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Hurricane Katrina:
It's An Ill Wind that Blows No Good

Picking Up After a Hurricane Katrina: The EPA Response in Mississippi

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1. Introduction. **On August 29, 2005, Hurricane Katrina made landfall on the Mississippi Gulf Coast. A category III storm at this point, Katrina struck with winds of up to 140 mph and a storm surge of over 40 feet. Approximately two feet of rainfall fell on the Mississippi Gulf Coast. Forty-seven of the eighty-two counties in Mississippi were severely impacted. Thousands of residential and commercial structures were damaged or destroyed by the storm. Approximately one-half of the area of the coastal counties suffered total destruction. Estimates of total amounts of debris in Mississippi exceed 41 million cubic yards – roughly the amount of solid waste generated over a five year period.**

Hurricane Katrina also caused severe damage to timber resources in Mississippi. According to the Mississippi Forestry Association, the volume of downed timber in the state amounts to about 3.1 billion cubic feet. This equals about one-fourth of the annual consumption of lumber in the United States – enough to build 800,000 single-family homes. While the Environmental Protection Agency's (EPA or Agency) experience with prior hurricanes indicates that salvage rates typically vary from 25% to about 33%, the Agency is seeking to establish a bio-energy program to increase the percentage of recovery.

Unlike New Orleans and other parts of Louisiana affected by Hurricane Katrina, Mississippi and Alabama did not suffer sustained flooding and the resulting sewage, contaminated sediment, petroleum, and liquid waste problems that confronts the agencies involved in that clean-up. Conversely, Louisiana did not

[1] **The authors would also like to acknowledge the significant contributions to this paper by the Environmental Protection Agency's Office of General Counsel.**

suffer the extensive damage to timber resources that occurred in Mississippi. While Alabama was also significantly impacted by Hurricane Katrina, especially the coastal areas, it did not suffer the extensive damage and large scale devastation that occurred in Mississippi.

The massive amount of debris from the hurricane requires significant coordination by federal agencies with state and local governments, as well as extensive resource commitments. This paper briefly examines the legal authorities EPA has employed in responding to Hurricane Katrina in Mississippi and, in particular, the Agency's efforts to recycle and reuse as much of the debris as possible.

2. Legal Authorities. The Stafford Act, more formally known as the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, 42 U.S.C. Sections 5121, et seq., is the overarching statutory authority for the federal government response to declared major disasters and emergencies. Following an event such as a hurricane, the Governor of a state may make a request to the President for a declaration that a major disaster or emergency exists. Such requests are based on findings that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the affected state and local governments, and that federal assistance is necessary. 42 U.S.C. §§ 5170 and 5191(a).

Under the Stafford Act, once the President issues a disaster or emergency declaration, the Federal Emergency Management Agency (FEMA) is the lead agency for the federal response. Federal agencies, under Section 402 of the Stafford Act and under FEMA's lead, use their authorities under other relevant provisions of federal law in support of state and local assistance efforts and, under Section 403, provide assistance essential to meeting immediate threats to life and property.[2] 42 U.S.C. §§ 7150a and 5170b.

"Emergency" is defined under the Stafford Act to mean any occasion where, in the determination of the President, federal assistance is needed to supplement state and local efforts and capabilities to save lives and protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States. A "major disaster" includes any natural catastrophe – including a hurricane – which, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance to supplement the efforts and available resources of States, local governments, and disaster relief organizations. 42 U.S.C. § 5122 (1) and (2).

In response to a "major disaster," FEMA activates the National Response Plan (NRP). The NRP "establishes a process and structure for the systematic and

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[2] **While the primary statutory authority for disaster response is the Stafford Act, EPA may also draw on its authorities under other statutes, if necessary, such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Oil Pollution Act (OPA); the Resource Conservation and Recovery Act (RCRA); the Clean Water Act; the Safe Drinking Water Act; the Marine Protection, Research, and Sanctuaries Act; the Clean Air Act; the Toxic Substances Control Act; and the Federal Insecticide, Fungicide, and Rodenticide Act.**

coordinated delivery of federal assistance to address the consequences of any major disaster or emergency declared under [the Stafford Act]." The NRP (which replaced the Federal Response Plan and other plans) establishes a comprehensive, national, all-hazards approach to domestic incident management.

The NRP consists of a Base Plan, together with Emergency Support Function Annexes, Support Annexes, and Incident Annexes. While EPA has a role in many of the annexes, the Agency is primarily involved with Emergency Support Function (ESF) #10, Oil and Hazardous Material Response. FEMA, in turn, issues "Mission Assignments" (MA) to Federal agencies to respond to a disaster. The MA is used by FEMA to specify the assistance needed from Support Agencies.

In the case of Hurricane Katrina, the Governor of Mississippi made a request for federal assistance under the Stafford Act, and the President issued the necessary declarations to activate the federal response under the NRP.

Under the NRP, EPA is the Coordinator and Primary Agency, along with the Coast Guard, for ESF #10, which includes:

- **detecting, identifying, containing, and the cleanup and disposal of oil or hazardous materials**
- **removal of drums, barrels, tanks, or other bulk containers, that contain oil or hazardous materials**
- **household hazardous waste collection**
- **monitoring of debris disposal**
- **water quality monitoring and protection**
- **air quality sampling and monitoring**
- **protection of natural resources**

EPA is also a Support Agency for the following Emergency Support Functions:

- **ESF #3 – Public Works and Engineering. EPA's role includes drinking water and waste water facilities infrastructure protection; determining suitability of drinking water sources; and monitoring of contaminated debris management activities.**
- **ESF #5 – Emergency Management. EPA's role includes support to the Joint Field Office, as well as provision of staff liaisons and technical experts.**
- **ESF #8 – Public Health and Medical. EPA's role includes providing technical assistance and environmental information for**

health/medical aspects of hazardous material response actions and assistance regarding the suitability of drinking water supplies.

- **ESF #11 – Agriculture and Natural Resources. EPA's role includes providing technical assistance on the handling of biological and chemical agents, contaminated crops/animals, and food/product decontamination.**

- **ESF #12 – Energy. EPA's role includes response to state/local requests for fuel waivers to address fuel shortages.**

- **ESF #14 – Long-Term Community Recovery. EPA's role includes technical assistance for planning for contaminated debris management and environmental remediation, ecological restoration, and infrastructure rebuilding.**

To help facilitate disaster response activities, the Stafford Act also addresses the authority of federal agencies to access private property for debris and hazardous material removal. Section 403 of the Stafford Act provides that "federal Agencies may on direction of the President, provide assistance essential to meeting immediate threats to life and property resulting from a major disaster." That section goes on to explain that federal agencies may "perform on public or private lands or waters any work or services essential to saving lives and protecting and preserving property or public health and safety, including — (A) debris removal, . . . (E) demolition of unsafe structures, . . . and (I) reduction of immediate threats to life, property, and public health and safety." 42 U.S.C. § 5170b.

Under section 407 of the Stafford Act, the President may direct federal agencies "to clear debris and wreckage resulting from a major disaster from publicly and privately owned lands and waters;" however "[n]o authority under this section shall be exercised unless the affected state or local government shall first arrange an unconditional authorization for removal of such debris or wreckage from public and private property, and, in the case of removal of debris or wreckage from private property, shall first agree to indemnify the Federal Government against any claim arising from such removal." 42 U.S.C. § 5173.

In order to provide access to private property for removal of hazardous materials and debris by federal agencies, the affected local governments on the Mississippi Gulf Coast have provided assurances to FEMA agreeing to hold harmless and indemnify the federal agencies involved. Additionally, the local governments have had landowners sign Right of Entry agreements granting unconditional authorization for federal agencies to remove hazardous materials and debris from private property. Where owners could not be found, the local governments have published notices in newspapers, and have posted signs in the impacted areas, giving homeowners a specified time-frame to opt out of federal clean-up of their property. Residents who choose to clean up their own property can still be reimbursed by FEMA for their verifiable clean-up costs.

<u>3. The EPA Response in Mississippi.</u> Under the Stafford Act, EPA, through its Headquarters and Regions 4 and 6, has been engaged in a substantial range of response activities on the Gulf Coast. For example, immediately after the storm,

EPA employed its authority under the Clean Air Act to grant emergency waivers of fuel standards to help ensure adequate availability of fuel supplies, particularly for emergency vehicles. EPA has also played an important role in assisting the U.S. Army Corps of Engineers (COE) as it discharges its debris mission, including assisting the COE with hazardous material clean-up. In Mississippi, EPA Region 4 staff brought drinking water and wastewater treatment plants back into operation, because local personnel were displaced by the hurricane or were unable to return to work. Other EPA activities have included collection of air, water, and sediment data, and the provision of the resulting information to FEMA for further distribution to local officials and the public. EPA has also distributed over a million flyers providing information about potential environmental health hazards and other important issues to residents returning to the Gulf Coast in Mississippi and to southern Louisiana parishes.

Shortly after Hurricane Katrina struck, EPA established collection points for hazardous materials recovered from public or private property. COE contractors, private contractors, local governments, and private individuals were encouraged to drop-off containers of hazardous materials at these collection points, or to call EPA to arrange pick-up. Typical materials collected include propane tanks (large 250 or 500 gallon tanks and small, grill-type cylinders), containers of bleach or chlorine, batteries, and various solvents, paints, and other common household cleaning items.

In many cases, EPA returned large propane tanks to the rightful owners, as these are typically leased and have contact information or company logos stenciled on the tanks. Small propane cylinders have been given to local propane dealers for reuse. However, if any container is deemed to be unsuitable for reuse, it is scrapped and the metal is sent to a recycler.

Since new deliveries of chlorine to water treatment plants was impractical immediately after the storm, EPA used the chlorine and bleach recovered from the collection points to re-start wastewater and drinking water treatment facilities. Similarly, EPA has recovered oil, diesel, and gasoline from abandoned automobiles, trucks, boats, and storage tanks. Some of the fuel has been used to power generators and response vehicles. After accumulating several thousand gallons of a particular fuel type, or collecting contaminated but recyclable fuel, an EPA contractor would sell the fuel and use the proceeds to offset the cost of its contract.[3]

While EPA Region 4 has been able to reuse and recycle much of the hazardous material collected at the staging areas, some materials, such as paints and extremely flammable materials or hazardous materials in leaking containers, had to be disposed of by traditional hazardous waste disposal methods. Similarly, large amounts of spoiled food from homes, restaurants, and commercial facilities have had to be sent to landfills.

Besides downed timber, the largest category of debris on the Gulf Coast is building materials from the thousands of homes and other structures damaged or destroyed by Hurricane Katrina. The Mississippi Department of Environmental

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[3] **EPA Region 4 has used 19 staff persons (including On-Scene Coordinators) and 92 contractor personnel in its response activities in Mississippi and Alabama.**

Quality (MDEQ) and EPA provided information on the demolition of unsound structures and how to handle suspected asbestos contaminated materials.

MDEQ also moved quickly to establish sites for the staging of white goods and automobiles that were abandoned after the storm. Over 60,000 trucks and automobiles were damaged or abandoned in Mississippi as a result of Hurricane Katrina. Since they are licensed by the state and taxed by local governments, vehicles and boats present unique logistical problems since the question of ownership must be resolved before disposition. The Mississippi Department of Public Safety, working with a consortium of automobile and boat insurers, established collection points where each Vehicle Identification Number or marine registration number was recorded and attempts were then made to contact the owner while insurance adjustors evaluated each vehicle or boat. If the owner had already reported the vehicle or boat as lost, the insuror would sell the vehicle or boat for scrap and pay off the owner or lien-holder, as appropriate. Unclaimed vehicles or boats are subject to state law forfeiture procedures whereby local governments must follow a process before abandoned vehicles or boats can be sold.

The collection and disposal of white goods (e.g., refrigerators, freezers, washers, and dryers) also present significant logistical problems. As an indicator of the volume of white goods requiring disposition on the Mississippi Gulf Coast, FEMA has contracted for 35,000 travel trailers to be used by Gulf Coast residents while their homes or apartments are rebuilt. While not every home damaged or destroyed had a washer and dryer, almost all had refrigerators. Thus, a significant part of the debris mission has been devoted to the collection and recycling of white goods. The COE assigned a contractor to operate staging facilities and process white goods for recycling. Appliances that are in fairly good condition are dismantled for parts. Appliances that cannot be salvaged are sent to metal recyclers. Washers and dryers can be easily recycled; however, refrigerators and freezers contain refrigerant that must be removed before recycling. To facilitate this effort, EPA provided information on how to properly remove refrigerants from refrigerators, freezers, trucks, automobiles, refrigerated trailers, and air conditioners, as well as how to properly recycle or dispose of the refrigerant. The COE contractor is tasked with removing the refrigerant for reclamation or proper disposal prior to disposition of the appliances.

Unlike New Orleans, where most of the multi-story buildings remained intact after Hurricane Katrina, buildings on the Mississippi Gulf Coast (mostly one or two story structures) suffered significant internal damage from both the storm surge and almost two feet of rainwater after high winds tore off roofs or knocked over walls. As a result, most of the electronic devices (televisions, computers, stereos, etc.) in these structures suffered extensive water damage and thus had negligible recycling potential. Since transport costs alone have significantly outweighed the return on recycled water-damaged electronics, disposal in landfills has been the typical fate for damaged computers and televisions.[4]

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[4] **In New Orleans however, electronic devices on the upper floors of many office buildings, apartments, and schools were not damaged by flooding or rainwater, typically had minor problems due to power surges that occurred during the storm, and were thus able to be salvaged.**

Immediately after Katrina struck, EPA and MDEQ began working with the Mississippi Forestry Commission and the United States Department of Agriculture to determine how to use as much as possible of the 3.1 billion cubic feet of downed timber for energy recovery or for building materials. Two weeks after Hurricane Katrina made landfall on the Gulf Coast, MDEQ, with EPA assistance, established an Interim Permitting Process for Wet Decking operations to salvage timber for building materials. "Wet Decking" is the process by which logging operations stage harvested timber (typically White Pines or similar trees) and continually spray water on the timber to prevent the timber from drying out and becoming unusable for lumber. Wet Decking requires a Clean Water Act National Pollution Discharge Elimination System (NPDES) permit because rainfall can cause runoff from the trees into surface waters, which can harm fish and aquatic plants. The Interim Wet Decking Permitting Process shortens the lengthy NPDES permitting process while requiring operators to comply with the requirements of the Clean Water Act itself. By allowing for the creation of interim Wet Decking facilities, MDEQ hopes to salvage millions of cubic feet of timber that otherwise would deteriorate before it could be processed into lumber or other wood products.

On December 6 and 7, 2005, EPA Region 4 sponsored a conference in Jackson, Mississippi, with MDEQ and other public and private entities to develop a plan to encourage bio-energy activities utilizing vegetative debris from Katrina. The conferees also discussed hurdles, such as air permitting, transportation, and technical issues, that must be resolved before the vegetative debris can be used for fuel. The next step is for EPA to issue a report proposing the most practical approach to this particular problem, while MDEQ explores the feasibility of both constructing a co-generation facility to burn the vegetative debris and processing some components of the vegetative debris matrix into wood chips to sell in other parts of the country.

<u>4. Conclusion.</u> The clean-up from Hurricane Katrina is one of the largest environmental response activities ever undertaken by federal, state, and local governments. The sheer size of the area impacted – over 90,000 square miles – and the various environmental challenges caused by the storm have required a significant commitment of EPA staff and contractor resources. However, from the day after Hurricane Katrina struck EPA recognized that there was an opportunity to recover, recycle, or reuse resources seemingly lost in the storm. EPA has maintained that focus while assisting FEMA and the COE in their important missions to re-establish basic utilities infrastructure, clear debris, and return life to normal on the Gulf Coast. The Agency continues to work closely with the State of Mississippi, local governments, FEMA, the Corps of Engineers, the Coast Guard, and other federal agencies to try and resolve the difficult issues facing Mississippi as it recovers from Hurricane Katrina.