

Massachusetts  
2011 Periodic Emissions Inventory of  
VOC, NO<sub>x</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and NH<sub>3</sub>

February 2018

**SECTION 2**  
**STATIONARY POINT SOURCES**

- 2.1 DESCRIPTION
- 2.2 NON-REACTIVE VOCs
- 2.3 METHODOLOGY: EMISSION  
ESTIMATION PROCEDURES

# SECTION 2

## STATIONARY POINT SOURCES

### 2.1 DESCRIPTION

This section inventories stationary sources with actual emissions greater than 1 ton per year for all facilities reporting under MassDEP's Source Registration program (310 CMR 7.12) for calendar year 2011. Data from all facilities that report under this program are submitted to EPA's Emissions Inventory System via the Central Data Exchange so they may be included in the National Emissions Inventory.

Emissions from minor sources not reported under Source Registration are covered in Section 3 – Stationary Area Sources. Where there are point source emissions available the point source emissions are deducted from area source emissions in the same category (e.g., degreasing and dry cleaning) in order to prevent double counting. Where there are point source combustion data available, the fuel amounts from the point source data are subtracted from the total state-wide fuel usage before the area source emissions are calculated. Fuel is subtracted rather than emissions because the point source emissions calculations are likely to be more accurate because some point source emissions are based on unit-specific emission factors or data.

Stationary point source data are reported by facilities through eDEP, MassDEP's on-line forms application. MassDEP mails a notice annually to major and minor sources such as factories, power plants, large business facilities, and institutions that are subject to the Source Registration regulation. Facilities report to MassDEP the amount and type of fuels, materials used, and emissions of the inventoried pollutants. All major and some minor sources with higher potential emissions report annually. Minor sources are required to report to MassDEP every three years, and so emissions for some minor stationary sources are not included in the 2011 inventory (instead, they are accounted for in the stationary area sources). See 310 CMR 7 for definitions of major and minor stationary sources and for applicability criteria for the Source Registration program.

Facilities are responsible for determining the emissions from each emission unit and reporting those emissions for each individual emissions unit. Facilities may select the method for estimating their emissions and are instructed to use the method that will be the most appropriate to their facility's equipment. The most common method for calculating combustion emissions involves the use of emission factors in combination with activity factors. The activity factor is the quantity of fuel used. The eDEP Source Registration forms have an auto calculation feature that uses a built-in table of EPA WebFIRE<sup>1</sup> emission factors that are based on source classification codes (SCC) related to the specific unit and fuel. Facilities must identify each unit and fuel by SCC and facilities may elect to use the auto calculation feature for combustion emissions or make the calculations themselves. Facilities are instructed to use unit-specific data/emission factors and to calculate their own emissions if subject to tighter restrictions that

---

<sup>1</sup> Available on-line. See: <http://epa.gov/ttn/chief/webfire/index.html>

would make the auto calculation method an over estimate. Similarly, facilities determine how best to estimate emissions from their non-combustion units. This estimation may use the materials balance or mass balance method, emissions and activity factors, or other methods. No auto calculation feature exists for process and incinerator emissions within the eDEP forms. Facilities must report the control equipment on each emissions unit and its effectiveness, and take these into account when calculating emissions for their units (or allow eDEP to do this for them with the auto calculation feature). Instructions for the Source Registration program provide examples of calculations to assist facilities in reporting.

Table 2-1 (below and in accompanying spreadsheet file) presents the stationary point source emissions for each criteria pollutant on an annual and seasonal daily basis for each county. The rest of this section describes the development of the stationary point source inventory including data collection, verification, and emission estimation techniques.

**TABLE 2.1**  
**2011 POINT SOURCE EMISSIONS SUMMARY BY COUNTY**

County Code (250XX)	County Name	VOC Actual Emissions (TPY)	VOC Actual Emissions (TPSD)	NO2 Actual Emissions (TPY)	NO2 Actual Emissions (TPSD)	CO Actual Emissions (TPY)	CO Actual Emissions (TPSD)	CO Actual Emissions (TPWD)	SO2 Actual Emissions (TPY)	PM10 Actual Emissions (TPY)	PM25 Actual Emissions (TPY)	NH3 Actual Emissions (TPY)
1	BARN	31.5	0.09	139.8	0.41	176.6	0.53	0.62	136.5	18.0	15.0	0.0
3	BERK	34.4	0.08	321.3	0.75	144.5	0.37	0.42	136.3	23.9	18.7	8.6
5	BRIS	338.0	0.91	3,128.8	8.29	1,191.7	3.19	4.10	18,904.0	201.8	123.0	34.2
7	DUKE	14.7	0.09	115.5	0.67	38.9	0.23	0.03	11.9	3.3	3.3	0.0
9	ESSEX	543.5	1.48	3,487.3	9.48	788.1	2.14	2.18	3,850.5	59.2	44.1	47.9
11	FRANK	63.8	0.17	176.4	0.48	76.0	0.21	0.21	218.0	40.3	15.0	1.0
13	HAMPD	555.1	1.49	1,032.5	2.84	503.5	1.35	1.54	1,068.0	136.3	80.6	74.2
15	HAMPS	98.9	0.27	109.2	0.30	80.8	0.22	0.22	56.0	44.4	34.8	8.5
17	MIDSX	703.7	1.96	1,508.3	3.93	708.5	1.97	1.77	321.5	194.9	114.6	34.9
19	NANTU	0.0	0.00	1.0	0.00	0.0	0.00	0.00	0.0	0.0	0.0	0.0
21	NORF	400.7	1.11	789.7	2.23	239.5	0.67	0.64	443.1	245.4	115.4	28.1
23	PLYM	201.4	0.54	1,587.4	4.36	528.3	1.40	1.44	594.3	43.8	11.9	0.0
25	SUFF	431.4	1.16	1,165.3	3.08	364.6	1.00	1.00	128.2	95.0	84.7	45.2
27	WORC	701.6	1.90	2,123.6	5.83	700.5	1.91	1.90	757.5	158.4	96.3	72.8
<b>STATE TOTAL</b>		<b>4,118.5</b>	<b>11.25</b>	<b>15,686.1</b>	<b>42.64</b>	<b>5,541.5</b>	<b>15.17</b>	<b>16.07</b>	<b>26,625.9</b>	<b>1,264.8</b>	<b>757.3</b>	<b>355.3</b>

TPY = tons per year

TPSD = tons per summer day

file: point/1.point source by county jan8 2014

file: ks/inv-2011/section 2 Point source by county nov 6 2014

## 2.2 NON-REACTIVE VOCs

Large non-combustion point sources submit to MassDEP an annual report of their VOC emissions. However, some of these VOCs are considered to be “non-reactive” and therefore do not contribute to ozone formation. MassDEP instructs facilities to exclude VOCs that are considered to be “non-reactive” for ozone purposes. The list of excluded VOCs may be found in the instructions for the Source Registration program APPENDIX A: DEFINITIONS under VOLATILE ORGANIC COMPOUND.<sup>2</sup>

## 2.3 METHODOLOGY: EMISSION ESTIMATION PROCEDURES

Emissions from a point source emission unit depend on its size, process type, and control equipment. Facilities may calculate actual emissions using methods as described in the instructions for the Source Registration program<sup>3</sup>. A facility may also use a method based on the particular characteristics of their units or monitoring data when available. Control equipment and its efficiency are also factored into the emission calculations.

- The most common method for calculating emissions from combustion sources involves the use of emission factors in combination with fuel use. Emission factors are applied to various types of activity data such as the quantity of fuel or materials used by a facility to calculate emissions. Facilities may use emission factors from EPA’s latest WebFIRE listing<sup>4</sup> or *Compilation of Air Pollutant Emission Factors, AP-42 Vol. 1 Stationary Point and Area Sources*<sup>5</sup>, or they may substitute equipment-specific factors.
- A materials balance or mass balance approach may be used for non-combustion sources in which materials such as solvents are used in the production process. Emissions are the difference between material input and output and evaporation of solvents in the application and drying processes.
- Source testing or stack sampling is a short-term measurement of emissions at a stack or vent that is used by a small number of sources as may be required by a permit.
- Continuous emission monitoring (CEM) involves long term source testing in which concentration data are converted to mass emission rates. Power plants and municipal waste incinerators are required to do CEM.

---

<sup>2</sup> INSTRUCTIONS, Detailed instructions for the on-line Source Registration forms. See:

<http://www.mass.gov/eea/agencies/massdep/service/online/how-to-file.html>

Also, on November 29, 2004, EPA issued a final rule (69F.R. 69298) revising its definition of VOCs to exclude tertiary butyl acetate (TBAC) for certain purposes based on its photochemical reactivity properties. Unlike the reporting requirements that apply to the “non-reactive” VOCs listed above, states are required by EPA to include TBAC in VOC emissions inventories. MassDEP instructs facilities to report TBAC separately from other “reactive” and “non-reactive” VOCs. As of 2002, EPA had not determined that TBAC should be treated as a “non-reactive” VOC for any purpose, so TBAC emissions are included in the “reactive” VOCs in this inventory.

<sup>3</sup> INSTRUCTIONS, Detailed instructions for the on-line Source Registration forms. See:

<http://www.mass.gov/eea/agencies/massdep/service/online/how-to-file.html>

<sup>4</sup> WebFIRE available on-line. See: <http://epa.gov/ttn/chief/webfire/index.html>

<sup>5</sup> *Compilation of Air Pollutant Emission Factors, AP-42 Vol. 1 Stationary Point and Area Sources*, EPA, OAQPS RTP. N.C.; See <http://www.epa.gov/ttn/chief/ap42/index.html>.

Data from source-specific emission tests or continuous emission monitors (CEMs) are usually preferred for estimating stationary source emissions because they provide the best representation of the tested source's emissions. However, test data from individual sources are not always available and they may not reflect the variability of actual emissions over time. Thus, emission factors may be used for estimating emissions, in spite of their limitations. Where facilities report CEMs-based emission data to EPA, MassDEP instructs them to ensure the emissions reported in Source Registration are consistent with those reported to EPA.

The MassDEP Source Registration forms require facilities to report operating schedules, seasonal throughput, days per week and weeks per year. MassDEP uses these data to determine the daily emission rates for the summer and winter periods reported here.

Tables for this section are provided in a separate file: Section 2 Stationary Point Sources 2011 – Tables.xls. Appendix Table 1 lists the point source emissions by facility for each of the pollutants inventoried. Appendix Table 2 lists emissions from power plants (also included in Appendix Table 1). The data from both tables are summarized by county in Table 2.1.