2002 Air Toxics Summary

New Jersey Department of Environmental Protection

Introduction

Air pollutants can be divided into two categories: the criteria pollutants (ozone, sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter, and lead); and air toxics. The criteria pollutants have been addressed at the national level for many years. The United States Environmental Protection Agency (USEPA) has set National Ambient Air Quality Standards (NAAQS) for them, and they are subject to a standard planning process that includes monitoring, reporting, and control requirements. Each of these pollutants is discussed in its own section of this NJDEP 2002 Air Quality Report.

Air toxics are basically all the other chemicals that can be released into the air and have the potential to cause adverse health effects in humans. These effects cover a wide range of conditions, from lung irritation to birth defects to cancer. There are no NAAQS for these pollutants, but in 1990 the U.S. Congress directed the USEPA to begin to address a list of almost 200 air toxics by developing control technology standards for specific categories of sources that emit them. These air toxics are known as the Clean Air Act Hazardous Air Pollutants (HAPs). You can get more information about HAPs at the USEPA Air Toxics web site at www.epa.gov/ttn/atw. NJDEP also has several web pages dedicated to air toxics. They can be accessed at www.state.nj.us/dep/airmon/airtoxics.

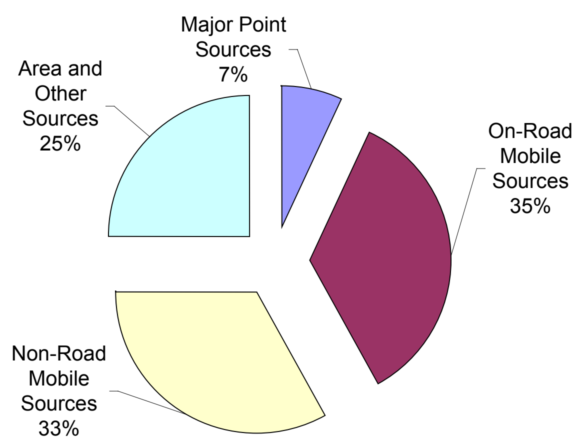
Health Effects

People exposed to significant amounts of air toxics may have an increased chance of getting cancer or experiencing other serious health effects. The noncancer health effects can range from respiratory, neurological, reproductive, developmental, or immune system damage, to irritation and effects on specific organs. In addition to inhalation exposure, there can be risks from the deposition of toxic pollutants onto soils or surface waters. There, they can be taken up by plants and animals which are later consumed by humans.

Sources of Air Toxics

A few years ago, USEPA began a national study of air toxics, the National-Scale Air Toxics Assessment (NATA). To determine people's exposure to air toxics around the country, USEPA first prepared a comprehensive inventory of air toxics emissions from all man-made sources in 1996. The 1996 emissions inventory for New Jersey was briefly reviewed and revised by NJDEP before being finalized. Although there are likely to be some errors in the details of such a massive undertaking, the emissions inventory still can give us an indication of the most important sources of air toxic emissions in our state. The pie chart in Figure 1, based on the 1996 NATA emissions estimates, shows that mobile sources are the largest contributors of air toxics emissions in New Jersey.

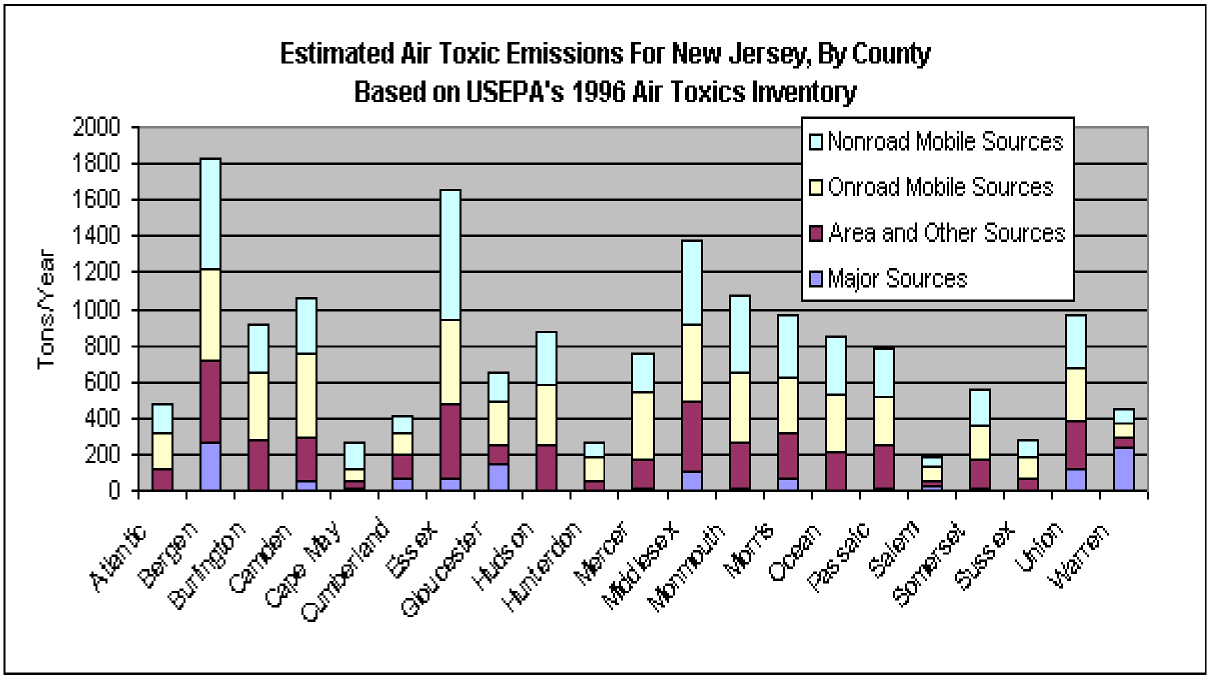
Figure 1
1996 Air Toxics Emissions Estimates for New Jersey



Source: USEPA's National Air Toxics Assessment, 1996

On-road mobile sources (cars and trucks) account for 35% of the emissions, and non-road mobile sources (airplanes, trains, construction equipment, lawnmowers, boats, dirt bikes, etc.) contribute 33%. Area sources (residential, commercial, and small industrial sources) represent 25% of

Figure 2



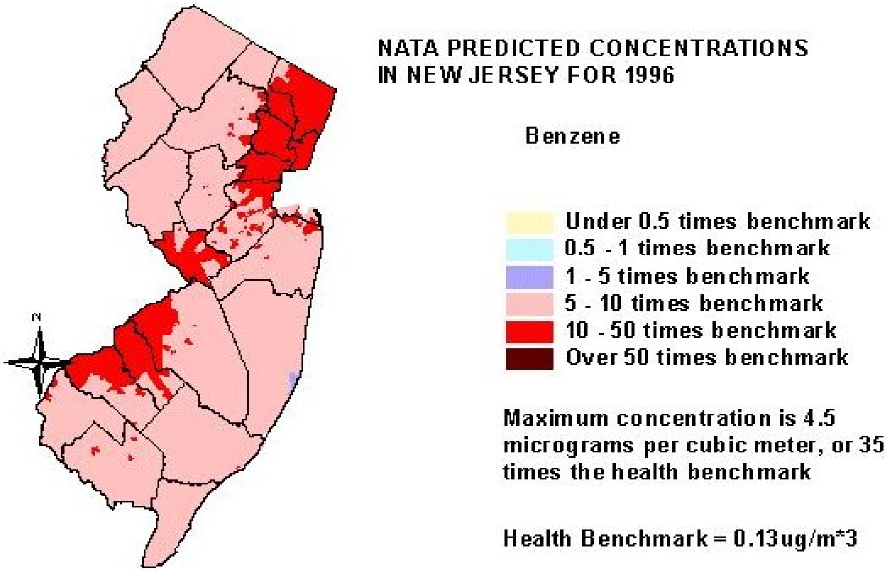
the inventory, and major point sources (such as factories and power plants) account for the remaining 7%.

Air toxics come from many different sources - not only manufacturing, but also other kinds of human activity. When New Jersey's emissions estimates are broken down by county (see Figure 2), it is evident that the areas with the largest air toxic emissions are generally those with the largest populations. This is directly related to high levels of vehicle use, solvent use, heating, and other population-related activities in those counties.

ESTIMATING AIR TOXICS EXPOSURE

The next step in USEPA's NATA project was to use the emissions information in an air dispersion model. The model estimates the concentrations of air toxics that people may be exposed to in different parts of the country. The map in Figure 3 shows the predicted concentrations of benzene throughout New Jersey. The high concentration areas tend to overlap the more densely

Figure 3



populated areas of the state, following the pattern of emissions. Not all air toxics follow this pattern, as some are more closely associated with individual point sources, but in general, larger populations result in greater emissions of, and exposure to, air toxics.

Our preliminary analysis of the state and county average air toxics concentrations generated by NATA indicates that nineteen chemicals were predicted to exceed their health benchmarks, or level of concern, in one or more counties in 1996. Eighteen of these are considered to be cancer-causing (carcinogenic) chemicals, and one (acrolein) is not. These chemicals are summarized in Table 1. Estimated air concentrations of these 19 pollutants vary around the state, depending on the type of sources that emit them.

Table 1

Air Toxics of Greatest Concern in New Jersey
Based on 1996 National Air Toxics Assessment

Pollutant of Concern	Extent	Primary Source of Emissions
Benzene	Statewide	Mobile; Background Concentration
1,3-Butadiene	Statewide	On-Road Mobile
Carbon tetrachloride	Statewide	Background Concentration
Chloroform	Statewide	Background Concentration; Point
Diesel particulate matter	Statewide	Off-Road Mobile
Ethylene dibromide	Statewide	Background Concentration
Ethylene dichloride	Statewide	Background Concentration
Formaldehyde	Statewide	Mobile
Acrolein	20 Counties	Mobile
Polycylic organic matter	20 Counties	Area
Chromium compounds	17 Counties	Area
Acetaldehyde	13 Counties	Mobile
Tetrachloroethylene	11 Counties	Area; Background Concentration
7-PAH	5 Counties	Area
Arsenic compounds	4 Counties	Area; Point
Cadmium compounds	4 Counties	Area
Nickel compounds	4 Counties	Area
Beryllium compounds	1 County	Area
Hydrazine	1 County	Area

Air Toxics Monitoring Program

NJDEP has established four air toxics monitoring sites around the state. They are located in Camden, Elizabeth, New Brunswick and Chester (see Figure 4). The Camden Lab site has been measuring several toxic volatile organic compounds (VOCs) since 1989. The Elizabeth Lab began measuring VOCs in 2000, and the New Brunswick and Chester sites became operational in July 2001. Analysis of toxic metals at all four sites also began in July 2001.

A comparison of the concentrations predicted by NATA and actual monitored levels can be made for the Camden Lab site. In 1996, thirteen of the compounds evaluated in NATA were measured at Camden Lab. Table 2 compares the NATA predictions with the measured concentrations for 1996. Measured 2002 levels, and the percent of change from 1996, are also shown. Of the thirteen air toxics measured, five of them fell below detection limits in 1996, so a concentration of zero or a value under the detection limit is reported for that year. A comparison of some of the key compounds (Figure 5) shows that for most air toxics, the agreement between predicted and monitored concentrations is remarkably good. Acetaldehyde and Formaldehyde do not show a good agreement between predicted and monitored concentrations in 1996; however, measurements in subsequent years of these pollutants are closer in agreement to the 1996 predicted values. For most of the thirteen air toxics in Table 2, the 2002 levels measured at the Camden Lab were substantially lower than the concentrations measured in 1996.

Figure 4
2002 Air Toxics Monitoring Network

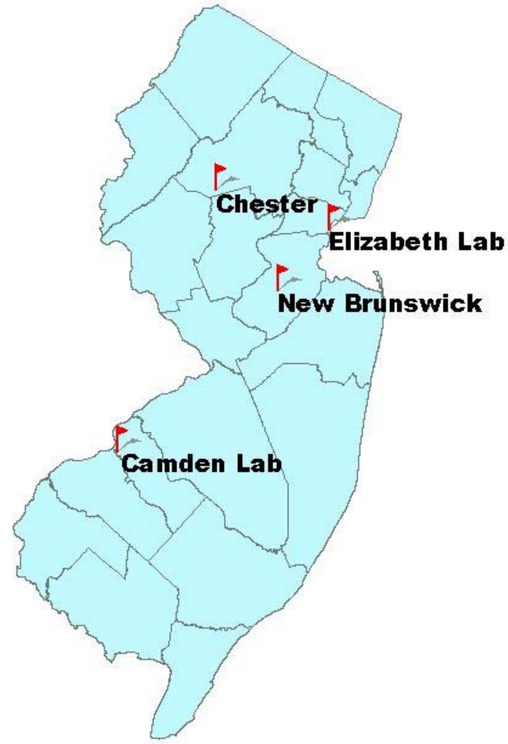


Figure 5
Air Toxics Levels Measured in 1996 at Camden, New Jersey Compared to NATA Predicted Levels

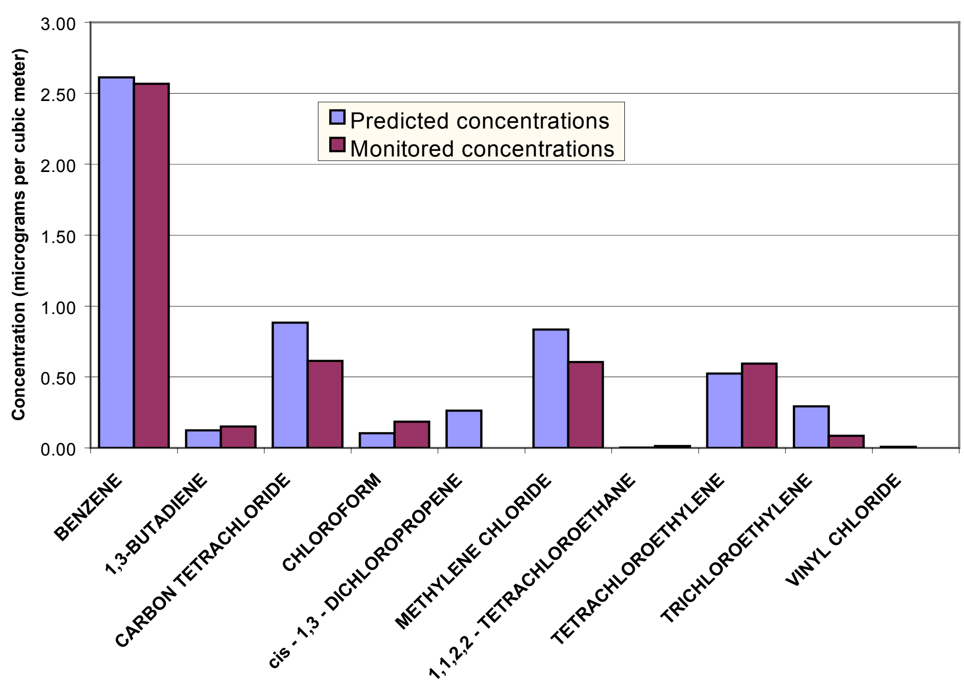


Table 2
Comparison of NATA Predicted to Measured Levels in Camden, NJ

NA – Not Available
$\mu g/m^3$ - Micrograms Per Cubic Meter

Pollutant (HAP)	NATA Predicted 1996, $\mu g/m^3$	Measured 1996 Level, $\mu g/m^3$	Measured 2002 Level, $\mu g/m^3$	Percent change in measured levels in 1996 & 2002
Acetaldehyde	1.74	4.53	1.19	-73.7%
Acrylonitrile	0.003	NA	0.81	NA
Benzene	2.61	2.57	1.66	-35.4%
1,3-Butadiene	0.12	0.15	0.09**	-40.0%
Carbon Tetrachloride	0.88	0.61	0.50	-18.0%
Chloroform*	0.10	0.18**	0.01**	-94.4%
cis-1,3-Dichloropropene*	0.26	0.00**	0.00**	0.0%
Formaldehyde	2.20	14.63	2.85	-80.5%
Methylene Chloride	0.83	0.61	1.49	144.3%
1,1,2,2-Tetrachloroethane*	0.00	0.01**	0.00**	-100.0%
Tetrachloroethylene	0.52	0.59	0.34**	-42.4%
Trichloroethylene	0.29	0.09**	0.02**	-77.8%
Vinyl Chloride *	0.01	0.00**	0.00**	0.0%

* Measurements for 1996 and 2002 were below detection limits
** Measurement fell below detection limits
Negative values for percent change mean measured levels went down from 1996 to 2002

AIR TOXICS MONITORING RESULTS FOR 2002

The results of the air toxics monitoring program for 2002 are shown in Table 3 (page 6). This table shows the average concentration for each air toxic measured at the four New Jersey monitoring sites. All values are in parts per billion by volume (ppbv). More detailed tables (Tables 4-7) that show additional statistics, detection limit information, health benchmarks used by NJDEP, and levels in ppbv and micrograms per cubic meter ($\mu g/m^3$) can be found at the end of this section. The ppbv units are more common for monitoring results, while $\mu g/m^3$ units are generally used in modeling and health studies. Note that many of the compounds that were tested were often below the detection limit of the method used. Concentrations below the detection limit, including zero values, were used in the calculation of the annual average concentrations.

Reported averages for which a significant portion of the data (more than 50%) was below the detection limit should be viewed with extreme caution. Median values (the value of the middle sample value when the results are ranked) are reported along with the mean (average) concentrations because for some compounds only a single or very few high values were recorded. These high values will tend to increase the average concentration significantly but would have less effect on the median value. In such cases, the median value may be a better indicator of long term exposures, on which most of the health benchmarks for air toxics are based. The average concentrations for some of the more prevalent air toxics are graphed in Figure 6 (page 6).

Figure 6
Selected Toxic Volatile Organics
2002 Annual Averages
New Jersey

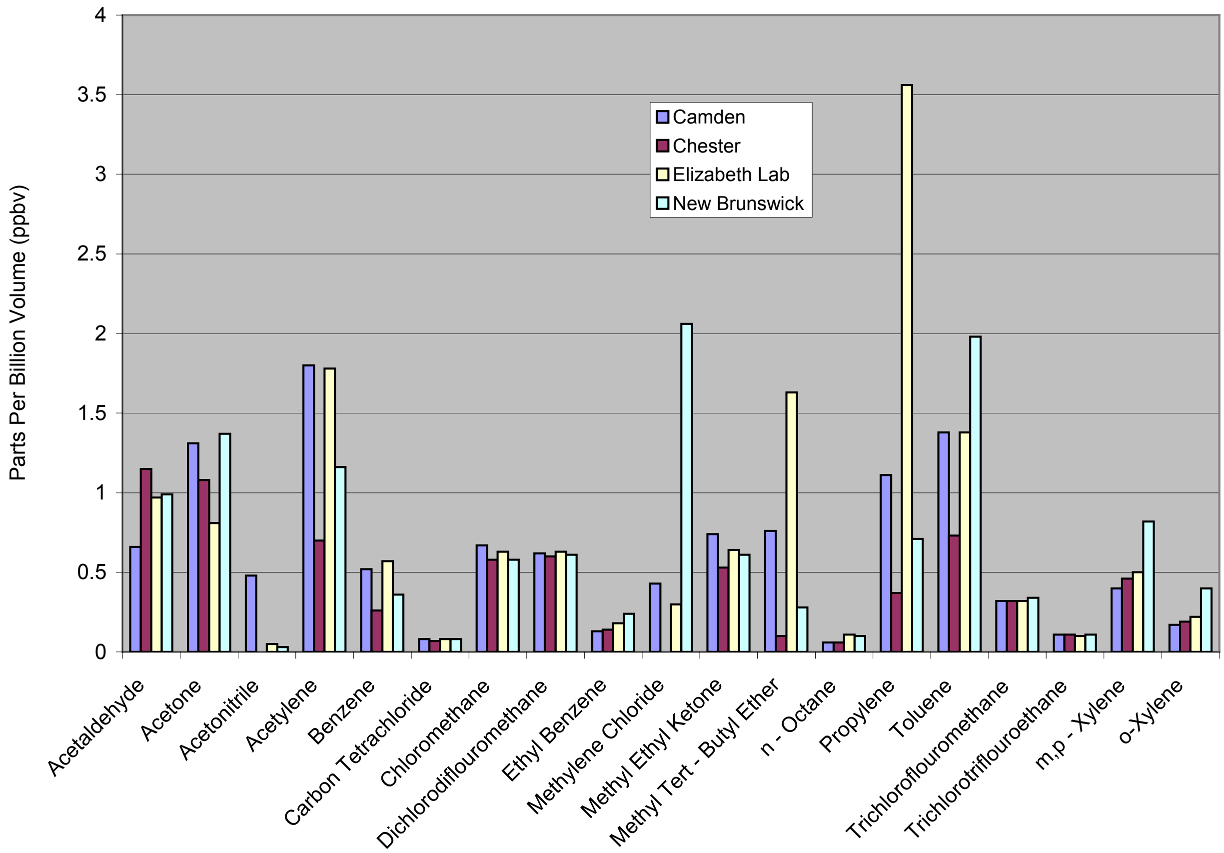


Table 3
New Jersey Air Toxics Summary – 2002

Annual Average Concentration
ppbv – Parts Per Billion by Volume

Pollutant	Camden Lab	Chester	Elizabeth Lab	New Brunswick
Acetaldehyde	0.66	1.15	0.97	0.99
Acetone	1.31	1.08	0.81	1.37
Acetonitrile	0.48	8.32	0.05	0.41
Acetylene	1.80	0.70	1.78	1.16
Acrylonitrile	0.00	0.00	0.10	0.03
tert-Amyl Methyl Ether	0.01	0.00	0.00	0.00
Benzaldehyde	0.04	0.03	0.04	0.04
Benzene	0.52	0.26	0.57	0.36
Bromochloromethane	0.00	0.00	0.00	0.00
Bromodichloromethane	0.00	0.00	0.00	0.00
Bromoform	0.00	0.00	0.00	0.00
Bromomethane	0.55	0.00	0.00	0.00
1,3-Butadiene	0.04	0.00	0.09	0.02
Butyr/Isobutyraldehyde	0.11	0.14	0.10	0.15
Carbon Tetrachloride	0.08	0.07	0.08	0.08
Chlorobenzene	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.00	0.01

Table 3 (Continued)
New Jersey Air Toxics Summary – 2002

Annual Average Concentration
ppbv – Parts Per Billion by Volume

Pollutant	Camden Lab	Chester	Elizabeth Lab	New Brunswick
Chloroform	0.00	0.00	0.00	0.00
Chloromethane	0.67	0.58	0.63	0.58
Chloromethylbenzene	0.00	0.00	0.00	0.00
Chloroprene	0.00	0.00	0.00	0.00
Crotonaldehyde	0.02	0.01	0.01	0.02
Dibromochloromethane	0.00	0.00	0.00	0.00
1,2-Dibromoethane	0.00	0.00	0.00	0.00
m-Dichlorobenzene	0.00	0.00	0.00	0.00
o-Dichlorobenzene	0.00	0.00	0.00	0.00
p-Dichlorobenzene	0.02	0.00	0.00	0.00
Dichlorodifluoromethane	0.62	0.60	0.63	0.61
1,1-Dichloroethane	0.00	0.00	0.00	0.00
1,2-Dichloroethane	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00
cis-1,2-Dichloroethylene	0.01	0.00	0.01	0.00
trans-1,2-Dichloroethylene	0.00	0.00	0.00	0.00
1,2-Dichloropropane	0.00	0.00	0.00	0.00
cis-1,3-Dichloropropene	0.00	0.00	0.00	0.00
trans-1,3-Dichloropropene	0.00	0.00	0.00	0.00
Dichlorotetrafluoroethane	0.00	0.00	0.00	0.00
2,5-Dimethylbenzaldehyde	0.00	0.00	0.00	0.00
Ethyl Acrylate	0.00	0.00	0.00	0.00
Ethylbenzene	0.13	0.14	0.18	0.24
Ethyl tert-Butyl Ether	0.00	0.00	0.00	0.00
Formaldehyde	2.32	3.04	2.04	2.44
Hexachloro-1,3-butadiene	0.00	0.00	0.00	0.00
Hexaldehyde	0.02	0.02	0.02	0.04
Isovaleraldehyde	0.00	0.00	0.00	0.00
Methylene Chloride	0.43	12.27	0.30	2.06
Methyl Ethyl Ketone	0.74	0.53	0.64	0.61
Methyl Isobutyl Ketone	0.03	0.01	0.01	0.00
Methyl Methacrylate	0.00	0.00	0.01	0.00
Methyl tert-Butyl Ether	0.76	0.10	1.63	0.28
n-Octane	0.06	0.06	0.11	0.10
Propionaldehyde	0.04	0.07	0.07	0.07
Propylene	1.11	0.37	3.56	0.71
Styrene	0.01	0.00	0.01	0.01
1,1,2,2 - Tetrachloroethane	0.00	0.00	0.00	0.00
Tetrachloroethylene	0.05	0.01	0.04	0.02
Tolualdehydes	0.03	0.02	0.04	0.03
Toluene	1.38	0.73	1.38	1.98
1,2,4-Trichlorobenzene	0.00	0.00	0.00	0.00
1,1,1 - Trichloroethane	0.01	0.01	0.01	0.01

Table 3 (Continued)
New Jersey Air Toxics Summary – 2002

Annual Average Concentration
ppbv – Parts Per Billion by Volume

Pollutant	Camden Lab	Chester	Elizabeth Lab	New Brunswick
1,1,2 - Trichloroethane	0.00	0.00	0.00	0.00
Trichloroethylene	0.00	0.00	0.00	0.00
Trichlorofluoromethane	0.32	0.32	0.32	0.34
Trichlorotrifluoroethane	0.11	0.11	0.10	0.11
1,2,4-Trimethylbenzene	0.12	0.04	0.16	0.07
1,3,5-Trimethylbenzene	0.03	0.01	0.05	0.01
Valeraldehyde	0.03	0.01	0.03	0.04
Vinyl Chloride	0.00	0.00	0.00	0.00
m,p - Xylene	0.40	0.46	0.50	0.82
o - Xylene	0.17	0.19	0.22	0.40

TRENDS

The site in Camden Lab is the only monitoring location that has been measuring air toxics for an extended period. The graph in Figure 7 shows the change in concentrations for three of the most prevalent air toxics (benzene, toluene, and xylene) from 1990 to 2002. The graph shows that while average concentrations can vary significantly from year to year, the overall trend is a significant decrease of concentrations over the last ten years. High individual samples may result in high annual averages in some years, e.g., the annual average for xylene in 1999 would be 2.2 $\mu g/m^3$ instead of 6.9 $\mu g/m^3$ if the value measured on July 5, 1999 were excluded. Because air toxics comprise such a large and diverse group of compounds, however, these general trends may not hold for other pollutants in different areas of the state.

Figure 7
Annual Averages for Selected Hazardous Air Pollutants (HAPs) at Camden Lab from 1990-2002

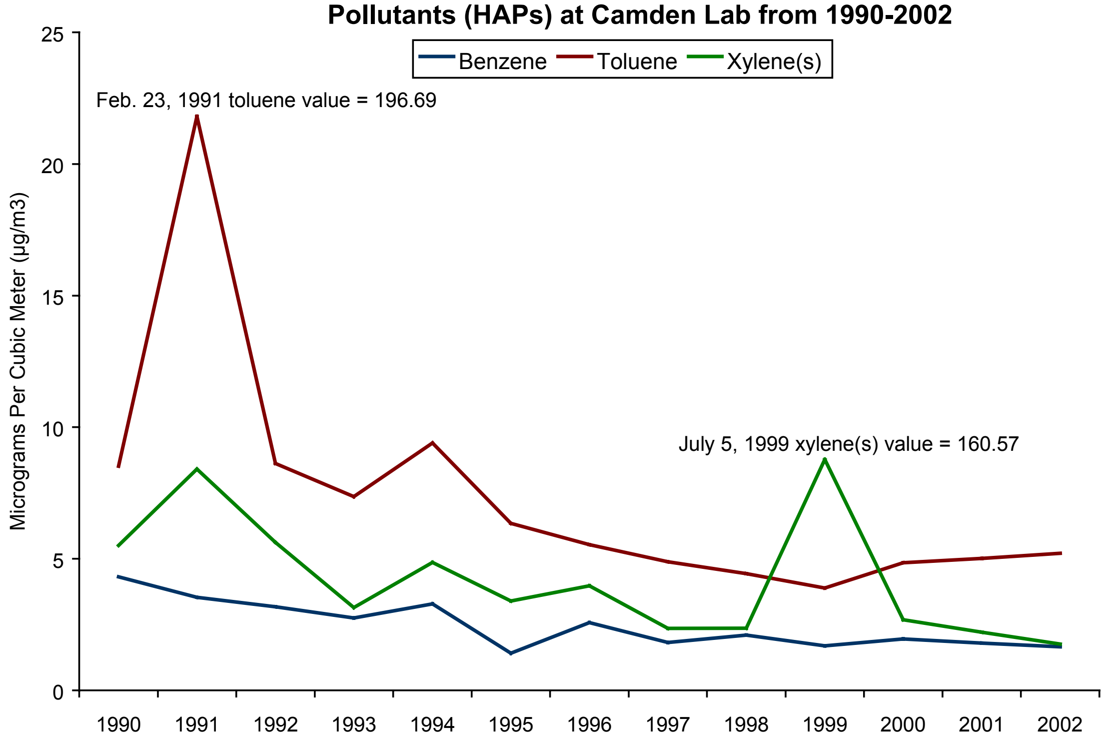


Table 4
Air Toxics Data – 2002
Camden Lab, New Jersey

$\mu g/m^3$ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark $\mu g/m^3$	Mean $\mu g/m^3$	Mean ppbv	Max. ppbv	Median ppbv
Acetaldehyde	**0.01**	**100%**	**0.45**	**1.19**	**0.66**	**2.44**	**0.48**
Acetone	0.00	100%	30881	3.11	1.31	9.9	0.69
Acetonitrile	0.25	5%	60	0.81	0.48	23.28	0
Acetylene	0.13	100%		1.91	1.8	8.6	1.38
Acrylonitrile	0.21	2%	0.015	0.01	0	0.16	0
tert-Amyl Methyl Ether	0.12	4%		0.04	0.01	0.68	0
Benzaldehyde	0.00	100%		0.17	0.04	0.15	0.03
Benzene	**0.04**	**100%**	**0.13**	**1.66**	**0.52**	**2**	**0.45**
Bromochloromethane	0.12	0%		0.00	0	0	0
Bromodichloromethane	0.06	0%		0.00	0	0	0
Bromoform	0.08	0%	0.91	0.00	0	0	0
Bromomethane	0.09	25%	5	2.13	0.55	13.78	0
1,3-Butadiene	**0.07**	**45%**	**0.033**	**0.09**	**0.04**	**0.5**	**0**
Butyr/Isobutyraldehyde	0.01	94%		0.32	0.11	0.96	0.08
Carbon tetrachloride	**0.08**	**89%**	**0.067**	**0.50**	**0.08**	**0.21**	**0**
Chlorobenzene	0.06	0%	1000	0.00	0	0	0
Chloroethane	0.08	0%		0.00	0	0	0
Chloroform	0.05	5%	0.043	0.01	0	0.04	0
Chloromethane	**0.05**	**100%**	**0.56**	**1.38**	**0.67**	**1.11**	**0.66**
Chloromethylbenzene	0.07	0%		0.00	0	0	0
Chloroprene	0.1	0%	7	0.00	0	0	0
Crotonaldehyde	0.01	80%		0.06	0.02	0.36	0.01
Dibromochloromethane	0.08	0%		0.00	0	0	0
1,2-Dibromoethane	0.08	0%	0.0045	0.00	0	0	0
m-Dichlorobenzene	0.05	0%		0.00	0	0	0
o-Dichlorobenzene	0.06	0%	200	0.00	0	0	0
p-Dichlorobenzene	**0.09**	**25%**	**0.091**	**0.12**	**0.02**	**0.14**	**0**
Dichlorodifluoromethane	0.04	100%	200	3.06	0.62	1.19	0.6
1,1-Dichloroethane	0.08	0%	0.63	0.00	0	0	0
1,2-Dichloroethane	0.06	0%	0.000053	0.00	0	0	0
1,1-Dichloroethene	0.1	0%	200	0.00	0	0	0
cis-1,2-Dichloroethylene	0.1	2%		0.04	0.01	0.29	0
trans-1,2-Dichloroethylene	0.06	0%		0.00	0	0	0
1,2-Dichloropropane	0.07	0%	0.1	0.00	0	0	0
cis-1,3-Dichloropropene	0.1	0%	0.25	0.00	0	0	0
trans-1,3-Dichloropropene	0.11	0%	0.25	0.00	0	0	0
Dichlorotetrafluoroethane	0.05	4%		0.01	0	0.04	0
2,5-Dimethylbenzaldehyde	0.00	10%		0.00	0	0.02	0
Ethyl Acrylate	0.16	0%	2	0.00	0	0	0

Table 4 (Continued)
Air Toxics Data - 2001
Camden Lab, New Jersey

$\mu g/m^3$ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark $\mu g/m^3$	Mean $\mu g/m^3$	Mean ppbv	Max. ppbv	Median ppbv
Ethylbenzene	0.04	84%		0.56	0.13	0.59	0.12
Ethyl tert-Butyl Ether	0.15	0%		0.00	0	0	0
Formaldehyde	**0.02**	**100%**	**0.077**	**2.85**	**2.32**	**12.71**	**1.07**
Hexachloro-1,3-butadiene	0.06	0%	0.045	0.00	0	0	0
Hexaldehyde	0.00	94%		0.08	0.02	0.12	0.02
Isovaleraldehyde	0.00	2%		0.00	0	0.13	0
Methylene Chloride	0.06	82%	2.1	1.49	0.43	12.92	0
Methyl Ethyl Ketone	0.15	55%		2.18	0.74	8.82	0.25
Methyl Isobutyl Ketone	0.15	5%	80	0.12	0.03	1.14	0
Methyl Methacrylate	0.18	2%	700	0.01	0	0.09	0
Methyl tert-Butyl Ether	0.18	89%	3.8	2.74	0.76	3.44	0.62
N-Octane	0.06	53%		0.28	0.06	0.27	0.04
Propionaldehyde	0.01	86%		0.09	0.04	0.13	0.02
Propylene	0.05	100%	3000	1.91	1.11	4.18	0.76
Styrene	0.07	25%	1.8	0.04	0.01	0.16	0
1,1,2,2-Tetrachloroethane	0.06	0%	0.017	0.00	0	0	0
Tetrachloroethylene	**0.06**	**33%**	**0.17**	**0.34**	**0.05**	**0.92**	**0**
Tolualdehydes	0.009	94%		0.15	0.03	0.13	0.02
Toluene	0.06	100%	400	5.20	1.38	13.64	0.84
1,2,4-Trichlorobenzene	0.06	0%	200	0.00	0	0	0
1,1,1-Trichloroethane	0.06	36%	1000	0.05	0.01	0.1	0
1,1,2-Trichloroethane	0.06	0%	0.063	0.00	0	0	0
Trichloroethylene	0.07	4%	0.5	0.02	0	0.12	0
Trichlorofluoromethane	0.04	100%	700	1.80	0.32	1.18	0.3
Trichlorotrifluoroethane	0.07	91%		0.84	0.11	0.28	0
1,2,4-Trimethylbenzene	0.07	87%		0.59	0.12	0.73	0.11
1,3,5-Trimethylbenzene	0.07	47%		0.15	0.03	0.23	0
Valeraldehyde	0.01	98%		0.11	0.03	0.13	0.01
Vinyl chloride	0.06	0%	0.11	0.00	0	0	0
m,p-Xylene	0.05	98%	100	1.74	0.4	1.86	0.31
o-Xylene	0.05	87%	100	0.74	0.17	0.76	0.14

Table 5
Air Toxics Data – 2002
Chester, New Jersey

μg/m^3 – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark μg/m^3	Mean μg/m^3	Mean ppbv	Max. ppbv	Median ppbv
Acetaldehyde	**0.01**	**100%**	**0.45**	**2.07**	**1.15**	**2.63**	**1.05**
Acetone	0.00	100%	30881	2.56	1.08	1.75	1.09
Acetonitrile	0.25	18%	60	13.96	8.32	264.01	0
Acetylene	0.13	100%		0.74	0.7	1.67	0.64
Acrylonitrile	0.21	0%	0.015	0.00	0	0	0
tert-Amyl Methyl Ether	0.12	0%		0.00	0	0	0
Benzaldehyde	0.00	100%		0.13	0.03	0.19	0.02
Benzene	**0.04**	**100%**	**0.13**	**0.83**	**0.26**	**0.62**	**0.25**
Bromochloromethane	0.12	0%		0.00	0	0	0
Bromodichloromethane	0.06	0%		0.00	0	0	0
Bromoform	0.08	0%	0.91	0.00	0	0	0
Bromomethane	0.09	2%	5	0.01	0	0.17	0
1,3-Butadiene	0.07	6%	0.033	0.01	0	0.06	0
Butyr/Isobutyraldehyde	0.01	100%		0.41	0.14	0.39	0.13
Carbon tetrachloride	**0.08**	**86%**	**0.067**	**0.44**	**0.07**	**0.14**	**0.08**
Chlorobenzene	0.06	0%	1000	0.00	0	0	0
Chloroethane	0.08	2%		0.01	0	0.15	0
Chloroform	0.05	6%	0.043	0.01	0	0.03	0
Chloromethane	**0.05**	**100%**	**0.56**	**1.20**	**0.58**	**1.25**	**0.58**
Chloromethylbenzene	0.07	2%		0.00	0	0.04	0
Chloroprene	0.1	0%	7	0.00	0	0	0
Crotonaldehyde	0.01	69%		0.03	0.01	0.05	0
Dibromochloromethane	0.08	0%		0.00	0	0	0
1,2-Dibromoethane	0.08	0%	0.0045	0.00	0	0	0
m-Dichlorobenzene	0.05	0%		0.00	0	0	0
o-Dichlorobenzene	0.06	0%	200	0.00	0	0	0
p-Dichlorobenzene	0.09	4%	0.091	0.00	0	0.03	0
Dichlorodifluoromethane	0.04	100%	200	2.96	0.6	0.96	0.58
1,1-Dichloroethane	0.08	0%	0.63	0.00	0	0	0
1,2-Dichloroethane	0.06	0%	0.000053	0.00	0	0	0
1,1-Dichloroethene	0.1	0%	200	0.00	0	0	0
cis-1,2-Dichloroethylene	0.1	0%		0.00	0	0	0
trans-1,2-Dichloroethylene	0.06	0%		0.00	0	0	0
1,2-Dichloropropane	0.07	0%	0.1	0.00	0	0	0
cis-1,3-Dichloropropene	0.1	0%	0.25	0.00	0	0	0
trans-1,3-Dichloropropene	0.11	0%	0.25	0.00	0	0	0
Dichlorotetrafluoroethane	0.05	4%		0.00	0	0.02	0
2,5-Dimethylbenzaldehyde	0.00	10%		0.00	0	0.01	0
Ethyl Acrylate	0.16	0%	2	0.00	0	0	0

Table 5 – (Continued)
Air Toxics Data – 2002
Chester, New Jersey

μg/m³ - Micrograms Per Cubic Meter
ppbv - Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark μg/m³	Mean μg/m³	Mean ppbv	Max. ppbv	Median ppbv
Ethylbenzene	0.04	84%		0.61	0.14	0.62	0.12
Ethyl tert-Butyl Ether	0.15	0%		0.00	0	0	0
Formaldehyde	**0.02**	**100%**	**0.077**	**3.73**	**3.04**	**10.33**	**2.57**
Hexachloro-1,3-butadiene	0.06	0%	0.045	0.00	0	0	0
Hexaldehyde	0.00	100%		0.08	0.02	0.04	0.01
Isovaleraldehyde	0.00	0%		0.00	0	0	0
Methylene Chloride	**0.06**	**80%**	**2.1**	**42.59**	**12.27**	**215.23**	**0.38**
Methyl Ethyl Ketone	0.15	35%		1.56	0.53	7.22	0
Methyl Isobutyl Ketone	0.15	4%	80	0.04	0.01	0.32	0
Methyl Methacrylate	0.18	0%	700	0.00	0	0	0
Methyl tert-Butyl Ether	0.18	29%	3.8	0.36	0.1	1.07	0
N-Octane	0.06	29%		0.28	0.06	1.92	0
Propionaldehyde	0.01	100%		0.17	0.07	0.23	0.05
Propylene	0.05	100%	3000	0.64	0.37	1.33	0.36
Styrene	0.07	4%	1.8	0.02	0	0.14	0
1,1,2,2-Tetrachloroethane	0.06	0%	0.017	0.00	0	0	0
Tetrachloroethylene	0.06	16%	0.17	0.07	0.01	0.11	0
Tolualdehydes	0.009	100%		0.10	0.02	0.1	0.02
Toluene	0.06	100%	400	2.75	0.73	3.3	0.61
1,2,4-Trichlorobenzene	0.06	0%	200	0.00	0	0	0
1,1,1-Trichloroethane	0.06	33%	1000	0.05	0.01	0.11	0
1,1,2-Trichloroethane	0.06	0%	0.063	0.00	0	0	0
Trichloroethylene	0.07	0%	0.5	0.00	0	0	0
Trichlorofluoromethane	0.04	100%	700	1.80	0.32	0.75	0.3
Trichlorotrifluoroethane	0.07	96%		0.84	0.11	0.21	0.11
1,2,4-Trimethylbenzene	0.07	57%		0.20	0.04	0.17	0.04
1,3,5-Trimethylbenzene	0.07	14%		0.05	0.01	0.06	0
Valeraldehyde	0.01	100%		0.04	0.01	0.08	0.01
Vinyl chloride	0.06	0%	0.11	0.00	0	0	0
m,p-Xylene	0.05	100%	100	2.00	0.46	1.77	0.39
o-Xylene	0.05	88%	100	0.82	0.19	0.75	0.17

Table 6
Air Toxics Data – 2002
Elizabeth Lab, New Jersey

$\mu g/m^3$ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark $\mu g/m^3$	Mean $\mu g/m^3$	Mean ppbv	Max. ppbv	Median ppbv
Acetaldehyde	**0.01**	**100%**	**0.45**	**1.75**	**0.97**	**2.66**	**0.01**
Acetone	0.00	100%	30881	1.92	0.81	2.46	0.00
Acetonitrile	0.25	2%	60	0.08	0.05	2.93	0.25
Acetylene	0.13	100%		1.89	1.78	6.24	0.13
Acrylonitrile	**0.21**	**2%**	**0.015**	**0.22**	**0.1**	**5.73**	**0.21**
tert-Amyl Methyl Ether	0.12	2%		0.01	0	0.13	0.12
Benzaldehyde	0.00	100%		0.17	0.04	0.1	0.00
Benzene	**0.04**	**100%**	**0.13**	**1.82**	**0.57**	**1.62**	**0.04**
Bromochloromethane	0.12	0%		0.00	0	0	0.12
Bromodichloromethane	0.06	0%		0.00	0	0	0.06
Bromoform	0.08	0%	0.91	0.00	0	0	0.08
Bromomethane	0.09	2%	5	0.01	0	0.13	0.09
1,3-Butadiene	**0.07**	**76%**	**0.033**	**0.20**	**0.09**	**0.23**	**0.07**
Butyr/Isobutyraldehyde	0.01	100%		0.29	0.1	0.53	0.01
Carbon tetrachloride	**0.08**	**89%**	**0.067**	**0.50**	**0.08**	**0.22**	**0.08**
Chlorobenzene	0.06	0%	1000	0.00	0	0	0.06
Chloroethane	0.08	0%		0.00	0	0	0.08
Chloroform	0.05	7%	0.043	0.01	0	0.04	0.05
Chloromethane	**0.05**	**100%**	**0.56**	**1.30**	**0.63**	**1.12**	**0.05**
Chloromethylbenzene	0.07	0%		0.00	0	0	0.07
Chloroprene	0.1	0%	7	0.00	0	0	0.1
Crotonaldehyde	0.01	98%		0.03	0.01	0.1	0.01
Dibromochloromethane	0.08	0%		0.00	0	0	0.08
1,2-Dibromoethane	0.08	0%	0.0045	0.00	0	0	0.08
m-Dichlorobenzene	0.05	0%		0.00	0	0	0.05
o-Dichlorobenzene	0.06	0%	200	0.00	0	0	0.06
p-Dichlorobenzene	0.09	9%	0.091	0.03	0	0.08	0.09
Dichlorodifluoromethane	0.04	100%	200	3.11	0.63	1.09	0.04
1,1-Dichloroethane	0.08	0%	0.63	0.00	0	0	0.08
1,2-Dichloroethane	0.06	0%	0.000053	0.00	0	0	0.06
1,1-Dichloroethene	0.1	0%	200	0.00	0	0	0.1
cis-1,2-Dichloroethylene	0.1	2%		0.04	0.01	0.4	0.1
trans-1,2-Dichloroethylene	0.06	0%		0.00	0	0	0.06
1,2-Dichloropropane	0.07	0%	0.1	0.00	0	0	0.07
cis-1,3-Dichloropropene	0.1	0%	0.25	0.00	0	0	0.1
trans-1,3-Dichloropropene	0.11	0%	0.25	0.00	0	0	0.11
Dichlorotetrafluoroethane	0.05	5%		0.00	0	0.01	0.05
2,5-Dimethylbenzaldehyde	0.00	11%		0.00	0	0.05	0.00
Ethyl Acrylate	0.16	0%	2	0.00	0	0	0.16

Table 6 – (Continued)
Air Toxics Data – 2002
Elizabeth Lab, New Jersey

$\mu g/m^3$ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark $\mu g/m^3$	Mean $\mu g/m^3$	Mean ppbv	Max. ppbv	Median ppbv
Ethylbenzene	0.04	93%		0.78	0.18	0.51	0.04
Ethyl tert-Butyl Ether	0.15	0%		0.00	0	0	0.15
Formaldehyde	**0.02**	**100%**	**0.077**	**2.50**	**2.04**	**6.37**	**0.02**
Hexachloro-1,3-butadiene	0.06	0%	0.045	0.00	0	0	0.06
Hexaldehyde	0.00	100%		0.08	0.02	0.05	0.00
Isovaleraldehyde	0.00	5%		0.00	0	0.17	0.00
Methylene Chloride	0.06	89%	2.1	1.04	0.3	1.19	0.06
Methyl Ethyl Ketone	0.15	49%		1.88	0.64	3.95	0.15
Methyl Isobutyl Ketone	0.15	7%	80	0.04	0.01	0.36	0.15
Methyl Methacrylate	0.18	4%	700	0.04	0.01	0.42	0.18
Methyl tert-Butyl Ether	**0.18**	**95%**	**3.8**	**5.87**	**1.63**	**6.5**	**0.18**
N-Octane	0.06	71%		0.51	0.11	1.24	0.06
Propionaldehyde	0.01	96%		0.17	0.07	0.2	0.01
Propylene	0.05	100%	3000	6.12	3.56	19.74	0.05
Styrene	0.07	24%	1.8	0.04	0.01	0.09	0.07
1,1,2,2-Tetrachloroethane	0.06	0%	0.017	0.00	0	0	0.06
Tetrachloroethylene	**0.06**	**42%**	**0.17**	**0.27**	**0.04**	**0.28**	**0.06**
Tolualdehydes	0.009	98%		0.20	0.04	0.09	0.009
Toluene	0.06	100%	400	5.20	1.38	5.41	0.06
1,2,4-Trichlorobenzene	0.06	0%	200	0.00	0	0	0.06
1,1,1-Trichloroethane	0.06	35%	1000	0.05	0.01	0.11	0.06
1,1,2-Trichloroethane	0.06	0%	0.063	0.00	0	0	0.06
Trichloroethylene	0.07	4%	0.5	0.01	0	0.04	0.07
Trichlorofluoromethane	0.04	100%	700	1.80	0.32	0.6	0.04
Trichlorotrifluoroethane	0.07	89%		0.77	0.1	0.19	0.07
1,2,4-Trimethylbenzene	0.07	89%		0.79	0.16	0.39	0.07
1,3,5-Trimethylbenzene	0.07	58%		0.25	0.05	0.19	0.07
Valeraldehyde	0.01	100%		0.11	0.03	0.2	0.01
Vinyl chloride	0.06	0%	0.11	0.00	0	0	0.06
m,p-Xylene	0.05	100%	100	2.17	0.5	1.42	0.05
o-Xylene	0.05	96%	100	0.95	0.22	0.6	0.05

Table 7
Air Toxics Data – 2002
New Brunswick, New Jersey

μg/m³ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark μg/m³	Mean μg/m³	Mean ppbv	Max. ppbv	Median ppbv
Acetaldehyde	**0.01**	**100%**	**0.45**	**1.78**	**0.99**	**2.29**	**0.9**
Acetone	0.00	100%	30881	3.25	1.37	3.43	1.27
Acetonitrile	0.25	13%	60	0.69	0.41	5.29	0
Acetylene	0.13	100%		1.23	1.16	3.08	1.05
Acrylonitrile	**0.21**	**2%**	**0.015**	**0.07**	**0.03**	**1.38**	**0**
tert-Amyl Methyl Ether	0.12	0%		0.00	0	0	0
Benzaldehyde	0.00	100%		0.17	0.04	0.38	0.03
Benzene	**0.04**	**100%**	**0.13**	**1.15**	**0.36**	**1.17**	**0.34**
Bromochloromethane	0.12	0%		0.00	0	0	0
Bromodichloromethane	0.06	0%		0.00	0	0	0
Bromoform	0.08	0%	0.91	0.00	0	0	0
Bromomethane	0.09	2%	5	0.01	0	0.13	0
1,3-Butadiene	**0.07**	**27%**	**0.033**	**0.04**	**0.02**	**0.15**	**0**
Butyr/Isobutyraldehyde	0.01	100%		0.44	0.15	0.27	0.14
Carbon tetrachloride	**0.08**	**92%**	**0.067**	**0.50**	**0.08**	**0.23**	**0.08**
Chlorobenzene	0.06	0%	1000	0.00	0	0	0
Chloroethane	0.08	2%		0.03	0.01	0.27	0
Chloroform	0.05	10%	0.043	0.02	0	0.09	0
Chloromethane	**0.05**	**98%**	**0.56**	**1.20**	**0.58**	**1.57**	**0.56**
Chloromethylbenzene	0.07	0%		0.00	0	0	0
Chloroprene	0.1	0%	7	0.00	0	0	0
Crotonaldehyde	0.01	92%		0.06	0.02	0.2	0.01
Dibromochloromethane	0.08	0%		0.00	0	0	0
1,2-Dibromoethane	0.08	0%	0.0045	0.00	0	0	0
m-Dichlorobenzene	0.05	0%		0.00	0	0	0
o-Dichlorobenzene	0.06	0%	200	0.00	0	0	0
p-Dichlorobenzene	0.09	8%	0.091	0.02	0	0.07	0
Dichlorodifluoromethane	0.04	100%	200	3.01	0.61	1.08	0.59
1,1-Dichloroethane	0.08	0%	0.63	0.00	0	0	0
1,2-Dichloroethane	0.06	0%	0.000053	0.00	0	0	0
1,1-Dichloroethene	0.1	0%	200	0.00	0	0	0
cis-1,2-Dichloroethylene	0.1	0%		0.00	0	0	0
trans-1,2-Dichloroethylene	0.06	0%		0.00	0	0	0
1,2-Dichloropropane	0.07	0%	0.1	0.00	0	0	0
cis-1,3-Dichloropropene	0.1	0%	0.25	0.00	0	0	0
trans-1,3-Dichloropropene	0.11	2%	0.25	0.01	0	0.06	0
Dichlorotetrafluoroethane	0.05	0%		0.00	0	0	0
2,5-Dimethylbenzaldehyde	0.00	11%		0.00	0	0.01	0
Ethyl Acrylate	0.16	0%	2	0.00	0	0	0

Table 7 – (Continued)
Air Toxics Data – 2002
New Brunswick, New Jersey

μg/m³ – Micrograms Per Cubic Meter
ppbv – Parts Per Billion by Volume

Compounds in Bold had Annual Mean Concentrations Greater Then Their Accepted Health Benchmark

Pollutant	Detection Limit ppbv	% Detects	Benchmark μg/m³	Mean μg/m³	Mean ppbv	Max. ppbv	Median ppbv
Ethylbenzene	0.04	87%		1.04	0.24	0.59	0.21
Ethyl tert-Butyl Ether	0.15	0%		0.00	0	0	0
Formaldehyde	**0.02**	**100%**	**0.077**	**2.99**	**2.44**	**10.92**	**1.55**
Hexachloro-1,3-butadiene	0.06	0%	0.045	0.00	0	0	0
Hexaldehyde	0.00	96%		0.16	0.04	0.15	0.03
Isovaleraldehyde	0.00	6%		0.00	0	0.03	0
Methylene Chloride	**0.06**	**85%**	**2.1**	**7.15**	**2.06**	**39.09**	**0.2**
Methyl Ethyl Ketone	0.15	46%		1.79	0.61	4.38	0
Methyl Isobutyl Ketone	0.15	2%	80	0.00	0	0.04	0
Methyl Methacrylate	0.18	0%	700	0.00	0	0	0
Methyl tert-Butyl Ether	0.18	58%	3.8	1.01	0.28	2.43	0.18
N-Octane	0.06	40%		0.47	0.1	1.68	0
Propionaldehyde	0.01	100%		0.17	0.07	0.15	0.07
Propylene	0.05	100%	3000	1.22	0.71	4.29	0.55
Styrene	0.07	17%	1.8	0.04	0.01	0.11	0
1,1,2,2-Tetrachloroethane	0.06	0%	0.017	0.00	0	0	0
Tetrachloroethylene	0.06	29%	0.17	0.14	0.02	0.24	0
Tolualdehydes	0.009	98%		0.15	0.03	0.12	0.03
Toluene	0.06	100%	400	7.45	1.98	32.85	1.16
1,2,4-Trichlorobenzene	0.06	0%	200	0.00	0	0	0
1,1,1-Trichloroethane	0.06	27%	1000	0.05	0.01	0.1	0
1,1,2-Trichloroethane	0.06	0%	0.063	0.00	0	0	0
Trichloroethylene	0.07	4%	0.5	0.02	0	0.1	0
Trichlorofluoromethane	0.04	100%	700	1.91	0.34	1.11	0.3
Trichlorotrifluoroethane	0.07	90%		0.84	0.11	0.27	0.11
1,2,4-Trimethylbenzene	0.07	69%		0.34	0.07	0.31	0.08
1,3,5-Trimethylbenzene	0.07	25%		0.05	0.01	0.12	0
Valeraldehyde	0.01	98%		0.14	0.04	0.28	0.03
Vinyl chloride	0.06	0%	0.11	0.00	0	0	0
m,p-Xylene	0.05	100%	100	3.56	0.82	2.12	0.68
o-Xylene	0.05	96%	100	1.74	0.4	0.97	0.37

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