

# **Management of Hazardous Wastes during EPA's Emergency Response to Hurricanes Katrina and Rita**

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## **INTRODUCTION**

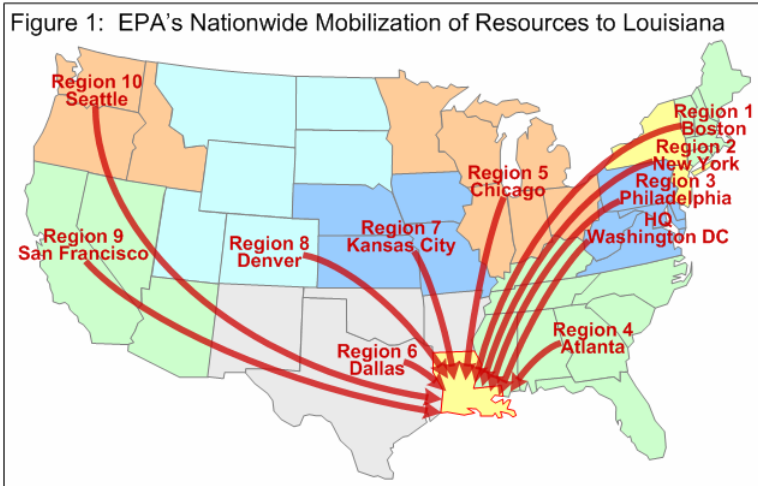
When Hurricane Katrina made landfall on the Louisiana coast on August 29, 2005, followed 26 days later by Hurricane Rita on September 24, it caused the worst natural disaster in U.S. history. Large portions of 36 Louisiana parishes, encompassing 30,855 square miles (including the 350 square mile Greater New Orleans area) were inundated by 120+ mph winds, 30 foot storm surges, and flooding up to 15 feet in depth.

This has resulted in arguably the largest hazardous waste management project in U.S. history. Preliminary assessments estimated 22 million tons of debris; 200,000 homes requiring demolition; 350,000 abandoned automobiles with associated oils, fluids, and tires; 1 million tons of abandoned white goods; 1,000 damaged underground storage tanks (USTs); and 60,000 abandoned/damaged boats in Louisiana. Hazardous wastes potentially contaminated dozens of petrochemical refineries; hundreds of light industrial facilities; thousands of retail buildings; hundreds of schools; an estimated 500,000 homes; 24 Superfund sites; and 8,277 square miles of marshes, wetlands, islands, lakes, and canals.

Due to the sheer size of the damaged areas and the numbers of businesses and homes affected, more than 70 Federal, State, and local government agencies became involved in response and recovery efforts. This created numerous command, control, communication, and coordination issues that had to be resolved quickly to expedite the provision of critically needed supplies and services. Extensive damage to regional infrastructure systems (e.g., power, roads, fuel distribution, potable water, food, housing, communication) posed severe logistical obstacles that further complicated this massive hazardous waste management project.

## **EPA's Response Structure**

The Federal Emergency Management Agency (FEMA) is responsible for implementing the National Response Plan (NRP) in response to Hurricanes Katrina and Rita. The NRP includes 15 Emergency Support Functions (ESFs). The US Environmental Protection Agency (EPA) was assigned the lead role for implementing ESF #10: Oil and Hazardous Materials Response and a major support role for ESF #3: Public Works and Engineering led by the US Army Corps of Engineers (USACE). EPA formed a Unified Command with the US Coast Guard (USCG) and the Louisiana Dept. of Environmental Quality (LDEQ), the two agencies with major support roles in the implementation of ESF #10. All response and recovery efforts associated with oil and hazardous materials are coordinated by this Unified Command. EPA mobilized technical and managerial personnel, as well as On-Scene Coordinators (OSCs) to support the Unified Command from its nationwide resources, as shown on the following page in **Figure 1**.



The Unified Command organized its Louisiana response efforts into 3 geographical regions: East, Central, and West Branches, dividing the 36-parish, 30,855 square mile region into 3 roughly equal areas. Division Leaders were assigned to direct hazardous waste management activities in each parish. Functional areas of responsibility were organized as Environmental Assessment, Emergency Response and Removal, Logistics, Planning, Public Information, etc.

EPA's Emergency and Rapid Response Services (ERRS) contractors have played a major role in the location, characterization, segregation, transportation, and disposal of enormous volumes of hazardous wastes in the aftermath of hurricanes Katrina and Rita. As a Region 6 ERRS prime contractor, Environmental Quality Management (EQ) has provided more than 700 skilled personnel and specialized equipment in support of these tasks under uniquely difficult conditions. In addition, EPA Superfund Technical Assessment and Response Team (START) contractors and USCG Basic Order Agreement (BOA) spill response contractors supported the Unified Command to implement its many responsibilities.

EQ responded with 60 personnel, vehicles, and small-to-medium-sized boats within 24 hours of EPA's order to mobilize, and an additional 40 employees during the second 24 hour period. The EQ and EPA hazardous waste staff joined fire fighters, police, and other first responders and rescued nearly 800 people in Louisiana during the first 2 weeks following Katrina.

## Approach to Managing Hazardous Wastes

Of the 36 parishes designated by LDEQ as "Emergency Areas," the Unified Command focused its efforts primarily in 14 parishes with the most storm damage and populations centers, shown on the following page in **Figure 2**. Building-by-building, block-by-block, neighborhood-by-neighborhood, wetland-by-wetland, our *Response/Removal Teams* inspected each area and identified, characterized, collected, and transported hazardous waste items to central collection areas. *Abandoned/Orphaned Explosives Teams* focused on finding and collecting firearms, ammunition, and other explosive wastes. *School Assessment Teams* inspected 562 schools and associated chemistry and biology laboratories, removing hazardous and reactive chemicals from 116 of them. Hazardous waste teams wore Levels B, C, or D personal protective equipment (PPE), depending upon the hazard anticipated.



Figure 3: Hazardous Waste Collection Centers

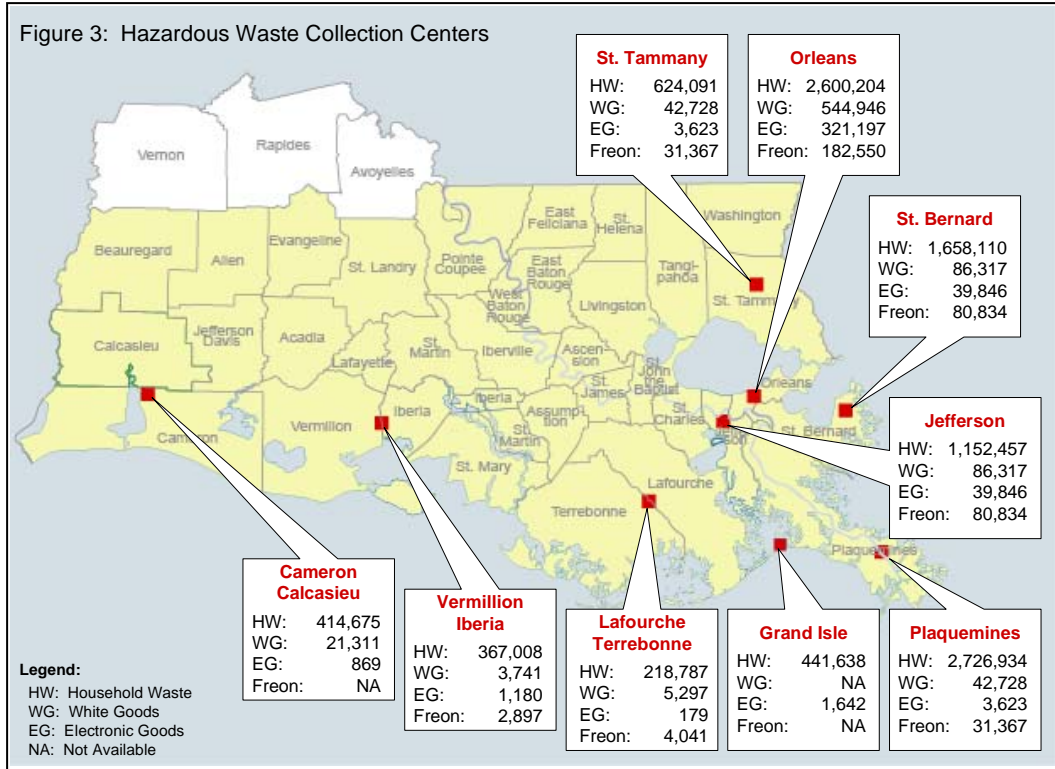
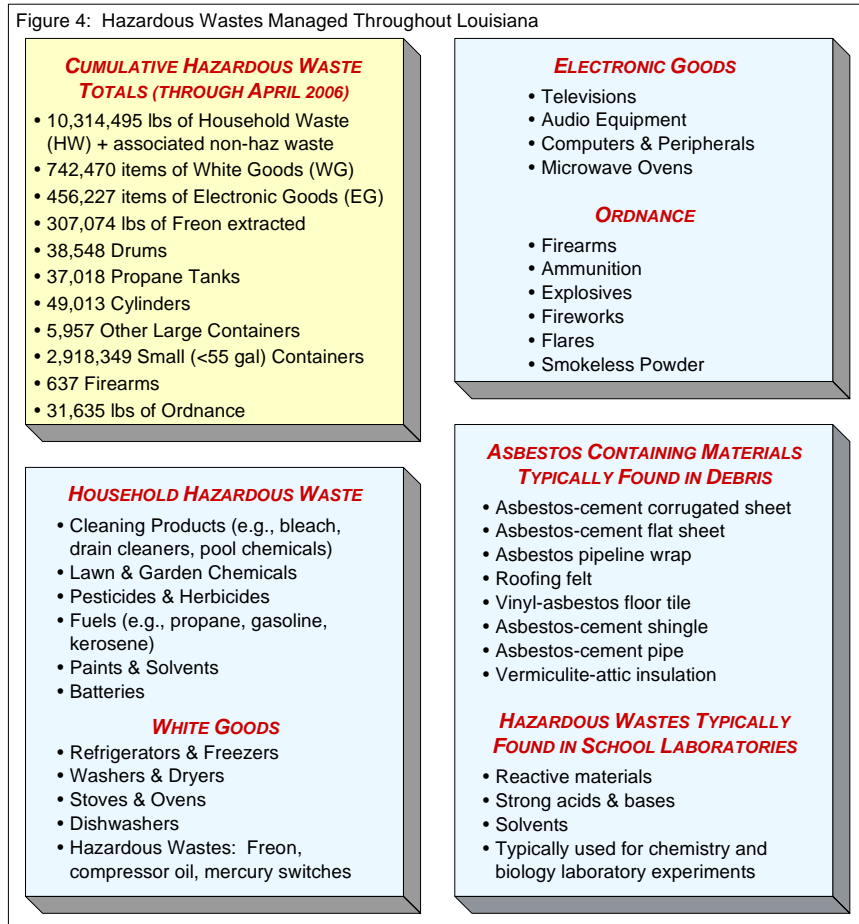


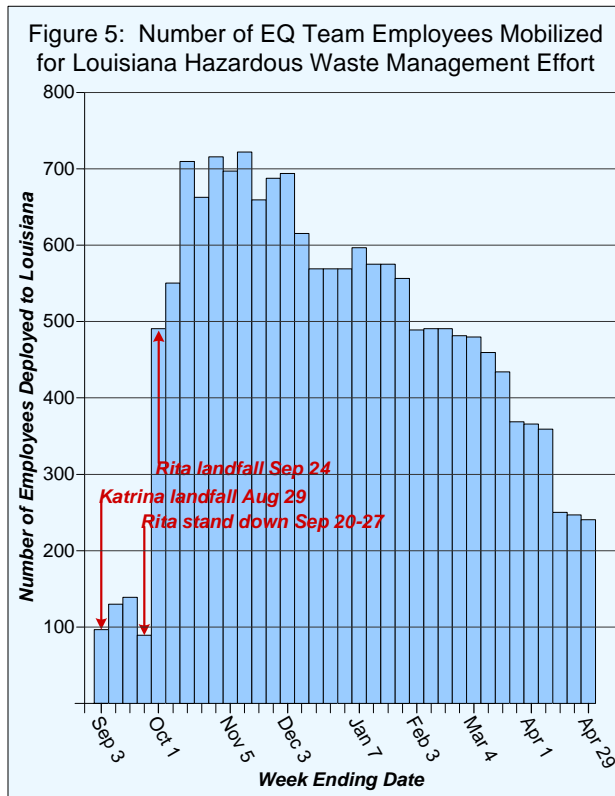
Figure 4: Hazardous Wastes Managed Throughout Louisiana



## Unique Logistical Challenges

### Hiring, Training, Providing Subsistence for 700+ Staff:

With the severe infrastructure damage and widespread displacement of people in Louisiana, it was extremely difficult to find, hire, train, feed, and shelter the 700+ workers that EQ mobilized to perform hazardous waste management activities, as shown below in **Figure 5**. No hotels or restaurants were functioning during the first 6 weeks of work. Several unique methods of hiring, training, and providing subsistence for our workforce will be presented at the conference.



### Finding Vendors for Supplies and Services:

Fuel was in critically short supply during the first several weeks of work, as were vendors such as hazardous waste transporters, certified landfills, etc. Several innovative methods to provide and/or procure these supplies and services will be presented at the conference.

### Communication and Coordination with Multiple Agencies:

Cellular and landline telephone service was not functional for several weeks following the hurricanes, requiring the use of satellite, shortwave, and citizens band radio communications until widespread cellular phone service was restored. Coordination of hundreds of contractor and government workers, contracted by dozens of agencies, and interface with hundreds of thousands of displaced citizens required effective and expedited command and control procedures. These will be described in detail at the conference.

## **SUMMARY**

Hurricanes Katrina and Rita caused widespread release and abandonment of hazardous materials from homes, businesses, vehicles, boats, etc. across 30,000 square miles of urban, suburban, industrial, highly isolated rural, and marsh/wetlands areas. EPA, LDEQ, USCG, and EPA ERRS contractors collected, processed, and disposed or recycled millions of pounds of hazardous waste, amidst massive damage to basic infrastructure (e.g., power, roads, potable water, housing, communications) and severe shortages of critical resources (e.g., workers, waste transporters, certified waste disposal and recycling facilities). Many of the innovative methods to overcome logistical, regulatory, and management obstacles described herein will provide valuable “lessons learned” for planners of future disaster response efforts.

## **ACKNOWLEDGEMENTS**

We acknowledge the invaluable assistance of numerous employees of EPA Region 6, Louisiana Dept. of Environmental Quality, and the Unified Command headquartered in New Orleans, LA in the compilation of data included in this abstract and the conference presentation.

## **REFERENCES**

Some of the data presented in this abstract and the conference presentation are available from various EPA Region 6 (<http://www.epa.gov/earth1r6/katrina/index.htm>) and LDEQ (<http://www.deq.louisiana.gov/portal/>) websites.