

Comparison of Toxic Air Pollutant Emissions from “Burn Barrels” and Major Industrial Sources in New Mexico

Notes

The [graphs](#) comparing toxic emissions for burn barrels to major industrial sources were created by NMED to support analysis of the impacts of trash burning in New Mexico. The data for major industrial emissions were obtained from the Toxic Release Inventory (TRI) database for the year 2000. The TRI data do not include all emissions of a given chemical, but they do include emissions from many of the major industries that handle or release toxic chemicals.

To understand what emissions are included in the TRI data, it's important to know that a facility must report emissions to the TRI program if:

- the facility is in any of these industry sectors: - manufacturing - metal and coal mining - coal- and oil-burning electrical power plants - hazardous waste treatment and disposal facilities - wholesale distributors of chemicals - petroleum refineries, bulk plants, and terminals - solvent recovery services - federal facilities;
- the facility has 10 or more full-time employees; and
- the facility manufactures, processes, or uses more than a threshold amount of any listed chemical.

Therefore, the emissions reported in the TRI do not include emissions from smaller industrial sources, from very small businesses, from households and consumer products, or from motor vehicles.

The TRI doesn't inventory some types of toxic chemicals emitted by burn barrels. More information on the TRI and updated data are available from the [E.P.A. Toxics Release Inventory web page](#).

The TRI doesn't inventory emissions from burn barrels. In order to calculate this information, NMED followed a methodology published as the Emission Inventory Improvement Program Volume III, Chapter 16, Open Burning (“EIIP” 1999). This methodology includes the following steps:

1. Year 2000 population of New Mexico areas which
 - are within Air Quality Bureau (AQB) jurisdiction; and
 - burn household refuse.

From 2000 Census data:

$$\begin{aligned} \text{Population in AQB jurisdiction} &= \text{NM population} - \text{Bernalillo Co.} - \text{Indian lands} \\ \mathbf{1,174,526} &= 1,819,045 - 556,678 - 87,841 \end{aligned}$$

2. Population burning refuse:

From the population of AQB jurisdiction, we subtract the population of Santa Fe, Los Alamos, and Rio Arriba Counties, because these have county-wide ordinances prohibiting open burning of household refuse (since this is for the year 2000, we did not account for local or county bans on refuse burning enacted since then, such as a recent ordinance in Sandoval County). We also subtract out all municipalities with a population greater than 3,000, because the original state *Open Burning* regulation already prohibited open burning of refuse in communities of this size.

We did not take into account that a few communities with a population less than 3,000 may either prohibit burning by ordinance or provide trash pickup service, which would make trash burning illegal according to the state regulation. We think that the effects of this are compensated for by our not being able to account for open burning of non-residential refuse (for example, by small businesses and institutions) and by illegal refuse burning where it is prohibited.

$$\begin{aligned} \text{Pop. in AQB jurisdiction which can burn} &= \text{Pop. AQB juris.} - (\text{Santa Fe, Los Alamos, Rio} \\ &\text{Arriba Cos.}) - (\text{all incorporated municipalities } > 3000 \text{ in other counties}) \\ \mathbf{443,704} &= 1,174,526 - 188,825 - 541,997 \end{aligned}$$

3. Amount of refuse generated, burned, combusted:

From data in the NM Solid Waste Bureau's 2000 Annual Report, the New Mexico per capita waste generation in 1999 was about 1.12 tons per person per year. This does not include construction and demolition waste or estimated waste generated by tourism). The U.S. EPA Office of Solid Waste estimates that about 60% of municipal solid waste is residential (that is, not commercial). Multiplying this percentage times New Mexico's rate would give about 0.67 tons per person per year of residential waste.

$$\text{Annual refuse generated} = 443,704 \text{ persons} \times 0.67 \text{ tons/person/yr} = \mathbf{297,282 \text{ tons/yr}}$$

We estimate that about 80% of this refuse is burned, with the other 20% going to solid waste disposal or recycling facilities, or being illegally dumped. This is our "educated guess" based on field experience, and uncertainty in this percentage is probably the greatest source of uncertainty in our emission estimates.

$$\text{Amount refuse burned} = 297,282 \text{ tons/yr} \times 0.80 = \mathbf{237,825 \text{ tons/yr}}$$

The portion of waste burned that is actually combusted is assumed to be 80% (from EIIP). The remainder is cans, bottles, ashes, and other noncombustible refuse.

Amount refuse combusted = 237,825 tons/yr × 0.80 = **190,260 tons/yr**

3. Pollutant emissions

Emissions are calculated by multiplying either the amount of refuse burned or the amount combusted by an Emissions Factor (EF) which gives the amount of the pollutant emitted per ton of refuse burned or combusted. EFs for open burning of refuse have been determined by actual measurements of emissions from test burns. We used the EF values given in the EIIP document.

Here are two examples:

- Carbon Monoxide Emissions = 237,825 tons refuse burned/yr × 85 lb carbon monoxide/ton refuse burned = 20,215,125 lbs/yr
- Benzene Emissions = 190,260 tons refuse combusted/yr × 2.48 lb benzene/ton refuse combusted = 471,845 lbs/yr