2008 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 since the 1970s. 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 New Jersey Department of Environmental Protection (NJDEP) 2008 Air Quality Report.

Air toxics are basically all the other chemicals released into the air that 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/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 non-cancer 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.

The effects on human health resulting from exposure to specific air toxics can be estimated by using chemical-specific "health benchmarks." These toxicity values are developed by the USEPA and other agencies, using health studies on a chemical. For carcinogens, the health benchmark is the concentration of the pollutant that corresponds to a one-in-a-million increase in the risk of getting cancer if a person was to breathe that concentration over his or her entire lifetime. The health benchmark for non-carcinogens is a concentration at which no adverse health effect is expected to occur (this is also known as a reference concentration). Not all air toxics have health benchmarks, because of a lack of toxicity studies. Available health benchmarks for the air toxics monitored in New Jersey are listed in Tables 4 through 7. If ambient air concentrations exceed the health benchmarks then some action, such as a reduction in emissions, should be considered.

Sources of Air Toxics

A number of years ago, USEPA began the National-Scale Air Toxics Assessment (NATA). Starting with the year 1996, they set out on a three-year cycle to determine people's exposure to air toxics around the country. To do this, USEPA first prepares a comprehensive inventory of air toxics emissions from all man-made sources. The emissions inventory is reviewed and updated by each state. Although there are likely to be some errors in the details of such a massive undertaking, the emissions inventory still can give us a reasonable indication of the most important sources of air toxic emissions in our state. The pie chart in Figure 1, based on the 2002 NATA emissions estimates, shows that mobile sources are the largest contributors of air toxics emissions in New Jersey. On-road mobile sources (cars and trucks) account for 33% of the air toxics emissions, and non-road mobile sources (airplanes, trains, construction equipment, lawnmowers, boats, dirt bikes, etc.) contribute and additional 34%. Area sources (residential, commercial, and small industrial sources) represent 28% of the inventory, and major point sources (such as factories and power plants) account for the remaining 5%.

ESTIMATING AIR TOXICS EXPOSURE

The second step in USEPA's NATA project is to use the emissions information in an air dispersion model to estimate air toxic concentrations across the country. The map in Figure 2 shows the predicted concentrations of benzene throughout New Jersey. The high concentration areas tend to overlap the more densely 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.

Analysis of the NATA state and county average air toxics concentrations indicates that twenty-one chemicals were predicted to exceed their health benchmarks, or level of concern, in one or more counties in 2002. Twenty of these are considered to be cancer causing (carcinogenic) chemicals, and one (acrolein) is not. Estimated air concentrations of these 21 pollutants vary around the state, depending on the types of sources that emit them. This is summarized in Table 1.

Figure 1
2002 Air Toxics Emissions Source Estimates for New Jersey

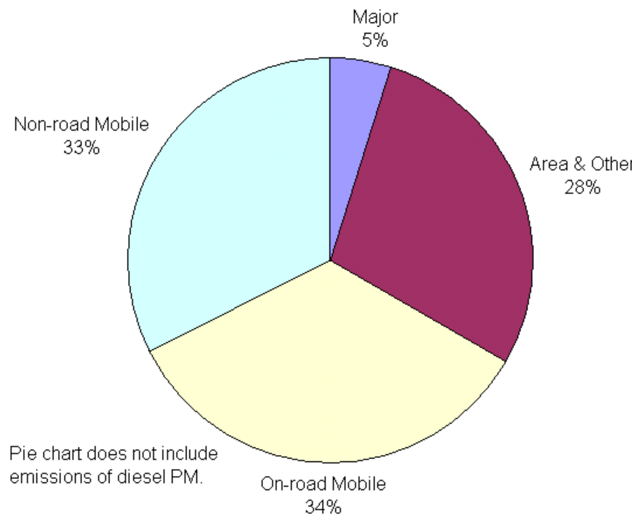


Figure 2
BENZENE
2002 NATA Predicted Concentrations for NJ

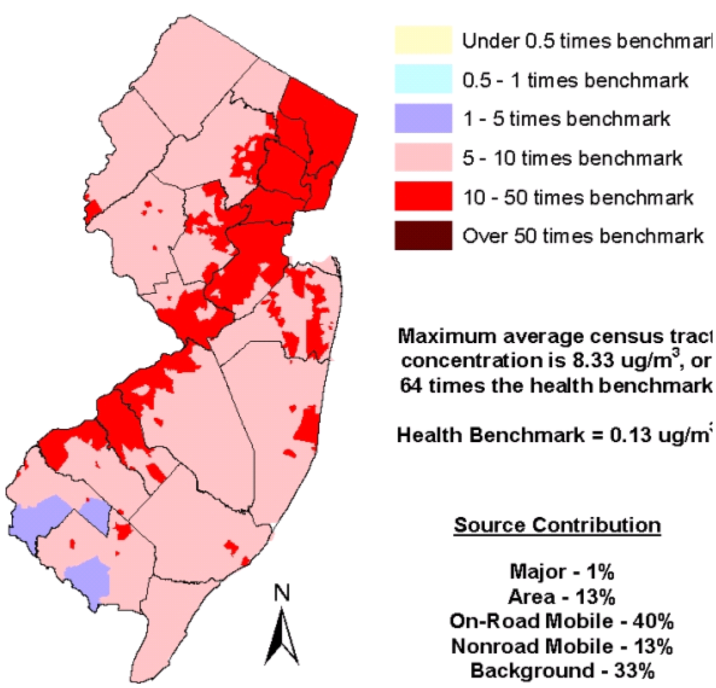


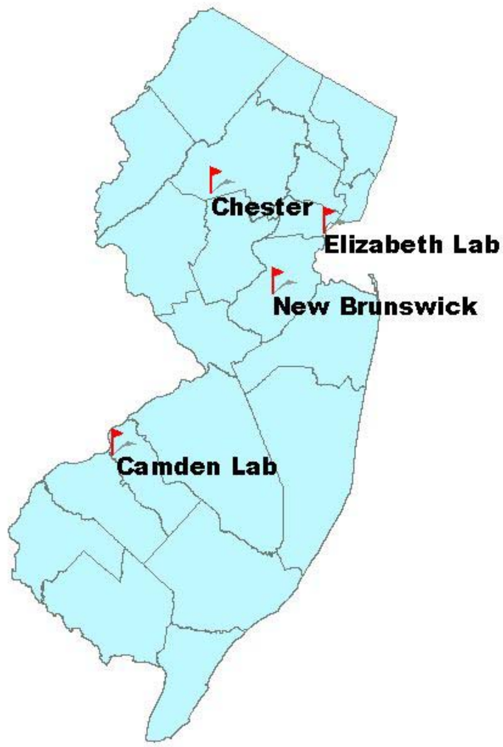
Table 1
Air Toxics of Greatest Concern in New Jersey
Based on 2002 National-Scale Air Toxics Assessment

Pollutant of Concern	Number of Counties Above Health Benchmark	Primary Source of Emissions
Acetaldehyde	Statewide	Mobile & background
Acrolein	Statewide	Mobile
Arsenic Compounds	19	Background & area
Benzene	Statewide	Mobile & background
1,3-Butadiene	Statewide	Mobile & background
Cadmium Compounds	1 (Warren)	Major
Carbon Tetrachloride	Statewide	Background
Chloroform	Statewide	Area & background
Chromium (hexavalent)	19	Major & background
1,4-Dichlorobenzene	8	Area & background
1,3-Dichloropropene	1 (Hudson)	Area
Diesel Particulate Matter	Statewide	Mobile
Ethylbenzene	7	Mobile
Ethylene Oxide	7	Area & background
Formaldehyde	Statewide	Mobile & background
Methyl Chloride	Statewide	Background
Methyl tert-Butyl Ether	Statewide	Background
Naphthalene	19	Area
PAH/POM	18	Area
Perchloroethylene	7	Area & background
1,1,2-Trichloroethane	1 (Salem)	Area

NJ AIR TOXICS MONITORING PROGRAM RESULTS FOR 2008

NJDEP has established four air toxics monitoring sites around the state. They are located in Camden, Elizabeth, New Brunswick and Chester (see Figure 3). The Camden site has been measuring several toxic volatile organic compounds (VOCs) since 1989, but was shut down in October due to security concerns. The Elizabeth site 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 2001. Metals data can be found in Appendix B (Fine Particulate Speciation Summary 2008) of the Air Quality Report.

Figure 3
2008 Air Toxics Monitoring Network



2008 air toxic monitoring results for VOCs are shown in Table 2. This table contains the annual average concentration for each air toxic measured at the four New Jersey monitoring sites. All values are in micrograms per cubic meter (μg/m^3). More detail can be found in Tables 5 through 8, including additional statistics, detection limit information, health benchmarks used by NJDEP, risk ratios, and concentrations in parts per billion by volume (ppbv). The ppbv units are more common for monitoring results, while μg/m^3 units are generally used in modeling and health studies. Many of the compounds that were analyzed were below the detection limit of the method used. These are listed separately in Table 9.

Reported averages for which significant portions of the data (more than 50%) were 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 (the basis for most of the air toxics health benchmarks).

The Chester and New Brunswick sites had the lowest concentrations for the majority of the prevalent air toxics, while Elizabeth had the highest concentration for most compounds. This is comparable to previous years, however Chester also detected the most compounds, but with many only detected once on August 8th.

Table 2
New Jersey Air Toxics Summary – 2008

Annual Average Concentration
micrograms per cubic meter ($\mu g/m^3$) [a]

Pollutant	Camden	Chester	Elizabeth	New Brunswick
Acetaldehyde	1.82	1.39	2.33	2.57
Acetone	3.58	2.24	3.81	3.22
Acetonitrile	3.94	1.06	5.36	0.43
Acetylene	1.08	0.68	1.47	0.98
Acrolein	0.92	0.69	1.31	0.64
Acrylonitrile	(0.03)	(0.06)	(0.70)	(0.02)
tert-Amyl Methyl Ether	(0)	(0)	(0)	(0)
Benzaldehyde	0.15	0.09	0.15	0.05
Benzene	1.36	0.60	1.84	0.70
Bromochloroemethane	-	(0)	-	-
Bromodichloromethane	-	(0)	-	-
Bromoform	-	(0)	(0)	(0)
Bromomethane	0.82	0.04	0.06	0.05
1,3-Butadiene	0.09	0.03	0.15	0.06
Butyraldehyde	0.29	0.21	0.36	0.21
Carbon Disulfide	1.92	11.13	7.01	3.47
Carbon Tetrachloride	0.66	0.71	0.68	0.75
Chlorobenzene	(0)	(0)	(0.01)	(0)
Chloroethane	0.05	0.03	0.07	0.07
Chloroform	0.12	0.12	0.19	0.18
Chloromethane	1.29	1.33	1.43	1.35
Chloromethylbenzene	-	(0)	-	-
Chloroprene	-	(0.01)	-	-
Crotonaldehyde	0.31	0.26	0.33	0.26
Dibromochloromethane	(0)	(0)	(0)	(0)
o-Dichlorobenzene	-	-	(0)	-
p-Dichlorobenzene	0.18	0.05	0.18	0.10
Dichlorodifluoromethane	2.56	2.66	2.80	2.77
1,1-Dichloroethane	-	(0)	-	-
1,2-Dichloroethane	(0.01)	(0.10)	-	-
1,1-Dichloroethene	(0)	(0)	(0)	(0)
cis-1,2-Dichloroethylene	-	(0.01)	-	(0)
trans-1,2-Dichloroethylene	(0)	(0.01)	-	(0)
Dichloromethane	0.55	0.89	1.59	0.68
1,2-Dichloropropane	-	-	(0)	-
Dichlorotetrafluoroethane	0.11	0.10	0.11	0.11
Ethyl Acrylate	-	(0)	-	-
Ethyl tert-Butyl Ether	-	(0)	-	-
Ethylbenzene	0.47	0.24	0.87	0.21
Formaldehyde	3.30	2.26	3.20	1.46

[a] Numbers in parenthesis indicate averages based on less than 50% detection and dashes represent 100% non-detects

Table 2 (Continued)
New Jersey Air Toxics Summary – 2008

Annual Average Concentration
micrograms per cubic meter ($\mu g/m^3$) [a]

Pollutant	Camden	Chester	Elizabeth	New Brunswick
Hexachloro-1,3-butadiene	-	(0)	(0)	-
Hexaldehyde	0.16	0.10	0.19	0.07
Isovaleraldehyde	(0.02)	(0.01)	(0.03)	(0)
Methyl Ethyl Ketone	1.39	1.08	1.39	0.97
Methyl Isobutyl Ketone	0.20	0.45	0.21	0.15
Methyl Methacrylate	(0.14)	(0)	(0.05)	(0.01)
Methyl tert-Butyl Ether	0.07	(0.02)	0.05	0.03
n-Octane	0.15	0.08	0.27	0.09
Propionaldehyde	0.36	0.26	0.44	0.21
Propylene	1.10	0.38	4.97	0.93
Styrene	0.24	0.24	0.63	0.08
1,1,2,2-Tetrachloroethane	-	(0)	-	-
Tetrachloroethylene	0.48	0.15	0.35	0.24
Tolualdehydes	0.12	0.10	0.17	0.11
Toluene	4.27	1.90	5.05	1.17
1,2,4-Trichlorobenzene	-	-	(0)	-
1,1,1-Trichloroethane	0.10	0.09	0.10	0.10
1,1,2-Trichloroethane	(0)	(0)	(0)	(0)
Trichloroethylene	0.17	(0.03)	0.07	0.07
Trichlorofluoromethane	1.60	1.50	1.57	1.57
Trichlorotrifluoroethane	0.68	0.68	0.69	0.71
1,2,4-Trimethylbenzene	0.35	0.24	0.64	0.18
1,3,5-Trimethylbenzene	0.11	0.07	0.19	0.06
Valeraldehyde	0.10	0.08	0.14	0.06
Vinyl chloride	0.02	(0)	(0.01)	(0.01)
m,p-Xylene	1.00	0.48	2.23	0.51
o-Xylene	0.37	0.20	0.88	0.20

[a] Numbers in parenthesis indicate averages based on less than 50% detection and dashes represent 100% non-detects

ESTIMATING HEALTH RISK

A simplified way to determine whether the ambient concentration of an air toxic could pose a potential human health risk is to compare the air concentration to its health benchmark. The number that we get when we divide the air concentration by the benchmark is called a "risk ratio." If the risk ratio is less than one, the air concentration should not pose a health risk. If it is greater than one, it may be of concern. The risk ratio also indicates how much higher or lower the estimated air concentration is than the health benchmark.

Camden and Elizabeth had twelve compounds with annual average concentrations that exceeded their health benchmarks, New Brunswick had eleven and Chester had ten. The toxic air pollutants that exceeded their health benchmarks at all sites are acetaldehyde, acrolein, acrylonitrile, benzene, 1,3 butadiene, carbon tetrachloride, chloroform, chloromethane, and formaldehyde. Camden, New Brunswick and Elizabeth all exceeded health benchmarks for tetrachloroethylene (perchloroethylene).

The top five toxic compounds of concern based on annual risk ratios are listed in Table 3. Acrolein contributed the highest risk at every site, but note that the magnitude of the risks was highest at Elizabeth. Carbon tetrachloride, benzene and formaldehyde were common to all four sites as well.

TRENDS AND COMPARISONS

The site in Camden is the New Jersey monitoring location that has been measuring air toxics for the longest period. The graph in Figure 4 shows the change in concentrations for three of the most prevalent air toxics, benzene, toluene, and xylene, from 1990 to 2008. The graph shows that while average concentrations can vary significantly from year to year, the overall trend is downward. High individual samples may also result in high annual averages in some years. Concentrations of most air toxics have declined significantly over the last ten years. Because air toxics comprise such a large and diverse group of compounds, however, these general trends may not hold for other compounds.

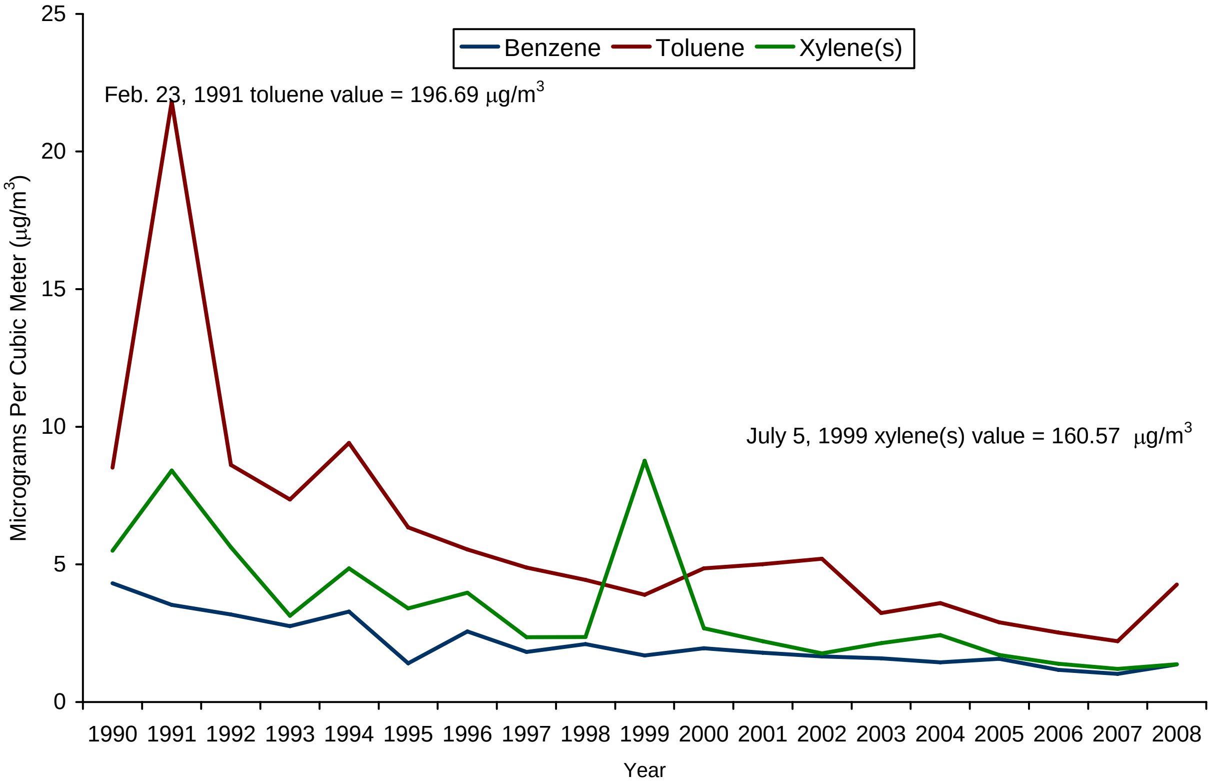
Table 3
Analytes with the Five Highest Risk Ratios [a,b]
at NJ's Air Toxics Monitoring Sites in 2008

	Camden		Chester		Elizabeth		New Brunswick	
Rank	**Analyte**	**Risk Ratio**	**Analyte**	**Risk Ratio**	**Analyte**	**Risk Ratio**	**Analyte**	**Risk Ratio**
1	Acrolein	46	Acrolein	34	Acrolein	66	Acrolein	32
2	Formaldehyde	43	Formaldehyde	29	Acrylonitrile	47	Formaldehyde	19
3	Benzene	10	Carbon Tetrachloride	11	Formaldehyde	42	Carbon Tetrachloride	11
4	Carbon Tetrachloride	10	Benzene	5	Benzene	14	Acetaldehyde	6
5	Acetaldehyde	4	Acrylonitrile	4	Carbon Tetrachloride	10	Benzene	5

[a] The risk ratio for a chemical is a comparison of the annual mean air concentration to a long-term health benchmark.

[b] The long-term health benchmark is defined as the chemical-specific air concentration above which there may be human health concerns. For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure. For a non-carcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime. These toxicity values are not available for all chemicals. For more information, go to www.nj.gov/dep/aqpp/risk.html.

Figure 4
Annual Averages for Selected Hazardous Air Pollutants (HAPs) at Camden from 1990-2008[a]



[a] Annual concentrations for Camden in 2008 calculated from data spanning January to October 21st.

The graphs in Figures 5 through 8 below show concentrations of some of the air toxics in New Jersey with the highest risk ratios (see Table 3): benzene, acetaldehyde, carbon tetrachloride, and formaldehyde. These graphs compare data from our four different monitoring sites over the past seven or more years. (Acrolein data began to be reported in 2005). As seen in Figures 4 and 5, benzene concentrations have been gradually decreasing over the past decade. Most benzene now comes from mobile and area sources, and is transported in from other regions. Acetaldehyde, shown in Figure 6, is also emitted primarily by on-road mobile sources such as cars.

Figure 5. Benzene Monitored Concentrations 1990-2008

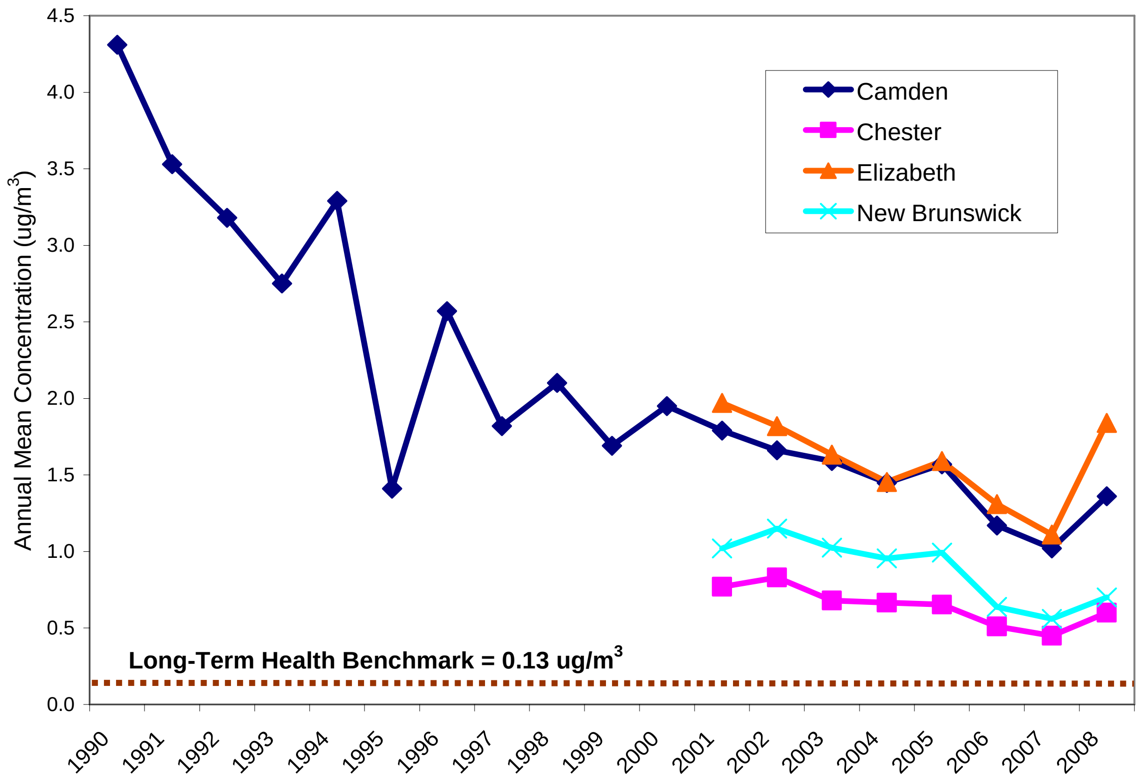
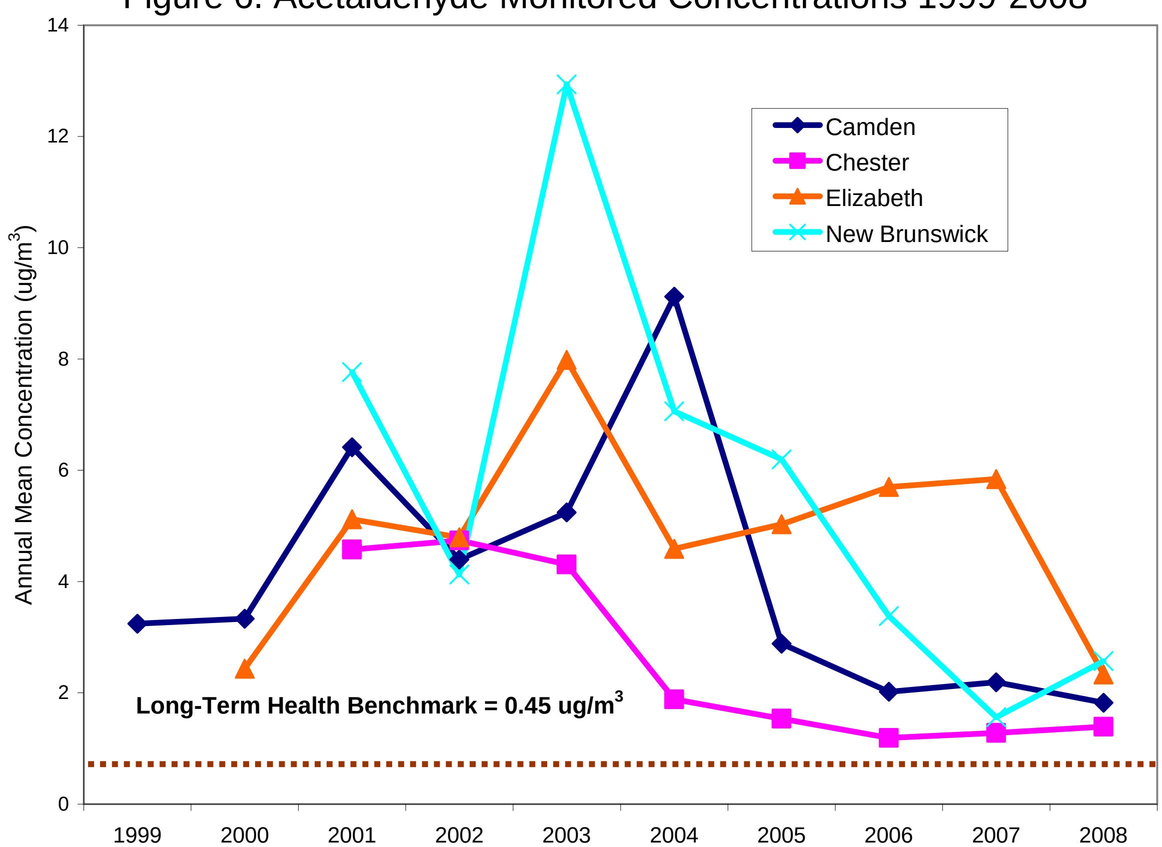
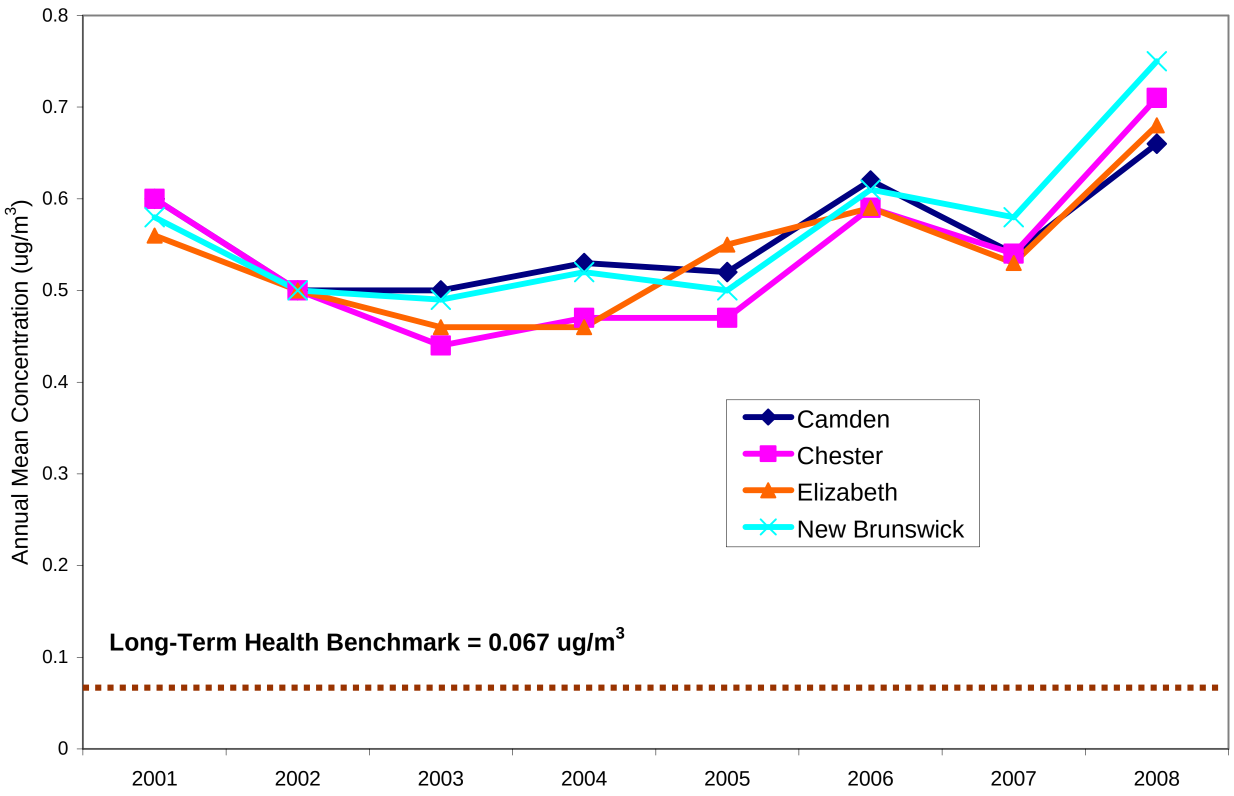


Figure 6. Acetaldehyde Monitored Concentrations 1999-2008



Carbon tetrachloride (Figure 7) is rarely emitted from any type of source these days. It was once widely used in industry, as a solvent and in the production of propellants and refrigerants. Its production and use was substantially reduced after it was discovered that it contributes to destruction of the stratospheric ozone layer. It has been phased out over the past two decades under the U.S. Clean Air Act Amendments of 1990 and the Montreal Protocol international agreement. However, it is very stable in the atmosphere and degrades very slowly, so ambient concentrations will continue to decline very gradually.

Figure 7. Carbon Tetrachloride Monitored Concentrations 2001-2008



Formaldehyde (Figure 8) is a ubiquitous pollutant that is often found at higher concentrations indoors rather than outdoors because of its use in many consumer goods. It is used in the production of fertilizer, paper, plywood, and urea-formaldehyde resins. In New Jersey the primary emitters of formaldehyde are on-road mobile sources, although secondary formation and transport can contribute significantly to high outdoor concentrations. Monitored concentrations in New Jersey average around 30 times over the health benchmark (thirty in a million risk level).

Figure 8. Formaldehyde Monitored Concentrations 1996-2008

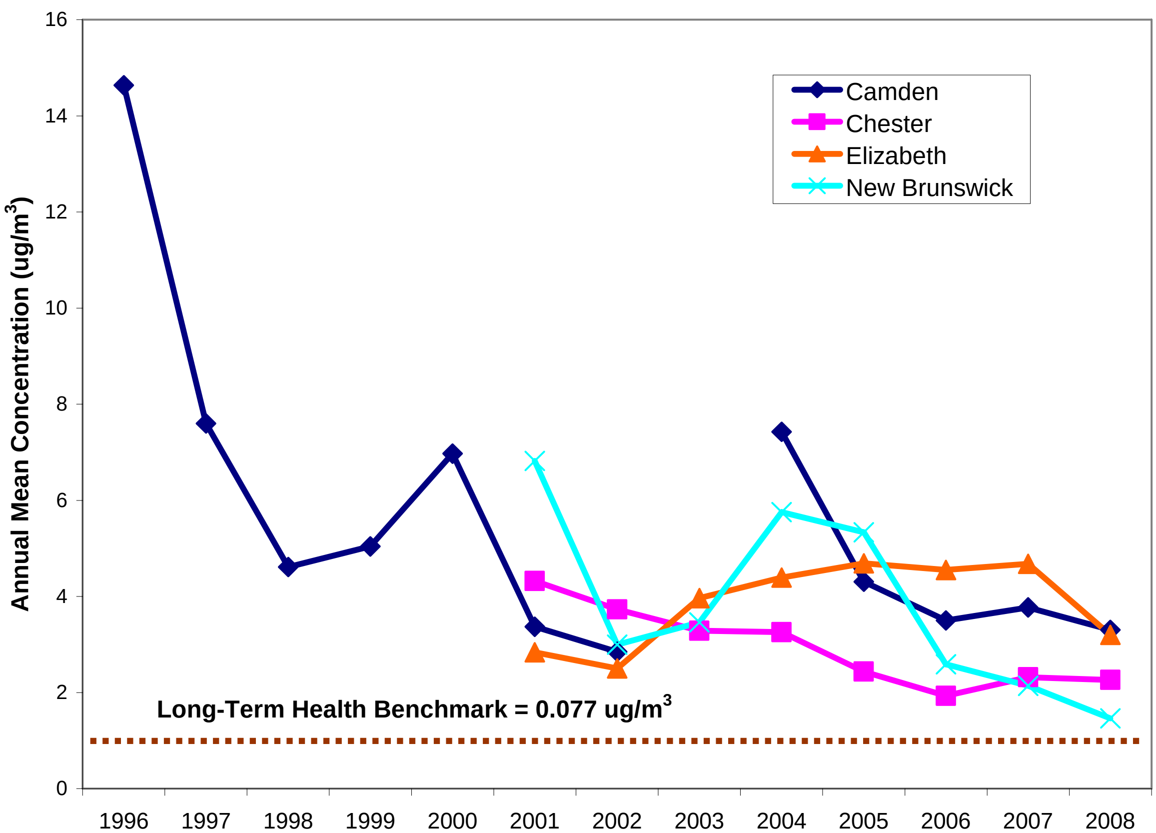


Figure 9 below shows a comparison of annual average concentrations measured at New Jersey's four air toxics monitoring sites in 2002 with annual average concentrations predicted by USEPA's 2002 NATA (at the monitoring site census tract). The comparison for five chemicals (acetaldehyde, benzene, chloromethane, ethylbenzene and formaldehyde) at all four monitoring sites shows agreement within a factor of 2 or less.

Figure 9
2002 NJ Monitored Air Toxics Concentrations
Compared to NATA Predicted Concentrations

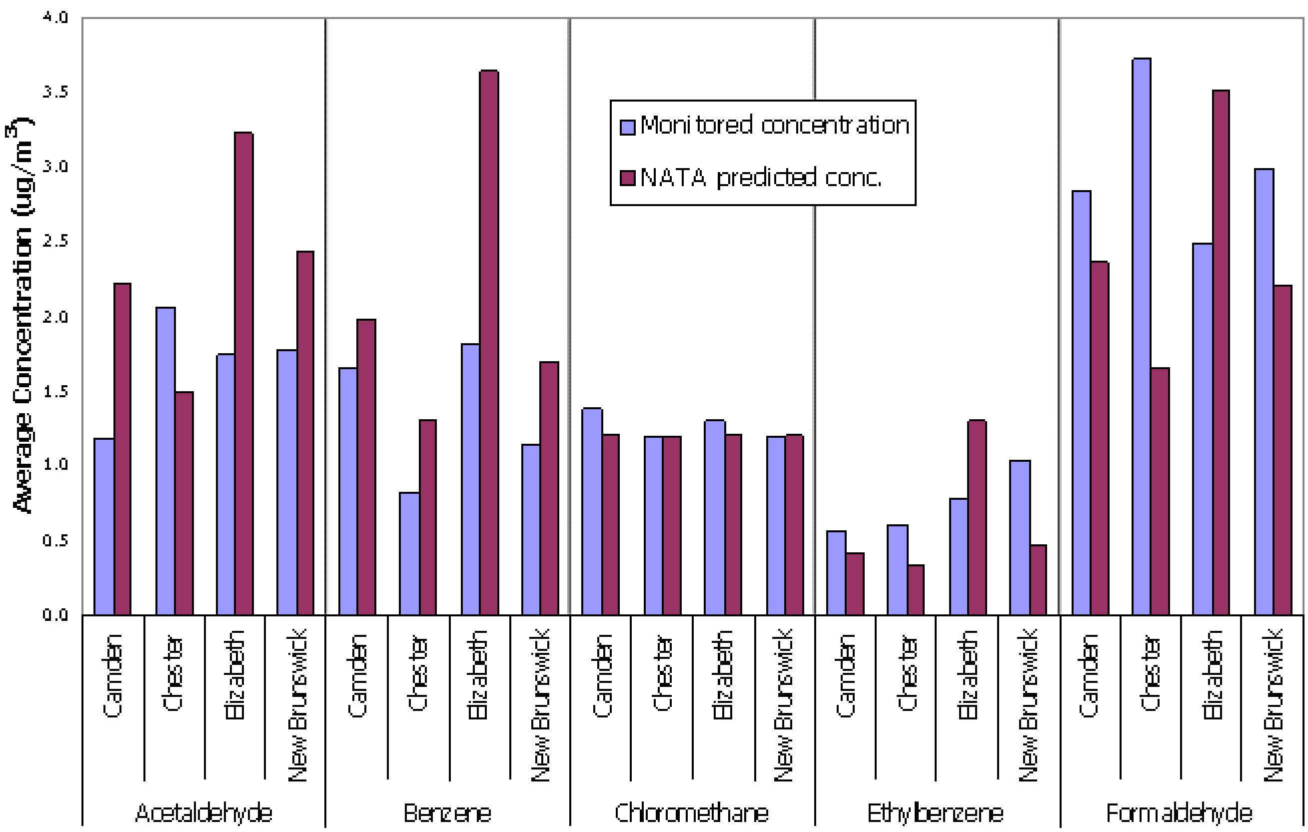


Table 4
2008 Air Toxics Data for Camden, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (μg/m^3)[b,c]	Annual Median (μg/m^3)[c]	24-Hour Max. (μg/m^3)	Long-Term Health Benchmark (μg/m^3)[d]	Annual Mean Risk Ratio[e]	Detection Limit (μg/m^3)	% Above Minimum Detection Limit[f]
Acetaldehyde	75-07-0	1.01	0.80	2.52	**1.82**	1.44	4.54	0.45	**4**	0.0072	100
Acetone	67-64-1	1.51	1.09	4.97	3.58	2.59	11.81	31000	0.0001	0.0166	100
Acetonitrile	75-05-8	2.35	0.94	26.70	3.94	1.58	44.83	60	0.1	0.1662	95
Acetylene	74-86-2	1.02	0.89	2.45	1.08	0.94	2.61			0.0245	100
Acrolein	107-02-8	0.40	0.34	1.46	0.92	0.77	3.35	0.02	**46**	0.2453	100
Acrylonitrile	107-13-1	(0.01)	0	0.27	**(0.03)**	0	0.58	0.015	**1.7**	0.1237	8
tert-Amyl Methyl Ether	994-05-8	(0.0001)	0	0.002	(0.0002)	0	0.01			0.0501	3
Benzaldehyde	100-52-7	0.03	0.03	0.08	0.15	0.13	0.33			0.0087	100
Benzene	71-43-2	0.43	0.35	2.95	**1.36**	1.11	9.42	0.13	**10**	0.0160	100
Bromomethane	74-83-9	0.21	0.05	1.92	0.82	0.21	7.46	5	0.2	0.0388	100
1,3-Butadiene	106-99-0	0.04	0.03	0.16	**0.09**	0.08	0.35	0.033	**3**	0.0133	100
Butyraldehyde	123-72-8	0.10	0.09	0.25	0.29	0.26	0.73			0.0029	100
Carbon Disulfide	75-15-0	0.62	0.36	3.58	1.92	1.12	11.15	700	0.003	0.0280	100
Carbon Tetrachloride	56-23-5	0.10	0.10	0.15	**0.66**	0.62	0.97	0.067	**10**	0.0566	100
Chlorobenzene	108-90-7	(0.001)	0	0.03	(0.004)	0	0.15	1000	0.000004	0.0230	3
Chloroethane	75-00-3	0.02	0.02	0.04	0.05	0.05	0.11			0.0211	100
Chloroform	67-66-3	0.02	0.02	0.05	**0.12**	0.10	0.26	0.043	**3**	0.0195	89
Chloromethane	74-87-3	0.63	0.61	0.91	**1.29**	1.25	1.88	0.56	**2**	0.0289	100
Crotonaldehyde	123-73-9	0.11	0.05	0.53	0.31	0.13	1.51			0.0029	100
Dibromochloromethane	594-18-3	(0.0001)	0	0.002	(0.001)	0	0.02			0.0993	5
p-Dichlorobenzene	106-46-7	0.03	0.03	0.07	**0.18**	0.16	0.42	0.091	**1.9**	0.0361	97
Dichlorodifluoromethane	75-71-8	0.52	0.51	0.64	2.56	2.53	3.17	200	0.01	0.0247	100
1,2-Dichloroethane	107-06-2	(0.003)	0	0.09	(0.01)	0	0.38	0.038	0.3	0.0607	3
1,1-Dichloroethene	75-35-4	(0.0003)	0	0.01	(0.001)	0	0.04	200	0.00001	0.0555	3
trans-1,2-Dichloroethylene	156-60-5	(0.001)	0	0.02	(0.003)	0	0.08			0.0714	5
Dichloromethane	75-09-2	0.16	0.12	0.77	0.55	0.40	2.66	2.1	0.3	0.0591	100
Dichlorotetrafluoroethane	1320-37-2	0.02	0.02	0.02	0.11	0.11	0.15			0.0210	100
Ethylbenzene	100-41-4	0.11	0.08	1.00	**0.47**	0.33	4.34	0.4	**1.2**	0.0217	100
Formaldehyde	50-00-0	2.69	2.22	5.66	**3.30**	2.73	6.95	0.077	**43**	0.0061	100
Hexaldehyde	66-25-1	0.04	0.04	0.09	0.16	0.16	0.38			0.0082	100
Isovaleraldehyde	590-86-3	(0.01)	0	0.04	(0.02)	0	0.15			0.0035	34
Methyl Ethyl Ketone	78-93-3	0.47	0.32	2.43	1.39	0.94	7.16	5000	0.0003	0.1296	100
Methyl Isobutyl Ketone	108-10-1	0.05	0.03	0.26	0.20	0.13	1.05			0.0287	97
Methyl Methacrylate	80-62-6	(0.04)	0	1.42	(0.14)	0	5.00	700	0.0002	0.0211	14
Methyl tert-Butyl Ether	1634-04-4	0.02	0.01	0.30	0.07	0.03	1.10	3.8	0.02	0.0072	73
n-Octane	111-65-9	0.03	0.03	0.12	0.15	0.12	0.54			0.0280	97

Table 4 (Continued)
2008 Air Toxics Data for Camden, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (μg/m^3)[b,c]	Annual Median (μg/m^3)[c]	24-Hour Max. (μg/m^3)	Long-Term Health Benchmark (μg/m^3)[d]	Annual Mean Risk Ratio[e]	Detection Limit (μg/m^3)	% Above Minimum Detection Limit[f]
Propionaldehyde	123-38-6	0.15	0.13	0.37	0.36	0.30	0.88	8	0.04	0.0048	100
Propylene	115-07-1	0.64	0.54	1.60	1.10	0.93	2.75	3000	0.0004	0.0155	100
Styrene	100-42-5	0.06	0.03	0.67	0.24	0.11	2.84	1.8	0.1	0.0426	97
Tetrachloroethylene	127-18-4	0.07	0.04	0.50	**0.48**	0.27	3.39	0.17	**3**	0.0746	100
Tolualdehydes		0.03	0.02	0.06	0.12	0.12	0.28			0.0147	97
Toluene	108-88-3	1.13	0.42	22.60	4.27	1.58	85.16	5000	0.0009	0.0188	100
1,1,1-Trichloroethane	71-55-6	0.02	0.02	0.03	0.10	0.10	0.15	1000	0.0001	0.0164	100
1,1,2-Trichloroethane	79-00-5	(0.0002)	0	0.01	(0.001)	0	0.04	0.063	0.02	0.0327	3
Trichloroethylene	79-01-6	0.03	0.02	0.22	0.17	0.11	1.20	0.5	0.3	0.0537	92
Trichlorofluoromethane	75-69-4	0.28	0.28	0.35	1.60	1.59	1.97	700	0.002	0.0393	100
Trichlorotrifluoroethane	26523-64-8	0.09	0.09	0.12	0.68	0.66	0.93			0.0920	100
1,2,4-Trimethylbenzene	95-63-6	0.07	0.04	0.50	0.35	0.22	2.43			0.0147	100
1,3,5-Trimethylbenzene	108-67-8	0.02	0.01	0.13	0.11	0.07	0.62			0.0197	97
Valeraldehyde	110-62-3	0.03	0.03	0.07	0.10	0.09	0.24			0.0035	100
Vinyl chloride	75-01-4	0.01	0.01	0.07	0.02	0.02	0.17	0.11	0.2	0.0204	70
m,p-Xylene	1330-20-7	0.23	0.16	0.80	1.00	0.71	3.47	100	0.01	0.0391	100
o-Xylene	95-47-6	0.08	0.06	0.29	0.37	0.26	1.24	100	0.004	0.0174	100

[a] Analytes in bold text had annual means above the long-term health benchmark.

[b] Numbers in parentheses are arithmetic means (or averages) based on less than 50 percent detection.

[c] For a valid 24-hour sampling event when the analyzing laboratory reports the term "Not Detected" for a particular pollutant, the concentration of 0.0 ppbv is assigned to that pollutant. These zero concentrations were included in the calculation of annual averages and medians for each pollutant regardless of percent detection.

[d] The long-term health benchmark is defined as the chemical-specific air concentration above which there may be human health concerns. For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure. For a non-carcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime. These toxicity values are not available for all chemicals. For more information, go to www.nj.gov/dep/aqpp/risk.html.

[e] The risk ratio for a chemical is a comparison of the annual mean air concentration to the long-term health benchmark. If the annual mean is 0, then the annual mean risk ratio is not calculated.

[f] There were 40 total VOC samples and 38 total carbonyl samples collected in 2008 in Camden.

Table 5
2008 Air Toxics Data for Chester, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (µg/m^3)[b,c]	Annual Median (µg/m^3)[c]	24-Hour Max. (µg/m^3)	Long-Term Health Benchmark (µg/m^3)[d]	Annual Mean Risk Ratio[e]	Detection Limit (µg/m^3)	% Above Minimum Detection Limit[f]
Acetaldehyde	75-07-0	0.77	0.75	2.12	**1.39**	1.36	3.82	0.45	**3**	0.0072	100
Acetone	67-64-1	0.94	0.88	2.69	2.24	2.09	6.39	31000	0.0001	0.0166	100
Acetonitrile	75-05-8	0.63	0.22	9.83	1.06	0.38	16.50	60	0.02	0.1662	93
Acetylene	74-86-2	0.64	0.53	2.84	0.68	0.57	3.02			0.0245	100
Acrolein	107-02-8	0.30	0.19	3.26	**0.69**	0.44	7.48	0.02	**34**	0.2453	100
Acrylonitrile	107-13-1	(0.03)	0	0.50	**(0.06)**	0	1.09	0.015	**4**	0.1237	16
tert-Amyl Methyl Ether	994-05-8	(0.0001)	0	0.004	(0.0003)	0	0.02			0.0501	2
Benzaldehyde	100-52-7	0.02	0.02	0.05	0.09	0.08	0.22			0.0087	98
Benzene	71-43-2	0.19	0.16	0.73	**0.60**	0.51	2.32	0.13	**5**	0.0160	100
Bromochloromethane	74-97-5	(0.0004)	0	0.01	(0.002)	0	0.07			0.1005	4
Bromodichloromethane	75-27-4	(0.0001)	0	0.004	(0.0005)	0	0.03			0.0469	2
Bromoform	75-25-2	(0.0003)	0	0.01	(0.003)	0	0.10	0.91	0.003	0.1758	4
Bromomethane	74-83-9	0.01	0.01	0.05	0.04	0.04	0.21	5	0.01	0.0388	95
1,3-Butadiene	106-99-0	0.02	0.01	0.14	**0.03**	0.02	0.32	0.033	**1.03**	0.0133	82
Butyraldehyde	123-72-8	0.07	0.07	0.18	0.21	0.21	0.52			0.0029	100
Carbon Disulfide	75-15-0	3.57	2.85	12.90	11.13	8.88	40.17	700	0.02	0.0280	100
Carbon Tetrachloride	56-23-5	0.11	0.11	0.21	**0.71**	0.71	1.34	0.067	**11**	0.0566	100
Chlorobenzene	108-90-7	(0.0001)	0	0.01	(0.0006)	0	0.03	1000	0.000001	0.0230	2
Chloroethane	75-00-3	0.01	0.01	0.06	0.03	0.02	0.16			0.0211	82
Chloroform	67-66-3	0.02	0.02	0.08	**0.12**	0.10	0.40	0.043	**3**	0.0195	96
Chloromethane	74-87-3	0.65	0.64	1.04	**1.33**	1.32	2.15	0.56	**2**	0.0289	100
Chloromethylbenzene	100-44-7	(0.0001)	0	0.0040	(0.0004)	0	0.02			0.0259	2
Chloroprene	126-99-8	(0.002)	0	0.10	(0.01)	0	0.35	7	0.001	0.0797	4
Crotonaldehyde	123-73-9	0.09	0.03	0.57	0.26	0.08	1.63			0.0029	98
Dibromochloromethane	594-18-3	(0.0001)	0	0.01	(0.001)	0	0.05			0.0993	2
p-Dichlorobenzene	106-46-7	0.01	0.003	0.11	0.05	0.02	0.67	0.091	0.5	0.0361	58
Dichlorodifluoromethane	75-71-8	0.54	0.54	0.91	2.66	2.65	4.49	200	0.01	0.0247	100
1,2-Dichloroethane	107-06-2	(0.02)	0	1.32	**(0.10)**	0	5.34	0.038	**3**	0.0607	4
1,1-Dichloroethane	75-34-3	(0.0002)	0	0.01	(0.0007)	0	0.04	0.63	0.001	0.0243	2
1,1-Dichloroethene	75-35-4	(0.0001)	0	0.01	(0.0005)	0	0.03	200	0.000002	0.0555	2
cis-1,2-Dichloroethylene	156-59-2	(0.0019)	0	0.11	(0.01)	0	0.42			0.0634	2
trans-1,2-Dichloroethylene	156-60-5	(0.0013)	0	0.07	(0.01)	0	0.26			0.0714	4
Dichloromethane	75-09-2	0.26	0.09	8.25	0.89	0.31	28.66	2.1	0.4	0.0591	100
Dichlorotetrafluoroethane	1320-37-2	0.01	0.02	0.02	0.10	0.10	0.17			0.0210	96
Ethyl Acrylate	140-88-5	(0.0001)	0	0.004	(0.0003)	0	0.02	2	0.0001	0.0450	2
Ethyl tert-Butyl Ether	637-92-3	(0.0001)	0	0.01	(0.0004)	0	0.03			0.0293	2

Table 5 (Continued)
2008 Air Toxics Data for Chester, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (μg/m³)[b,c]	Annual Median (μg/m³)[c]	24-hour Max. (μg/m³)	Long-Term Health Benchmark (μg/m³)[d]	Annual Mean Risk Ratio[e]	Detection Limit (μg/m³)	% Above Minimum Detection Limit[f]
Ethylbenzene	100-41-4	0.06	0.02	0.78	0.24	0.09	3.40	0.40	0.6	0.0217	100
Formaldehyde	50-00-0	1.84	1.45	5.03	**2.26**	1.78	6.18	0.077	**29**	0.0061	100
Hexachloro-1,3-butadiene	87-68-3	(0.0002)	0	0.01	(0.002)	0	0.13	0.045	0.05	0.1386	2
Hexaldehyde	66-25-1	0.02	0.03	0.05	0.10	0.10	0.20			0.0082	98
Isovaleraldehyde	590-86-3	(0.0016)	0	0.02	(0.01)	0	0.06			0.0035	18
Methyl Ethyl Ketone	78-93-3	0.37	0.21	5.39	1.08	0.63	15.87	5000	0.0002	0.1296	100
Methyl Isobutyl Ketone	108-10-1	0.11	0.02	4.98	0.45	0.07	20.40			0.0287	86
Methyl Methacrylate	80-62-6	(0.0002)	0	0.01	(0.0007)	0	0.02	700	0.000001	0.0211	4
Methyl tert-Butyl Ether	1634-04-4	(0.01)	0	0.13	(0.02)	0	0.48	3.8	0.005	0.0072	25
n-Octane	111-65-9	0.02	0.01	0.26	0.08	0.05	1.22			0.0280	82
Propionaldehyde	123-38-6	0.11	0.10	0.25	0.26	0.24	0.58	8.00	0.03	0.0048	100
Propylene	115-07-1	0.22	0.19	0.91	0.38	0.32	1.56	3000	0.0001	0.0155	100
Styrene	100-42-5	0.06	0.01	1.31	0.24	0.03	5.58	1.8	0.1	0.0426	74
1,1,2,2-Tetrachloroethane	79-34-5	(0.0001)	0	0.004	(0.0005)	0	0.03	0.017	0.03	0.0893	2
Tetrachloroethylene	127-18-4	0.02	0.01	0.31	0.15	0.09	2.12	0.17	0.9	0.0746	93
Tolualdehydes		0.02	0.02	0.17	0.10	0.07	0.82			0.0147	98
Toluene	108-88-3	0.50	0.14	11.60	1.90	0.52	43.71	5000	0.0004	0.0188	100
1,1,1-Trichloroethane	71-55-6	0.02	0.02	0.03	0.09	0.09	0.16	1000	0.0001	0.0164	100
1,1,2-Trichloroethane	79-00-5	(0.0001)	0	0.01	(0.0007)	0	0.04	0.063	0.01	0.0327	2
Trichloroethylene	79-01-6	(0.01)	0	0.13	(0.03)	0	0.68	0.5	0.06	0.0537	25
Trichlorofluoromethane	75-69-4	0.27	0.25	0.57	1.50	1.42	3.20	700	0.002	0.0393	100
Trichlorotrifluoroethane	26523-64-8	0.09	0.09	0.12	0.68	0.66	0.95			0.0920	100
1,2,4-Trimethylbenzene	95-63-6	0.05	0.01	0.92	0.24	0.06	4.54			0.0147	98
1,3,5-Trimethylbenzene	108-67-8	0.01	0.01	0.27	0.07	0.02	1.31			0.0197	79
Valeraldehyde	110-62-3	0.02	0.02	0.05	0.08	0.07	0.18			0.0035	98
Vinyl chloride	75-01-4	(0.0009)	0	0.01	(0.002)	0	0.03	0.11	0.02	0.0204	12
m,p-Xylene	1330-20-7	0.11	0.04	1.94	0.48	0.17	8.42	100	0.005	0.0391	100
o-Xylene	95-47-6	0.05	0.02	0.82	0.20	0.08	3.56	100	0.002	0.0174	100

[a] Analytes in bold text had annual means above the long-term health benchmark.

[b] Numbers in parentheses are arithmetic means (or averages) based on less than 50 percent detection.

[c] For a valid 24-hour sampling event when the analyzing laboratory reports the term "Not Detected" for a particular pollutant, the concentration of 0.0 ppbv is assigned to that pollutant. These zero concentrations were included in the calculation of annual averages and medians for each pollutant regardless of percent detection.

[d] The long-term health benchmark is defined as the chemical-specific air concentration above which there may be human health concerns. For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure. For a non-carcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime. These toxicity values are not available for all chemicals. For more information, go to www.nj.gov/dep/aqpp/risk.html.

[e] The risk ratio for a chemical is a comparison of the annual mean air concentration to the long-term health benchmark. If the annual mean is 0, then the annual mean risk ratio is not calculated.

[f] There were 57 total VOC samples and 57 total carbonyl samples collected in 2008 in Chester.

Table 6
2008 Air Toxics Data for Elizabeth, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (μg/m³)[b,c]	Annual Median (μg/m³)[c]	24-Hour Max. (μg/m³)	Long-Term Health Benchmark (μg/m³)[d]	Annual Mean Risk Ratio[e]	Detection Limit (μg/m³)	% Above Minimum Detection Limit[f]
Acetaldehyde	75-07-0	1.30	1.28	3.23	**2.33**	2.30	5.82	0.45	**5**	0.0072	100
Acetone	67-64-1	1.60	1.44	4.82	3.81	3.42	11.45	31000	0.0001	0.0166	100
Acetonitrile	75-05-8	3.19	3.42	12.50	5.36	5.74	20.99	60	0.1	0.1662	100
Acetylene	74-86-2	1.38	1.13	3.16	1.47	1.20	3.36			0.0245	100
Acrolein	107-02-8	0.57	0.44	2.05	**1.31**	1.01	4.70	0.02	**66**	0.2453	100
Acrylonitrile	107-13-1	(0.32)	0	1.92	**(0.70)**	0	4.17	0.015	**47**	0.1237	44
tert-Amyl Methyl Ether	994-05-8	(0.0002)	0	0.01	(0.001)	0	0.04			0.0501	4
Benzaldehyde	100-52-7	0.04	0.03	0.12	0.15	0.14	0.52			0.0087	100
Benzene	71-43-2	0.58	0.32	10.70	**1.84**	1.03	34.18	0.13	**14**	0.0160	100
Bromoform	75-25-2	(0.0001)	0	0.003	(0.001)	0	0.03	0.91	0.001	0.1758	4
Bromomethane	74-83-9	0.01	0.01	0.06	0.06	0.05	0.21	5	0.01	0.0388	94
1,3-Butadiene	106-99-0	0.07	0.06	0.19	**0.15**	0.13	0.42	0.033	**5**	0.0133	100
Butyraldehyde	123-72-8	0.12	0.10	0.36	0.36	0.30	1.06			0.0029	100
Carbon Disulfide	75-15-0	2.25	1.53	6.53	7.01	4.75	20.34	700	0.01	0.0280	100
Carbon Tetrachloride	56-23-5	0.11	0.10	0.23	**0.68**	0.63	1.44	0.067	**10**	0.0566	100
Chlorobenzene	108-90-7	(0.003)	0	0.14	(0.01)	0	0.66	1000	0.00001	0.0230	2
Chloroethane	75-00-3	0.03	0.02	0.26	0.07	0.04	0.67			0.0211	91
Chloroform	67-66-3	0.04	0.04	0.09	**0.19**	0.17	0.45	0.043	**4**	0.0195	100
Chloromethane	74-87-3	0.69	0.64	2.35	**1.43**	1.33	4.85	0.56	**3**	0.0289	100
Crotonaldehyde	123-73-9	0.12	0.06	0.66	0.33	0.18	1.89			0.0029	100
Dibromochloromethane	594-18-3	(0.0002)	0	0.01	(0.002)	0	0.06			0.0993	7
o-Dichlorobenzene	95-50-1	(0.0002)	0	0.01	(0.001)	0	0.07	200	0.00001	0.0301	2
p-Dichlorobenzene	106-46-7	0.03	0.02	0.14	**0.18**	0.12	0.87	0.091	**2**	0.0361	94
Dichlorodifluoromethane	75-71-8	0.57	0.55	0.88	2.80	2.72	4.37	200	0.01	0.0247	100
1,1-Dichloroethylene	75-35-4	(0.0004)	0	0.02	(0.001)	0.00	0.08	200	0.00001	0.0555	2
Dichloromethane	75-09-2	0.46	0.30	2.76	1.59	1.05	9.59	2.1	0.8	0.0591	100
1,2-Dichloropropane	78-87-5	(0.0001)	0	0.01	(0.001)	0	0.03	0.1	0.005	0.1525	2
Dichlorotetrafluoroethane	1320-37-2	0.02	0.02	0.02	0.11	0.12	0.15			0.0210	98
Ethylbenzene	100-41-4	0.20	0.18	0.83	**0.87**	0.78	3.60	0.4	**2**	0.0217	98
Formaldehyde	50-00-0	2.61	2.39	5.83	**3.20**	2.94	7.16	0.077	**42**	0.0061	100
Hexachloro-1,3-butadiene	87-68-3	(0.0001)	0	0.003	(0.001)	0	0.03	0.045	0.01	0.1386	2
Hexaldehyde	66-25-1	0.05	0.04	0.10	0.19	0.18	0.41			0.0082	100
Isovaleraldehyde	590-86-3	(0.01)	0	0.04	(0.03)	0	0.15			0.0035	39
Methyl Ethyl Ketone	78-93-3	0.47	0.41	1.15	1.39	1.20	3.39	5000	0.0003	0.1296	100
Methyl Isobutyl Ketone	108-10-1	0.05	0.04	0.26	0.21	0.16	1.06			0.0287	96

Table 6 (Continued)
2008 Air Toxics Data for Elizabeth, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (µg/m³)[b,c]	Annual Median (µg/m³)[c]	24-Hour Max. (µg/m³)	Long-Term Health Benchmark (µg/m³)[d]	Annual Mean Risk Ratio[e]	Detection Limit (µg/m³)	% Above Minimum Detection Limit[f]
Methyl Methacrylate	80-62-6	(0.01)	0	0.12	(0.05)	0	0.42	700	0.0001	0.0211	30
Methyl tert-Butyl Ether	1634-04-4	0.01	0.01	0.05	0.05	0.04	0.18	3.8	0.01	0.0072	72
n-Octane	111-65-9	0.06	0.06	0.18	0.27	0.27	0.83			0.0280	100
Propionaldehyde	123-38-6	0.19	0.18	0.48	0.44	0.42	1.13	8	0.06	0.0048	100
Propylene	115-07-1	2.89	1.32	18.30	4.97	2.27	31.50	3000	0.002	0.0155	100
Styrene	100-42-5	0.15	0.10	0.76	0.63	0.44	3.25	1.8	0.3	0.0426	100
Tetrachloroethylene	127-18-4	0.05	0.04	0.23	**0.35**	0.27	1.53	0.17	**2**	0.0746	100
Tolualdehydes		0.03	0.03	0.11	0.17	0.14	0.54			0.0147	98
Toluene	108-88-3	1.34	1.01	4.13	5.05	3.79	15.56	5000	0.001	0.0188	100
1,2,4-Trichlorobenzene	102-82-1	(0.0003)	0	0.01	(0.002)	0	0.08	4	0.0006	0.1113	4
1,1,1-Trichloroethane	71-55-6	0.02	0.02	0.03	0.10	0.10	0.19	1000	0.0001	0.0164	100
1,1,2-Trichloroethane	79-00-5	(0.00004)	0	0.002	(0.0002)	0	0.01	0.063	0.003	0.0327	2
Trichloroethylene	79-01-6	0.01	0.01	0.04	0.07	0.06	0.23	0.5	0.1	0.0537	65
Trichlorofluoromethane	75-69-4	0.28	0.26	0.49	1.57	1.49	2.76	700	0.002	0.0393	100
Trichlorotrifluoroethane	26523-64-8	0.09	0.09	0.12	0.69	0.69	0.95			0.0920	100
1,2,4-Trimethylbenzene	95-63-6	0.13	0.10	0.51	0.64	0.49	2.49			0.0147	100
1,3,5-Trimethylbenzene	108-67-8	0.04	0.03	0.14	0.19	0.15	0.69			0.0197	100
Valeraldehyde	110-62-3	0.04	0.03	0.22	0.14	0.11	0.78			0.0035	100
Vinyl chloride	75-01-4	(0.003)	0	0.02	(0.01)	0	0.06	0.11	0.07	0.0204	37
m,p-Xylene	1330-20-7	0.51	0.43	2.63	2.23	1.88	11.42	100	0.02	0.0391	100
o-Xylene	95-47-6	0.20	0.16	0.84	0.88	0.71	3.63	100	0.01	0.0174	100

[a] Analytes in bold text had annual means above the long-term health benchmark.

[b] Numbers in parentheses are arithmetic means (or averages) based on less than 50 percent detection.

[c] For a valid 24-hour sampling event when the analyzing laboratory reports the term "Not Detected" for a particular pollutant, the concentration of 0.0 ppbv is assigned to that pollutant. These zero concentrations were included in the calculation of annual averages and medians for each pollutant regardless of percent detection.

[d] The long-term health benchmark is defined as the chemical-specific air concentration above which there may be human health concerns. For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure. For a non-carcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime. These toxicity values are not available for all chemicals. For more information, go to www.nj.gov/dep/aqpp/risk.html.

[e] The risk ratio for a chemical is a comparison of the annual mean air concentration to the long-term health benchmark. If the annual mean is 0, then the annual mean risk ratio is not calculated.

[f] There were 54 total VOC samples and 54 total carbonyl samples collected in 2008 in Elizabeth.

Table 7
2008 Air Toxics Data for New Brunswick, NJ

Analyte[a]	CAS No.	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (µg/m^3)[b,c]	Annual Median (µg/m^3)[c]	24-Hour Max. (µg/m^3)	Long-Term Health Benchmark (µg/m^3)[d]	Annual Mean Risk Ratio[e]	Detection Limit (µg/m^3)	% Above Minimum Detection Limit[f]
Acetaldehyde	75-07-0	1.43	1.21	5.05	**2.57**	2.18	9.10	0.45	**6**	0.0072	100
Acetone	67-64-1	1.35	1.13	4.83	3.22	2.68	11.47	31000	0.0001	0.0166	100
Acetonitrile	75-05-8	0.26	0.20	1.41	0.43	0.33	2.37	60	0.01	0.1662	95
Acetylene	74-86-2	0.92	0.78	2.91	0.98	0.83	3.10			0.0245	100
Acrolein	107-02-8	0.28	0.23	1.64	**0.64**	0.52	3.76	0.02	**32**	0.2453	98
Acrylonitrile	107-13-1	(0.01)	0	0.34	**(0.02)**	0	0.74	0.015	**1.2**	0.1237	5
tert-Amyl Methyl Ether	994-05-8	(0.00004)	0	0.002	(0.0002)	0	0.01			0.0501	2
Benzaldehyde	100-52-7	0.01	0.01	0.05	0.05	0.05	0.20			0.0087	84
Benzene	71-43-2	0.22	0.20	0.53	**0.70**	0.63	1.68	0.13	**5**	0.0160	100
Bromoform	75-25-2	(0.0002)	0	0.01	(0.002)	0	0.10	0.91	0.002	0.1758	2
Bromomethane	74-83-9	0.01	0.01	0.08	0.05	0.04	0.32	5	0.01	0.0388	93
1,3-Butadiene	106-99-0	0.03	0.02	0.11	**0.06**	0.04	0.23	0.033	**1.8**	0.0133	98
Butyraldehyde	123-72-8	0.07	0.06	0.27	0.21	0.19	0.79			0.0029	100
Carbon Disulfide	75-15-0	1.11	0.95	3.22	3.47	2.96	10.03	700	0.005	0.0280	100
Carbon Tetrachloride	56-23-5	0.12	0.12	0.18	**0.75**	0.72	1.12	0.067	**11**	0.0566	100
Chlorobenzene	108-90-7	(0.0004)	0	0.02	(0.002)	0	0.11	1000	0.000002	0.0230	2
Chloroethane	75-00-3	0.03	0.02	0.21	0.07	0.04	0.55			0.0211	95
Chloroform	67-66-3	0.04	0.03	0.16	**0.18**	0.12	0.77	0.043	**4**	0.0195	95
Chloromethane	74-87-3	0.66	0.65	0.89	**1.35**	1.34	1.85	0.56	**2**	0.0289	100
Crotonaldehyde	123-73-9	0.09	0.05	0.47	0.26	0.13	1.36			0.0029	98
Dibromochloromethane	594-18-3	(0.0002)	0	0.01	(0.002)	0	0.08			0.0993	5
p-Dichlorobenzene	106-46-7	0.02	0.01	0.09	**0.10**	0.06	0.54	0.091	**1.1**	0.0361	85
Dichlorodifluoromethane	75-71-8	0.56	0.54	0.87	2.77	2.68	4.28	200	0.01	0.0247	100
1,1-Dichloroethylene	75-35-4	(0.0002)	0	0.01	(0.001)	0	0.04	200	0.000004	0.0555	2
cis-1,2-Dichloroethylene	156-59-2	(0.0009)	0	0.05	(0.003)	0	0.19			0.0634	2
trans-1,2-Dichloroethylene	156-60-5	(0.0001)	0	0.01	(0.0004)	0	0.02			0.0714	2
Dichloromethane	75-09-2	0.20	0.15	0.86	0.68	0.52	2.97	2.1	0.3	0.0591	100
Dichlorotetrafluoroethane	1320-37-2	0.02	0.02	0.02	0.11	0.11	0.17			0.0210	98
Ethylbenzene	100-41-4	0.05	0.04	0.18	0.21	0.16	0.79	0.4	0.5	0.0217	100
Formaldehyde	50-00-0	1.19	1.02	3.55	**1.46**	1.25	4.36	0.077	**19**	0.0061	100
Hexaldehyde	66-25-1	0.02	0.02	0.09	0.07	0.06	0.36			0.0082	82
Isovaleraldehyde	590-86-3	(0.001)	0	0.02	(0.005)	0.00	0.08			0.0035	9
Methyl Ethyl Ketone	78-93-3	0.33	0.29	1.11	0.97	0.85	3.27	5000	0.0002	0.1296	100
Methyl Isobutyl Ketone	108-10-1	0.04	0.03	0.23	0.15	0.11	0.93			0.0287	95
Methyl Methacrylate	80-62-6	(0.002)	0	0.05	(0.01)	0	0.18	700	0.00001	0.0211	5

Table 7 (Continued)
2008 Air Toxics Data for New Brunswick, NJ

Analyte[a]	Cas #	Annual Mean (ppbv)[b,c]	Annual Median (ppbv)[b]	24-Hour Max. (ppbv)	Annual Mean (μg/m^3)[b,c]	Annual Median (μg/m^3)[c]	24-Hour Max. (μg/m^3)	Long-Term Health Benchmark (μg/m^3)[d]	Annual Mean Risk Ratio[e]	Detection Limit (μg/m^3)	% Above Minimum Detection Limit[f]
Methyl tert-Butyl Ether	1634-04-4	0.01	0.004	0.08	0.03	0.01	0.29	3.8	0.01	0.0072	53
n-Octane	111-65-9	0.02	0.02	0.09	0.09	0.08	0.41			0.0280	91
Propionaldehyde	123-38-6	0.09	0.08	0.28	0.21	0.20	0.67	8	0.03	0.0048	100
Propylene	115-07-1	0.54	0.39	3.76	0.93	0.67	6.47	3000	0.0003	0.0155	100
Styrene	100-42-5	0.02	0.01	0.14	0.08	0.05	0.58	1.8	0.04	0.0426	95
Tetrachloroethylene	127-18-4	0.04	0.03	0.24	**0.24**	0.18	1.62	0.17	**1.4**	0.0746	96
Tolualdehydes		0.02	0.02	0.13	0.11	0.09	0.62			0.0147	96
Toluene	108-88-3	0.31	0.22	1.32	1.17	0.84	4.97	5000	0.0002	0.0188	100
1,1,1-Trichloroethane	71-55-6	0.02	0.02	0.04	0.10	0.10	0.19	1000	0.0001	0.0164	100
1,1,2-Trichloroethane	79-00-5	(0.0002)	0	0.01	(0.001)	0	0.06	0.063	0.02	0.0327	2
Trichloroethylene	79-01-6	0.01	0.01	0.11	0.07	0.03	0.60	0.5	0.1	0.0537	56
Trichlorofluoromethane	75-69-4	0.28	0.26	0.61	1.57	1.48	3.40	700	0.002	0.0393	100
Trichlorotrifluoroethane	26523-64-8	0.09	0.09	0.12	0.71	0.69	0.95			0.0920	100
1,2,4-Trimethylbenzene	95-63-6	0.04	0.03	0.16	0.18	0.15	0.77			0.0147	98
1,3,5-Trimethylbenzene	108-67-8	0.01	0.01	0.05	0.06	0.05	0.24			0.0197	93
Valeraldehyde	110-62-3	0.02	0.02	0.07	0.06	0.05	0.23			0.0035	73
Vinyl chloride	75-01-4	(0.002)	0	0.02	(0.01)	0	0.05	0.11	0.1	0.0204	36
m,p-Xylene	1330-20-7	0.12	0.09	0.50	0.51	0.39	2.16	100	0.01	0.0391	100
o-Xylene	95-47-6	0.05	0.03	0.18	0.20	0.15	0.79	100	0.002	0.0174	100

[a] Analytes in bold text had annual means above the long-term health benchmark.

[b] Numbers in parentheses are arithmetic means (or averages) based on less than 50 percent detection.

[c] For a valid 24-hour sampling event when the analyzing laboratory reports the term "Not Detected" for a particular pollutant, the concentration of 0.0 ppbv is assigned to that pollutant. These zero concentrations were included in the calculation of annual averages and medians for each pollutant regardless of percent detection.

[d] The long-term health benchmark is defined as the chemical-specific air concentration above which there may be human health concerns. For a carcinogen (cancer-causing chemical), the health benchmark is set at the air concentration that would cause no more than a one-in-a-million increase in the likelihood of getting cancer, even after a lifetime of exposure. For a non-carcinogen, the health benchmark is the maximum air concentration to which exposure is likely to cause no harm, even if that exposure occurs on a daily basis for a lifetime. These toxicity values are not available for all chemicals. For more information, go to www.nj.gov/dep/aqpp/risk.html.

[e] The risk ratio for a chemical is a comparison of the annual mean air concentration to the long-term health benchmark. If the annual mean is 0, then the annual mean risk ratio is not calculated.

[f] There were 55 total VOC samples and 56 total carbonyl samples collected in 2008 in New Brunswick.

Table 8.
Analytes with 100 Percent Non-Detects in 2008

Analyte	CAS #	Detection Limit (µg/m³)	Location			
			Camden	Chester	Elizabeth	New Brunswick
Bromochloromethane	74-97-5	0.1005	X		X	X
Bromodichloromethane	75-27-4	0.0469	X		X	X
Bromoform	75-25-2	0.1758	X			
Chloromethylbenzene	100-44-7	0.0259	X		X	X
Chloroprene	126-99-8	0.0797	X		X	X
1,2-Dibromoethane	106-93-4	0.1383	X	X	X	X
m-Dichlorobenzene	541-73-1	0.0607	X	X	X	X
o-Dichlorobenzene	95-50-1	0.1525	X	X		X
1,1-Dichloroethane	75-34-3	0.0243	X		X	X
1,2-Dichloroethane	107-06-2	0.0607			X	X
cis-1,2-Dichloroethylene	156-59-2	0.0634	X		X	
trans-1,2-Dichloroethylene	542-75-6	0.0635			X	
1,2-Dichloropropane	78-87-5	0.1525	X	X		X
cis-1,3-Dichloropropene	542-75-6	0.0635	X	X	X	X
trans-1,3-Dichloropropene	123-73-9	0.0029	X	X	X	X
2,5-Dimethylbenzaldehyde	5799-94-2	0.0049	X	X	X	X
Ethyl Acrylate	140-88-5	0.0450	X		X	X
Ethyl tert-Butyl Ether	637-92-3	0.0293	X		X	X
Hexachloro-1,3-butadiene	87-68-3	0.1386	X			X
1,1,2,2-Tetrachloroethane	79-34-5	0.0893	X		X	X
1,2,4-Trichlorobenzene	102-82-1	0.1113	X	X		X

In 2008, collected samples of these chemicals were never above the detection limits at the specific monitoring locations. However, they may be present in the air below the detection limit level.

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