LOOKING FORWARD AFTER KATRINA: Environmental Health Problems and Recommendations for Officials U.S. PIRG Education Fund September 21, 2005

INTRODUCTION

Hurricane Katrina was the worst natural disaster to strike our country in its history. Hundreds of people have lost their lives, and the devastation to the regions in Louisiana, Mississippi, Alabama, and Florida is difficult to fathom. As the rebuilding begins in these areas, we need to ensure that more people are not harmed by taking a close look at the environmental health risks left behind.

In the wake of Hurricane Katrina, some Gulf Coast residents found themselves up to their shoulders in water filled with sewage and toxic chemicals. Up to 80% of New Orleans was covered in contaminated water, and other cities including Biloxi, Mississippi were flooded by storm surges. Almost immediately after the floodwaters began to rise, people familiar with New Orleans and the surrounding industrial area began sounding alarm bells that this liquid covering New Orleans was not just water, but a "toxic gumbo."

Initial testing by the Environmental Protection Agency (EPA) found elevated bacteria and lead levels, as well as some amounts of long-banned pesticides in the water. Some officials tried to downplay the potential health threat while warning those in New Orleans not to expose themselves to the floodwater.

Soon after the disaster, EPA and the Centers for Disease Control and Prevention (CDC) formed the Environmental Health Needs Assessment and Habitability Taskforce (EH-NAHT) in order to identify the "overarching environmental health issues faced by New Orleans to re-inhabit the city."¹ This task force identified 13 issues dealing with environmental health and infrastructure that local, state, and federal officials will have to address. In each issue area, the task force laid out the current situation, possible barriers for progress, and decisions that must be made.

The toxic water and sludge left in Katrina's wake are a major cause for concern. Over the next several months, government agencies such as EPA, the Coast Guard, the CDC, and state and local officials will be working to clean up this disaster. Throughout the process, these government officials must guarantee workers' and evacuees' right to know about the toxic chemicals found in the air, soil, and water and ensure that all cleanup is completed to the highest possible health standard.

We have developed a quick snapshot of some of the environmental health problems in the wake of the hurricane, as well as recommendations for governmental officials to take into account as they move forward.

ENVIRONMENTAL HEALTH CONCERNS

Three weeks after Katrina struck the Gulf Coast, federal and state officials are still working to obtain a comprehensive picture of the hurricane's toll on the environment. High winds, pounding rains, storm surges and floodwaters contributed to a level of devastation unprecedented in United States history. In addition to the physical damage caused to the region, the hurricane stirred up toxic and hazardous substances from homes as well as the area's chemical plants, refineries, and sewage treatment plants, creating a serious environmental and public health threat. EPA and CDC have determined that the "distribution of contamination is unknown," but the "potential exists" for releases from many sources.²

Industrial Sources of Toxic Chemicals

The Gulf Coast areas of Louisiana, Mississippi and Alabama are heavily industrialized and the form the center of the oil, gas and chemical industries in the United States. The affected areas are home to 31 hazardous waste sites and 466 industrial facilities that handle large quantities of hazardous substances.³ The region's history of weak enforcement of environmental laws and the heavy concentration of industrial facilities has created a toxic legacy that now threatens the health of response workers, residents and evacuees.

As federal and state officials continue to respond to the damage caused by Katrina, the nature and extent of toxic releases from industrial sources are coming into focus. Facilities that use and produce hazardous substances from southeast Louisiana to the panhandle of Florida have sustained serious structural damage. The public health threats these facilities now pose is not the inevitable result of some natural force, but a foreseeable consequence of using and producing toxic substances.

In Louisiana, we know that dozens of facilities use and store toxic chemicals, which could have made their way into the floodwaters. According to data from the most recent EPA Toxic Release Inventory, the flooded Jefferson and Orleans Parishes are home to 29 facilities that release more than 10 million pounds of toxic chemicals annually. In the heavily affected St. Bernard Parish, just two large facilities account for the release of more than 1.8 million pounds of toxic chemicals released from these facilities, such as dioxin, lead and mercury, can persist in the environment for decades.

At least 450 chemical spills or releases have been reported in the hurricane-damaged areas of Mississippi and Alabama.⁵ A wall of seawater raised by the hurricane flooded the industrial town of Pascagoula, Mississippi. Oil refineries and chemical plants in the town were inundated with floodwater, and portions of the Chevron/DuPont refinery were covered with up to six feet of water. A potentially dangerous situation has unfolded in Pass Christian, Mississippi, where DuPont's DeLisle plant, the country's second largest titanium dioxide producer, was devastated by Katrina.⁶ This facility produces 14 million pounds of toxic waste per year and stores much of this waste at on-site landfills.⁷ The plant's landfill contained 2.3 million pounds of hazardous waste when a 25-foot storm surge covered both the plant and landfill with 7 to 9 feet of water.⁸

EPA released results of chemical testing done on New Orleans' floodwaters sampled September 3, 4 and 6. The tests revealed hexavalent chromium, arsenic and lead, all carcinogens, at unsafe levels. In addition, banned pesticides, including dieldrin, were found in the floodwaters.⁹ Air monitoring data taken by EPA from the area around the Murphy Oil Refinery spill in St. Bernard Parish showed high levels of benzene, toluene and xylene, highly

toxic substances found in oil.¹⁰ EPA also reported diesel fuel, other fuels, arsenic and lead in soil samples.¹¹

Government officials and the media already have reported stories of first responders and evacuees who are getting sick from exposure to floodwater during and after the hurricane. The CDC has reported, to date, 32 *Vibro* infections, bacteria more commonly associated with food-borne illnesses, and six deaths from those infections.¹² CDC also lists "toxic exposure" as one of the top ten health conditions in its health assessment of people staying in evacuation centers between September 10 and September 12.¹³

Sewage in the Floodwaters

The sewage in the widespread flooding in New Orleans has created an immediate public health threat for the residents and emergency responders in New Orleans. Waste from overflowing and backed up sewer systems contaminated the floodwaters with bacteria, viruses, parasites, toxics and other hazards. People become sick when they drink water and eat food contaminated with sewage, or if they swallow the water when swimming or wading through it. Sewage causes gastrointestinal illnesses, such as vomiting, diarrhea, and stomach pains, as well as hepatitis and respiratory diseases. These ailments can become life threatening for young children, the elderly and people with weakened immune systems.

Nearly a week after the hurricane, EPA began testing the floodwaters in New Orleans. Data released from government testing done September 3 through September 10 show high levels of the bacteria found in sewage. Some samples had levels of E.Coli, bacteria that indicates other pathogens in the water, more than 50 times greater than what the EPA considers safe.¹⁴ Based on the biological and chemical water testing data, EPA and CDC have recommended that the public and emergency responders avoid contact with the floodwaters.¹⁵ As the floodwater is removed from New Orleans, the sludge and sediment left behind create another public health problem. EPA has recently released test results showing high bacteria and chemical levels in soil samples from New Orleans and has issued a public health warning with the Louisiana Department of Environmental Quality recommending avoiding all contact with sediment deposited by the flood.¹⁶

While New Orleans residents and emergency responders had the most direct contact with floodwaters contaminated by sewage, sewage systems across the Gulf Coast were harmed or destroyed by the hurricane. As a result, many residents are without adequate sewage facilities. Two weeks after the hurricane hit, 114 wastewater treatment systems in Louisiana and nine in Mississippi were not operating.¹⁷ For example, in Harrison County, Mississippi, three of the counties' nine wastewater treatment facilities were destroyed or severely damaged by the hurricane.¹⁸

Hurricane Katrina has affected not only sewage systems but also drinking water systems. Drinking water systems across the region have been disabled or destroyed, leaving hundreds of thousands of residents without safe water to drink. Nearly three weeks after the hurricane, close to 500 drinking water systems in the Gulf region remained inoperable, were operating on boil water notices as the water was unsafe, or their status was unknown.¹⁹ In addition, EPA says that some of the drinking water systems the agency considers operational are in need of repair and may need to be rebuilt.²⁰

Superfund Sites Flooded by the Storm

Superfund sites are the nation's most hazardous toxic waste sites. In New Orleans, officials are concerned that highly hazardous substances may have flowed off any one of five Superfund

sites in the area.²¹ Two of these Superfund sites are particularly worrisome, the Thompson-Hayward chemical facility and the Agricultural Street Landfill.

During its 40 years of operation, the Thompson-Hayward Chemical facility in the center of New Orleans produced a variety of pesticides and herbicides, including the infamous chemicals DDT and Agent Orange. These operations left behind soil heavily contaminated with highly toxic and persistent substances such as dioxin. When the facility closed in 1986, cleanup actions included leaving more than 2,600 pounds of contaminated soil in place and covering it with a layer of clean dirt.²² If floodwaters breached this layer of clean dirt, the site's toxic heritage will once again pose a threat to public and environmental health.

The 95-acre Agricultural Street Landfill is located about halfway between Lake Pontchartrain and the French Quarter, an area that was inundated with floodwaters. For almost a century, the landfill accumulated municipal and industrial wastes. After decades of haphazard disposal practices, the landfill became a hot spot of contamination loaded with lead, dioxin, carcinogenic hydrocarbons and the pesticide DDT. Constantly recurring underground fires and an unearthly stench prompted residents to nickname the toxic site "Dante's Inferno." EPA's cleanup plan for this site was similar to that of the Thompson-Hayward site and involved capping the landfill with a plastic liner and two feet of clean dirt.

The "cap and ignore" solutions to Dante's Inferno and Thompson-Hayward has prompted serious concerns in the wake of Katrina. Officials are still uncertain whether the minimal protective layers at these sites were breached, but warn that such a breach could have disseminated contaminants across a wide area of downtown New Orleans.

Oil Spills

The most easily identifiable consequence of Katrina's collision with industry is the black oily sheen covering vast areas of the affected Gulf States. The Coast Guard has reported 11 major and medium oil spills from refineries or tank farms, which released approximately 7.4 million gallons of oil.²³ The largest documented oil spill to date occurred at the Murphy Oil Refinery in Chalmette, Louisiana when floodwaters ruptured a storage tank and spilled more than 819,000 gallons of oil.²⁴

Officials have yet to calculate the impact of the many smaller spills likely to have occurred. According to the Louisiana Department of Environmental Quality, many of the 2,200 underground fuel tanks in the affected area are potentially ruptured, leaking an unknown amount of oil.²⁵ Gasoline from gas stations and flooded cars are likely to add an additional 1 to 2 million gallons of oil to the contamination problem. In addition, tens of thousands of barrels of oil have spilled from refineries and drilling rigs in at least 13 sites between Lake Pontchartrain and the Gulf of Mexico.²⁶ As of mid-September, the U.S. Coast Guard reports that more than three-quarters of the oil spills caused by the hurricane have not been addressed.²⁷

Oil causes extensive environmental damage and is a serious risk to public health. All crude oil contains the hazardous substances benzene, toluene, xylene and ethylbenzene. Together, these volatile organic toxics cause health impacts ranging from eye, nose and throat irritation to leukemia, central nervous system damage and cancer. Failure to implement a comprehensive plan to clean up the vast areas polluted with oil could have short and long-term consequences for the local environment and public health.

MOVING FORWARD AFTER KATRINA: RECOMMENDATIONS FOR EPA

Learning Lessons from EPA's Response to 9/11

The national disaster of Hurricane Katrina, as well as its cleanup aftermath, is reminiscent of the impact of the September 11th, 2001 terrorist attacks on New York City. Local, state, and federal officials should look to the lessons learned from that recovery effort.

In 2004, the Governmental Accountability Office (GAO) estimated that 250,000 to 400,000 people were exposed to a toxic mixture of "pulverized concrete, fibrous glass, particulate matter, asbestos" and other chemicals following the 9/11 attacks. According to the GAO, hundreds of fire fighters had to end their careers, and "the full health impact of the attack is unknown."²⁸

The Sierra Club has followed the cleanup process closely and issued a series of reports documenting the health impacts and the lack of adequate government response to the 9/11 attacks. Just this September, Sierra Club released *Pollution and Deception at Ground Zero Revisited: Why It Could Happen Again*, providing the latest information on the health impacts on workers and residents near Ground Zero. In addition, this report analyzes the Department of Homeland Security's new *National Response Plan* and other government plans and details how they are inadequate to protect the public in a national emergency. Specifically, Sierra Club notes the federal government's unwillingness "to put public health and safety first in its response."²⁹

EPA and other officials can learn from the public health problems experienced after 9/11 when dealing with the devastation and cleanup of Hurricane Katrina. Every effort must be made to protect the health and safety of evacuees and workers as we move forward.

Adequate Air, Soil, and Water Testing

EPA must complete adequate testing of air, land, and water in the affected areas. This testing must provide an assessment of current contamination levels, as well as continued monitoring in order to update the situation as cleanup progresses. EPA should immediately disclose and disseminate these test results to the public, particularly the communities and workers most likely exposed to dangerous substances.

After 9/11, EPA was criticized for not testing enough at Ground Zero and for its methods. Specifically, critics raised concerns about EPA's use of an older method for measuring the presence of asbestos that is reportedly less effective at identifying very thin asbestos fibers as well as short fibers; its failure to measure ultra-fine particles; and its many findings of "non-detect" for measurements of chemicals that critics argue are ubiquitous in the environment, raising concerns about the sensitivity of the agency's equipment.³⁰

EPA must learn from these criticisms of its post-9/11 testing and use the best testing technology and methods available to determine the full extent of the environmental health threat posed by toxic chemicals in the air, land, and water of the hurricane-affected areas.

The Environmental Health Needs Assessment and Habitability Taskforce (EH-NAHT) stated that "comprehensive sampling and testing of a broad array of toxic chemicals will be required to identify any widespread contamination or selected hot spots and to ensure the safety of returning inhabitants or for redevelopment." In its assessment, however, EH-NAHT noted that officials need to first design a comprehensive sampling and analysis plan and decide on the "degree to which repeated, costly, and time-consuming analysis may be required."³¹ Because

this analysis is critical for protecting human health, officials should ensure that cost does not inhibit adequate testing of all potentially affected areas.

Health Monitoring of Workers and Evacuees

As of March 2004, 380 firefighters were no longer able to serve for the New York Fire Department because of the respiratory problems they had developed from working at Ground Zero following the 9/11 attacks.³² Despite this clear risk to workers, as well as the health effects reported by residents living near Ground Zero, the GAO found that no comprehensive health study was done of those exposed following 9/11.

In response to Hurricane Katrina, CDC must monitor the health of workers and evacuees throughout the cleanup process and beyond. Many of the evacuees and workers, including police and other first responders, may have been exposed to chemicals and bacteria that may cause immediate symptoms. Other workers and evacuees, however, may not show symptoms for weeks, months or even years. Because of the high possibility of long-term effects of exposure to these toxic chemicals and bacteria, CDC must monitor the health of the workers and evacuees long after cleanup has commenced. This monitoring should include bio-monitoring, or monitoring blood and other substances for presence of toxic chemicals in people's bodies, as well as regular health effects monitoring.

In its initial assessment, the EH-NAHT did not lay out health monitoring as a priority in the short-term or long-term as part of the Hurricane Katrina response. This health monitoring is critical to identify and treat health problems associated with exposure to toxic chemicals and other harmful substances. EPA and CDC should conduct thorough testing of first responders, including police, fire fighters, and National Guardsmen, as well as evacuees.

Ensuring the Safety of Those Returning to Evacuated Areas

Residents are already being allowed to return to the areas flooded and devastated by Hurricane Katrina. Local, state, and federal officials again should look to the lessons learned from the aftermath of 9/11 attacks for guidance. Officials rushed soon after 9/11 to allow workers and inhabitants to return to the area surrounding Ground Zero. The New York Stock Exchange opened on September 17 and brought hundreds and thousands of people back to Lower Manhattan, despite possible health threats from the debris at Ground Zero.³³ Local, state, and federal officials are feeling similar pressure to allow people to return to New Orleans in order to get back to their homes and businesses.

The EH-NAHT indicated it is collaborating with local and state officials to determine the issues and decisions that must be made as citizens re-inhabit the city. EPA and other officials must take extensive precaution, however, to ensure that people are not needlessly exposed to toxic chemicals and bacteria when they return to their homes and businesses. Government officials should ensure that returning evacuees have the information they need and supply protective gear to those returning to areas deemed potentially hazardous to public health. In addition, pregnant women and children, who are particularly vulnerable to the long-term health consequences of exposure to toxic chemicals, should receive special protection.

Ensuring the Public's Right-to-Know

For weeks we have heard news accounts and people calling for more information about everything from the toxic threats to the status of rescue crews and supplies. People have the right to know about the extent of the contamination, as well as the precautions they should take to reduce their exposure to bacteria and toxic chemicals. Full public disclosure does not mean simply posting data on the EPA website; rather, full rightto-know includes a full communications strategy to reach all affected communities with the necessary information. At minimum, local, state, and federal officials should maintain up-todate websites, start a hotline with contamination information, and post and distribute information at checkpoints leading back into and around the contaminated areas.

The EH-NAHT identified occupational safety and health/public safety as a "cross-cutting" issue. The task force determined the need to "give clear guidance for recovery workers and public on appropriate health and safety methods," which could include adequate communication on protective measures.³⁴ Officials must make these decisions with an eye to giving the public, evacuees, and workers more information, not less.

In addition, officials need to communicate with the public about which local, state, or federal agencies are in charge of public health issues surrounding the cleanup and rebuilding effort. Currently, red tape and bureaucratic confusion is limiting the public's access to information they sorely need.

Involving the Public and Local Communities in Decision-Making

All levels of government must involve the public in all environmental health decisions made regarding the cleanup and recovery of Katrina-related damage. Most importantly, the local communities most affected by the hurricane must be involved in decisions on cleanup, recovery, and rebuilding. Government officials should work closely with public interest organizations on cleanup, recovery, and rebuilding decisions in order to ensure a democratic and safe process.

Recognizing the importance of this point, the EH-NAHT recommended involving "state, local, and other stakeholders in decision-making." The taskforce also recommended developing a mechanism to communicate with the "displaced population," to keep them up to date on progress, activities, and decisions.³⁵ Implementing this recommendation will be critical as EPA, CDC, and other officials move forward.

Rebuilding with an Eye Toward Public Health

Rebuilding all or some of the affected areas, particularly the city of New Orleans, offers opportunities to rebuild with an eye to public health.

Some of the wastewater treatment systems originally disabled by the hurricane are operating, but others will need additional repairs and some will need to be rebuilt entirely. The rebuilding of New Orleans and other cities provides an opportunity to prevent future sewer overflows from smaller storms by increasing the landscape's ability to absorb stormwater. As widespread sprawl has replaced filtrating soils with impervious asphalt, more rain water has ended up in sewer systems. The most efficient way to stop sewage overflows into waterways and onto streets is to stop water from flooding wastewater treatment systems when it rains.

It will cost millions, possible billions, of dollars to restore all of the drinking water and wastewater treatment facilities around the Gulf Coast. The federal government should increase funding for wastewater and drinking water infrastructure.

Oil refineries and chemical facilities are prevalent in the affected areas. While many are already online and functioning, others will need repairs before restarting. This provides an opportunity to upgrade pollution controls and look for safer ways of doing business that pose less of a threat to the surrounding community. For instance, oil refineries in the area that currently use hydrofluoric acid, a highly dangerous chemical, could be reformatted to use a safer alternative. This could eliminate the risk these facilities pose to surrounding communities and prevent future industrial disasters.

Many communities affected by the hurricane lived close to industrial centers that spewed harmful air pollutants and endangered thousands in the event of a catastrophic release of toxic chemicals used and stored onsite. The rebuilding effort provides an opportunity to provide buffer zones for these communities that will be protective of their health and safety in the future.

To lessen the impact of future storms and reduce flooding, coastal wetlands should be preserved and restored as part of the rebuilding. Coastal wetlands can absorb storm surges, protecting people, land and cities. Every 2.7 miles of wetlands can reduce a flood surge by an entire foot.³⁶

Finally, officials have the opportunity to rebuild New Orleans with an eye to public health and the environment. Officials can construct energy-efficient schools, buildings, and homes with safer and more environmentally-friendly building materials. Officials can install solar panels on buildings and homes to make the city more energy-independent. Rebuilding the city also affords an opportunity to construct a strong public transportation system.

Cleaning Up to the Most Protective Standards

The federal government should not waive any environmental laws under the guise of expediting the cleanup process. Shortcuts that threaten public health and the environment, such as weakening standards to allow the incineration of building materials, should not be taken. Lowering our environmental and public health standards would only add insult to injury in the wake of the hurricane. Cleanup efforts must reflect the toxic threats within the city of New Orleans and other Gulf communities, and all cleanups must be done to a standard that is protective of human health and the environment.

The EH-NAHT identified many issues and decision areas dealing with cleanup, but recommended that public and worker safety and health should be a "central focus" of the rebuilding effort. In addition, the EH-NAHT noted that officials need to "determine appropriate clean-up levels (standards and regulations)."³⁷ Simply, EPA and state environmental officials should clean up New Orleans and other affected areas to standards that are most protective of people's health.

Making Corporations Pay Their Fair Share

At a time when corporations are earning record-breaking profits, such as ExxonMobil's earnings of \$8 billion in the second quarter of 2005, corporations, rather than taxpayers, should shoulder a bulk of the costs of cleaning up the toxic chemicals polluting the affected communities' air, land, and water. The federal government could levy a "Katrina Response Cleanup Fee" on corporations that use and produce chemicals in the affected areas. This Katrina cleanup fee mirrors the equitable policy of the Superfund "polluter pays" fees by imposing cleanup costs on sources of toxic contamination. The fee also spreads costs across the industry and avoids placing significant financial burdens on any one corporation. The industrial facilities that release toxic contamination into the environment and nearby communities have a responsibility to assist with the cleanup and to protect the public from their toxic substances.

Reducing Toxic Chemical Use and Exposure

Ultimately, the way to prevent the catastrophic public health consequences from natural disasters like Hurricane Katrina, as well as other accidents and catastrophic events, is to reduce our use of and exposure to toxic chemicals. For example, many petroleum refineries use toxic hydrofluoric acid in production processes, although safer alternatives exist and are in use at more than 100 refineries across the country. Switching to safer chemicals will reduce or eliminate public health risks in the event of a catastrophic event, and state and federal officials must renew efforts to implement these protective changes.

END NOTES

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