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Executive Summary

Previous analyses of data from New Jersey and Massachusetts, the two states that track quantities of toxic chemicals, show that amounts shipped as or in products are much greater than the amounts of chemicals released to the environment. This is not surprising, since several industries in those states are in the business of producing toxic chemicals.

Much of that "product," however, also becomes raw material for other facilities that manufacture products likely to be used in the home. [illegible] examines amounts of chemicals shipped in products from those facilities and focuses on specific chemicals that are known or suspected neurotoxins, carcinogens, or reproductive or developmental toxins. Certainly, most consumers would expect that products in their homes will contain minimal amounts of these particular chemicals. While New Jersey and Massachusetts may not be representative of the U.S. as a whole, the results show that environmental releases of these types of chemicals are small compared to the tens of millions of pounds of these chemicals shipped in products from facilities in those states. Among the findings:

- On average, for every pound of neurotoxins, carcinogens, or reproductive or developmental toxins facilities in New Jersey and Massachusetts report as released to the air, water, or land, they ship 42 pounds of the same chemicals as or in products that could be used in or around the home.
- The top 10 chemicals shipped as or in products examined for this report are all neurotoxins. In addition, one of the 10, toluene, is a developmental toxin, and lead compounds and creosote are carcinogens.
- The top five chemicals shipped as or in products that are likely to be inhaled by users are chlorine, toluene, xylene, methyl ethyl ketone, and n-hexane.
- The five industry categories that shipped the most neurotoxins, carcinogens, or reproductive or developmental toxins in products are paints, varnishes, and enamels; specialty cleaning products; motor vehicle and passenger car bodies; adhesives and sealants; and wood preservatives. These five industrial classifications account for more than 85 percent of the amount of the chemicals examined in this report.

- While most of the amount of chemicals shipped as or in products was intended to be part of the product, a substantial portion was not, such as raw material impurities, solvents, or unreacted chemicals. Together, these represent millions of pounds of toxic chemicals "along for the ride," serving no particular purpose in the product.

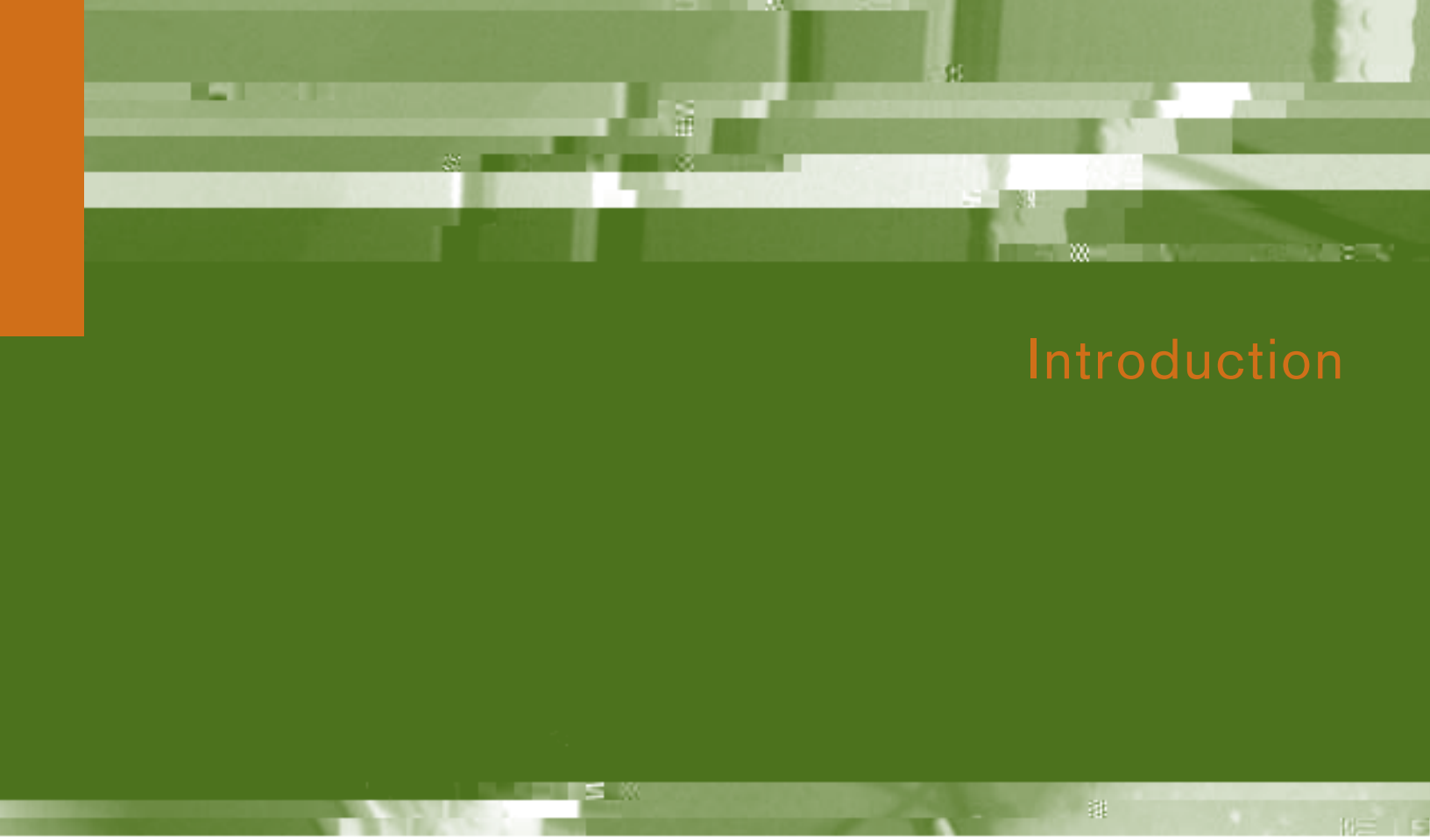
[illegible] calls on policymakers to consider a number of reforms to address the problem of toxics in products:

- Congress should require nationwide reporting of chemicals in products as is currently required in Massachusetts and New Jersey. As in those two states, the tracking can be combined with programs that have explicit goals for reducing the use of toxic chemicals.

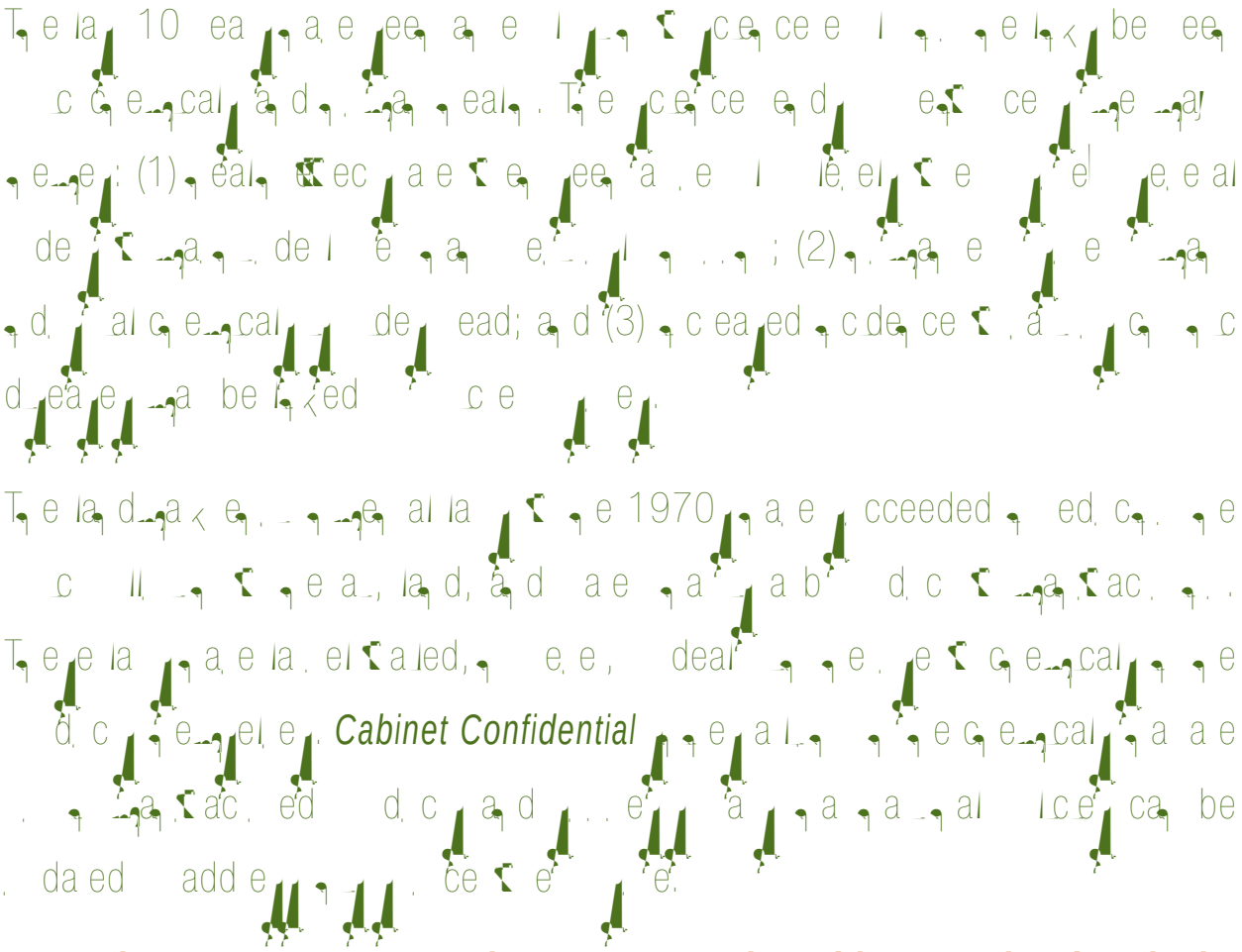
- Virtually all of the chemicals examined in this report were "grandfathered" under the Toxic Substances Control Act of 1976 (TSCA), meaning that they are exempt from even the rudimentary requirements of the Act. Since 1976, Congress has broken new ground in reducing pesticide exposures through the Food Quality Protection Act, and the European Union is considering a wide-ranging program that will dramatically change its regulation of toxic chemicals. Congress should apply lessons from these policies and revise TSCA. Specifically, TSCA should require industry to identify the potential health effects of exposure to chemicals that are used in products and accelerate the introduction of less toxic or non-toxic alternatives.

- In the meantime, the other federal agencies with some jurisdiction over products—primarily the Food and Drug Administration and the Consumer Product Safety Commission—should reform the way they deal with issues of chemical exposure to reflect recent science on low-level exposures and a precautionary ethic.

- To help gauge the extent of potential exposure, the Centers for Disease Control should expand its bio-monitoring program to include chemicals found in products used in and around the home. Only one of the 10 chemicals most likely to be found in household products is currently on the CDC's bio-monitoring list.



Introduction



Emerging Consensus: People Are More Vulnerable to Toxic Chemicals

Peer-reviewed studies in scientific journals such as [illegible] continuously find that common chemicals impact health at lower levels than previously believed. Chemicals as ubiquitous as lead,[1] cadmium,[2] bisphenyl-A,[3] and phthalates[4] have all been found to cause profound health effects at very low levels in recent years. In the case of lead, researchers could only discover the lower level effects after bans on lead in paint and gasoline succeeded in reducing the levels in a majority of children.

There has also been increased attention to the fact that in the real world—as opposed to the laboratory—people are exposed to multiple chemicals at the same time. Some chemicals have similar mechanisms of toxicity and therefore their effect on the body is additive. (Two small doses of each may be the same thing to the body as getting a larger dose of one.) Combinations of other chemicals are believed to be synergistic—producing different effects together than they would separately.

In the early '90s, a panel of the National Academy of Sciences (NAS) declared that children were more vulnerable to toxic chemicals than adults and that policies governing pesticide exposures failed to protect them.[5] Congress reacted to the panel's findings and incorporated them into the Food Quality Protection Act of 1996. The FQPA reformed the way EPA sets the allowable amounts of pesticide residues left on food to reflect children's special vulnerability and cumulative exposure. Though the NAS report focused specifically on pesticides, the same principles apply to other chemical uses. Yet the NAS report has not prompted a similar reform in the area of industrial and commercial chemicals.

Toxic Chemicals and Chronic Diseases

Various chronic diseases have increased in incidence during the last two decades, prompting some experts and policy makers to call for more comprehensive tracking of diseases and environmental exposures to toxic chemicals. According to the Trust for America's Health:

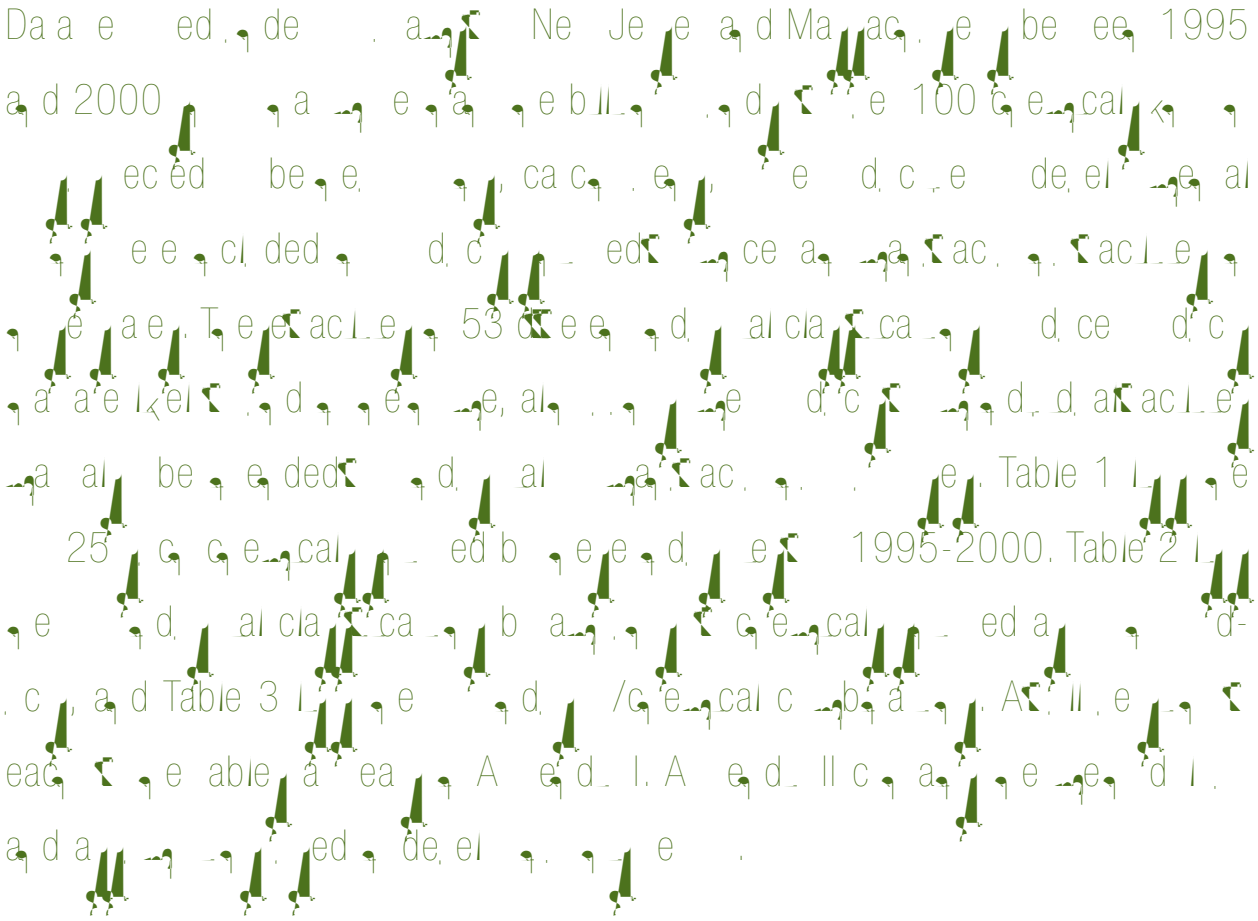
- The number of people with asthma increased 75% between 1980 and 1994. Among children under four, the disease has exploded by 160%. Today, asthma attacks are the number one cause of school absenteeism.
- Endocrine and metabolic chronic diseases like diabetes increased 20% between 1986 and 1995.
- The number of low birth weight and premature babies has been rising since 1980, and birth defects are the number one killer of infants in America today.
- Neurological diseases such as multiple sclerosis increased 20% between 1986 and 1995.
- Brain cancers and other tumors in children's nervous systems rose by more than 25% between 1973 and 1996.
- Leukemia, the most common childhood cancer, increased more than 15% over the past 20 years.[6]

The federal government currently monitors a cross-section of the population for exposure to toxic chemicals, but has yet to link that information with information tracking various diseases. In February 2003, the Centers for Disease Control (CDC) documented that a broad

environment as a by-product of combustion, like dioxin. Studies by other governments and private entities have similarly documented widespread human exposure to common industrial chemicals all over the world. Senator Hillary Clinton (D–NY) and Representative Nancy Pelosi (D–CA) have called for a national program to coordinate and improve disease tracking and match it with the CDC data on chemical exposures.

Even without a national system to track environmental exposures and diseases, scientists already attribute environmental exposure to chemicals to disease incidence. A June 2000

Results and Discussion



In reviewing these data, it is important to keep the following limitations and qualifications in mind:

- The presence of chemicals in products potentially found in the home does not necessarily mean that people are directly exposed to all, or even some, of these chemicals during use of particular products. This report does not attempt to estimate exposure levels or risk.

to minimize inhalation exposure, but this is generally more difficult than avoiding swallowing or touching the products. In addition, inhalation is often a more significant exposure route than oral or dermal exposure.

- Because this report examines industrial classifications and not specific products made at individual facilities, it is not possible to say that an individual product will contain a given toxic chemical. For example, although the paints, varnishes, lacquers, enamels, and allied products industry (SIC code 2851) as a group reported shipping toluene as or in products, it does not mean that every product from each facility in SIC code 2851 contains toluene.

- Although this report contains data submitted by industrial classifications selected for producing products likely to be found in and around the home, facilities do not report the amount of chemicals shipped in products actually intended for home use. There are no data available to determine exactly how much of the amount of chemicals shipped in products actually end up in products intended for home use.

- The data used in this report were those collected by New Jersey and Massachusetts, and they are subject to the rules of those reporting programs. The programs do not include every chemical that could be classified as a neurotoxin, carcinogen, or reproductive or developmental toxin that may be shipped in products intended for use in the home. Facilities reporting the data used in this report are not required to measure the amounts of these chemicals shipped as or in products, but only to provide good-faith estimates from available data.

Finally, while these results only apply to facilities in New Jersey and Massachusetts making it impossible to extrapolate for the U.S. as a whole, there is no reason to assume these two states have higher concentrations of toxic chemicals in products than the other 48. In fact, New Jersey and Massachusetts are the only ones to establish specific programs to reduce the use of toxic chemicals by industry.

The Consumer Product Safety Commission and Vinyl Toys

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TABLE 1

Top 25 Known or Suspected Neurotoxins, Carcinogens, or Reproductive or Developmental Toxins Shipped As or in Products Likely Found in the Home, 1995-2000

Rank	Chemical	Number of Facilities Reporting the Chemical	Amount of the Chemical Shipped As or in Product (pounds)	Percent of Total Shipped As or in Product	Percent of Total Shipped in Product Not Intended to Be in Product	Releases of Chemical per Pound of Intended Use in Product
1	Chlorine	11	207,151,360	19.50	0.0	1 / 38,000
2	Lead compounds	25	150,661,278	14.18	0.0	1 / 40,000
3	Toluene	160	129,203,585	12.16	1.2	1 / 18
4	Xylene (mixed isomers)	98	78,453,460	7.39	1.0	1 / 85
5	Glycol ethers	100	73,125,317	6.88	0.6	1 / 40
6	Ethylene glycol	36	48,539,935	4.57	9.2	1 / 2,500
7	Creosote	1	46,585,535	4.39	0.0	1 / 4,900
8	Methyl ethyl ketone	113	44,772,785	4.21	3.8	1 / 15
9	n-Hexane	26	32,730,852	3.08	0.7	1 / 30
10	Methanol	77	21,938,673	2.07	4.1	1 / 12
11	1,1-Dichloro-1-fluoroethane (HCFC-141b)	6	16,779,390	1.58	4.4	1 / 42
12	Dichloromethane	36	14,311,797	1.35	0.6	1 / 11
13	Methyl isobutyl ketone	65	12,787,886	1.20	1.2	1 / 13
14	Cresol (mixed isomers)	3	12,264,839	1.15	0.0	1 / 3,400
15	Di(2-ethylhexyl) phthalate	18	11,255,981	1.06	0.0	1 / 2,900
16	Dibutyl phthalate	17	10,007,413	0.94	0.0	1 / 12,000
17	Methyl methacrylate	14	9,637,337	0.91	10.1	1 / 95
18	Ethylbenzene	29	9,440,257	0.89	5.6	1 / 84
19	Ammonia	61	8,825,612	0.83	2.8	1 / 10
20	Dichlorodifluoromethane (CFC-12)	5	8,348,297	0.79	0.0	1 / 48
21	1,2,4-Trimethylbenzene	27	7,926,658	0.75	1.6	1 / 180
22	Sodium phosphate, tribasic	6	7,275,650	0.68	0.0	1 / 98,000
23	Methyl tert-butyl ether	5	7,177,334	0.68	0.0	1 / 790
24	Nickel compounds	8	7,078,892	0.67	0.3	1 / 4,800
25	Ethyl acetate	32	5,970,218	0.56	0.0	1 / 2.8
Total for all records		**466**	**1,062,264,637**	**100.00**	**1.8**	**1 / 42**

Top Chemicals

The top 10 chemicals shipped as or in products examined for this report are all neurotoxins. In addition, toluene is a developmental toxin, and lead compounds and creosote are carcinogens. (See Table 1. Appendix I, Table 1 lists the particular known or suspected health effects for each of the chemicals.)

1	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	64	266,003,016	25.04	2.0	1 / 230
2	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	17	259,478,985	24.43	0.0	1 / 5,600
3	3711	Motor Vehicles And Passenger Car Bodies	3	182,848,676	17.21	2.3	1 / 330
4	2891	Adhesives And Sealants	36	147,696,824	13.90	1.0	1 / 120
5	2491	Wood Preservatives	5	50,524,985	4.76	0.0	1 / 5,300
6	2841	Soap And Other Detergents, Except Specialty Cleaners	14	28,268,535	2.66	0.0	1 / 2,300
7	3089	Pla					

1	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Chlorine	207,118,000	0	Zero
2	3711	Motor Vehicles And Passenger Car Bodies	Lead compounds	126,199,317	0	Zero
3	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Xylene (mixed isomers)	65,515,051	0.99	1 / 320
4	2891	Adhesives And Sealants	Toluene	58,044,213	0	1 / 340
5	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Toluene	54,837,908	0	1 / 160
6	2491	Wood Preservatives	Creosote	46,585,535	0	1 / 4,900
7	2891	Adhesives And Sealants	n-Hexane	30,766,665	0	1 / 300
8	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Glycol ethers	30,655,568	0	1 / 6,200
9	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Glycol ethers	26,845,953	0.11	1 / 290
10	3711	Motor Vehicles And Passenger Car Bodies	Ethylene glycol	23,465,057	12.42	Zero
11	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Ethylene glycol	20,545,349	0	1 / 9,300
12	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Methyl ethyl ketone	19,886,702	1.26	1 / 110
13	2891	Adhesives And Sealants	Methyl ethyl ketone	19,044,027	0	1 / 85
14	3069	Fabricated Rubber Products, NEC	Lead compounds	17,601,129	0	1 / 840,000
15	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Methyl isobutyl ketone	12,054,501	1.09	1 / 340

Industry/Chemical Combinations

Table 3 lists the top industry/chemical combinations for amounts of neurotoxins, carcinogens, and reproductive or developmental toxins shipped in products between 1995 and 2000.

Releases to the Environment per Pound of Intended Use in Product

These data show that, on average, for every pound of neurotoxins, carcinogens, or reproductive or developmental toxins facilities report as released to the air, water, or land, manufacturers ship 42 pounds of these chemicals as or in products. And the 42 pounds is just an average. For some industry/chemical combinations, the ratio is much higher. For example, for neurotoxic glycol ethers in soaps and detergents, the ratio is 1,800 to one. For some volatile organic chemicals in paints and adhesives, the ratio is in the hundreds.

Obviously, facilities are in the business of producing products and not releases to the environment, so it is not surprising that more chemicals end up in products than in air, water, or land. Still, these data are important because of the large numbers and the scarcity of such information except for New Jersey and Massachusetts. Releases to the environment are reported nationally and sometimes regulated under state and federal programs. Amounts shipped as or in products are only reported in two states, and regulation is far more elusive. While it is well beyond the scope of this report to compare the relative risk from living near a facility that produces paint to painting the average home, the large ratio of amounts in products to releases suggests that the products represent potentially important sources of exposure.

The U.S. Food and Drug Administration and Bisphenyl-A

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Policy Implications

Tracking Chemicals in Products

As the "Methodology" section in Appendix II makes clear, this report was only possible because of policies in Massachusetts and New Jersey requiring facilities to report chemical use. These states are alone in requiring manufacturers to distinguish between the chemicals they use, generate, and put in products from the amounts they emit into the environment, and to document both sources of potential exposure.

New Jersey and Massachusetts also have planning programs specifically designed to reduce the use of toxic chemicals "at the source" of manufacturing. The Pollution Prevention Act and the Toxics Use Reduction Act, respectively, require industrial facilities to examine their processes for opportunities to reduce the use or generation of toxic chemicals. Massachusetts also provides technical assistance. The combination of expanded right-to-know and use reduction planning has shown some success, especially in reducing the amount of chemical waste.

Similar "source reduction" laws in California and Oregon have proven less successful, partly because there is no expanded right-to-know requirement to create incentives for taking the planning requirements seriously and to track results. The same is true of the federal Pollution Prevention Act. Combining source reduction planning with chemical use reporting at the state and federal level could yield substantial reductions in the use of toxic chemicals. A federal program to report chemical use should be established to protect the public's right-to-know and to spur corporations' interest in positive public relations that would drive innovations to reduce the use of toxic chemicals in products. These two forces are widely credited by industry and environmentalists with the success of the federal Toxic Release Inventory (TRI) program in reducing toxic pollution.

Weak Law Leads to Voluntary Measures on Health Effects

Some health effects information is available for most of the chemicals identified in this report. Either federal or California lists, for example, identify certain chemicals as neurotoxins, carcinogens, or reproductive or developmental toxins. For the vast majority of the 70,000 chemicals used in commerce, however, publicly available health effects information is non-existent.

This is partly due to the federal law governing toxics in products, which has turned out to be a paper tiger (in contrast to the landmark pollution laws). For the chemicals already on the market at the time of its passage, the Toxic Substances Control Act (TSCA) requires EPA to show that a chemical presents an "unreasonable risk" and to demonstrate likely human exposure before the EPA can require it to be

tested. Because the testing is needed to help demonstrate risk, the law has been ineffective with the large group of untested chemicals. TSCA does require pre-manufacture notices for those chemicals introduced since the passage of the law, and EPA has used this provision to raise questions about some chemicals–prompting industry to withdraw them–and has moved to restrict the use of others. Yet, the majority of chemicals in commerce remain unregulated by this law.

Spurred by an investigation by Environmental Defense, the EPA found that only seven percent of the approximately 3,000 chemicals produced in high volumes (in quantities over one million pounds per year) had a basic set of publicly available toxicity information.[18] The percentage is believed to be worse for the tens of thousands of additional chemicals produced in smaller volumes.

In 1998, the EPA and the American Chemistry Council, with the participation of Environmental Defense, set up the voluntary High Production Volume (HPV) Challenge Program to develop basic health effects information by 2005 for chemicals made or imported in quantities of one million pounds or more per year. Chemicals raising "red flags" in this basic screening would be singled out for comprehensive testing. As of summer 2003, the program's progress was mixed. Commitments to evaluate hundreds of chemicals have been made, but there are approximately 500 "orphaned" chemicals for which industry will not take responsibility and many others for which fundamental toxicological assessments have yet to be done. Thus the program has produced only modest results so far.[19] Work on a similar program, the Voluntary Children's Testing Program, is too preliminary to provide results.

Consumer Product Safety Commission Fails to Fill the Gap

The U.S. Consumer Product Safety Commission (CPSC) has failed to fill the gap left by environmental laws. Technically empowered to ensure product safety, including protection from chronic environ-

The Food and Drug Administration and Toxics in Products

The FDA has jurisdiction over certain consumer products that contain toxic chemicals, including food wraps and cosmetics, yet it has failed to use its authority to ensure these products are safe. In November 2002, for example, the FDA's review panel for cosmetics ingredients declined to follow the lead of the European Union and ban carcinogens and reproductive toxins in cosmetics. In 1998, the FDA also failed to respond to new science showing the ubiquitous chemical bisphenol-A, used as a softener for plastic, posed a hazard by leaching from baby bottles, food wraps, and other items containing polycarbonate plastic. (☞ bisphenol-A sidebar, page 23.)

Europe Integrates Health Effects and Chemical Regulation

Over the last several years, the European Union has moved to rationalize and integrate its regulation of toxic chemicals in ways that provide a model for the United States. The Registration, Evaluation, and Authorization of Chemicals (REACH) policy[20] was formally proposed in May 2003 and is almost sure to be enacted in some form by the EU over the next three years. The registration policy would require industry to generate health effects information for chemicals that have none by a specific deadline. For chemicals produced in very large quantities, or others that raise concerns during the registration phase,

Products as Waste and Extended Producer Responsibility

Even when products such as discarded computers and other electronic equipment don't expose consumers to the toxics they contain during their useful life, they may expose other people and the environment when they become waste. Investigators have uncovered the terrible environmental and human health effects of China's sprawling, unregulated computer "recycling" industry.[21] Recycling centers for large appliances and cars have also been hampered by the toxic content of the products they dismantle, and some have contributed to or become Superfund sites.[22] State legislatures and members of Congress are considering plans to regulate the toxic waste of the electronics industry with mechanisms similar to the beverage container deposit systems that exist in several states.[23] At the same time,

Recommendations

Products likely to be found in the home may contain far higher amounts of potentially toxic chemicals–and thus may present a much greater exposure risk–than manufacturers release into the air, water, and soil. The actual quantities of these chemicals and their effects on humans are unknown, making them an unacceptable health risk for Americans. The following policy recommendations are intended to address this issue:

1. Congress should enact a national system to track and report chemical use in products, modeled on the programs in New Jersey and Massachusetts.

2. Congress should reform the Toxic Substances Control Act so that the EPA can more effectively anticipate and prevent adverse health effects from toxic chemicals in products. The reform should be modeled generally on the European Union's REACH policy and base allowable exposure levels on children's heightened vulnerability to chemicals, similar to the Food Quality Protection Act's standard for pesticides.

3. Congress should continue to fund bio-monitoring and health tracking initiatives at the Centers for Disease Control (CDC) and state health departments to improve our understanding of links between toxics and illness and to help inform enlightened public policy.

4.

Appendix I: Tables

1	Chlorine	--	--	y	11	207,151,360	19.50	0.0	1 / 38,000
2	Lead compounds	y	--	y	25	150,661,278	14.18	0.0	1 / 40,000
3	Toluene	--	y	y	160	129,203,585	12.16	1.2	1 / 18

TABLE 1 CONTINUED

Rank	Chemical				Number of Facilities Reporting the Chemical	Amount of the Chemical Shipped As or in Product (pounds)	Percent of Total Shipped As or in Product	Percent of Total Shipped in Product Not Intended to Be in Product	
59	Folpet	y	--	--	2	510,555	0.05	0.0	Zero
60	Antimony trioxide	y	--	--	5	492,133	0.05	0.0	1 / 98,000
61	p-Xylene	--	--	y	1	446,320	0.04	0.0	1 / 21
62	Isophorone	--	--	y	2	424,879	0.04	0.0	1 / 52
63	Triethylamine	--	--	y	11	416,241	0.04	5.1	1 / 77
64	tert-Butyl alcohol	--	--	y	3	415,658	0.04	0.0	1 / 640
65	Lead	y	y	y	4	375,812	0.04	0.0	1 / 34,000
66	Aluminum (fume or dust)	--	--	y	7	353,117	0.03	0.0	1 / 1,200
67	Formic acid	--	--	y	13	352,153	0.03	0.0	1 / 90
68	Thiram	--	--	y	1	332,535	0.03	0.0	Zero
69	Cyanide compounds	--	--	y	3	293,883	0.03	0.0	1 / 540
70	2-Mercaptobenzothiazole	--	--	y	1	278,049	0.03	0.0	Zero
71	Tributyltin methacrylate	--	y	y	1	272,330	0.03	0.0	Zero
72	Dichlorotetrafluoroethane (CFC-114)	--	--	y	2	234,899	0.02	0.0	1 / 13
73	Toluenediisocyanate (mixed isomers)	y	--	y	11	209,697	0.02	42.7	1 / 41
74	1,4-Dichlorobenzene	y	--	y	1	190,932	0.02	0.0	Zero
75	Nickel	y	--	y	4	184,781	0.02	0.0	1 / 2,800
76	C.I. Direct Blue 218	y	--	--	2	163,237	0.02	0.0	Zero
77	2-Phenylphenol	y	--	y	2	156,418	0.01	0.0	1 / 6,300
78	p-Phenylenediamine	--	--	y	1	152,696	0.01	0.0	1 / 17,000
79	Biphenyl	--	--	y	4	147,570	0.01	0.0	1 / 42
80	Cupric sulfate	--	--	y	1	118,000	0.01	0.0	1.6 / 1
81	Diethanolamine	--	--	y	9	112,676	0.01	1.0	1 / 17
82	nicotine and salts	--	y	y	2	106,695	0.01	0.0	Zero
83	Diglycidyl resorcinol ether	y	--	y	1	98,996	0.01	0.0	Zero
84	Chlorothalonil	y	--	y	1	95,295	0.01	0.0	1 / 95,000
85	Hydroquinone	--	--	y	1	94,203	0.01	0.0	1 / 13,000
86	Cadmium compounds	y	--	--	4	87,960	0.01	0.0	1 / 320
87	o-Xylene	--	--	y	2	86,544	0.01	5.6	Zero
88	Piperonyl butoxide	--	--	y	1	70,399	0.01	0.0	Zero
89	Arsenic	--	--	y	1	69,979	0.01	0.0	1 / 14,000
90	Lithium carbonate	--	y	y	1	65,446	0.01	0.0	Zero
91	Aluminum oxide (fibrous forms)	--	--	y	3	64,339	0.01	0.0	Zero
92	Tetracycline hydrochloride	--	y	--	1	47,135	0.00	0.0	Zero
93	Zineb	--	--	y	1	44,545	0.00	0.0	Zero
94	Thiourea	y	--	--	1	41,447	0.00	0.0	1 / 8,300
95	Hydrazine sulfate	y	--	y	2	38,769	0.00	0.0	1 / 39,000
96	Cadmium	y	y	y	1	34,211	0.00	0.0	Zero
97	Bis(tributyltin) oxide	--	--	y	1	29,088	0.00	0.0	Zero
98	Sodium azide	--	--	y	1	27,000	0.00	0.0	Zero
99	Silver nitrate	--	--	y	1	15,851	0.00	0.0	Zero
100	Acetaldehyde	y	--	y	2	11,714	0.00	0.0	1 / 6.5
101	4,4'-Methylenebis(2-chloroaniline)	y	--	y	2	10,600	0.00	0.0	1 / 290
102	Nitroglycerin	--	--	y	1	7,332	0.00	0.0	1 / 7,300
103	Cobalt	y	--	y	1	6,584	0.00	100.0	Zero
104	2-Methoxyethanol	--	y	y	5	6,113	0.00	0.0	1.8 / 1
105	Propylene oxide	y	--	y	2	5,856	0.00	100.0	Undefined
106	Ethyl acrylate	y	--	y	5	5,569	0.00	100.0	Undefined
107	Freon 113	--	--	y	1	4,500	0.00	0.0	1 / 45
108	Benzyl chloride	y	--	y	2	3,325	0.00	100.0	Undefined
109	Acrylonitrile	y	--	y	4	706	0.00	87.5	13 / 1
110	Dimethyl sulfate	y	--	y	1	497	0.00	100.0	Undefined
111	Toluene-2,4-diisocyanate	--	--	y	2	246	0.00	0.0	Zero
112	Polychlorinated biphenyls (PCBs)	y	y	y	1	18	0.00	100.0	Zero
113	n-Methylolacrylamide	y	--	y	3	8	0.00	0.0	3.1 / 1
114	Dioxin and Dioxin-like Compounds	y	--	--	3	3 (grams)	0.00	100.0	Undefined
Total for all records					**466**	**1,062,264,637**	**100.00**	**1.8**	**1 / 42**

1	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	house paint, wood stain	64	266,003,016	25.04	2.0	1 / 230
2	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	disinfectant, dry cleaning, floor wax	17	259,478,985	24.43	0.0	1 / 5,600
3	3711	Motor Vehicles And Passenger Car Bodies	cars, trucks	3	182,848,676	17.21	2.3	1 / 330
4	2891	Adhesives And Sealants	epoxy, pipe sealing compound	36	147,696,824	13.90	1.0	1 / 120
5	2491	Wood Preserving	structural lumber, wood fence	5	50,524,985	4.76	0.0	1 / 5,300
6	2841	Soap And Other Detergents, Except Specialty Cleaners	detergent, soap	14	28,268,535	2.66	0.0	1 / 2,300
7	3089	Plastics Products, NEC	plastic cups, bubble packing	23	23,142,164	2.18	3.6	1 / 21
8	3069	Fabricated Rubber Products, NEC	bibs. bottles. rubberized fabric	18	19,863,659	1.87	3.5	1 / 7.4
9	2834	Pharmaceutical Preparations	cold remedies, drugs	23	14,208,961	1.34	1.7	1 / 16
10	2893	Printing Ink	newspaper	15	11,954,489	1.13	0.0	1 / 130
11	2844	Perfumes, Cosmetics, And Other Toilet Preparations	shampoo, deodorant	13	11,567,696	1.09	0.0	1 / 200
12	3086	Plastics Foam Products	plastic foam cups, carpet cushion	14	8,319,520	0.78	0.0	1 / 14
13	2833	Medicinal Chem7(5)hoAnd Sealantsroducts, i4.25 TD[9)-1421.60.0455.7, 19.b7, v7(reparatmi deo6375)-213(8,311771(1.7(,6)-21)-2916.5(8895.5(1.0)-21.18.1(0.0)-222.1.1(797ara)-21.1(9-4.9941 -1.252Tw[7)-1337.5(						

Rank	SIC Code	Industry Classification	Chemical	Amount of the Chemical Shipped As or in Product (pounds)	Percent of Total Shipped in Product Not Intended to Be in Product	Releases of Chemical per
62	3711	Motor Vehicles And Passenger Car Bodies	Benzene	1,890,533	0	1 / 28,000
63	3089	Plastics Products, NEC	Lead compounds	1,862,253	0	1 / 25,000
64	3089	Plastics Products, NEC	Chlorodifluoromethane (HCFC-22)	1,850,253	0	1 / 84
65	3021	Rubber And Plastics Footwear	Di(2-ethylhexyl) phthalate	1,803,643	0	Zero
66	2893	Printing Ink	Cyclohexanone	1,777,764	0	1 / 330
67	2269	Finishers Of Textiles, NEC	Trichloroethylene	1,771,000	100	Undefined
68	3944	Games, Toys, And Children's Vehicles, Except Dolls And Bicycles	Dibutyl phthalate	1,664,849	0	Zero
69	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	4,4'-Isopropylidenediphenol	1,626,773	0	1 / 81,000
70	2844	Perfumes, Cosmetics, And Other Toilet Preparations	Toluene	1,466,163	0	1 / 69
71	2891	Adhesives And Sealants	Caprolactum dust and vapor	1,405,373	0	1 / 1,900
72	2834	Pharmaceutical Preparations	Dibutyl phthalate	1,329,927	0	1 / 440,000
73	2844	Perfumes, Cosmetics, And Other Toilet Preparations	Ammonia	1,310,944	0	1 / 4,800
74	2891	Adhesives And Sealants	Vinyl acetate	1,276,185	0.03	1 / 540
75	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	N-Methyl-2-pyrrolidone	1,228,311	0	1 / 86
76	3711	Motor Vehicles And Passenger Car Bodies	Glycol ethers	1,197,515	21.74	1 / 23
77	3711	Motor Vehicles And Passenger Car Bodies	Ethylbenzene	1,138,939	32.59	1 / 10
78	3711	Motor Vehicles And Passenger Car Bodies	n-Hexane	1,134,811	0	1 / 28,000
79	2295	Coated Fabrics, Not Rubberized	Methyl ethyl ketone	1,132,329	96.29	9.6 / 1
80	2891	Adhesives And Sealants	Trichloroethylene	1,058,547	0	1 / 700
81	2891	Adhesives And Sealants	Ethylenediamine	999,749	0	1 / 2,100
82	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Styrene	986,820	2.15	1 / 200
83	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Methyl ethyl ketone	923,740	0	1 / 72
84	3086	Plastics Foam Products	Methanol	893,473	0	1 / 1,000
85	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Naphthalene	878,308	0	1 / 450
86	2891	Adhesives And Sealants	Ethylbenzene	850,598	0	1 / 680
87	3069	Fabricated Rubber Products, NEC	Ethylene thiourea	846,339	0	Zero
88	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Methyl methacrylate	784,202	46.95	1 / 89
89	2679	Converted Paper And Paperboard Products, NEC	Ethyl acetate	760,714	0	1 / 1.4
90	2891	Adhesives And Sealants	Cyclohexane	755,175	0	1 / 570
91	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Ammonia	750,694	8.26	1 / 210
92	2891	Adhesives And Sealants	Methyl acrylate	748,234	0	1 / 370
93	2891	Adhesives And Sealants	Furan, tetrahydro-	736,607	0	1 / 75
94	2891	Adhesives And Sealants	N-Methyl-2-pyrrolidone	735,904	0	1 / 180
95	2295	Coated Fabrics, Not Rubberized	Phenol	733,969	0	1 / 13
96	2891	Adhesives And Sealants	Dibutyl phthalate	731,074	0	1 / 1,100
97	2841	Soap And Other Detergents, Except Specialty Cleaners	Toluene	699,389	0	1 / 1,200
98	3949	Sporting And Athletic Goods, NEC	Styrene	693,212	0	1 / 210
99	3088	Plastics Plumbing Fixtures	Styrene	687,175	0	1 / 9.3
100	2833	Medicinal Chemicals And Botanical Products	Methanol	673,001	80.15	1.6 / 1
101	3944	Games, Toys, And Children's Vehicles, Except Dolls And Bicycles	Dimethyl phthalate	629,242	0	Zero
102	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Dichloromethane	606,891	0	1 / 870
103	2841	Soap And Other Detergents, Except Specialty Cleaners	Sodium phosphate, tribasic	606,869	0	1 / 11,000
104	3089	Plastics Products, NEC	Methyl methacrylate	600,100	100	Zero
105	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	n-Hexane	589,051	0	1 / 310
106	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Dibutyl phthalate	586,073	0	Zero
107	3711	Motor Vehicles And Passenger Car Bodies	Antimony	547,487	0	Zero
108	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Cumene	533,196	0	1 / 320
109	2893	Printing Ink	Methyl isobutyl ketone	532,327	0	1 / 93
110	2841	Soap And Other Detergents, Except Specialty Cleaners	Sodium dodecylbenzenesulfonate	523,418	0	1 / 75,000
111	2891	Adhesives And Sealants	1,1,1-Trichloroethane	522,555	0	1 / 63
112	3086	Plastics Foam Products	Chlorodifluoromethane (HCFC-22)	521,972	0	1 / 45
113	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Folpet	510,555	0	Zero
114	2672	Coated And Laminated Paper, NEC	Toluene	498,593	100	240,000 / 1
115	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	N,N-Dimethylformamide	496,488	0	1 / 940
116	2893	Printing Ink	Dichloromethane	478,909	0	1 / 240
117	3961	Costume Jewelry And Costume Novelties, Except Precious Metal	Lead compounds	467,596	0	Zero
118	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	p-Xylene	446,320	0	1 / 21
119	2087	Flavoring Extracts And Flavoring Syrups, NEC	Methanol	436,600	1.19	1 / 59
120	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Isophorone	424,879	0	1 / 52
121	2295	Coated Fabrics, Not Rubberized	Antimony trioxide	415,404	0	Zero
122	2834	Pharmaceutical Preparations	Formaldehyde	409,663	0	1 / 270

123	2893	Printing Ink	Ethylene glycol	389,778	0	1 / 19,000
124	3089	Plastics Products, NEC	Styrene	389,013	0	1 / 20

245	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Antimony	48,179	0	Zero
246	2834	Pharmaceutical Preparations	Tetracycline hydrochloride	47,135	0	Zero
247	2851	Paints, Varnishes, Lacquers, Enamels, And Allied Products	Zineb	44,545	0	Zero
248	3220	Glass And Glassware, Pressed Or Blown	Lead	42,640	0	Zero
249	2834	Pharmaceutical Preparations	tert-Butyl alcohol	41,958	0	Zero
250	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Thiourea	41,447	0	1 / 8,300
251	2833	Medicinal Chemicals And Botanical Products	Toluene	41,313	100	Undefined
252	3069	Fabricated Rubber Products, NEC	Antimony trioxide	39,901	0	Zero
253	2891	Adhesives And Sealants	Ammonia	39,169	0	1 / 51
254	2842	Specialty Cleaning, Polishing, And Sanitation Preparations	Formic acid	38,919	0	Zero
255	2833	Medicinal Chemicals And Botanical Products	Hydrazine sulfate	38,769	0	1 / 39,000
256	3069	Fabricated Rubber Products, NEC	Dichloromethane	37,706	100	Undefined
257	2891	Adhesives And Sealants	Antimony trioxide	36,828	0	1 / 7,400
258	2672	Coated And Laminated Paper, NEC	Phenol	36,602	0	Zero
259	2841	Soap And Other Detergents, Except Specialty Cleaners	Formic acid	35,768	0	Zero
260	3111	Leather Tanning And Finishing	Ammonia	34,969	0	1 / 3.4
261	3220	Glass And Glassware, Pressed Or Blown	Cadmium	34,211	0	Zero
262	2833	Medicinal Chemicals And Botanical Products	Chlorine	33,360	100	Undefined

306	2087	Flavoring Extracts And Flavoring Syrups, NEC	Acetaldehyde	11,714	0	1 / 330

Appendix II: Methodology

Data Sources

This report uses data from a number of sources, all current as of December 2002:

- Data on toxic chemicals from certain facilities in Massachusetts were taken from Toxic Use Reports filed under the Massachusetts Toxic Use Reduction Act (TURA). Data for 1995-2000 were obtained on a CD-ROM disc provided by Massachusetts' Department of Environmental Protection, TURA program. Facilities report these data if they are within certain industries, have more than 10 full-time employees, and use certain toxic chemicals above listed thresholds. The reporting requirements follow those of the federal Toxic Release Inventory (TRI), except that beginning in 1995, Massachusetts required certain non-manufacturing industries to report data, and it also requires chemicals on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list to be reported. Massachusetts has also de-listed a few chemicals from TURA reporting that are found on the TRI and CERCLA lists. Reporting criteria for TURA can be found at <www.state.ma.us/dep/bwp/dhm/tura/turapubs.htm>.

- Similar data for some facilities in New Jersey were taken from Release and Pollution Prevention Reports (RPPR) filed under the authority of the New Jersey Worker and Community Right-to-Know Act. Data for 1996-1997 were obtained from the New Jersey Department of Environmental Protection (DEP) website, <http://www.state.nj.us/dep/enforcement/relprev/crtk/index.html>; data for 1998-2000 were sent electronically by New Jersey DEP in October 2002. Data for 1995 were obtained from Hampshire Research, a consulting firm which had done additional data quality work for a previous report using these data. Facilities complete RPPR reports only if they also report federal Toxic Release Inventory (TRI) forms; therefore the data are limited to certain industries, to facilities with more than 10 full-time employees, and those that use certain toxic chemicals above thresholds. Reporting criteria for TRI/RPPR can be found at <www.epa.gov/tri/>.

- Lists of reproductive and developmental toxins, and of carcinogens, were taken from the California Proposition 65 list, <www.oehha.ca.gov/prop65.html>, updated in June 2002.

- A list of known and suspected neurotoxins was obtained from the "Scorecard" website maintained by Environmental Defense, <www.scorecard.org>, updated September 2002.

- Some facilities in the Massachusetts and New Jersey databases had missing SIC code (industrial classification) information; in addition, the Massachusetts database does not collect TRI-style manufacturing, processing, and use codes which were used in this report's analysis. These data were obtained

from the federal TRI in cases where a facility was missing information but could be linked to its record within TRI. TRI data were taken from a copy used by the Right-to-Know Network, RTK NET, <www.rtk.net>.

Chemicals were listed in this report if they were reported to the New Jersey or Massachusetts databases (i.e., if they were on the TRI or CERCLA chemical lists) and if they appeared on the Proposition 65 list of carcinogens, the Proposition 65 list of reproductive or developmental toxins, or the Scorecard list of suspected neurotoxins. A few chemicals were eliminated because they have been de-listed from the federal TRI. The final chemical list used in this report can be found in Appendix I, Table 1.

Industries That Produce Products Likely to be Found in the Home

Only certain industries are included in this report. Specific industries that make products likely to be found in or around the home were selected from the list of those reported by the two databases. In general, these were foods and household consumer products, although certain other industries (such as car bodies) were added to fully reflect the range of potentially toxic chemicals used in and around the home. Some industries manufacture both consumer and industrial products, and in these cases an ad hoc decision was made to include or exclude the entire industry.

The final list of industries used can be seen in Appendix I, Table 2, along with some sample products produced by each industry. No effort was made to verify that the particular facilities that reported within these industries actually made products that match the sample products listed. The industry was classified based on its primary Standard Industrial Classification (SIC) code as shown on its New Jersey or Massachusetts reporting form. Records with blank SIC codes used SIC information from TRI if a link between the two could be made. Some facilities reported SIC codes that were valid under the 1977 rather than the standard 1987 SIC list; these were converted to the more recent code numbers when possible. Some facilities reported more than one SIC code per form: in these cases the first SIC code was taken to be the primary one as described in reporting instructions.

Although petroleum refineries were not included in this report, those in New Jersey shipped over 100 billion pounds of neurotoxins, carcinogens, and reproductive or developmental toxins in products between 1995 and 2000. While these data dwarf all the other industries profiled in this report, it is unclear how much of the product produced from these facilities was gasoline and how much was industrial lubricants. More perplexing was how much of the chemicals of interest were in each type of product. Even if the amount that was gasoline could be determined, it would be difficult to project the amount of gasoline that would have gone into passenger cars and light trucks versus heavy trucks.

Data on Releases, Amounts Shipped As or in Products, and Chemical Use

Amounts of toxic chemicals listed in this report consist of releases, amounts reported as shipped as or in products, and total use amounts. Releases are totals of amounts reported released to air, water, land, or underground on-site at each facility; these are reported in similar fashion in the Massachusetts and New Jersey databases, both of which have TRI-style reporting. Amounts of toxic chemicals going into products are reported as simple data fields within both databases. Calculating the total amount of toxic chemical use is somewhat more complicated because these data are reported differently within the two databases, and because it is constructed from other quantities.

- For New Jersey, the amount of chemical used was calculated as the amount in inventory at the start of the year minus the amount in inventory at the end of the year, plus the amount produced, plus the amount brought on-site, plus the amount recycled on-site.

- For Massachusetts, the amount of chemical used was calculated as the sum of the amounts manufactured, processed, and otherwise used.

In cases where the calculated usage amount was less than the total amount released, transferred off-site, and going into products, the usage amount was adjusted upwards to equal this total. For the data used within this report, this resulted in a total upward adjustment of 4.2 million pounds (for a total of 560 million pounds) of chemical use in Massachusetts and 31 million pounds (to make a total of 1.5 billion pounds) for New Jersey. All amounts in this report are in pounds, except for quantities of dioxin and dioxin-like compounds which are reported in grams.

Chemicals Shipped As or in Products That Are Not Intended to Be in Products

For some data analyses, amounts in products were separated into amounts intended to be in the products (because the chemical is part of the product formulation) and amounts left in the products as contaminants or remnants of the production process. This second category was referred to as “amounts not intended in product.” Categorization was done using the manufacturing, processing, and other use codes used in the TRI and the New Jersey database. Facilities in Massachusetts had these codes taken from TRI in cases where a link to a TRI report for the facility could be established. The codes were evaluated as follows:I].c0 Twllows:

- If the facility indicated that the chemical was manufactured as a by-product or an impurity, processed as a reactant or process impurity, or otherwise used as a chemical processing aid, manufacturing aid,

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