

Eliminating Hometown Hazards

CUTTING CHEMICAL RISKS
AT WASTEWATER TREATMENT FACILITIES



ENVIRONMENTAL DEFENSE

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AT WASTEWATER TREATMENT FACILITIES

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ENVIRONMENTAL DEFENSE

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Environmental Defense is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic and social support because they are nonpartisan, cost-effective and fair.

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Executive summary

Thousands of wastewater treatment facilities exist across the United States. Many use toxic chlorine gas to disinfect the water, storing the gas onsite in large tankers. The practice puts surrounding communities at risk from an accidental release or even an attack. Chlorine can burn the eyes, lungs and skin and is fatal in high concentrations. It is so powerful it was used as a chemical weapon by Germany in World War I.

Fortunately, cost-effective, safe alternatives to chlorine gas exist, and many plants, especially in the wake of September 11, 2001, have switched to safer disinfectants. Their actions prompted our coalition of citizen and environmental groups to investigate available public information to determine the risk posed to Americans by wastewater treatment plants that persist in using dangerous chemicals, and to alert those populations that are still threatened. We found:

- **More than 20 million people** who were once at risk from chemical releases at nearby wastewater facilities are now safer because facilities have switched to less dangerous disinfectants.
- **19 million Americans** remain at risk from facilities that continue to use chlorine gas in heavily populated areas.
- Six of these facilities could each affect any of **more than one million** residents.
- 39 wastewater treatment facilities could affect any of **100,000 to one million** people.

With cost-effective alternatives readily available, it is unacceptable for sewage treatment plants to continue placing citizens at risk. Government officials should require facilities to stop using dangerous chemicals in populated areas using these tools:

- **End public funds for dangerous facilities.** Millions of public dollars are spent each year to help build or improve wastewater treatment facilities. Congressional, state and Environmental Protection Agency officials should ensure that, allowing time for transition, taxpayer money is not spent at facilities that pose an unnecessary risk.
- **Maintain public access to risk information.** Public access to information about the potential consequences of chemical releases is one of the most effective tools for minimizing those risks. Access to this information is already restricted, yet some in Congress want to eliminate even that. EPA should resist such pressure and protect public access to company reports on potential risks.
- **Set federal standards for reducing hazards.** More than two years after September 11, 2001, there are no federal requirements for facilities using dangerous chemicals to employ the best possible industry practices to reduce hazards. The Chemical Security Act of 2003 would require safer practices, but has stalled in Congress where it has met opposition by the chemical industry.

Requiring cost-effective changes at wastewater treatment plants is an important step in reducing America's vulnerability to terrorist attacks and making communities safe from chemical accidents. Ignoring the risks leaves millions of Americans in harm's way. It's time for Congress and the wastewater facilities to act.

Eliminating hometown hazards

Like many people on September 11, 2001, Mike Marcotte spent the night awake wondering what might be the next target for terrorists. Mike was especially anxious because he knew something that much of the American public did not: The plant where he was chief engineer—the Blue Plains Sewage Treatment Facility in Washington, D.C.—had several rail cars of chlorine gas that would make an enticing target for terrorists. An attack on the tanks might release a toxic cloud that could affect more than 1.7 million D.C. area residents.

Mike faced several choices. He could do nothing and hope that terrorists were not aware of the potential target. Or he could beef up security to prevent intruders. But the 150 acres of property within the facility's boundaries could be very costly to protect. And even the most extensive security would not be sufficient against a determined terrorist.

Either way, he would still have to worry about accidental releases of chlorine. Chlorine is commonly used to remove contaminants from sewage before the treated sewage is discharged into local waterways. Chlorine gas is transported and stored as a liquid under high pressure. If released into the atmosphere, it quickly vaporizes into a gas cloud that hugs the ground because it is heavier than air. Pure chlorine can be deadly to humans if inhaled; contact with lower concentrations can burn eyes and skin and inflame the lungs. It is so powerful that it was used as a chemical weapon by Germany during World War I.

Chlorine accidents, though rare, have occurred at Blue Plains. In August 1994, four men fishing on the Potomac River were overcome when a small plume of chlorine was accidentally released from nearby Blue Plains. All four were admitted to the hospital with eye, skin and lung irritation. According to news accounts, two of them nearly died in the incident.¹

Next time could be worse. In fact, internal documents from 1982 described the potential for a catastrophic chlorine release that could kill or seriously injure thousands of people within 3.4 miles of the facility. For over a decade, Blue Plains neighbors such as Bolling Air Force Base and the Anacostia Naval Station objected to having the chlorine rail cars ride through their property.

In the end, Mike chose to eliminate the source of the problem—chlorine gas—and replace it with a safer substitute to disinfect the wastewater. The plant had already made plans to replace the gas within a few years because of the potential for an accidental release. The plant rapidly accelerated these plans, and the chlorine was replaced with sodium hypochlorite, essentially a strong version of household bleach.

Laboring around the clock, workers installed new storage tanks and piping for liquid rather than gaseous chlorine to be added to the sewage. The liquid bleach was trucked in and the railcars with chlorine gas were carefully removed. Within about 10 weeks, Blue Plains had completed interim facilities that eliminated the potential for a catastrophic toxic gas leak. The construction cost was about \$500,000. Subsequent capital improvements that included upgrading the liquid bleaching facilities were completed in 2003 at a cost of \$15 million.

Using the safer chemical adds about 25 cents to the average customer's monthly bill. Mike considers this a bargain for the peace of mind that comes from knowing the community—including plant workers—is safer from terrorist attacks, operational mishaps and even catastrophic accidents.

The additional costs are also cushioned by a reduction in security costs. With the elimination of dangerous chlorine gas, the plant's on-site police presence dropped from two or three police cars around the clock to virtually no presence now. Because the new

system is simpler and easier to operate, maintenance costs have declined by approximately \$300,000 annually. And the facility no longer has to deal with Environmental Protection Agency (EPA) and city rules regarding highly hazardous substances.

What about other wastewater treatment facilities?

Thousands of wastewater treatment facilities exist across the United States. Plants are located in every state, and often near large cities. Not all facilities use chlorine gas, but many do, potentially putting surrounding communities at risk. The citizen and environmental groups who authored this report used information submitted to EPA in 1999 to determine that about 1,300 wastewater facilities were each using at least 2,500 pounds of chlorine gas.

The success at Blue Plains, and the risks posed by using chlorine gas, prompted our coalition to investigate whether other facilities were making similar changes. Common features among wastewater treatment processes made it reasonable to expect that safety improvements at one facility could be replicated elsewhere.

Chemical Accident Prevention Program

In 1990, Congress passed the Chemical Accident Prevention Program as Section 112(r) of the Clean Air Act Amendments. The law requires facilities that store enough of certain dangerous chemicals to submit a Risk Management Plan (RMP) to EPA. The plan must describe the potential consequences to communities outside the fence line in the event of a sudden, large release of certain chemicals. The RMP also includes steps by the facility to prevent such releases.

The original law mandated that RMPs be made accessible to the public. Congress and EPA expected that public disclosure would “likely lead to a significant reduction in the number and severity of accidental chemical releases” (EPA, April 18, 2000). In June 1999, however, before the first RMPs were submitted, Congress limited citizen access to information about the impacts of a worst-case accident. With input from the FBI and CIA, the administration established that the off-site consequences analysis portion of the RMPs would only be available through federal reading rooms where a visitor’s access is limited to information on 10 facilities per month. The remaining parts of the RMPs, primarily summary information, were made publicly available by EPA until shortly after September 11, 2001, when the agency removed the data from its web site. Currently, access to any RMP information must be through the federal reading rooms.

The rationale for limiting access was that the plans could provide a blueprint for terrorists. However, the RMPs provide little helpful information for those wishing to do harm. The plans focus on the consequences of a chemical incident. They contain no information about how to cause a chemical release. The plans also provide no details about the operations of a facility or the location of chemicals stored on site. Despite this, some in Congress want to close public access to even the federal reading rooms, entirely eliminating the public’s access to information about the risks in their own communities.

More than 100 organizations from across the nation have formed the Safe Home-towns Initiative to press for better safety measures and to call for preserving public access to RMPs. Hiding information about risks will not reduce the danger. In fact, evidence indicates that public scrutiny encourages safer practices. Many facilities that have reduced hazards point to the disclosure of the RMPs as an important motivator. Congress itself recognized the importance of letting citizens know about the hazards in their communities when they passed the Chemical Accident Prevention Program. The real danger is posed not by public access to the RMPs, but by the use of dangerous chemicals in populated areas.

The remaining risk also prompted the coalition to highlight this information in public forums through this report, so that citizens could know of the potential risks, and take steps to manage those risks.

Our priority was to find out if large facilities, which we defined to be those that pose a threat to 100,000 or more people, had modified operations to reduce hazards. With so many people at risk, these facilities could make potentially attractive targets for terrorists.

Using EPA information, we investigated the following questions:

- How many people live in a plant’s vulnerability zone? The vulnerability zone includes all residents who might be affected by a worst-case accident.² The amount and type of chemical stored on site as well as the number of people living nearby affects the size of the vulnerability zone. Each facility calculates its vulnerability zone based on EPA guidance.
- Did the wastewater facility eliminate or significantly reduce chlorine gas since it submitted its original Risk Management Plan in 1999? Such facilities can “deregister” from the Risk Management Program, effectively removing the facility from the list of potential risky sites.
- Finally, did any of the facilities with 100,000 or more people living in the vulnerability zone reduce chlorine use but not officially deregister? For this information, Environmental Defense staff contacted the facilities directly by phone and in writing to obtain the most up-to-date information.

Safer chemicals eliminate risks at largest wastewater facilities

We found 62 wastewater treatment plants reported in 1999 that a major chemical accident at their facility could affect 100,000 or more people. Since 1999, and especially in the last two years, 12 of these facilities have eliminated chlorine gas (Table 1). The result of these actions: More than 20 million people are no longer at risk of serious injury from a chemical release from a wastewater treatment facility.

Change is especially evident at the facilities that pose the greatest risk. Of the 12 facilities that have eliminated chlorine gas, six were among the very largest—previously, each could have affected one million or more people.

TABLE 1
Wastewater treatment facilities that have eliminated chemical hazard risks

Facility	City	State	New disinfection method	Population previously in vulnerability zone
Middlesex County Utilities Authority	Sayreville	NJ	Sodium Hypochlorite	10,740,000
Blue Plains Wastewater Treatment Plant	Washington	DC	Sodium Hypochlorite	1,700,000
Northeast Water Pollution Control Plant	Philadelphia	PA	Sodium Hypochlorite	1,575,971
Southeast Water Pollution Control Plant	Philadelphia	PA	Sodium Hypochlorite	1,470,000
R.M. Clayton WRC	Atlanta	GA	Ultraviolet Light	1,151,993
Wyandotte Wastewater Treatment Facility	Wyandotte	MI	Ultraviolet Light	1,100,000
Mill Creek WWTP	Cincinnati	OH	Sodium Hypochlorite	860,000
Jefferson Parish East Bank WWTP	Harahan	LA	Sodium Hypochlorite	790,000
East Section Reclamation Plant	Renton	WA	Sodium Hypochlorite	650,000
Buckman Water Reclamation Facility	Jacksonville	FL	Ultraviolet Light	360,000
Joint Water Pollution Control Plant	Carson	CA	Sodium Hypochlorite	210,000
South Valley Water Reclamation Facility	West Jordan	UT	Ultraviolet Light	131,968

SODIUM HYPOCHLORITE

Eight of the facilities replaced chlorine gas with sodium hypochlorite. Sodium hypochlorite, a strong version of standard household bleach, is much less deadly than chlorine gas. It has the same disinfecting advantages of chlorine gas, though because it is not pure chlorine about 20% more sodium hypochlorite is needed to disinfect the same amount of sewage.

Switching to sodium hypochlorite is straightforward—instead of injecting the gas into sewage, the liquid chlorine is added to the sewage via a feed pump. New storage facilities and in some cases unloading platforms are needed, since sodium hypochlorite arrives by truck, whereas chlorine gas is transported by rail.³ Wastewater treated with sodium hypochlorite must be de-chlorinated before being discharged into local waterways; however, de-chlorinating can be done with sodium bisulfite, which is significantly less dangerous than the sulfur dioxide required for chlorine gas-treated sewage. The result is that the entire facility is made safer.

ULTRAVIOLET LIGHT

Another disinfecting alternative, chosen by four of the urban facilities, is to avoid chemicals altogether, adopting instead a physical process using ultraviolet light to break down disease-causing microorganisms. Initial installation costs are high, but projected operation and maintenance costs are lower than for either chlorine gas or sodium hypochlorite because no chemicals are needed. Because ultraviolet light is a mechanical process, it represents no hazards to facility workers and poses no problems of chemical corrosion. Moreover, while sodium hypochlorite and chlorine gas leave a residue even after the treated sewage is dechlorinated, UV technology has no residue that can be harmful to humans and aquatic life.

In addition to the 12 facilities that have eliminated use of chlorine gas, another five facilities have significantly reduced their use of chlorine gas to levels below the EPA's reporting threshold of 2500 pounds. While some risks to workers and nearby residents remain, the danger is greatly diminished.

Unnecessary hazards persist in many cities

Today an estimated 19 million people remain at risk from the 45 wastewater facilities that use toxic chlorine gas in populated areas (Table 2). Each of these facilities could seriously injure over 100,000 people in the event of a major chemical release.

An additional 1,309 wastewater treatment facilities in 49 states submitted Risk Management Plans to EPA in 1999 (Table 3). At that time, all met or exceeded EPA's threshold for using dangerous chemicals.⁴ The facilities include some that may have minimal effect on public safety because they are located in remote areas. Others, however, may affect close to 100,000 people. While some of these facilities may have replaced or reduced chlorine gas since 1999, as of spring 2003 they had neither deregistered from the RMP program nor submitted updated plans. Updated Risk Management Plans are required once every five years.

Blueprint for eliminating wastewater treatment hazards

Given the variety of alternatives to chlorine gas and the cost effectiveness and ease of substitution, wastewater treatment facilities should no longer use chemicals that pose a threat to millions. Sewage treatment facilities, especially those in heavily populated areas, can and should change as soon as possible. The top priority should be the

six facilities that pose a threat to 1,000,000 or more people. Two of those facilities—in Baltimore and Denver—have plans to replace chlorine gas and should be held to their commitments.

Where facilities don't improve quickly enough, local, state, and federal officials have at least three tools to ensure that hazards are reduced:

1. END PUBLIC FUNDS FOR DANGEROUS FACILITIES

Withholding public funds from facilities that pose a risk is one way states and EPA can press for changes. Since 1972 Congress has appropriated more than \$71 billion to help states build or improve wastewater treatment facilities⁵. As part of the State Revolving Loan Fund (SRF), EPA allocates funds to each state based on wastewater treatment needs and population. States in turn decide how to allocate the funds to local treatment facilities. Local communities are required to repay the loans from the state under generally favorable repayment conditions.

TABLE 2
Wastewater facilities that continue to use chlorine gas in populated areas

State	City	Facility	Population within Vulnerability Zone	Status as of Nov. 2003*
AZ	Phoenix	23rd Avenue Wastewater Treatment Plant	330,000	
CA	Cerritos	Los Coyotes Water Reclamation Plant	190,000	Currently evaluating possible alternatives such as sodium hypochlorite and UV
CA	Irvine	Michelson Water Reclamation Plant	340,000	
CA	Lodi	White Slough Water Pollution Control Facility	606,505	
CA	Marina	Monterey Regional Treatment Plant	218,100	
CA	Modesto	Secondary Wastewater Treatment Plant	1,040,932	
CA	Moreno Valley	Moreno Valley RWRP	217,900	
CA	Palo Alto	Palo Alto Regional Water Quality Control Plant	140,000	
CA	Perris	Perris Valley RWRP	144,400	
CA	Roseville	Dry Creek Wastewater Treatment Plant	512,387	
CA	San Jose	San Jose/Santa Clara Water Pollution Control Plant	190,000	Currently evaluating possible alternatives such as sodium hypochlorite and UV
CA	Stockton	City of Stockton Tertiary Treatment Plant	382,000	
CA	Whittier	San Jose Creek Water Reclamation Plant	110,000	
CO	Denver	Metro Wastewater Reclamation District	1,560,000	Switching to SH in 2007
DE	Wilmington	City of Wilmington Water Pollution Control Fac.	486,651	
FL	Lakeland	W. Carl Dicks Water Reclamation Facility	150,000	
FL	Lakeland	McIntosh Power Plant/Northside WWTP	131,000	
FL	Tampa	City of Tampa-Howard F. Curren AWTP	910,000	
IL	Moline	North Slope Treatment Plant	206,752	
IL	Moline	Moline South Treatment Plant	136,735	
IN	Fort Wayne	Water Pollution Control Plant	210,000	
LA	Baton Rouge	Central Wastewater Treatment Plant	134,911	
LA	Baton Rouge	North Wastewater Treatment Plant	100,191	

Taxpayer money should not be spent at wastewater treatment facilities that pose an unnecessary risk to the American public. State and EPA officials should allocate SRF funds only to facilities that eliminate or significantly reduce chemical hazard threats to workers and nearby residents.

As an interim measure, federal funds could be used to cover the capital costs of converting to a safer disinfecting process. Several bills in Congress would provide extra funds specifically to boost security at wastewater facilities, but only one bill would hold facilities accountable. The Wastewater Treatment Works Security and Safety Act (S. 779) would require wastewater treatment facilities to prepare and submit to EPA a vulnerability assessment and emergency response plan and would provide grants to wastewater facilities to do the studies. However, the bill does not link the allocation of public funding with the elimination or reduction of chlorine gas. While a short-term funding boost may be needed for facilities to change, after a set time period, public funding should be given only to facilities that have adopted safer measures.

TABLE 2 (CONTINUED)

Wastewater facilities that continue to use chlorine gas in populated areas

State	City	Facility	Population within Vulnerability Zone	Status as of Nov. 2003*
LA	New Orleans	East Bank Wastewater Treatment Plant	772,300	
MD	Baltimore	Back River Wastewater Treatment Facility	1,470,000	Switching in 2004
MD	Frederick	City of Frederick Wastewater Treatment Plant	111,683	
MI	Detroit	Detroit Wastewater Treatment Plant	1,900,000	
MN	Duluth	Western Lake Superior Sanitary District	128,293	Request to eliminate chlorine gas denied by state
MN	St. Paul	Metropolitan Wastewater Treatment Plant	494,000	Switching to sodium hypochlorite in 2005
NY	Niagara Falls	City of Niagara Falls Wastewater Treatment Plant	1,100,000	
OR	Portland	Columbia Boulevard Wastewater Treatment Plant	157,000	Switching in 2005
PA	Bristol	Bristol Borough Wastewater Treatment Plant	145,000	
PA	Croydon	Bristol Township Wastewater Treatment Plant	174,000	
PA	Levittown	LBCJMA Wastewater Treatment Plant	133,000	
SC	Charleston	North Charleston Sewer District WWTP Herbert Site	332,012	Switching to ultra-violet light within 2 years
TN	Madison	Dry Creek Wastewater Treatment Plant	115,564	
TN	Nashville	Central Wastewater Treatment Plant	962,161	
TN	Nashville	Whites Creek Wastewater Treatment Plant	141,695	
TX	Arlington	Village Creek Wastewater Treatment Plant	220,000	
TX	Brownsville	South Wastewater Treatment Plant	110,000	
TX	Dallas	Dallas Water Utilities Central WWTP	250,000	
TX	Grand Prairie	Central Regional Wastewater System	620,000	
TX	South Houston	South Houston Wastewater Plant	150,000	
UT	Salt Lake City	Central Valley Water Reclamation	1,150,000	
VA	Richmond	City of Richmond Wastewater Treatment Plant	495,386	

*Updated information based on written correspondence from facility

TABLE 3

Wastewater treatment facilities in the Risk Management Program

State	Under 100,000^a	100,000–1 million^b	Over 1 million^b	Total
Alabama	41			41
Alaska	1			1
Arizona	10	1		11
Arkansas	27			27
California	121	12	1	134
Colorado	9		1	10
Connecticut	10			10
Delaware	4	1		5
Florida	144	3		147
Georgia	57			57
Hawaii	6			6
Idaho	3			3
Illinois	17	2		19
Indiana	30	1		31
Iowa	6			6
Kansas	7			7
Kentucky	23			23
Louisiana	44	3		47
Maine	2			2
Maryland	21	1	1	23
Massachusetts	17			17
Michigan	29		1	30
Minnesota	18	2		20
Mississippi	23			23
Missouri	12			12
Montana	3			3
Nebraska	7			7
Nevada	2			2
New Jersey	3			3
New Mexico	6			6
New York	29		1	30
North Carolina	55			55
North Dakota	4			4
Ohio	28			28
Oklahoma	27			27
Oregon	15	1		16
Pennsylvania	59	3		62
Rhode Island	3			3
South Carolina	58	1		59
South Dakota	2			2
Tennessee	31	3		34
Texas	210	4		214
Utah	15		1	16
Vermont	3			3
Virginia	31	1		32
Washington	19			19
West Virginia	6			6
Wisconsin	8			8
Wyoming	3			3
Totals	1309	39	6	1354

^a The number of facilities affecting less than 100,000 are based solely on Risk Management Plan data much of which dates to 1999.

^b The number of the larger facilities—those affecting over 100,000—are updated based on phone calls and letters with facility officials in fall 2003.

Half of the facilities that endangered more than one million people have already made cost-effective changes in the last two years by eliminating chlorine gas use. Other high priority facilities should follow or risk losing access to public funding. Doing otherwise in today's world poses unnecessary dangers to citizens and communities.

2. MAINTAIN PUBLIC ACCESS TO THE RISK MANAGEMENT PLANS

Public access to information about the potential consequences of a chemical accident is one of the most effective tools for holding decisionmakers accountable and motivating improvements. Many facilities that have reduced hazards point to disclosure of the RMPs as an important motivator.

Some in Congress, citing national security concerns, want to close the federal reading rooms. However, hiding the information does not reduce the threat. In fact, secrecy in this case would be counterproductive to the goal of public safety since it diminishes the public's ability to take steps to ameliorate risks and reduces the opportunity for public scrutiny. EPA should resist such pressure and preserve public access to the Risk Management Plans.

EPA also should make it easier for the public to know whether safer approaches have been adopted by providing public access to prior as well as current RMPs. Under current rules, the public only has access to the most recent RMP, but a facility may have made several submissions. This makes it impossible for citizens to compare a facility's current and previous submissions. Without such comparisons, people will not be able to assess the impact of changes at the facility. Access to current and previous submissions will facilitate public understanding of changes taking place in industry.

3. SET FEDERAL STANDARDS FOR REDUCING HAZARDS

The federal government should require facilities to reduce hazards whenever practicable. Even today, two years after September 11, 2001, there are no federal requirements that any facility using dangerous chemicals employ the best possible industry practices to reduce hazards. Only two states—New Jersey and Delaware—have programs that go beyond the limited federal rules for accident prevention.

While facilities in other states claim to have taken steps to prevent terrorist attacks, neither EPA, the Department of Homeland Security (DHS) nor affected citizens have any way to verify such claims.

EPA could use its authority under the Clean Air Act to address risks from a potential terrorist attack. However, because the extent of the agency's authority is unclear, EPA is concerned that lawsuits by chemical facilities will obstruct efforts to reduce hazards. Instead the agency is relying on voluntary initiatives with industry to increase security.⁶

DHS's broad mission could include requiring all chemical facilities to reduce hazards that pose a risk in the event of a terrorist attack; however, the new agency has not yet determined what role it will play with regard to these facilities. This gap in authority prompted both EPA and DHS to ask Congress for clear legislation on this matter.⁷

Congress and the administration understand that the risks posed by chemical facilities are an important issue for homeland security. Several bills, including one backed by the White House, have been debated, though most deal solely with boosting security. Only one bill—the Chemical Security Act of 2003—would promote safer operations at all facilities that use large quantities of dangerous chemicals. The bill, introduced in both the House and Senate, would require facilities that submit Risk Management Plans to evaluate safer ways of doing business. If cost-effective, practical options are available—as in the case of most wastewater treatment facilities—the facil-

New Jersey's accident prevention program

Under New Jersey's Toxic Catastrophe Prevention Act (TCPA) program, facilities that have an "extraordinarily hazardous substance" (EHS) at certain specified threshold quantities (generally at or below the federal reporting threshold), must submit a risk management plan for state approval, pay a fee based on the amount and type of chemical on site and assess ways to prevent accidents. As a result of this program, almost all 290 wastewater treatment facilities in New Jersey that reported using chlorine gas when the program began in 1988 have since eliminated or significantly reduced their use of chlorine gas.

ities would be obligated to adopt such practices or explain why they could not. The bill passed the Senate Environment and Public Works Committee unanimously in July 2002, but languished because of opposition from the chemical industry.

Efforts to protect Americans from terrorist attacks are often costly and complicated. However, instances when protection of the public can be achieved in a straightforward and cost-efficient fashion should be aggressively pursued. That some of these options have side benefits, such as eliminating the potential for chemical accidents, makes them all the more appealing. Wastewater treatment facilities offers such an opportunity. The government should insist that these facilities reduce the risk they pose to millions by eliminating chlorine gas.

Notes

- ¹ "Plant Warnings Go Unheeded: City Ignores Lapses in Handling Toxic Chemical at Blue Plains" Washington Post, November 5, 1999
- ² In determining the vulnerability zone, facilities rely on certain assumptions (set by EPA) regarding wind conditions, how quickly a chemical is released, etc. For example, for toxic gases, facilities assume that all of the chemical stored in a container or pipe is released into the air within 10 minutes. Also, the extent of injury would depend on the chemical released.
- ³ Switching to sodium hypochlorite can reduce risks during transportation. While trucks carrying sodium hypochlorite are not risk-free, they pose less risk than chlorine gas being transported by rail where rail lines go through urban areas.
- ⁴ For wastewater treatment plants, chlorine gas is the primary chemical that triggers RMP reporting requirements (threshold of 2500pounds). However, some facilities report based on their sulfur dioxide use which has a higher threshold of 5000 pounds. Sulfur dioxide is used to de-chlorinate wastewater that has been treated with chlorine gas, so facilities reporting based on sulfur dioxide also have chlorine gas. For large chemical releases, the vulnerability zone is similar whether based on chlorine gas or sulfur dioxide.
- ⁵ Copeland, Claudia, Congressional Research Service, Report for Congress, "Water Infrastructure Financing: History of EPA Appropriations," Updated May 21, 2003, page 1.
- ⁶ U.S. General Accounting Office, "Homeland Security—Voluntary Initiatives are Underway but the Extent of Security Preparedness is Unknown," March 2003, page 4.
- ⁷ *A Security Requirement*, Letter to the Editor from Christine Whitman and Tom Ridge, Washington Post, Sunday, October 6, 2002; Page B06



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