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United States Government Accountability Office  
Washington, DC 20548

August 25, 2008

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

The Honorable James L. Oberstar  
Chairman  
The Honorable John L. Mica  
Ranking Member  
Committee on Transportation and Infrastructure  
House of Representatives

Subject: *Hurricane Katrina: Continuing Debris Removal and Disposal Issues*

In 2005, as a result of Hurricane Katrina, more than 1,600 people lost their lives and more than a million were driven from their homes on the Gulf Coast. Tens of thousands of homes in New Orleans were flooded, many requiring either demolition or gutting before reconstruction. Nearly 3 years later, the New Orleans area still faces significant debris management issues and challenges. For example, the Louisiana Department of Environmental Quality (LDEQ) stated that while the Department of Homeland Security's Federal Emergency Management Agency (FEMA) estimated in July 2008 that it had funded about 16,900 home demolitions, an estimated 6,100 homes remained to be demolished around the New Orleans area. Further, it is estimated that when the demolition and renovation of damaged property in the New Orleans area resulting from Hurricane Katrina are completed, more than 100 million cubic yards of disaster debris will have been generated.<sup>1</sup> This is more than twice the amount of disaster-related debris generated in 1992 by Hurricane Andrew—the event that prior to Hurricane Katrina had resulted in the greatest recorded amount of disaster-related debris in U.S. history.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) establishes programs and processes for the federal government to provide major disaster and emergency assistance to states, local governments, tribal nations, and

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<sup>1</sup>Congressional Research Service, *Disaster Debris Removal After Hurricane Katrina: Status and Associated Issues*, RL33477 (Apr. 2, 2008).

others. FEMA has the responsibility for administering the provisions of the Stafford Act, including approving and funding the assistance provided under it. This assistance has been provided to the Gulf Coast under the Department of Homeland Security's National Response Framework (formerly called the National Response Plan). The National Response Framework is the basis for how federal agencies have worked with state and local entities in managing the coordinated federal response to Hurricane Katrina. In New Orleans, the U.S. Army Corps of Engineers (Corps of Engineers) was the primary federal agency responsible for providing debris removal and disposal until it concluded its response activities in September 2007. The Environmental Protection Agency (EPA), the coordinator of federal emergency support for oil and hazardous materials releases, also assisted the Corps of Engineers and LDEQ with debris removal and disposal and continues to undertake Katrina response activities, such as monitoring landfill operations. FEMA has agreed to continue funding EPA's activities through August 29, 2008, at which point EPA expects that it will conclude its Katrina response activities.

The federal law addressing the management of hazardous and other solid wastes—the Resource Conservation and Recovery Act—addresses nonhazardous solid wastes under subtitle D. According to subtitle D, states have primary responsibility for permitting, monitoring, and carrying out enforcement actions at solid waste disposal facilities (generally referred to as landfills), as well as developing waste management plans in accordance with minimum federal requirements.<sup>2</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.<sup>3</sup> RCRA provides EPA with limited authority to address environmental problems at solid waste landfills.

The Water Resources Development Act of 2007 directed GAO to address certain activities related to debris management in the wake of Hurricane Katrina. We briefed relevant committee staff on the results of our work on March 6, 2008, and held subsequent discussions with them in March and April 2008. We are following up with this report, which provides more detail on the topics covered in the briefing. This report describes (1) key plans and practices federal and state agencies are currently using to oversee debris removal and disposal in response to Hurricane Katrina in New Orleans, (2) enforcement actions state and federal agencies have taken related to Katrina debris removal and disposal, and (3) actions by LDEQ and EPA in response to potential environmental issues at the Gentilly Landfill in New Orleans. The report also provides information on the status of the Chef Menteur Landfill in New Orleans;

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<sup>2</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>3</sup>The Stafford Act authorizes FEMA and other federal agencies to clear debris and wreckage resulting from a major disaster from publicly and privately owned lands and waters, as well as authorizes grants to any state or local government for the purpose of removing debris. 42 U.S.C. § 5173(a). Action taken or assistance provided under this provision does not constitute a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. 42 U.S.C. § 5159.

an EPA disaster debris reduction pilot project in St. Bernard Parish, Louisiana; and a debris provision in the Water Resources Development Act.

Our review focused on EPA's and LDEQ's 2007 and 2008 debris-related Hurricane Katrina response activities in the New Orleans area, where the vast majority of the debris was generated.<sup>4</sup> In conducting this work, we reviewed EPA, LDEQ, and Corps of Engineers documents on debris removal and disposal practices in use in New Orleans in response to Katrina, including federal and state regulatory requirements and other agency practices. We also reviewed EPA and LDEQ plans for overseeing debris removal and disposal in New Orleans, and we followed up on relevant prior GAO recommendations to EPA from our June 2007 report, *Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast* (GAO-07-651). In addition, we reviewed EPA and LDEQ documents on the number and types of debris management enforcement actions related to Hurricane Katrina in Louisiana and interviewed officials regarding the nature and results of these actions. Finally, as agreed, we reviewed a draft February 2006 report prepared for FEMA by a consulting firm, the National Infrastructure Support Technical Assistance Consultants, on the potential environmental impacts from hurricane debris disposal at the Gentilly Landfill. We discussed the draft report with EPA and LDEQ officials and obtained information on actions LDEQ took to settle a lawsuit filed by an environmental organization that also responded to some issues raised in the draft report. We did not evaluate the technical merits of the draft report or the effectiveness of LDEQ's responses. We conducted our work from December 2007 to August 2008 in accordance with generally accepted government auditing standards, which require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## Overview

Key plans and practices state and federal agencies are using to oversee and implement debris removal and disposal in response to Hurricane Katrina in New Orleans include (1) a state emergency order covering debris removal and disposal at landfills, currently extended until August 29, 2008; (2) EPA "no action assurance" letters to LDEQ concerning asbestos emissions requirements related to building demolitions; and (3) EPA's asbestos emissions monitoring plan. In addition, both LDEQ and EPA have issued guidance related to disaster cleanup and debris management. The state emergency order broadens the state of Louisiana's definition of construction and demolition (C&D) debris. Initially promulgated in August 2005, a November 2005 amendment to the emergency order allows some potentially hazardous materials—including furniture, carpeting, painted or stained lumber contained in demolished buildings, and the incidental mixture of "construction and

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<sup>4</sup>See GAO, *Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast*, GAO-07-651 (Washington, D.C.: June 25, 2007), which covers EPA's Katrina response activities from August 2005 through June 2007 and included EPA's actions as the coordinator of emergency support for the oil and hazardous materials response.

demolition debris with asbestos-contaminated waste” that cannot be extracted from C&D debris—to be disposed of in C&D landfills rather than in landfills with liners approved for such waste.<sup>5</sup> The broadened C&D debris definition was initially approved for landfills in 25 Louisiana parishes but has been scaled back in emergency order amendments to cover fewer parishes and specific landfills; it is currently applicable to four named landfills in 3 parishes until August 29, 2008. In July 2008, LDEQ officials said the agency would likely continue to reauthorize the expanded C&D definition for some landfills beyond that date under an amended state emergency order. We note that LDEQ amended and completely replaced its solid waste regulations in June 2007; at that time, LDEQ revised its regulatory definition of C&D debris, which is now more similar to the emergency order. According to LDEQ officials, special authority under the emergency order would be needed only to dispose of furniture and carpeting in C&D landfills.

Regarding asbestos practices, since 2006—under EPA no action assurance letters—EPA has not been enforcing certain Clean Air Act regulations for asbestos for homes demolished under government orders. EPA has narrowed the areas covered by the no action assurance letters over time, initially covering all homes in Louisiana that were damaged by Hurricanes Katrina and Rita and met specified criteria. As of February 2008, residences in five parishes meeting specified criteria are effectively not subject to otherwise applicable requirements for inspection and removal of asbestos prior to demolition until August 29, 2008, provided certain emission control practices are followed. In terms of oversight of debris removal and disposal activities, key practices that LDEQ and EPA are using include surveillance at landfills and other debris sites—daily observations at landfills receiving large quantities of Katrina debris; observations at demolitions sites; and monitoring of asbestos emissions at demolition sites. Specifically, EPA and LDEQ said that they have conducted 3,364 landfill observations at 13 landfill and debris storage or staging sites since October 2005, and the agencies have observed demolition activities at 8,706 residences since March 2006. EPA has also monitored for asbestos emissions at 300 demolitions in the New Orleans area since August 2007. The pace of home demolitions, which are now managed by the individual parishes, continues to be slow.<sup>6</sup> For example, as stated in our June 2007 report, LDEQ indicated that 12,000 residence demolitions funded by FEMA had been completed by February 2007. However, 17 months later and nearing the 3-year anniversary of Hurricane Katrina, LDEQ provided FEMA estimates showing that, as of July 2008, only another 5,000 of these home demolitions had been completed—with an estimated 6,100 more remaining in the New Orleans area. Enclosure I provides more information regarding key plans and practices currently guiding state and federal agencies’ debris removal and disposal in response to Katrina.

As of May 15, 2008, LDEQ had issued 120 enforcement actions for Hurricane Katrina-related violations. Fifty-three of these actions involved solid waste, hazardous waste,

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<sup>5</sup>State of Louisiana Department of Environmental Quality, Second Amended Declaration of Emergency and Administrative Order, Hurricane Katrina and its Aftermath, Appendix D, page 24 (Nov. 2, 2005).

<sup>6</sup>The Corps of Engineers managed FEMA-funded demolitions in a number of parishes prior to ending its Katrina response activities in September 2007. The majority of home demolitions have occurred in Orleans and St. Bernard Parishes. Notably, St. Bernard Parish has managed building demolitions throughout the entire Hurricane Katrina response without the assistance of the Corps of Engineers.

or water program actions taken against businesses or individuals who, among other things, improperly disposed of C&D debris at unauthorized sites. LDEQ's 120 enforcement actions also included actions taken against five C&D landfills that received Katrina C&D debris: Empire Pit, Gentilly, Industrial Pipe, Slidell, and Stranco. Though the violations at these five C&D landfills varied, those at Industrial Pipe and Slidell included disposing of unauthorized waste such as tires, medical waste, and creosote telephone poles; as a result, LDEQ's enforcement actions at these two landfills also included potential penalties against the landfills' operators. Other violations at landfills included failing to cover waste with 12 inches of soil every 14 days, failing to meet effluent limitations, and inadequate supervision and security of the site. LDEQ issued seven air-related violations, all of which related to the handling of asbestos-containing materials, such as failing to adequately wet the asbestos—a critical step in controlling the release of asbestos fibers into the air—and failing to dispose of the material after removal as soon as practical.

In other enforcement actions, LDEQ worked with EPA, the Corps of Engineers, and the Louisiana National Guard in a joint effort to combat illegal dumping activities after the hurricane in an area east of New Orleans called the Almonaster Corridor. Although illegal dumping had been a problem in this area for many years prior to Hurricane Katrina, the amount of debris from the hurricane greatly exacerbated illegal dumping in the area. Together, in March and April 2007, the agencies inspected 178 sites and referred 147 to LDEQ's enforcement division. Violations from this effort included the unauthorized disposal of solid waste, transporting solid waste to an unauthorized location, and open burning of debris. LDEQ expects to complete an overall summary of this effort by the end of the summer of 2008. Enclosure II provides more information regarding enforcement actions taken in response to Katrina.

We reported in June 2007 that LDEQ made decisions about landfills and the disposal of debris that some studies suggest could have long-term, negative environmental impacts. One of the landfills highlighted in our report, the Gentilly Landfill, is constructed on top of a former municipal waste landfill that operated from the early 1960s until the mid-1980s. In authorizing the use of this landfill for hurricane debris disposal, LDEQ stated that it had considered alternative sites and determined that the Gentilly Landfill met state solid waste requirements.<sup>7</sup> Further, LDEQ considered the proximity of the Gentilly Landfill—one of four landfills currently authorized by emergency order to receive C&D debris under a broadened definition that includes some potentially hazardous materials—to the hurricane-generated C&D debris. However, the use of this landfill has been controversial. For example, FEMA has questioned whether federal agencies could become liable to pay cleanup costs if the landfill were to become a Superfund site. In response to a request from FEMA, EPA provided a technical analysis and recommendation for the use of the Gentilly Landfill. EPA concluded that while there is no way “to protect against future Superfund liability absolutely”—particularly for a landfill—the 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. To further assess concerns about the Gentilly Landfill, FEMA

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<sup>7</sup>LDEQ issued a permit in December 2004 authorizing the Gentilly Landfill to receive and dispose of C&D debris and wood wastes. The landfill started accepting C&D waste after Hurricane Katrina.

contracted with a firm to study the landfill to help it make debris management decisions. The subsequent February 2006 draft report included a number of recommendations to address concerns related to possible environmental impacts at the site. At the same time, LDEQ was facing a lawsuit from an environmental group. LDEQ officials told us that although they had concerns about the quality of the draft report and they disagreed with some of the recommendations, the agency took steps that addressed a number of the recommendations in the draft report. The actions taken were aimed at settling the lawsuit, but there were a number of similarities in the draft report's recommendations and the charges in the lawsuit. The actions LDEQ would take were agreed upon at a February 2006 meeting with officials from LDEQ, EPA, the Corps of Engineers, FEMA, and the consulting firm that developed the draft report for FEMA. EPA concurred with LDEQ's actions at the landfill, which included installing ground and surface water monitoring systems and limiting the volume of debris accepted at the landfill. Enclosure III provides more information regarding debris disposal issues and the actions taken by LDEQ and EPA at the Gentilly Landfill to address them.

Finally, we are providing information on (1) the status of the Chef Menteur Landfill in New Orleans, (2) a disaster debris reduction pilot project in St. Bernard Parish that was scaled back prior to its implementation in June 2008, and (3) the effect of a debris provision in the Water Resources Development Act of 2007. First, the Chef Menteur Landfill, which was controversial because of its proximity to a national wildlife refuge and a residential neighborhood, was opened under emergency authority in April 2006 and closed in August 2006. However, final closure activities have not yet been performed. Further, the landfill underwent comprehensive testing in November 2007 after citizen complaints regarding odor. None of the air samples exceeded state or federal regulations. The landfill is currently waiting on, among other things, a Corps of Engineers permit under section 404 of the Clean Water Act, after which final closure activity can commence.<sup>8</sup> Second, EPA conducted a disaster debris reduction pilot in St. Bernard Parish in June 2008. According to EPA, this pilot was originally planned to test methods for disposing of regulated asbestos-containing material. The two planned methods to be evaluated involved (1) grinding asbestos-containing waste material from homes and (2) burning asbestos-containing waste material from homes using a thermal treatment process called an "air curtain burner." However, the asbestos pilot project became controversial, in part because of community concerns. EPA has acknowledged that an error in its risk estimate of the potential health effects of exposure to asbestos related to the pilot was a factor in the decision to exclude regulated asbestos-containing material from the revised pilot. According to EPA, the new pilot was limited to the burning of vegetative and C&D debris and was redesigned to specifically exclude regulated asbestos-containing material. Third, a provision of the Water Resources Development Act prohibits federal funds from being used to reimburse any state or local entity in Louisiana for the disposal of C&D debris in a C&D landfill in Louisiana unless that waste meets the federal definition of that debris. However, federal regulations do not specifically define C&D debris, instead stating that a C&D landfill "typically receives any one or more of the following types of solid wastes: roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste." While

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<sup>8</sup>Section 404 of the Clean Water Act generally prohibits discharges of dredged or fill material into waters of the United States without first obtaining a permit from the Corps of Engineers.

Louisiana regulations are more stringent than federal guidelines, under the emergency order still in effect in five parishes, the debris that C&D landfills can receive includes some potentially hazardous materials that normally would not be allowed to be disposed of in unlined C&D landfills under Louisiana's regulations. However, in August 2006, EPA Region 6 reviewed LDEQ's C&D debris definition under the emergency order and determined that the types of waste "seem consistent with what EPA identifies as material typically sent to a C&D landfill." While LDEQ officials acknowledged that the provision has therefore not impacted debris disposal operations, EPA and LDEQ officials emphasized that C&D disposal practices in Louisiana have complied with the provisions of the Water Resources Development Act of 2007. Enclosure IV provides more information regarding the Chef Menteur Landfill, the EPA disaster debris reduction pilot project, and the Water Resources Development Act debris provision.

While we are not making recommendations based on the work we conducted for this review, we made six recommendations in our 2007 Hurricane Katrina report addressing several environmental issues as well as Katrina-related communications to the public about environmental health risks.<sup>9</sup> During our current review, we found that EPA has taken actions in response to two of the recommendations: (1) developing and implementing an expanded asbestos monitoring plan in the New Orleans area to provide monitoring at demolition sites and (2) providing more detailed guidance to state and local entities on managing debris disposal following disasters. We have requested but not yet received information from EPA on its responses to the other four recommendations in our 2007 report. As we are currently in another hurricane season, we encourage EPA to expeditiously complete its responses to all of the recommendations in our prior report, which are aimed at minimizing environmental risks from future disasters and providing environmental health risk information to the public that is timely, complete, clear, and consistent. Looking ahead, we also encourage EPA to carefully consider the continued need to waive certain aspects of the Clean Air Act's asbestos requirements for building demolitions and to work with LDEQ as it considers whether it is necessary to continue to allow carpeting and furniture into some C&D landfills. While much work continues, important factors that should be carefully weighed in considering extensions beyond the 3-year anniversary of Hurricane Katrina on August 29, 2008, are the continued slow pace of activities—independent of the relaxation of these environmental standards—and the possible culmination of FEMA-funded EPA support in conducting oversight of landfill operations and demolitions in the New Orleans area.

### **Agency Comments and our Evaluation**

We provided a draft of this report to EPA and LDEQ for review and comment. EPA generally agreed with the information in the report and provided some recommended changes, and LDEQ provided technical comments for consideration. We incorporated comments from both agencies, as appropriate. EPA's letter and our response to it appear in enclosure V, while LDEQ's letter and our response are provided in enclosure VI.

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<sup>9</sup>GAO-07-651.

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We are providing copies of this report to interested congressional committees, the Administrator of the Environmental Protection Agency, and the Secretary of the Louisiana Department of Environmental Quality. We will also make copies available to others upon request. In addition, this report will be available 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. Key contributors to this report were Christine Fishkin, Assistant Director; Richard Johnson; Kirk Menard; Joanna Owusu. Ben Shouse, Michael Derr, and Phylis Cline also made important contributions to this report.

A handwritten signature in black ink that reads "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

Enclosures

## Enclosure I: Key Federal and State Plans and Practices to Oversee Debris Removal and Disposal

Following are the key plans and practices the Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LDEQ) are currently using to oversee debris removal and disposal in response to Hurricane Katrina in New Orleans.

### Key Debris Removal Plans and Practices

**LDEQ emergency order.** Debris removal in the New Orleans area is conducted under the terms of LDEQ's February 29, 2008, Declaration of Emergency and Administrative Order, which is in effect until August 29, 2008. Initially promulgated on August 30, 2005, and applicable to 25 of the state's 64 parishes, the emergency order has been amended and extended numerous times. The second amended emergency order issued on November 2, 2005, included provisions broadening the state's definition of construction and demolition (C&D) debris. Specifically, under the November 2005 amended emergency order

- the types of debris that C&D landfills can receive was broadened to include some potentially hazardous materials, including furniture, carpeting, and painted or stained lumber contained in demolished buildings; and "the incidental admixture of construction and demolition debris with asbestos-contaminated waste<sup>10</sup> (i.e., incidental asbestos-contaminated debris that cannot be extracted from the demolition debris)."

In June 2007, LDEQ amended and completely replaced its solid waste regulations; at that time, LDEQ revised its regulatory definition of C&D debris, which LDEQ officials stated is now more similar to the emergency order.<sup>11</sup> As a result, according to these officials, the only materials cited in the emergency order that are not allowed in C&D landfills under LDEQ's current regulations are furniture and carpeting.

Beginning with the eighth amended emergency order issued on January 19, 2007, LDEQ reduced the number of parishes in the emergency area covered by the order to eight, noting the progress of hurricane recovery efforts.<sup>12</sup> The ninth amended emergency order issued on March 19, 2007, further reduced the number of covered parishes to six.<sup>13</sup> Importantly, this order also limited the sites authorized to dispose

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<sup>10</sup>The current state emergency order includes the following footnote: "This provision is, and in prior Declarations of Emergency and Administrative Orders has been, intended to provide an authorized deviation from the definition of "Construction/Demolition Debris" provided in LAC 33:VII.115. Any Asbestos Containing Waste Material subject to regulation under the Air Quality Regulations (Louisiana Emission Standards for Hazardous Air Pollutants [LESHAP – LAC 33:III.5151] or the National Emission Standard for Hazardous Air Pollutants [NESHAP 40 CFR 61.140 et. seq] shall be managed and disposed of in accordance with the standards established therein as provided in the protocols established in Appendix D."

<sup>11</sup>LAC 33:VII.115.

<sup>12</sup>The eight parishes are Iberville, Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. Tammany, and Washington. Iberville parish is located southwest of Baton Rouge. The remaining parishes are in the New Orleans and surrounding areas.

<sup>13</sup>The six parishes are Iberville, Jefferson, Orleans, Plaquemines, St. Bernard, and St. Tammany.

of hurricane-generated C&D debris under the broadened debris definition to those specifically named in the emergency order: Gentilly, Highway 90, River Birch, Stranco, and Tidewater Sanitary landfills. The order states that the progress of recovery efforts in the emergency area reduced the need for disposal facilities for C&D debris and that after consultation with the U.S. Army Corps of Engineers (Corps of Engineers) and local government authorities, certain facilities were selected based upon consideration of available permitted landfill capacity, quantities and types of debris remaining, the distance between landfills and remaining debris, and other factors.

The February 2008 emergency order currently in effect is the Third Extension of the Twelfth Amended Declaration of Emergency and Administrative Order and covers five parishes: Jefferson, Orleans, Plaquemines, St. Bernard, and St. Tammany. Under the order, four landfills located in three of the five parishes can receive C&D debris as defined above: Gentilly (Orleans Parish), Highway 90 (Jefferson Parish), River Birch (Jefferson Parish), and Tidewater Sanitary (Plaquemines Parish). LDEQ's extension of the current emergency order through August 29, 2008, notes that the need for an additional extension to the emergency order will be evaluated by the order's expiration date. The emergency order extension further notes that should the order be extended beyond August 29, 2008, the regulatory flexibility afforded by the expanded definition of C&D debris will no longer be necessary to respond to the Hurricane Katrina emergency in Jefferson, Plaquemines, and St. Tammany Parishes once the parishes have a reasonable opportunity to prepare for the change. According to the extension, LDEQ may decide to continue to authorize the expanded C&D debris definition in Orleans and St. Bernard Parishes after August 29, 2008, if many houses remain to be demolished in these parishes at that time. In July 2008, LDEQ officials said the agency would likely continue to reauthorize the expanded C&D definition for some landfills beyond that date under an amended state emergency order.

**EPA asbestos “no action assurance.”** Since 2006, to facilitate the removal of the extraordinary amounts of debris after Hurricane Katrina, EPA has not been enforcing certain Clean Air Act regulations (called work practice standards) for asbestos in the case of government-ordered demolitions of homes, using “no action assurance” letters to LDEQ.<sup>14</sup> Specifically, under the current “no action assurance” letter issued in February 2008, residences in five New Orleans area parishes 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 through August 29, 2008, provided certain emission control practices are followed. These emission control practices include the wetting of materials from before demolition through disposal. According to LDEQ officials, the no action assurance has significantly helped the recovery effort by allowing demolition without the prior removal of regulated asbestos-containing materials, thereby reducing by 2 or 3 days the time required to demolish homes.

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<sup>14</sup>EPA first issued no action assurance letters for these asbestos requirements in February 2006. Additional no action assurance letters were issued in February 2007, September 2007, and December 2007.

Under the no action assurance provisions, EPA and LDEQ are to conduct additional oversight activities, including continuing to observe demolitions to verify compliance with asbestos requirements and meeting regularly to discuss oversight activities and to identify and address any other concerns.

**EPA asbestos monitoring plan.** In September 2007, EPA issued an additional asbestos monitoring plan to (1) evaluate the effectiveness of the demolition practices being employed in the New Orleans area, (2) assure the safety of existing and potential residents, (3) inform the public of the asbestos concentrations observed, and (4) explain the significance of the findings of the monitoring. This plan responds to our June 2007 recommendation that EPA develop and implement an expanded asbestos monitoring plan in the New Orleans area that addresses the potential health effects of the nonenforcement, under no action assurance letters, of certain asbestos requirements covering government-ordered demolitions of residences. The asbestos monitoring plan calls for monitoring a minimum of 10 percent of the FEMA-funded demolitions of houses known to have, or assumed to have, regulated asbestos-containing material.<sup>15</sup>

**LDEQ guidance.** LDEQ issued a *Comprehensive Plan for Disaster Clean-Up and Debris Management* in July 2006, building on its September 2005 Hurricane Katrina Debris Management Plan. This plan addresses the determination of appropriate sites for staging, transferring, and disposing of debris and the management of different types of debris, among other topics.

**EPA guidance.** As we had recommended in June 2007, EPA's Office of Solid Waste and Emergency Response updated and significantly expanded its 1995 disaster debris guidance in March 2008. The new guidance, *Planning for Natural Disaster Debris*, discusses debris management from natural disasters such as hurricanes, earthquakes, tornadoes, and floods and is intended for use in developing or revising disaster debris management plans. The guide addresses issues such as identifying the types of debris and forecasting the amounts of debris that could occur from a natural disaster; creating an inventory of current capacity for managing the debris; preselecting temporary debris management sites that can be used for storing, sorting, and processing debris; and creating a debris removal strategy that recognizes that disaster debris that may pose an immediate threat to human health and the environment should be a first collection priority. The guide states that environmental assessment monitoring may be needed before, during, and after a disaster if disaster debris is placed in previously closed debris management facilities or if new facilities are opened. It further notes that attempting to conduct an assessment after a disaster can limit the assessment, delay debris management, and increase citizen anxiety. The

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<sup>15</sup>EPA, *Assessing Asbestos Emissions at Regulated Asbestos-Containing Material (RACM) Demolition Sites in Katrina/Rita Response—Quality Assurance Project Plan* (Sept. 13, 2007). The plan directs that sampling locations will be on public right-of-ways that do not exceed 100 feet upwind and downwind from the demolition and states that, on average, one demolition per day will be sampled. EPA developed a risk-based screening level for asbestos concentrations observed during the response to Hurricanes Katrina and Rita, using EPA's cancer risk methodology and assuming a 1-year continuous inhalation exposure. The data collected are intended to supplement and complement Occupational Safety and Health Administration data obtained by the Corps of Engineers and contractors.

new guidance responds to our June 2007 recommendation to EPA to 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.<sup>16</sup>

### Oversight Practices

**Observations at landfills.** Following the hurricane, LDEQ, with EPA assistance, has increased its surveillance of debris disposal at landfills and other debris sites in the New Orleans area.<sup>17</sup> Observations at landfills receiving large quantities of hurricane debris increased from weekly from late October 2005 through mid-February 2006, to twice weekly from mid-February 2006 to mid-May 2006, to daily in May 2006. EPA contractors began conducting daily landfill observations for LDEQ in October 2006.

- According to LDEQ, LDEQ or EPA contractor staff generally conducted daily observations at Gentilly, Highway 90, Slidell, and Tidewater Sanitary C&D landfills since May 2006. EPA contractors conducted observations at the Paris Road site, a temporary debris staging and reduction area, twice a week since July 2007. EPA or LDEQ staff observe debris entering the landfills in trucks and debris being deposited at the landfill to ensure that inappropriate debris is not disposed at the site.
- Observations are recorded in a standardized form that is reviewed by LDEQ, according to LDEQ officials. LDEQ staff also conduct regulatory inspections that entail a more thorough review of permit requirements and landfill records.
- LDEQ officials told us that problems identified by LDEQ and EPA are frequently addressed immediately. For example, inappropriate debris identified in trucks is turned away at the landfill entrance, and inappropriate debris spotted being deposited at the landfill is immediately pulled out and segregated. LDEQ officials said that in one case, problems identified by EPA involving the improper handling of asbestos debris prompted a formal LDEQ inspection that resulted in an enforcement action.

According to EPA and LDEQ, they have conducted 3,364 landfill observations at 13 landfill and debris storage or staging sites since October 2005.<sup>18</sup> Table 1 provides an overview of EPA and LDEQ observations by landfill or debris site since October 2005.

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<sup>16</sup>GAO-07-651.

<sup>17</sup>EPA also provided other debris-related assistance to Louisiana which we discussed in our prior report on EPA's Katrina actions (GAO-07-651).

<sup>18</sup>Through May 15, 2008.

**Table 1: Number of EPA and LDEQ Observations at Landfill or Debris Sites from October 2005 through May 2008**

New Orleans area landfills and temporary debris storage or staging sites	EPA and LDEQ observations
Chef Menteur C&D landfill <sup>a</sup>	89
Empire Pit C&D landfill <sup>b</sup>	140
Gentilly C&D landfill	699
Highway 90 C&D landfill	755
Industrial Pipe C&D landfill <sup>c</sup>	125
Jefferson Parish Type I-II landfill <sup>d</sup>	38
Killona C&D landfill <sup>e</sup>	28
River Birch Type I-II landfill	136
St. Bernard temporary debris storage and reduction site #1 (Paris Road Landfill)	232
St. Bernard temporary debris storage and reduction site #2 (Old Asphalt Plant) <sup>f</sup>	54
Slidell C&D landfill	616
Stranco C&D landfill <sup>g</sup>	143
Tidewater Sanitary / Coast Guard Road C&D landfill	309
<b>Total</b>	<b>3,364</b>

Sources: EPA and LDEQ.

<sup>a</sup>Landfill ceased accepting debris on August 14, 2006.

<sup>b</sup>Landfill closed on October 15, 2007.

<sup>c</sup>Landfill ceased accepting hurricane debris in December 2006.

<sup>d</sup>Landfill was a white goods staging site; hurricane debris not disposed of at this landfill.

<sup>e</sup>Landfill ceased accepting hurricane debris in December 2006.

<sup>f</sup>Site closed on December 18, 2006.

<sup>g</sup>Landfill closed on January 7, 2008.

**Observations at demolition sites.** EPA has also assisted LDEQ in observing home demolitions conducted under the scope of EPA’s no action assurance letters by the Corps of Engineers or parishes for compliance with asbestos requirements. According to LDEQ, FEMA estimates that as of July 25, 2008, approximately 16,900 residences in Jefferson, Orleans, Plaquemines, St. Bernard, and St. Tammany Parishes that are not subject to otherwise applicable requirements for inspection and removal of asbestos have been demolished with FEMA funding since February 2006.<sup>19</sup> The pace of home demolitions, which are now managed by the individual parishes, continues to be slow. For example, as stated in our June 2007 report, LDEQ indicated that 12,000 residence demolitions funded by FEMA had been completed by February 2007. However, by July 2008, 17 months later, FEMA estimated that about another 5,000 of these home demolitions had been completed. According to LDEQ, FEMA also estimates that nearly 3 years after Hurricane Katrina, an estimated 6,100 homes remain to be demolished in the New Orleans area.

- LDEQ and EPA have observed demolition activities at 8,706 residences since March 2006. LDEQ conducted 1,109 observations at such demolition sites from March 27, 2006, through October 20, 2006. EPA began assisting with this effort on October 21, 2006, conducting 7,597 demolition observations through

<sup>19</sup>EPA first issued no action assurance letters for these asbestos requirements in February 2006. An additional no action assurance letter was issued on February 29, 2008, stating that EPA will not enforce these asbestos requirements in five New Orleans area parishes through August 29, 2008.

July 2008.<sup>20</sup> EPA visits demolition sites and completes an LDEQ checklist on demolition activities that is forwarded to LDEQ for review. If concerns are identified, EPA representatives contact LDEQ, which sends a representative to the site to evaluate the concern and may request that EPA document the observations in an LDEQ form that could initiate the state enforcement action process. LDEQ officials also told us that EPA typically brings any potential problems to the attention of contractors as soon as the problem is observed. In addition to these demolition observations, EPA is also observing the removal of regulated asbestos-containing material in the form of floor tiles that were originally left on slabs during demolitions. EPA has conducted 828 floor tile demolition observations through July 2008.

- According to EPA officials, the primary concerns identified when monitoring demolitions are contractors (1) not adequately wetting regulated asbestos-containing material, (2) using nonaccredited asbestos personnel, and (3) not adequately containing regulated asbestos material in secured or sealed wrapping.

**Monitoring asbestos emissions at demolition sites.** In response to our June 2007 recommendation regarding developing and implementing an expanded asbestos monitoring plan in the New Orleans area that would provide monitoring at demolition sites, EPA has monitored for asbestos emissions at 300 of the 1,253 demolitions conducted under EPA's no action assurance letters. These demolitions took place in the New Orleans area between August 6, 2007, and May 15, 2008, consistent with its September 2007 plan. EPA officials told us that 1 out of 1,170 samples taken from over 300 demolition sites exceeded EPA's health-screening level for asbestos concentrations. However, LDEQ officials informed us this instance was caused by a misinterpretation of the sampling analysis results and none of the samples exceeded EPA's health-screening levels. EPA confirmed that the one sample result in question was deemed inconclusive due to excessive particulate on the sample filter and stated that the sampling procedures have been adjusted to prevent the filter from becoming overloaded to obtain a more accurate sample of monitored demolition activity. EPA also stated that asbestos below the screening level has been detected in some samples. Although the asbestos monitoring plan states that monitoring can be discontinued after data from 100 demolitions have been evaluated if problems are not identified, EPA plans to continue sampling at demolition sites as part of its FEMA-funded response activities through August 29, 2008.

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<sup>20</sup> According to LDEQ, a demolition site can have more than one observation visit. For example, if a demolition of a property lasts 3 days, three observations are generally conducted to document the demolition.

## Enclosure II: Enforcement Actions Taken by State and Federal Agencies

Following are the enforcement actions state and federal agencies have taken related to Hurricane Katrina debris removal and disposal.

**LDEQ enforcement actions.** According to LDEQ, as of May 15, 2008, the agency had issued 120 enforcement actions for Hurricane Katrina related violations.<sup>21</sup>

- Fifty-one were actions involving issues that cut across LDEQ's air, water, solid waste, or hazardous waste programs. For example, several of these actions involved automotive related sites such as auto salvage yards that LDEQ cited for improperly disposing of solid waste and failing to submit a notice of intent for storm water discharges.
- Fifty-three were actions involving only solid waste, hazardous waste, or water. For example, several of these solid waste actions involved businesses and individuals who improperly disposed of C&D debris at unauthorized sites.
- Nine were actions under the state's expedited penalties process. For example, four of these involved violations related to the disposal of car tires.
- Seven were air-related actions that addressed regulated asbestos-containing material violations and included issues such as failing to adequately wet the asbestos and to dispose of the material as soon as practical after removal.

**Landfill enforcement actions.** LDEQ's enforcement actions cited above also included actions against the following five landfills that received Katrina C&D debris.

- *Empire Pit Landfill:* LDEQ issued a compliance order enforcement action on November 8, 2006, against this landfill, which was granted temporary authorization to receive Katrina C&D debris in a state emergency order. The violations noted in the action included failing to (1) keep records documenting the removal and disposal of unauthorized waste, (2) cover wastes with 12 inches of soil every 14 days, and (3) provide containers for segregating unauthorized waste. LDEQ's March 2007 emergency order no longer authorized disposal of C&D debris at this landfill, and the site was closed on October 15, 2007. Prior to its closure, LDEQ conducted inspections at the temporary landfill on May 30, 2007, and July 19, 2007, to ensure that the site was being closed in accordance with the state's debris management plan. Based on LDEQ's evaluation during these visits and a review of the engineering certification documentation, the state determined necessary closure requirements had been met.
- *Gentilly Landfill:* LDEQ issued a compliance order enforcement action against this landfill on January 31, 2007, for several violations at the site. These violations included failing to (1) deposit and compact waste and cover the waste, (2) install surface run-off devices at entrance and exit ramps of the

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<sup>21</sup>According to LDEQ, the first Katrina-related enforcement actions were issued in March 2006.

disposal area, and (3) meet effluent limitations. After the enforcement action, monitoring and compliance at the landfill were determined in several ways, such as (1) daily landfill assessments conducted by EPA (which did not result in any subsequent enforcement referrals), (2) monthly submissions to LDEQ of the landfill's required National Pollutant Discharge Elimination System Discharge Monitoring Report (some of which indicated exceedances that are being addressed by LDEQ's enforcement division), and (3) compliance information provided by the landfill as required under the action. An inspection conducted by LDEQ on December 17, 2007, found that all solid waste issues identified in the enforcement action had been resolved.

- *Industrial Pipe Inc. Landfill:* LDEQ issued a compliance order and notice of potential penalty enforcement action against this landfill on July 24, 2007, for several violations. The violations included (1) depositing waste in the landfill without checking for unacceptable waste items, (2) allowing the disposal of unacceptable waste (tires, bags of municipal solid waste, medical waste, vehicle windshields, and hydraulic hoses), and (3) failing to place appropriate cover over waste. After the enforcement action, monitoring and compliance at the landfill were determined in several ways, such as (1) periodic landfill assessments conducted by LDEQ (which did not result in other enforcement actions), (2) monthly submissions to LDEQ of the landfill's required National Pollutant Discharge Elimination System Discharge Monitoring Report (which indicated no discharges), and (3) compliance information provided by the landfill as required under the action. LDEQ inspected the landfill on February 13, 2008, and noted no areas of concern.<sup>22</sup> LDEQ has not issued a penalty to date regarding the violations from the July 2007 inspection.
- *Slidell Landfill:* LDEQ issued a consolidated compliance order and notice of potential penalty enforcement action against this landfill on February 28, 2007, for several violations. The violations included (1) accepting unauthorized waste such as residential waste and unopened black garbage bags (that were not inspected prior to being deposited in the landfill), (2) failing to minimize blowing paper and litter with cover material, (3) allowing the disposal of unacceptable wastes such as liquid paint, creosote telephone poles, railroad ties, and garage doors, (4) causing or allowing the unauthorized discharge of potentially contaminated stormwater at a location not specified in the landfill's permit, and (5) effluent excursions in violation of the permit. After the action, monitoring and compliance at the landfill were determined in several ways, such as (1) daily landfill assessments conducted by EPA (which did not result in any subsequent enforcement referrals), (2) monthly submissions to LDEQ of the landfill's required National Pollutant Discharge Elimination System Discharge Monitoring Report (which showed exceedances in March and April 2007 but not in the following months), and (3) compliance information such as weekly preventative maintenance forms provided by the landfill as required under the action. An LDEQ compliance evaluation inspection was conducted on October 26, 2007, and no violations were identified. LDEQ is currently in

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<sup>22</sup>The primary purpose of the inspection, referred to by LDEQ as a "start-up inspection," was to renew the facility's permit.

settlement negotiations with the landfill regarding the February 2007 violations, and no penalty has been issued to date.

- *Stranco Landfill*: LDEQ issued a compliance order enforcement action on December 14, 2006, against the landfill, which was granted temporary authorization to receive Katrina C&D debris in a state emergency order. The violations noted in the action included failing to (1) provide adequate supervision and security of the site to control the disposal of materials, (2) completely extinguish fires from debris burned at the landfill (smoke was observed smoldering from the waste at the site), (3) document the source of waste received at the site, and (4) cover waste with 12 inches of soil every 14 days. Subsequent LDEQ inspections found continued violations.<sup>23</sup> Specifically, the violations were failing to cover wastes with 12 inches of soil every 14 days and not removing unauthorized waste from the site every 7 days, as required. Because of these continuing issues, on April 9, 2007, LDEQ issued a consolidated compliance order and notice of potential penalty enforcement action against the landfill. The landfill operator's April 2007 response to LDEQ explained why the deficiencies had occurred and how they would be corrected. In October 2007, LDEQ conducted an inspection to ensure that the landfill, which had been undergoing closure activities, was being properly closed. This landfill was closed in January 2008.

**Interagency enforcement efforts.** Other enforcement actions have been taken in conjunction with an interagency state and federal enforcement operation.

- LDEQ worked with EPA, the Corps of Engineers, and the Louisiana National Guard in March and April 2007 in a joint effort called Operation Cleansweep to combat the illegal dumping activities and the presence of unpermitted facilities operating along an area in eastern New Orleans referred to as the Almonaster Corridor.<sup>24</sup> According to LDEQ, illegal dumping along the corridor had been a problem for many years prior to Katrina, but the amount of debris from the hurricane exacerbated the problem greatly. With FEMA funding, EPA acquired and loaned LDEQ surveillance cameras, which were installed at various illegal dumping hot spots along the Almonaster Corridor. These investigations revealed that the illegal dumping rate was increasing and the material being dumped was consistent with hurricane-related debris, such as building components, furnishings, white goods, electronics, and vegetative waste. As a result, these agencies joined with the Corps of Engineers and the Louisiana National Guard to perform door-to-door inspections of all properties and facilities along this roughly 5-mile by 1-mile area. Overall, the agencies inspected 178 sites and referred 147 to LDEQ's enforcement division. The violations identified from these efforts included, but were not limited to, the unauthorized disposal of solid waste, transporting solid waste to an

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<sup>23</sup>The April 2007 LDEQ enforcement action also reported that state inspections in November 2006, December 2006, January 2007, and February 2007 also found these violations.

<sup>24</sup>The Almonaster Corridor is located in eastern New Orleans and is bounded by the Innerharbor Navigation Canal on the west, the Intracoastal Waterway on the south, Interstate 510 on the east, and Chef Highway on the north. The area is about 5 miles long and about 1 mile wide.

unauthorized location, and open burning of debris. LDEQ expects to complete an overall summary of these efforts by the end of the summer of 2008.

- As part of Operation Cleansweep, Corps of Engineers and EPA staff inspected 20 potential wetland sites in the Almonaster Corridor to determine if Katrina-related disaster debris had been dumped there illegally and to identify any wetlands violations. Specifically, section 404 of the Clean Water Act generally prohibits discharges of dredged or fill material into waters of the United States without first obtaining a permit from the Corps of Engineers. According to EPA, the Corps of Engineers issued cease and desist orders to owners of five sites that were in violation of section 404. According to EPA, the Corps of Engineers reported that the illegal dumping was no longer occurring at the five sites and one owner had begun site cleanup. EPA officials also said that the Corps of Engineers is the lead agency in wetlands violation cases as long as the property owner is cooperative, which was the situation in these five cases.

### **Enclosure III: Actions by LDEQ and EPA in Response to Potential Environmental Issues at the Gentilly Landfill**

The Gentilly C&D Landfill was constructed on top of a former municipal waste landfill that operated from the early 1960s until the mid-1980s.<sup>25</sup> LDEQ’s authorization of the use of this C&D landfill located near hurricane-devastated areas in New Orleans has been controversial because of the potential for long-term, negative environmental impacts.<sup>26</sup> For example, in October 2005, the Louisiana Environmental Action Network filed suit against LDEQ, challenging the decision to authorize the use of the Gentilly Landfill for hurricane-related debris disposal.<sup>27</sup> Also, as we reported in 2007, studies conducted by an environmental engineering firm and Louisiana State University raised concerns about debris disposal at the Gentilly Landfill. 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>28</sup> The studies identified concerns about the potential discharge of leachate (water that has come into contact with waste) into groundwater and surface water from the Gentilly Landfill.<sup>29</sup> In addition, a February 2006 draft report contracted by FEMA raised these and other environmental issues. The Gentilly Landfill is also one of four landfills currently authorized by a Louisiana emergency order to receive C&D debris under a broadened definition that includes some potentially hazardous materials, including furniture, carpeting, painted or stained lumber from demolished buildings, and “incidental asbestos-contaminated waste that cannot be extracted from the demolition debris.” As discussed in our prior report on Hurricane Katrina, a draft 1995 report prepared for EPA (and cited by the agency in its review of LDEQ’s expanded C&D definition) identifies a number of the debris components being allowed at C&D landfills under the emergency order—including furniture and wood paints and stains—as “problematic,” even though these materials are not necessarily classified as hazardous wastes under RCRA.<sup>30</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. 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

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<sup>25</sup>The practice of placing one landfill on top of another has been used throughout the country and utilizes the existing cover system over the closed landfill as a liner system for the landfill on top.

<sup>26</sup>LDEQ, the entity in Louisiana with primary responsibility for solid waste disposal under RCRA subtitle D, issued a permit in December 2004 authorizing the Gentilly Landfill to receive and dispose of C&D debris and wood wastes.

<sup>27</sup>*Louisiana Environmental Action Network v. Louisiana Department of Environmental Quality*, No. 537, 649, Section 8 (La. 19th Judicial Dist.).

<sup>28</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).

<sup>29</sup>One of the studies also raised concerns about debris disposal at another landfill (Chef Menteur), which we discuss in enclosure IV.

<sup>30</sup>ICF, Inc., *Construction and Demolition Waste Landfills* (draft document prepared for the EPA Office of Solid Waste, 1995).

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 disabilities, impaired hearing, and behavioral problems, and in pregnant women, it can result in adverse developmental effects in 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.

In authorizing the use of the Gentilly Landfill under the Hurricane Katrina emergency order, LDEQ stated that it had considered alternative sites and determined that the Gentilly site met state solid waste requirements and was located near the bulk of the hurricane-generated C&D debris. LDEQ further noted that diverting debris disposal to the alternate landfills would increase waste-hauling time and expense and exacerbate traffic problems, thereby hindering New Orleans's recovery. Although EPA did not have a formal role in LDEQ's decision to authorize the Gentilly Landfill, the agency has conducted oversight activities at this and other landfills and provided technical support to LDEQ and FEMA. For example, FEMA requested EPA to provide a technical analysis and recommendation for the concurrent and continued use of the Gentilly Landfill because of potential Superfund liability of the federal agencies engaged in hurricane response for future cleanup of the landfill. In response, EPA's review of the Gentilly site following its authorization to receive Hurricane Katrina debris concluded 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 protect against future Superfund liability absolutely, particularly for a landfill, whether historic or modern, municipal or private."<sup>31</sup>

To further assess concerns about disposing of hurricane-generated C&D debris at the Gentilly Landfill, FEMA contracted with a consulting firm, the National Infrastructure Support Technical Assistance Consultants, to perform a study. According to a February 15, 2006, letter from FEMA to EPA, the purpose of the study was to assist FEMA in making decisions regarding the management of the debris stream generated by Hurricanes Katrina and Rita. A February 2006 draft report from this study listed concerns related to the landfill's subsurface soils and groundwater and possible impacts on the environment from placing new wastes over the old landfill.<sup>32</sup>

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<sup>31</sup>EPA, *Potential Federal CERCLA Liability for use of the Gentilly Landfill for debris operations from Hurricane Katrina*, FEMA-1603-DR-LA, ESF#10 Task Order (New Orleans, L.A., Nov. 11, 2005).

<sup>32</sup>The February 14, 2006, draft National Infrastructure Support Technical Assistance Consultants' study, *Potential Impact by the Old Gentilly Landfill on the Environment Due to the Placement of the New Type III C&D Landfill—Document Review* (FEMA-1603-DR-LA, ESF#10 Task Order), was not finalized. In April 2006, FEMA reported to EPA that it suspended further activities on the study because of an expected LDEQ decision document on Gentilly that was subsequently issued in August 2006.

Specifically, the draft report recommended the following:<sup>33</sup>

- additional geotechnical and hydrogeologic analysis;
- the installation of a groundwater monitoring system, a groundwater sampling and analysis plan, and a detection monitoring program;
- an evaluation of the leachate generation potential from both the old and new landfill;
- an evaluation of the new C&D landfill's waste disposal plan, including a revised analysis of the "worst-case" impacts of the settling of the C&D landfill to evaluate the integrity of the clay cap covering the old landfill;
- running slope stability analyses for the C&D landfill;
- running preliminary calculations to estimate the quantity of "waters of consolidation" produced and released under the old landfill's cap during C&D debris disposal operations;
- installing and monitoring a landfill gas monitoring system, running landfill gas generation calculations, and collecting and analyzing landfill gas samples for volatile gas compounds; and
- conducting a levee evaluation to estimate whether the adjacent Gulf Intracoastal Waterway Levee is protective of the facility against a 100-year flood.

Although LDEQ and EPA officials told us they had a some concerns about the quality of the draft report and they disagreed with some of the recommendations, LDEQ said that steps it took to settle the lawsuit filed by the Louisiana Environmental Action Network also addressed many of the draft report's recommendations. Specifically, on February 24, 2006, officials from FEMA, LDEQ, EPA, the Corps of Engineers, and National Infrastructure Support Technical Assistance Consultants met to discuss the concerns that had been raised regarding the Gentilly Landfill. At this meeting, the officials agreed on a course of action to address these concerns that focused on four operating parameters at the landfill: (1) maximum daily debris load, (2) the placement and sequencing of waste, (3) geotechnical monitoring, and (4) groundwater monitoring.

After completing additional analyses and plans, on August 28, 2006, LDEQ issued an administrative order to the city of New Orleans (the owner of the landfill) and a related "Decision for Utilization of Gentilly Landfill 'Type III' for the Disposal of Hurricane Generated Debris" (or decision document) supporting the use of Gentilly for receiving hurricane debris. The administrative order and decision document

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<sup>33</sup>The draft report made 13 recommendations that we have aggregated into 8 on the basis of the topics addressed.

called for the installation of 10 inclinometers,<sup>34</sup> 11 groundwater monitoring wells, and 3 surface water sampling ports, according to specifications outlined in a geotechnical investigation and slope stability analyses, groundwater monitoring plan, and surface water monitoring plan provided as attachments to the decision document. LDEQ officials told us that although the administrative order and decision document resulted from an agreement with the Louisiana Environmental Action Network to settle its lawsuit regarding the Gentilly Landfill,<sup>35</sup> the steps outlined in the order generally responded to the recommendations in the draft report by the National Infrastructure Support Technical Assistance Consultants.

The first operating parameter agreed upon by LDEQ, EPA, and others addressed maximum daily debris load. The August 2006 administrative order specified that daily intake shall not exceed 50,000 cubic yards and called for limiting the weekly intake of uncompacted C&D waste to 210,000 cubic yards initially and gradually increasing the weekly intake to 280,000 cubic yards, provided inclinometer and visual readings confirm the landfill stability. LDEQ relied on slope stability analyses to arrive at this landfill parameter. According to LDEQ, an initial slope stability analysis was conducted for Gentilly as part of the landfill permitting process and is a regular component of the permitting application. An additional slope stability investigation, included as an attachment to the administrative order, was undertaken for LDEQ in July 2006 by a third party firm and entailed additional soil borings and laboratory analysis to determine the engineering and physical properties of the subsurface soils. LDEQ officials told us that daily debris intake was limited because LDEQ determined that 50,000 cubic yards per day is the maximum amount of debris that a C&D landfill can safely manage and because analysis showed that accepting this amount of debris each day would allow the underlying soil to get stronger, or gain “shear strength,” and support the weight of the landfill without failing or becoming unstable. LDEQ officials told us the Gentilly Landfill is currently receiving about 6,000 to 7,000 cubic yards of debris each day. The officials said that although the additional slope stability analysis was conducted as part of the previously discussed lawsuit settlement, it also addressed the draft National Infrastructure Support Technical Assistance Consultants’ recommendation that a slope stability analyses be performed for the landfill.

The second operating parameter addressed the placement and sequencing of waste. Under the August 2006 administrative order, debris is dumped in a given disposal area until it reaches an elevation of no more than 25 feet; then the next debris disposal area is opened. This process is repeated from one end of the landfill to the other, then back again. LDEQ officials explained that this sequencing of waste is done at landfills to make sure the soft soil under the waste does not fail and create a

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<sup>34</sup>According to LDEQ officials, inclinometers are instruments used to measure the horizontal movement of the landfill, an indicator of the stability of the landfill’s slope.

<sup>35</sup>In February 2006, LDEQ and the Louisiana Environmental Action Network reached a settlement providing that LDEQ would, among other things, (1) limit the daily waste intake at Gentilly to 19,000 cubic yards per day until LDEQ issued a formal decision document authorizing Gentilly to accept hurricane-related debris, (2) include in the decision document an analysis of the effects of waste disposal at Gentilly on nearby levees, (3) develop groundwater and surface water monitoring plans for the landfill, and (4) require spotters to be present on the face of the landfill during operation of the facility.

problem with landfill stability. Slope stability analysis conducted as part of the landfill permitting process and additional analyses conducted in July 2006 also informed LDEQ's decision on the elevation of waste placed in the landfill. According to LDEQ officials, the process of disposing of waste is managed by landfill engineers, who monitor elevations and determine when to move on to a new area. The officials said if any stability concerns were identified by the inclinometers installed at the site, LDEQ would take remedial action to relieve the pressure by removing waste. So far, LDEQ has not had to take remedial action, and the officials told us such action was unlikely given the rate of debris disposal at the site. LDEQ officials told us the actions taken under this operating parameter address the draft National Infrastructure Support Technical Assistance Consultants' recommendation to evaluate the landfill's waste disposal plan.

The third operating parameter addressed monitoring the integrity of the landfill (geotechnical monitoring). In this regard, the administrative order called for the installation of inclinometers along the southern slope of the landfill based on the inclinometer installation and monitoring plan that was developed for Gentilly and included as part of the order. According to LDEQ officials, all 10 of the inclinometers that the plan required were installed along the southern boundary of the landfill, in accordance with plan specifications. The officials also informed us that, based on quarterly landfill inclinometer reports, there has been no significant movement in Gentilly's slope, though the inclinometers were sensitive enough to pick up movement from construction of an access road near the landfill. Officials said that Gentilly is the only landfill out of about 50 in Louisiana that has inclinometers and that this requirement—which goes beyond state and federal regulations—was implemented in an effort to help settle the previously mentioned lawsuit. Additionally, LDEQ officials said that the inclinometers also addressed the draft National Infrastructure Support Technical Assistance Consultants' recommendation that additional geotechnical analysis was needed for the landfill.

And finally, the administrative order addressed the fourth operating parameter—groundwater monitoring—by requiring the landfill to implement the groundwater monitoring plan that was included with the order. Among other things, the plan called for the installation of 11 groundwater wells around the landfill's perimeter and the installation of 3 shallow surface water sampling ports. According to LDEQ officials, all of the groundwater wells and surface water ports were installed and met the plan specifications. LDEQ is testing groundwater for 62 chemicals, including arsenic, benzene, and lead; and surface water for 9 chemicals. The officials said the quarterly landfill sampling results obtained to date have been within normal ranges, with the exception of seven metals in groundwater samples and one metal in surface water samples.<sup>36</sup> According to LDEQ, additional testing showed that metals were not present or detected at lower levels when soil sediment was filtered out of the water. As such, LDEQ officials attribute the metal levels to the surrounding soil sediment, which naturally contains metals such as lead at levels of around 15 to 20 parts per million, and stated they would continue to analyze all of the landfill's groundwater and surface water sampling results to develop baseline data for future use. The

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<sup>36</sup>According to LDEQ, barium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in groundwater samples and zinc was detected in surface water samples.

officials said that although the groundwater and surface water monitoring conducted at the landfill was done to satisfy the lawsuit settlement, it also addressed the draft National Infrastructure Support Technical Assistance Consultants' recommendations regarding the installation of a groundwater monitoring system, a groundwater sampling and analysis plan, and a detection monitoring program.

LDEQ officials told us that several of the February 2006 draft report recommendations had been previously addressed during the Gentilly Landfill's permitting application process and also said they disagreed with several of the recommendations. For example, LDEQ officials said the agency disagreed with, and has not taken action to respond to, the draft report's recommendations regarding landfill gas monitoring. LDEQ officials cited three reasons for disagreeing with the draft report's recommendations on landfill gas monitoring: (1) LDEQ generally does not require landfill gas monitoring at C&D landfills; (2) gas is a product of decomposition, and LDEQ's evaluations showed that the underlying municipal waste was already decomposed; and (3) gas monitors are typically installed if gas could be a health hazard or explosion hazard, or if there is a concern about lateral gas movement underground affecting neighboring populations. However, there are no residential communities near the Gentilly Landfill. Further, LDEQ officials said that the gas monitoring equipment worn by landfill workers, as required by the Occupational Safety and Health Administration, detected no emissions above Occupational Safety and Health Administration limits.

According to EPA, agency staff participated in meetings with LDEQ to discuss the groundwater monitoring locations, screening depths, intervals, constituents, and data analysis; funded some of the geotechnical testing used in the slope stability analyses; and discussed the analyses with LDEQ in relation to the maximum daily debris load and debris sequencing parameters. In September 2006, EPA reported to FEMA that it had reviewed LDEQ's administrative order, decision document, and attached plans and concurred with the findings and the approach taken on each of the four operating parameters for the landfill. EPA officials said the agency has not had a direct role in overseeing the implementation of the state administrative order. However, the officials noted that EPA contractors continue to conduct landfill observations at Gentilly and other landfills receiving the greatest concentrations of hurricane debris. Our June 2007 report underscored that EPA's guidance to states and localities on planning for disposal of disaster debris is 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.<sup>37</sup> Such guidance could help states and localities consider the potential 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,

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<sup>37</sup>GAO-07-651.

and during the 1940s and 1950s the area was routinely sprayed with DDT.<sup>38</sup> The landfill was reopened after Hurricane Betsy 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. 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>39</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 parties recently settled the case in August 2008. Under the terms of the consent decree, which recognized the city's difficult financial circumstances, the city will pay no money but will perform certain in-kind services, provide site access to EPA, and assist in the placement of institutional controls.

We recommended in June 2007 that EPA 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. We noted that such guidance 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. As discussed in enclosure I, EPA did update its 1995 guidance on managing disaster debris disposal in March 2008.

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<sup>38</sup>These activities occurred before the enactment of federal regulations governing landfills.

<sup>39</sup>*United States v. City of New Orleans, et al*, Civil Action No. 02-3618, Section E, Magistrate 3 (E.D. La.).

## **Enclosure IV: Other Hurricane Katrina Debris-Related Areas of Interest**

Following is a discussion of the status of the Chef Menteur Landfill in New Orleans, an EPA disaster debris-reduction pilot project in St. Bernard Parish, and a debris provision in the Water Resources Development Act.

**Status of the Chef Menteur Landfill.** Another landfill that generated controversy when LDEQ approved its use as a C&D landfill under emergency authority in April 2006 is the Chef Menteur Landfill, located near a minority residential community and a national wildlife refuge. An environmental study identified concerns about the potential discharge of leachate (water that has come into contact with waste) into the wetlands surrounding the Chef Menteur Landfill. Although the landfill was closed in August 2006, LDEQ subsequently received numerous citizen complaints regarding odors from the site. According to LDEQ, because of the concerns raised, the agency undertook a comprehensive sampling of air, water, and soil cover at the landfill in November 2007. Air samples were collected both at the landfill and a nearby community center, and the results indicated no exceedances of either state or federal regulations. Water samples collected from an open excavation next to the landfill that contained runoff from the site did not detect any volatile organic compounds or metal samples. However, the results did show some constituents that exceeded the site's discharge limits.<sup>40</sup> According to LDEQ, no water has been discharged from the landfill, including the open excavation site. However, they said that the owners of Chef Menteur would be required to provide some type of treatment for these constituents if they were discharged into the surrounding area. Final closure activity cannot commence at Chef Menteur until, among other things, the Corps of Engineers issues a permit required under the Clean Water Act. According to LDEQ, as of the end of May 2008, the Corps of Engineers had not provided a time frame for the issuance of the permit. There are several pending lawsuits that could affect the nature and timing of the landfill closure.

**Disaster debris reduction pilot in St. Bernard Parish.** EPA conducted a disaster debris pilot project in St. Bernard Parish in June 2008 to evaluate methods for reducing large volumes of debris from Hurricane Katrina. The pilot studied the use of a thermal treatment process, known as an air curtain burner, as an option to expedite debris removal in a cost-effective and environmentally sound manner. Vegetative and C&D debris that does not contain regulated asbestos-containing material was used during the project, which was conducted at the Paris Road debris staging site in St. Bernard Parish. According to an EPA official, the site used for the pilot is a closed landfill in a remote part of the parish.

This pilot was originally planned to test methods for disposing of regulated asbestos-containing material. The two planned methods to be evaluated involved (1) grinding asbestos-containing waste material from homes and (2) burning asbestos-containing waste material from homes in the air curtain burner. However, the asbestos pilot projects became controversial in part because of community concerns. EPA has acknowledged that an error in its risk estimate of the potential health effects of exposure to asbestos related to the pilot was a factor in the decision to exclude

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<sup>40</sup>Biochemical oxygen demand and total suspended solids water sample results from the open excavation next to Chef Menteur were the constituents that exceeded the landfill's discharge limits.

asbestos-containing material for the revised pilot. The new pilot was limited to the burning of vegetative and C&D debris and was redesigned to specifically exclude regulated asbestos-containing material.

**Water Resources Development Act debris provision.** A provision of the Water Resources Development Act of 2007 prohibits federal funding of the disposal of waste that does not meet federal C&D debris guidelines in Louisiana C&D landfills.<sup>41</sup> However, federal regulations do not specifically define C&D debris, instead stating that a C&D landfill “typically receives any one or more of the following types of solid wastes: roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste.”<sup>42</sup> While the Louisiana definition is more stringent than federal guidelines, under the emergency order still in effect in five parishes, the debris that C&D landfills can receive includes some potentially hazardous materials that normally would not be allowed in unlined C&D landfills under Louisiana’s regulations.<sup>43</sup> In August 2006, EPA Region 6 reviewed LDEQ’s C&D debris definition under the emergency order and determined that the types of waste “seem consistent with what EPA identifies as material typically sent to a C&D landfill.” While LDEQ officials acknowledged that the provision has therefore not impacted debris disposal operations, EPA and LDEQ officials emphasized that C&D disposal practices in Louisiana have complied with the provisions of the Water Resources Development Act of 2007.

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<sup>41</sup>Specifically, the provision states that “no Federal funds may be used to pay for or reimburse any state or local entity in Louisiana for the disposal of C&D debris generated as a result of Hurricane Katrina in 2005 in a landfill designated for C&D debris as described in section 257.2 of title 40, Code of Federal Regulations, unless that waste meets the definition of C&D debris, as specified under Federal law and described in that section.” Pub. L. No. 110-114, § 4101(c), 112 Stat. 1189 (2007).

<sup>42</sup>40 C.F.R. § 257.2.

<sup>43</sup>Although C&D landfills are not required to have liners, Louisiana’s environmental regulations for these landfills state that these facilities shall have natural stable soils of low permeability for the area occupied by the landfill. According to the regulation, this soil requirement will provide a barrier to prevent surface spills from penetrating into groundwater aquifers underlying the area, or to a sand or other water-bearing stratum, that would provide a conduit to such aquifers (LAC 33:VII.719,D.1.).

# Enclosure V: Comments from the Environmental Protection Agency

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



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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AUG 13 2008

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U.S. GAO

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 comment on the "Draft Report on GAO's Review of Hurricane Katrina Debris Removal and Disposal Issues." EPA and GAO have developed a productive working relationship through this and previous Hurricane Katrina and Rita reviews. We are proud of our contributions to this unprecedented natural disaster recovery and the progress we have made in our preparedness and response operations in light of our experience with Hurricane Katrina. Some of these changes in response operations address comments made by GAO in 2007. GAO recognized and mentioned these improvements in this draft report. A separate response from EPA Headquarters will address GAO's previous recommendations.

In regards to this recent Draft GAO report, EPA generally agrees with the information contained in the document. However, we have some recommended additions and revisions. These recommendations are summarized below:

1. EPA recommends that GAO eliminate the statements on pages 6, 8, 10, 13, 28 and 39 where the report mentions that the State of Louisiana's emergency order broadens the State's definition of construction and demolition debris (C&D) and allows for some "potentially hazardous materials" to be disposed of in C&D landfills rather than in landfills with liners approved for such waste. These misleading statements guide the reader to infer that the C&D definition under the Louisiana emergency order is inconsistent with federal requirements. However, as mentioned in the report on page 39, EPA reviewed the definition under the emergency order and determined that the types of waste seem consistent with what EPA identifies as material typically sent to a C&D landfill. Furthermore, the use of the term "potentially hazardous material" is also misleading. For example, EPA is unaware of any document that describes furniture and/or carpet as a "hazardous material." Therefore, EPA recommends that these statements be eliminated from the report.

See comment 1.

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See comment 2.

2. A discussion of oversight practices begins on page 17 of the GAO report. In this section there are discussions on Landfill Observations, Demolition Observations and asbestos monitoring at demolition sites. Since this is a report concerning debris activities, the following language should be added at the beginning of this section.

*EPA provided 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.*
- *Additional curbside segregation during collection activities. These efforts were closely coordinated with the appropriate Emergency Support Function (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 their entrance into the landfill.*
- *Landfill operators also had landfill spotters that worked the landfill and watched 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 and EPA performed landfill observations which are discussed in more detail below.*

See comment 3.

3. The discussion in the report on pages 35 and 36 regarding the Agriculture Street Landfill omits significant details, contains inaccuracies and suggests inferences unwarranted by the underlying facts. Specifically, the report's attempt to correlate the conditions associated with the Agriculture Street Landfill and the activities at current C&D landfills is not supported by facts. EPA conducted an extensive investigation into the material placed in the Agriculture Street Landfill and could not conclude that the 1965 Hurricane Betsy C&D debris contributed to the hazardous substances found in the landfill. Therefore, it is inaccurate to describe the Agriculture Street Landfill as an example of a prior problem with hurricane debris.

See comment 3.

In addition, the paragraph as written invites the reader to infer that the Hurricane Katrina generated sediment contained potentially dangerous levels of lead, arsenic, and PAHs, but the inference is not supported by EPA's specific findings concerning Hurricane Katrina sediment. EPA did not detect lead, arsenic, and PAHs in Hurricane Katrina sediment above health-based levels. Due to these inaccuracies, this paragraph should be removed from the report.

Should you need additional information or clarifications related to our comments, please contact Sam Coleman, Director, Superfund Division at 214-665-6701.

Sincerely yours,



Richard E. Greene  
Regional Administrator

Enclosure

## GAO Comments

1. We disagree with EPA's comment that our report "guides the reader to infer" that Louisiana's C&D definition is inconsistent with federal requirements. In fact, as EPA points out, we state in the draft report that EPA Region 6 reviewed LDEQ's C&D debris definition under the emergency order and determined that the types of waste "seem consistent with what EPA identifies as material typically sent to a C&D landfill." This statement is included in both the Overview section and the body of the draft and final reports. We also disagree with EPA's comment that the use of the term "potentially hazardous material" is misleading and are puzzled by its statement that the agency is not aware of any document that describes furniture and/or carpet as a hazardous material. For example, when EPA reviewed LDEQ's C&D debris definition under the emergency order, the agency referred to a 1995 report prepared for EPA entitled "Construction and Demolition Waste Landfills," which provided information about the variety of materials disposed of in C&D landfills. In this draft report, carpeting and furniture were listed as "problematic items," as were wood paints and stains, among other items. Furthermore, the report stated that many C&D wastes contain "inseparable hazardous constituents" and as examples cited "carpeting that can leach formaldehyde and treated or coated wood and wood products." Additionally, as we reported in our June 2007 report on EPA's Hurricane Katrina activities, studies by a Louisiana State University research institute and an environmental engineering firm state that these categories of wastes can introduce hazardous materials into landfills, increasing the likelihood of pollution. 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 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. In response to EPA's comment, we are adding this information from our prior report to the body of this report.
2. As stated in our draft report, this review focuses on EPA's and LDEQ's 2007 and 2008 debris-related Hurricane Katrina response activities in the New Orleans area. Further, in the draft and final reports, we refer readers to our 2007 report that covers EPA's Katrina response activities from August 2005 through June 2007, including EPA's actions as the coordinator of emergency support for the oil and hazardous materials response. We did not add the detailed text that EPA proposed about EPA's debris-related activities because it includes activities from the earlier years not addressed in the draft report. We did, however, add a footnote in the report section cited by EPA to remind

readers that the prior report, *Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast* (GAO-07-651), also discusses EPA's debris-related activities.

3. We continue to believe there are lessons that can be learned from the Agriculture Street Landfill, which was—like the Gentilly Landfill—reopened on top of a former municipal landfill after a hurricane. (The Agriculture Street Landfill was reopened after Hurricane Betsy hit New Orleans in 1965.) In both cases, the closed municipal landfills had operated prior to the enactment of the Resource Conservation and Recovery Act in 1976. In the draft report, we excerpted information about the Agriculture Street Landfill that we provided in our prior report on Hurricane Katrina (GAO-07-651). EPA stated that the draft report omits significant details and requested that the paragraph be removed from the report. Alternatively, to address EPA's concerns, we are including the entire discussion of this landfill that was included in the prior report. This text was reviewed by EPA prior to the issuance of our 2007 report and reflects changes we made in response to the agency's comments on this section at that time. We do not agree with EPA that the information contains inaccuracies and "suggests inferences unwarranted by the underlying facts." Finally, EPA stated that the paragraph in the draft report on the Agriculture Street Landfill "invites the reader to infer" that Hurricane Katrina generated sediment containing "potentially dangerous levels" of lead, arsenic, and polycyclic aromatic hydrocarbons (PAH). We disagree. In our draft report, we state that these were the primary contaminants of concern identified in EPA's sediment tests following Hurricane Katrina. That these same contaminants were identified at elevated levels based on EPA-initiated investigations at the Agriculture Street Landfill site in 1986 is a matter of record.

## Enclosure VI: Comments from the Louisiana Department of Environmental Quality

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

BOBBY JINDAL  
GOVERNOR



HAROLD LEGGETT, PH.D.  
SECRETARY

State of Louisiana  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
OFFICE OF THE SECRETARY

August 14, 2008

John B. Stephenson  
Director, Natural Resources and Environment  
General Accounting Office  
441 G St. NW, Room 2075  
Washington, DC 20548

Re: Draft Report of GAO's Review of Hurricane Katrina debris Removal & Disposal

Dear Mr. Stephenson:

The Louisiana Department of Environmental Quality (LDEQ) has reviewed the draft report of GAO's review of LDEQ's Hurricane Katrina debris removal and disposal activities. LDEQ has the following comments in response to the report:

**Comment on Page 6, 13, and 29:**

The incidental mixture of "construction and demolition debris with asbestos-contaminated waste" should read asbestos containing waste.

**Regarding the "slow" pace of demolitions, first paragraph, Page 7:**

Categorizing the pace of demolitions as slow is an artifact of the time period selected and does not account for the types of demolitions being conducted and the obstacles which must be overcome to complete them.

Although Hurricane Katrina occurred on August 29, 2005, demolitions did not begin until March 2006. Almost all of the early demolitions were voluntary i.e. the homeowner gave permission for the demolition. As a result about 12,000 residential demolitions had been completed by February 2007.

However, the processing of houses that have to be condemned takes much longer. The public notice requirements alone extend the process for each demolition by 30 to 60 days. Also, FEMA required that the Parishes take over the management of the demolitions

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See comment 1.

See comment 2.

which required re-bidding contracts which resulted in a three to five month lull in demolitions until the new contractors were in place.

As a result due to the transition in the management of the demolitions from U.S. Army Corps of Engineers to the parish only about 1,000 demolitions were done from March 2007 till May 2008. However, over the past few months the demolition rate has increased and the total number of demolitions as of August 1, 2008, exceeds 16,000.

See comment 3.

**Comment on Page 8 “one of four landfills currently authorized by emergency order to receive C&D debris under a broadened definition that includes some potentially hazardous materials:**

It is important to note that the Gentilly landfill was permitted before the storms. The statement could be interpreted as LDEQ deliberately allowed the disposal of hazardous material at these landfills. In reality, the unprecedented multi layer waste inspections, waste segregations and recycling efforts in the field were testament to LDEQ and its partners’ commitments to prevent hazardous materials being disposed at landfills.

See comment 4.

**Comment on Page 9 regarding the installation of additional groundwater monitoring:**

There are no regulatory requirements for groundwater monitoring for C&D landfills.

See comment 5.

**Regarding the EPA’s No Action Assurance (NAA) Letters and the impact to the Hurricane Katrina Response (Page 15):**

The EPA has promulgated Clean Air Act regulations, the National Emission Standards for Hazardous Air Pollutants (NESHAP), which address the control of asbestos emissions. These regulations are mirrored by the Louisiana Emission Standards for Hazardous Air Pollutants (LESHAP). Both NESHAP and LESHAP allow for the demolition of houses that are structurally unsound and in imminent danger without the removal of asbestos prior to the demolition.

The EPA’s No Action Assurance (NAAs) letters allow certain other categories of houses that were seriously damaged by Hurricane Katrina to be demolished under the same regulations provided that a strict protocol is followed. This protocol is designed to prevent air emissions from the demolition activity and the handling and disposal of the demolition debris. The effectiveness of the protocol has been verified by the results of air monitoring at thousands of demolition sites by both the contractors conducting the demolitions and the EPA through its perimeter air monitoring efforts.

Although the regulatory flexibility provided by the NAAs is relatively minor, the impact to the recovery effort has been enormous. If the NAAs were not in effect, the Regulated Asbestos Containing Materials would have been required to be removed prior to the demolition. This means that a demolition which would require less than a day to complete under the NAA would instead take three to four days.

FEMA estimates that, as of July 25, 2008, 16,910 houses have been demolished with 6,092 awaiting demolition. Without the NAA letters, these numbers would likely be

reversed and the public would have been exposed to a potentially greater public health and safety hazard from almost 17,000 abandoned houses awaiting demolition.

See comment 6.

**Comments on Observations at Demolition Sites, Page 20:**

LDEQ and EPA have observed demolition activities at more than 8,500 residences since...EPA began assisting with this effort on October 21, 2006, conducting more than 7,500 demolition observations through July 2008....EPA has conducted more than 830 floor tile demolition observations through July 2008.

See comment 7.

**Comments on Monitoring Asbestos Emissions at Demolition Sites:**

None of the samples taken at demolition sites have exceeded EPA's health screening level for asbestos concentrations. The one case where EPA thought that this had occurred was found to be due to a misinterpretation of the results of the sampling analysis.

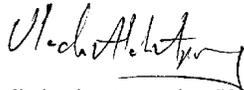
See comment 8.

**Comment on Page 36:**

It is not a fair comparison of debris management undertaking after hurricane Betsy in 1965 and the LDEQ's response to hurricanes Katrina and Rita in 2005. To our knowledge, there were no environmental regulations in effect in 1965 to prevent Agriculture Street from becoming a superfund site.

The LDEQ appreciates the opportunity to comment on the report. If you have any questions regarding these comments, please contact Lourdes Iturralde at 225-219-3712.

Sincerely,



Vladimir Alex Appeaning, Ph.D.  
Deputy Secretary

c: Kirk Mcnard, Senior Analyst  
GAO

## GAO Comments

1. LDEQ requested that we replace the term “construction and demolition debris with asbestos-contaminated waste” with the term “asbestos containing waste.” We did not make this change because, as indicated in the draft and final reports, we are quoting the language in LDEQ’s Hurricane Katrina Emergency Orders, including the current order that is in effect until August 29, 2008.
2. We agree that there are obstacles that must be overcome before a home can be demolished. And while we understand there was a lull in between when the U.S. Army Corps of Engineers ceased demolitions and the parishes took over the management of the demolitions, it is not unreasonable to believe that local governments should have anticipated taking over this responsibility at some point. We have updated our report with the revised FEMA demolition numbers provided by LDEQ but believe that the pace of demolitions continues to be slow.
3. LDEQ commented that it is important to note that the Gentilly Landfill was permitted before the storms. Our draft and final reports state that LDEQ “issued a permit in December 2004 authorizing the Gentilly Landfill to receive and dispose of C&D debris and wood wastes.”
4. Regarding our statement about the “additional groundwater monitoring” at the Gentilly Landfill, LDEQ commented that there are no regulatory requirements for groundwater monitoring for C&D landfills. We used the word “additional” to reflect that the number of water monitors at Gentilly was increased. We do not believe that describing the use of such monitors at the landfill suggests that the monitors are required by regulation.
5. LDEQ emphasized the importance of EPA’s no action assurance letters in completing home demolitions. In response, we revised the report to include LDEQ’s statement that the no action assurance letters significantly helped the recovery effort by allowing demolition without the prior removal of regulated asbestos-containing materials, reducing by 2 or 3 days the time required to demolish homes. We also updated our report with the revised demolition numbers provided. However, we note that LDEQ’s letter also provided explanations for the slow pace of demolitions that are independent of the regulatory flexibility provided by no action assurances—namely, the lengthy house condemnation process and the lull in demolitions that occurred after FEMA required the parishes, rather than the U.S. Army Corps of Engineers, to manage the demolitions. We continue to believe that important factors should be carefully weighed in considering extensions beyond the 3-year anniversary of Hurricane Katrina on August 29, 2008—including the possible culmination of FEMA-funded EPA support in conducting oversight of landfill operations and demolitions in the New Orleans area.
6. LDEQ provided updated information on LDEQ and EPA observations at demolition sites, and we have revised the report to reflect information from LDEQ and EPA.

7. LDEQ provided a clarification about the asbestos samples taken at demolitions. We have revised our report with information from LDEQ and EPA.
8. We continue to believe there are lessons that can be learned from the Agriculture Street Landfill, which was—like the Gentilly Landfill—reopened on top of a former municipal landfill after a hurricane. In 1994, this landfill became the Agriculture Street Superfund Site. As previously discussed with LDEQ officials, our draft and final reports reflect the fact that the activities that occurred at the landfill (during the 1940s and 1950s) occurred before the enactment of federal regulations governing landfills.

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