The U.S. Environmental Protection Agency
1999 National-Scale Air Toxics Assessment and
Louisiana's Air Toxics Program

Questions & Answers

The U.S. Environmental Protection Agency (EPA) completed its most recent National Air Toxics Assessment (NATA) on national health risk estimates for air toxics. The first version of the study utilized 1996 air toxics data and was released by EPA in 2002. The current study is a comprehensive evaluation of air toxics for the calendar year 1999. It includes an expansion of air toxics monitoring, improved emissions inventories, improved modeling, updated research on health effects and exposures to both ambient and indoor air, and improvement of assessment tools. The assessment consists of various components including emissions inventory data, modeled ambient concentrations and estimated risk exposures via inhalation. Processing all the information necessary to prepare the assessment is very labor intensive, requiring years to accumulate and assimilate the data into one report. Upon completion of the report, the assessment is then extensively reviewed at various levels prior to its public release. As technology advances, the agency hopes to shorten the timeline in providing the assessment to the public. Along those lines, the next version of the NATA study, which will incorporate 2002 data, is anticipated to be released in a shorter timeframe, nearer the end of 2006.

1. What are air toxics?

Air toxics, or toxic air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health problems. Health concerns may be associated with both short and long term exposures to these pollutants. Many air toxics are known to have respiratory, neurological, immune or reproductive effects, particularly for more susceptible sensitive populations, such as the elderly and children. Examples of these pollutants include benzene, xylene, toluene, methanol, and ammonia. The degree to which an toxic air pollutant affects a person's health depends on many factors, including the route of the exposure, quantity of pollutant, the duration and frequency of exposure, the toxicity of the chemical and a person's general health.

2. Why did EPA perform this study?

EPA developed this assessment for use as a screening tool to assist regulatory agencies and communities focus their air toxic priorities. It can be used to prioritize pollutants or emission sources and to identify areas of concern for further investigation. However, the EPA urges that the assessment not be used for regulatory purposes, for estimating risk at the local level, quantifying benefits of reduced air toxic emissions, or for identifying local problem areas.

3. What information is provided in the assessment?

The assessment provides a snapshot of air quality across the nation and the estimated cancer risks associated with those toxics if the air toxics remain unchanged from the 1999 levels. The assessment does not take into consideration any reductions in air toxics that have occurred since the 1999 data was collected.

The assessment estimates that the average cancer risk for 1999 is **43 in a million (1 in 20,800**), as a result of exposure to air toxics. This is comparable to the1996 study of 55 in a million (1 in 18,200). When all causes of cancer are taken into account, it is estimated that one out of three Americans will contract cancer during a lifetime. The average noncancer risk for 1999 is **6.4** (hazard index for respiratory), which is comparable to the 1996 study of 5.2 hazard index. A respiratory hazard index is an indicator that a potential may exist for adverse irritation to the respiratory system. The assessment estimates that persons living in urban areas (as opposed to rural areas) have a lifetime cancer risk greater than 25 in a million for air toxics. Additionally, persons living in transportation corridors have an even greater risk, 50 in a million, for developing cancer from air toxics exposure.

4. Which pollutants are covered in this assessment?

The assessment covers 177 out of 188 toxic air pollutants that are listed in the Clean Air Act, plus it now includes diesel particulate matter. For 133 of these air toxicswhere health-based data on chronic exposure exists, the study includes risk assessments of cancer and non-cancer for respiratory and neurological health effects (the 1996 study covered only 32 air toxics). The risks are associated with air toxics exposure from breathing the pollutants, and do not address other exposure pathways.

5. What were the results of the assessment?

The assessment indicates that benzene is the most significant air toxic for which cancer risks were estimated. At the state level, data for Louisiana also indicates that benzene is the cancer risk-driver. *Onroad* mobile sources (vehicles that are found on the roads and highways, i.e., cars, trucks, buses) were the key source category for benzene. These sources were followed by *non-road* mobile sources (vehicles not found on roads, i.e., airplanes, trains, lawnmowers, construction equipment, farm machinery) and *open burning* (prescribed burning and wildfires). According to the NATA report, these three sources represent 82% of benzene emissions in the environment.

For non-cancer respiratory risks, acrolein is presented as the most significant driver for risk at the national level. Open burning is the key source category for acrolein, which is also released as the result of manufacturing processes, combustion of petroleum fuels, as a component of cigarette smoke and as a photo oxidation product of hydrocarbon pollutants. However, Louisiana data indicate that chlorine is the most significant indicator for noncancer respiratory risk. Chlorine is used in the manufacture of many

everyday products such as paper products, dyestuffs, textiles, petroleum products, etc. It is used to produce safe drinking water around the world. It is also used in the manufacturing of chlorinated compounds for sanitation, pulp bleaching, disinfectants, and textile processing. For non-cancer neurological risks, mercury is the most significant chemical at both the national and state levels. Onroad mobile sources represent 56% of the source sector contributions for noncancer risks.

6. Does Louisiana have any additional regulatory programs on air toxics?

In 1991, the Louisiana Department of Environmental Quality (LDEQ) established regulations and a set of ambient air standards for the toxic air pollutants. The Comprehensive Toxic Air Pollutant Emission Control Program, formed under LAC 33:III.Chapter 51 regulates major sources of air toxics. Major sources of air toxics emit or have the potential to emit 10 tons per year of any single toxic air pollutant or 25 tons per year of any combination of the listed toxic air pollutants. Each year, these sources must submit their emissions in accordance with Louisiana's Toxic Emissions Data Inventory (TEDI) Program. The program requires all major sources to apply Maximum Achievable Control Technology (MACT) for emissions of all Class I or Class II toxic air pollutants above the minimum emission rates and to comply with ambient air standards for all three classes. Major sources that obtained minor source status prior to December 20, 1992, are also regulated. Chapter 51, Table 51.1 lists regulated toxic air pollutants by three class designations:

Class I:	known and probable human carcinogens
Class II:	suspected human carcinogens & known or suspected human reproductive toxins
Class III:	acute and chronic non-carcinogenic toxins

Approximately 280 regulated facilities submit inventory data on an annual basis for about 200 different toxic air pollutants. Since the initial reporting year, total toxic air pollutant emissions have decreased by approximately 64%.

Louisiana is one of only three states nationally to develop ambient air standards for toxics. These state standards are more stringent than those imposed by EPA. There are two averaging periods specified in these air standards including 8-hour and annual (Arithmetic Mean) average standards. The standards can be found in LAC 33:III.Chapter 51; Table 51.2.

LDEQ operates between 12 and 16 ambient air monitoring stations around the state for air toxics at any given time. Special purpose air toxics monitoring efforts may be of limited duration depending on a number of factors, therefore site locations may fluctuate from year to year.

7. Why are air standards based upon average concentrations?

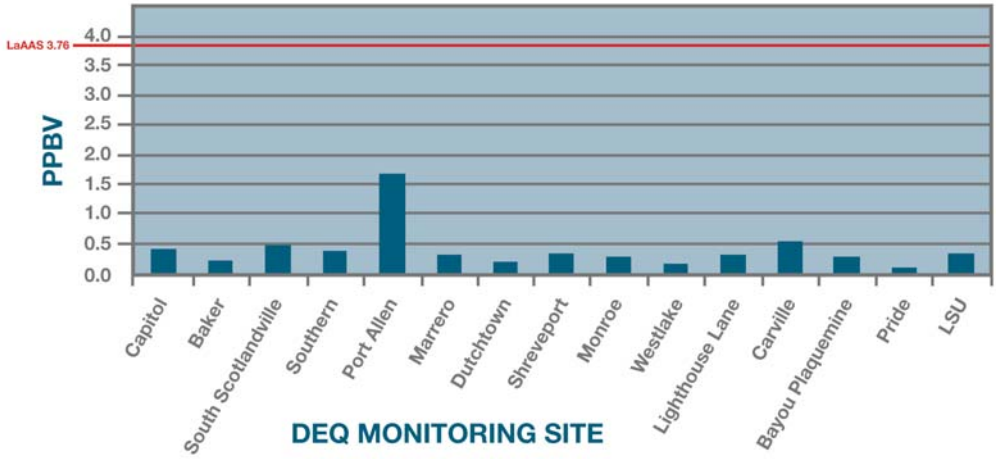
The concentration of all air pollutants are known to be highly variable. A single measurement of a pollutant at a given point in time may not be representative of the overall air quality. The concentration of a pollutant is affected by several factors including meteorological conditions, the number of pollutant sources in the area and the distance between those sources and the air monitor and the amount of naturally occurring background pollution. These factors can cause the concentration of a pollutant at a given location to change quite rapidly over a very short period of time. In order to determine a representative air quality reading, it is necessary to collect many air quality measurements over a specified period of time. These sets of measurements may be averaged together to determine a true representative reading.

8. What was the most predominant toxic pollutant for Louisiana?

Benzene is the predominant toxic air pollutant in Louisiana. Benzene is one of a family of chemicals known as volatile organic compounds or VOCs. It is a component of products derived from coal and petroleum and is found in gasoline and other motor fuels. Benzene is used in the manufacture of plastics, detergents, pesticides, and other chemicals. Benzene is also a major component in tobacco smoke. (Research has shown benzene to be a carcinogen with long term exposure to the chemical.) Because it is found in so many products benzene is a very common air pollutant. According to the NATA study, the majority of benzene pollution in the ambient air comes from on-road mobile sources such as motor fuel exhaust, non-road mobile sources and open burning. Although emissions from industrial sources have declined, the majority of emissions from on-road and non-road mobile sources have not. Additionally, open burning, which consists of prescribed and wild fires, has increased emissions in most recent years. Home use of solvents or gasoline, leaking underground storage tanks and automobile emissions are primary sources of *community exposure* to benzene. Normal ambient air concentration of benzene tend to average less than 1 part per billion statewide but it is not uncommon for benzene concentrations to be higher for brief periods of time.

As a measure to protect public health, the DEQ has established an ambient air standard for benzene of 3.76 parts per billion (mean annual average). This standard is partially based upon the most recent EPA risk assessment data for benzene. Currently, none of the ambient monitoring conducted in Louisiana has shown any exceedance of the state standard for benzene.

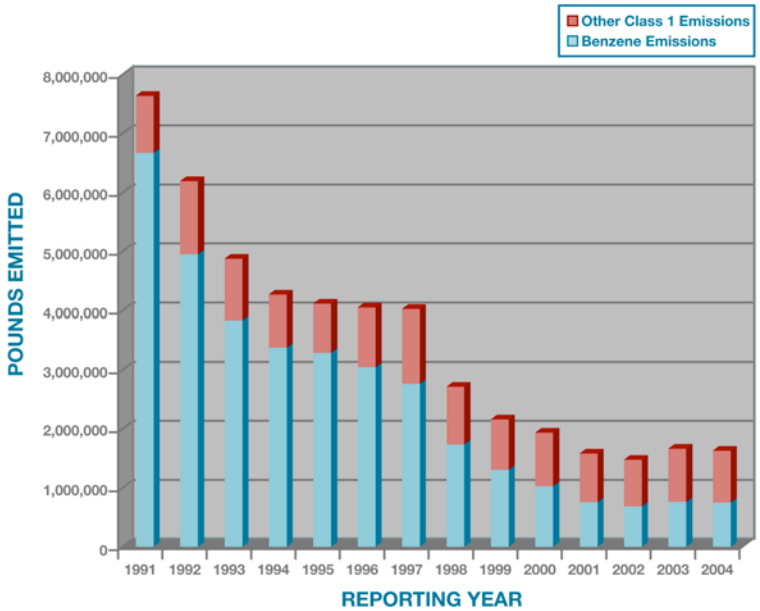
Figure 1 – Louisiana Ambient Air Monitoring Data for Benzene



LaAAS- Louisiana Ambient Air Standard for benzene at 3.76 ppbv (parts per billion by volume).

***Source: Louisiana Department of Environmental Quality Ambient Air Monitoring Data, 2004**.

Figure 2 - Benzene vs Other Class I Emissions from Industrial Sources

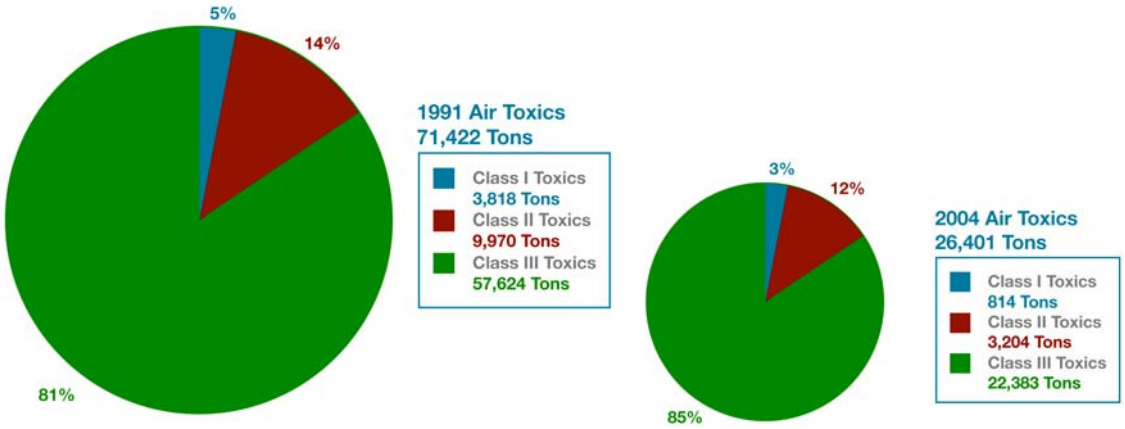


***Source: Louisiana Toxic Emissions Data Inventory (TEDI) database from Industrial Sources, 2004.**

Under the TEDI program, benzene is the predominant carcinogen reported annually. As shown in Figure 2, benzene emissions have steadily declined from 87% of all Class I chemicals in 1991 to 47% in the 2004 reporting year. In 1999, annual benzene emissions represented 60% of all Class I chemicals reported under TEDI.

Since the program's inception, industrial toxic emissions reported under TEDI have shown a steady decline since 1991. In 2004, Class I chemicals represented 3% of all emissions (see Figure 3) and have decreased from approximately 7 million pounds in 1991 to 1 million pounds in 2004 (Figure 4). Class II chemicals represented 12% of all emissions and decreased from 19 million pounds in 1991 to 6 million pounds in 2004. Class III chemicals represented the majority of TEDI emissions (85%) and have decreased from 115 million pounds to 43 million pounds. Figures 5, 6 and 7 show the top chemicals reported for 2004 in each of the classes.

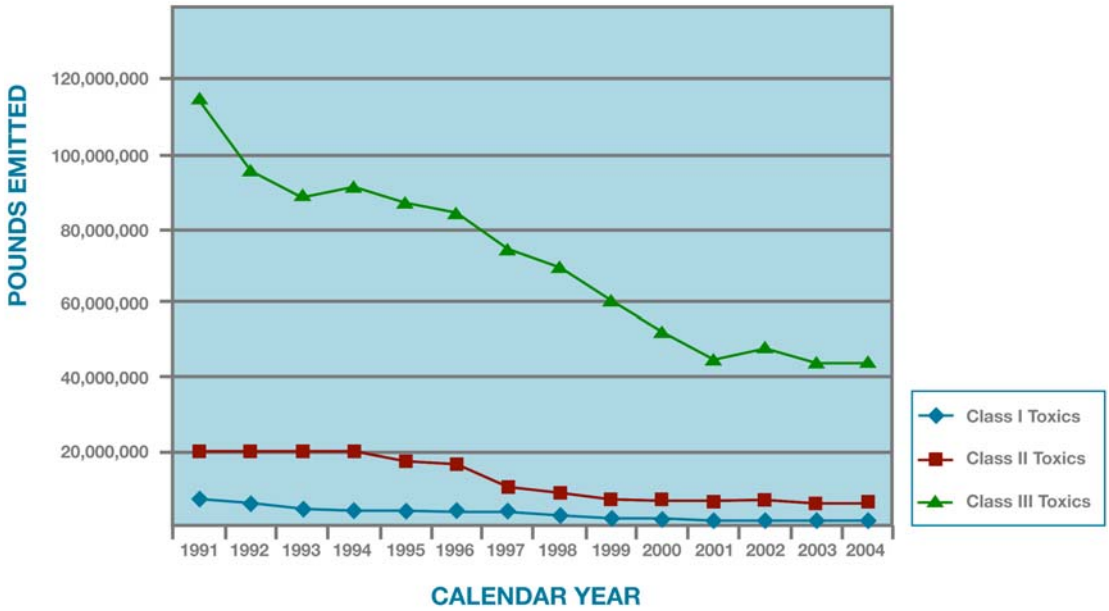
Figure 3 – Air Toxics Contribution By Class From Industrial Sources - 1991 vs. 2004



***Source: Louisiana Department of Environmental Quality TEDI database from Industrial Sources, 2004**.

Class I Toxics: known and probable human carcinogens
Class II Toxics: suspected human carcinogens & known or suspected human reproductive toxins
Class III Toxics: acute and chronic non-carcinogenic toxins

Figure 4 – Year-to-Year Trends of Class I, II and III Toxic Chemicals From Industrial Sources



***Source: Louisiana Department of Environmental Quality TEDI database from Industrial Sources, 2004.**

Figure 5 – Top Class I Toxics Emitted by Industrial Sources in 2004

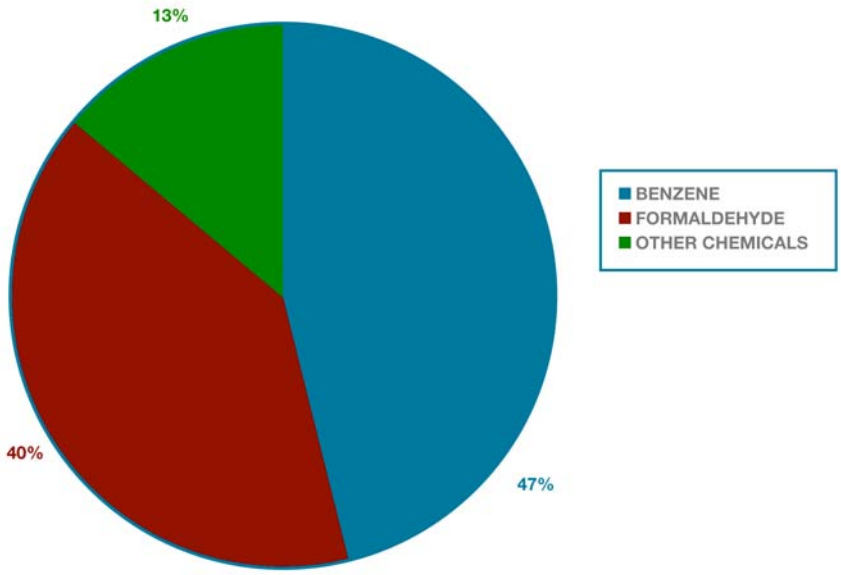


***Figure 5 Source: Louisiana Department of Environmental Quality TEDI from Industrial Sources, 2004**

Figure 6 – Top Class II Toxics Emitted by Industrial Sources in 2004

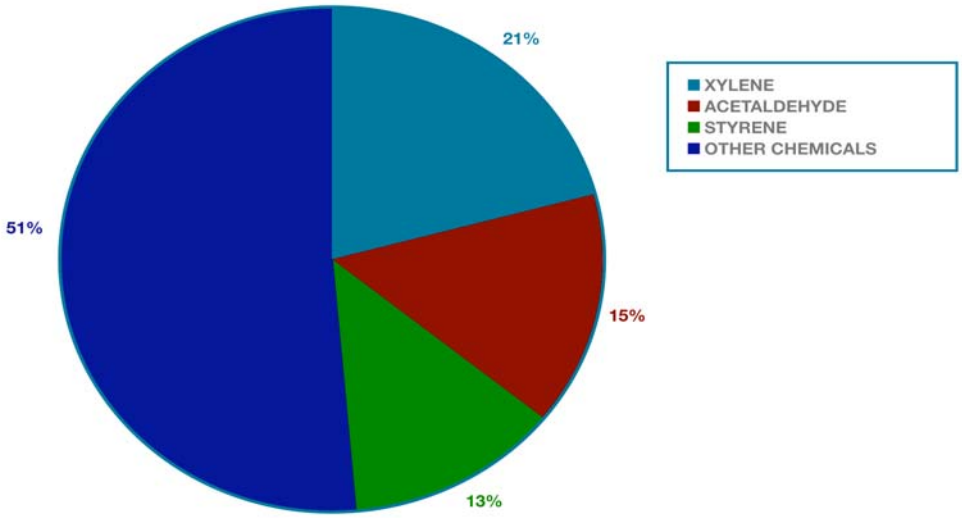


***Figure 6 Source: Louisiana Department of Environmental Quality TEDI from Industrial Sources, 2004**

Figure 7 – Top Class III Toxics Emitted by Industrial Sources in 2004

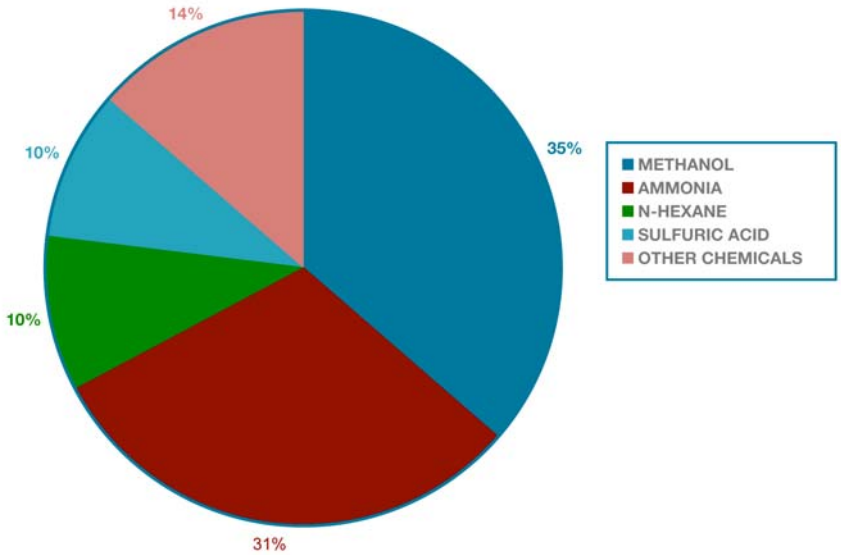


***Figure7 Source: Louisiana Department of Environmental Quality TEDI from Industrial Sources, 2004**.

9. What additional information is available on mercury in Louisiana?

The state has several on-going projects to reduce and monitor mercury use and releases. State regulations are in place to reduce mercury releases from industrial sources, such as electric arc furnaces, steel recycling facilities, hazardous waste, municipal solid waste and medical waste incinerators. According to state estimates, our chlor-alkali plants (2), coal-fired power plants (6), and electric arc furnace (1) are the primary sources of industrial mercury releases in Louisiana. In an effort to further reduce mercury emissions, the state has been working with one of the chlor-alkali plants, PPG, which has agreed to cut back on its use of mercury, thereby dramatically reducing mercury emissions over the next few years.