types will be assigned according to the EPA's Source Classification Codes.

3.2.2. Emission Factors for Fuel Types

Emissions factors used in the study will be based on the EPA's AP-42: Compilation of Air Pollutant Emissions Factors and those used in the EPA's National Emissions Inventory (NEI).

3.2.3. Point Sources

AACOG will identify point sources using State of Texas Air Reporting System (STARS) and/or TCEQ's point-source site level summary report published on the Point Source Emission Inventory webpage in conjunction with employment data. Employment data sources are also used for spatial allocation and are discussed in more detail in the next section.

3.2.4. Spatial and temporal allocation factors

AACOG will obtain a report from the Texas Workforce Commission (TWC) that can be used for spatial allocation. This report provides location, industry classifications (NAICS), and number of employees per employer in the AACOG region. AACOG may also use for spatial allocation the U.S. Census Business Patterns, which provide industry classifications (NAICS) and the number of employees per county. AACOG will use NAICS industry sectors 42-99 to isolate the commercial/institutional sector.

Monthly and weekly temporal files will be determined based on the AACOG region's historical ozone season, the EPA's default monthly profiles used for the CAIR modeling platform, or any other source that would more accurately reflect annual consumption cycles.

3.2.5. Growth factors

Growth factors are needed to project the emissions inventory to a future year. AACOG will base growth factors on percentages calculated using EIA's Annual Energy Outlook.

4. QUALITY METRICS

The quality requirements of the secondary data include (1) audits of data quality and (2) a report of findings. Audits of data quality require that 10 percent of the data sets be audited for accuracy. If any problems are found, then all data sets will be audited. This includes independent verification of every spreadsheet or automated calculation and the percentage shown of manual calculations. A report of findings is required in the final report.

In addition, a disclaimer will accompany any project deliverable to indicate that the quality of the secondary data has not been evaluated by the EPA. It will read, "The quality of the secondary data has not been evaluated by the EPA for this specific application."

5. DATA ANALYSIS, INTERPRETATION, AND MANAGEMENT

5.1. Data Reporting Requirements

Data must be reported for ozone season daily emissions by county for the base year and for the projected year. The following is the planned method of approach:

1. The first step is to calculate the number of area source employees per county, selecting only commercial NAICS.

$$\begin{aligned} \text{No. of County Employees} &= \\ \text{Total No. of County Employees} &- \text{No. of Point Source County Employees} \end{aligned}$$

2. Then, annual emissions per county are calculated for the base year using the state activity, emission factors, and number of employees.

$$\begin{aligned} \text{Base Year Annual Emissions} &= \\ \text{Base Year Activity} * \text{Emission Factor} &* (\text{No. of County Employees} / \text{No. of State Employees}) \end{aligned}$$

3. Once the annual emissions are calculated, ozone season daily emissions can be calculated using the temporal profiles for the base year.

$$\begin{aligned} \text{Base Year Ozone Season Daily Emissions} &= \\ \text{Adjusted Base Year Annual Emissions} &* \text{Temporal Factors} \end{aligned}$$

4. Finally, the growth factors are applied to project future emissions.

$$\begin{aligned} \text{Future Ozone Season Daily Emissions} &= \\ \text{Base Year Ozone Season Daily Emissions} &* \text{Growth Factors} \end{aligned}$$

5. To spatially allocate emissions, the number of employees per geographic coordinate (facility) is classified into a 4-kilometer geographical grid cell using ArcGIS. Maps are then created using the emissions assigned to each grid cell.

5.2. Data Validity and Summarization

The sources of data selected for this study are considered to be reliable sources of secondary data. They have historically been used in similar studies and they are recommended in published reports issued for TCEQ.

Descriptive statistics may be used to describe and review the data, but other validation methods may also include:

- Subtotals, totals, and row counts will be used to verify that data exported from online data sources matches its original source.
- Excel pivot tables will be used to summarize and review data in different views to look for outliers and inconsistencies in data.

- Using Excel graphs, data will be compared to current emissions to test for reasonableness.

AACOG will also perform local research to determine if the activity reflects a complete picture of the activity in the region and to search for other local sources of data. Local sources of data are preferable because they are likely to provide more accurate results. In addition, results calculated using local data can also be compared to results calculated using state- or higher-level data.

5.3. Data Storage

All data and analysis will be stored on AACOG's server, which is backed up daily.

6. REPORTING

The required deliverables for task 3.2 under the contract (grant) # 582-16-30180 and PGA and notice to commence # 582-16-60849-01 are provided below:

- Deliverable 3.2.1: The Performing Party shall deliver a Category III QAPP for the Commercial Fuel Combustion Emissions inventory. The QAPP shall be delivered to the TCEQ in a Microsoft Office Word and Adobe Acrobat Reader (*.pdf) formats.
- Deliverable 3.2.2: The Performing Party shall prepare a report documenting the emissions inventory improvement project and provide the information necessary to update TCEQ modeling files. The deliverables shall also contain the appropriate “upstream” inputs that TCEQ can incorporate into its EPS3 processing efforts for photochemical model input. The report will describe the steps taken and any background the Performing Party feels is relevant to the project. The Performing Party shall provide the report in Microsoft Office Word and Adobe Acrobat Reader (*.pdf) formats. Any supporting data or information shall be provided in like format or in a format agreed to by the TCEQ and the Performing Party.