FULL DISCLOSURE

What Ohioans Need to Know to Clean Up Their Rivers and Tap Water

Ohio Citizen Action

Environmental Working Group™

Acknowledgments

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Foreword

Experts among the leadership of America's drinking water utilities expressed serious reservations when they reviewed an early draft of this report.

One of their main worries was that publication of the study would send a message that neither they nor we want to send. Namely, that Ohio water utilities are to be blamed for the numerous contaminants that EWG and Ohio Citizen Action found in tests we commissioned this past summer in 12 Ohio communities.

Because we've come to value the judgment of these leaders, and respect their commitment to cleaning up tap water, we took their reservations seriously.

Water suppliers in few states face the serious challenges Ohio utilities confront in delivering clean, safe drinking water. Data from the U.S. Environmental Protection Agency, presented in this study, certainly bear out that observation: Ohio ranks below the national average in 17 of 19 tap water violation categories in 1996—the most recent year for which comprehensive data are available.

The central problem is not how Ohio utilities treat their water. The problem is the quality of the water they start with. In most of the communities we studied, the water is contaminated when it flows into their intake pipe at the drinking water plant. That is to say, the problem isn't with the people who treat the water. The problem is with the polluters who contaminate it upstream.

As a result, dozens of utilities in Ohio and elsewhere in America have had to undertake increasingly heroic efforts over time to clean up problems not of their making. Many water suppliers, for example, now thoroughly cleanse their water with activated carbon in spring and summer to scrub out pesticides. Some cities, unable to wait for river clean ups, have installed massively expensive carbon filtration systems or found alternate, less polluted water sources that are blended to dilute the tainted supplies. But in many cases, even after considerable effort and expense, finished water may be tainted with a half dozen or more pollutants. The problem can be especially serious in smaller towns. We found

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The problem isn't with the people who treat the water. The problem is with the polluters who contaminate it upstream.

There are no strong laws on the books, no effective regulations in place, and no funds available to clean up source waters by forcing, goading or paying polluters not to pollute. Not in Ohio. Not anywhere.

16 contaminants in a single sample of Defiance, Ohio tap water, and ten or more contaminants in five other cities in the state, including Columbus.

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Left to their own devices and counsel, state and federal governments simply will not solve the problem. They'll move at a glacial pace, if they move at all, to set and enforce sufficiently protective standards. But if history serves, government will compromise with polluters all the way, pesticide and fertilizer companies and farm groups foremost among them. It is simply too big a fight for most politicians and environmental bureaucracies to take on. So they haven't. And they won't.

Source water will not be cleaned up until the people who drink the water find out that it is contaminated, complain repeatedly about it, and insist that the pollution be stopped.

Neither municipally owned nor private sector water utilities anywhere in the United States have the authority or wherewithal—political or financial—to clean up source waters themselves. They don't have legal purview to so much as identify polluters, much less rein them in. Even city governments that own their own water treatment plants don't own the entire watershed from which their source waters originate.

As a result, water suppliers have to take and clean up what they get. And what they get in many towns in Ohio and elsewhere in the Midwest is water that is tainted by a half dozen different weed killers, and contaminated with nitrate at levels so high that it is potentially lethal to infants. In fact, water suppliers in many midwestern towns frequently issue warning to that effect to their customers, and in extreme cases, utilities have supplied bottled water when nitrate levels have spiked dramatically. In some place, residents have actually acclimated themselves to accept this outrageous state of affairs.

Tap water in Ohio and the rest of the country requires action—citizen action—aimed upstream, not at the treatment plant. Source water will not be cleaned up by anyone until the people who drink the water find out that it is contaminated, complain repeatedly about it, and insist that the pollution be stopped.

Citizens won't act, of course, unless they know that there *is* a problem. New federal regulations, issued under a 1996 rewrite of the nation's drinking water law, will inform people—to a point. If the utilities in our study adhered to the bare bones federal guidelines, for instance, their customers wouldn't know much at all about the contaminants we found.

The disclosure question can be a touchy one for utilities. No water supplier wants to provide water it deems unsafe. Likewise, no water supplier would casually make trouble for itself by telling customer about contaminants or con-

tamination levels that, in a legal sense, are not violations of current federal safeguards.

Should a water utility be required to tell its customers about the detection of a contaminant for which the government has yet to develop a health standard? Some utilities feel they should not report such problems, and federal law does not require it. EWG and Citizen Action believe in full disclosure of tap water contaminants. That is the meaning of "right to know", originally enshrined in federal law through the Toxics Release Inventory (TRI). Factories that release toxic substances are required to disclose those releases, the vast majority of which are perfectly legal. What has been the result? Companies and trade groups that originally opposed the TRI on grounds that they'd be disclosing "nonproblems" now brag about the voluntary pollution reductions they've achieved simply through the disclosure process.

That same basic dynamic will happen with full disclosure of tap water contaminants, only in this case, informed citizens must make demands not on water utilities, but on polluters.

What will happen if citizens do not get involved? More and more, we'll become a nation where a large portion of the population drinks contaminated tap water because the government just plain did not have the gumption to clean it up. People who are attuned to environmental contamination, or a special health concern, and who have the money, will buy their way out of the problem. They'll purchase bottled water that they hope is clean. They'll install costly home filtration systems at their own expense. America gradually will abandon the idea that we can supply safe and affordable water from the tap for pregnant women and infants, cancer patients, or others with compromised immune systems. We will have concluded that it is simply too expensive—and it probably *is* too expensive—to clean up pollution problems at the drinking water treatment plant.

Accepting that future would mean accepting as fact that the water many of us will get from the faucet will be just fine—for the lawn, the laundry, and washing the car. Our rivers and groundwater will be a contaminated mess, and the people who pollute it will do so with impunity.

We haven't met anyone in the water supply industry who thinks that this scenario is even remotely acceptable. Yet a good many people in that business are profoundly frustrated whenever we publish a report, because they end up taking the heat instead of the polluters upstream. We hope that with this report, and others in the works, we can instead help water suppliers help citizens to understand and act on the problems at their source.

Kenneth A. Cook
President, EWG

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Chapter 1

Executive Summary

The federal government and the states have adopted a high-cost, high-risk strategy in their drinking water programs, where consumers pay water suppliers to try to make polluted water drinkable. In spite of the vigorous efforts of drinking water providers, tap water made from dirty rivers and lakes is often host to multiple toxic chemicals, or is contaminated with the by-products of the clean-up process itself.

In spite of the vigorous efforts of drinking water providers, tap water made from dirty rivers and lakes is often host to multiple toxic chemicals, or is contaminated with the by-products of the clean-up process itself.

In the summer of 1998, EWG and Ohio Citizen Action coordinated a citizens' tap water monitoring program in 12 Ohio communities, from large cities like Cleveland and Columbus to small towns like Williamsburg and Defiance. Single samples of tap water were taken in each community, and then analyzed for a host of contaminants including pesticides, nitrates, petroleum products, industrial chemicals and the by-products of water treatment.

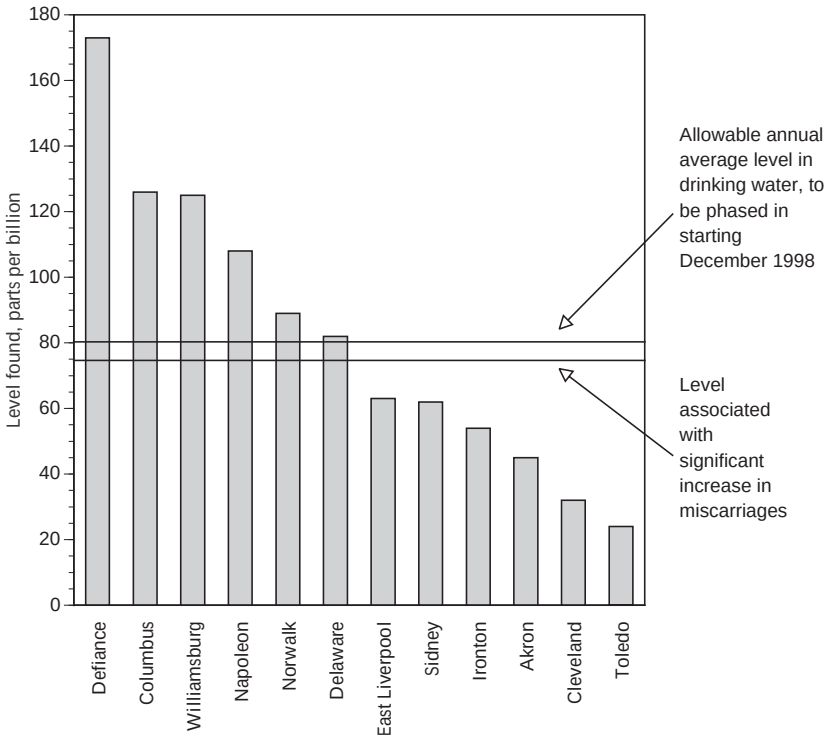
Independent laboratory analysis found 20 different contaminants in the water systems sampled, often at levels above federal safety standards or guidelines. The most common contaminants were trihalomethanes (THMs) — potent carcinogens and reproductive toxins that are by-products of water chlorination, found in every system tested. Atrazine, a cancer-causing weed killer, and nitrates, fertilizer residues that can be fatal to infants, were found in 10 of 12 water systems.

THMs, atrazine and nitrates were all found at levels above federal annual enforcement standards. Several individual THM compounds, as well as the pesticides cyanazine and acifluorfen, were detected at levels above non-enforceable federal health guidelines. In six communities (Columbus, Defiance, Delaware, Napoleon, Norwalk, and Williamsburg), THMs were found at levels above those associated with a significant increase in miscarriage rates in a recent study of 5,100 pregnant women in California (Waller et al. 1998, EPA 1998a) (Figure 1).

Disturbingly, for two-thirds (14 out of 20) of the contaminants detected, there are no enforceable drinking water standards — even though all have been identi-

For two-thirds of the contaminants detected, there are no enforceable drinking water standards — even though all have been identified as posing health risks.

Figure 1. Trihalomethane levels in tap water in half the communities tested exceeded both new federal standards and levels associated with a significant increase in miscarriage rates.



Source: Environmental Working Group, compiled from results of citizens tap water testing program, summer 1998.

fied as posing health risks. Even worse, aside from some short-term reporting requirements that apply to only six of these chemicals, the public has no right to know about the presence of these 14 contaminants in their tap water.

Cities with the most contaminants in tap water

Residents in Columbus, Defiance, Delaware, Napoleon, Norwalk, and Williamsburg drank tap water containing ten or more contaminants, including multiple weed killers, and high levels of THMs (Table 1). High levels of nitrate were found in Napoleon and Defiance. Tap water in Defiance also contained xylenes, a component of gasoline that is believed to cause birth defects. Water in Williamsburg, Akron and Norwalk contained low levels of phenanthrene and fluorathene, which are polycyclic aromatic hydrocarbons (PAHs), some of which have been found to cause cancer.

Defiance's water contained the most contaminants: 16 different chemicals, including three (total THMs, atrazine and nitrates) at levels higher than federal enforcement standards and three others (two THM compounds plus cyanazine) at levels above non-enforceable federal health guidelines. Twelve contaminants were found in Napoleon and Delaware and 11 in Williamsburg. Since all of these were one-day samples and the EPA bases "violations" for most chemicals on an average of test results from samples taken throughout the year, only the nitrate levels detected in Defiance would be considered a violation of federal drinking water standards.

Our finding of multiple contaminants in Ohio tap water raises serious health concerns, particularly for infants, young children, pregnant women and people with compromised immune systems. EPA regulates only a handful of chemicals on the basis of cumulative health

Table 1. Tap water in half the communities tested had 10 or more contaminants.

	Number of contaminants found	acetochlor	acifluorfen	alachlor	atrazine	bromodichloromethane	bromoform	chloroform	cyanazine	dalapon	desethyl atrazine	desisopropyl atrazine	dibromochloromethane	dicamba	fluoranthene	metolachlor	nitrate and nitrite	phenanthrene	propazine	simazine	xylenes
Defiance	16	X		X	X	X		X	X	X	X	X	X	X		X	X		X	X	X
Delaware	12		X		X	X		X	X		X	X	X	X		X	X			X	
Napoleon	12	X		X	X	X		X	X		X	X	X	X		X	X				
Norwalk	11	X			X	X		X	X		X		X		X	X	X	X			
Williamsburg	11				X	X		X	X		X	X	X		X	X		X		X	
Columbus	10				X	X		X	X		X	X	X			X	X			X	
Sidney	7				X	X		X					X	X		X	X				
Cleveland	6				X	X		X					X			X	X				
East Liverpool	6				X	X	X	X					X				X				
Akron	5					X		X					X		X			X			
Ironton	5				X	X		X					X				X				
Toledo	4					X		X					X				X				

Source: Environmental Working Group, compiled from results of citizens tap water testing program, summer 1998.

effects. These chemicals, regulated as groups, include total THMs, xylenes, and nitrates. Otherwise, tap water contaminated with any number of multiple pollutants is officially "safe" to drink as long as no single contaminant exceeds the federal enforcement standard.

Right to know?

The 1996 amendments to the Safe Drinking Water Act require water systems to prepare an annual summary of the quality of water they delivered to consumers' taps throughout the year. Water suppliers' first annual "Consumer Confidence Report" must be delivered to each consumer by October 1999.

But EPA's highly touted new program falls far short of ensuring the public's right to know. While some utilities may do more, water suppliers are required only to inform the public about contaminants in their tap water covered by an official enforcement standard known as a maximum contaminant level (MCL). Of the 20 contaminants we found in Ohio drinking water, MCLs have not been adopted for 14. Aside from some special, short-term reporting requirements, the public has no federally-guaranteed, long term right to know about these 14 contaminants in their tap water (Table 2).

All Ohio residents could be affected by this serious shortcoming in the federal right-to-know rules. At least 60 percent of the contaminants detected in every town in our survey are not subject to long-term right-to-know reporting requirements. People who drink water drawn from ag-

At least 60 percent of the contaminants detected in every town in our survey are not subject to long-term right-to-know reporting requirements.

Table 2. Twenty different contaminants were found in our single samples of tap water in 12 Ohio communities.

Contaminant	Type of Contaminant	Number of communities where contaminant was found (of 12)	Federally-guaranteed, long term right to know?
total trihalomethanes (TTHMs)	group of four volatile organic compounds (VOCs)	12	yes
bromoform	VOC	1	no
chloroform	VOC	12	no
bromodichloromethane	VOC	12	no
dibromochloromethane	VOC	12	no
atrazine	pesticide	10	yes
nitrate and nitrite	inorganic compound	10	yes
metolachlor	pesticide	8	no
cyanazine	pesticide	6	no
desethyl atrazine	pesticide	6	no
desisopropyl atrazine	pesticide	5	no
dicamba	pesticide	4	no
simazine	pesticide	4	yes
acetochlor	pesticide	3	no
fluoranthene	polycyclic aromatic hydrocarbon (PAH)	3	no
phenanthrene	PAH	3	no
alachlor	pesticide	2	yes
acifluorfen	pesticide	1	no
dalapon	pesticide	1	yes
propazine	pesticide	1	no
xylenes (total)	group of VOCs	1	yes

Source: Environmental Working Group, compiled from results of citizens tap water testing program, summer 1998.

Test communities included Akron, Cleveland, Columbus, Defiance, Delaware, East Liverpool, Ironton, Napoleon, Norwalk, Sidney, Toledo, and Williamsburg.

The six water systems in our survey with the most contaminated tap water, all get their water from rivers that flow through heavily farmed areas.

ricultural watersheds will almost certainly be exposed to levels of contaminants that exceed federal health guidelines and not be told about it. The six water systems in our survey with the most contaminated tap water, all get their water from rivers that flow through heavily farmed areas.

The EPA also requires water suppliers to inform consumers about the health effects of contaminants, but here the new rules are even weaker. If water suppliers follow EPA rules, as many surely will, customers will receive health effects information only for chemicals found at levels high enough to trigger an enforcement action for formal violation of an MCL.

Under federal requirements, only Defiance and Napoleon in our survey would need to provide health effects information to their consumers, and then only

for one contaminant, nitrate. Water suppliers in the other 10 communities could comply with federal regulations without providing health effects information of any kind about the 20 contaminants found in their tap water — including five contaminants we found at levels above federal enforcement standards or health guidelines.

Risks for Pregnant Women

In the past six years, five studies conducted by the California Department of Health Services have shown a relationship between tap water and miscarriages (Waller et al. 1998, Deane et al. 1992, Windham et al. 1992, Wrensch et al. 1992, Swan et al. 1992). Additional studies by scientists at the U.S. Public Health Service and the state of New Jersey have shown a link between THMs and birth defects like cleft palate, neural tube defects, major cardiac defects, and low birth weight (Bove et al. 1992, Bove et al. 1995, Klotz and Pyrch 1998).

In the most recent study, women in the first trimester of pregnancy who drank five or more glasses of tap water a day with total THMs above 75 ppb had a 15.7 percent rate of miscarriage. Women who drank water with less than 75 ppb total THMs, or less than five glasses of water per day, or both, had a 9.5 percent rate of miscarriage (Waller et al. 1998, EPA 1998a).

In Columbus, Defiance, Delaware, Napoleon, Norwalk, and Williamsburg, THM levels were found far above 75 ppb (Figure 1). Women in these communities receive no warning when THM levels in tap water rise above this level of significant risk.

The proposed drinking water standard for THMs, 80 ppb, does not take into account potential adverse reproductive outcomes.

Protecting the Source: Safer, Cheaper, Fairer

Tap water appears to be much more contaminated in communities that rely on surface water from agricultural areas. Tainted tap water in these communities is typically caused by three factors. These towns often draw water from rivers that are close to major sources of agricultural pollution, with high concentrations of pesticides and nitrate. These rivers are often loaded with organic matter, from farm runoff and other sources, which reacts with chlorine to produce THMs. Finally, many smaller towns cannot afford expensive treatment methods, such as granular activated carbon or reverse osmosis, needed to lower levels of chemical pollutants in tap water. Because current policy does little to protect source water from contamination, water suppliers are forced to spend scarce tax revenues trying to turn polluted water into “safe” tap water — while the public is kept in the dark about most of the contaminants in the water they drink.

Protecting source water is by far the most cost effective and

Because current policy does little to protect source water from contamination, water suppliers are forced to spend scarce tax revenues trying to turn polluted water into “safe” tap water.

A strong public right to know about all contaminants in their tap water is the essential first step in building support for source water protection initiatives.

fair way to improve the quality of tap water. It avoids the need for costly upgrades to drinking water facilities, and it puts the burden of cleaning up water where it belongs — with the polluters. A strong public right to know about all contaminants in their tap water is the essential first step in building support for source water protection initiatives. Comprehensive monitoring, in turn, is the foundation of any good right to know program.

Recommendations

Improving drinking water quality in Ohio will require action by the federal government, Ohio EPA, and Ohio citizens. Private individuals can make a difference by, at a minimum, encouraging their water suppliers to go beyond weak federal requirements for next year's Consumer Confidence Reports.

To protect public health and improve water quality in Ohio and the nation, EPA and the State of Ohio must:

- Adopt tough, enforceable, source water protection plans. In Ohio this means that the state's requirements for source water protection should go beyond the weak federal guidance. Ohio EPA must define areas of ground water and surface water that contribute to each water supply, using robust hydrogeologic methods. Ohio EPA must identify and make public current and potential sources of contamination, along with the name and address of the polluter. Ohio EPA should require buffer zones along surface water bodies upstream of intakes. Ohio EPA should implement a program of pesticide and fertilizer use reduction.

- Require meaningful, frequent testing for unregulated contaminants, in programs tailored to each individual water supplier, that include all contaminants found in their source waters. Require comprehensive testing of agricultural pollutants by all water suppliers, regardless of size, that draw their water from agricultural regions. At a minimum, water suppliers should test for all water-soluble pesticides applied by farmers in the watershed, all industrial contaminants discharged to source water, and all individual THMs. To help water suppliers target their testing and inform the public about possible contaminants, comprehensive pesticide use reporting must be required, and the results must be made available to the public in a timely fashion.

- Require public reporting of all detections of all tap water contaminants along with meaningful health effects information.

- Implement and then go beyond the first steps proposed in the federal Clean Water Action Plan. While the federal government studies health effects and the need for new standards, Ohio EPA must require reductions in the use of pesticides and fertilizers that are found in Ohio's tap water.

- Establish a THM standard that provides an adequate margin of safety against the risk of miscarriages and birth defects, including reproductive risk from individual THMs. Require weekly monitoring of THMs for surface water systems, and mandate public notification when THM levels exceed 75 ppb in tap water at any location served by the water supplier. We recommend a public notice similar to that used by Chesapeake, Virginia, with additional language stressing the importance of drinking adequate amounts of water during pregnancy.

  "The Chesapeake Health Department and the Department of Public Water suppliers has issued a notice of a potential health risk to women in their first trimester of pregnancy.

  A California study released in March states that women in their first 13 weeks of pregnancy who drink more than five glasses of tap water per day from water systems that have higher than normal THMs may have an increased risk of spontaneous abortions.

  The health alert applies to areas of Chesapeake where THM levels exceed 75 ppb. You can monitor the THM level in your area by calling the Water Quality Hotline for weekly readings. The City's Water Quality Hotline will be updated regularly to inform pregnant women of the status of THMs and the potential risks in all areas of Chesapeake." (excerpted from Chesapeake Health Department, 1998)

- Immediately eliminate the waiver for THM testing for water suppliers serving less than 10,000 people.

- Ban the herbicide atrazine. Current federal law requires that all exposure to pesticides are safe for infants and children. Atrazine, which was found in 10 of the 12 water systems tested, is not safe for in-

EPA must establish a THM standard that provides an adequate margin of safety against the risk of miscarriages and birth defects.

fants, particularly infants in small towns in agricultural regions who drink formula reconstituted with tap water laced with high levels of atrazine for months at a time.

- Increase the frequency of monitoring for nitrate during the peak season and lower the standard for nitrates in water to 5 parts per million, equivalent to the guidelines for European nations.

- Fund health effects research of tap water contaminants in an amount of at least $10 million per year, as required under the Safe Drinking Water Act amendments.

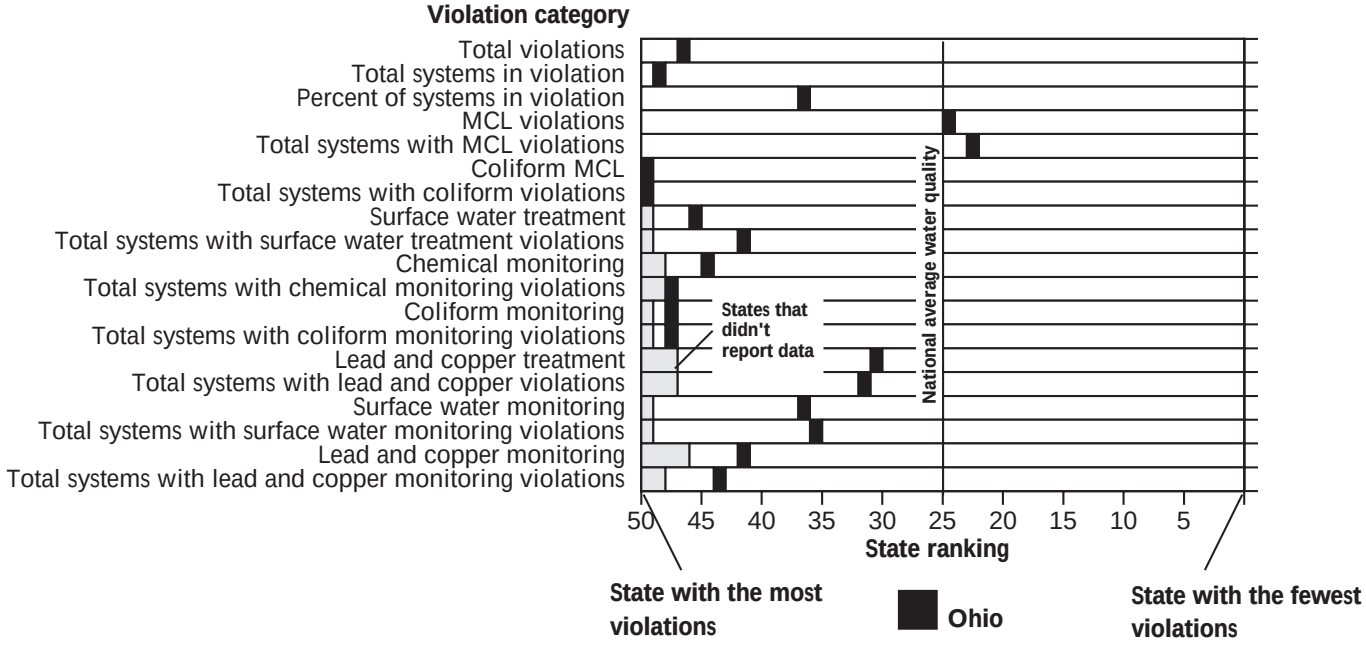
How Ohio Tap Water Stacks Up

A recent EPA report summarizing national drinking water quality shows that Ohio tap water ranks below the national average water quality level in 17 of 19 violation categories, ranging from the number of systems with violations, to neglecting to test for contaminants (EPA 1998b) (Figure 2).

In fact, when all EPA categories are considered together, in 1996, Ohio's tap water was rated second worst in the nation for violations of health standards and monitoring requirements. Ohio was the worst of all 50 states in protecting the public from waterborne illness, registering the most violations of federal standards in the country for disease-causing microorganisms in drinking water. Ohio water suppliers trailed only Michigan in their rate of neglecting to test for these microor-

When all EPA categories are considered together, Ohio's tap water was rated second worst in the nation for violations of health standards and monitoring requirements.

Figure 2. A recent EPA report showed that Ohio tap water ranked below the national average in 17 of 19 violation categories.



Source: EPA 1998b.

ganisms, and they followed only North Carolina and New Jersey in the total number of times in 1996 they neglected to conduct required testing for regulated contaminants.

In 1996, fully one half of Ohio's 6000 public water systems were in violation of drinking water standards — more drinking water violations than all but three states (North Carolina, Arizona, and New Jersey).

Enforcement actions don't always fix the problem, even when a water system violates a drinking water standard, and serves water to their customers that EPA considers unsafe year after year. For instance, in Alliance, Ohio, average yearly total trihalomethane levels violated the drinking water standard for three of six years from 1989 to 1994. Chronic violations such as these harm public health.

Ohio's poor tap water quality drives home the importance of the public's right to know about contaminants in the water they drink. In a state that can't even seem to follow the basic requirements of the Safe Drinking Water Act, the public should at the very least be told about all detected contaminants in their water, and the potential health effects.

Contaminants and Regulations

In the summer of 1998, Environmental Working Group and Ohio Citizen Action found 20 contaminants in one-time tap water samples from 12 communities across Ohio (Figure 3). One-third (6 of 20) of the contaminants we found in Ohio tap water, plus one contaminant group, total THMs, are regulated by EPA. Regulated contaminants are those for which the EPA has adopted an enforcement standard known as the maximum contaminant level, or MCL. An MCL is not necessarily a level the EPA considers without risk, nor is it based entirely on health considerations. An MCL is best thought of as the safest level deemed feasible for water suppliers to attain.

The other contaminants we found in Ohio tap water are unregulated contaminants, those for which EPA has not adopted an MCL. For some of these contaminants, EPA has not established health-based standards or enforcement standards of any type. For others, EPA has established one or both of two non-enforceable health-based levels:

- a maximum contaminant level goal (MCLG), a true health-based standard that represents a safe level of lifetime exposure. For most carcinogens the MCLG is zero.

- a lifetime health advisory (LHA). An LHA is a non-enforceable health guideline that represents an exposure level thought to be without an appreciable risk over a lifetime.

There are no long-term requirements for water suppliers to monitor for unregulated contaminants with MCLGs or LHAs, or to report the results to the public. Nor does contamination in excess of these health-based limits bring any enforcement action.

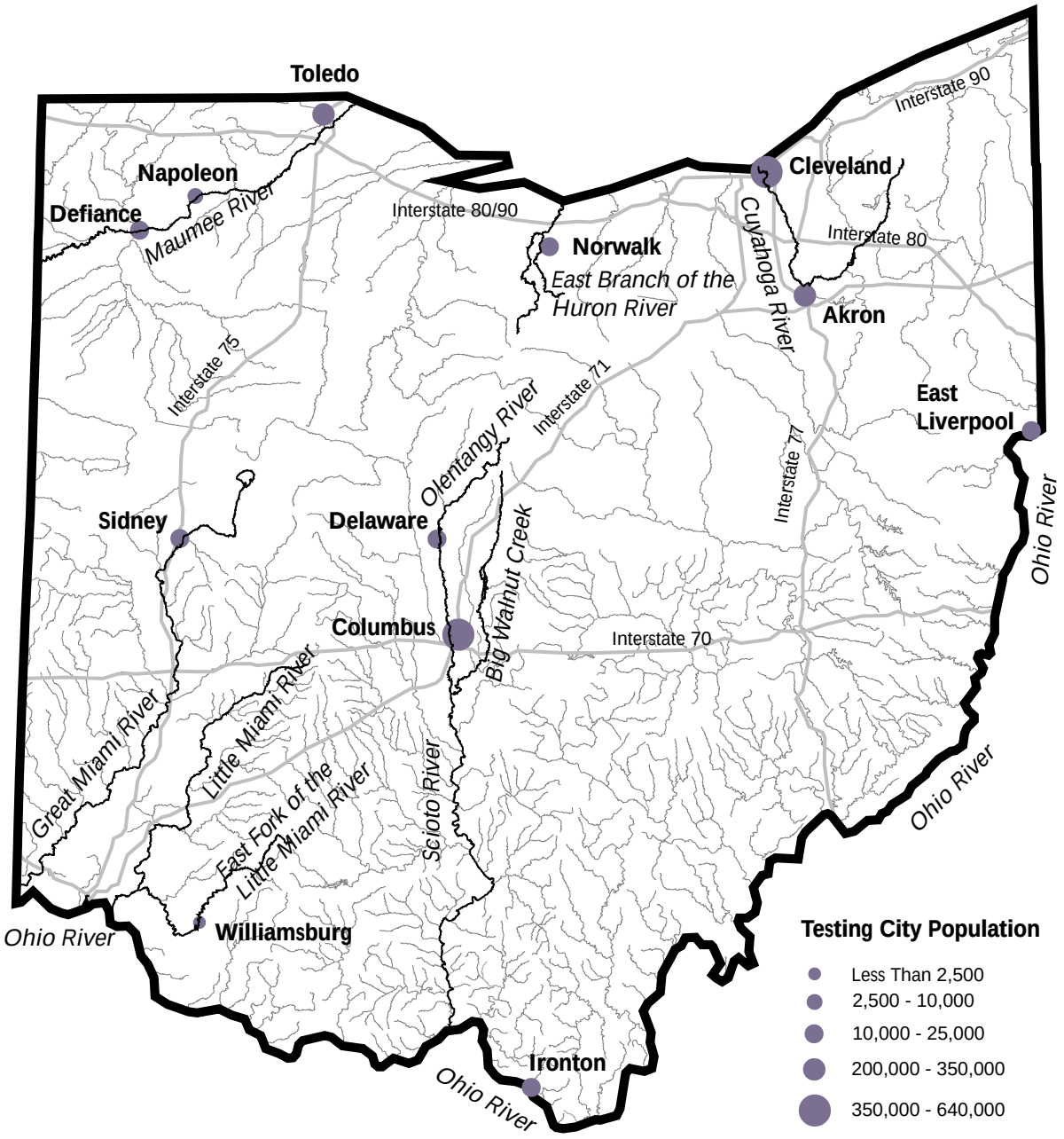
For 14 of the 20 contaminants we found in Ohio drinking water, there are no enforceable drinking water standards (MCLs) (Table 3). EPA has adopted LHAs or MCLGs for nine of these 14 unregulated contaminants. For the five other chemicals we detected, there are no enforcement standards or health guidelines of any kind.

Tap water in Defiance had 11 different weed killers and metabolites; Delaware and Napoleon had eight each; Williamsburg and Columbus had six and Norwalk had five.

What We Found

Weed Killers. Ohio farmers used more than 18 million pounds

Figure 3. We tested tap water in 12 communities across Ohio, from water sources ranging from the Ohio River in Ironton to Big Walnut Creek in Columbus.



Source: Environmental Working Group.

Table 3. If water suppliers follow weak federal rules, the public will not be told over the long term about 14 contaminants we found in Ohio tap water, even those found above levels considered safe.

Contaminant	Number of communities where contaminant was found (of 12)	Maximum level found in this summer's tap water testing (parts per billion)	Health-based limit
bromodichloromethane	12	22 ppb	zero exposure
chloroform	12	150 ppb	zero exposure
dibromochloromethane	12	15 ppb	60 ppb
metolachlor	8	8.4 ppb	70 ppb
cyanazine	6	2.5 ppb	1 ppb
desethyl atrazine	6	1.1 ppb	not established
desisopropyl atrazine	5	0.5 ppb	not established
dicamba	4	1.5 ppb	200 ppb
acetochlor	3	1.1 ppb	not established
fluoranthene	3	0.1 ppb	not established
phenanthrene	3	0.3 ppb	not established
acifluorfen	1	0.26 ppb	zero exposure
bromoform	1	2 ppb	zero exposure
propazine	1	0.13 ppb	10 ppb

Source: Environmental Working Group, compiled from results of citizens tap water testing program, summer 1998.

of weed killers in 1997, with corn growers accounting for 13 million pounds, and soybean growers adding another 5 million pounds. The most popular weed killer in Ohio is atrazine. According to the U.S. Department of Agriculture estimates, 4.4 million pounds of atrazine were applied to Ohio cornfields in 1997, followed by metolachlor (3.4 million pounds) and acetochlor (1.7 million pounds). All of these compounds are water soluble; none are effectively removed from drinking water without expensive activated carbon treatment.

Tap water in Defiance had 11 different weed killers and metabolites; Delaware and Napoleon had eight each; Williamsburg and Columbus had six and Norwalk had five. Atrazine was found in the tap water of 10 out of 12 communities tested, metolachlor in eight and acetochlor in three. In three communities, atrazine was found at levels above the annual average MCL of 3 parts per billion: Defiance (10 ppb), Napoleon (5.9 ppb) and Williamsburg: (3.4 ppb).

Atrazine metabolites — chemicals formed as by-products of the breakdown of atrazine — are not regulated by the EPA, yet are typically found wherever the weed killer is found. On average,

When water suppliers struggle to make potable tap water out of polluted source water, the public often ends up drinking high levels of THMs.

atrazine metabolites are found at levels equal to 10 to 20 percent of atrazine levels. In the communities where we tested, this ranged from zero to 29 percent.

Cyanazine, an even more toxic triazine herbicide scheduled to be phased out in 2002, was found at levels above the federal LHA of 1 ppb in three communities: Defiance (2.5 ppb), Williamsburg (2.2 ppb), and Napoleon (1.6 ppb).

Acetochlor, a probable carcinogen allowed onto the market by the Clinton Administration in 1993, was found in three of the systems tested.

A growing body of evidence indicates that THMs, and particularly some individual THM components, cause miscarriages and birth defects.

Monitoring required by Ohio EPA shows that levels of weed killers in the state's tap water peak for a three to six month period in the spring and summer months, although some persist well into fall. Alachlor, atrazine, and cyanazine are particularly persistent at high levels in Ohio drinking water supplies. From 1995-98, the Ohio EPA data show that three-month averages for at least one of these three weed killers in the water supplies of 27 communities exceeded federal safety standards or health guidelines. This number included the communities of Columbus, Defiance, Delaware, Napoleon, Norwalk, and Williamsburg in our survey. Cyanazine was found at unsafe levels in 25 communities, and atrazine in 23.

Trihalomethanes. Trihalomethanes (THMs) are potent cancer-causing and reproductive toxins that are by-products of the chlorination process. When water suppliers struggle to make potable tap water out of polluted source water, the public often ends up drinking high levels of THMs.

More than 10 peer-reviewed epidemiological studies have found an increase of as many as 10,000 cases of cancer in the United States associated with THMs in tap water (Morris et al. 1992). While some experts dispute the number of cancer cases that THMs cause, there is virtually no argument that THMs cause cancer in humans (EPA 1998a). A growing body of evidence indicates that THMs, and particularly some individual THM components, cause miscarriages and birth defects (Waller et al. 1998, Bove et al. 1995, Bove et al. 1992, Narotsky 1997, EPA 1998a).

EPA has spent more than ten years promulgating a new contaminant standard of 80 ppb for total THMs. This standard, based on yearly average contamination levels throughout the water system, will be promulgated in November 1998 and phased in over the next four years. The standard was developed to protect the public from long-term cancer risks, and does not take into account the potential risk for miscarriages or birth defects from short-term exposures. One-day levels of THMs exceeded the 80 ppb standard in our single tap water samples in

six of 12 water systems tested: Columbus, Defiance, Delaware, Napoleon, Norwalk, and Williamsburg (Figure 1). In Defiance, the levels found were more than two times greater than the new health standard.

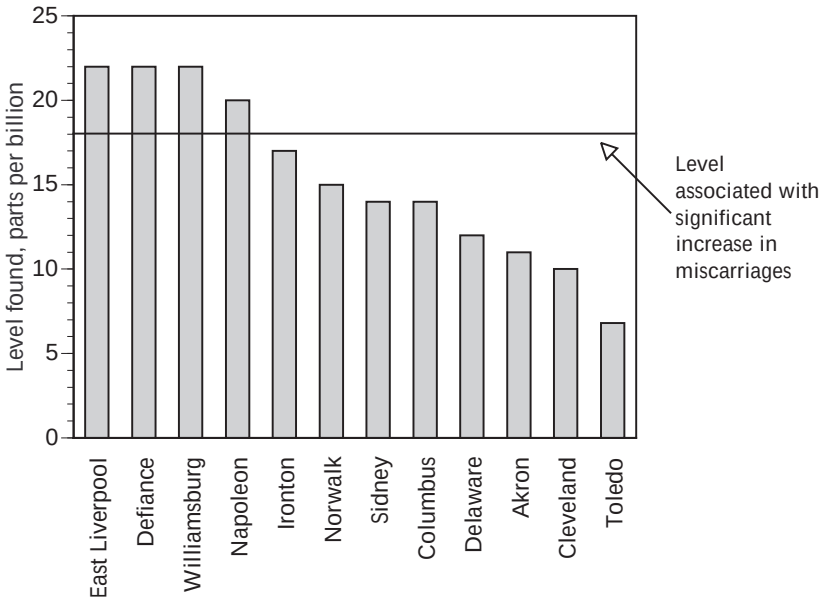
Total THM levels in these six communities also exceeded the level associated with a significant increase in spontaneous abortions (miscarriages). In a recent study of more than 5,100 pregnant women in California, women in the first trimester of pregnancy who drank five or more glasses of tap water a day with total THMs above 75 ppb had a 15.7 percent rate of miscarriage. Women who drank water with less than 75 ppb total THMs, or less than five glasses of water per day, or both, had a 9.5 percent rate of miscarriage (Waller et al. 1998, EPA 1998a).

The California study also analyzed miscarriage rates in relation to individual THMs, and found an even stronger association between miscarriages and high levels of the THM bromodichloromethane (BDCM). BDCM levels above 18 ppb, the level associated with more miscarriages, were found in tap water samples from Defiance, Napoleon, Williamsburg, and East Liverpool. Levels of BDCM in Ironton were 17 ppb (Figure 4).

Currently, the federal government does not require testing of THMs in communities of less than 10,000 people. In Ohio this means that water suppliers in Napoleon and Willamsburg, and 77 other small Ohio communities, do not test for THMs. And there is no standard at all for BDCM in water, although EPA has established a non-enforceable contaminant goal of zero, based on concerns about the chemical's ability to cause cancer.

In Ohio, which registered the most violations in the nation for disease-causing microorganisms in drinking water, a reduction in chlorination is not the answer to reducing THM levels (EPA 1998). Given Ohio's chronic coliform problems, a broad reduction in chlorination would almost certainly increase the risk and incidence of waterborne disease

Figure 4. Levels of bromodichloromethane in tap water in four communities exceeded levels associated with a significant increase in miscarriage rates.



Source: Environmental Working Group, compiled from results of citizens tap water testing program, summer 1998.

Total THM levels in six communities exceeded the level associated with a significant increase in miscarriages.

The EPA Scientific Advisory Board observed that the agency's nitrate standard "excludes, for all practical purposes, protection of sensitive members of the population."

from microorganisms. At the same time, women need to avoid exposures to high level of THMs during pregnancy. Until source waters are cleaned up, this goal would be best achieved through low cost, low risk public warnings and education.

Nitrate. Nitrate in tap water above federal health-based limits can cause methemoglobinemia, or blue baby syndrome, a potentially fatal condition of oxygen deprivation in the bloodstream. Any exposure above the federal limit is of concern for the fetus or infants under six months of age, because, unlike any other federal drinking water standard, the nitrate standard has no built-in margin of safety to protect sensitive individuals. In 1987, the EPA Scientific Advisory Board observed that the agency's standard "excludes, for all practical purposes, protection of sensitive members of the population." (Carlson 1987)

Nitrate is also suspected of causing birth defects and is transformed into potent carcinogens in the human body. For this reason, the European Economic Community has adopted a health guideline for nitrate (5.6 ppm) almost twice as protective as the U.S. standard of 10 parts per million (ppm). Nitrate is also one of a very few chemicals for which EPA is requiring health effects information in Consumer Confidence Reports even when detections do not trigger an official violation. This special policy, otherwise applied only to arsenic and lead, suggests that EPA considers nitrate to pose a health risk even at levels below the current MCL.

Ohio tap water testing showed nitrate at levels of concern in Defiance, where levels were 12 parts per million on June 23, 1998 and Napoleon, where levels were 7.5 ppm (well above the European guideline) on June 26. In Defiance and Napoleon, levels during that week mandated a federal warning "[encouraging] parents . . . to provide infants with an alternative source of drinking water."

According to the Ohio EPA, water supplies also exceeded the nitrate standard in the summer of 1998 in Columbus, Fremont and McClure. These three water suppliers, along with those in Defiance and Napoleon, serve a population of more than 400,000.

Nitrate warnings are common in Ohio, but the Safe Drinking Water Act requires no action beyond public notice that the water is unsafe for infants and expectant mothers. Even as warnings are posted, the public is served nitrate-contaminated tap water for an indefinite period, based on the hope that no potentially sensitive person will drink it. Lacking an adequate safety margin, this enforcement policy almost certainly fails to protect a small but real percentage of the vulnerable population from exposure to unsafe levels of nitrate.

Averaging Away Cancer Risks

Even for carcinogens for which EPA has adopted MCLs, contamination above that level is not necessarily a "violation." Under EPA rules, a violation is determined on the basis of the average of results from samples taken throughout the year. In many of our sampling locations, levels detected exceeded the MCL — sometimes by huge margins. But these are not violations because lower levels at other times of the year could bring the annual average under the MCL.

Indeed, the EPA allows levels of carcinogens in drinking water far in excess of annual health standards for months at a time, as long as the annual average exposure falls below the MCL. For example, compliance with the EPA's new standard for total THMs is based on an average of samples taken throughout the water system in four different quarters of the year.

For pesticide contamination of food, EPA uses a different yardstick: One exceedence of the standard is a violation. The scientific validity of characterizing these periodic and repeated high exposures to carcinogens in drinking water as safe is increasingly controversial. EPA's Office of Research and Development held a two-day meeting in August 1998 about health risks from short-term, high-dose exposures.

Xylenes and PAHs. Xylenes were found in the tap water in Defiance, and two polycyclic aromatic hydrocarbons, phenanthrene and flouranthene, were found in the tap water in Akron, Norwalk, and Williamsburg.

Xylenes, a component of gasoline and other petroleum based solvents, likely causes birth defects in humans. According to the California Office of Environmental Health Hazard Assessment (OEHHA) there is a "medium to high" level of concern over the ability of xylenes to cause birth defects and other reproductive problems. OEHHA noted that xylenes have been found to cause all major types of birth defects, including fetal death, miscarriages, malformations, growth deficits, and functional and behavioral abnormalities in lab animals (OEHHA 1998).

The two polycyclic aromatic hydrocarbons (PAHs) found at trace levels in Akron, Norwalk, and Williamsburg tap water are largely unstudied and unregulated. The European Community has established drinking water standards for PAHs, but the EPA has not. Some PAHs have been found to cause cancer and PAHs are regulated in the workplace air by the Occupational Safety and Health Administration.

Health Effects

On June 23, 1998, the tap water in Defiance contained 16 different chemical pollutants, most at levels above federal health standards or guidelines. These contaminants included three THMs, 11 weed killers, xylenes, nitrite and nitrate. Although Defiance had the most seriously contaminated water, Defiance was not alone. Half of the Ohio communities tested had 10 or more contaminants in their tap water.

Half of the Ohio communities we tested had 10 or more contaminants in their tap water.

Is water like this safe to drink? In our opinion the answer is clearly no, particularly for pregnant women, infants, young children, and individuals with compromised immune systems. Consider that on June 23, 1998, in Defiance:

Is water like this safe to drink? In our opinion the answer is clearly no.

- A nitrate advisory was in effect, warning parents not to serve this water to infants, due to acute risk of methemoglobinemia, or "blue baby" syndrome, a potentially fatal condition of oxygen deprivation in the baby's bloodstream. Nitrates may also cause birth defects and miscarriages (NAS 1995, Dorsch, et al. 1984), and are converted to potent cancer-causing N-nitroso compounds in the human body.

- The water also contained at least 11 weed killers or metabolites, almost all of which cause cancer in animals through disruption of the hormone system. Again, this is particularly troubling for pregnant women and infants, because small doses of hormone disruptors may cause serious and permanent changes in sexual development or contribute to cancer and malformations of the reproductive organs if exposure occurs at the right window of vulnerability during pregnancy or early infancy.

- Also present were high levels of THMs, for which there is overwhelming evidence that exposure can cause cancer. That day in Defiance, THM levels were more than twice the level allowed by a new EPA standard that will be promulgated in November 1998 (173 ppb vs. 80 ppb). Perhaps worse, levels of THMs

The pesticides most frequently detected in the Ohio samples cause a litany of health effects, including cancer, birth defects, and disruption of the hormone system.

in tap water in Defiance and five other cities tested were well above the levels associated with an increase in the miscarriage rate from 9.5 to 15.7 percent in a recent study of 5,100 women California (Waller et al. 1998, EPA 1998a).

- On top of all this, health standards and advisories for the above contaminants do not include special protections for infants and the fetus (with the possible exception of the nitrate standard), nor do they account in any way for the additive effects of drinking all these contaminants at once. Standards are still established as though an individual adult is exposed to one pollutant, and one pollutant only.

Weed Killers

The pesticides most frequently detected in the Ohio samples cause a litany of health effects, including cancer, birth defects, and disruption of the hormone system.

The triazine herbicides (atrazine, cyanazine, simazine, propazine) all cause mammary gland cancer in female rats through interference with the normal functioning of the hormone system (Hauswirth 1988a, Dykstra 1991, Rinde 1989). Cyanazine, simazine, and atrazine cause other cancers in animals as well (Gahli 1985, Pinter et al. 1990, Rinde 1989). Cyanazine is also a reproductive toxin, causing heritable genetic mutations in a number of tests, and birth defects in rabbits and rats (Rinde 1991).

The acetanilide herbicides (alachlor, acetochlor, metolachlor) all cause a rare cancer in animals (EPA 1984, EPA 1987, Rinde 1986, Dapson 1993, EPA 1994). Alachlor causes this rare cancer even when test animals are exposed only for the first six months of their lives, suggesting that infants may be at higher risk (Hauswirth 1987). Two of the acetanilide herbicides, alachlor and the recently registered acetochlor, are classified by EPA as probable human carcinogens. Alachlor has also been found to disrupt the endocrine system.

Trihalomethanes

THMs form when chlorine, added to water to kill microorganisms, reacts with organic material in the water. Numerous human epidemiological studies indicate that these chemicals are associated with rectal, bladder, or pancreatic cancers, and a 1993 article in the American Journal of Public Health estimated than annually, 10,700 rectal and bladder cancers may be caused each year by disinfection byproducts like the trihalomethanes (Morris, et al. 1992). The current debate is not about whether THMs cause cancer, but instead is about how many cases of cancer THMs cause each year (EPA 1998a).

Recently, a major prospective California study found a significant increase of the rate of spontaneous abortion among women who drank chlorinated tap water with high, but nonetheless legal levels of THMs (Waller et al. 1998). The implications of this study are powerful. Not only did researchers show that the effects of trihalomethanes can be acute and relatively immediate, but the study also showed that miscarriages may occur at concentrations considered safe by the EPA. Peak contamination levels in our snapshot of Ohio tap water were more than twice the level that caused a significant increase in spontaneous abortions in the California study.

The Waller study has prompted additional research in other parts of the country. The study authors themselves stress that the 75 ppb THM benchmark associated with increased numbers of miscarriages is not set in stone. The science will continue to evolve, and it is likely that additional studies will come to different conclusions on the exact amount of THMs that cause significant adverse reproductive outcomes. Regardless of the exact number, the Waller study is just one in a series of studies that have shown serious reproductive problems from short-term exposures to THMs.

A study by the U.S. Public Health Service showed that chlorine disinfection byproducts are also associated with birth defects, including spine and neural tube defects (Bove et al. 1992). A subsequent study by the U.S. Public Health Service and New Jersey Department of Health found that THMs are associated with reduced fetal body weight, central nervous system defects, oral cleft defects, and major cardiac defects (Bove, et al. 1995). THMs also cause low birth weight, miscarriages, and decreased sperm motility in animal studies (Klinefelter et al. 1995, Narotsky et al. 1997, and Kramer et al. 1992). The current MCL for total THMs considers only the cancer risk from trihalomethanes.

Nitrate

When levels of nitrate in tap water are low, as is the case for the vast majority of tap water in the United States, health concerns are minimal. Serious concerns arise, however, when levels approach or exceed the 10 ppm standard, as occurred in several of the cities we tested in Ohio. As a measure of concern, EPA, in an unusual step, is requiring public notification of nitrate toxicity in Consumer Confidence Reports any time nitrate is detected at levels that exceed one half the MCL (5 ppm). This distinctly atypical requirement suggests that even EPA has reservations about the adequacy of the public health protection provided by the current 10 ppm standard.

There is substantial evidence that the 10 ppm nitrate standard does not protect infants from blue baby syndrome. First, methemoglobinemia has been re-

Peak contamination levels in our snapshot of Ohio tap water were more than twice the level that caused a significant increase in spontaneous abortions in the California study.

Trihalomethanes as Reproductive Toxins — The Evidence

For the past decade scientists and doctors have conducted a series of studies establishing trihalomethanes as reproductive toxins, and linking tap water to adverse reproductive outcomes:

Waller et al. 1998. This study of over 5000 pregnant women found a near doubling of risk for miscarriage among those women drinking at least five glasses of tap water a day containing 75 ppb trihalomethanes, a level considered safe by the EPA.

Narotsky et al. 1998. High doses of bromodichloromethane were shown to cause full litter resorption in rats.

Klotz and Pyrch 1998. Exposure of a quarter million pregnant women to total trihalomethanes in drinking water was shown to nearly double the risk of neural tube defects in infants.

Klinefelter et al. 1995. This study, the first reporting of effects of trihalomethanes on male reproduction, showed that low levels of bromodichloromethane decrease sperm motility in F344 rats.

Bove et al. 1995. In a study of over 80,000 births in New Jersey, these researchers found that mothers who drank tap water with high trihalomethanes were more likely to have small babies, or babies with birth defects that included central nervous system defects, oral cleft defects, and major cardiac defects.

Wrensch et al. 1992. In a study of 1016 pregnant women, miscarriages were 4 times higher among women who drank any tap water, compared with those drinking bottled water only.

Kramer et al. 1992. This study of almost 1000 births in Iowa found a near doubling of risk for intrauterine growth retardation when mothers drank tap water containing levels of chlorform at just one tenth of the level currently allowed by the EPA.

Windham et al. 1992. Researchers found miscarriage rates twenty percent higher for those women drinking any tap water during pregancy than for those drinking only bottled water in this study of 626 preganant women.

Swan et al. 1992. A review of five major reproductive outcome studies suggested that women abstaining from tap water or drinking bottled water during the first trimester of pregnancy may be at reduced risk of miscarriage.

Deane et al. 1992. In a study of 400 pregnancies, these researchers found miscarriage rates 3.4 times higher among women who drank any tap water during their pregnancy, compared with women who drank only bottled water.

ported in the literature at levels below 10 ppm (Sattelmacher 1962, Simon 1964). These studies indicate that 3 to 4 percent of all cases of methemoglobinemia occur at contamination levels below 10 ppm.

Nor does the 10 ppm standard adequately protect infants and young children from high doses of cancer-causing compounds. When nitrate is consumed in tap water, it is converted in the body to *N-nitroso*

compounds, for which there is scientific consensus of carcinogenicity (IARC 1978, NAS 1977). Conventional wisdom, however, always assumed that tap water was a minor source of exposure to such compounds. While this is likely true for most young children, the National Research Council of the National Academy of Sciences estimates that 27,000 infants may drink tap water contaminated above 10 ppm each year (NRC 1995).

There is no doubt that exposure to N-nitroso carcinogens should be avoided during infancy. This explains why in 1980, the U.S. Department of Agriculture established a zero-tolerance for added nitrate in food destined for infants and children, and why most European countries have banned N-nitroso compounds, along with their nitrate and nitrite precursors, from baby bottle nipples (Westin 1990).

Nitrate in water may also cause birth defects. Studies in rats and hamsters have shown that N-Nitroso compounds are potent teratogens (Druckery 1966; Givelber 1969). Other studies have indicated that nitrite can be transferred from the mother to the fetus and could affect behavioral development at sublethal doses (Shuval and Gruener 1972).

A 1984 Australian study analyzed birth defects in relation to nitrate contamination in drinking water and found statistically significant associations between birth defects of the central nervous system and musculoskeletal system and increasing nitrate concentration of drinking water (Dorsch, et al. 1984). A follow-up study in Canada found the evidence for an association between nitrate and birth defects to be weaker. However, the majority of the Canadian study population was exposed to levels much lower than the high-dose group in Australia. A 1995 study of nitrate by the National Research Council recommended further study of the reproductive risk of nitrate (NRC 1995).

A 1995 study of nitrate by the National Research Council recommended further study of the reproductive risk of nitrate.

Xylenes

Xylenes, a component of gasoline and other petroleum-based solvents, are a likely cause of human birth defects. According to the California Office of Environmental Health Hazard Assessment (OEHHA) there is a "medium to high" level of concern over the ability of xylenes to cause birth defects and other reproductive problems.

OEHHA cites 19 different peer-reviewed animal studies showing "all four manifestations" of developmental toxicity after exposure to xylenes: fetal death (including miscarriages), malformations, growth deficits, and functional (and behavioral) abnormalities. Adverse effects have been reported in three mammalian species, and chicks, and by oral and inhalation routes of exposure. There is evidence of miscarriages and birth defects in

humans after exposure to xylenes, as well as animal studies indicating xylene toxicity to the male reproductive system (OEHHA, 1998).

PAHs

The health effects of the two polycyclic aromatic hydrocarbons, or PAHs, found in Ohio tap water are largely unknown. PAHs occur in industrial discharges, in urban storm runoff, or can leach from the linings of tanks and pipes in water distribution systems. PAHs in the air are regulated in the workplace, because they are considered potentially carcinogenic. Although the European Community has established drinking water standards for PAHs, these compounds remain largely unregulated in U.S. drinking water.

What You Don't Know Can Hurt You

Major problems with EPA policy undermines the public right to know about many potentially hazardous contaminants in their tap water.

The 1996 amendments to the Safe Drinking Water Act require water systems to prepare an annual summary of the quality of water they delivered to consumers' taps throughout the year — a "right to know" that consumers in California and a handful of other water systems across the country have enjoyed for several years. Large water systems must deliver this Consumer Confidence Report to each customer served water from the system, with the first annual report delivered by October 1999. State governors can waive mailing requirements for systems serving fewer than 10,000 people. These systems could instead print the results in the newspaper or post them in a public place.

Since passage of the Act, EPA has developed final rules for water suppliers when implementing the right to know amendments. Unfortunately, the final rules do not include long-term reporting requirements for the majority of the contaminants we found in Ohio tap water.

Weak monitoring requirements undermine the public's right to know

The public's right to know about drinking water contaminants is dependent first on what water suppliers monitor for, and second what monitoring results and other information about the contaminants they tell the public. Major problems with EPA policy in both of these areas undermines the public right to know about many potentially hazardous contaminants in their tap water.

Most notably, EPA does not require routine monitoring of unregulated contaminants in tap water. EPA's unregulated contaminants monitoring stipulates just one test every five years for a select list of 48 contaminants without enforcement standards. Public reporting requirements of the current list of monitored, unregulated contaminants will expire after the first several years of Consumer Confidence Reports. Large water systems are also required to report results of special trihalomethane monitoring, but these requirements also expire after the first several years of reporting.

In Ohio, the monitoring of unregulated contaminants will almost surely not provide any useful information to the public because:

- Most (8 out of 14) of the unregulated contaminants we found are not included in

In the 12 Ohio communities where we tested, a combination of weak state and federal right-to-know rules will leave vulnerable populations like pregnant women, infants, young children, and people with compromised immune systems with virtually no meaningful information about contaminants in their tap water.

the program.

- Water suppliers may have fulfilled their testing requirements and not test at all for unregulated contaminants during the last three years. In these cases nothing is required to be reported to the public.

- One test every five years is an extraordinarily infrequent testing schedule. Even if the contaminant is found once during the five year period, this finding will trigger no subsequent requirement to monitor or inform the public about it.

The Right to Know in Ohio

Under a state-level pesticide testing program the Ohio EPA currently requires monitoring in certain communities of two unregulated contaminants in tap water: metolachlor and metribuzin. The agency plans to require continued testing in 59 communities with high-risk water supplies, beginning in 1999. To date, however, the state has no plans to inform the public about when, how much, and where these contaminants are found, even when they are found at levels above federal health guidelines.

Monitoring requirements by the Ohio EPA do nothing to enhance the flow of information to the public. In the 12 Ohio communities where we tested, a combination of weak state and federal right-to-know rules will leave vulnerable populations like pregnant women, infants, young children, and people with compromised immune systems with virtually no meaningful information about contaminants in their tap water.

This is because federal law does not require water suppliers to test for and disclose the presence of many of the contaminants we found, and because some very small water suppliers lack the funding to perform comprehensive testing in the first place. The effects of a weak drinking water law are:

- Of the 21 contaminants or contaminant groups (total THMs) we found in Ohio tap water, only the 7 with MCLs would be required to be reported to the public beyond the first years of the right to know program (Table 2).

- At least 60 percent of the contaminants detected in every town in our survey are not subject to long term right-to-know reporting requirements.

- Communities that draw their tap water from agricultural areas face a particularly serious problem because unregulated contaminants (those without MCLs) can be more prevalent and at levels of greater health concern than contaminants regulated by the

EPA.

- Consumers have almost no right to know about the health effects of contaminants in their drinking water. Under EPA guidelines, citizens must receive health effects information only for contaminants found at levels that trigger an enforcement action for formal violation of an MCL. Under these criteria, for the 20 contaminants plus total THMs found in the 12 Ohio communities tested, health effects information would be provided to residents of just two communities, Defiance and Napoleon, about just one contaminant in their tap water, nitrate.

  No health effects information of any kind would be required to be reported to residents of 10 of the 12 communities about any of the 20 contaminants found in their tap water, including the seven found at levels above federal enforcement standards or health guidelines. For the other 15 contaminants in Defiance, and the other 11 pollutants in Napoleon, no information on health effects would be required to appear in the right-to-know report.

- Residents of communities with less than 10,000 people will have no effective right to know what is in their drinking water. EPA's right to know rule requires that reports be mailed only to those who live in communities of more than 10,000 residents. In smaller communities reports can instead be printed in a newspaper or posted in a public place. More than 1.7 million Ohio residents live in these small communities. There, if water suppliers follow EPA rules, the burden of finding a Consumer Confidence Report for the local tap water will be on the consumer.

Contaminants in Ohio tap water: What you may not be told, and why

Our analysis found 20 contaminants in the tap water of 12 communities where citizens sampled this summer. Under EPA right to know reporting requirements, the public would be told about only 6, plus the contaminant group total THMs. The other 14 contaminants include six pesticide active ingredients, two atrazine metabolites, four individual THMs and two PAHs (Table 2).

Pesticides

- **Triazines**. Water suppliers are not required to test for the unregulated triazine pesticides cyanazine and propazine, and the atrazine metabolites desethyl atra-

No health effects information of any kind would be required to be reported to residents of 10 of the 12 communities about any of the 20 contaminants found in their tap water, including the seven found at levels above federal enforcement standards or health guidelines.

Metolachlor, a carcinogen and testicular toxin, was found in 7 of the 12 communities tested. Under federal rules metolachlor is not required to appear in Consumer Confidence Reports beyond the year 2000.

zine and desisopropyl atrazine. These compounds have not yet made it through the notoriously slow regulatory process that leads to EPA establishing a final drinking water standard and a concurrent monitoring requirement.

Some water suppliers voluntarily test for unregulated contaminants. EPA is "strongly encouraging" but not requiring that detected unregulated contaminants be shown in Consumer Confidence Reports, but only when contaminants are found at levels above established health-based limits. Health-based levels have not been established for the atrazine metabolites desethyl atrazine and desisopropyl atrazine, despite their potentially serious health effects.

- **Acetochlor.** Acetochlor, classified by EPA as a probable human carcinogen, will likely not appear in a Consumer Confidence Report. EPA has placed acetochlor on a list of 30 contaminants that may be monitored under a special unregulated contaminant monitoring program. But EPA has indicated that acetochlor will likely get special treatment under this program and be tested in only a fraction of the water systems where the other contaminants are tested. Indications from EPA are that they believe widespread testing of acetochlor should not be performed since the contaminant does not currently have a government-sanctioned test method.

  When they registered the product, however, EPA required the manufacturer to demonstrate a reliable test method, and EPA currently makes assurances that two different, existing test methods can be used to reliably test for acetochlor.

  Acetochlor was rejected for registration by EPA during the Reagan and Bush administrations. The Clinton EPA approved acetochlor in 1993. Nationwide, the extent of its occurrence in drinking water is unknown. Our tests found acetochlor in three of 12 locations. Previous tap water testing by EWG found acetochlor in 15 communities of 29 tested throughout the Midwest corn belt and Mississippi River basin.

- **Metolachlor.** Metolachlor, a carcinogen and testicular toxin, was found in 7 of the 12 communities tested. Under federal rules metolachlor is not required to appear in Consumer Confidence Reports beyond the year 2000. The Ohio EPA is requiring that

certain water suppliers continue to test for this compound in a special pesticide monitoring program. Ohio EPA may require that the results of this testing be shown in Consumer Confidence Reports — but two communities where we found metolachlor, Cleveland and Sidney, will not be included in the program.

- **Dicamba.** Dicamba has been shown to cause birth defects in laboratory animals. It was found in four of our 12 test communities. EPA has established a lifetime health advisory (LHA) for this compound, but has decided not to develop a drinking water standard because the agency has established that levels of dicamba in drinking water supplies are in general below the LHA.

- **Acifluorfen.** Acifluorfen is listed by California as a chemical known to cause cancer and by EPA as a probable human carcinogen. It is unregulated in drinking water and testing is not required, although EPA has set maximum contaminant limit goal, or MCLG, of zero. Acifluorfen was found in the tap water of Delaware, Ohio, but will not be required to appear in Consumer Confidence Reports for that community.

Trihalomethanes

The individual THMs found in this summer's citizens tap water testing project fall into a gray area of reporting requirements. Some water suppliers are required to test for these compounds sometime between the year 1998 and 2000 either as part of EPA's unregulated contaminant monitoring requirements, or as part of EPA's information collection rule. Both of these monitoring requirements for trihalomethanes end by the year 2000.

Results from these short-term monitoring programs will be reported for the first years of Consumer Confidence Reports. After that, only total trihalomethanes are required to be reported.

In communities where the water systems serve less than 10,000 people, Napoleon and Williamsburg in our survey, THM testing is not required at all, even though our test results found that total THMs exceeded the maximum contaminant level (MCL) in finished tap water in these communities.

PAHs

The two PAHs found in the tap water from Akron, Norwalk, and Williamsburg are in a broad class of contaminants that includes known carcinogens. PAHs are regulated in the workplace, in air, because they are considered potentially carcinogenic. Although the European Community has established

In communities where the water systems serve less than 10,000 people, THM testing is not required at all, even though our test results found that total THMs exceeded the maximum contaminant level (MCL) in finished tap water in these communities.

Some utilties do more. In response to a recent major study linking high but legal levels of THMs with miscarriages, a handful of water suppliers — from Virginia Beach, Virginia to Lakeside, California — chose to inform their customers of this risk.

drinking water standards for PAHs, these compounds remain largely unregulated in drinking water in the U.S. The two compounds found in Williamsburg are unregulated in U.S. drinking water and testing is not required. Information on these compounds is not be required to appear in Consumer Confidence Reports.

Will health effects of drinking water contaminants be shown?

The federal requirements for reporting health effects of drinking water contaminants in yearly Consumer Confidence Reports are even weaker than reporting requirements for the contaminants themselves. Water suppliers are not required to include information on health effects of contaminants except when they are found at levels that violate MCLs. While that approach might make sense for those concerned about a public "over-reaction", it is clearly inadequate to protect public health.

Of the 20 different contaminants found in Ohio tap water, 14 will not be shown at all in the Consumer Confidence Reports. Of the remaining six contaminants reported to the public, health effects information is required for only one, nitrate, and only in two communities.

What about the other five individual contaminants, and the group of contaminants called total THMs? The people in these 12 communities will not be told about the health effects because of special rules surrounding how EPA determines if a water supply violates an MCL. For these six contaminants, compliance with an MCL is based on the yearly average level in the water system. Regardless of how far over the MCL contamination goes, if the annual average level calculated from official monitoring samples is lower than the MCL, EPA does not require that the Consumer Confidence Report contain information on health effects of these contaminants.

Some utilities do more. In response to a recent major study linking high but legal levels of THMs with miscarriages, a handful of public spirited water suppliers — from Virginia Beach, Virginia to Lakeside, California — chose to inform their customers of this risk. Chesapeake, Virginia went the extra step, setting up a water quality hotline that pregnant women can use to find weekly trihalomethane levels in their drinking water. This kind of public education and outreach should be the rule, not the exception.

Who will be left in the dark?

People from large communities have a better chance to see a Consumer Confidence Report than people from small communities. This is a serious failing of EPA's right to know requirements because the small communities that we tested in Ohio had by far the most contaminated tap water, and nationwide drinking water violations occur

disproportionately in small communities (NRC 1997).

Of Ohio's 1,443 community water systems, only 156, or about 10 percent, will be required to deliver Consumer Confidence Reports to the door of every consumer. These are systems which serve at least 10,000 people. EPA gave state governors the authority to waive the mailing requirements for smaller systems.

Small water systems serve 1.7 million of Ohio's 11 million residents, or about 15 percent of the people in the state. To comply with the federal right to know law, these systems can print the report in the local newspaper. So of these 1.7 million residents, only those who subscribe to the local newspaper and read beyond the front page will see the report, unless the water supplier goes beyond federal requirements.

People who live in communities of 500 people or fewer (118,000 of Ohio's citizens) might not even see the report in a newspaper. In these communities, water systems would be required only to post the report in a public place, and notify customers that the report is available.

Infants and children will be especially hard hit by the shortcomings of the Consumer Confidence Report requirements. The Safe Drinking Water Act Amendments require reporting for water systems where people reside, but not necessarily where they work or go to school. Nearly 500 schools and daycare centers in Ohio have their own wells that are pumped to provide drinking water to 180,000 infants and children, according to the Ohio EPA. These small systems were exempted by Congress from the reporting requirements. The infants and children served includes more than 3,000 preschoolers, who are particularly vulnerable to the effects of certain kinds of chemicals, including certain pesticides and nutrients from fertilizers.

Of Ohio's 1,443 community water systems, only 156, or about 10 percent, will be required to deliver Consumer Confidence Reports to the door of every consumer.

Unregulated Contaminant Monitoring: Why it Doesn't Enhance Ohio's Right to Know

Unregulated contaminants include all chemicals that occur in drinking water and that lack a final drinking water standard. But when EPA talks about "unregulated contaminants," they mean a special list of 48 (soon to be 30) contaminants that are included in limited, short-term testing programs.

EPA requires limited monitoring of unregulated contaminants under two programs, the Unregulated Contaminant Monitoring program and the Information Collection Rule. Some of the contaminants we found in Ohio tap water are on these lists.

EPA designed these two programs to provide data for future rulemakings. These programs do not provide all individual water suppliers with a comprehensive picture of what's in the water. By and large, this monitoring won't help Ohio citizens make informed decisions about their drinking water. And it certainly won't help Ohioans learn about other unregulated contaminants that don't happen to fall on EPA's special lists. Here's why:

- Under the current Unregulated Contaminant Monitoring program, water suppliers are required to test their water 2 or 3 three times, for 48 chemicals, over a 12 year period that ends in 2000. Then the data collection requirement ends. Two or three pieces of data over 12 years is not comprehensive monitoring. In our testing, six contaminants fall under this program: the four trihalomethanes, metolachlor, and dicamba.

- Beginning in 2000, the list of chemicals in the Unregulated Contaminant Monitoring program will completely change, to 30 new chemicals. In this summer's testing, only acetochlor falls under the new list currently being considered by EPA. EPA is proposing testing for acetochlor in only 300 communities nationwide.

- Under the Information Collection Rule, large communities are required to test for disinfection byproducts monthly for 18 months. Water suppliers are testing for the four trihalomethanes under this program, but only if they serve more than 100,000 people and only until December 1998. Then the testing requirement ends.

- Seven unregulated contaminants we found in Ohio tap water aren't included even in these short-term testing programs: cyanazine, desethyl atrazine, desisopropyl atrazine, simazine, fluoranthene, phenanthrene, acifluorfen, and propazine.

Ohio EPA requires additional pesticide testing in vulnerable communities, including 10 of the 12 communities from this summer's tap water testing. Two unregulated contaminants are included in Ohio EPA's 1999 program, metolachlor and metribuzin.

Of the contaminants we found in Ohio's tap water, 14 are unregulated. Eight fall on these special short-term federal and state monitoring lists and may be included in right-to-know reports for the next several years. Six are not included in any testing programs and are not likely to appear in right to know reports. None of the 14 are required to be disclosed to the public over the long term.

Chapter 6

Methodology

All samples were of municipally treated tap water.

This report presents the results of tap water testing in 12 communities throughout Ohio. Participants in the study collected tap water samples on a single summer day, providing a snapshot of water quality in their community.

Twelve communities, with water systems that serve a total population of more than 2.8 million, were selected for participation in this study. These communities and their source of water, as listed in Ohio EPA's yearly water supply evaluation reports, are shown in Table 4.

Communities were selected based on previous indications of contamination, the willingness and availability of project participants, and the need to ensure geographic diversity in regions tested. The fact that a community is not included in the study does not indicate the relative quality of its drinking water.

In all communities testing was performed during the summer of 1998. In Sidney, Delaware, and Williamsburg, participants sampled in July. The sampler in Columbus collected water in September, and in the remaining 8

Table 4. We tested tap water in twelve communities during the summer of 1998.

Community	Drinking water source
Akron	Lake Rockwell
Cleveland	Lake Erie
Columbus	Hap Cremean plant: Big Walnut Creek
Defiance	Maumee River
Delaware	Olentangy River, supplemented by groundwater wells
Ironton	Ohio River
East Liverpool	Ohio River
Napoleon	Maumee River
Norwalk	Norwalk Creek, Memorial Reservoir, supplemented by East branch of Huron River
Sidney	Great Miami River, Tawawa Creek, and four groundwater wells
Toledo	Lake Erie
Williamsburg	East Fork of Little Miami River and reservoir

Source: Ohio EPA yearly water supply evaluation reports.

Table 5. Tap water from this summer's Ohio citizen sampling program was tested for 9 contaminant groups and 122 individual contaminants.

Contaminant group	Number of contaminants reported by the laboratory in this group	Test method
Volatile organic compounds (includes trihalomethanes)	57	OA-502.2
Gas chromatograph / mass spectroscopy extractables	2	EPA 525.2, extraction method EPA 525
Nitrogen-containing herbicides (includes triazine and acetanilide herbicides)	12	EPA 507, extraction method EPA 507
Glyphosate and AMPA	2	EPA 547
Organophosphate insecticides	6	EPA 507, extraction method EPA 507
Chlorohydrocarbon insecticides	20	EPA 508
Acid herbicides	6	EPANPS3, extraction method EPA 515.1
Polycyclic aromatic hydrocarbons (PAHs)	16	OA-550
Nitrate and nitrite	reported as a group	EPA 353.2

Source: University of Iowa Hygienic Laboratory, Iowa City, Iowa.

The lab follows strict Quality Assurance and Quality Control guidelines, and is certified to perform environmental analysis ranging from drinking water to hazardous waste.

communities participants sampled in June.

All samples were of municipally treated tap water, collected at a kitchen or bathroom sink. No home water treatment units (softeners or filters) were used on taps that were sampled. Cold water was used for all samples, and was allowed to run for two to three minutes before sample collection.

The laboratory provided each sampler with specially prepared sample bottles that had been sterilized and filled with sample preservatives as necessary. Samplers filled the bottles with tap water, packed them in coolers with ice, and shipped the coolers the same day to the University of Iowa Hygienic Laboratory in Iowa City, Iowa. The laboratory refrigerated the samples at 4 degrees Centigrade until they were analyzed.

The laboratory shipped additional, pre-filled sampling bottles with each sampling kit. The samplers returned these bottles, untouched, to the laboratory along with the tap water samples. The laboratory tested the distilled water in the pre-filled bottles to determine if samples had been contaminated during shipping or when the lab was preparing the bottles. The lab routinely uses this procedure to ensure the quality of the tap water tests.

The University of Iowa Hygienic Laboratory is a nationally respected environmental and public health laboratory that has been in operation for over 90 years, and routinely performs analytical work for the U.S. EPA,

other federal and state agencies, public water suppliers, and industry. The lab follows strict Quality Assurance and Quality Control guidelines, and is certified to perform environmental analysis ranging from drinking water to hazardous waste.

The lab tested samples for volatile organic compounds (primarily industrial chemicals and disinfection byproducts), nitrogen-containing herbicides (the triazine and acetanilide herbicides), glyphosate and AMPA, organophosphate insecticides, chlorohydrocarbon insecticides, acid herbicides, polycyclic aromatic hydrocarbons (PAHs), and nitrate and nitrite, according to methods described in Table 5.

The lab established quantification limits for each group of compounds, and routinely calibrates instruments according to established procedures. The laboratory stored the test results electronically, and validated the results using established validation procedures.

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