

# **Area Source Inventories**

## AREA SOURCE OVERVIEW

This section of the Technical Support Documentation (TSD) gives information describing how the Area Source Inventory is developed.

*Area Sources* are typically smaller, yet pervasive sources that do not qualify as point sources under the relevant emissions cutoffs. Area sources encompass more widespread sources that may be abundant, but that, individually, release small amounts of a given pollutant. These are sources for which emissions are estimated as a group rather than individually. Examples typically include dry cleaners, residential wood heating, auto body painting, and consumer solvent use. With the exception of certain oil and gas industry sources, area sources generally are not required to submit individual emissions estimates.

The main distinction between point and area sources is the methodology used to estimate emissions. Point sources are inventoried individually and area sources are inventoried collectively and given as county totals. The only exception to this distinction is based on Utah Administrative Code R307-150 which requires a triennial emissions inventory submission from “sources with Standard Industrial Classification codes in the major group 13 that have uncontrolled actual emissions greater than one ton per year for a single pollutant of PM<sub>10</sub>, PM<sub>2.5</sub>, oxides of nitrogen, oxides of sulfur, carbon monoxide or volatile organic compounds. These sources include, but are not limited to, industries involved in oil and natural gas exploration, production, and transmission operations; well production facilities; natural gas compressor stations; and natural gas processing plants and commercial oil and gas disposal wells, and ponds.”

The term “process” is used here to name an operation or activity that produces emissions. Area sources include broad groups of processes such as:

1. Commercial and consumer solvent usage;
2. Stationary fuel combustion;
3. Material storage and distribution;
4. Waste treatment and disposal;
5. Miscellaneous industrial manufacturing operations;
6. Miscellaneous sources (agricultural/forest burning, structure fires, mining, and construction);
7. Fuel distribution; and

## 8. Oil and gas industry sources.

Each of these broad groups of processes contains a number of more specific groups or categories that share similar emission processes and emission estimation methods.

This section includes reports for the categories included in the Area Source Inventory. Summary tables for 2017 of the area source.

Activity data is used to calculate area source categories. This data includes population, employment, VMT, fuel usage, animal, crop, oil and gas industry throughput submissions, and other estimates. A list of the individual data tables and sources of the data used in the calculation processes is included in the relevant Excel input workbook. This activity data workbook contains the activity data by county. The oil and gas database contains activity data from industry submissions while the oil and gas workbook contains emissions summations by category from database queries, applicable EPA/NOMAD (Nonpoint Methods Advisory group) oil and gas tool outputs and additional emissions estimates (“gap filling”). All databases and workbooks are available upon request

Excel workbooks and relevant oil and gas database files are available upon request. Area sources were adjusted for potential overlaps and double counts with point sources. Adjusted categories include bakeries, mining and quarrying, fuel combustion, industrial surface coatings, publicly owned treatment works (POTW), municipal landfills, etc.

Excel workbooks and relevant oil and gas database files are included for reference. The area source inventory workbooks contain annual outputs by source category code and by county from the main calculation workbook which draws activity data from the input workbook. The oil and gas inventory workbook gathers annual emissions information from database queries, EPA/NOMAD oil and gas tool outputs and gap filling emissions estimates. Emissions data from area source inventory, the oil and gas database, EPA/NOMAD oil and gas tool output and gap filling emissions are, thereafter, processed through SMOKE which adjusts the data for the desired episode and applies additional relevant controls.

The following database table and views were exported, joined using python and formatted for SMOKE: facilities list table (for geospatial data), centrifuges, dehydrators, fugitives, pneumatic controllers, pneumatic pumps, separators heaters, produced water injection, rice turbines, solid waste, tanks, truck loading, and well completions views.

# **INPUT DATA**

## **ACTIVITY DATA FOR ESTIMATION METHODS**

Emissions from area sources are nearly always estimated using some type of calculation procedure. Direct measurement of area source emissions is hardly ever practical because of technical and cost considerations.

There are four basic approaches for developing an area source emission estimate:

- \_ Extrapolation from a sample set of the sources (surveys, permit files, or other databases);
- \_ Material balance method;
- \_ Mathematical models; and
- \_ Emission factors applied to activity levels.

The calculation procedures determine what data is used to estimate the area source emissions. A list of the individual data tables and sources of the data used in the calculation processes is included in the relevant Excel input and oil and gas workbooks and the oil and gas database files. These data are used in the calculations to estimate emissions for area sources.

# SUMMARY TABLE

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The baseline (2017) area source calculation workbook is included in this submission along with several other workbooks and source files: an input workbook with activity data used in the calculation workbook, sources files (appendices) for the activity data, a model data workbook, and the oil and gas workbook and relevant database files. These files were used to generate outputs for use in SMOKE. Note that following table and views were exported from the database joined using python and formatted for SMOKE: facilities list table (for geospatial data), centrifuges, dehydrators, fugitives, pneumatic controllers, pneumatic pumps, separators heaters, prod water injection, rice turbines, solid waste, tanks, truck loading, and well completions views. The files are also included with this submission but have had jurisdictional assumptions, company names and facility names removed.

Included in the calculation and oil and gas workbooks, are the annual emissions that were input into SMOKE for the various area source categories. While they incorporate currently applied controls (with the exception of residential wood combustion rules), they do not include the effectiveness of any control strategies applied as a result of applicable proposed SIP controls. SMOKE also adjusts the area source and applicable oil and gas calculation workbook emissions from tons per year by county to the episode timeframe of interest as well as boundary/area of interest. An explanation of how the various area source categories were calculated is found in the “Area Source Categories” section of the TSD.

Sector	2017 Emissions (tons per day)		
	NOx	VOC	CO
Area Sources	0.43	13.66	0.91

## **AREA SOURCE CATEGORIES**

Individual reports for the area source categories are found in the category spreadsheets for the baseline year are included in the Excel area source calculation, oil and gas workbooks and the oil and gas database files. These spreadsheets calculate the emissions and contain a list of assumptions, emission factors, equations and references for the specific categories and are included in this submission. The oil and gas database consolidates throughputs and emissions from individual inventory workbooks submitted by oil and gas sources. A copy of the oil and gas workbook and instructions used by sources for their individual inventories is available upon request.

Some categories that are included in the workbook were not used in the SMOKE process because emissions from these categories do not occur in the county and/or during the time period of interest. The categories not included in are indicated by their absence in the SMOKE output.