

June 2007

# HURRICANE KATRINA

## EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast





Highlights of [GAO-07-651](#), a report to congressional committees

## Why GAO Did This Study

In 2005, Hurricane Katrina's impact on the Gulf Coast included damage to the environment from chemical and hazardous materials releases. Also, the widespread demolition and renovation activities still under way in New Orleans may release asbestos fibers into the air, posing a potential additional health risk. This report, conducted at the Comptroller General's initiative, addresses (1) the Environmental Protection Agency's (EPA) actions to assess and mitigate Katrina's environmental impacts, (2) the extent to which EPA has assurance that public health is protected from asbestos inhalation risks in New Orleans, (3) the extent to which EPA's environmental health risk communications provided useful information to the public, and (4) challenges EPA faces in addressing environmental impacts.

## What GAO Recommends

GAO recommends that EPA develop an asbestos air monitoring plan for New Orleans, improve its communications on environmental risks for future disasters, and take steps to address several challenges EPA has faced. EPA agreed with all but one recommendation, commenting that other agencies should address the challenge of obtaining timely funding for the removal of hazardous materials from federal lands after disasters. GAO modified its recommendation to include additional relevant agencies with which EPA should work to address the problem GAO identified.

[www.gao.gov/cgi-bin/getrpt?GAO-07-651](http://www.gao.gov/cgi-bin/getrpt?GAO-07-651).

To view the full product, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841 or [stephensonj@gao.gov](mailto:stephensonj@gao.gov).

# HURRICANE KATRINA

## EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast

### What GAO Found

Under challenging circumstances, EPA worked with federal and state partners to respond to chemical and oil spills, collect abandoned chemical containers, coordinate recycling of damaged appliances, and collect and recycle electronic waste. EPA also conducted air, water, sediment, and soil sampling; helped assess drinking water and wastewater infrastructures; and issued timely information to the public on a variety of environmental health risks.

However, as cleanup continues, EPA's assurance that public health is protected from risks associated with inhalation of asbestos fibers is limited because the agency has not deployed air monitors in and around New Orleans neighborhoods where demolition and renovation activities are concentrated. While EPA took steps to monitor asbestos after the hurricane—for example, more than doubling the number of ambient (outdoor) air monitors and monitoring emissions at debris reduction sites—monitors were not placed in areas undergoing substantial demolition and renovation, such as the Ninth Ward. This is problematic because monitors effectively detect releases of asbestos from demolition activities only if they are located immediately adjacent to demolition sites. Further, many thousands of homes being demolished and renovated by or for individual homeowners are generally not subject to EPA's asbestos emissions standards aimed at limiting releases of fibers into the air.

While EPA provided useful environmental health risk information to the public via flyers, public service announcements, and the EPA Web page, the communications were at times unclear and inconsistent on how to mitigate exposure to some contaminants, particularly asbestos and mold. Further, the usefulness of three key reports on EPA's environmental sampling in New Orleans—developed with, among others, the Louisiana Department of Environmental Quality to address potential health risks from exposure to floodwaters, sediments, and air—was limited by a lack of timeliness and insufficient disclosures about EPA's sampling program. For example, EPA did not state until August 2006 that its December 2005 report—which said that the great majority of the data showed that adverse health effects would not be expected from exposure to sediments from previously flooded areas—applied to short-term visits, such as to view damage to homes.

Mitigating several challenges EPA faces addressing Hurricane Katrina could better protect the environment in the future. First, EPA did not remove hazardous materials from national wildlife refuges in a timely manner as part of its response in part because disaster assistance funding generally is not used for debris cleanups on federal lands. Second, because states generally have authority over landfill decisions, EPA does not have an effective role in emergency debris disposal decisions that could cause pollution. Finally, lack of clarity in federal debris management plans and protocols precluded the timely and safe disposal of some appliances and electronic waste.

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**Abbreviations**

C&D	construction and demolition
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Corps	U.S. Army Corps of Engineers
DHS	Department of Homeland Security
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
RCRA	Resource Conservation and Recovery Act

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United States Government Accountability Office  
Washington, D.C. 20548

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### Congressional Committees

The scope and severity of the destruction that Hurricane Katrina caused on the Gulf Coast in 2005 are staggering. More than 1,600 people lost their lives and more than a million were driven from their homes, many still unable to return. Moreover, tens of thousands of homes in New Orleans were flooded, many requiring either demolition or gutting before reconstruction. This natural disaster affected an area of over 90,000 square miles, destroying or severely damaging not only countless buildings but also bridges, roads, and the area's power and communications infrastructures. Hurricane Katrina severely damaged the environment as well: Millions of gallons of oil and unknown quantities of potentially hazardous chemicals were released into the environment.<sup>1</sup> Hazardous materials—such as industrial drums containing toxic and flammable chemicals, asbestos-containing materials, household chemicals, paints, pesticides, and propane tanks—were commingled with the storm's unprecedented levels of other debris, slowing its collection and disposal. The environmental contamination caused by this natural disaster could have both short- and long-term effects on the health of residents in affected areas, as well as on workers, volunteers, and wildlife.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act establishes programs and processes for the federal government to provide major disaster and emergency assistance to states, local governments, tribal nations, individuals, and qualified private nonprofit organizations. Under the Stafford Act, state governors may request assistance from the federal government when an incident overwhelms state and local resources. Such assistance has been—and to some extent continues to be—provided to the Gulf Coast under the Department of Homeland Security's (DHS) National Response Plan. This plan serves as a basis for how federal departments and agencies are to work together with state, local, and tribal governments and the private sector in managing incidents requiring a coordinated federal response, including a major disaster such as Hurricane Katrina that was determined to be an "incident of national

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<sup>1</sup>Unless otherwise noted, this report addresses EPA's response to Hurricane Katrina, the storm that caused the bulk of the hurricane-related damage to the Gulf Coast in 2005. Other storms, in particular Hurricane Rita, also caused significant damage to the region in 2005, some in the same areas hit by Katrina.

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significance.” Key federal agencies with responsibilities for supporting and implementing state and local recovery efforts in the Gulf Coast include DHS’s Federal Emergency Management Agency (FEMA), the Environmental Protection Agency (EPA), the U.S. Coast Guard, and the U.S. Army Corps of Engineers.

EPA serves as the coordinator of emergency support for the oil and hazardous materials response, 1 of 15 emergency support functions identified in the National Response Plan. When the National Response Plan is activated, EPA and the Coast Guard are the primary agencies that provide federal support in response to actual or potential discharges of oil or hazardous materials, including assessments and cleanups. The National Response Plan incorporates many aspects of the National Contingency Plan, a plan for responding to releases of oil or hazardous materials.<sup>2</sup> This plan implements provisions of the Clean Water Act and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, also called the Superfund law). Under the Superfund law, EPA conducts short-term cleanups to address immediate threats to communities from actual or potential releases of hazardous substances and conducts or oversees long-term cleanups of the nation’s Superfund sites.

EPA also has a role in assisting other agencies that are coordinating other emergency support functions under the National Response Plan, including public works and engineering (assisting with such tasks as contaminated debris management) and public health and medical services response (providing such support as technical assistance in assessing the health aspects of situations involving hazardous materials). Aside from the emergency support roles defined in the plan, EPA enforces key environmental laws, such as the Clean Air Act. To facilitate the removal of the extraordinary amounts of debris in Louisiana and Mississippi after Hurricane Katrina, EPA is not enforcing certain Clean Air Act emissions standards for asbestos in the case of government-ordered demolitions of homes. In addition, these emissions standards generally do not apply to the demolition or renovation of homes by or for individual homeowners. Nevertheless, because asbestos inhaled into the lungs can cause cancer, it is important for EPA to ensure that public health risks are minimized during the demolition and renovation of buildings containing asbestos, activities that can release asbestos fibers into the air.

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<sup>2</sup>Under the National Contingency Plan, EPA and the Coast Guard also serve as primary responders.

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In this context, we (1) reviewed EPA's actions under the National Response Plan to assess and mitigate the environmental impacts of Hurricane Katrina, (2) determined the extent to which EPA has assurance that public health in New Orleans is being protected from asbestos inhalation health risks posed by extensive demolition activities, (3) determined the extent to which EPA's communications on environmental health risks posed by Hurricane Katrina have provided useful information to the public, and (4) identified challenges EPA has faced in addressing environmental impacts of Hurricane Katrina that, if mitigated, could enable EPA to better protect the environment in future disasters. Because of the widespread congressional interest in these subjects, we are conducting this work at the Comptroller General's initiative.

In conducting our work, we reviewed relevant laws and regulations, DHS's National Response Plan, federal and state protocols related to the hazardous materials response to Katrina, and evaluations of the federal government's Katrina response actions. We also reviewed, for example, EPA planning documents, environmental risk assessment summaries and related communications, and federal guidance to state and local agencies related to the 2005 hurricane response. We interviewed officials from EPA's Office of Emergency Management, Office of Enforcement and Compliance Assurance, Office of Water, Office of Air and Radiation, and Office of Solid Waste, among other headquarters offices. We met with EPA officials in Regions 4 and 6 in Mississippi and Louisiana, visited EPA's Incident Command Centers in Mississippi and Louisiana, and toured affected areas in both states. We also interviewed federal officials from FEMA, the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry and Centers for Disease Control and Prevention (CDC), the Army Corps of Engineers, and the Department of the Interior's U.S. Fish and Wildlife Service. In addition, we interviewed state and local officials involved with EPA's response efforts from the Louisiana and Mississippi Departments of Environmental Quality and from Jefferson, Plaquemines, Orleans, and St. Bernard Parishes in Louisiana and from Jackson, Hancock, and Harrison Counties in Mississippi. We also spoke with national and regional stakeholder groups, including the Natural Resources Defense Council, the Lake Pontchartrain Basin Foundation, the Louisiana Environmental Action Network, the Louisiana Mid-Continent Oil and Gas Association, the Mississippi Environmental Recovery Alliance, the Mississippi Power Company, and Sierra Club chapters in Louisiana and Mississippi. In determining the extent to which EPA's communications on Hurricane Katrina's environmental health risks provided useful information to the public, we focused on the communications themselves and did not

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evaluate the agency's environmental risk assessment methodology. (See app. I for a more detailed description of the scope and methodology of our review.) We conducted our work from November 2005 through June 2007 in accordance with generally accepted government auditing standards.

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## Results in Brief

Under challenging circumstances, EPA conducted a wide variety of activities to assess and mitigate the environmental impacts of Hurricane Katrina. As of December 2006, EPA had spent an estimated \$416 million on its hurricane response and, at its peak, employed about 1,600 staff and contractors on response activities. For example, EPA and its contractors, along with other federal and state partners, have responded to chemical and oil spills at industrial facilities; have collected over 200,000 large abandoned containers, such as drums and tanks; and continue to oversee cleanup of a million-gallon oil spill at a facility in St. Bernard Parish, Louisiana, that affected neighboring homes. EPA has also coordinated recycling efforts for damaged refrigerators and other appliances (referred to as "white goods") to remove chlorofluorocarbons and other refrigerants that are harmful to the environment from 380,000 abandoned refrigerators, freezers, and air conditioners. In addition, EPA helped collect and recycle over 660,000 units of electronic waste and removed and safely disposed of almost 5 million household hazardous waste containers, such as paint cans and propane tanks. Because of the extensive number of home demolitions and renovations that have yet to be completed in the New Orleans area, debris removal from uninhabited residences is far from complete. Regarding assessing the environmental contamination caused by the hurricane, EPA conducted air, water, and sediment and soil sampling for chemicals of potential concern in Louisiana and Mississippi. In particular, EPA reports having collected about 1,800 sediment and soil samples since September 2005 in and around New Orleans. EPA has analyzed most of these samples for over 200 potentially harmful metals and organic chemicals. In coordination with state and local partners, including the Louisiana Department of Environmental Quality, EPA concluded that, in general, the sediments left behind by the flooding are not expected to cause adverse health impacts to individuals returning to New Orleans. In addition, EPA helped both the Louisiana and Mississippi Departments of Environmental Quality perform 4,000 drinking water and wastewater infrastructure assessments to help bring these facilities back online as quickly as possible.

However, as cleanup continues, EPA's assurance that the public health is being protected from the risks associated with the inhalation of asbestos

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fibers is limited because the agency has not deployed air monitors in and around neighborhoods in New Orleans where demolition and renovation activities are concentrated. EPA took steps to monitor asbestos after Hurricane Katrina, initially more than doubling the ambient (outdoor) air monitors that were in the area before the storm and then conducting emissions monitoring at specific sites, such as landfills, that involve waste handling or debris reduction activities—for example, grinding. However, EPA has neither conducted emissions monitoring at demolition sites nor placed ambient air monitors in neighborhoods with substantial demolition and renovation activities. For example, no monitors have been located in the Ninth Ward, where flooding was widespread and extensive demolition and renovation are occurring. This is problematic because, according to officials from EPA's Office of Research and Development, monitors are effective in detecting asbestos emissions from demolitions only if they are located immediately adjacent to the sites. Further, in July 2006, the agency scaled back its ambient monitoring to the prestorm level and reduced the frequency of sampling. EPA said it based this decision, in part, on not having found measurable amounts of asbestos in the air samples. However, EPA's expanded monitoring covered only the first few months of demolition activities. For these reasons, the results may not be representative of asbestos exposures in some neighborhoods. Further, for building demolition and renovation activities, EPA regulates asbestos emissions by setting standards for work practices. However, EPA's asbestos work practice standards generally do not apply to the demolition or renovation of a residential building by or for an individual homeowner. In addition, to help expedite cleanup and rebuilding, EPA is not enforcing some of the work practice standards for certain residences under government demolition orders, although for these demolitions, some work practice standards—such as the wetting of materials from before demolition through disposal in order to control emissions—are still required. The fact that many thousands of demolitions and renovations may occur in the same geographic area and in the same general time frame—some of which are not subject to the enforcement of certain asbestos work practice standards while others are not subject to the standards at all—represents a potential health problem that warrants monitoring.

In addition, while EPA provided a substantial amount of useful information to the public on environmental health risks using reports (environmental assessment summaries), flyers, public service announcements, and EPA's Web page, the usefulness of this information was limited in several ways. Specifically, some key communications about the environmental

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contamination in New Orleans stemming from Hurricane Katrina were not timely or complete. For example, EPA's communications about the potential health risks from environmental contamination—three environmental assessment summaries prepared with, among others, the Louisiana Department of Environmental Quality—were released about 3, 6, and 11 months after the hurricane, limiting their usefulness to residents who would have benefited from more timely information about the environmental health risks they could face when returning home. Further, EPA did not disclose until August 2006 that its December 2005 assessment summary—which said that the great majority of the data showed that adverse health effects would not be expected from exposure to sediments from previously flooded areas—applied to short-term visits, such as to view damage to homes. In addition, the summaries do not disclose an important EPA assumption—that the results of sediment samples from streets and other outdoor public access areas can be extrapolated to private properties, such as yards and the inside of homes. This is important because, for example, environmental contamination levels inside buildings can be significantly higher than and different from the contamination outside, potentially causing more adverse health effects. Finally, some of EPA's flyers and other public service communications provided unclear and inconsistent information on actions residents should take to mitigate exposure to contaminants that were likely to be found in many homes. For example, the most widely distributed flyer on environmental health risks stated that buildings constructed before 1970 are likely to contain asbestos, while a document on debris and damaged buildings on EPA's Web page stated that all structures built before 1975 may contain significant amounts of asbestos and that structures built after 1975 may also contain asbestos. EPA also used varying and confusing terms when identifying the respiratory protection that residents should wear in many cases when cleaning up their homes.

EPA faced some challenges in addressing the environmental impacts of Hurricane Katrina that, if mitigated, could better enable EPA to protect the environment in future disasters.

- First, EPA did not remove clearly visible abandoned chemical drums and tanks from several national wildlife refuges in Louisiana in a timely manner as part of its Katrina response activities in part because FEMA disaster assistance funding generally is not used for debris cleanups on federal lands. As a result, more than a year later, debris containing hazardous materials continued to pose an environmental threat to natural resources at several national wildlife refuges, and at least one

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major refuge remained closed to the public. While the Fish and Wildlife Service obtained funding for this activity as part of a June 2006 supplemental appropriation and signed interagency agreements with EPA and the Coast Guard to obtain these agencies' assistance in the fall of 2006, the delay in removing the debris from this and other wildlife refuges complicated and increased the cost of its removal—some of which is not yet completed.

- Second, EPA's debris management role is limited under federal law and the National Response Plan; consequently, its guidance to states and localities on planning for disposal of disaster debris could be especially important in helping ensure that hazardous storm debris is disposed of in landfills with appropriate safeguards, thereby preventing contaminants from migrating and causing air, soil, or water pollution. However, while EPA's 1995 guide on planning for disposal of disaster debris acknowledges that such debris can overwhelm existing landfills or force communities to use disposal options that otherwise would not be acceptable, the guide does not make specific suggestions for addressing these potential problems—such as studying potential sites for future use—or practices that state agencies should consider when making special debris disposal accommodations following disasters.<sup>3</sup> Along these lines, in its emergency orders following Hurricane Katrina, the state of Louisiana made decisions about landfill sites and the disposal of debris that some studies indicate could have long-term, negative environmental impacts.
- Finally, because of a lack of clarity in the National Response Plan and the absence of interagency protocols about federal roles in debris management, EPA, in the immediate aftermath of the storms, could not ensure that debris such as white goods and electronic waste was handled in a timely and appropriate manner that mitigated the potential for environmental contamination. Local officials in both Louisiana and Mississippi told us that confusion about responsibility for this work resulted in delays in removing and disposing of the debris, creating the potential in the weeks following Katrina that it was improperly disposed of in landfills.

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<sup>3</sup>EPA Office of Solid Waste and Emergency Response, *Planning for Disaster Debris* (December 1995).

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We are making recommendations to EPA to implement an asbestos monitoring plan that addresses the potential health impacts in New Orleans from ongoing extensive demolition and renovation activities, improve its future communications to the public on environmental risks resulting from disasters, and take several actions to better enable the agency to minimize environmental risks following disasters. In commenting on a draft of this report, EPA's Associate Administrator for Homeland Security agreed with all but one of the recommendations. Specifically, EPA agreed with the recommendations to provide additional asbestos air monitoring in New Orleans, improve environmental health risk communications following disasters, provide more guidance to states on managing debris disposal following disasters, and clarify debris management roles with the Army Corps of Engineers. However, EPA disagreed with our recommendation that the agency convene a working group that includes potentially affected federal land management agencies and the Coast Guard to develop protocols or memorandums of understanding on the steps the agencies should take to obtain disaster funding for environmental cleanups on federal lands in the future—and thereby address damage to federal lands and wildlife in a timely and efficient manner. Rather, EPA asserted that this recommendation would be more appropriately addressed to the Department of the Interior and FEMA. We continue to believe that EPA should be involved in helping resolve these issues because, under the National Response Plan, EPA is the chair of the National Response Team, whose duties include national planning and response coordination for oil and hazardous materials incidents. We do agree that FEMA, which declined to provide funding to the Department of the Interior for cleanup after Hurricane Katrina, and DHS, which coordinates the federal response to such incidents as major disasters under the National Response Plan, should also take part in planning efforts to resolve funding issues concerning the removal of hazardous materials from federal lands following a disaster. Accordingly, we have modified our recommendation to state that EPA should also work with DHS and FEMA, as well as with federal land management agencies and the Coast Guard, to determine what actions are needed to ensure that environmental contamination on federal lands, such as national wildlife refuges, can be expeditiously and efficiently addressed in future disasters. EPA also provided comments on aspects of the report it considered misleading or inaccurate, as well as technical comments, which we incorporated as appropriate. EPA's letter and our detailed response to it appear in appendix II.

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## Background

Issued in December 2004, the Department of Homeland Security's National Response Plan establishes a comprehensive framework for the management of domestic incidents where federal involvement is necessary. Hurricane Katrina marked the first time the National Response Plan was implemented in response to an "incident of national significance"—an actual or potential high-impact event that requires a coordinated response by a combination of federal, state, local, tribal, nongovernmental, or private-sector entities in order to save lives, minimize damage, and provide the basis for long-term community recovery and mitigation activities.<sup>4</sup> The National Response Plan describes the structure and process of this national approach, sets forth federal roles and responsibilities, and includes 15 emergency support function annexes that describe the missions and responsibilities of federal agencies for coordinating resource and program support in specific disaster response areas.

Under the National Response Plan, EPA serves as the coordinator of the federal emergency support function for oil and hazardous materials releases. Under this support function, both EPA and the U.S. Coast Guard are the primary agencies charged with providing the federal support, including assessments and cleanups in response to releases. According to the plan, EPA generally leads responses to inland releases, while the Coast Guard leads responses to releases in coastal zones. The National Response Plan incorporates the structures and response mechanisms of the National Oil and Hazardous Substances Pollution Contingency Plan, the federal government's guide to oil and hazardous substances spill response under the Clean Water Act and the Superfund law. EPA's role under the National Response Plan and the National Contingency Plan is similar: providing response and recovery actions to minimize threats to public health, welfare, or the environment caused by the actual or potential release of oil and hazardous materials. However, in the context of providing major disaster assistance to the states under the Stafford Act, EPA's response is approved and funded by FEMA, while when it responds under the National Contingency Plan, EPA uses its own processes and funding, based on its

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<sup>4</sup>The National Response Plan applies to all incidents requiring a coordinated federal response as part of an appropriate combination of federal, state, local, tribal, private-sector, and nongovernmental entities. For incidents requiring a coordinated federal response, but of lesser severity than an incident of national significance, the plan includes a comprehensive network of incident annexes and supplemental federal contingency plans that may be implemented by the departments and agencies with established authorities in coordination with the National Response Plan framework.

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authority under the Clean Water Act or Superfund law. Thus, in its Hurricane Katrina response, EPA actions were primarily funded by FEMA; however, EPA used Superfund authority and funding to test for contamination at Superfund sites in the affected Gulf Coast area.

Under the National Response Plan, other agencies, including the Department of Defense (U.S. Army Corps of Engineers) and the Department of Health and Human Services, are given supporting roles in the federal response to oil and hazardous materials releases. The Army Corps of Engineers (Corps) is also the primary federal agency tasked with providing technical assistance, engineering, and construction management resources and support during response activities related to public works and engineering. Among other things, the Corps is responsible for providing debris removal and disposal and the repair, replacement, or restoration of disaster-damaged public facilities. EPA provides support to the Corps for, among other activities, assessing drinking water supplies and wastewater and solid waste facilities. The Department of Health and Human Services is the primary federal agency tasked with assisting state, local, and tribal governments in identifying and meeting public health and medical services needs. Health and Human Services' responsibilities include providing medical care personnel, equipment, and supplies and coordinating with EPA and the Corps on water and wastewater issues, solid waste disposal issues, and other environmental health issues. The Department of Health and Human Services also determines the appropriateness of requests for public health and medical information.<sup>5</sup>

EPA can exercise its existing environmental authorities during disaster response activities. For example, under the Clean Air Act, EPA regulates emissions of volatile organic compounds in gasoline, which contribute to the formation of ground-level ozone. Also under the Clean Air Act, EPA regulates emissions of air toxics such as asbestos. Under the Superfund law, EPA responds to the actual or threatened release of hazardous substances that pose a threat to public health or welfare or the environment. In this regard, EPA maintains the National Priorities List, its

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<sup>5</sup>In addition, the primary Joint Information Center, established in support of the National Response Plan, is authorized to release general medical and public health response information to the public after consultation with the Department of Health and Human Services. The Joint Information Center is a physical location where public affairs professionals from organizations involved in incident management activities provide emergency information, crisis communications, and public affairs support.

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list of seriously contaminated Superfund sites.<sup>6</sup> Under the Resource Conservation and Recovery Act (RCRA), EPA has a role in establishing criteria for classifying different types of solid waste disposal facilities (generally referred to as landfills) and solid waste disposal practices that may result in adverse effects on health or the environment. In order to facilitate response and recovery activities following the hurricanes, EPA exercised its enforcement discretion by issuing “no action assurance” letters stating that EPA would not enforce certain Clean Air Act requirements for building demolitions involving asbestos-containing material to facilitate debris removal in Louisiana and Mississippi. According to EPA, the agency also waived some Clean Air Act fuel requirements to prevent fuel supply interruptions in the months following Hurricanes Katrina and Rita.

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## **EPA Has Taken Numerous Actions to Mitigate and Assess the Environmental Impacts of Katrina**

Under challenging circumstances, EPA conducted a wide variety of activities to assess and mitigate the environmental impacts of Hurricane Katrina. Specifically, EPA and federal and state partners have responded to chemical and oil spills at industrial facilities, collected abandoned chemical drums and tanks, and coordinated recycling efforts for damaged refrigerators and other appliances. EPA has also taken a number of actions to assess the environmental contamination caused by the hurricane, including conducting air, water, and sediment and soil sampling for chemicals of potential concern in Louisiana and Mississippi.

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<sup>6</sup>The Hazard Ranking System is the principal mechanism EPA uses to place sites on the National Priorities List. The system serves as a screening device to evaluate the potential for releases of uncontrolled hazardous substances to cause human health or environmental damage.

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## EPA Has Conducted a Variety of Activities to Mitigate the Impacts of Oil Spills and Hazardous Materials Releases

As of December 2006, EPA had spent an estimated \$416 million on a wide variety of activities to assess and mitigate the environmental impacts of the hurricanes.<sup>7</sup> At its peak, EPA had about 1,600 staff and contractors working in the Gulf Coast region to assist with response and cleanup activities, as well as thousands of additional employees supporting the agency's response from headquarters and regional offices across the country.<sup>8</sup> Because EPA's environmental protection responsibilities require it to be among the first federal agencies to arrive after a disaster, before Hurricane Katrina made landfall, EPA deployed personnel and resources to FEMA and state emergency operations centers in Louisiana, Mississippi, Alabama, and Florida to facilitate a quick response in the states threatened by Katrina. In this regard, the agency assumed an unanticipated role in New Orleans, joining federal, state, and local responders in the massive search and rescue efforts in the days following the storm. Using watercraft equipped to address oil and hazardous substances releases, EPA staff and contractors helped save nearly 800 residents from the New Orleans floodwaters.

As the coordinator for the federal response to actual or potential oil and hazardous materials releases under the National Response Plan, EPA led efforts to evaluate and clean up such spills on land and in inland waters, while the Coast Guard led these efforts for spills into coastal waters.<sup>9</sup> EPA conducted "reconnaissance" activities at the many industrial facilities, such as oil refineries and chemical plants, in the Gulf Coast area to identify and plan any cleanup needed as a result of Katrina's impact. Specifically, EPA conducted aerial and ground assessments of these facilities and used

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<sup>7</sup>EPA officials said that, as of December 31, 2006, EPA had received funding from FEMA totaling \$718.4 million. Of this amount, EPA had obligated \$563.7 million and had expended \$415.5 million, including \$80.1 million passed directly to the U.S. Coast Guard. In addition, EPA had expended approximately \$13 million of appropriated resources in support of the responses to Hurricanes Katrina and Rita.

<sup>8</sup>EPA used its existing emergency support contracts during its Katrina response: (1) Emergency and Rapid Response Services contracts for personnel, equipment, and materials to provide emergency removal and remedial response cleanup services, including containing, recovering, and disposing of hazardous substances; and (2) Superfund Technical Assessment and Response Team contracts for personnel providing technical support for gathering and analyzing site assessment technical data, preparing reports on oil and hazardous substance investigations, and providing technical support for cleanup efforts.

<sup>9</sup>The Coast Guard estimated that 8 million gallons of oil were released due to Katrina and that the hurricane caused six major spills (at least 100,000 gallons each) and numerous minor ones (less than 10,000 gallons each).

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facility self-assessments to determine the magnitude of potential hazardous releases and to prioritize facilities needing additional assessments. EPA also conducted cleanups at stores selling chemicals for swimming pools, home repair and building supply stores, and other sites. Working with the Louisiana Department of Environmental Quality, EPA also evaluated potentially hazardous chemicals at over 350 chemistry and biology laboratories in schools in southern Louisiana, removing chemicals from more than 130 schools.

In addition, EPA worked with the Coast Guard and the Louisiana Department of Environmental Quality to oversee sampling and cleanup of a large oil spill at the Murphy Oil USA refinery in St. Bernard Parish, Louisiana. The floodwaters from Katrina had damaged a large aboveground storage tank at the refinery, releasing about 1 million gallons of mixed crude oil onto the facility and an adjacent residential neighborhood, affecting approximately 1,800 homes. EPA and the Coast Guard divided responsibility for overseeing Murphy Oil's voluntary cleanup of the spill. EPA worked with the Louisiana Department of Environmental Quality to oversee Murphy Oil's cleanup in residential areas accessible to the public, such as parks, school yards, roads, and sidewalks.<sup>10</sup> In addition, EPA is continuing to oversee Murphy Oil's soil sampling at residential and other properties—for example, by having 10 percent of the soil samples Murphy Oil collects analyzed by both Murphy Oil and a separate laboratory as a quality control measure. According to EPA officials, the agency will continue to oversee Murphy Oil's cleanup of affected areas until these activities are complete.<sup>11</sup>

Other EPA efforts to mitigate the environmental impacts of Hurricane Katrina have centered on managing the disposition of debris that may contain hazardous materials. Specifically, EPA established a plan to segregate, collect, and properly dispose of debris such as household hazardous waste (household cleaning chemicals, paints, and pesticides); electronic waste (computers, televisions, printers, DVD players, and other

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<sup>10</sup>The Coast Guard oversaw the company's removal of oil from the canals in the area, an oil tank farm containment area, and storm drains.

<sup>11</sup>Murphy Oil agreed to settle a class action lawsuit brought against the company by individuals and entities that were allegedly injured or damaged from the oil spill. In January 2007, a court approved a \$330 million settlement agreement that pays for the acquisition of property, damage remediation, and compensation for losses. *Turner v. Murphy Oil U.S.A., Inc.*, No. 05-4206 (E.D. LA. filed Aug. 9, 2005).

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electronics); and white goods (large appliances such as air conditioners, dishwashers, refrigerators, stoves, and freezers). These items frequently contain contaminants, such as lead, mercury, or chlorofluorocarbons, that can enter the ground, water, or air if they are not disposed of properly. In both Louisiana and Mississippi, EPA organized neighborhood curbside pickups of household hazardous waste and circulated information about them; EPA also worked with local officials to establish collection and drop-off sites for debris that may contain hazardous materials. In addition, EPA established debris staging areas for sorting and categorizing industrial and household hazardous waste that EPA and its contractors had collected, draining and recycling hazardous chemicals, and ensuring that hazardous containers were disposed of properly. As of September 1, 2006, EPA's efforts to facilitate the appropriate disposal of debris that may contain hazardous materials had resulted in the

- collection of more than 5.1 million containers of potentially hazardous waste consisting of about 4.9 million small household containers and about 200,000 large abandoned containers, such as drums, tanks, and cylinders;
- removal of the chlorofluorocarbons and other refrigerants that are harmful to the environment and recycling of 380,000 white goods; and
- collection and recycling of over 660,000 units of electronic waste.

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### EPA Has Sampled the Air, Water, and Sediment and Soil in Affected Gulf Coast Areas to Identify and Assess Environmental Contamination Caused by the Storm

EPA also conducted numerous activities to identify and assess air, water, and sediment and soil contamination in Gulf Coast areas affected by Katrina. For example, EPA was concerned about the potential environmental impact of Katrina on the 24 Superfund sites in the affected Gulf Coast areas. These sites are on EPA's National Priorities List, which identifies the agency's highest-priority cleanup sites. Many of the Gulf Coast Superfund sites have been cleaned up and have remedies in place to maintain the standard of cleanup achieved.<sup>12</sup> To determine whether the hurricane had caused additional contamination, from September 29 to October 14, 2005, EPA collected sediment, surface water, and groundwater samples at or near the 24 Superfund sites in Louisiana, Mississippi, and Alabama, comparing the samples obtained after the hurricane with pre-

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<sup>12</sup>EPA also assessed the potential impact on an additional 30 Superfund National Priorities List sites in southwest Louisiana and southeast Texas after Hurricane Rita struck this area.

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Katrina samples collected during remedial investigations or routine monitoring activities.<sup>13</sup> EPA found that four sites in Louisiana had elevated contaminant levels, one with contaminants that had not been previously detected.<sup>14</sup> Given the particular situations at these four Superfund sites, EPA determined that continued monitoring according to the sites' routine operation and maintenance plans would address these problems. On the basis of the sampling results, EPA concluded that the other 20 sites reviewed were not impacted by Katrina. Additionally, EPA Region 4 conducted soil and sediment samples near several industrial facilities in the affected areas of Mississippi to determine if flooding from Katrina had released hazardous materials. With one exception, the region found that there did not appear to be any indication of any potential releases due to the hurricane.<sup>15</sup>

In addition, potential sources of air pollution that could occur as a result of a hurricane include spills of volatile chemicals, releases or leaks from industrial plants, dust from building demolition and debris transport, contaminated sediments that can be resuspended as dust, and smoke from open burning of debris. EPA began screening air quality in Louisiana and Mississippi in coordination with state departments of environmental quality on August 30, 2005, to provide initial air quality assessments. EPA employed such equipment as the agency's (1) Airborne Spectral Photometric Environmental Collection Technology flying laboratory,

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<sup>13</sup>EPA Region 4 also compared the sample results from the Superfund sites reviewed in Mississippi and Alabama with the EPA Office of Water 2004 National Recommended Water Quality Criteria and EPA Region 9 Preliminary Remediation Goals to determine if those sites' conditions might also represent previously unrecognized risks to human health and the environment.

<sup>14</sup>EPA concluded from the assessment of the Agriculture Street Landfill in New Orleans, 1 of the 24 Superfund sites reviewed, that the flooding did not cause any lead (the contaminant of concern) to migrate up through the site's soil cover. However, sediment samples EPA collected on the site and in the area contained benzo(a)pyrene levels that exceeded Louisiana Department of Environmental Quality risk standards. EPA reported on August 17, 2006, that it had contacted the Housing Authority of New Orleans (the property owner and manager) regarding the sampling results and planned to work with the authority to ensure plans for the site addressed this contamination. Additionally, EPA stated it would provide a closeout report when the authority announced its specific plans.

<sup>15</sup>The one exception EPA Region 4 identified involved the Naval Construction Battalion Center in Gulfport, Mississippi. Although EPA detected elevated dioxins at some of the sampling points near this facility, the agency concluded that none of the concentrations detected caused concern about effects on human health and that the site was not adversely impacted by Katrina.

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equipment mounted in a small aircraft that can obtain detailed chemical information from a safe distance; and (2) Trace Atmospheric Gas Analyzer mobile laboratories, which are self-contained units capable of real-time sampling and analysis, to conduct air monitoring immediately following Katrina. In addition, EPA worked with state partners to restore damaged or lost air quality monitoring stations. EPA has performed air sampling to test for contaminants such as lead, arsenic, asbestos fibers, volatile organic compounds, particulate matter, and other pollutants using temporary ambient air monitoring stations in Louisiana and Mississippi.

Another key component of EPA's activities to assess the environmental impacts of Katrina focused on helping both Louisiana and Mississippi perform drinking water and wastewater infrastructure assessments. Many of these facilities along the Gulf Coast were damaged and became inoperable. EPA helped perform about 4,000 drinking water and wastewater infrastructure assessments to help bring these facilities back online as quickly as possible after the hurricane. Among other things, EPA provided assistance to help assess the status of both states' public water systems; helped collect and analyze drinking water samples, including providing mobile labs to help with this effort; and provided information to the public, such as flyers about drinking water quality. EPA's Office of Emergency Management also noted in its September 2006 annual report that EPA was working closely with FEMA and Louisiana and Mississippi state officials to establish long-term recovery plans, with an emphasis on water and wastewater infrastructure.

EPA also coordinated with various federal and state agencies to test surface water bodies (such as rivers, lakes, and the Gulf of Mexico) and floodwaters in the aftermath of Hurricanes Katrina and Rita. Among other efforts, EPA, the National Oceanic and Atmospheric Administration, the Food and Drug Administration, and the U.S. Geological Survey coordinated an environmental impact assessment of the coastal waters throughout the affected region. By integrating response activities aboard two EPA and National Oceanic and Atmospheric Administration survey and research vessels, small boat teams were able to characterize the magnitude and extent of the coastal contamination and ecological effects from these hurricanes. These efforts, which were conducted between September 27 and October 14, 2005, generally found that the water was safe for recreational use, including swimming. EPA also coordinated with the Mississippi Department of Environmental Quality to conduct a water quality study in the rivers and bays along the Mississippi coast in September 2005. The objective of this study was to provide sediment and

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water quality data on the major bay systems along the Mississippi Sound.<sup>16</sup> According to this study, few pollutants were identified.

The severe and sustained flooding of about 80 percent of New Orleans and large areas of Plaquemines and St. Bernard Parishes from Hurricanes Katrina and Rita prompted EPA and the Louisiana Department of Environmental Quality to test the floodwaters and the resulting sediment from the hurricanes. Because the flooded portions of the New Orleans area were below sea level and had little natural drainage, there were grave concerns about the environmental health risks as the floodwaters commingled with contaminants such as oil and gas from ruptured lines and storage tanks; sewage; and various chemicals leached from abandoned drums, containers, and vehicles. The additional storm surge from Hurricane Rita, which occurred about 1 month after Katrina, further exacerbated the situation when it reflooded much of New Orleans and the surrounding parishes. To determine the potential environmental effects of the floodwaters, EPA and the Louisiana Department of Environmental Quality collected nearly 400 water samples of the flooded areas and also periodically collected samples from Lake Pontchartrain as the floodwaters were being pumped from the flooded areas around New Orleans into the lake. The samples from the floodwaters were tested for bacteria and about 200 chemicals. While numerous samples revealed elevated bacteria levels, EPA and the Louisiana Department of Environmental Quality reported that this was expected, given the commingling of floodwaters with sewage collection system waters. Although a small number of samples contained concentrations of chemicals that exceeded short-term (i.e., 90 days) standards for dermal contact and incidental ingestion, the agencies concluded that there was realistically no circumstance that would lead to continuous exposure to the floodwaters beyond a few days.<sup>17</sup> Unlike Louisiana, areas in Mississippi and Alabama hit by Katrina did not

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<sup>16</sup>The Mississippi Sound spans the entire Mississippi Gulf Coast and is separated from the Gulf of Mexico by a series of narrow islands and sandbars. Numerous coastal bays are contained within the system, including St. Louis Bay, Biloxi Bay, and Pascagoula Bay. EPA stated that the study was not designed to identify specific pollutant sources or provide definitive information on the potential long-term effects of the hurricanes on human or ecological health.

<sup>17</sup>Additionally, the Louisiana Department of Environmental Quality and the U.S. Geological Survey collected over 100 samples from 50 pumping stations in the Lake Pontchartrain area during September and October 2005 that showed low bacteria concentrations in the lake within recreational standards.

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experience any sustained flooding, although they did experience severe damage from the hurricane's storm surge, high winds, and rainfall.

Once the Army Corps of Engineers completed draining the floodwaters from the New Orleans area on October 11, 2005, the environmental health risk to area residents and emergency responders from the waters was eliminated. However, renewed concerns arose over the potentially contaminated sediment the floodwaters left behind. As the floodwaters in New Orleans and the surrounding parishes receded, sediments ranging in depth from less than an inch to several feet remained in some areas.<sup>18</sup> As would be expected, sediment was more prevalent in those areas where the floodwaters flowed over or breached levees, while in other areas, little or no sediment was left behind.

EPA, in coordination with the Louisiana Department of Environmental Quality and several other federal and state agencies, carried out sediment testing in four phases, collecting up to 1,800 sediment and soil samples. The samples were collected from streets and other public access areas, including golf courses, in sections of New Orleans that had been flooded. On the basis of these samples, EPA and the Louisiana Department of Environmental Quality generally concluded, in conjunction with other federal and state agencies, that the sediments left behind by the flooding were not expected to cause adverse health effects to individuals returning to New Orleans. Specifics regarding the four phases of the sediment testing follow. Unless otherwise noted, the samples were (1) analyzed for about 200 metals and organic chemicals, including lead, arsenic, gasoline, diesel fuel, and oil, as well as for bacteria; and (2) evaluated using Louisiana Department of Environmental Quality Risk Evaluation/Corrective Action Program Screening Option Standards and EPA's risk criteria based on long-term (30 years) residential exposure assumptions.<sup>19</sup>

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<sup>18</sup>For purposes of its hurricane response sampling effort, EPA defined sediment as "residuals deposited by receding floodwaters which may include historical sediment from nearby water bodies, soil from yards, road and construction debris, and other materials."

<sup>19</sup>The Louisiana Department of Environmental Quality has developed a Risk Evaluation/Corrective Action Program to address risks to human health and the environment from the release of chemical constituents. The program consists of a screening option and three management options. The screening option may be used to manage an area of concern expeditiously, or determine if it warrants further investigation, while the three-tiered management options allow site evaluation and corrective action efforts to be tailored to site conditions and risks.

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- Phase 1 of the sediment sampling included about 450 samples as follows: (1) 430 individual samples EPA collected from September 10 to October 14, 2005, in Jefferson, Orleans, Plaquemines, and St. Bernard Parishes; (2) 23 samples collected by the Louisiana Department of Environmental Quality on November 10, 2005;<sup>20</sup> and (3) 14 samples collected on November 19 and 20, 2005, by EPA and the Louisiana Department of Environmental Quality at locations tested previously where contaminant concentrations exceeded the Louisiana Department of Environmental Quality and EPA risk criteria.<sup>21</sup>
  - Phase 2 of the sediment sampling included about 280 individual samples collected in the Lower Ninth Ward (part of Orleans Parish) and St. Bernard Parish from October 29 to November 27, 2005—areas that were severely impacted by the flooding.
  - Phase 3 of the sediment sampling focused primarily on 43 locations in flood-impacted areas where elevated concentrations of arsenic, lead, or benzo(a)pyrene had been found in phases 1 and 2.<sup>22</sup> To determine whether the elevated levels of these contaminants were limited to the specific location originally sampled or reflected more widespread contamination, up to 10 composite samples were collected within a 500-foot radius of each of the 43 locations from February 16 to February 22, 2006. The composite samples combined four discrete sediment or soil samples, and most were analyzed only for the individual contaminant that was elevated in the original sediment sample.
  - Phase 4 sediment sampling included 586 samples collected in Orleans and St. Bernard Parishes from February 6 to June 30, 2006.<sup>23</sup> These samples were analyzed for polycyclic aromatic hydrocarbons, pesticides, herbicides, diesel and oil range organic chemicals, and

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<sup>20</sup>These 23 samples were analyzed for arsenic, lead, polynuclear aromatic hydrocarbons, and total petroleum hydrocarbons.

<sup>21</sup>The agencies resampled at 14 of the 145 locations at which the initial sampling exceeded the risk criteria based on their resampling criteria: the sediment depth had to exceed 1.5 centimeters (a little more than one-half inch).

<sup>22</sup>To address public concerns, phase 3 also included samples in public access areas of a neighborhood near a former pesticide blending facility that had not been included in phases 1 and 2. These composite samples were analyzed for a complete spectrum of pesticides.

<sup>23</sup>Duplicate samples were collected at 126 of the locations, resulting in the analysis of 712 samples.

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metals. In this phase, potential sampling sites were selected using a grid of the “eastern half of the flooded area.” EPA identified 1,676 potential sampling sites on the grid. EPA did not collect samples from a majority of these sites (1,090) because (1) the sampling site was in a commercial area, (2) the sediment was less than 0.5 centimeters thick (less than one-quarter of an inch), or (3) no sediment was present.

EPA’s response activities have included providing a substantial amount of information to the public on the environmental health risks from Katrina, including three environmental assessment summaries that focused primarily on the results of these sediment samples taken in New Orleans. The first summary also conveyed the results of air and water sampling in the New Orleans area. Beginning shortly after Hurricane Katrina, in September 2005, EPA started to provide other information to the public on environmental health risks and actions to mitigate exposures via flyers, health advisories, and public service announcements that were distributed at various locations throughout the hurricane-damaged areas, made available to the media, and posted on EPA’s Web page. For example, EPA reported that it distributed over 3.8 million flyers on various topics, such as hazardous waste collection, mold problems, and potential environmental health hazards.

Overall, EPA’s response activities varied in Louisiana and Mississippi based, in part, on the environmental impacts and needs of the affected parishes and counties. While EPA’s response is complete in Mississippi, EPA Region 6 continues to assist the state of Louisiana with its recovery efforts and currently plans to continue to do so until at least September 2007. State and local government decisions continue to affect the length of time EPA will need to maintain a presence in Louisiana parishes. For example, local government decisions about home condemnation and demolition processes will affect the length of time EPA needs to continue its debris management and air monitoring activities in the New Orleans area.

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## EPA's Air Monitoring for Releases of Asbestos Fibers in New Orleans Does Not Adequately Address Neighborhoods with Substantial Building Demolition and Renovation Activities

EPA's Clean Air Act asbestos regulation seeks to minimize the significant human health risks—including lung disease and cancer—associated with inhalation of asbestos fibers from building demolition and other activities. To facilitate and expedite demolition and rebuilding following Hurricane Katrina, EPA stated that it would not enforce certain requirements under the asbestos regulation, at the request of the Louisiana and Mississippi Departments of Environmental Quality. In addition, many demolition and renovation activities—those by individual homeowners—are generally unregulated under EPA's asbestos regulation. EPA took steps to measure asbestos emissions after Hurricane Katrina—for example, initially more than doubling from 5 to 12 the ambient (outdoor) air monitors in the area prior to the storms.<sup>24</sup> However, air monitors generally have not been located in areas in which much of the building demolition and renovation is occurring.

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## EPA's Clean Air Act Asbestos Regulation Covering Building Demolition Activities Seeks to Minimize the Significant Human Health Risks Associated with Exposure to Asbestos Fibers in the Air

The Clean Air Act of 1970, as amended, requires EPA to develop and enforce regulations to protect the general public from exposure to hazardous air pollutants—also called air toxics—that are known to be hazardous to human health. Asbestos is an air toxic consisting of naturally occurring fibrous minerals with high tensile strength, the ability to be woven, and resistance to heat and most chemicals. Because of these properties, asbestos fibers have been used in a wide range of manufactured goods, including roofing shingles, ceiling and floor tiles, paper and cement products, and textiles. Exposure to asbestos can be harmful to human health if asbestos fibers are released into the air, such as when asbestos is disturbed or in poor condition and these fibers are inhaled into the lungs. Such releases of asbestos fibers can occur during building renovations and demolitions. Asbestos was among the first air toxics EPA regulated. EPA has promulgated regulations governing the renovation and demolition of buildings with asbestos-containing materials to protect the public from the risks associated with exposure to asbestos fibers.<sup>25</sup>

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<sup>24</sup>According to EPA, the monitors can measure ambient concentrations of the following potential pollutants and categories of pollutants from local and regional sources: arsenic, asbestos, lead, particulate matter, polycyclic aromatic hydrocarbon chemicals, and volatile organic compounds.

<sup>25</sup>See National Emissions Standard for Asbestos, 40 CFR Part 61, Subpart M.

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Some significant health effects associated with asbestos exposure—such as asbestosis and lung cancer—have been recognized for many years. Asbestosis is a serious, progressive, long-term disease caused by inhaling asbestos fibers that produces scarring and inflammation of the lung tissue, thereby making it harder for the lungs to get oxygen into the blood. Lung cancer causes the largest number of deaths related to asbestos exposure. Individuals working in occupations involving the mining, milling, manufacturing, and use of asbestos and its products, including construction and demolition workers, are more likely to get lung cancer than the general population.

Diseases linked to asbestos exposure take a long time to develop. Specifically, most cases of lung cancer or asbestosis in asbestos workers occur 15 years or more after initial exposure to asbestos, and cases of mesothelioma (cancer of the lining of the lungs) are commonly diagnosed 30 years or more after exposure. Cases of mesothelioma have been reported in family members of asbestos workers after exposure to these workers at home and in individuals without occupational exposure who live close to asbestos mines.<sup>26</sup>

According to EPA, scientists have not been able to identify a safe, or threshold, level for exposure to airborne asbestos. Rather than regulating this air toxic by setting emission standards for emission sources, as is typically done to mitigate health risks, EPA's national emissions standards for asbestos regulate various potential sources of asbestos emissions, including renovation and demolition activities, by setting standards for work practices.<sup>27</sup> EPA has granted some states, including Louisiana and Mississippi, approval to implement and enforce the asbestos standards. However, EPA retains the authority to enforce its requirements; to oversee states' implementation of the air toxics program in general; and to withdraw the delegation of the program if a state does not, for example, adequately enforce the program. Under EPA's regulations of demolitions

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<sup>26</sup>Related information on the adverse health effects due to asbestos can be found via the Department of Health and Human Services, Agency for Toxic Substances and Disease Registry Web page at [http://www.atsdr.cdc.gov/asbestos/asbestos/health\\_effects](http://www.atsdr.cdc.gov/asbestos/asbestos/health_effects).

<sup>27</sup>The Clean Air Act provides EPA with the authority to promulgate a work practice standard to mitigate health risks if it is not feasible to establish an emission standard. 42 U.S.C. § 7412(h). In its 1978 rule amending EPA's asbestos standard, the agency said that it was not feasible to prescribe a numerical emission standard for building demolitions or renovations. See 40 C.F.R. § 61.145(c), *Procedures for asbestos emissions control*.

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involving asbestos, the owner or operator of the demolition activity generally must

- inspect buildings for asbestos where demolition or substantial renovation activity will occur;
- provide written notice to EPA or the state of intention to renovate or demolish buildings that have asbestos-containing material;
- remove all regulated asbestos-containing material before any activity begins that would break up, dislodge, or disturb the material;<sup>28</sup>
- wet all regulated asbestos-containing material exposed during cutting or disjoining operations and stripping operations so that no emissions are visible during the demolition;
- take steps to contain asbestos-containing material in preparation for disposal, such as wetting the material or encasing it in leak-tight wrapping; and
- undertake the removal of asbestos-containing material in the presence of an on-site representative who has been trained to comply with the provisions of the asbestos standard.

However, if a building is to be demolished by government order because it is structurally unsound *and* in danger of imminent collapse, it is not required to be inspected for asbestos, and the regulated asbestos-containing materials are not required to be identified and removed first. Nevertheless, specified notification requirements and emission control

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<sup>28</sup>Regulated asbestos containing material (RACM) means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by the asbestos work practice standards. Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 C.F.R. part 763, section 1, Polarized Light Microscopy. Category II nonfriable ACM means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 C.F.R. part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

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requirements—primarily the wetting of asbestos-containing materials to limit releases of asbestos fibers—still apply to the demolition operation.<sup>29</sup> Importantly, these standards generally do not apply to the demolition or renovation of a residential building by or for an individual homeowner.<sup>30</sup>

Many of the flooded homes in New Orleans that will be demolished or substantially renovated are likely to contain asbestos-containing materials, such as roof shingles, siding, flooring, and ceilings. For example, analysis by the Louisiana Department of Environmental Quality shows that the majority of land tracts in the New Orleans area contain homes built before 1980, when use of asbestos products was prevalent. As of January 2007, about 25,000 homes had been identified as awaiting demolition—98 percent of which are concentrated in the Orleans and St. Bernard Parishes.<sup>31</sup> According to the Louisiana Department of Environmental Quality, another 80,000 homes that were flooded in the New Orleans area are not yet included in the demolition estimates, but many of them will likely be demolished. Those that are not demolished will very likely have to be substantially renovated.

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## EPA Has Issued “No Action Assurances” for Certain Clean Air Act Asbestos Requirements Governing the Demolition of Buildings to Help Expedite the Gulf Coast Cleanup

On rare occasions, EPA issues “no action assurance” letters stating that it will not enforce certain legal requirements. EPA recognizes that such assurances could erode the credibility of the agency’s enforcement program by creating real or perceived inequities in the agency’s treatment of the regulated community. Consequently, under EPA policy guidance, such assurances are to be used only in extremely unusual cases when clearly necessary to serve the public interest—such as to avoid extreme risks to public health or safety or to obtain important information for research purposes—when no other mechanism can adequately address the problem presented.

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<sup>29</sup>40 C.F.R. § 61.145(a)(3); see EPA Office of Compliance, *Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development*, at VII-15 (April 2005).

<sup>30</sup>Demolition or renovation by the individual homeowner of a residential building with four or fewer dwelling units is not covered by EPA’s asbestos national emissions standards, unless the demolition is part of a larger overall project carried out by one owner or operator.

<sup>31</sup>Summary of homes remaining for demolition. Information compiled from the January 6, 2007, weekly status report from the Department of Homeland Security.

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To facilitate and expedite demolition and rebuilding following Hurricane Katrina, Louisiana and Mississippi requested that EPA issue no action assurance letters concerning some provisions of the national emissions standard for asbestos. In light of the extraordinary demolition, cleanup, and debris disposal required on the Gulf Coast, EPA issued several no action assurance letters to Louisiana and Mississippi. Under letters issued in February 2006, residences that are subject to a government-issued demolition order based on the residence being (1) structurally unsound but not necessarily in danger of imminent collapse, (2) moved off of its foundation, or (3) uninhabitable for other environmental reasons, such as flooding, are effectively not subject to otherwise applicable requirements for inspection and removal of asbestos prior to demolition. Such structures must nonetheless be demolished, transported, and disposed of in accordance with specified requirements aimed at ensuring adequate protection of any asbestos the buildings may contain. These requirements include notification, thorough wetting of the building both prior to and during the demolition process, and proper disposal of all of the debris as if it contained asbestos.<sup>32</sup> EPA's 2006 no action assurance letters also allowed government-issued demolition orders to be expanded to groups of residences instead of only individual residences because it may not be practical for state or local officials to make an individual determination for every residential structure. The no action assurances apply to the Louisiana and Mississippi Departments of Environmental Quality, to local governments, and to the Army Corps of Engineers, as well as to any persons operating at the direction of these government entities.

The Army Corps of Engineers is the prime contractor for many of the demolitions covered by the no action assurances, including all of them in Orleans Parish. Some parishes—most notably St. Bernard Parish—use other contractors or a mix of the Corps and other contractors. According to data from FEMA, of the vast majority of the remaining 25,000 demolitions estimated as of January 2007, approximately half are in Orleans Parish and half in St. Bernard. Regarding demolitions conducted by the Corps and its contractors, the Corps said that approximately 85 percent of the 2,600 demolitions conducted in Orleans Parish, which includes the Ninth Ward, were classified as containing regulated asbestos-containing materials,

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<sup>32</sup>EPA also issued an April 28, 2006, no action assurance letter to the Louisiana Department of Environmental Quality allowing a staging process for debris from approximately 70 residential structures to be used in debris grinding and burning pilot studies in Louisiana until July 31, 2006. However, FEMA did not approve funding for these pilot studies for several reasons.

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primarily because inspections could not be performed inside properties.<sup>33</sup> The Corps also said that in other parishes, between 10 percent and 40 percent of the structures it had demolished were classified as containing regulated asbestos-containing materials on the basis of inspections.

Initially, the no action assurance letters were in effect for 1 year—that is, until February 2007. Officials from Louisiana told us that while EPA's no action assurances were helpful in allowing demolitions to proceed at a faster pace, a number of other issues, such as landfill capacity and the building condemnation process, have contributed to demolition delays. As a result, on December 21, 2006, the Louisiana Department of Environmental Quality requested an extension of the no action assurances until February 2008 because many demolitions have yet to be conducted. Citing information from the Army Corps of Engineers, the Louisiana Department of Environmental Quality told EPA that, as of December 2006, 10,000 residences had been demolished, but more than 25,000 demolitions are likely to be needed.<sup>34</sup> In supplemental information supporting the extension request, the Louisiana Department of Environmental Quality provided EPA with repopulation estimates on the basis of estimates by The Brookings Institution's December 2006 report, *Katrina Index: Tracking Variables of Post-Katrina Recovery*. For the Orleans and St. Bernard Parishes, 41 percent and 39 percent, respectively, of the residents were estimated to have returned as of August 2006, compared with Census 2000 population estimates.<sup>35</sup> The Louisiana Department of Environmental Quality also cited a plan for the recovery of the Ninth Ward that stated about 20 percent of the residents of the Ninth Ward had returned.<sup>36</sup> This plan also stated that homeowners have gutted 30 percent of the houses in this ward and that owners have repaired or are in the process of repairing another 30 percent of the housing. A March 2007 update to the *Katrina Index*, which did not update the August 2006 repopulation estimates, stated

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<sup>33</sup>According to the Army Corps of Engineers, residences it had demolished were inspected for asbestos prior to demolition except when it was not safe to enter a structure, the structure had transite shingles or siding (which the Corps classifies as regulated asbestos-containing materials), or the structure was completely demolished.

<sup>34</sup>In February 2007, the Louisiana Department of Environmental Quality stated that 12,000 residences had been demolished and estimated 30,000 more home demolitions were needed.

<sup>35</sup>The margin of error for the estimates was plus or minus 9.8 percent for Orleans Parish and plus or minus 14.4 percent for St. Bernard Parish.

<sup>36</sup>*A Peoples' Plan for Overcoming the Hurricane Katrina Blues* (draft study prepared by ACORN Housing/University Partnership, Feb. 1, 2007).

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that thousands of college students and families on spring break are coming to the Gulf Coast to help with rebuilding; it also reported that the New Orleans metropolitan area gained more than 50,000 workers from November 2006 to January 2007.

On February 2, 2007, EPA approved an extension of the no action assurances through September 30, 2007, for the 11 parishes covered under Louisiana Emergency Declarations and Administrative Orders. EPA also approved an extension of the no action assurance it provided the Mississippi Department of Environmental Quality through September 30, 2007, for four counties in Mississippi. In its no action assurance letters to Louisiana and Mississippi, EPA stated that it reserved the right to revoke or modify the assurances if it determined that doing so was necessary to protect public health or the environment. Moreover, we believe that the potential public health effect of demolition and renovation activities by individual homeowners—which are generally not regulated under EPA’s asbestos work practice standards—also warrants evaluation.

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## Current Asbestos Monitoring Is Not Sufficient to Assess the Potential Public Health and Environmental Impacts of Demolition and Renovation Activities

Many homes in the New Orleans area contain hazardous materials such as asbestos that could be released during demolition and renovation activities, posing health hazards for individuals exposed to asbestos fibers. The bulk of these demolition and renovation activities have yet to occur. For example, in December 2006, the Army Corps of Engineers said it had completed about 2,000 of the 6,000 to 12,000 residential demolitions it expected to perform in the Orleans Parish.<sup>37</sup> In addition to these demolitions covered by the no action assurances, the demolition and renovation activities by individual homeowners that are outside the scope of EPA’s asbestos national emissions standards will likely be substantial. For example, in December 2006, the Corps stated that the demolition effort by individual homeowners was approximately equal to the public demolition effort. Further, because of mold problems caused by the extensive flooding, many residences that do not require demolition must nonetheless be gutted—stripping the walls down to the studs—before they can be renovated. Numerous volunteer organizations continue to help individual owners by gutting the homes. For example, the Corps reported that, as of October 2006, 6,500 homes were on a list for gutting services to be provided by volunteers from various nonprofit organizations. According

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<sup>37</sup>According to the Corps, the number of residence demolitions continues to be speculative and is dependent on the city of New Orleans finalizing condemnation packages.

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to EPA, whether demolitions by volunteer groups would be subject to the asbestos work practice standards depends upon the number and location of sites and who is supervising the demolition. That thousands of demolitions and substantial renovations may occur in the same geographic area and in the same general time frame without being subject to the asbestos work practice standards represents a potential health problem—especially since the protective requirement to wet any asbestos-containing materials does not apply to unregulated demolitions and disposal.

To be responsive to potential public questions and concerns, EPA took steps to measure asbestos emissions after Hurricane Katrina—initially more than doubling from 5 to 12 the number of the ambient (outdoor) air monitors in the New Orleans area prior to the storm. EPA officials said the agency’s monitoring network was designed to include measuring the effects from both the regulated asbestos-containing material to which no action assurance letters might apply and activities not regulated, which would include demolition or renovation activities by or for individual homeowners.<sup>38</sup> In July 2006, the agency scaled back ambient air monitoring to its prestorm level of five ambient air quality monitors and also reduced the frequency of sampling to several times a month.<sup>39</sup> EPA said the decision to reduce the monitoring sites was based in part on the fact that no measurable amounts of asbestos fibers were found for the period of time that a 12-monitor network had been in place.<sup>40</sup> However, because the demolition activities in the New Orleans area generally did not start until 7 or more months after Hurricane Katrina, EPA’s cutback in asbestos air monitoring occurred before (1) most of the demolitions that are now

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<sup>38</sup>EPA is using a 1-year screening level of 0.01 fibers of the length greater than 5 µm found per cubic centimeter of air. According to EPA, this screening level was developed with consideration of the Asbestos Hazard Emergency Response Act regulations and EPA’s asbestos risk estimates.

<sup>39</sup>One monitor is in St. Tammany Parish, north of Lake Ponchartrain and Orleans Parish; one is in Metairie, west of Orleans; one is in St. Bernard Parish (Arabi); and two are in Orleans Parish—in the north at the University of New Orleans and in the east at a fire training academy near some landfill operations.

<sup>40</sup>According to air sampling information on EPA’s Web page, measurements of asbestos were below the method detection limit, a value below the minimum detectable by the method used. According to EPA, the reduction in air monitors was also a response to the delays in the demolition activities.

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completed had taken place and (2) the substantial number of remaining demolitions had begun.<sup>41</sup>

While officials from EPA's Office of Research and Development said the use of air monitors would not be effective in detecting asbestos emissions from home demolitions and renovations unless monitors were located immediately adjacent to demolition and renovation sites, monitors generally have not been located in areas in which much of the building demolition and renovation is occurring. For example, since Hurricane Katrina, EPA has not located ambient or emissions monitors in the Ninth Ward, a residential area subjected to widespread flooding in which extensive demolition and renovation are occurring. Specifically, the closest monitor is in Arabi, a city south of the Ninth Ward. EPA's air monitoring focus has not included proximity to demolition sites. EPA officials said the locations for the monitors, initially selected in October 2005, were chosen based on proximity to public access (e.g., near populated areas), wind and geographical factors, and locations of waste-moving activities.

In January 2007, EPA said that its air monitoring currently focuses on more limited geographic areas where "grinding and other remediation activities are ongoing"—for example, at debris volume reduction sites, which are often landfills. This monitoring does not rely solely on the five ambient air monitors around New Orleans but instead includes some monitoring at sites involving waste handling, burning, or grinding activities. According to EPA, conducting air monitoring at debris reduction sites is more conservative than at demolition sites since volume reduction activities such as grinding or burning have the potential to release more asbestos fibers as the material is destroyed. While this focus on debris and landfills is important, so, too, is monitoring data from areas undergoing concentrated levels of demolition and renovation.

Along these lines, according to EPA, the Army Corps of Engineers and its contractors who are conducting demolitions under government orders have monitored the air at demolition sites for asbestos emissions, and the Louisiana Department of Environmental Quality has told EPA that this monitoring has found "little or no asbestos emissions." For example, in

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<sup>41</sup>The Army Corps of Engineers demolished the first storm-damaged homes in Orleans Parish in March 2006, and demolition activities started in St. Bernard Parish in April 2006. According to Corps data reported in the December 2006 Brookings Institution *Katrina Index* cited above, the Corps had completed 195 demolitions in Orleans Parish as of July 2006 and 2,289 as of December 2006.

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November 2006, one Corps contractor reported on air sampling conducted at demolition sites where samples were primarily taken from the site perimeters (using personal sampling pumps) and from employees wearing personal monitoring equipment required by the Occupational Safety and Health Administration (OSHA).<sup>42</sup> Most of the sampling was conducted at sites that the Corps classified as containing regulated asbestos materials, and the contractor concluded that exposures to asbestos were minimal and respiratory protection was needed only as a precautionary measure.

Such air monitoring data from the Corps and its contractors do not, however, address potential asbestos emissions from the privately sponsored demolitions and renovations by individual homeowners. Since these activities are not regulated—and emissions control actions such as wetting the material from before the demolition process through disposal are not required—the potential for asbestos emissions at these sites is greater than at the regulated sites. Because EPA's air monitors have not been deployed in and around neighborhoods where demolition and renovation activities—both publicly and privately sponsored—are concentrated, the agency's finding of no measurable amounts of asbestos at its ambient monitoring sites does not necessarily address the asbestos to which residents, workers, and volunteers may be exposed in some neighborhoods.

This monitoring gap exists even though immediately after Hurricane Katrina, EPA recognized the potential health and environmental issues that could arise in New Orleans from asbestos emissions at both demolition and disposal sites. Specifically, EPA's September 2005 Overview Plan for Ambient Air Monitoring After Hurricane Katrina—which addresses air monitoring in Louisiana, Mississippi, and Alabama—discusses asbestos monitoring tentatively planned at a number of fixed sites and states that additional monitoring requirements to more specifically address both asbestos demolition and disposal operations may be established. The October 2005 Regional Air Monitoring Plan for Hurricane Katrina in Louisiana, developed by EPA Region 6, mentions air monitoring for potential emissions during decontamination, demolition, removal, and remedial action in impacted areas, but it does not establish additional monitoring requirements for asbestos demolition or disposal operations.

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<sup>42</sup>While the report includes some samples covering other activities, such as canal cleaning and debris removal, 93 percent of the samples identified in the report were collected at demolition sites.

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This plan also notes that a site-specific air sampling plan will be established to assess air pollutants resulting from debris burns and building demolition. In this regard, EPA Region 6 issued its Air Monitoring and Sampling Plan for Construction and Demolition Debris Burning or Grinding Sites in February 2006.<sup>43</sup> This plan addresses the asbestos sampling methodology to be used around activity areas such as debris piles or landfills. While this plan notes that numerous properties are expected to contain hazardous materials such as asbestos that could result in inhalation exposure, posing health hazards for individuals in the vicinity, it does not include any requirements for monitoring asbestos emissions at building renovation or demolition sites.

In contrast, EPA's conditions for granting the first Hurricane Katrina-related asbestos no action assurance to Louisiana in October 2005—which Louisiana chose not to use and which expired in April 2006—included a requirement that the Louisiana Department of Environmental Quality ensure that adequate monitoring was conducted prior to and during demolition of residences.<sup>44</sup> EPA's conditions, which were reviewed by EPA's Science Advisory Board, specifically directed Louisiana to develop a plan for monitoring that provides information sufficient to ensure adequate protection of public health and the environment and to have the plan approved by EPA Region 6. EPA further directed that the plan must, at a minimum, include representative asbestos monitoring at demolition sites.

Along these lines, an EPA pilot study conducted in 2006 in Fort Smith, Arkansas, demonstrates that air monitoring close to the source of asbestos emissions is important to detect releases of asbestos fibers. The pilot was designed to test the effectiveness of an alternative asbestos control method for building demolitions using monitoring information from the demolition

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<sup>43</sup>Region 4 officials told us they did not develop additional air monitoring plans for Mississippi because they determined that the overview plan developed for both states was adequate.

<sup>44</sup>The initial no action assurance letter largely focused on disposition of the construction and demolition debris using an open burning technology. Louisiana Department of Environmental Quality officials said the state chose to not conduct the test burn required under the terms of the letter or exercise the flexibility EPA authorized in the letter because of the conditions for the test burn and the time it would take to reach agreement with EPA on a test protocol.

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site and the landfill.<sup>45</sup> Specifically, the quality assurance project plan for the pilot—which had been subject to independent peer review—called for, among other things, perimeter asbestos monitoring during demolition as well as at landfill sites.<sup>46</sup> The quality assurance project plan also specified that an air monitoring network consisting of two concentric rings of monitors would be placed at intervals around each of the two buildings being demolished. According to EPA officials, it is preferable to have emissions monitors stationed as close to a potential source of asbestos emissions as possible because the risk of exposure decreases by orders of magnitude the farther away one is from the emissions source. For this reason, EPA’s pilot was intentionally located in Arkansas in a “remote, secure location to ensure no public exposure,” with the nearest residence approximately 2 miles from the demolition site. The plan also called for asbestos monitoring in the soil at the demolition site, in dust that settled on surfaces near the demolition site, and in collected runoff water from wetting the building and debris during demolition and debris loading. EPA officials said that any monitoring of asbestos emissions at demolition sites in New Orleans would not need to be as elaborate as that done for the pilot, which was conducted to develop data for potential use in a revision to EPA’s asbestos regulation. However, they noted that using the second concentric ring of monitors in the pilot allowed EPA’s Office of Research and Development to compare air monitor results between the outer perimeter ring and the inner ring and project emissions levels outward with increased accuracy.

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<sup>45</sup>The methods used in the pilot had more stringent requirements before and during demolition than EPA is requiring under the current asbestos no action assurances in Louisiana and Mississippi.

<sup>46</sup>Environmental Quality Management and EPA, *Quality Assurance Project Plan: Evaluation of an Alternative Asbestos Control Method for Building Demolition* (Mar. 31, 2006).

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## Some Shortcomings in EPA's Communications on Environmental Health Risks Have Limited the Communications' Usefulness to the Public

EPA's key communications about the potential health risks from exposure to environmental contamination in New Orleans—three environmental assessment summaries prepared with, among others, the Louisiana Department of Environmental Quality—did not sufficiently disclose some information that would have helped residents better understand the potential health risks of returning home and how to mitigate them. In addition, some of EPA's other communications, including flyers and public service announcements, provided unclear and inconsistent information on mitigating exposure to some contaminants many returning residents would likely be exposed to in their homes.

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## EPA's Insufficient Disclosure about Its Decisions Regarding Sampling of Contaminants Limited Residents' Understanding of the Potential Health Risks of Returning Home

Following disasters such as Hurricane Katrina, an immediate and primary concern of evacuees is whether and when it is safe to return to their homes. Accurate and timely information on many factors is important for residents to make this assessment—and to determine what they should bring with them when they do return, including items to mitigate potential health risks. One important factor residents need information on is the environmental contamination to which they may be exposed when they return home. Such contamination was a particular concern in New Orleans, a densely populated, older urban area in proximity to petroleum and chemical industry sites, as well as a number of Superfund sites, from which contaminants may have migrated into residential areas.

EPA worked with other federal and state agencies to support local officials evaluating home and neighborhood safety. In addition, as discussed earlier, EPA provided a substantial amount of information to the public on environmental health risks using reports (environmental assessment summaries), flyers, public service announcements made available to the media, and EPA's Web page. However, EPA's communications about the potential health risks from environmental contamination in New Orleans—three environmental assessment summaries prepared with, among others, the Louisiana Department of Environmental Quality<sup>47</sup>—were released about 3, 6, and 11 months after Hurricane Katrina, limiting their usefulness to residents who would have benefited from more timely information about

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<sup>47</sup>In addition, EPA worked with the Centers for Disease Control and Prevention, the Agency for Toxic Substances and Disease Registry, the Louisiana Department of Health and Hospitals, and FEMA.

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the environmental health risks they could face when returning home. These environmental assessment summaries convey some helpful information about the floodwaters, sediments, and air quality in the New Orleans area after the hurricanes—that is, about the potential health risks of being outdoors in the New Orleans area.

However, because some sampling decisions that EPA made were not sufficiently disclosed, residents could have been given the wrong impression about the potential health risks they could face in returning to their homes. For example, the first environmental assessment summary, released in December 2005, states that “the great majority of the data available show that adverse health effects would not be expected from exposure to the sediments from previously flooded areas provided people used common sense and good personal hygiene and safety practices.” However, 8 months later in its third and final assessment summary, released in August 2006, EPA said that the December 2005 summary indicated no immediate health risk to residents returning for a quick assessment of damage to their homes. The August 2006 summary said that the focus of the analyses of sediments reported on in December 2005 was to assess “(1) whether hazardous substances were present in the sediment in residential areas and (2) the potential health effects to emergency workers and residents from short-term exposure to any hazardous substances found in the sediment.” Because the December 2005 summary did not include this qualification, residents could have misinterpreted it and assumed it was generally safe to return to their homes.

EPA also insufficiently disclosed an important decision it had made about sampling in New Orleans. That is, all sediment samples analyzed were taken outdoors, from streets and other areas of public access in previously flooded residential areas, and samples were not collected from private property, such as residents’ yards or inside residences. Regarding disclosure of this sampling decision, EPA states in its first assessment summary that all of its sampling was conducted “outdoors.” While the subsequent assessment summaries issued in March 2006 and August 2006 provide overviews of the previous assessment summaries, they do not disclose that the assessments did not include sediment samples taken inside buildings or on private property. For example, the March 2006 summary states only that the December 2005 assessment summary was based on the results of “samples from floodwaters and sediments analyzed throughout the flood-impacted areas.”

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However, according to EPA officials, in its assessments, the agency assumes that results from sediment samples collected from streets or other public access areas in residential neighborhoods can be used to characterize the degree and nature of contamination in New Orleans, including inside homes and in yards. We believe this assumption is important and warrants highlighting in the EPA environmental assessment summaries for two main reasons. First, environmental contamination levels inside buildings can potentially be significantly higher than and different from the contamination levels outside for a variety of reasons, potentially causing more adverse health effects. For example, contaminants that could have been washed into a building during the flooding—such as petroleum-based products and arsenic—are not dispersed into the atmosphere over time if confined indoors. Moreover, any toxic chemicals or other contaminants already in a building at the time of the flooding—such as pesticides, asbestos, and lead-based paint—may be released inside the building. Finally, after flooding, mold frequently forms and spreads. For example, in the case of the Gulf Coast 2005 hurricanes, the Centers for Disease Control and Prevention (CDC) concluded that the duration and extent of the flooding and the number of structures flooded made massive mold contamination a certainty.<sup>48</sup> Along these lines, the Natural Resources Defense Council conducted tests in several mold-contaminated homes in New Orleans and found that mold in one home was at concentrations that would render the building “dangerously uninhabitable”; in three other homes, mold spore concentrations were “dangerously high.” In addition to causing respiratory discomfort, mold also can cause major allergic reactions, asthma attacks, and a pneumonia-like illness (pneumonitis) that causes breathing difficulty and fever. Second, to understand the level of assurance that EPA can provide about the extent to which localized areas of contamination may exist throughout the city, it is important to understand that limiting sediment and soil sampling to outdoor, public access areas can be problematic in that, for example, sediments in streets may be subject to more dispersion than those that settled in more protected areas, such as close to residences.

Further, regarding indoor sampling, in September 2005, EPA’s Science Advisory Board had suggested that EPA consider some indoor sampling in New Orleans, including sampling of surface films on walls and structures,

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<sup>48</sup>Generally, CDC has said that any structure flooded after hurricanes or major floods should be presumed to contain materials contaminated with mold if those materials were not thoroughly dried within 48 hours.

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because material deposited outdoors may have been different from material indoors, where the potential for human exposure is likely to be greater. At that time, EPA said that indoor testing of private homes could not be conducted in the initial sampling effort because of worker safety issues and difficult logistical issues—such as obtaining owners’ consent—that could not be quickly resolved. EPA stated the agency would revisit this recommendation as these issues were addressed. To date, while CDC has tested some New Orleans homes for mold contamination, EPA has not tested for contamination inside homes that were flooded as a result of the hurricanes. EPA officials told us the agency has not tested indoors because state and local governments did not request this assistance and because EPA determined that indoor testing was not necessary to characterize the environmental contamination resulting from the storm.

During the time EPA was conducting the sediment sampling program, the agency posted test results on its Web page as the results became available, identifying the general area of the sampling sites on a map of the New Orleans area. Thus, any residents with access to the Internet and with experience in searching and reviewing government Web sites could obtain some information about the environmental contamination in New Orleans prior to the release of the assessment summaries. However, the information about the individual samples on EPA’s Web page is highly technical and would be of limited value to individuals who are not experts in health risk assessment. For example, the Web page provides information on the micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) of arsenic and benzo(a)pyrene in the sediment at one sampling site. Accompanying text indicates whether the detected levels were above or below the “LDEQ RECAP value” and states that in cases where they exceeded the RECAP value, “the levels fall within EPA’s risk range of 1 in 1,000,000 to 1 in 10,000 risk of an individual developing cancer over a lifetime from exposure to those concentrations in residential soils.” Although we believe that posting data on the individual samples on EPA’s Web site was not a particularly effective tool for communicating information to residents about potential health risks and mitigation strategies, we agree with EPA’s Inspector General that EPA’s posting of information on sediment contamination on its Web page provided timely information to the states and other federal decision makers for use in determining associated risk and impact assessment.<sup>49</sup>

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<sup>49</sup>EPA Office of Inspector General, *EPA Provided Quality and Timely Information on Hurricane Katrina Hazardous Material Releases and Debris Management*, Report No. 2006-P-00023 (Washington, D.C., May 2, 2006).

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Some Information EPA  
Provided to Residents in Its  
Public Service  
Communications Was  
Unclear and Inconsistent

Although EPA did not perform environmental assessments of any flooded homes in New Orleans, it did provide information to residents based on general knowledge and assumptions about potential environmental health risks inside buildings following disasters. Specifically, EPA relied on flyers, public service announcements, and EPA's Web site to provide information on the potential health risks in buildings stemming from exposure to, for example, asbestos, lead, and mold—three contaminants that were of concern to EPA and other officials immediately after the hurricanes. While the flyers, public service announcements, and documents on EPA's hurricane Web page provide information on mitigating exposure to these contaminants, some information lacks clarity and consistency on certain key points.<sup>50</sup> For example, EPA's most widely distributed flyer on environmental health risks—*EPA and Louisiana Department of Environmental Quality Warn of Potential Environmental Health Hazards When Returning to Homes and Businesses*<sup>51</sup>—states that buildings constructed before 1970 are likely to contain asbestos, including pipe and other insulation, ceiling tiles, exterior siding, and roof shingles. In contrast, another document available on EPA's hurricane Web page, *Dealing with Debris and Damaged Buildings*, states that all structures built before 1975 may contain significant amounts of asbestos, and structures built after 1975 may also contain asbestos. Further, in developing estimates of the number of homes that may contain asbestos, the Louisiana Department of Environmental Quality included homes built before 1980 as those likely to contain asbestos.<sup>52</sup> Accurate and consistent information about the age of buildings that are most likely to contain asbestos is important in helping residents understand what protections they may need when entering and working in their homes.

In addition, EPA's flyer on potential environmental health hazards recommends seeking assistance from public health authorities and specially trained contractors, if possible, when a resident knows or

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<sup>50</sup>EPA's hurricane Web page, "Response to 2005 Hurricanes," is still accessible on EPA's Web site using a search function, but it is no longer highlighted on EPA's home page.

<sup>51</sup>In August 2006, EPA reported that more than 1.3 million of these flyers had been distributed, as had about 900,000 flyers on mold problems.

<sup>52</sup>This date is consistent with other sources we reviewed that indicate that any building constructed before 1980 can be presumed to contain asbestos. See "Asbestos: A Legal Primer for Air Force Installation Attorneys," *Air Force Law Review* (2004); and "Asbestos in Construction Hazard Alert," The Center to Protect Workers' Rights (2004).

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suspects that asbestos or lead-based paint may be in the home and these materials have been damaged or will be disturbed during cleanup. However, the flyer does not contain the following more strongly worded guidance from the *Frequent Questions* document on EPA's hurricane Web page: "Before you begin your cleanup, seek help from public health authorities and specially trained contractors. Although conditions following a hurricane may make it difficult to obtain such assistance, EPA strongly advises against individuals attempting to handle such materials themselves."

Both the flyer and the *Frequent Questions* document then list a number of steps individuals should take when handling this debris. However, the information provided on the hurricane Web page regarding respiratory protection that individuals should wear is more clear and useful than the information in the widely distributed flyer on potential environmental health hazards and in the relevant EPA public service announcement. Specifically, the flyer states, "In handling materials that are believed to be contaminated with asbestos or lead, EPA recommends that, at a minimum, you wear gloves, goggles, and most importantly, OSHA-approved respiratory protection, if available." The public service announcement recommends wearing "gloves, goggles, and a face mask." The information on EPA's hurricane Web page, however, is more specific about what respiratory protection is required, where it can be purchased, and the importance of wearing it: "Wear gloves, goggles, pants, shirts, socks, and most importantly, a tightly-fitted N-95 OSHA-approved respiratory mask. A regular 'dust mask' is not enough to protect against lead or asbestos. N-95 masks are available at minimal cost at the hardware store. Carefully follow instructions when using a respiratory mask to make sure it fits correctly. A tight fit is important, and despite the heat, it is the best way to protect yourself."

However, a safety step EPA recommended on its hurricane Web page that many individuals were not likely to have been able to perform was to determine if asbestos-containing products—specifically, asbestos-cement corrugated sheet, asbestos-cement flat sheet, asbestos pipeline wrap, roofing felt, vinyl-asbestos floor tile, asbestos-cement shingle, millboard, asbestos-cement pipe, and vermiculate-attic insulation—were present in their damaged homes. How individuals would determine if these asbestos-containing products were present is not clear, as another EPA document (available on the general EPA Web site but not cited in either the flyer for residents or the *Frequent Questions* document) states that unless they are labeled, materials containing asbestos cannot be identified by visual

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inspection. This document further cautions readers to treat the material as if it contained asbestos when in doubt or have it sampled and analyzed by a qualified professional.

Some communications about exposures to mold also were not sufficiently clear or consistent to be helpful to residents whose homes had been flooded. For example, a flyer distributed to many residents specifically addressing mold is more focused on urging people to clean up than on providing information on how to protect themselves while doing so. The flyer, *Cleaning Up After a Flood: Addressing Mold Problems*, gives this general safety advice: “Take precautions to limit your exposure to mold and mold spores when attempting to clean up mold. If you have health concerns, you may want to have someone else clean up the mold.” Yet this flyer does not explain what precautions to take. Moreover, the flyer urges residents to act quickly to remove materials contaminated with mold and bacteria, explaining that these contaminants can trigger allergic reactions and induce respiratory infections. For “more specific information on mold,” the flyer refers readers to EPA’s Indoor Air Quality Hotline, EPA and CDC Web sites, and two documents available on EPA’s Web page (one addressing mold in schools and commercial buildings and the other addressing mold in homes). The document that addresses mold in homes includes the following somewhat tentative guidance: “In order to limit your exposure to airborne mold, you may want to wear an N-95 respirator, available at many hardware stores and from companies that advertise on the Internet....” However, other information on EPA’s general Web site that is not specifically cited in the flyer less ambiguously recommends wearing an N-95 respirator. Specifically, *Flood Cleanup and the Air in Your Home* says to wear an “N-95 respirator” over the mouth and nose to avoid breathing in mold. This publication further explains that a dust mask or handkerchief does not provide protection from mold because it can pass through them. In contrast, EPA’s flyer on potential environmental health hazards advises readers to wear “an N-95 respirator, if available, or a dust mask” when, for example, cleaning significant areas of mold contamination.

Importantly, as of March 2007, none of EPA’s communications, including its hurricane Web page, were updated to highlight comprehensive information on mold exposure released by CDC on June 9, 2006. Specifically, CDC’s report *Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods* includes population-specific recommendations for protection from exposure to mold in buildings after

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hurricanes and major floods.<sup>53</sup> For example, CDC states that healthy individuals do not need to take special precautions for exposure to mold in buildings after hurricanes when they are observing from outside or simply inspecting or assessing damage. However, if healthy individuals are recovering moldy personal belongings (thereby disturbing some dust or mold), CDC recommends that they wear respiratory protection (N-95 filtering face pieces), gloves, and dermal protection. This report also identifies individuals who should avoid specific activities (inspecting, recovering belongings, sweeping, etc.) and specifies the protection they should have to conduct the activities. For example, pregnant women and those over the age of 65 may recover personal belongings wearing respiratory protection, dermal protection, and eye protection but are to avoid any sweeping or cleaning activities. Individuals with “profound immunosuppression”—such as those with HIV infection—are to avoid all exposures, while those with “immunosuppression”—such as those in cancer treatment—or those with lung disease can conduct some specified activities with recommended protective gear.

In addition, some information in EPA’s December 2005 environmental assessment summary was inconsistent. For example, according to the summary, it does not address indoor environmental issues associated with re-entry into flooded homes and structures. However, the following excerpt from the conclusions section of the summary appears to contradict this statement:

Good personal hygiene should be practiced with frequent hand washing, laundering of clothing, and cleaning of the homes (i.e. vacuuming, dusting, etc.). Efforts should be made to avoid tracking sediments into homes from un-vegetated or uncovered areas as well as stirring up dust from those same areas. Obvious signs of hazardous material or oil spillage should be avoided and reported, as well.

This guidance does not acknowledge that sediments and contaminants may have been washed into or spilled inside structures as a result of flooding. Thus, the detailed guidance the summary provides for working outdoors, which may also be applicable for working inside homes, is not recommended for working indoors. Specifically, the December assessment summary provides the following “good personal hygiene” guidance for those working with or near exposed sediments outdoors:

- “Wear gloves, boots, and safety glasses.

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<sup>53</sup>CDC, *Morbidity and Mortality Weekly Report*, 55(RR08); 1-27 (June 9, 2006).

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- Wear a dust mask (an N-95 dust mask is recommended and can be purchased at your local pharmacy or building supply stores).
  - Keep arms and legs covered. Wear long sleeves and long pants.
  - Wash hands frequently with soap and water.
  - Wash work clothes separate from other laundry.”

In general, EPA’s communications recommend wearing some sort of respiratory protection as a key step in mitigating potential health effects of exposure to sediments and three contaminants— asbestos, lead, and mold—likely to be present in many homes damaged by the 2005 Gulf Coast hurricanes. However, EPA refers to this protection inconsistently and with varying levels of specificity:

- “a face mask”;
- “N-95 masks”;
- “OSHA-approved respiratory protection”;
- “a dust mask (an N-95 dust mask is recommended...)”;
- “an N-95 respirator, if available, or a dust mask”; and
- “a tightly fitted N-95 OSHA-approved respiratory mask—a regular ‘dust mask’ is not enough to protect against lead or asbestos.”

These varying terms are confusing and could result in an insufficiently protective choice. For example, “OSHA-approved respiratory protection” is not a common term or household item, and people might not understand what to look for and where to find it. Moreover, the federal agency that approves respirators to protect against a variety of hazards is the National Institute for Occupational Safety and Health (NIOSH). Thus, respirators approved by NIOSH that are available for purchase will be labeled as in

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compliance with specified NIOSH requirements.<sup>54</sup> Further, it is not clear what a “face mask” is, and “dust masks” and “dust respirators” vary widely in terms of the respiratory protection they provide. That is, dust masks can provide some protection to the lungs from the irritating effects of nontoxic dust and airborne particles such as pollen, common household dust, and cut grass, but they are not protective against mold spores or toxic dusts. Given the number and variety of dust masks and respirators that are available and that provide varying levels of protection, EPA’s communications would be more useful if they clearly and consistently named and described the type of respiratory protection the agency is recommending for the specific exposures being addressed.

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## EPA Faced Challenges in Assessing and Mitigating Some Environmental Impacts of the Gulf Coast Hurricanes

EPA did not remove clearly visible abandoned chemical drums and tanks from several national wildlife refuges in Louisiana as part of its Katrina response activities, in part because FEMA disaster assistance funding generally is not used for debris cleanups on federal land. As a result, more than a year later, debris containing hazardous materials continued to pose an environmental threat to natural resources at several refuges. In addition, EPA’s guidance to states on making some emergency debris disposal decisions is limited, and the agency has a limited debris management role under the National Response Plan and federal law. Finally, because of a lack of clarity in the National Response Plan and the absence of interagency protocols about federal roles in debris management, EPA, in the immediate aftermath of the storms, could not ensure that debris such as white goods and electronic waste was handled in a timely and appropriate manner that mitigated the potential for environmental contamination.

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## Funding Issues Delayed Cleanups at National Wildlife Refuges for More Than a Year

In 2005, Hurricanes Katrina and Rita caused debris containing hazardous materials to be released into several national wildlife refuges in Louisiana, posing an environmental threat to natural resources and requiring that some refuges be closed to the public because of safety issues. Under the National Response Plan, EPA is to take appropriate actions to prevent, minimize, or mitigate a threat to public health, welfare, or the

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<sup>54</sup>Respirator labels may cite compliance with both NIOSH and OSHA requirements. OSHA regulations require certain employers to have respiratory protection programs to protect employees against workplace hazards. A requirement of the programs is the selection of appropriate respirators approved by NIOSH.

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environment—including the protection of natural resources—caused by actual or potential oil and hazardous materials incidents.<sup>55</sup> As EPA and contractor responders worked to clean up releases of oil and hazardous materials in areas adjacent to several national wildlife refuges using disaster assistance funding authorized by FEMA, they identified clearly visible abandoned drums and tanks on the federal lands, and they could have efficiently removed them. However, FEMA did not approve the Department of the Interior's request for funding to clean up this debris in part because it was on federal lands. Consequently, EPA did not remove clearly visible abandoned chemical drums and tanks from national wildlife refuges in Louisiana as part of its hurricane response activities because disaster assistance funding was unavailable for debris cleanup actions on these federal lands. According to FEMA officials relying on the agency's regulations and debris management guidance, federal agencies are responsible for their own property, and FEMA does not have authority to provide assistance to federal agencies for debris removal following disasters unless the debris constitutes an immediate threat to life, public health, and safety.

According to Fish and Wildlife Service officials, in the fall of 2006—a year after the hurricanes—chemical drums and tanks remained in the Sabine and Cameron Prairie refuges in western Louisiana and may also have remained at the Bayou Sauvage and Big Branch Marsh refuges in the New Orleans area in eastern Louisiana. For example, a January 2006 study conducted for the Fish and Wildlife Service estimated that about 1,400 containers—potentially holding a total of between 115,000 and 350,000 gallons of hazardous liquids and gases—were at the Sabine National Wildlife refuge, a 125,000-acre refuge that consists almost entirely of marshland and open water. The study identified hazardous materials in containers ranging in size from 35-gallon drums to 10,000-gallon liquid storage tanks.

According to Fish and Wildlife officials, leaving this debris in place for about a year caused containers holding hazardous materials to settle into marshlands and begin to corrode and leak. For example, officials said that after a chemical sheen was observed on the water during a flight over a

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<sup>55</sup>The National Response Plan directs the Departments of Agriculture and the Interior, which are responsible for incidents affecting agriculture and natural resources, to coordinate with EPA and other oil and hazardous materials response partners on the removal of debris affecting natural and cultural resources.

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refuge in August 2006, a hazardous materials team found a leaking 55-gallon drum containing hydraulic fluid. Also in August 2006, a fire in the Big Branch Marsh refuge spread over 120 acres, reaching a debris field with propane and other hazardous material containers. When containers began exploding, firefighters had to let the fire burn through the field because it was too dangerous for them to attempt to put the fire out.

In addition to presenting safety concerns to responders cleaning up the debris, the delay in removing the debris complicated the required cleanup efforts and increased the cost of removal. Fish and Wildlife officials said that many containers were 2 or 3 feet under water, requiring excavation using heavy equipment. While smaller materials can be removed by hand, specialized equipment such as airboats, sleds or skids, and amphibious marsh vehicles are required to remove larger containers to minimize adverse effects to the marsh. Such excavations are costly and could damage sensitive marshy areas, which could have been avoided if drums and tanks had been removed expeditiously. In addition, Fish and Wildlife officials said that cleanup crews may not be able to locate all of the containers that have sunk into marshlands until the containers begin leaking, which could take several years.

According to the Fish and Wildlife Service, Sabine and other national wildlife refuges are important to the long-term recovery of Louisiana coastal communities because of the tourism they generate. For example, prior to being closed in 2005 because of safety concerns related to the debris from Hurricane Rita, the Sabine refuge, a principal component of the Creole Nature Trail All-American Road, a National Scenic Byway, and an All-American Road designated by the Federal Highway Administration, helped attract about 300,000 visitors each year. The Sabine refuge's 125,000 acres are home to concentrations of ducks, geese, alligators, muskrats, nutria, raptors, and other wildlife. Visitors to the refuge have opportunities to observe wildlife and have access to a wetland walkway and a visitors center; recreational options include boating, fishing, and hunting.

According to a Fish and Wildlife official, previous hurricanes in other Gulf states have not affected national wildlife refuges as severely as the hazardous material debris impacts of Hurricanes Katrina and Rita on Louisiana's refuges. Consequently, he said that Fish and Wildlife has not sought funding for hazardous material debris removal under the Stafford Act following other hurricanes in recent years. Because disaster assistance funding from FEMA was not available for cleaning up hazardous materials on these federal lands following Hurricanes Katrina and Rita, Interior's Fish

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and Wildlife Service sought appropriations for this activity, which the agency received as part of a June 2006 supplemental appropriation for disaster response activities.<sup>56</sup> The Fish and Wildlife Service allocated \$12 million for the cleanup of the Sabine refuge and \$8 million for the other refuges. The agency received this appropriation 8 months after EPA's cleanup of the adjacent area under the National Response Plan. In addition, EPA and the Fish and Wildlife Service do not have a protocol for expeditiously handling circumstances such as cleanup of national wildlife refuges following disasters, and developing interagency agreements with EPA and the Coast Guard for the cleanups required time and resulted in further delays.

In September 2006, Fish and Wildlife signed agreements with EPA and the Coast Guard to obtain these agencies' assistance in cleaning up the Sabine refuge. Subsequently, EPA provided the incident commander for the team that oversaw the hazardous materials recovery and debris cleanup in the Sabine and Cameron Prairie refuges in Cameron Parish, Louisiana, while the Coast Guard provided the deputy incident commander and other support. The project was completed in January 2007. While the Fish and Wildlife Service had estimated that about 1,400 containers potentially filled with hazardous liquids and gases had been deposited into the refuge, about 2,200 such containers were found and removed, along with several thousand household hazardous waste items, tires, batteries, munitions, and white goods. Fish and Wildlife estimated that cleanup at Bayou Sauvage and Big Branch Marsh would be completed by May 2007.

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<sup>56</sup>The Fish and Wildlife Service also considered requesting EPA cleanup assistance under the Superfund law, the Clean Water Act, and the Oil Pollution Act. In a draft 2006 letter to EPA, the Fish and Wildlife regional director stated that these authorities extended to the cleanup needed on the refuges because the debris was deposited on these lands by the hurricanes, not because of any action on the part of Fish and Wildlife. While Fish and Wildlife worked with EPA to draft a letter requesting EPA assistance under the Superfund law, the request was never sent to EPA. Under this law, the Superfund is generally unavailable at federal facilities. Funds from the Superfund may be used to pay for removal actions on federal lands at EPA's discretion but must be reimbursed by the relevant federal agency.

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## EPA Has a Limited Debris Management Role under Federal Law and the National Response Plan, and Its Guidance to States on Making Certain Emergency Debris Disposal Decisions Is Limited

EPA's 1995 guide on planning for disposal of disaster debris acknowledges that disaster debris can overwhelm existing landfills—solid waste management facilities—or force communities to use disposal options that otherwise would not be acceptable.<sup>57</sup> The guide also notes that state waste management agencies can make special accommodations for the unusual waste management needs resulting from a disaster, such as temporarily lifting permit requirements for landfills. However, the guide does not provide specific guidance on the selection of emergency landfill sites or practices that state agencies should consider when making special debris disposal accommodations following disasters.

In addition, as set forth in the Stafford Act and other executive policy, EPA and other federal agencies generally provide disaster assistance at the request of state or local governments.<sup>58</sup> Along these lines, when the National Response Plan is activated in response to a Stafford Act major disaster such as Hurricane Katrina, EPA's role regarding waste disposal is to provide assistance requested by a state. For example, EPA may supply environmental scientists and engineers to assess landfills, help locate disposal sites for debris clearance activities, and assist with contaminated debris management activities.<sup>59</sup> EPA's support may also include providing technical assistance and consultation to the Department of Health and Human Services on solid waste disposal issues related to public health effects.<sup>60</sup>

Further, the Resource Conservation and Recovery Act (RCRA), the federal law addressing the management of hazardous and other solid wastes, addresses nonhazardous solid wastes under subtitle D. According to subtitle D, states have primary responsibility for permitting and monitoring solid waste disposal facilities (generally referred to as landfills) and

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<sup>57</sup>EPA Office of Solid Waste and Emergency Response, *Planning for Disaster Debris* (December 1995).

<sup>58</sup>See 42 U.S.C. § 5170 *et seq.*; Homeland Security Presidential Directive 5 (Feb. 28, 2003).

<sup>59</sup>EPA provides this support to the U.S. Army Corps of Engineers, the federal coordinator for the public works and engineering emergency support function, which addresses debris removal and disposal, among other things.

<sup>60</sup>EPA provides this support under the public health and medical services emergency support function, which is coordinated by the Department of Health and Human Services. The department, in coordination with EPA's oil and hazardous materials response, may request this support from agencies such as EPA.

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developing solid waste management plans in accordance with minimum federal requirements.<sup>61</sup> EPA regulations establish criteria for classifying different types of landfills and practices that may result in adverse effects on health or the environment, among other things. The act prohibits “open dumping”—the disposal of solid waste in landfills failing to meet the relevant criteria—and requires state plans to prohibit the establishment of open dumps. RCRA provides EPA with limited authority to address environmental problems at solid waste landfills.

Solid waste landfills may generally receive household waste (garbage), industrial waste (solid waste generated by manufacturing, industrial, or mining processes), commercial nonhazardous waste (solid waste generated by stores, offices, restaurants, and other nonmanufacturing entities), and construction and demolition (C&D) waste (nonhazardous waste that is not water soluble, such as metal, concrete, and asphalt). Under Louisiana solid waste regulations, landfills that receive household waste, industrial waste, or commercial nonhazardous waste must have safeguards that include a liner designed to control groundwater contamination.<sup>62</sup> The regulations do not require C&D landfills to have liners in place.<sup>63</sup> Louisiana regulations exclude asbestos-contaminated waste, white goods, furniture, trash, and treated lumber from the categories of debris that may be disposed of at C&D landfills.

Because EPA’s debris management role is limited under federal law and the National Response Plan, its guidance to states and localities on planning for disposal of disaster debris could be especially important in helping ensure that hazardous materials are disposed of in landfills with appropriate safeguards when disposal options that would not otherwise be acceptable are used for disaster debris, thereby preventing contaminants from migrating and causing air, water, and soil contamination. Such guidance could help states and localities consider the potential

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<sup>61</sup>While EPA may review approved state subtitle D permit programs and withdraw approval of state programs it determines do not meet the national minimum requirements, EPA officials told us the agency has never withdrawn approval of a state subtitle D permit program.

<sup>62</sup>These landfills are designated as Type I or II facilities under Louisiana solid waste regulations. These facilities must have a composite liner that consists of a geomembrane liner at least 30-mil thick installed directly above and in uniform contact with a 3-foot recompacted clay liner.

<sup>63</sup>These landfills are designated as Type III facilities under Louisiana solid waste regulations.

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environmental impacts of debris management accommodations that may be made in emergency situations if affected areas are to be cleared of debris without causing adverse public health effects in the future. One potential example of a prior problem with hurricane debris is the Agriculture Street Superfund site in New Orleans, which was a municipal landfill from about 1909 until the late 1950s. During this period, oil was used to burn the refuse at the dump, and during the 1940s and 1950s the area was routinely sprayed with DDT. The landfill was reopened after Hurricane Betsy occurred in 1965 to receive debris from destroyed buildings and ash from municipal incinerators. In the 1970s and continuing into the late 1980s, portions of the site were developed with private and public housing units, an elementary school, and a community center. Following health concerns among residents in the area, EPA initiated investigations at the site in 1986, ultimately identifying elevated levels of lead, arsenic, and carcinogenic polycyclic aromatic hydrocarbons—the primary contaminants of concern identified in sediment tests following Hurricane Katrina. Analyses of the health effects of these contaminants found at the Agriculture Street Landfill led EPA to place the site on the Superfund National Priorities List in 1994. Cleanup of the site, which primarily entailed soil excavation, placement of clean cover and soil, and resodding, was completed in 2001.<sup>64</sup> As part of litigation involving EPA efforts to recover its cleanup costs at the site, some private parties have argued that the debris disposed of at the Agriculture Street Landfill in the wake of Hurricane Betsy contained hazardous substances that contributed to the contamination at the site.<sup>65</sup> EPA officials told us that after years of case development research and discovery the agency has no evidence that hazardous substances were disposed of at the Agriculture Street Landfill during the Hurricane Betsy response. The case is pending, and settlement negotiations are under way.

As the entity with primary responsibility for solid waste disposal under RCRA subtitle D, the Louisiana Department of Environmental Quality has made decisions about landfills and the disposal of debris that some studies suggest could have long-term, negative environmental impacts. For example, under a November 2005 Louisiana Department of Environmental

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<sup>64</sup>Soil samples collected at the Agriculture Street Landfill site following Hurricane Katrina revealed elevated levels of benzo(a)pyrene, a polycyclic aromatic hydrocarbon. EPA and local authorities are developing a plan to address this contamination.

<sup>65</sup>*United States v. City of New Orleans, et al*, Civil Action No. 02-3618, Section E, Magistrate 3 (E.D. La.).

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Quality amendment to an emergency order addressing Hurricane Katrina and its aftermath, the types of debris that C&D landfills could receive were broadened to include some potentially hazardous wastes, including furniture, painted or stained lumber from demolished buildings, and asbestos-contaminated waste that cannot be extracted from demolition debris.<sup>66</sup> The order states that this and other actions were taken because Hurricane Katrina created conditions that require immediate action to prevent irreparable damage to the environment and serious threats to life or safety. A Louisiana Department of Environmental Quality official told us that the department elected to include these categories of waste because separating this waste from other debris took considerable effort, and the department determined the environmental risks resulting from the expanded definition were minimal. The official also noted that the expanded definition allowed this waste to be cleaned up more quickly, enabling residents to return home.

However, a draft 1995 study prepared for EPA identifies a number of the debris components being allowed at C&D landfills under the emergency order—including asbestos insulation and shingles, furniture, and wood paints and stains—as “problematic,” even though these materials are not necessarily classified as hazardous wastes under RCRA.<sup>67</sup> Moreover, studies by a Louisiana State University research institute and an environmental engineering firm state that these categories of waste can introduce hazardous materials into landfills, increasing the likelihood of pollution.<sup>68</sup> For example, wood treated with chromated copper arsenate as a preservative can leach arsenic, which can cause problems with circulatory systems and may increase cancer risk if ingested. Chromated copper arsenate is often used to prevent termite infestation in areas where termites are prevalent, such as New Orleans. Lumber with lead paint also poses health hazards. Lead poisoning in children can cause learning

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<sup>66</sup>State of Louisiana Department of Environmental Quality, Second Amended Declaration of Emergency and Administrative Order regarding Hurricane Katrina and Its Aftermath (Nov. 2, 2005). The Louisiana Department of Environmental Quality extended the emergency order several times, most recently extending the broadened definition through May 18, 2007.

<sup>67</sup>ICF Inc., *Construction and Demolition Waste Landfills* (draft document prepared for the EPA Office of Solid Waste, 1995).

<sup>68</sup>G.F. Lee, *Summary of Findings on the Environmental Impacts of the Proposed C&D Landfill on Top of the Closed Gentilly Landfill* (February 2006); and John H. Pardue, Director, Louisiana Water Resources Research Institute, Louisiana State University, *Anticipating environmental problems facing hurricane debris landfills in New Orleans East* (undated).

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disabilities, impaired hearing, and behavioral problems, and in pregnant women, it can result in adverse developmental effects to fetuses. Even before Hurricane Katrina struck, concentrations of lead as much as 10 times EPA's screening level were detected in soil samples taken in New Orleans. In addition, some household furniture is treated with fire retardants containing polybrominated diphenyl ethers, carcinogens that have been found as environmental pollutants accumulating in human breast milk and wildlife.

The inclusion of asbestos-contaminated waste mixed with other debris in the state's expanded definition of C&D debris may also present a potential health hazard. As we previously noted, asbestos exposure has been recognized for many years as causing serious human health problems. Moreover, the requirements of the Clean Air Act's asbestos work practice standard generally do not apply to residential buildings with four or fewer units, and unregulated asbestos-containing material may be disposed of in C&D landfills.<sup>69</sup> The extensive renovation and demolition activities in New Orleans create the potential for large quantities of asbestos-contaminated waste to enter C&D landfills.

Furthermore, while white goods and household hazardous waste may generally not be disposed of at C&D landfills, until recently the emergency order stated that such wastes should be segregated from other solid waste prior to disposal in C&D landfills except in cases where segregation is not practicable. The order did not specifically state what must happen in cases where segregation is not practicable. Environmental groups filed a lawsuit against Louisiana in August 2006 alleging that the state's order authorizes the disposal of white goods and household hazardous waste in landfills that do not meet RCRA criteria for these types of debris and, therefore, that the state has authorized "open dumping" of potentially dangerous solid wastes in violation of RCRA's prohibition on such dumping.<sup>70</sup> The state contends that the order does not authorize any practices that violate RCRA and,

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<sup>69</sup>Louisiana also authorized some landfills in the New Orleans area to operate as "enhanced" C&D landfills that may receive regulated asbestos-containing material as well as unregulated material. These facilities are required to have additional controls in place, such as air monitoring for asbestos emissions. According to the Louisiana Department of Environmental Quality, these landfills meet the landfill requirements under the federal asbestos standard (40 C.F.R. § 61.154).

<sup>70</sup>The lawsuit further alleges that because the emergency orders conflict with RCRA's open dumping prohibition, the state's issuance and implementation of the orders violates the Supremacy Clause in Article VI of the U.S. Constitution.

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accordingly, that the groups' suit is without merit. EPA is currently mediating settlement negotiations between the parties. On January 19, 2007, the Louisiana Department of Environmental Quality issued an amended emergency order that, among other things, deleted the phrase "where segregation is not practicable."

In addition, the Louisiana Department of Environmental Quality authorized the controversial use of two landfills to receive C&D waste in locations of concern to nearby communities and environmental organizations. Specifically, pursuant to its Katrina emergency authorities, the Louisiana Department of Environmental Quality authorized (1) the utilization of an existing C&D landfill in proximity to hurricane-devastated areas in New Orleans called the Gentilly Landfill and (2) the construction and operation of the Chef Menteur landfill, located near a minority residential community and a national wildlife refuge.<sup>71</sup> Studies conducted by an environmental engineering firm and Louisiana State University raised concerns about debris disposal at the Gentilly and Chef Menteur landfills, citing possible surface water and groundwater implications from potentially hazardous storm debris. These studies suggest that debris disposal in landfills without appropriate safeguards could result in the migration of contaminants, potentially causing pollution and affecting public health and the environment.<sup>72</sup> For example, the studies identified concerns about the potential discharge of leachate (water that has come into contact with waste) into water—in the case of Gentilly, into groundwater and surface water, and in the case of Chef Menteur, into surrounding wetlands. In both cases, concerned groups filed lawsuits. The Gentilly suit was settled, with the Louisiana Department of Environmental Quality agreeing to limit the amount of debris entering the landfill daily. In the case of Chef Menteur, an environmental group alleged that proper procedures had not been followed in issuing an emergency authorization for the landfill under the Clean Water

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<sup>71</sup>The Louisiana Department of Environmental Quality issued a permit to conduct construction and demolition waste disposal to the Gentilly Landfill in 2004 and an Order to Authorize Commencement of Operations on August 29, 2005. However, according to the Louisiana Department of Environmental Quality, following the litigation related to a lawsuit against the Louisiana Department of Environmental Quality, "It became apparent that although the decision to use the Gentilly landfill was properly based upon the Louisiana Department of Environmental Quality's emergency authority under the Louisiana Environmental Quality Act, this authority and the underlying reasoning for arriving at that decision was not clearly reflected in the Order." Therefore, the order was revoked and an administrative order and decision were issued authorizing use of the landfill pursuant to state law and the Hurricane Katrina emergency order.

<sup>72</sup>See footnote 68.

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Act—in particular, that the public had not been provided notice and the opportunity to comment on the action.<sup>73</sup>

In authorizing the use of the Gentilly landfill under the Hurricane Katrina emergency order, the Louisiana Department of Environmental Quality stated that it had considered alternative sites and determined that the Gentilly site met state solid waste requirements and was located in proximity to the bulk of the hurricane-generated C&D debris. The department further noted that allowing debris disposal at Gentilly would decrease waste-hauling time and expense and alleviate traffic problems, thereby aiding New Orleans' recovery. In addition, although the Chef Menteur site faced opposition, the Louisiana Department of Environmental Quality maintained that it was environmentally suitable, citing independent sampling of air and water quality in May and June of 2006. The air results found no contaminants at or above health risk levels, while the water quality results showed that the contaminants tested for fell within the daily maximum limits of the site's discharge permit, though ammonia was detected above the monthly average discharge limit. Furthermore, the Louisiana Department of Environmental Quality underscored the importance of the centrally located landfill to disaster cleanup in Orleans Parish.

EPA's review of the Gentilly site following its authorization to receive Hurricane Katrina debris found that current use of the landfill appeared to be consistent with the types and volumes of wastes for which it was designed and permitted by the state, but noted that there is no way to insulate the federal government against future Superfund liability absolutely. EPA recommended steps that Gentilly operators should take to minimize risks, including posting signs, developing debris inspection and segregation procedures, and working with the Louisiana Department of Environmental Quality on groundwater monitoring. EPA officials told us the agency worked with the Department of Environmental Quality to develop a process for reviewing key technical areas of concern at the Gentilly site, and EPA officials said that the Louisiana Department of Environmental Quality has put effective measures in place to address these areas of concern. In May 2007, EPA said that the Gentilly landfill operator installed groundwater monitoring wells and inclinometers at the Gentilly

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<sup>73</sup>This lawsuit was dismissed by the court 2 days after the landfill was closed on August 14, 2006, when, as is discussed later in this report, the local order authorizing the zoning of the landfill expired and was not renewed.

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site and reported that the environmental samples “do not indicate any problem.” The newly constructed Chef Menteur landfill continued to generate considerable controversy, and the Mayor of New Orleans allowed the local order authorizing the zoning of the landfill to expire on August 14, 2006—closing it 4 months after it opened.

While EPA provided consultations to the Louisiana Department of Environmental Quality on some landfill decisions, under the National Response Plan and RCRA, the agency does not have a formal role in this decision making. Further, EPA did not review or approve state decisions regarding the use of the Gentilly or Chef Menteur landfills. However, at the request of the state, EPA did provide technical support and conducted some oversight activities at New Orleans area landfills to supplement existing controls at landfills.<sup>74</sup> Specifically, EPA took steps to promote the segregation of debris before it entered landfills, such as organizing hazardous waste collection events. At the request of the Louisiana Department of Environmental Quality, EPA also began sending landfill observers to about 12 landfills in the New Orleans area in February 2006.<sup>75</sup> EPA’s landfill observers usually visited landfills unannounced and documented that they were generally operating appropriately—with entrance tower monitors and dump-site spotters in place, record keeping on violations, and financial and other documentation in order—and prepared and transmitted a report to the Louisiana Department of Environmental Quality citing any problems.<sup>76</sup> EPA officials told us the problems observers identified were minor, such as excessive dust on roads or instances of debris segregation not taking place. Moreover, EPA officials believe that work practices at the landfills, such as periodic covering, mitigate the potential migration of specific materials from the landfills. However, the officials also noted that while EPA’s limited oversight

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<sup>74</sup>According to the Louisiana Department of Environmental Quality, landfills were subject to several controls intended to minimize hazardous waste disposal, including monitoring at entrance towers and debris dump sites. In addition, daily inspections by department officials at five construction and demolition landfills in the New Orleans area, an increase from twice-weekly inspections, were conducted in May and June 2006.

<sup>75</sup>According to EPA, as of December 2006, EPA landfill observers were observing at seven landfills, the reduced number reflecting the fact that some landfills are no longer receiving hurricane-related debris.

<sup>76</sup>EPA landfill observers also visited landfill sites in Mississippi from October 2005 to June 2006.

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provided assistance to the state, it did not allow the agency to ensure that debris containing hazardous materials would not enter landfills.

Finally, detailed guidance from EPA to the states on advance planning for potential emergency landfill sites and practices to consider when making special debris disposal accommodations following disasters might have helped Louisiana avoid some of the controversies and lawsuits it faced as a result of its emergency debris management decisions in New Orleans. Along these lines, after reviewing its Hurricane Katrina response actions in Mississippi, EPA's Region 4 identified helping states with hurricane-prone coastal areas with such advance planning as one of several steps EPA could take to improve its emergency responses in the future. Specifically, Region 4's September 2006 summary report on its response actions in Mississippi stated that advance planning for landfill sites would allow geologic and other crucial data to be known before an incident, including data for staging areas or temporary landfills for vegetative and C&D debris. The report said that EPA Region 4 could provide assistance to states so that debris-clearing operations have preapproved disposal sites that would not pose long-term environmental issues after they were used during an emergency.

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**Lack of Clarity on Federal Debris Management Roles Delayed Actions to Ensure That White Goods and Electronic Waste Were Handled in a Timely and Appropriate Manner**

The recycling and disposal of debris such as white goods and electronic waste also presented the agency with a challenge in mitigating the potential for environmental contamination following the storms. Because of a lack of clarity in the National Response Plan and the absence of interagency protocols about federal roles in debris management, EPA could not ensure that debris such as white goods and electronic waste was handled in a timely and appropriate manner. Specifically, the plan does not state whether EPA or the Army Corps of Engineers should manage the collection, processing, recycling, and disposal of white goods, such as refrigerators and freezers, and electronic waste, such as televisions, computers, and printers. Recycling of white goods entails the removal of chemicals, such as chlorofluorocarbons and other refrigerants that are harmful to the environment. Recycling of electronic waste entails removing toxic components, such as lead and mercury. Computers contain toxic chemicals such as mercury, while the average television contains more than 4 pounds of lead.

The National Response Plan assigns the Corps primary responsibility for the public works and engineering emergency support function, which includes debris removal and disposal. In addition to EPA's role as the

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coordinator for the federal response to actual or potential discharges of oil and hazardous materials, the plan states that EPA can, among other things, assist the Corps with contaminated debris management activities by coordinating and providing resources, assessments, data, expertise, technical assistance, monitoring, and other appropriate support. In this regard, EPA's Hurricane Katrina response activities included the collection and disposal of household hazardous waste such as paints, pesticides, and propane tanks. While debris such as white goods and electronic waste contain hazardous materials, neither the plan nor interagency protocols address whether EPA or the Corps should manage the collection, processing, recycling, and disposal of these types of waste.

After initial delays in determining whether EPA or the Corps would be responsible for white goods and electronic waste disposal, the agencies agreed that they would fulfill this role jointly in Louisiana, while the Corps or local agencies would handle white goods and electronic waste disposal in Mississippi. Local officials in Louisiana and Mississippi told us that confusion about EPA's role in white goods and electronics waste disposal resulted in delays in removing and disposing of this debris. A parish official in Louisiana also said that the delays may have resulted in the inappropriate disposal of some electronic waste in landfills without proper safeguards.

In Mississippi, county officials from the three coastal counties hit by Katrina expressed frustration that EPA did not assist with either white goods or electronic waste disposal. Officials in one county told us that the collection of white goods was delayed for 7 weeks because of confusion among EPA, the Corps, and the county about responsibility for this task. Officials from another county said that while they appreciated EPA's assistance with household hazardous waste collection, the county would have also appreciated EPA's help with other activities that they believed involved environmental issues, such as white goods and electronic waste disposal and removing and cleaning up fuel that leached into waterways and bayous from abandoned automobiles. Although EPA did help coordinate some electronic waste recycling in one Mississippi county, an official from this county said that the effort was limited and only came about at the county's insistence. According to officials from all three counties, EPA generally informed them that white goods and electronic waste disposal were beyond the purview of the agency's disaster response activities in Mississippi. One of these officials suggested that EPA and the Corps should develop a better plan to address the collection of white goods following future disasters. According to EPA, the agency has been having a

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series of discussions with the Corps and FEMA to clarify roles and responsibilities and enhance coordination, based on Katrina experience related to debris, among other things. EPA said it has not yet been determined how the discussions will be documented, but possibilities include a memorandum of understanding or supporting documents to the National Response Plan.

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## Conclusions

Working under extraordinary conditions, EPA undertook a broad range of activities to support state and local entities in Louisiana and Mississippi in assessing and minimizing the environmental risks resulting from Hurricane Katrina, including search and rescue efforts that brought 800 New Orleans residents to safety. Because of the breadth and scope of this disaster, cleanup and recovery efforts are still under way in the New Orleans area. For example, many homes have yet to be demolished or substantially renovated. A significant number of them will be demolished or renovated during the next year, and likely these activities will continue for a longer period of time. Given the age of many New Orleans residences, environmental hazards such as asbestos are likely to be present. For the demolitions covered by the no action assurances, in lieu of the requirement for prior identification and removal of regulated asbestos-containing materials, homes that are not inspected before demolition are required to be wetted during the demolition and disposition processes to reduce potential asbestos emissions. However, much of the demolition and renovation activities, including house gutting, will be undertaken by individual homeowners; these activities are not regulated and therefore none of the asbestos control requirements apply. While EPA has taken steps to monitor asbestos concentrations in the air in New Orleans, it is not clear how its approach can accomplish the agency's stated goal of measuring the effects from both the regulated asbestos-containing material, to which the no action assurances might apply, and the unregulated activities, which would include demolitions and renovations by individual homeowners. To date, according to EPA, the asbestos air data it has collected have not identified potential problems regarding public exposure to asbestos fibers. However, these results may not be representative of asbestos releases to which residents, workers, and volunteers may be exposed in some neighborhoods because of monitoring gaps stemming from monitor locations and the scaling back of monitoring sites a few months after demolitions began. Specifically, without sufficient and targeted asbestos air monitoring data from neighborhoods where demolitions and renovations are concentrated, EPA has limited assurance that the public health is protected from risks associated with inhalation of

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asbestos fibers potentially stemming from the substantial levels of both regulated and unregulated demolition and renovation activities occurring in concentrated geographic areas.

In addition, EPA could improve the effectiveness of its communications about the potential health risks from exposure to environmental contamination when responding to future disasters. Following a disaster that has involved evacuation, residents are typically anxious to return to their homes, and public leaders are eager to take steps to return to normalcy, including having residents return as soon as it is safe for them to do so. Among the important information residents need in order to minimize their environmental health risks when they do return is timely, complete, clear, and consistent guidance about the environmental contamination they may be exposed to, both indoors and outdoors, and how to best protect themselves from it. Without such information, people may return too soon or without the proper protective gear and supplies, which might expose them to both short-term and long-term negative health effects. This could well have been the case in New Orleans since, for example, EPA did not state until August 2006 that its December 2005 assessment summary applied to short-term visits, such as to view the external damage to their homes. This situation was exacerbated by some confusing information EPA provided in public service communications—for example, about the respiratory protection residents should use to mitigate potential exposure to asbestos, lead, and mold in their homes.

Mitigating some challenges EPA faced addressing Hurricane Katrina could better protect the environment in the future. For example, while under the National Response Plan, EPA's responsibilities include mitigating threats to the environment—including the protection of natural resources—funding may not always be available to carry out these essential actions. It is shortsighted, inefficient, and potentially dangerous to limit the removal of debris containing hazardous materials to state lands and waterways, halting such cleanups arbitrarily at federal land or water boundaries. Thus, while the Department of the Interior's Fish and Wildlife Service ultimately requested and received funding through supplemental appropriations that it then provided to EPA to conduct the cleanups, this is not an effective or efficient solution in disaster situations. In such situations, timely cleanup can lessen the damage to the environment, better protect the public from exposure to contaminants, prevent further migration of hazardous materials, and likely be more cost-effective. Without a framework in place to enable EPA, the Coast Guard, and federal land management agencies such as the Department of the Interior and the Department of Agriculture

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to quickly obtain funding to respond to environmental impacts of disasters on federal lands and waterways, these natural resources—and state areas that can be harmed by the migration of chemical releases from federal lands—are at risk.

In addition, given EPA's limited role in ensuring that states dispose of storm debris appropriately, EPA's lack of sufficient guidance to state and local entities on selecting additional landfill sites and on practices that state agencies should consider when making special accommodations for debris disposal following disasters becomes increasingly important. Such guidance could help avoid controversies over landfill sites selected under emergency conditions, assist state and local agencies in planning for accommodations that may be needed to handle large volumes of hazardous materials after disasters, and identify strategies needed to mitigate the potential environmental impacts of such accommodations. Finally, greater clarity in the roles of EPA and the Army Corps of Engineers in recycling and disposing of white goods and electronic waste could help minimize the inappropriate disposal of these wastes in the immediate aftermath of disasters.

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## Recommendations for Executive Action

To enhance EPA's ability to monitor and assess information on asbestos emissions resulting from the extensive demolition and renovation activities in New Orleans, we recommend that the EPA Administrator develop and implement an asbestos monitoring plan that addresses the potential health effects of both (1) the nonenforcement of certain asbestos requirements covering government-ordered demolitions of residences and (2) the general exemption from EPA's asbestos work practice standards for demolition and renovation activities of residential buildings with four or fewer dwelling units when done at the initiative of individual homeowners.

To provide environmental health risk information to the public that is timely, complete, clear, and consistent about (1) the environmental contamination to which individuals may be exposed subsequent to disasters and (2) how individuals can best protect themselves, we recommend that the EPA Administrator take the following two actions:

- Develop protocols to ensure that the agency's communications following disasters are timely and sufficiently disclose all of the information that affected residents would need to understand the potential health risks they may face upon returning, including

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information on the scope and methodology for EPA's assessments of environmental health risks.

- Develop clear and consistent generic information for the public regarding mitigating exposure to contaminants—such as asbestos, lead, and mold—likely to be present in many disaster situations and ensure that this information can be expeditiously communicated via all appropriate media, thereby providing the public with basic protective information at the same time that EPA is developing any additional event-specific health risk information that is needed.

To better enable EPA and its partner agencies to minimize the environmental risks resulting from future disasters, we recommend that the EPA Administrator take the following three actions:

- Work with potentially affected federal land management agencies, the Coast Guard, DHS, and FEMA to determine what actions are needed to ensure that environmental contamination on federal lands, such as national wildlife refuges, can be expeditiously and efficiently addressed in future disasters. Potential actions include the development of protocols or memorandums of understanding or amendments to the Stafford Act if the agencies determine that amendments are needed to achieve the timely availability of such funding when responding to disasters involving federal lands.
- Provide more detailed guidance to state and local entities on managing debris disposal following disasters to better ensure protection of public health and the environment and prevent the creation of future Superfund sites. This guidance should address the selection of landfill sites for disaster debris, including advance selection of potential landfill sites, and practices to consider when making special accommodations for debris disposal in emergency situations.
- Work with the Army Corps of Engineers to clarify each agency's role in debris disposal and develop a memorandum of understanding or other agency protocol to allow the agencies to quickly manage and recycle white goods and electronic waste following future disasters.

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## Agency Comments and Our Evaluation

In commenting on a draft of this report, EPA's Associate Administrator for Homeland Security agreed with all but one of the recommendations. Specifically, EPA agreed with the recommendations to provide additional

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asbestos air monitoring in New Orleans, improve environmental health risk communications following disasters, provide more guidance to states on managing debris disposal following disasters, and clarify debris management roles with the Army Corps of Engineers. However, EPA disagreed with our recommendation that the agency convene a working group that includes potentially affected federal land management agencies and the Coast Guard to develop protocols or memorandums of understanding on the steps the agencies should take to obtain disaster funding for environmental cleanups on federal lands in the future—and thereby address damage to federal lands and wildlife in a timely and efficient manner. EPA asserted that this recommendation would be more appropriately addressed to the Department of the Interior and FEMA. We continue to believe that EPA should be involved in helping to resolve these issues because, under the National Response Plan, EPA is the chair of the National Response Team, whose duties include national planning and response coordination for oil and hazardous materials incidents. We do agree that FEMA, which declined to provide funding to the Department of the Interior for cleanup after Hurricane Katrina, and DHS, which coordinates the federal response to disasters under the National Response Plan, should also take part in planning efforts to resolve funding issues concerning the removal of hazardous materials from federal lands following a disaster. Accordingly, we have modified our recommendation to state that EPA should also work with DHS and FEMA, as well as with federal land management agencies and the Coast Guard, to determine what actions are needed to ensure that environmental contamination on federal lands, such as national wildlife refuges, can be expeditiously and efficiently addressed in future disasters. This recommendation is aimed at supporting EPA's efforts in conducting its environmental protection and coordination missions expeditiously in future disasters, thereby avoiding situations in which the removal of hazardous materials is halted at federal land or water boundaries and individual federal land management agencies waste valuable time seeking appropriations to pay EPA to conduct cleanup, as was the case during the year following the Gulf Coast hurricanes. Further, as was the case following Hurricane Katrina, EPA will often have the necessary cleanup infrastructure in place (such as contractors, equipment, and personnel with cleanup oversight expertise) to respond rapidly and effectively to contamination. EPA also provided comments on aspects of the report it considered misleading or inaccurate, as well as technical comments, which we incorporated as appropriate. EPA's letter and our detailed response to it appear in appendix II.

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We are sending copies of this report to the Administrator, EPA; appropriate congressional committees; and other interested parties. We will also make copies available to others on request. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-3841 or [stephensonj@gao.gov](mailto:stephensonj@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Other GAO staff who made major contributors to this report are listed in appendix III.

A handwritten signature in black ink, reading "John B. Stephenson". The signature is written in a cursive style with a long horizontal flourish at the end.

John B. Stephenson  
Director, Natural Resources  
and Environment

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*List of Committees*

The Honorable Barbara Boxer  
Chairman  
The Honorable James M. Inhofe  
Ranking Member  
Committee on Environment and Public Works  
United States Senate

The Honorable John D. Dingell  
Chairman  
The Honorable Joe Barton  
Ranking Member  
Committee on Energy and Commerce  
House of Representatives

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# Objectives, Scope, and Methodology

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The objectives of our work on environmental issues stemming from Hurricane Katrina were to (1) review the Environmental Protection Agency's (EPA) actions under the Department of Homeland Security's National Response Plan to assess and mitigate the environmental impacts of Hurricane Katrina; (2) determine the extent to which EPA has assurance that public health in New Orleans is being protected from asbestos inhalation health risks posed by extensive demolition activities; (3) determine the extent to which EPA's communications on environmental health risks posed by Hurricane Katrina have provided useful information to the public; and (4) identify challenges EPA has faced in addressing the environmental impacts of Hurricane Katrina that, if mitigated, could enable EPA to better protect the environment in future disasters.

In reviewing EPA's actions under the National Response Plan to assess and mitigate the environmental impacts of Hurricane Katrina, we analyzed the National Response Plan and its accompanying annexes—particularly the Emergency Support Function Annexes, which specify the various responsibilities EPA and other agencies have with regard to providing emergency assistance. We discussed EPA's hurricane response actions with EPA's Offices of Emergency Management, Enforcement and Compliance Assurance, Water, Air, and Solid Waste and reviewed documentation related to these actions. We visited the EPA Incident Command Centers in both Metairie, Louisiana, and Biloxi, Mississippi, and discussed with various EPA officials from Region 6 (covering Louisiana) and Region 4 (covering Mississippi) their overall Hurricane Katrina response actions. We visited affected areas to survey the massive damage and cleanup operations, including the Lower Ninth Ward and the Murphy Oil Spill in Louisiana and some of the Mississippi's most severely damaged areas, such as Waveland, Bay St. Louis, Biloxi, and Gulfport. We interviewed other federal, state, and local officials who were either directly or indirectly involved with EPA's response efforts, such as officials with the Federal Emergency Management Agency, the Department of Health and Human Services' Agency for Toxic Substances and Disease Registry and Centers for Disease Control and Prevention, the Army Corps of Engineers, and the Department of the Interior's U.S. Fish and Wildlife Service. State and local officials interviewed included representatives with the Louisiana and Mississippi Departments of Environmental Quality and local officials from Jefferson, Plaquemines, Orleans, and St. Bernard Parishes in Louisiana and from Jackson, Hancock, and Harrison Counties in Mississippi. In addition, we spoke with national and regional stakeholder groups, including the Natural Resources Defense Council, the Lake Pontchartrain Basin Foundation, the Louisiana Environmental Action Network, the Louisiana

Mid-Continent Oil and Gas Association, the Mississippi Environmental Recovery Alliance, the Mississippi Power Company, and Sierra Club chapters in both Louisiana and Mississippi. We also reviewed various Congressional Research Service reports that provided an overall context for various environmental issues emerging from Hurricane Katrina, as well as reports from the EPA Inspector General on the hurricane response.

To analyze the extent to which EPA has assurance that public health in New Orleans is being protected from asbestos inhalation health risks posed by extensive demolition activities, we reviewed key documents, such as relevant Clean Air Act provisions; EPA's national emissions standards for asbestos, which set work practice standards for building demolition and renovation activities; and EPA's no action assurance letters to Louisiana and Mississippi. Other key documents reviewed include EPA's September 2005 *Overview Plan for Ambient Air Monitoring After Hurricane Katrina*, EPA's October 2005 *Regional Air Monitoring Plan for Hurricane Katrina in Louisiana*, and EPA's February 2006 *Contingency Air Monitoring and Sampling Plan for C&D Burning or Grinding Sites*, all of which cover areas of southern Louisiana impacted by Hurricanes Katrina and Rita. We also reviewed EPA's March 2006 Quality Assurance Project Plan for a building demolition project in Fort Smith, Arkansas, testing an alternative asbestos control method for building demolition. Additionally, we examined the air monitoring data EPA posted on its "Response to 2005 Hurricanes" Web page, which identified the location of the various air monitors the agency used to measure air quality after Hurricanes Katrina and Rita in Louisiana and Mississippi and the pollutants each monitor measured. We spoke with officials from EPA's Office of Enforcement and Compliance Assurance regarding EPA's asbestos no action assurance letters and its approach to addressing asbestos issues resulting from the hurricanes. We also spoke with EPA officials in the Office of Emergency Management, Office of Research and Development, and Regions 4 and 6 regarding asbestos and demolition issues, as well as with officials from the Army Corps of Engineers and the Louisiana and Mississippi Departments of Environmental Quality.

To determine the extent to which EPA's communications on environmental health risks posed by Hurricane Katrina have provided useful information to the public, we reviewed the agency's key communications about the potential health risks from environmental contamination in New Orleans—three environmental assessment summaries that were released in December 2005, March 2006, and August 2006. We also reviewed EPA's various flyers, public service announcements, advisories, and other

documents on EPA's "Response to 2005 Hurricanes" Web page that provide information to the public about environmental health risks and how to mitigate them. We spoke with EPA officials from the Office of Emergency Management and Regions 4 and 6 about the agency's efforts to communicate information regarding the environmental health risks from the hurricanes and reviewed comments provided by EPA's Science Advisory Board related to EPA's sediment sampling plan. Additionally, we reviewed various reports from the Department of Health and Human Services' Centers for Disease Control and Prevention, including the agency's June 2006 report *Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods*. We also reviewed EPA Inspector General reports on EPA's response activities. The focus of our review of EPA's communications of environmental health risks following Hurricane Katrina was on their content and the extent to which they provided clear and consistent information; we did not evaluate the scientific merits of EPA's environmental risk assessment methodology.

In conducting this work, we identified several challenges EPA faced in addressing the environmental impacts of Hurricane Katrina, based on our interviews with the federal, state, local, and private-sector officials identified above; our site visits in Louisiana and Mississippi; and a review of federal and private-sector reports and articles about environmental cleanup activities in the Gulf Coast after the hurricanes. Regarding the landfill issues, we reviewed related laws and guidance such as the Stafford act, the Resource Conservation and Recovery Act, the National Response Plan, Federal Emergency Management Agency debris management guidance, state regulations and emergency orders, and independent reports that addressed potential debris issues at landfill sites in Louisiana that received debris from Katrina. Finally, we visited the Chef Menteur and Old Gentilly landfill sites to observe debris management activities. Officials of the Federal Emergency Management Agency, the Department of the Interior's Fish and Wildlife Service, and the Army Corps of Engineers reviewed sections of the draft report that applied directly to their agencies. We conducted our work from November 2005 through June 2007 in accordance with generally accepted government auditing standards.

# Comments from the Environmental Protection Agency

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MAY 9 2007

THE ADMINISTRATOR

Ms. Christine Fishkin  
Assistant Director, Natural Resources  
and Environment  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington DC 20548

Dear Ms. Fishkin:

Thank you for the opportunity to review the Draft Report entitled "Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced in the Gulf Coast". We appreciate your acknowledgement of the extensive work conducted by EPA under challenging circumstances. We are proud of our contributions to this unprecedented response and also of the progress that we have made in our preparedness and response operations in recent years. We, along with other federal agencies, are continuing to make improvements in our work in light of our experience with the Hurricane Katrina response.

While we generally agree and have implemented many of your recommendations, we have concerns with several aspects of the report as they are misleading and in some instances, inaccurate. In these instances, the report does not provide a complete picture of the challenges faced and the work that was successfully completed. These themes are summarized below:

- The report creates a misleading impression that EPA was not timely in providing sufficient information about environmental conditions, i.e., that the information was not provided until December 2005 through an "assessment summary." In fact, EPA provided comprehensive information to FEMA in September 2005 which was combined with other information to assist local officials in their determination of when to allow displaced residents to return to their homes. Also, EPA provided almost daily web postings, informational handouts and numerous press releases immediately following the storm's landfall in August and beyond that assisted displaced residents to understand the potential health risks of returning home and how to mitigate them.
- The report creates a misleading impression that it was EPA's role to determine if it was "safe" for residents to return to their homes. In fact, that is the proper role of state and local officials in close coordination with the Department of Homeland Security. Also, the report does not recognize that communication about the environmental conditions represented a coordinated effort among appropriate federal and state agencies.

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See comment 1.

See comment 2.

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See comment 3.

- The report does not recognize that EPA worked with the Louisiana Department of Environmental Quality (LDEQ), the Louisiana Department of Health and Hospitals (LDHH), the Centers for Disease Control and Prevention (CDC), the Agency for Toxic Substances and Disease Registry (ATSDR) and the Federal Emergency Management Agency (FEMA) in the development of the environmental sampling summaries. Importantly, a number of comments in the draft report are related to the decisions and language included in the “assessment summary” that were the work product of other agencies with primary jurisdiction in addition to EPA.

See comment 4.

- The report suggests that EPA’s sampling program was incomplete because sediment samples were only collected in public access areas, but does not provide any data to demonstrate how these data would be significantly different from sediments collected on or inside nearby private properties. EPA believes that sediment samples collected in the median of a street or right-of-way between a curb and a sidewalk can be extrapolated to characterize the private properties in the immediate vicinity of the sample from the public access area. EPA did not find evidence of widespread contamination of petroleum-based products or arsenic “that could have been washed into a building during flooding.”

See comment 5.

- The report claims that the environmental contamination caused by this natural disaster could have both short-and long-term effects on the health of residents in impacted areas, as well as workers, volunteers, and wildlife. The data collected by EPA to date does not support this statement.

See comment 6.

- The report asserts that EPA’s August 2006 summary indicates that the data presented in the December 2005 summary applied only to short term visits. In fact, both summaries discuss how samples were compared to both short and long term health criteria.

See comment 7.

- The report underestimates the extent of asbestos monitoring that was conducted in that it does not include a complete picture of the robust federal and state network created to provide necessary information regarding exposure to workers and the public. The US Army Corps of Engineers (USACE), the Occupational Safety and Health Administration (OSHA) and EPA have collected over 20,000 asbestos samples in locations where major demolition is taking place.

See comment 8.

- The report is misleading regarding responsibility for mitigation of environmental impacts on national wildlife refuges during incidents of national significance. The decision to remove hazardous materials from the national wildlife refuge was the responsibility of FEMA and DOI, and did not involve EPA.

See comment 9.

- The report asserts that EPA had a limited role in ensuring that states dispose of storm debris appropriately. Even though EPA has limited formal authority over solid waste landfills, it did work closely with federal, state and local partners to institute extensive procedures to address waste segregation, recycling, and landfill operations. These procedures were reflected in a comprehensive “Debris Management Plan” to which EPA was a party.

I will continue by commenting on the five recommendations outlined in the report and I will also provide specific comments on the report for clarification and accuracy.

**Response to Recommendations:**

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Note: Pages in draft report may differ from those in this report.

**Recommendation 1, page 62: “We recommend that the EPA Administrator develop and implement an asbestos monitoring plan that addresses the potential health impacts of both (1) the non-enforcement of certain asbestos requirements covering government –ordered demolitions of residences and (2) the general exemption from EPA’s asbestos work practice standards for demolition and renovation activities of residential buildings with four or fewer dwelling units when done at the initiative of individual homeowners.”**

**Response:** EPA shares GAO’s concern regarding the potential impacts from asbestos. On September 20, 2006, EPA sent a letter to the Federal Emergency Management Agency (FEMA), US Army Corps of Engineers (USACE), the Occupational Safety and Health Administration (OSHA) and the Agency for Toxic Substances and Disease Registry (ATSDR) outlining our shared goals of protecting the public and response workers from the dust and contaminants that could be released during demolition or similar activities in southern Louisiana. EPA believes that the established engineering controls protect the public from the inhalation of asbestos and the asbestos monitoring network provides additional assurance.

See comment 10.

EPA believes that the current asbestos monitoring network, which extends beyond regulatory requirements, is more than adequate to provide necessary information. EPA, working with its federal and state partners, has established an asbestos monitoring network that is made up of area wide, waste reduction and demolition specific components. The USACE conducts air monitoring along the perimeter of demolition sites as well as from employees wearing personal monitoring equipment required by Occupational Safety and Health Administration (OSHA). LDEQ is the principal Agency monitoring the demolition activities at facilities that are not regulated by NESHAP. LDEQ inspectors frequently inspect and issue enforcement notices where these demolition activities appear to present environmental harm. LDEQ has developed guidance documents and provides compliance assistance to the private contractors conducting the majority of these demolitions. This multi-layered network has resulted in the collection of over 20,000 asbestos samples in Orleans and St. Bernard Parishes alone. A review of data collected from this network has not identified any environmental concerns.

See comment 11.

Asbestos is designated a hazardous air pollutant under Section 112 of the Clean Air Act. With respect to hazardous air pollutants, such as asbestos, for which it is not feasible to prescribe or enforce an emission standard, Section 112(h) of the Clean Air Act allows the Agency to establish a design, equipment, work practice, or operational standard, or some combination thereof. In the case of asbestos, EPA promulgated work practice standards designed to minimize the release of asbestos fibers. Even though section 112 does not mandate ambient air monitoring for asbestos, EPA included it in the monitoring plan developed for the Katrina response to be responsive to potential public questions and concerns. The Science Advisory Board reviewed this monitoring plan in October 2005. The network was designed to measure impacts from both the regulated asbestos containing material to which no action assurance letters might apply, as well as asbestos from materials not regulated.

See comment 12.

There are several areas in the report which are misleading concerning the monitoring that is underway. For example, the report indicates that our area wide component is not effective because the stations are not adjacent to demolition sites. The report fails to capture the proactive

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See comment 13.

engineering controls that are in place to prevent asbestos from being released. These controls include wetting before, during and after demolition, wrapping of the waste, and establishment of an asbestos work zone. Additionally, EPA's efforts to conduct perimeter air monitoring of grinding sites where volume reduction was occurring, was established to address the specific issue of potential asbestos releases from unregulated sources. EPA believes that this targeted approach is more conservative than monitoring at demolition sites since volume reduction activities have the potential to release more asbestos fibers as the material is being destroyed.

See comment 14.

EPA will continue to evaluate the data collected from this monitoring network. With regard to the unregulated activities, building upon the September 20, 2006 letter mentioned above (which EPA previously provided to GAO) and subsequent advisories, EPA will work with state and local officials to develop further demolition/renovation advisories that can be used throughout the area to advise individuals to take appropriate precautions.

Although EPA believes that these current activities have been more than adequate, to address GAO concerns expressed in the report, we will work with our federal, state and local partners to develop and implement a plan for additional monitoring.

**Recommendation 2, page 62: "We recommend that the EPA Administrator**

- **develop protocols to ensure that the agency's communications following disasters are timely and sufficiently disclose all the information that affected residents would need to understand the potential health risks they may face upon returning, including information on the scope and methodology for EPA's assessments of environmental health risks, and**
- **develop clear and consistent generic information for the public regarding mitigating exposure to contaminants-such as asbestos, lead, and mold-likely to be present in many disaster situations and ensure that this information can be expeditiously communicated via all appropriate media, thereby providing the public basic protective information at the same time that EPA is developing any additional event-specific health risk information that is needed.**

See comment 15.

**Response:** EPA's communications activities following Hurricane Katrina were unprecedented. In a timely manner, the Agency provided information to the public to identify potential risks, increase awareness, and prevent careless actions. We worked through the media, web postings and also through distribution of over 3.8 million flyers. Throughout the response, we saw evidence of our successful public communications through voluntary curbside sorting of household chemicals and recyclable electronics, careful return of residents to their homes, inquiries for certified contractors and distribution of supplies by non-profit organizations.

See comment 16.

Following the Katrina response, EPA created a Crisis Communications Work Group which is co-chaired by the Office of Public Affairs, the Office of Emergency Management and includes representatives from offices across the Agency. This group was tasked with the development of a crisis communications plan to address internal and external processes during response to Incidents of National Significance, building on the Katrina response. The plan has been reviewed by appropriate Agency personnel and will be finalized in the near future. Additionally, the group will begin developing a resource guide which will revise and organize existing crisis

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communication facts sheets, message maps, templates and other information to ensure that accurate and consistent information can be accessed quickly at the time of response. The guide will also include new information that will be developed based on identified needs. The guide is expected to be completed during early 2008 and will be reviewed and revised annually thereafter.

**Recommendation 3, page 63: Convene a working group with potentially affected federal land management agencies and the Coast Guard to develop protocols or memoranda of understanding on the steps the agencies should take to obtain disaster funding for environmental cleanups on federal lands in the future so that damage to federal lands and wildlife, such as on national wildlife refuges, can be addressed in a timely and efficient manner or seek amendments to the Stafford Act should EPA determine that amendments are needed to achieve the timely availability of such funding when responding to disasters.**

See comment 17.

**Response:** The report contains a misleading statement “EPA did not remove hazardous materials from national wildlife refuges in a timely manner as part of its hurricane response in part because disaster assistance funding generally is not used for debris cleanups on federal lands.” This statement implies that EPA was involved in the decision to remove or not to remove hazardous materials from national wildlife refuges. On page 45, the report correctly states that FEMA did not approve Interior’s request for funding to cleanup this debris.

See comment 18.

When the Department of the Interior (DOI) received funding, it requested assistance from EPA and the U.S. Coast Guard (USCG). EPA and USCG completed the requested work under budget and ahead of schedule.

See comment 8.

Nevertheless, we do not agree with this recommendation and suggest that the discussion of this issue be deleted from the report. As stated in the report, FEMA declined DOI’s request for assistance to mitigate environmental impacts of the hurricane in several national wildlife refuges. EPA was informed of this decision through routine debris management meetings conducted by FEMA at the Joint Field Office. We suggest that this issue would be more appropriately addressed to FEMA and DOI. DOI, as a federal agency, is responsible for the mitigation of environmental impacts on land managed by DOI.

**Recommendation 4, page 63: Provide more detailed guidance to state and local entities on managing debris disposal following disasters to better ensure protection of public health and the environment and prevent the creation of future Superfund sites. This guidance should address the selection of solid waste disposal sites for disaster debris and practices that can mitigate air, water, and soil contamination resulting from the disposal of debris containing hazardous materials, including advance selection of potential landfill sites.**

See comment 9.

**Response:** While EPA agrees that we should incorporate information learned during the Katrina response into our existing guidance, we believe that the assistance we provided in debris management was extensive and successful, resulting in the disposal of over 5 million containers of household hazardous waste, the proper handling and recycling of over 380,000 large appliances, and over 1,000,000 electronic goods to save important landfill space and ensure the

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reuse of metal components. We disagree with statements in the report that the Agency's assistance was limited.

See comment 19.

The report correctly states that EPA does not have a formal role in the decision-making processes associated with the two specific landfills mentioned in the report. However, it should be noted that EPA consulted with LDEQ throughout the response. The report indicates that EPA provided oversight; this is not correct, rather EPA provided assistance in a variety of ways. The report raises the concern that the two landfills would allow waste materials to leach out of the landfills and impact the surrounding environment. However, it neglects to mention that the landfill operator installed groundwater monitoring wells and inclinometers at the active Gentilly landfill, and environmental samples do not indicate any problem. Further, the report does not acknowledge that the groundwater beneath the landfill and surrounding area is saline and generally of poor quality.

See comment 20.

The Agency has started to make revisions to its current Disaster Debris Manual and plans to incorporate lessons learned from Hurricanes Katrina and Rita and provide more detailed guidance to states and local entities regarding acceptable practices, siting criteria, and the need for advanced planning/selection of potential staging/disposal areas. The changes will help states build upon the successes and lessons of the recent responses as they make decisions geared towards protection of human health and the environment. The Agency expects to have a revised version of the Disaster Debris Manual by the end of the calendar year.

**Recommendation 5, page 63: Work with the Corps of Engineers to clarify each agency's role in debris disposal and develop a Memorandum of Understanding or other agency protocol to allow the agencies to quickly manage and recycle white goods and electronic waste following future disasters.**

See comment 21.

**Response:** EPA and USACE worked cooperatively regarding the management of debris, meeting on a daily basis to assure timely and appropriate procedures were in place. As indicated above, EPA provided extensive assistance to both states, resulting in very successful operations. The report indicates that local officials indicated there were initial delays caused by confusion over roles for collection of white goods and electronics. However, in Louisiana, electronic wastes were first collected on September 10, 2005 and to date, over 1 million electronic units have been collected. Also, the USACE requested EPA's assistance with collection of white goods when they became overwhelmed. EPA began white goods collection on September 25, 2005 and collected or processed over 380,000 units prior to transition to the USACE in June 2006.

Despite this successful coordination, EPA agrees it would be beneficial to clarify the roles of EPA and USACE with respect to debris disposal. As noted in the GAO report, EPA has already initiated discussions with USACE to address this issue. We will document our final agreements in appropriate protocols, which may include language in the NRP Emergency Support Functions (ESFs), ESF supporting documents, and/or a Memorandum of Understanding.

**Specific Comments:**

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See comment 22.

**Highlights section, second paragraph under “What GAO found”:** “While the EPA took steps to monitor asbestos after Hurricane Katrina – for example, more than doubling the number of ambient (outdoor) air monitors in the area...” This statement and subsequent statements incorrectly suggests that these monitors were focused mainly on emissions from debris. In fact those monitors were used to characterize ambient air quality concerning numerous potential pollutants from broad sources both local and regional.

**Highlights section, third paragraph under “What GAO found”:** “EPA’s three reports on its environmental sampling in New Orleans conveyed important information on potential health risks from exposure to floodwaters, sediments and air. However, their usefulness was limited by a lack of timeliness and insufficient disclosures about EPA’s environmental sampling. For example, EPA did not disclose until August 2006 that its December 2005 assessment summary – which indicated that it was generally safe for residents to return to New Orleans – applied only to short-term visits such as to view the damage to homes.”

See comments 1, 3, and 6.

The criticism regarding the timeliness of EPA’s communications is reiterated on pages 6, 34, 35 and 60 of the report, and stems largely from a misinterpretation of the December 2005 assessment summary published on EPA’s website. The report asserts that the December 2005 assessment summary: 1) indicated that it was generally safe for residents to return to New Orleans, and; 2) applied only to short-term visits. In addition, the report states that information was provided too late and the assessment summary reports were EPA documents. As stated on page 1, EPA provided comprehensive information to FEMA in September 2005 to assist local officials in their determination of when to allow displaced residents to return to their homes. EPA also provided daily web postings, information hand-outs, and over 90 press releases following the storm’s landfall in August 2005 and on an ongoing basis through December 2005. Examples of these communication efforts were documented in a 45 page matrix entitled, “Hurricane Katrina Meeting, Community Outreach and Information Distribution” which has been previously provided to GAO. The assessment summary report was a collaborative effort with EPA, LDEQ, LDHH, CDC, ATSDR, and FEMA.

See comments 2 and 24.

The December 2005 assessment does not state that it was “safe” for residents to return to New Orleans. The report assumes that it was EPA’s role to answer the question of whether it was “safe” for residents to return to their homes, and also assumes that EPA was well placed to provide such advice. In fact, EPA was not in possession of adequate information to answer such a question, and to do so would have usurped the proper role of state and local officials, working in coordination with the Department of Homeland Security (DHS).

See comment 23.

In the response to Hurricane Katrina, FEMA gave EPA a mission assignment under ESF-10 to collect and maintain environmental data in order to characterize the nature of environmental impacts of the hurricane. The Department of Health and Human Services, specifically the Agency for Toxic Substances and Disease Registry, had the mission assignment under ESF-8 to provide data and technical assistance related to the health and medical aspects of situations involving hazardous materials. DHS had the public communication assignment under ESF-15 of the National Response Plan, which gives DHS the responsibility to:

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- Provide accurate, coordinated, and timely information to audiences affected by the hurricane, including governments, media, the private sector and individual citizens;
- Coordinate messages among all levels of government;
- Inform state and local officials on response efforts and recovery programs;
- Coordinate with the state to identify community leaders and groups to assist in the rapid dissemination of information;
- Establish and maintain a network for information exchange; and,
- Facilitate planning and mutual support at all levels of government for the hurricane response effort.

Under these responsibilities, EPA provided information on environmental issues to DHS beginning in September 2005. DHS shared this information with state and local officials for their use in making assessments regarding the impacts to human health and safety and the environment on environmental media affected by the hurricane. Specifically, a matrix of information on environmental conditions for each zip code was considered by Mayor Nagin when making his decision to allow residents to return to their homes.

See comments 1 and 2.

There were many factors that entered into the decision of whether it was safe to return to impacted areas, such as the integrity of the levees in the event of another storm or heavy rain, the structural soundness of storm-damaged homes, the adequacy of city services in a community (electricity, water utilities, sewerage, garbage collection, etc.), and the availability of police and fire protection, just to name a few. EPA collected data that was relevant to only a subset of the safety issues, such as whether drinking water at the point it enters the distribution system met federal standards. EPA endeavored to provide information to local officials and the public on those areas within our jurisdiction.

EPA believes that the local officials were best placed to collect and assess all these pieces of information – data from the Corps of Engineers on the condition of the levees, from state building inspectors on the stability of houses, from CDC on the medical risks of mold, from EPA and the state DEQ on the levels of contaminants in the drinking water, and so on. It is then within their purview, as representatives of the community, to make the judgment of whether it is “safe” for people to return. City and parish officials were consistent in this approach throughout Louisiana.

Lastly, the report asserts that EPA’s August 2006 assessment summary indicates that the data presented in the December 2005 assessment “applied only to short-term visits.” The basis for this assertion is unclear to us. The August 2006 summary discusses how the data from approximately 450 sediment samples were compared to both short-term and long-term health criteria. In addition, the December 2005 summary clearly discusses the comparison of the data to LDEQ’s Risk Evaluation/Corrective Action Program (RECAP) and US EPA’s risk criteria (e.g., range of 1 in 1,000,000 to 1 in 10,000 risk of an individual developing cancer over a lifetime) based on long-term (30 years) residential exposure assumptions.

See comment 6.

**Suggested revisions to the Highlights section of the report to address the above concerns:** However, as cleanup continues, ~~EPA’s assurance that the public health is protected from EPA needs to address potential risks associated with inhalation of asbestos fibers is limited because the agency has not deployed air monitors in and around New Orleans neighborhoods where~~

See comment 7.

Note: Strike-throughs indicate deletions suggested by EPA.

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demolition and renovation activities are concentrated. While EPA took steps to monitor asbestos after Hurricane Katrina—for example, more than doubling the number of ambient (outdoor) air monitors in the area and monitoring emissions at debris reduction sites—monitors were not placed in areas undergoing substantial demolition and renovation, such as the Ninth Ward. ~~This is problematic because monitors are effective in detecting releases of asbestos from demolition sites.~~ Further, many thousands of homes being demolished and renovated by or for individual homeowners are generally not subject to EPA’s asbestos emissions standards aimed at limiting releases of fibers into the air.

See comments 6 and 24.

Note: Strike-throughs indicate deletions suggested by EPA.

EPA’s three reports on its environmental sampling in New Orleans, which were coordinated with their federal and state partners, conveyed important information on potential health risks from exposure to floodwaters, sediments, and air. However, their usefulness was limited by a lack of timeliness, ~~and insufficient disclosures about EPA’s environmental sampling.~~ For example, EPA ~~did not disclose until August 2006 that its December 2005 report—which indicated it was generally safe for residents to return to New Orleans—applied to only short-term visits, such as to view the damage to homes.~~ Further, while EPA provided a substantial amount of useful information via flyers, public service announcements, and its Web page, these communications were at times unclear and inconsistent on how to mitigate exposure to some contaminants, particularly asbestos and mold.

See comments 8 and 9.

Note: Strike-throughs indicate deletions suggested by EPA.

Mitigating some challenges EPA faces addressing Hurricane Katrina could better protect the environment in the future. ~~First, EPA did not remove hazardous materials from national wildlife refuges in a timely manner as part of its hurricane response in part because disaster assistance funding generally is not used for debris cleanups on federal lands.~~ Second, States generally have authority over landfill decisions, and EPA has limited statutory enforcement authority to address environmental problems posed by solid waste landfills. ~~does not have an effective oversight role over emergency debris disposal decisions that could result in pollution.~~ Finally, in some instances, lack of clarity in plans and protocols on federal debris management roles was perceived to precluded the timely and safe disposal of some appliances and electronic waste.

See comment 5.

**Page 1:** The draft report states, “The environmental contamination caused by this natural disaster could have both short-and long-term effects on the health of residents in impacted areas, as well as on workers, volunteers, and wildlife.” The volume of data that EPA has collected to date does not support this statement. We recommend that this statement be deleted from the report.

**Page 2 (last sentence); page 6 (first paragraph referring to demolition or renovation by or for an individual homeowner; page 24 (2nd paragraph), page 28 (last 3 sentences)/ page 31 (first paragraph “privately sponsored demolitions and renovations ... .. volunteers”**

See comment 25.

The document contains numerous references that imply that the asbestos NESHAP requirements do not apply to individual homeowners or volunteer groups that are assisting the homeowner in the demolition/renovation of homes that may contain asbestos. This is not correct. There are situations where demolitions or renovations by homeowners or volunteer associations are covered by the NESHAP regulations.

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The July 28, 1995 Federal Register Notice (60 Fed. Reg. 38725-38726 (1995)) entitled "Asbestos NESHAP Clarification of Intent" discusses the applicability of NESHAPs to demolitions and renovations of private homes by the owner or others. It addressed the conditions under which an owner or operator (e.g., a volunteer group) may be subject to the asbestos NESHAP requirements.

If an owner or operator is demolishing two or more buildings on the same site (e.g., demolition of housing on several contiguous city blocks), the entire area is considered a site. EPA does not interpret the residential building exemption as applying to larger demolitions or renovations on a particular site, even where small residential buildings are involved. The definition of facility in the regulations includes an installation. Installation means any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control). Owner or operator is defined in the regulations and means any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated. To determine if a volunteer group is subject to the NESHAP regulation, a determination would be needed as to the number and location of sites (contiguous or not) and who has control or is supervising the demolition or renovation.

See comment 26.

**Page 6:** The statement in the first paragraph that "...EPA is not enforcing some of the work practice standards for certain residences" is inaccurate. To expedite the demolition of homes, EPA decided to allow houses that the government had decided needed to be demolished due to major damage by the Hurricanes to be treated the same as buildings subject to similar demolition orders based on a determination that they were structurally unsound and in danger of imminent collapse. For a building which is structurally unsound and in danger of imminent collapse, the regulations do not require the owner/operator to inspect for and remove asbestos prior to the demolition of the building. The advance notification is also not required although notification is required. The regulations do require the owner/operator to assume that there is asbestos and implement work practices to minimize potential release of asbestos fibers on the assumption that the material may be asbestos. Materials must be adequately wetted to prevent releases of asbestos fibers prior to, during, and after demolition all the way through to disposal. Disposal must be tracked and debris must be disposed of in a NESHAP compliant landfill. The landfill must meet specific requirements found in the NESHAP regulation. This relief was deemed necessary to help expedite the demolition of thousands of homes.

See comment 4.

**Page 6, bottom of the page:** The report suggests that EPA's sampling program was incomplete due to the fact that sediment samples were only collected in public access areas. *"In addition, the summaries do not disclose an important EPA assumption – that the results of sediment samples from streets and other outdoor public access areas can be extrapolated to private properties, such as yards and the inside of homes. This is important because, for example, environmental contamination levels inside buildings can be significantly higher than and different from the contamination outside, potentially causing more adverse health effects. For example, contaminants that could have been washed into a building during the flooding - like petroleum-based products and arsenic - are not dispersed into the atmosphere over time if confined indoors. Moreover, any toxic chemicals or other contaminants already in a building at*

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*the time of flooding - such as pesticides, asbestos and lead-based paint - may be released inside the building. Finally, after flooding, mold frequently forms and spreads.”*

Criticism regarding the comprehensiveness of EPA’s sampling program is reiterated on pages 35, 36, 37, and 60 of the report.

See comment 4.

Firstly, the report suggests that sediment data collected from public access areas would be significantly different from sediments collected on or inside nearby private properties. The report presents no data to support this assertion. EPA believes that sediment samples collected in the median of a street or the right-of-way between a curb and a sidewalk can be extrapolated to characterize the private properties in the immediate vicinity of the sample from the public access area. Similarly, EPA believes that the level of contamination in sediment samples collected outside of houses would be approximately the same as the level of contamination of any sediment found inside. With the exception of the area impacted by the Murphy Oil spill, EPA found no evidence of widespread contamination of petroleum-based products “that could have been washed into a building during flooding.” Similarly, EPA found no evidence that arsenic contamination was widespread.

See comment 27.

Secondly, EPA saw evidence supporting our successful public service communications regarding toxic chemicals that may have been present inside a building at the time of the flooding. Throughout the Federal response, EPA observed voluntary curbside sorting of household chemicals and recyclable electronics, inquiries for certified contractors, nonprofit organization distribution of supplies and thoughtful (perhaps cautious) return of residents to their homes.

See comment 28.

Lastly, EPA is not clear of the intended meaning of the statement that “after flooding, mold frequently forms and spreads.” It was obvious, upon visual inspection, that mold formed and spread in New Orleans after the flooding. The report includes a discussion of CDC’s report, *Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods*. CDC had the lead in providing information to the public regarding the potential health effects associated with exposure to mold, and did so.

See comment 29.

**Page 11:** In the first paragraph, the report acknowledges the EPA “exercised its enforcement discretion by issuing ‘no action assurance’ letters stating that EPA would not enforce certain Clean Air Act requirements...to facilitate debris removal in Louisiana and Mississippi.” The EPA wants to clarify that it issued the NAAs “in order to facilitate response and recovery activities” as the document says, but EPA did so because the conditions were extreme and EPA believed that the NAA included reasonable precautions. In order to provide the necessary regulatory flexibility, EPA’s decision whether or not to monitor under the NAA was related to the existing regulatory requirements that we were agreeing to address. It is important to note that EPA, when developing the asbestos NESHAP regulations, determined that it is not feasible to establish a numeric emission standard for asbestos. Instead, the Agency believed asbestos emission controls were the best “technology” to control asbestos emissions.

See comment 30.

**Page 13-14:** The draft Report uses the phrase “hazardous debris” to imply that all household hazardous wastes, electronic wastes, and white goods are hazardous by definition. While types of electronic goods, such as computers, may contain hazardous materials, it is not accurate to imply

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all electronic goods are hazardous debris, as defined by statute. We suggest the draft report be revised to read as follows: "Specifically, EPA established a plan to segregate, collect and properly dispose of debris: such as household hazardous wastes (household cleaning chemicals, paints, and pesticides); electronic waste (computers, televisions, printers, DVD players, and other electronics); and white goods (large appliances such as air conditioners, dishwashers, refrigerators, stoves, and freezers)."

See comment 31.

**Page 14, fifth line from the top of the page:** The draft report characterizes chlorofluorocarbons (CFCs) as "hazardous" contaminants. CFCs and hydro-chlorofluorocarbons (HCFCs) are ozone-depleting substances and are regulated by EPA under Title VI of the Clean Air Act, but they are not hazardous substances. Not all regulated substances are hazardous. For a list of hazardous substances see 40 C.F.R. § 302.4. CFCs and HCFCs are categorized as Class I Ozone Depleting Substances (CFCs) and Class II Ozone Depleting Substances (HCFCs) which have significantly less ozone depleting potential than Class I substances. Since 1995, refrigerators and freezers sold in the United States have used HCFCs, not CFCs. Thus, while there is a possibility that improper disposal of refrigerators and freezers may result in the release of Ozone Depleting Substances, it is more likely that Class II HCFCs that will be released instead of Class I CFCs, as stated in the GAO Report.

See comment 32.

**Page 21, first paragraph:** Although EPA's FEMA-funded activities are complete in Mississippi, EPA is still providing support to the State under the extension to the No Action Assurance for Mississippi granted on March 9, 2007. EPA and Mississippi will conduct enhanced compliance monitoring and oversight through monthly field inspections.

See comment 33.

**Page 21, footnote 25:** "monitors measure ambient concentrations up to six contaminants" this statement is followed by a list of several groups of chemicals including VOCs and PAHs that cover hundreds of pollutants. We recommend changing this statement to "monitors measure ambient concentrations of hundreds of pollutants in the following categories"

See comment 34.

**Page 23:** The report states "EPA has delegated the authority to implement and enforce the asbestos standards..." We do not "delegate" authority to the states under the Clean Air Act NESHAP; we "authorize" their programs. The difference is important because in an "authorized" program, EPA retains the authority for direct enforcement in addition to its authority to oversee the State program.

See comment 35.

**Page 23:** Footnote 29 combines a number of definitions together from the regulations. Doing so results in re-defining terms found in the regulation. It is important to keep the definitions separate, i.e., the definition of Regulated Asbestos Containing Material (RACM) should not be combined with definitions for Category I and Category II and friable. We recognize that this was done because the definitions are long but ask that GAO simply refer to the regulatory definitions. If GAO believes the definitions must be included, then EPA requests that the regulation be cited and verbatim definitions be used from the regulation.

See comment 36.

**Page 23:** In the first full paragraph, the report states that "... EPA's national emissions standards for asbestos regulate various potential sources of asbestos emissions, including renovation and demolition activities, by setting standards for work practices." This sentence

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references footnote 28. For clarity, we suggest that GAO add to this footnote the following sentence: "See 40 CFR 61.145(c), Procedures for asbestos emission controls."

See comment 37.

**Page 23:** The second bullet on page 23 states that "... the owner or operator of the demolition activity generally must ...provide written notice to EPA or the state of intention to renovate or demolish buildings that have asbestos-containing materials." Please note that owners or operators are only required to submit notifications for renovations if regulated asbestos-containing material which meets the regulatory threshold is present.

See comment 38.

**Page 24, first full paragraph, second sentence:** This is an incomplete description of how debris from a building that is structurally unsound and in danger of imminent collapse is treated under the asbestos NESHAP. It reads as if the asbestos NESHAP does not apply to structurally unsound buildings. We recommend that a comma be inserted at the end of that sentence followed by the phrase "...however debris from that structure must be treated as if it contains asbestos and properly wetted, contained, transported, and disposed of in a landfill authorized to accept asbestos contaminated waste."

See comment 39.

**Page 24, footnote 31:** Revise from "Demolition or renovation by the individual homeowner of residential buildings..." to "Demolition or renovation by the individual homeowner of a residential building..." A residential homeowner may not demolish/renovate more than one building or the residential exemption is lost, and all NESHAP requirements are applicable.

See comment 40.

**Page 29, footnote 39:** The footnote states "using 1 year screening level" referring to the asbestos screening level (SL) of 0.01 fibers >5umlength/cc, and it is referred to as being a "modified AHERA... ISO... standard". However, there is no "standard" and there is not an ISO "standard".

We recommend the reference statement be changed to state the SL was developed with consideration of AHERA regulations and EPA's asbestos risk estimates. ISO only comes in as a method used on some percentage of the positive results

See comment 41.

**Page 30:** The report says "...EPA said that its air monitoring currently focuses on more limited geographic areas where 'grinding and other remediation activities are ongoing'—for example, at debris volume reduction sites..." The report goes on to say "According to EPA, conducting air monitoring at debris reduction sites is more conservative than at demolition sites since volume reduction activities such as grinding or burning have the potential to release more asbestos fibers as the material is destroyed." The Agency wants to clarify that no burning or grinding of regulated asbestos containing material was performed under EPA's NAA. The October 2005 NAA set up a pilot program to explore the use of burning regulated asbestos materials, but the pilot never went forward.

**Page 32:** In the first full paragraph, GAO notes that EPA's conditions for granting the October 2005 NAA for a burn and grind pilot contained a requirement for monitoring prior to and during demolition. The October 2005 NAA was EPA's effort to provide needed relief to LDEQ to expedite the demolition and disposal of thousands of homes in the damaged areas, including the possibility of burning asbestos-containing material, which is currently prohibited by the asbestos regulations. EPA's February 3 and February 24, 2006 NAA allowed houses being demolished

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under a government order to be treated as though they were under a demolition order based on a determination that they were structurally unsound and in danger of imminent collapse. Thus, EPA allowed the homes to be demolished without an inspection and prior removal of asbestos, provided certain emission controls were employed, i.e., those controls required for houses containing asbestos, and the resulting debris was disposed of as asbestos-containing waste. Note an asbestos trained person is required to supervise the demolition, and emission controls such as wetting the material before, during, and after demolition continued to apply as did transport and disposal requirements that are applicable to asbestos containing waste.

EPA determined that this flexibility was appropriate given the potential hazards to workers entering the houses which could be uninhabitable (e.g., full of mold) and the pressing need to complete demolitions quickly to enable the state to rebuild the city. The initial request from LDEQ asked EPA to allow demolition of everything in a very short period of time. The request for burning, which the October 2005 NAA began to address, was primarily for volume reduction. However, over time, the quick demolition and volume reduction issues became less important because of the right of entry legal issues that arose which inhibited the demolition progress. For the later NAAs, where the focus was just on the demolition activities, EPA believed that the required work practices along with the OSHA required monitoring of workers, which provides surrogate data on asbestos levels in the vicinity of the demolition, provided protection reasonably comparable to the existing NESHAP regulations in these extreme circumstances while allowing necessary demolitions to move forward.

**Page 32:** In the second full paragraph, the report discusses the Fort Smith project. The Agency wants to clarify that the Fort Smith research project had a very different purpose - to develop data to show that an alternative work practice provided the same protections as is currently required under the asbestos regulations. The layers of air monitors deployed by ORD were necessary to collect asbestos emissions. The results of this alternative work practice will be used to determine if it is acceptable. This in turn may lead to amending the asbestos regulations so that the work practice can be used nationally and without a limited time frame for its use. The NAA granted to the Fort Smith research project provided similar relief for the demolition of houses that were severely damaged by the hurricane which were subject to a government issued demolition order for being structurally unsound and in danger of imminent collapse. Similar conditions were established for the Fort Smith research project whereby flexibility for some of the NESHAP requirements for asbestos emission controls was provided during the demolition but all other asbestos requirements applied to the resulting debris including wetting, transport requirements, and disposal pursuant to the NESHAP requirements. While extensive monitoring occurred at the Fort Smith research project, current asbestos regulations do not require air monitoring to be conducted at demolition operations.

Although EPA did not conduct the level of monitoring it conducted at its research project in Fort Smith, there was monitoring from Louisiana and Mississippi, which found little or no asbestos when demolishing the homes subject to the NAAs. In addition, the state had access to the data developed by the USACE to meet OSHA requirements for the monitoring of workers on the site. Those results indicate low levels of asbestos well below the permissible exposure limit. When considering the recent request from LDEQ for an extension of the NAA, EPA evaluated the data from air monitoring stations and worker monitoring in Louisiana and Mississippi.

See comment 42.

See comment 43.

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See comment 42.

**Page 32, footnote 46:** The footnote states “the pilot had more stringent requirements before and during the demolition than EPA is requiring under the current asbestos no action assurance...” This statement can be misleading if the reader is unaware as to why the pilot had more stringent requirements. We recommend adding: The pilot test required more stringent requirements as it was geared toward potential use to amend a regulation. The data requirements for this type of project are much more stringent than one-time demolitions that are the result of a natural disaster.

See comment 44.

**Page 33, last paragraph:** EPA does not agree that our “primary communications about the health risks from exposure to environmental contamination in New Orleans—three environmental assessment summaries prepared with, among other, the Louisiana Department of Environmental Quality—did not sufficiently disclose some information that would have helped residents better understand the potential health risks of returning home and how to mitigate them.” EPA issued numerous press releases and almost daily web postings providing this information to the public and the media. These messages contained health warnings and information about how to mitigate them. Examples of these communication efforts were documented in a 45 page matrix entitled, “Hurricane Katrina Meeting, Community Outreach and Information Distribution” which has been previously provided to GAO.

See comment 45.

**Page 48, second line from the bottom:** Replace “sanitary engineers” with “experienced Environmental Scientists and Environmental Engineers”. The phrase ‘sanitary engineers’ refers to persons who operate wastewater treatment systems, not landfills.

See comment 46.

**Page 49:** The report notes that “While RCRA does not provide EPA with authority to directly enforce this prohibition or the landfill criteria, the act authorizes EPA to take enforcement action, including issuing administrative orders, to address waste management activities that present an imminent and substantial endangerment to health or the environment.” The Agency wants to clarify that, according to Subtitle D, states have primary responsibility for permitting and monitoring solid waste disposal facilities and developing solid waste management plans in accordance with minimum federal requirements established by EPA. EPA regulations establish criteria for classifying different types of landfills and practices that may result in adverse effects on health or the environment, among other things. RCRA provides EPA with limited enforcement authority to address environmental problems posed by solid waste landfills. More specifically, EPA has the authority to enforce the municipal landfill criteria (40 CFR Part 258) only in those states where it has determined the state permit program for landfills that receive household hazardous waste or conditionally exempt hazardous waste from small quantity generators is not adequate. In such cases, EPA may exercise the enforcement authorities provided in RCRA sections 3007 and 3008. See RCRA section 4005 (c)(2)(A). EPA also maintains the authority to address solid waste activities that may present an imminent and substantial endangerment to public health or the environment.

See comment 47.

**Page 50, first full paragraph, line 12:** This discussion of the Agriculture Street Landfill Superfund Site contains some inaccuracies. We recommend editing as

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Note: Strike-throughs  
indicate deletions suggested  
by EPA.

follows: "During this period, trash collected from various sectors of the City and ash from municipal incinerators, among other things, was disposed of at the Site. Oil was used to burn the refuse at the dump, and during the 1940s and 1950s the area was routinely sprayed with DDT. The landfill was reopened after Hurricane Betsy to receive hurricane debris ~~from destroyed buildings and ash from municipal incinerators.~~" [Keep next sentence as written]. "Following concerns ~~about cancer~~ among residents in the area, EPA initiated investigations at the site in 1986, ultimately identifying elevated levels of lead, arsenic, and carcinogenic polycyclic aromatic hydrocarbons, the primary contaminants of concern identified in sediment tests following Hurricane Katrina but also ubiquitous in an urban, industrial setting. Analyses of the ~~health effects of~~ potential for exposure to these contaminants...."

See comment 48.

**Page 53, second line:** Delete "unless these buildings are subject to a government demolition order" because it is inaccurate. With respect to a residential building that meets the relevant exclusion from the term "facility," the fact that such a facility may be subject to a government demolition order, which would have to be issued because the facility is structurally unsound and in danger of imminent collapse, is not enough to bring the facility back within coverage of the asbestos NESHAP.

See comment 49.

**Page 53:** Footnote 69 says, "Louisiana also authorized some landfills...to operate as 'enhanced' C&D landfills that may receive regulated asbestos-containing material as well as unregulated material." The Agency wants to clarify that enhanced landfills in Louisiana are landfills that meet the requirements for disposal sites under the asbestos NESHAP. The NESHAP regulations have specific requirements for waste disposal sites that receive asbestos-containing wastes from a source covered under 40 C.F.R. §61.150 (included demolition/renovation activities covered by the NESHAP) as well as other sources. These requirements remain in effect.

See comment 50.

**Page 55, last line:** Substitute "technical assistance" for "oversight".

See comments 9 and 50.

**Page 56, last sentence of first paragraph:** Revise as follows: "While it is LDEQ's regulatory responsibility to ensure that debris containing hazardous materials would not enter landfills, multiple layers of technical assistance were provided by EPA to the state." The following explanation also applies to misleading sections in the last paragraph of the Highlights section:

EPA provided assistance to the state and not oversight. The assistance EPA provided was far from limited. EPA provided the assistance to the State of Louisiana via FEMA tasking. These assistance activities resulted in the establishment of several mechanisms to help ensure the proper sorting of debris prior to disposal. Below is a summary of these mechanisms:

- Education through the distribution of flyers that identified the proper categories of segregation.

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- Additional curbside segregation during collection activities. These efforts were closely coordinated with the appropriate ESF 3 party responsible for general debris (i.e., USACE or local governments).
- EPA and USACE oversight of curbside collection activities conducted by response contractors.
- Landfills also posted signs identifying the type of waste that the landfill could accept.
- Inspection towers were in place to inspect loads of debris prior to its entrance into the landfill.
- Landfill operators also had landfill spotters that worked the landfill and watch the loads as they were being placed in the landfill.
- The landfill machine operators also reviewed the material as it was being pushed into the landfill.
- The landfill operators maintained logs of rejected loads and kept a roll-off container to place unauthorized waste that was found through these precautions at the landfill. This waste was then disposed of at a proper facility off-site.
- LDEQ conducted inspections of these operations and kept a full time representative at 5 of the landfills.
- EPA performed landfill observation twice a week at several site to ensure that the precautions described above were in place and working.

These efforts are not “limited.” In fact, these efforts resulted in more than 5 million containers being separated from the general debris stream. While these efforts could not guarantee 100 percent segregation, they do demonstrate a due diligence and help to ensure that any hazardous debris placed in a landfill would be de minimis. Describing this assistance as oversight and limited is an inaccurate statement.

**Page 58, second full paragraph:** The report indicates that “In Mississippi, county officials from the three coastal counties hit by Katrina expressed frustration that EPA did not assist with either white goods or electronic waste disposal.” Shortly after the Hurricane Katrina debris efforts began, EPA issued to MDEQ, USACE and contractors working on debris reduction a four-page *Guidance for Handling Refrigerant Containing Appliances/Vehicles Damaged by Hurricanes* and a one-page memorandum entitled *Handling Procedures for White Goods Containing Refrigerants*. This latter memo included management practices for white goods that would help to ensure that refrigerant would be removed and recovered as required by the federal regulations. EPA fulfilled its supporting role under Emergency Support Function (ESF) #3 by helping the USACE and the counties understand how to handle white goods and properly evacuate refrigerants from refrigerators and freezers prior to disposal. USACE is the primary agency for ESF#3 and they did not request any additional support from EPA regarding white goods or electronic waste disposal.

EPA also had an electronics waste recycler, Global Investment Recovery, Inc., under the Recycling Electronics and Asset Disposition (READ) program remove several tractor-trailer loads of electronics from Mississippi. Further, in March of 2006, one of EPA’s Plug-in-to-eCycling Partners, Best Buy, Inc., held a very successful electronics collection event in Mississippi that resulted in almost 50 tons of electronic components being collected and taken by

See comment 51.

See comment 52.

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See comment 53.

Best Buy for recycling. Both events occurred several months before GAO began its investigation, yet both are omitted from the GAO report.

**Page 61, first paragraph, third sentence:** The report incorrectly describes EPA and the United States Coast Guard as "land management agencies".

Finally, I am attaching a list of corrections in the sections of the report which deviated from statutory or regulatory language.

Should you need additional information or clarifications related to these comments, please contact Dana Tulis at 202-564-7938.

Sincerely yours,



Thomas P. Dunne  
Associate Administrator for Homeland Security

Attachment

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The following are GAO's comments on the Environmental Protection Agency's letter dated May 9, 2007.

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## GAO Comments

1. As stated in the draft report, we reviewed the extent to which EPA's communications on environmental health risks posed by Hurricane Katrina have provided useful information to the public. In this regard, the issue with timeliness that we raise focused on EPA's three key environmental assessment summaries covering its environmental sampling in New Orleans after the floodwaters had receded. The draft report also addressed the many other communications on environmental health risks EPA provided to the public via flyers and health advisories distributed at various locations throughout the hurricane-damaged areas, public service announcements made available to the media, and information posted on EPA's Web page. We recognize that many of these communications preceded the release of the environmental assessment summaries. Therefore, to address EPA's concern that the report may be construed as indicating that EPA did not release information about environmental conditions following Hurricane Katrina until December 2005, when it released the first assessment summary, we have added a statement on the Highlights page that "EPA issued timely information to the public on a variety of environmental health risks." Also, in the body of the report, we now state that EPA started its communications efforts shortly after the storm, beginning in September 2005. In addition, EPA suggested we include some information it provided to FEMA, but we did not because it was not relevant to this report, which addresses EPA's communications to the public.
2. We do not agree that the draft report created an impression that it was EPA's role to determine if it was safe for residents to return to their homes. The draft report stated that "EPA worked with other federal and state agencies to support local officials evaluating home and neighborhood safety."
3. We disagree with EPA's statement that the draft report did not recognize that EPA worked with the Louisiana Department of Environmental Quality and other federal and state agencies in the development of the environmental assessment summaries. The draft report explicitly stated in several places, starting with the Results in Brief section and again in the body of the report, that EPA worked with the Louisiana Department of Environmental Quality and others in

developing the summaries. All of the other federal and state entities are identified in the body of the draft. We have, however, added the language used in the Results in Brief section of the report to the Highlights page.

4. We disagree with EPA's assertion that the draft report suggested that EPA's sampling program was incomplete. The draft report explicitly stated that we (1) determined the extent to which EPA's communications on environmental health risks posed by Hurricane Katrina have provided useful information to the public and (2) did not evaluate the agency's environmental risk assessment methodology. In the context of the usefulness of the communications to the public, the draft report stated that we believe *EPA's assumption* (that the results from sediment samples from streets or other public access areas can be used to accurately characterize the degree and nature of contamination in New Orleans, including inside homes and in yards) *is important and warrants highlighting in the environmental assessment summaries for two main reasons*. First, as the draft report stated, environmental contamination levels inside buildings can potentially be higher than and different from the contamination levels outside for a variety of reasons, potentially causing more adverse health effects. Further, as the draft report also stated, EPA's Science Advisory Board had suggested that EPA conduct some indoor sampling in New Orleans for this reason. Second, the draft report stated that to understand the level of assurance that EPA can provide about the extent to which localized areas of contamination may exist throughout the city, it is important to know that limiting sediment and soil sampling to outdoor, public access areas can be problematic. For example, sediments in streets may be subject to more dispersion than those that settled in more protected areas, such as on private property close to residences. Our point is that EPA should have disclosed, and provided its rationale for, important assumptions such as this in the assessment summaries themselves.
5. EPA said that the data the agency has collected to date do not support the statement in the draft report that the environmental contamination caused by this natural disaster could have both short- and long-term effects on the health of residents in impacted areas, as well as workers, volunteers, and wildlife. We believe that it would be premature to conclude that the environmental contamination caused by Hurricane Katrina has not and will not cause any short- and long-term public health effects. Further, EPA has not demonstrated that it has assurance

that the environmental contamination both has not and will not cause any short- and long-term public health effects.

6. EPA takes issue with the draft's assertion that EPA's August 2006 summary indicates that the data presented in the December 2005 summary applied to only short-term visits. In fact, the statement that EPA is questioning is taken directly from its August 2006 summary, which describes the results of EPA's analysis of 450 samples (termed phase I by EPA) addressed in its December 2005 summary. The complete statement in EPA's summary is as follows: "The results of the phase I sampling indicated that hazardous substances were not detected in the sediments at levels that would pose an immediate health risk to workers involved in response activities or to residents returning for a quick assessment of damage to their homes." Further, the August 2006 summary also states that the data from the phase I analysis were used to assess "(1) whether hazardous substances were present in the sediment in residential areas; and (2) the potential health effects to emergency workers and residents from *short-term exposure* [emphasis ours] to any hazardous substances found in the sediment." EPA's summary of the results of the testing, combined with its explanation of the goal of this testing, indicates that the data presented in the December 2005 summary apply to short-term visits.

Moreover, in its comments, EPA appears to question the assessment results it reported by stating that "both summaries discuss how samples were compared to both short and long term health criteria." While the summaries do not "discuss" the health criteria, they do state that the samples were compared to both "LDEQ Risk Evaluation/Correction Action Program (RECAP) and EPA's risk criteria based on long-term (30 years) residential exposure assumptions." EPA appears to be suggesting in its comments that a reader of the August 2006 summary should independently infer—on the basis of its reference to technical (and to the general public, arcane) risk criteria—that the December 2005 analysis also provided assurance that longer-term exposures would not pose any health risks. However, EPA's assessment of the initial 450 sediment samples addressed only short-term visits, according to the agency's August 2006 summary as quoted above. We believe this example, and EPA's response to it, illustrates the need for EPA to improve its environmental risk communications, as we are recommending.

7. We disagree with EPA's statement that the draft report underestimated the extent of asbestos monitoring. We believe the draft report accurately presented information about the monitoring conducted by the federal and state network—the ambient air monitors; some monitoring conducted at some debris reduction sites; and the monitoring conducted by the Army Corps of Engineers and its contractors, who are conducting demolitions under government orders. Further, although the draft report stated that the Louisiana Department of Environmental Quality has told EPA that monitoring by the Army Corps of Engineers and its contractors has found “little or no asbestos emissions,” it also stated that such air monitoring data from the Army Corps of Engineers and its contractors do not address potential asbestos emissions from the privately sponsored demolitions and renovations by individual homeowners. Since these activities are not regulated—and emissions control actions such as wetting the material from before the demolition process through disposal are not required—the potential for asbestos emissions at these sites is greater than at regulated sites. Because EPA's air monitors have not been deployed in and around neighborhoods both where publicly and privately sponsored demolition and renovation activities are concentrated, the agency's finding of no measurable amounts of asbestos at its ambient monitoring sites does not necessarily address the asbestos to which residents, workers, and volunteers may be exposed in some neighborhoods.
8. EPA said that the draft report was misleading regarding responsibility for mitigating environmental impacts on national wildlife refuges following disasters, stating that the decision to remove hazardous materials from the national wildlife refuges was the responsibility of FEMA and the Department of the Interior and did not involve EPA. We have revised the language in the report to clarify the discussion of responsibilities. In presenting this issue—which we cite as a challenge EPA faced in addressing the environmental impacts of Hurricane Katrina—the draft report explained that EPA did not remove hazardous materials from national wildlife refuges in a timely manner as part of its response in part because disaster assistance funding generally is not used for debris cleanups on federal lands. The draft report also explained that FEMA did not approve the Department of the Interior's request for funding to clean up this debris because it was on federal lands. The draft report showed the impact on national wildlife refuges from the 2005 Gulf Coast hurricanes: Debris that could have been removed in conjunction with EPA cleanup activities in areas

immediately adjacent to refuges was instead left in place for a year or more, allowing containers holding hazardous materials to settle into marshlands and begin to corrode and leak. In one refuge, a fire spread to a 120-acre debris field with propane and other hazardous material containers, causing explosions that endangered firefighters. We continue to believe that EPA should be involved in helping resolve these issues because, under the National Response Plan, EPA is the chair of the National Response Team, whose duties include national planning and response coordination for oil and hazardous materials incidents. We do agree that FEMA, which declined to provide funding to the Department of the Interior for cleanup after Hurricane Katrina, and DHS, which coordinates the federal response to disasters under the National Response Plan, should also take part in planning efforts to resolve funding issues concerning the removal of hazardous materials from federal lands following a disaster. Accordingly, we have modified our recommendation to state that EPA should also work with DHS and FEMA, as well as with federal land management agencies and the Coast Guard, to determine what actions are needed to ensure that environmental contamination on federal lands, such as national wildlife refuges, can be expeditiously and efficiently addressed in future disasters. Timely cleanup can lessen the damage to the environment, better protect the public from exposure to contaminants, and prevent further migration of hazardous materials to state and local waters and land—and would likely be more cost-effective.

9. We disagree with EPA's statement that the draft report asserted that EPA had a limited role in ensuring that states dispose of storm debris appropriately. Specifically, we stated in the draft that EPA's debris *management* role is limited; however, we did not say that EPA had a limited role in helping states dispose of storm debris appropriately. In fact, our draft report specifically highlighted EPA's efforts with its partners in addressing waste segregation, recycling, and landfill operations—the areas EPA's comments cited as not being recognized in the draft report. Our finding and recommendation in this area relate to current limitations in EPA guidance to states on making certain emergency debris disposal decisions—such as where to locate emergency landfills and the implications of selecting disposal options that otherwise would not be acceptable. We note that EPA has agreed to implement our recommendation as it makes revisions to its disaster debris manual in calendar year 2007.

10. The information EPA provides on its asbestos monitoring activities in this paragraph was presented and analyzed in the draft report. Specifically, the draft cited the asbestos monitoring conducted by demolition contractors using personal sampling pumps and employees wearing personal monitoring equipment required by the Occupational Safety and Health Administration. In addition, the draft report cited the Louisiana Department of Environmental Quality's report to EPA that this monitoring has found "little or no asbestos emissions." Further, the draft report discussed reasons we believe additional monitoring is warranted: (1) Neither ambient nor demolition site monitors have been located in neighborhoods with substantial demolition and renovation activities, such as the Ninth Ward; (2) EPA scaled back its ambient monitoring to the prestorm level and reduced the frequency of sampling—thus EPA's expanded monitoring covered only the first few months of demolition activities, when few demolitions were conducted; and (3) many thousands of demolitions and renovations may occur in the same geographic area and in the same general time frame—some of which are not subject to the enforcement of certain asbestos work practice standards, while others are not subject to the standards at all. The draft report also stated that as of January 2007, about 25,000 homes concentrated in the Orleans and St. Bernard Parishes were awaiting demolition, and another 80,000 homes that were flooded in the New Orleans area were not yet included in the demolition estimates, but many of these homes will likely be demolished. Those not demolished will likely have to be substantially renovated.
11. This information cited by EPA is background information about asbestos and EPA's asbestos regulation, which was provided in the draft report.
12. Contrary to EPA's assertion, the draft report did identify the emission controls required by EPA's no action assurances (in its comments, EPA refers to these controls as engineering controls). The draft also discussed the monitoring of air at grinding sites and EPA's rationale for focusing on these sites rather than demolition sites. We continue to believe it is appropriate for EPA or the state to conduct monitoring at both demolition and volume reduction sites. Further, while some emission controls may be in place at demolitions covered by the no action assurances, the many demolitions and substantial renovations by individual homeowners generally are not subject to any of these controls; further, the debris from these unregulated activities may be

transported without emission controls to construction and demolition landfills.

13. We encourage EPA to expeditiously implement the plan the agency discusses in its comments to work with state and local officials to develop further demolition/renovation advisories that can be used throughout the area to advise individuals to take appropriate precautions. We note that numerous volunteers of all ages travel to the Gulf Coast to help with demolitions and renovations, particularly during the summer months and holiday periods, and they should have clear guidance on protective measures to take when they are in areas undergoing demolition or renovation.
14. We urge EPA, in developing a plan for additional air monitoring, to evaluate the number and location of the air monitors to ensure sufficient coverage of areas with substantial demolition and renovation activities, both regulated and unregulated. If air monitors are not appropriately located in neighborhoods undergoing demolition and renovation, the monitoring network will not be adequate to ensure that public health is being protected.
15. Our draft report highlighted EPA's communications activities, which EPA reiterates in its comments.
16. Our draft report illustrated the need for EPA to revise and organize existing crisis communication fact sheets and other information to ensure that accurate and consistent information can be accessed quickly at the time of response. In its comments, EPA states its intention to do so by developing and using a resource guide to be completed in early 2008.
17. EPA's comments describe as misleading a statement in the draft report explaining that EPA did not remove hazardous materials from national wildlife refuges because disaster assistance funding generally is not used for debris cleanups on federal lands. We believe this statement is factual as written and does not imply that EPA was involved in the decision to remove or not to remove hazardous materials from national wildlife refuges. Further, the draft report also explained that FEMA did not approve the Department of the Interior's request for funding to clean up this debris because it was on federal lands. See comment 8.

18. EPA's comment that EPA and the Coast Guard completed their cleanup work at the national wildlife refuges "under budget and ahead of schedule" does not acknowledge the fact that the hazardous materials were left in place in national wildlife refuges for a year or more before the cleanup was initiated. During that time, containers holding hazardous materials settled into marshlands and began to corrode and leak. When the cleanup of the Sabine National Wildlife Refuge was completed—16 months after Hurricane Rita—about 2,200 containers potentially filled with hazardous liquids and gases had been found and removed, along with several thousand other hazardous waste items, tires, batteries, munitions, and white goods. At another refuge, a fire spread to a 120-acre debris field with propane and other hazardous material containers, causing them to explode and endanger the firefighters. EPA's comments also do not acknowledge that the delays in removing the debris complicated the cleanup efforts and increased the cost of removal—or that hurricane response actions to collect hazardous materials in adjacent areas were halted at federal boundaries.
19. EPA commented that it consulted with the Louisiana Department of Environmental Quality regarding landfills. The draft report so indicated. Further, EPA stated that its staff assisting the state at landfills did not provide oversight as the draft report indicated but "provided assistance in a variety of ways." Some of the assistance EPA provided, such as sending observers to landfills to monitor and report on activities, constitutes oversight. EPA also said that the operator of the Gentilly landfill has conducted monitoring of groundwater at the landfill. We have added this information to the report.
20. EPA said in its comments that it is revising the agency's disaster debris manual. If the revisions include detailed guidance to states and local entities on selecting additional landfill sites under emergency situations, and practices that agencies can adopt to mitigate the potential environmental impacts of special accommodations to address storm debris, EPA could help states avoid controversies over landfill sites selected under emergency conditions and help state and local agencies plan for accommodations that may be needed to handle hazardous storm debris after disasters.
21. Our report discusses delays in determining whether EPA or the Army Corps of Engineers would be responsible for white goods and electronic waste disposal in Louisiana and Mississippi. Local officials in

both states told us that confusion about EPA's role in disposing of white goods and electronics waste caused delays in removing and disposing of this debris. We note that EPA has agreed to clarify the roles of EPA and the Corps regarding debris disposal activities.

22. Among other things, our report addresses the extent to which EPA has assurance that public health is protected from asbestos inhalation risks in New Orleans, and the Highlights page appropriately discusses key actions by EPA to monitor asbestos after Hurricane Katrina. The body of the draft report provides more contextual information—that the ambient air monitors in and around New Orleans used to measure asbestos are also used to measure other contaminants. The report states that monitors measure ambient concentrations of the following pollutants: arsenic, lead, particulate matter, polycyclic aromatic hydrocarbon chemicals, and volatile organic compounds.
23. The introduction and background sections of the draft report provided information on the roles of EPA, the Coast Guard, the Army Corps of Engineers, and the Department of Health and Human Services as they relate to the topic of our review, EPA's hurricane response activities.
24. See comment 6. In addition, rather than stating that EPA's December 2005 risk assessment summary indicated it was generally safe for residents to return to New Orleans, we revised the report to cite EPA's exact language in that summary: "the great majority of the data showed that adverse health effects would not be expected from exposure to sediments from previously flooded areas."
25. Although EPA questions our statement that the asbestos work practice standards generally do not apply to individual homeowners, this statement is accurate as stands. We added wording to the final report regarding the possible applicability of the work practice standards to volunteer groups.
26. We disagree with EPA's statement that it is inaccurate to say that the agency is not enforcing some of the work practice standards for certain residences. Under most circumstances, EPA's asbestos work practices require the demolition operator to inspect buildings for asbestos and to remove the asbestos prior to demolition. In letters to the Louisiana and Mississippi Departments of Environmental Quality, EPA explicitly stated that its no action assurance letters would "allow [specified] houses to be demolished without inspection and removal of asbestos

prior to demolition.” Our draft report stated that EPA’s no action assurance letters did not extend to some other elements of the asbestos work practice standards. Finally, we note the purpose of EPA’s no action assurance letters is to provide assurance that it will not enforce certain legal requirements—as it has done for certain asbestos requirements.

27. EPA’s public service announcements and communications, which we highlighted in the draft report, addressed generic environmental health risks and guidance. The actions by the public that EPA cites in its comments (voluntary curbside sorting of household chemicals) may be related to those communications efforts. However, EPA appears to be making a link between these communications and actions and the comprehensiveness of EPA’s sampling program—a connection we do not find supportable.
28. EPA questioned the “intended meaning” of the draft report’s statement that “after flooding, mold frequently forms and spreads.” This statement was provided to identify mold as a likely indoor air contaminant in the discussion of contamination inside New Orleans residences that had been flooded. The draft then highlighted the Centers for Disease Control and Prevention’s conclusion that “the duration and extent of the flooding and the number of structures flooded made massive mold contamination a certainty.”
29. Key information about EPA’s no action assurances was included in our draft report.
30. We edited the sentence on household hazardous wastes as suggested.
31. In its comments, EPA incorrectly states that we characterized chlorofluorocarbons as “hazardous.” Actually, the draft report said that electronic waste and white goods frequently contain “potentially hazardous contaminants, such as lead, mercury, or chlorofluorocarbons....” The final report refers to these substances simply as “contaminants.”
32. The draft report reflected that EPA approved an extension of the no action assurance through September 30, 2007, for four counties in Mississippi.

33. Rather than stating that monitors measure ambient concentrations of up to six contaminants, we have revised the report in response to EPA's comment to state that the monitors can measure ambient concentrations of the following potential pollutants and categories of pollutants from local and regional sources: arsenic, asbestos, lead, particulate matter, polycyclic aromatic hydrocarbon chemicals, and volatile organic compounds.
34. EPA disagreed with the statement that EPA "delegated the authority" to states to implement and enforce the asbestos standard, asserting instead that EPA "authorizes" the programs. According to 40 C.F.R. § 61.04(c), EPA "delegates" the relevant authority to states. Nevertheless, the Clean Air Act uses the term "approve," and we revised the report as EPA suggested. We express no view concerning the apparent conflict between EPA's comments and the agency's decision to employ the term "delegate" in its regulations.
35. We revised our footnote defining regulated asbestos-containing materials to quote the regulations verbatim as EPA recommended.
36. We added the regulatory citation to the footnote as EPA suggested.
37. We state that the demolition owner or operator "generally" must notify EPA, which encompasses the contingency EPA notes here.
38. Our draft report stated that specified wetting and notification requirements still apply to demolition operations in which the building is structurally unsound and in danger of imminent collapse.
39. We made the editorial change EPA suggested for clarity.
40. We made the recommended revision to the footnote that specifies EPA's asbestos screening level.
41. The draft report stated that Louisiana chose not to use the October 2005 no action assurance, which authorized, among other things, a test of an open burn technology for disposing of construction and demolition debris.
42. EPA said that the agency wanted to clarify the purpose of the Fort Smith research project. We believe the draft report clearly stated the purpose of this pilot. For example, the second sentence of the short

paragraph describing the Fort Smith project identified the purpose of this research project. Further, the draft report stated that “EPA officials said that any monitoring of asbestos emissions at demolition sites in New Orleans would not need to be as elaborate as that done for the pilot which was conducted to develop data for potential use in a revision to EPA’s asbestos regulation.”

43. The draft report provided information on EPA’s asbestos monitoring efforts and on monitoring data from the Army Corps of Engineers.
44. The draft report referred to EPA’s environmental assessment summaries as “EPA’s primary communications about the health risks from exposure to contamination in New Orleans.” EPA disagreed that these summaries represented its primary communications, referring to the other health risk communications—which the draft report also discussed. To address EPA’s concern, we have revised the draft, describing the assessment summaries as key health risk communications because they are significant in that they provide EPA’s analyses of its sediment sampling efforts in New Orleans.
45. As suggested, we replaced the term “sanitary engineers” with “environmental scientists and engineers.”
46. The draft report identified the primary subtitle D responsibilities of states that EPA cited in its comments. As suggested, we clarified that EPA’s enforcement authority is limited.
47. EPA proposed several deletions from the paragraph on the Agriculture Street Landfill. In response, we have replaced “concerns about cancer” with “health concerns.” However, we did not delete “debris from destroyed buildings and ash from municipal incinerators” because EPA’s comments conflict with EPA documentation that we obtained during our review.
48. We made the suggested deletion.
49. We made the suggested clarification in the footnote.
50. We revised the draft to reflect that EPA provided technical support and undertook some oversight activities at New Orleans landfills because some of the activities involved overseeing and reporting on landfill operations.

51. EPA provided information on guidance the agency issued in Mississippi on management practices for white goods. However, the implementation of the procedures was problematic, as indicated by the comments of Mississippi county officials cited in the draft report.
52. Our finding and recommendation regarding problems with the disposition of electronic waste focused on the issues Louisiana and Mississippi officials described to us—these problems occurred in the weeks immediately after the storm because of confusion regarding the roles of EPA and the Corps. We did not identify problems after EPA and the Corps defined their responsibilities. Therefore, we did not report on all electronics recycling activities, such as the activities EPA says were omitted from the report.
53. We revised the sentence to more clearly separate the land management agencies referred to from the other agencies cited (EPA and the Coast Guard).

# GAO Contact and Staff Acknowledgments

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## Staff Acknowledgments

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