

# SEWAGE OVERFLOW



**BILLIONS OF GALLONS OF SEWAGE  
CONTAMINATE LAKE ERIE**

*Environment Ohio*  
and  
*Environment Ohio*  
*Research and Policy Center*

MAY 2007



# ACKNOWLEDGEMENTS

## SEWAGE OVERFLOW: BILLIONS OF GALLONS OF SEWAGE CONTAMINATE LAKE ERIE

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In 2006, Environment Ohio Research and Policy Center became the new home of the Ohio Public Interest Research Group (Ohio PIRG) Education Fund's environmental work, focusing on exclusively protecting Ohio's air, water and open spaces.

Drawing on more than 30 years of experience, our staff combines independent research, practical ideas, and effective educational campaigns to overcome the opposition of special interests and win real results for Ohio's environment.

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# EXECUTIVE SUMMARY

More than thirty years after the Cuyahoga River was engulfed in flames and the Clean Water Act was passed to clean up America's waterways, Ohio's lakes, rivers, and streams continue to be plagued by pollution.

Lake Erie, arguably Ohio's most important waterway continues to be threatened by pollution. Cherished by boaters, fishers, and families for its beaches, wildlife, and recreational uses, our Great Lake also provides drinking water to over eleven million people. While many different contaminants, ranging from mercury to PCBs, negatively impact Lake Erie, this report focuses on one major pollutant that we can eliminate: raw, untreated sewage. **From January - December 2005, Lake Erie was flooded with more than 10.9 billion gallons of untreated sewage.**

This report surveys how much sewage was dumped into the Lake Erie watershed basin from thirty-eight communities throughout 2005, while also looking critically at how our communities and the Ohio Environmental Protection Agency (OEPA) are addressing sewage pollution and protection of public health. In conclusion, this report offers a range of solutions for eliminating sewage and protecting the public from this health threat.

## The Problem

Combined sewer systems are designed to convey and attempt to treat sewage and rainwater. Combined sewer overflows (CSOs) are instances in which rainwater and untreated sewage overflow into our streams, lakes and rivers, including Lake Erie. Fifty-two communities within the Lake Erie Watershed Basin, ranging from small towns like Avon Lake, to the larger metropolitan cities including Toledo and Cleveland, have combined sewers and are plagued by CSOs. Together, these fifty-two communities have 598 combined sewer overflow outfalls, or pipes, that feed into waterways that lead into Lake Erie, or directly into the Lake itself.<sup>1</sup> An analysis of thirty-eight of the fifty-two communities that dump untreated sewage shows that these communities dumped more than ten billion gallons of sewage into the Lake Erie watershed in 2005. This is equivalent to more than three billion toilets flushing into Lake Erie, - a drinking water source for more than 11 million people.

Combined sewage overflows are a major cause of beach advisories, wildlife destruction, and human health problems.<sup>2</sup> Untreated sewage may contain disease-causing pathogens including *E. Coli*, Hepatitis A virus, and *Giardia*.<sup>3</sup> Anyone who comes into contact with water that is contaminated with sewage is putting their health at risk. Sewage is also a likely contributor to the dead zone in Lake Erie's central basin.

The Clean Water Act calls for the elimination of untreated or partially treated sewage releases into our waters. The law also requires that until sewage discharges are eliminated, sewage treatment facilities must monitor, report, and notify the public of all CSO events. Here in Ohio, sewage discharges are largely unmonitored and underreported to the OEPA. Although the OEPA has begun to require some communities to report sewage overflows on a monthly basis, there lacks a consistent statewide requirement. Therefore, neither the state agency, nor the public, is consistently aware of the billions of gallons of sewage overflowing into Lake Erie's waterways. Without this information, the OEPA cannot achieve its goals of enforcing the Clean Water Act and eliminating pollution in our waterways. In the meantime, the public cannot adequately protect themselves from disease-causing pathogens found in untreated sewage.

# Solutions

To eliminate sewage from entering our waterways and protect public health, the Environment Ohio Research and Policy Center recommends the following:

- 1) Communities need to incorporate technologies that help prevent excessive storm water from inundating our sewer systems. With more control over the storm water that enters our combined sewer systems, there will be less sewage overflowing into our waterways.
- 2) Our state and federal officials need to support more funding for sewage infrastructure improvements that strive toward the elimination of sewage overflows, such as the separation of sanitary sewer and storm sewer systems.
- 3) The OEPA needs to make reporting of any and all sewage discharges mandatory and consistent. The wastewater treatment facilities and the OEPA should notify the public in real time when these public health threats occur.
- 4) One promising development in the effort to stop sewage dumping is the Healing Our Waters - Great Lakes coalition and the US EPA-led Great Lakes Regional Collaborative. Both efforts are advocating federal support to fund a multi-billion dollar plan to restore the Great Lakes. The majority of this funding is allocated towards the “virtual elimination” of sewage dumping. The outcomes from this process will impact the future of eliminating sewage discharges into the Great Lakes.

Eliminating sewage dumping requires political will, citizen action, adequate funding and forward thinking. Until the day comes when sewage dumping is eliminated, state officials need to track how much sewage is overflowing into our waterways and develop a comprehensive public notification program to protect the public.

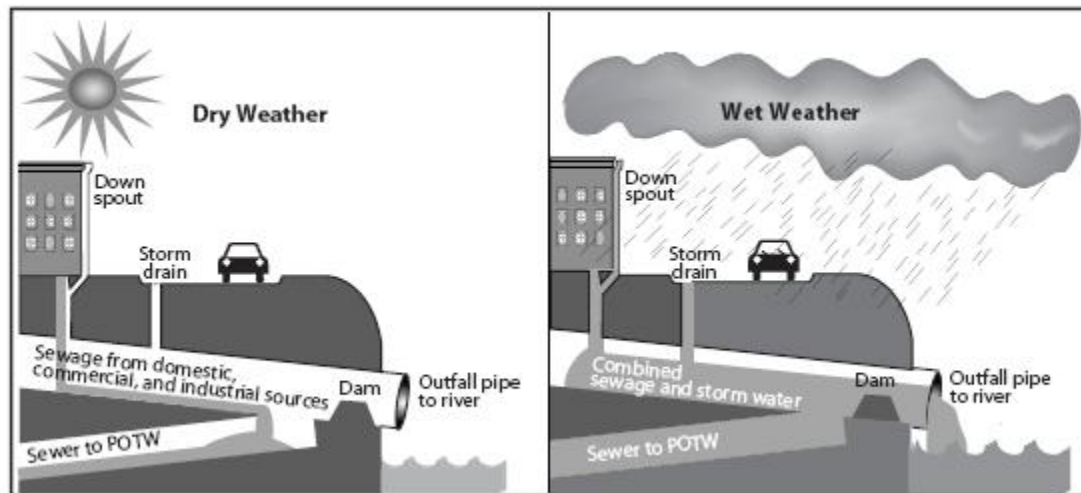
**“Civilized people should be able to dispose of sewage in a better way than by putting it into drinking water.”**

*President Theodore Roosevelt, 1910*

# COMBINED SEWER OVERFLOWS: CSOs

## WHAT ARE THEY?

Many of the earliest sewage systems were built to manage both municipal sewage (waste from domestic, commercial and industrial sources), and storm water, which flows into our sewers after a wet weather event. A combined sewer system delivers both types of wastewater to the treatment plant simultaneously. However, during moderate to heavy rain events or snowmelts, the combined sewer systems are inundated with storm water and sewage that often exceeds the system's treatment capacity. Combined sewer systems are built with an overflow pipe that discharges untreated sewage and storm water directly into the closest water source, such as the Cuyahoga River or Lake Erie. This discharge of untreated sewage is termed a combined sewer overflow or CSO.



**FIGURE 1. TYPICAL COMBINED SEWER SYSTEM**

Combined sewer systems are designed to discharge untreated sewage and storm water directly to surface water bodies such as rivers and lakes during wet weather events, causing a Combined Sewer Overflow or CSO. In dry weather the sewage is directed to the wastewater treatment plant (POTW).<sup>4</sup>

Communities that rely on combined sewer systems will experience increased sewage overflows with an increase in land development. As land is developed, less land is available to absorb storm water into the ground. Therefore more rainwater floods the combined sewer system causing larger combined sewage overflows. In addition, increased development creates additional sources of municipal sewage. Sewage treatment facilities are all too often faced with the burden of being incapable of adequately serving the rapidly growing communities that connect into these aging systems.

# THE HISTORY OF COMBINED SEWER OVERFLOWS

The development of combined sewer systems began in the mid-1800's, as a solution to the lack of sanitary sewage disposal systems. By the 1960's, it was clear that CSOs were a major threat to public health, and research efforts were made to search for better solutions to our growing sewage problems. It is clear to the current EPA that "CSOs are remnants of an aged infrastructure from a time before environmental effects of human action were of great concern to most people, partly because we didn't know the detriment that would be caused to the environment and public health, and partly because population and industry were much smaller at these times."<sup>5</sup>

In order to address the growing problems related to combined sewage, in 1994, the U.S. EPA adopted a CSO Control Policy which required all CSO communities to characterize their collection systems and overflows and implement nine minimum control measures. In 1995, the Ohio EPA released the "State of Ohio Combined Sewer Overflow Strategy," which was modeled after the U.S. EPA's CSO Control Policy.<sup>6</sup> The goal of the Control Policy was to minimize the pollutants from CSOs by eliminating them where possible. The minimum controls include expectations for CSO communities to monitor, report, and notify the public of all CSO events. As stated in the Ohio Combined Sewer Overflow Strategy, "the Ohio EPA expects communities to develop and implement an effective public advisory system that informs the public of the possible health and environmental impacts associated with CSOs, that notifies the public when discharges from CSOs occur and advises against contact recreation when elevated bacteria levels may endanger public health."<sup>7</sup>

In 2000, Congress incorporated the nine minimum control strategies into the Federal Clean Water Act.<sup>8</sup> Unfortunately, Ohio's communities continue to dump sewage without notifying the public of the health and environmental impacts.

Combined sewers are systems of the past. Decision makers need to work towards the permanent elimination of sewage overflows, and until sewage discharges are eliminated, the public should be appropriately informed.

# HEALTH THREATS

Combined Sewer Overflows pose dangerous threats to the health of humans and the environment.

CSOs deliver raw sewage, industrial waste, and large volumes of rainwater that contain pathogens, suspended solids, oxygen-depleting chemicals and toxic pollutants to receiving waters. They contribute to beach closures, contamination of drinking water supplies, wildlife destruction and human health problems.<sup>9</sup>

Untreated sewage contains disease-causing pathogens including *E. coli*, *salmonella*, fecal coliform, enterococci, *shigella*, hepatitis virus, *cryptosporidium*, and *giardia*. These pathogens pose a risk to those who ingest contaminated water directly through inadequately treated drinking water, or indirectly, through the consumption of food that has been contaminated by affected water. The pathogens found in untreated sewage can cause serious diseases including typhoid, cholera, dysentery, and diphtheria. These diseases are particularly harmful to those with weakened immune systems, such as young children, pregnant women, and the elderly.<sup>10</sup>

## RESULTS OF SEWAGE POLLUTION: DRINKING WATER CONTAMINATION

400,000 people got sick and 100 died in Milwaukee, Wisconsin due to drinking water contaminated with the parasite *cryptosporidium* in 1993. The root cause of the epidemic was determined to be untreated sewage that passed the filtration system of one of the city's drinking water plants. The Centers for Disease Control and Prevention (CDC) found that as many as half of the water utilities in the country sometimes failed to remove *cryptosporidium*, which caused more than half of the people in Milwaukee to get sick.

Source: Rultz, Dan (Sept. 2, 1996). "Milwaukee learned its water lesson, but many other cities haven't" CNN – Health. [www.cnn.com/HEALTH/9609/02/nfm/water.quality/](http://www.cnn.com/HEALTH/9609/02/nfm/water.quality/)

## IMPACTS ON THE CUYAHOGA RIVER AND LAKE ERIE'S BEACHES

The United States Geological Survey (USGS) collaborated with the National Park Service (NPS) during 2000-2004 to complete a study regarding water contamination in the Cuyahoga River. The results from this study showed:

- The Hepatitis A virus was detected in 29% of the tested water samples,
- Unacceptable levels of *E. Coli*. were found in 87% of the river samples,
- *Salmonella* was detected in 52% of the river samples,
- *Giardia* was detected in 44% of the river samples and 67% of the samples from the effluent of the Akron Water Pollution Control Station (WPCS).<sup>11</sup>

## Results of Sewage Pollution: Water Quality at Ohio's Beaches

From 2000 - 2005, water sample tests taken at 21 of Ohio's Lake Erie beaches found unsafe levels of *E. Coli* in about one out of every six tests. The tests taken at Century Beach in Lorain were deemed unsafe over 80% of the time, at Camp Perry in Port Clinton over 70% of the time, and Edgewater State Park in Cleveland over 50% of the time.

Source: Beach monitoring reports from Ohio Department of Health obtained on January 19, 2006 from [www.odh.gov/odhPrograms/ch/bbeach/beachmon.aspx](http://www.odh.gov/odhPrograms/ch/bbeach/beachmon.aspx)

The USGS report suggests that the Akron Water Pollution Control Station was the principal source of the Hepatitis A virus found in the river.<sup>12</sup> The Cuyahoga National Park discourages any contact with the river due to health threats caused by the frequently high pathogen concentrations.<sup>13</sup>

The Centers for Disease Control and Prevention details some of the primary parasites and bacteria in untreated sewage that pose major public health threats:

- *Escherichia coli*: known as *E. Coli* causes severe illness ranging from bloody diarrhea to kidney failure which can lead to death.<sup>14</sup>
- The pathogen *Giardia*, causes the disease Giardiasis, which involves a variety of intestinal symptoms including diarrhea, flatulence, cramps, and nausea.<sup>15</sup>
- *Cryptosporidium*, also known as *Crypto* causes the diarrheal disease known as cryptosporidiosis,

including symptoms such as: watery diarrhea, dehydration, stomach pain, fever, nausea, weight loss, and vomiting.<sup>16</sup>

- Shigellosis is a disease caused by a group of bacteria called *Shigella*, which may bring about diarrhea, painful urination, irritation of the eyes, as well as, chronic arthritis. One type of this bacterium that is found in the non-industrialized world causes deadly epidemics.<sup>17</sup>

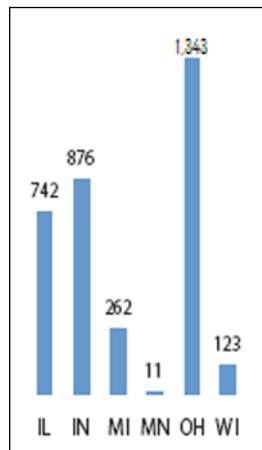
These known sewage contaminants endanger public health. The Ohio Department of Health suggests that anyone who swims in Lake Erie should keep their head and face out of the water, not swallow the water, shower after swimming, and wait at least 24 hours after a heavy rainfall before swimming.<sup>18</sup>

In 2005, the monitored beaches along the Lake Erie shoreline failed to meet criteria for primary-contact recreation, including swimming on 16 percent of the assessed days. Using *E. coli* as the indicator for swimmable beaches, Lake Erie's beaches resulted in health advisories for a total of 182 days in 2005.<sup>19</sup> This is a decrease from the 271 advisory days in 2004, 255 beach advisory days in 2003, and the 227 beach advisory days in 2002.<sup>20</sup>

# RESULTS

## THE LAKE ERIE BASIN: A DUMPING GROUND FOR OHIO

Ohio is one of the largest contributors to our nation's sewage pollution problems with eighty-five CSO communities that dump sewage out of 1,343 CSO outfalls throughout the state.<sup>21</sup> These outfalls are the actual pipe locations (point sources) where untreated sewage is released into our state's waterways. Of this number, there are fifty-two CSO communities that discharge sewage out of 598 CSO outfalls into Lake Erie or the waterways that feed into the lake.<sup>22</sup> This report looks at thirty-eight communities that discharge sewage into waters in the Lake Erie watershed basin.<sup>23</sup>



**FIGURE 2: Distribution of CSO Outfalls in the Great Lakes Region (U.S. EPA Region V) in 2004.**<sup>24</sup>

Note: The graph has been updated to reflect Ohio's elimination of thirty-five CSO Outfalls since 2004

From January to December 2005, the thirty-eight communities included in this report dumped more than 10.9 billion gallons of untreated sewage into Lake Erie and its tributaries. To put that into perspective, one toilet bowl flush uses an average of three and one half gallons of water.<sup>25</sup> Therefore, the Lake Erie sewage dumping problem is equivalent to over three billion toilet flushes into Lake Erie, a drinking water source for more than eleven million people.

This report looks at thirty-eight of the communities, including some of the largest and smallest contributors to sewage pollution in Lake Erie. The OEPA does not consistently track information from all of the contributing CSO communities and is not able to provide data to show the total amount of sewage discharged into Lake Erie. The available information on Ohio's illicit sewage discharges is not readily available to the public, and is arduously attainable by the OEPA. The following results therefore underestimate the actual amount of untreated sewage that is dumped into Lake Erie's waterways.

“Lake Erie’s sewage dumping problem is equivalent to over 3 billion toilet flushes into Lake Erie, a drinking water source for more than 11 million people.”

**TABLE 1**  
**Combined Sewer Overflows in the Lake Erie Basin,**  
**January 1, 2005 through December 31, 2005 (partial list)<sup>26</sup>**

<b>Community</b>	<b>Gallons of Untreated Sewage</b>
Akron	586,120,000 <sup>27</sup>
Avon Lake	99,500,000 <sup>28</sup>
Bowling Green	77,880,000
Bucyrus	259,900
Cleveland	4,925,521,000 <sup>29</sup>
Clyde	1,029,000
Crestline	15,792,000
Defiance	324,972,000 <sup>30</sup>
Delphos	205,000
Delta	398,000
Deshler	1,816,000
Dunkirk	336,000
Elyria	287,000
Findlay	67,502,500 <sup>31</sup>
Forest	3,070,000
Fostoria	226,134,000
Fremont	1,530,349,000
Gibsonburg	4,738,000
Hicksville	65,181,000
Lakewood	7,573,000
Leipsic	1,354,400
Lima	520,510,000
Luckey	1,072,000
McComb	35,106,000
Montpelier	770,000
North Baltimore	80,302,000
Norwalk	15,028,200
Paulding	3,300,000
Perrysburg	94,482,000
Port Clinton	12,250,000
Sandusky	746,545,000
Swanton	390,000
Tiffin	8,058,000
Toledo	1,172,711,000
Van Wert	124,018,000
Wapakoneta	159,190,000
Wauseon	1,000
Woodville	21,000
<b>TOTAL</b>	<b>10,913,772,000 <sup>32</sup></b>

# LAKE ERIE'S LARGER CITIES

## CLEVELAND'S NORTHEAST OHIO REGIONAL SEWER DISTRICT

The Northeast Ohio Regional Sewer District (NEORS) treats the sewage of the Greater Cleveland area, including downtown Cleveland, and parts of 59 surrounding communities. Their facilities include three wastewater treatment plants. The NEORS is the largest contributor of combined sewage in the Lake Erie Basin.

The City of Cleveland and portions of the surrounding suburbs were built with combined sewer systems. The NEORS discharges untreated sewage directly into Lake Erie through 19 CSO outfalls, and dumps sewage through their 107 other CSO outfalls to receiving waters including Mill Creek, the Cuyahoga River, Rocky River, and Big Creek.<sup>33</sup>

In the NEORS's "CSO Facilities Planning" report, they note that "Floating matter and debris is a highly visible problem that CSOs can cause. A more significant problem, however, is the bacteria carried in the overflow. High bacteria counts may pose health hazards to people involved in contact recreation, such as swimming."<sup>34</sup> The billions of gallons of combined sewage that the NEORS discharges into Greater Cleveland's waterways is a health threat.

Since the 2005 release of "Sewage Overflow: Billions of Gallons of Sewage Contaminate Lake Erie," NEORS has taken steps to educate the public of their sewage overflow problems. NEORS's website [www.neorsd.org](http://www.neorsd.org) contains educational information about their 126 overflow locations, and recent overflow occurrences at 25 of its monitored overflow locations. The sewer district provides a map of each of the sewage overflow locations and has posted signs at each outfall. The sewer district has taken a pro-active approach to protecting the public health of citizens recreating in the Edgewater Beach area by putting additional public advisory signage at the active overflow locations for up to 72 hours after an overflow has occurred.<sup>35</sup>

Within one year, NEORS has taken significant strides to protect the public health of Clevelanders from sewage pollution, particularly at Edgewater Beach. However, NEORS continues to be the largest contributor of sewage to Lake Erie with almost 5 billion gallons overflowing from the system in 2005. The NEORS must continue to develop innovative ways, beyond their website, to educate the public of these health threats.

## TOLEDO

In 2005 the city of Toledo discharged more than one billion gallons of sewage into area waterways. Its facilities serve approximately 340,000 people in the Toledo metropolitan area, and its 33 CSO outfalls discharge sewage into the Ottawa River, Maumee River and Swan Creek, which all feed into Lake Erie.<sup>36</sup>

The City of Toledo reports their CSOs to the OEPA on a monthly basis, and also makes much of this information available to the public through their website which shows the locations and activity of all of the combined sewer outfalls in their system ([http://www.toledowaterwaysinitiative.com/sewer\\_overflows.asp](http://www.toledowaterwaysinitiative.com/sewer_overflows.asp)).<sup>37</sup>

In August of 2002, The United States Environmental Protection Agency ordered a consent decree requiring Toledo to address the billions of gallons of sewage it releases into the environment. Under the settlement, Toledo created the Toledo Waterways Initiative, which is working towards eliminating most of its raw sewage discharges. The city held a special referendum in July of 2002, in which 78 percent of the voters approved of the improvements to the sewer systems. Ohio's Former Attorney General, Betty D. Montgomery, spoke in favor of the improvements, stating, "We applaud the city's willingness to commit to a long-term solution that will benefit citizens and the environment."<sup>38</sup>

"Our antiquated sewer system is broken. Toledo voters overwhelmingly approved an initiative to upgrade our sewer system because they understand the importance of protecting our waterways. We want clean rivers. The Toledo Waterways initiative is the long-term solution."

— former Toledo Mayor Jack Ford<sup>44</sup>

Source: Toledo Waterways Initiative:  
<http://www.toledowaterwaysinitiative.com/index.asp>

In Toledo, 20 percent of the city is still served by combined sewers, but the city is committed to major improvements. A large portion of city government's webpage is devoted to its plan to reduce CSOs, and there are opportunities available for public involvement. The citizens of Toledo may educate themselves about Toledo's combined sewer system through the website.

## AKRON

The city of Akron treats its own wastewater, as well as that of several neighboring communities, and has been in continuous service since 1928.<sup>39</sup> The entire service area that drains into the Lake Erie watershed is serviced with combined sewers. In the early 1990's the City of Akron installed monitors on all of its CSO outfalls in order to effectively measure the amount of untreated sewage that is released from the system. The city calculates this discharge and reports it to the OEPA on a monthly basis. In 2005, the City of Akron discharged approximately 586 million gallons of untreated sewage into the Cuyahoga River, and other waterways feeding into Lake Erie.<sup>40</sup>

The USGS released a report in 2004, regarding the water quality in the Cuyahoga River. The report looked at the water quality of the river water, as well as wastewater discharged directly from the Akron Water Pollution Control Station (WPCS). The study discovered the Hepatitis A virus in Akron's wastewater, as well as giardia, salmonella, and other dangerous viruses and bacterium (coliphage, *C. perfringes*, *enteroviruses* etc).

Whereas the City of Akron has reduced the volume of its sewage overflows by developing additional storage facilities, unfortunately, the City has not implemented any significant public notification system to educate the 330,000 people who live within its service territory.

# MONITORING, REPORTING AND NOTIFICATION INADEQUATE

Despite the monitoring, reporting, and notification requirements in the Clean Water Act, it is clear that neither the OEPA nor the CSO communities are enforcing these regulations. While the OEPA used to require wastewater treatment plants to report sewage discharges into Ohio's waterways, the agency suspended that requirement for many years. Within the past two years the OEPA has begun to re-introduce these requirements for some communities. However, the OEPA still does not have the ability to consistently collect statewide sewage overflow information, because not all communities report this data on a monthly basis. This lack of reporting ties the hands of agency officials whose job it is to enforce the Clean Water Act by holding polluters accountable. Without reporting, there is no enforcement, and without reporting also comes an unwillingness by wastewater treatment plant owners and operators to track or report sewage discharges. Without consistent and timely tracking, monitoring or reporting of sewage overflows the public is kept in the dark about the quality of their recreational waters and drinking water sources.

The following are examples of where the OEPA and individual communities have fallen short of adequately tracking, reporting or notifying the public of the health threats of sewage overflows:

- The OEPA is unable to provide a complete statewide analysis of Ohio's sewage overflows.
- The OEPA was able to provide sewage overflow information for less than ten communities in the Lake Erie Basin in 2004. In 2005, the OEPA collected monthly reports from thirty-four of the fifty-two communities in the Lake Erie Basin. Environment Ohio Research and Policy Center is currently seeking data regarding sewage overflows that occurred in 2006.
- Information from the remaining communities included in this report was obtained through annual reports or direct contact with individual sewage treatment utilities. One example of the inconsistency in this reporting was noted in the annual report from the City of Findlay, where the city stated "The City of Findlay created the enclosed report since there were no specific forms provided by the EPA for this data."<sup>41</sup>
- Cleveland is the largest polluter in the Lake Erie basin, dumping over 4 billion gallons of untreated sewage to Lake Erie's waterways in 2005. However, the OEPA did not have this information. Without this

information readily available the OEPA is unable to monitor the largest sewage polluter in the region or make the residents in the Cleveland area aware when sewage is polluting their recreational waterways. Cleveland has recently created a sewage pollution telephone recording that allows individuals to leave a message requesting more information about sewage overflows. Unfortunately, the recording does not include information about the current sewage overflow status, and the telephone number is not made easily available to the public, to encourage its use.

Other states in the Great Lakes Region, and some cities in Ohio are doing a better job of tracking and notifying the public of sewage overflows.

- Michigan implemented state specific legislation that requires immediate reporting of sewage overflows. Michigan also releases an annual report, which details its statewide sewage overflows.
- Indiana issued an executive order that required every community with sewage overflow problems to develop a comprehensive public notification plan. The city of Indianapolis included an email notification opportunity, and within the past year the city has issued 78 email notifications to alert the public of this threat.<sup>42</sup>
- After the U.S. EPA issued a consent order against Cincinnati, the city adopted an email notification system to send out notices of sewage overflows. Cincinnati also developed a local information phone line (513-244-5116) that has a recording of the latest sewage overflow information.<sup>43</sup>

## SOLUTIONS

The bottom line is that eliminating sewage dumping, in all but extreme circumstances, is not a technological issue because the technological solutions are available and being implemented in communities around the country. Rather it is an issue of mustering the political will, citizen action, adequate funding, and creative thinking about solutions to these problems.

### 1. ELIMINATE

The most effective way to stop sewage overflows is to stop storm water from overwhelming sewage treatment systems when it rains. In natural or forested areas the ground absorbs storm water and the water infiltrates and regenerates ground water supplies. This natural process cannot occur at the same rate in developed areas with extended impervious surfaces. Many cities are built with almost 100% impervious surfaces.<sup>44</sup> Concrete streets and paved over developments do not allow for storm water infiltration. Instead, the storm water 'runs off' into our sewer systems. Our aging sewer systems were built at a time with far less development and were not designed to manage the amount of storm water that typically runs off during a moderate to heavy rain event today. The lack of pervious surfaces, or "green space," in urbanized areas creates more storm water run-off and enhances the burden on our sewer systems.

There are many innovative and cost-effective methods to reduce storm water runoff: "Soft-path" or "Low-Impact Development" (LID) and other non-infrastructure ways to reduce sewage overflows have received scant attention and funding. Soft-path approaches include onsite wastewater treatment technologies, storm water retention and filtration (such as rain gardens, constructed wetlands and native species plantings), stream buffers, water conservation fixtures, rain barrels, reuse of "grey water," and other low impact development designs.<sup>45</sup> The goal is to "retain, detain, filter, treat, use, and reduce storm water."<sup>46</sup> Incentives, strategies, examples, and tools for controlling overflows without costly infrastructure improvements are needed.

The U.S. EPA and the Alliance for the Chesapeake Bay have also described methods to reduce storm water runoff:

- Develop construction erosion/sediment control ordinances.
- Limit the amount of impenetrable surfaces through the use of permeable paving surfaces, such as wood, decks, bricks, and concrete lattice to let water soak into the ground.
- Allow thick vegetation or buffer strips to grow along waterways to slow runoff and soak up pollutants. Plant trees, shrubs, and ground cover (they will absorb up to 14 times more rainwater than a grass lawn and don't require fertilizer).
- Divert runoff from pavement to grassy, planted, or wooded areas, so storm water can seep slowly into the ground.<sup>47</sup>

## 2. MITIGATE

The old, crumbling infrastructure in Ohio's Lake Erie watershed basin is in dire need of improvements to prevent sewage overflows. These improvements often involve better maintenance and operation, but also can involve major capital investments. Infrastructure improvements such as the separation of combined sewers and the construction of sewage holding facilities have resulted in thirteen communities in Ohio eliminating their sewage overflows.

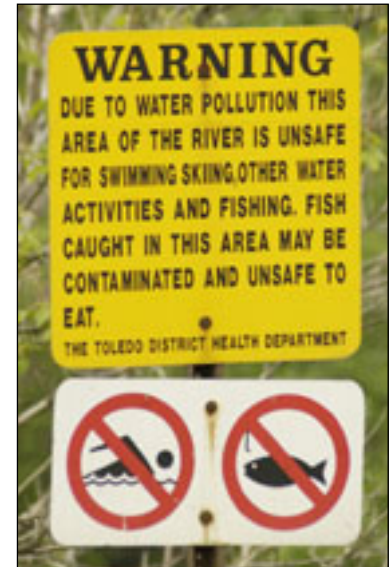
## 3. MONITOR, REPORT AND NOTIFY THE PUBLIC

Sewage treatment facilities need to report to the OEPA and notify the public when combined sewer overflows occur. Improvements in our sewer systems and changes in land use and urban green space development will take decades to fully eliminate the negative effects of combined sewer overflows. While we are waiting for these changes to materialize, we will continue to experience the harmful pollution from the billions of gallons of untreated sewage that is dumped into the Lake Erie Basin every year. The Environment Ohio Research and Policy Center report released in May of 2005, "Sewage Warning: What the Public Doesn't Know about Sewage Dumping in the Great Lakes," shows that Ohio has the worst public notification system of all of the Great Lakes states. Currently, Ohio has no statewide sewage overflow public notification system.

In order for Ohioans to protect themselves from the dangers of CSOs, leaders should work to develop a combined sewer overflow tracking, reporting, and public notification system.

The elements of a strong sewage right-to-know program include:

- Tracking all sewage overflows by plant operators
- Immediate and consistent reporting of overflows to the OEPA and the Ohio Department of Health
- Direct and immediate public notification. Notification should include multiple methods, as well as, pre-notification of potential sewage discharges, annual reports that detail the extent of the problem, and a public education and outreach program that teaches citizens how to avoid sewage contamination.



**FIGURE 3.**  
CSO Signage in Toledo, Ohio

It is essential to show the extent of sewage Ohio will be able to eliminate, in order for Ohio to secure federal funding to alleviate the expensive burden of sewage overflows. More importantly, we need the public to be aware of the health threats of combined sewage and the potential for major improvements.

## 4. GREAT LAKES RESTORATION: AN OPPORTUNITY FOR RESOURCES AND INNOVATION

Sewage dumping is a major problem throughout the Great Lakes region. Because all Great Lakes basin residents are dependent on an interconnected source of water and since the Great Lakes have such a high concentration of sewage dumping, a coordinated regional solution is desperately needed. Fortunately, an unprecedented coalition of environmental and conservation organizations-the Healing Our Waters (HOW) Great Lakes Coalition-was formed to advocate for restoration of the Lakes. This Coalition is urging congress to pass the Great Lakes Collaboration Implementation Act. The Act stems from a consensus based, comprehensive plan to restore the health of the Great Lakes and would implement the manageable solutions contained in that plan.

A significant component of this plan is a new perspective and additional resources for stopping sewage dumping in the Great Lakes. A team of government officials, wastewater treatment plant operators, industry officials and environmental organizations have come together to support this request for the "virtual elimination" of sewage dumping in the Great Lakes. The emphasis is on comprehensive stormwater management, including the use of low-impact development and other "softpath" controls as a trigger for funding. If the restoration plan is acted on in Congress and in the Great Lakes states, this unprecedented approach and collaboration has the potential to turn the tide and put an end to sewage dumping in the Lakes.

# CONCLUSION:

## TOO MUCH SEWAGE IN OUR GREAT LAKE

From January 2005 - December 2005 over 10.9 billion gallons of untreated sewage was dumped into Lake Erie and waterways within the Lake Erie watershed basin. The billions of gallons of untreated sewage that flow into our waterways each year is unacceptable, and even more so when factoring in the lack of monitoring, reporting and public notification. Ohioans are left in the dark to this unseen health threat that could expose themselves and their children to disease causing viruses and bacteria.

We must accomplish the Clean Water Act's goal of eliminating sewage discharges into our waterways, including Lake Erie.

In the meantime, state officials must do more to track, monitor, and report, discharges and hold polluters accountable to violating the law.

# NOTES

- <sup>1</sup> Ohio EPA, Division of Surface Water, Ohio CSO Inventory, September 2006. [http://www.epa.state.oh.us/dsw/cso/ohiocsoinventory\\_sep2006.pdf](http://www.epa.state.oh.us/dsw/cso/ohiocsoinventory_sep2006.pdf)
- <sup>2</sup> U.S. EPA Report to Congress: Impacts and Control of CSOs and SSOs, Fact Sheet August 2004. [http://www.epa.gov/npdes/pubs/csosso\\_rtc\\_fact-sheet.pdf](http://www.epa.gov/npdes/pubs/csosso_rtc_fact-sheet.pdf)
- <sup>3</sup> U.S. EPA, Mid-Atlantic Water Protection: Combined Sewer Overflows & Sanitary Sewer Overflows. Last updated June 21st, 2005 <http://www.epa.gov/reg3wapd/cso/EnvironmentalHealth.htm>
- <sup>4</sup> U.S. EPA Report to Congress: Impacts and Control of CSOs and SSOs. 2004 Chapter 2, Page 2. [http://www.epa.gov/npdes/pubs/csossoRTC2004\\_chapter02.pdf](http://www.epa.gov/npdes/pubs/csossoRTC2004_chapter02.pdf)
- <sup>5</sup> U.S. EPA, Mid-Atlantic Water Protection: Combined Sewer Overflows & Sanitary Sewer Overflows. <http://www.epa.gov/reg3wapd/cso/>.
- <sup>6</sup> Ohio CSO Strategy - March, 1995, Pg 5. [www.epa.state.oh.us/dsw/cso/csostrem.pdf](http://www.epa.state.oh.us/dsw/cso/csostrem.pdf)  
Nine minimum control measures identified by U.S. EPA.
  1. Proper operation and maintenance programs for the sewer system and CSO points;
  2. Maximum use of the collection system for storage;
  3. Review and modification of pretreatment programs or other local programs to minimize the impact of nondomestic discharges from CSOs;
  4. Maximization of flow to POTW for treatment;
  5. Prohibition of dry weather overflows;
  6. Control of solid and floatable materials in CSO discharges;
  7. Required inspection, monitoring and reporting of CSOs;
  8. Pollution prevention to reduce CSO impacts; and
  9. Public notification for any areas affected by CSOs, especially beach areas and areas where contact recreation occurs. (Ohio EPA expects communities to develop and implement an effective public advisory system that informs the public of the possible health and environmental impacts associated with CSOs, that notifies the public when discharges from CSOs occur and advises against contact recreation when elevated bacteria levels may endanger public health)
- <sup>7</sup> Ohio EPA, Division of Surface Water “State Of Ohio Combined Sewer Overflow Strategy” March 1995.
- <sup>8</sup> Ohio EPA, Division of Surface Water, Combined Sewer Overflow Control Program [www.epa.state.oh.us/dsw/cso/csoindex.html](http://www.epa.state.oh.us/dsw/cso/csoindex.html)
- <sup>9</sup> U.S. EPA Report to Congress: Impacts and Control of CSOs and SSOs, Fact Sheet August 2004. [http://www.epa.gov/npdes/pubs/csosso\\_rtc\\_fact-sheet.pdf](http://www.epa.gov/npdes/pubs/csosso_rtc_fact-sheet.pdf)
- <sup>10</sup> U.S. EPA, Mid-Atlantic Water Protection: Combined Sewer Overflows & Sanitary Sewer Overflows. Last updated June 21st, 2005 [www.epa.gov/reg3wapd/cso/EnvironmentalHealth.htm](http://www.epa.gov/reg3wapd/cso/EnvironmentalHealth.htm)
- <sup>11</sup> Cuyahoga Valley National Park - Water Quality. Updated Jan. 2005. <http://www.nps.gov/cuva/management/rmprojects/wquality.htm>
- <sup>12</sup> Rebecca N. Bushon and G.F. Koltun, (2000 and 2002). Microbiological Water Quality in Relation to Water-Contact Recreation, Cuyahoga River, Cuyahoga Valley National Park, Ohio. <http://pubs.usgs.gov/wri/wri034333/>
- <sup>13</sup> Cuyahoga Valley National Park - Water Quality. Updated Jan. 2005. <http://www.nps.gov/cuva/management/rmprojects/wquality.htm>
- <sup>14</sup> Department of Health and Human Services, Centers for Disease Control and Prevention, Division of Bacterial and Mycotic disease. Oct. 6, 2005. [http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli_g.htm)
- <sup>15</sup> Department of Health and Human Services, Centers for Disease Control and Prevention,
- <sup>16</sup> Department of Health and Human Services, Centers for Disease Control and Prevention, Division of Parasitic Diseases. Last updated August 19, 2005. [www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht\\_cryptosporidiosis.htm](http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht_cryptosporidiosis.htm)
- <sup>17</sup> Department of Health and Human Services, Centers for Disease Control and Prevention, Division of Bacterial and Mycotic disease Oct. 13, 2005. [www.cdc.gov/ncidod/dbmd/diseaseinfo/shigellosis\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/shigellosis_g.htm)
- <sup>18</sup> Ohio Department of Health, South Bass Island Q & A. Feb. 22, 2005. [www.odh.ohio.gov/ASSETS/9AD40C304B814361BF8E8417FB65A842/SBIFAQ.pdf](http://www.odh.ohio.gov/ASSETS/9AD40C304B814361BF8E8417FB65A842/SBIFAQ.pdf)
- <sup>19</sup> Natural Resource Defense Council “Testing the Waters 2005” <http://www.nrdc.org/water/oceans/ttw/sumohi.pdf>
- <sup>20</sup> Natural Resource Defense Council “Testing the Waters” 2005 edition. <http://www.nrdc.org/water/oceans/ttw/sumohi.pdf>
- <sup>21</sup> Ohio EPA Division of Surface Water, Combined Sewer Overflow Control Program <http://www.epa.state.oh.us/dsw/cso/csoindex.html>, updated in spreadsheet provided by Gary Stuhlfauth, October 2006.
- <sup>22</sup> *ibid.*
- <sup>23</sup> These CSO Communities were chosen based on the information that was made available through the Ohio EPA and through the individual communities of Akron, Cleveland (The Northeast Ohio Regional Sewage District Authority), and Avon Lake.
- <sup>24</sup> U.S. EPA Report to Congress: Impacts and Control of CSOs and SSOs, Chapter 4 p. 15 August 2004. [www.epa.gov/npdes/pubs/csossoRTC2004\\_chapter04.pdf](http://www.epa.gov/npdes/pubs/csossoRTC2004_chapter04.pdf). Note: Over 30 CSO outfalls in Ohio have been eliminated since the printing of the sited report in 2004.
- <sup>25</sup> The U.S. Department of Energy, Federal Energy Management Program, content last updated 01/25/2004. [http://www.eere.energy.gov/femp/technologies/eep\\_toilets.cfm](http://www.eere.energy.gov/femp/technologies/eep_toilets.cfm)
- <sup>26</sup> All information was provided by Gary Stuhlfauth of the OEPA Division of Surface Water, October 2006, unless footnoted otherwise. See Appendices 2-39 for individual overflow information.

# NOTES (CONT'D)

- <sup>27</sup> See Appendix #2 City of Akron, Ohio Wet Weather Combined Sewer Overflows Monthly Operating Reports Jan. - Dec. 2005
- <sup>28</sup> See Appendix #3 Long Term Control Plan, City of Avon Lake Municipal Utilities Department, Brown and Caldwell Ohio, LLC. Dec-03, updated through correspondence with Rick Eberle, Chief Utility Operations of Avon Lake Municipal Utilities, October 1, 2006.
- <sup>29</sup> See Appendix #6 Outfall list with CSO volumes September 2006 edits, provided by Frank Greenland, Deputy Director of Engineering and Construction September 28, 2006.
- <sup>30</sup> See Appendix #9 "2005 Combined Sewer Overflow Annual Report" Defiance, Ohio January 2006. Prepared by Arcadis G&M of Ohio Inc.
- <sup>31</sup> See Appendix #17 City of Findlay Water Pollution Control Center "Combined Sewer Overflow Annual Report," Randy Greeno, Superintendent. January 23, 2006.
- <sup>32</sup> The sum total of the volume of CSO from the 38 included communities
- <sup>33</sup> Northeast Ohio Regional Sewer District "CSO Facilities Planning Report"
- <sup>34</sup> Northeast Ohio Regional Sewer District "CSO Facilities Planning Report"
- <sup>35</sup> [http://www.neorsd.org/internet/do/viewDetails.do?page\\_id=51](http://www.neorsd.org/internet/do/viewDetails.do?page_id=51) last updated on March 9, 2007.
- <sup>36</sup> City of Toledo Long Term CSO Control Plan Existing Conditions Report, May 2005 p. 3-1, 4-1,
- <sup>37</sup> Phone conversation with Frank Chris Middlebrough, Acting Manager, Bay View Treatment Plant, Nov. 21, 2005. [http://www.toledowaterwaysinitiative.com/sewer\\_overflows.asp](http://www.toledowaterwaysinitiative.com/sewer_overflows.asp)
- <sup>38</sup> United States and Ohio Reach Clean Water Act Settlement with City of Toledo, Ohio <http://yosemite.epa.gov/opa/admpress.nsf/0/59f70abeacc274885256c24005e6240?OpenDocument>
- <sup>39</sup> Public Utilities Bureau, City of Akron, Ohio, Water Pollution Control Division <http://ci.akron.oh.us/PubUtil/wpc/index.htm>
- <sup>40</sup> City of Akron, Ohio Wet Weather Combined Sewer Overflows Monthly Operating Reports Jan. - Dec. 2005
- <sup>41</sup> City of Findlay Water Pollution Control Center "Combined Sewer Overflow Annual Report," Randy Greeno, Superintendent. January 23, 2006.
- <sup>42</sup> Through a personal experience I collected the email notifications from March 1, 2006 through March 1, 2007.
- <sup>43</sup> Sign up for Cincinnati's email notifications at <http://msdgc.org/mailman/listinfo/msd-cso/>
- <sup>44</sup> Developing Successful Runoff Control Programs for Urbanized Areas, 1994, Northern Virginia Soil and Water Conservation District. Fairfax, Virginia. <http://ntl.bts.gov/DOCS/RUNOFF.html>, Pg. 7.
- <sup>45</sup> Woodworth, James. Out of the Gutter: Reducing Polluted Runoff in the District of Columbia. Natural Resources Defense Council: July 2002.
- <sup>46</sup> Belan, Gary & B. Otto. Catching the Rain: A Great Lakes Resource Guide for Natural Storm water Management. America Rivers: 2004.
- <sup>47</sup> U.S. EPA and the Alliance for the Chesapeake Bay [www.epa.gov/owow/nps/abc.html](http://www.epa.gov/owow/nps/abc.html)