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SUBMITTED TO THE
U. S. HOUSE COMMITTEE ON HOMELAND SECURITY
HEARING ENTITLED
“PROTECTING THE PROTECTORS: 1ST RESPONDER HEALTH ISSUES IN THE
WAKE OF CATASTROPHIC EVENTS”

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I. INTRODUCTION

The Louisiana Department of Environmental Quality (LDEQ) appears before the United States House Committee on Homeland Security to provide testimony regarding response actions taken in the aftermath of Hurricanes Katrina and Rita to protect public health, safety, and welfare, and the environment, with emphasis on measures taken to protect emergency responders and affected public.

The testimony below will briefly describe the devastation caused by these hurricanes and provide a summary of the response actions taken by the LDEQ working in coordination with its federal, state, and local government partners to protect the public health, safety, and welfare, and the environment.

All exhibits referenced in this written testimony may be found at www.deq.louisiana.gov.

II. BACKGROUND

A. Hurricane Katrina

On August 29, 2005, Hurricane Katrina struck the Louisiana gulf coast, causing widespread damage within 25 parishes. Hurricane Katrina has proven itself to be the largest and most costly disaster to date in American history.

B. Hurricane Rita

On September 23 and 24, 2005, Hurricane Rita struck Louisiana, causing widespread damage to an additional ten parishes in the southwest portion of the state, and in addition causing further damage within a number of the same parishes devastated by Hurricane Katrina, notably the City of New Orleans, and Jefferson, Plaquemines, St. Bernard, and St. Tammany Parishes.

C. Impacts

The devastation caused on the Louisiana-Mississippi Gulf Coast by Hurricanes Katrina and Rita in August and September of 2005 cannot be adequately described in words. Statistics are useful but do not convey the experience of living through the violence of the storms and then, for survivors, the revelations of the aftermath. Many people's feelings mirrored the devastation of the natural and manmade environment around them—an environment ravaged by wind and water. More than 1,400 Louisiana residents lost their lives due to Hurricane Katrina, its approach caused the first mandatory evacuation in New Orleans' history, and it caused 1.3 million persons to leave their homes in south Louisiana. More than 200,000 Louisiana residents are still displaced.

In addition to the wind and storm surge damages normally accompanying hurricanes, overtopping of levees and failures of floodwalls resulted in rapid and extensive flooding of metropolitan New Orleans. Floodwaters from the two hurricanes filled the low lying areas of the metro area to depths in excess of 12 feet, resulting in about 80 percent of New Orleans being submerged for almost a month. While the damage done by the floodwaters to surface structures was extensive, the weight and salinity of the floodwaters also caused considerable damage to the city's infrastructure, including hundreds of miles of underground utilities—electric, gas, water, sewer, drainage, cable, and phone lines

Altogether, these storms combined to generate over 62 million cubic yards of debris. Given that an average dump truck can haul 40 cubic yards of debris, the cleanup of the storm debris will ultimately require more than 1.5 million truckloads.

D. Government Response to the Hurricanes

Preceding landfall of Hurricanes Katrina and Rita, Louisiana Governor Kathleen Babineaux Blanco issued declarations of emergency on August 26 and September 20, 2005, respectively, due to the imminent threat of high winds, torrential rain, flooding, damage to private and public property, and risk to the safety and security of the citizens of Louisiana. In the aftermath of each hurricane, the Governor extended the state of

emergency due to the extreme damage caused and the continuing disaster and emergency conditions in the affected areas.

The federal government responded similarly, with presidential and FEMA declarations of emergency. On August 29, 2005, in response to Hurricane Katrina, FEMA issued a Disaster Declaration covering south Louisiana. On September 21, 2005, the President of the United States declared that an emergency existed in Louisiana and authorized FEMA to mobilize and provide equipment and resources necessary to alleviate its impacts in response to Hurricane Rita.

E. LDEQ Emergency Response Activities

Consistent with the National Response Plan and the National Incident Management System, Louisiana's Office of Homeland Security and Emergency Preparedness (now the Governor's Office of Homeland Security and Emergency Preparedness) has a detailed Emergency Operations Plan. In this plan, LDEQ's responsibilities are contained primarily in Environmental Support Function 10 (ESF-10) – Oil Spill, Hazardous Materials and Radiation. LDEQ plays a support role in oil spills, but provides personnel and resources in the oversight of spill mitigation. LDEQ plays a support role in hazardous materials management. The Louisiana State Police has primary responsibility in this function during the emergency phase; however, LDEQ is responsible for the collection, removal, waste classification, transportation, and disposal of the hazardous disaster debris and wastes. LDEQ has primary responsibility for managing radiation issues.

LDEQ began assembling an Incident Management Team (IMT) at the LDEQ Headquarters immediately following Katrina's landfall. A Unified Command Center (UCC) was established to house and support the IMT. In addition to LDEQ, the UCC contained representatives from the United States Environmental Protection Agency (EPA), Texas Commission on Environmental Quality, US Army Corps of Engineers (Corps), US Coast Guard, National Oceanic and Atmospheric Agency, US Geological Survey (USGS), Louisiana Oil Spill Coordinators Office, Louisiana Department of Health and Hospitals (LDHH) and local governments. These representatives coordinated emergency response, hazard assessment, and environmental sampling and planning activities (**Exhibit 1**).

Even though LDEQ's responsibilities under Louisiana's Emergency Operations Plan are limited primarily to ESF-10, the Department conducted many activities as described below that yielded critical information to assist and protect first responders. This information was provided through the Unified Command Center.

- **Search and rescue** - Teaming with the Louisiana Sheriff's Association, LDEQ employees aided in the rescue of approximately 480 people from the area impacted by Hurricane Katrina.

- **Environmental threats assessment** – LDEQ and its partners utilized aerial reconnaissance to assess the damage caused by the storm. This included flyovers of industrial sites, oil spills, wastewater treatment plants, rail cars, barges, radioactive materials locations (**Exhibit 2**), drinking water sources and intakes, underground storage tanks, ruptured pipelines, superfund sites, access routes and photo documentation. Aerial photography was used to provide an initial evaluation of the status of industrial sites, water and wastewater treatment plants, rail cars, ships, barges, radioactive material locations, National Priority List (Superfund) sites, and known hazardous materials sites. In addition to high resolution aerial photography and satellite imagery, also utilized were the EPA ASPECT aircraft, the Department of Energy's airborne radiation detectors and a helicopter mounted infrared gas imaging HAWK camera. The HAWK was especially useful for identifying a propane leak at Conoco-Phillips, Inc., in Belle Chase near New Orleans (**Exhibit 3**). Hazards such as oil spills and gas releases were also photo documented and potential access routes were evaluated to assist first responders and for follow-up ground assessments. EPA used two of its Trace Atmospheric Gas Analyzer (TAGA) buses to sample the air quality in the New Orleans area on September 12, 2005. TAGA is a self-contained mobile laboratory capable of continuous, real-time sampling and analysis. It can detect chemicals in the low parts per billion levels of outdoor air or emissions from various environmental sources. The samples were analyzed for volatile priority pollutants such as benzene, toluene, and xylene, which are commonly found in gasoline, as well as other industrial solvents.
- **Accessibility** - As facilities and sites became accessible, ground assessments were made of all potential sources and known releases of hazardous materials. Drinking water sources were evaluated for contamination and the operational status of water and wastewater treatment plants were determined. In many cases multiple visits to sites were made in order to ascertain that potential hazards had been secured. For example, 383 visits were made to 258 radiation source licensees in order to verify that all of the radiation sources had been secured. To date, more than 6,000 damage assessments have been made.
- **Environmental Sampling and Assessment** – LDEQ, EPA and other partners collected thousands of environmental samples including floodwaters; waters of Lake Pontchartrain, adjacent coastal areas, and the Mississippi River; sediment and soils; seafood; and air quality. More than a million individual analyses were performed and data and health risk assessments presented to the public on EPA and LDEQ's websites, through press releases, press conferences, presentations, media interviews and radio call-in shows.
- **Hazardous Materials Management** – With valuable assistance and resources provided by EPA, more than 22.4 million of pounds of hazardous materials were

collected and removed from waste streams for proper treatment and disposal. More than a million white goods (refrigerator/freezers, ovens, washer/dryers, etc.) 956,000 electronic goods and 250,000 small engines were collected and sent to be recycled. More than 4 million orphan containers – many containing hazardous materials - were collected and processed for recycling or disposal. Over 110 school laboratories were cleared of hazardous materials.

The LDEQ also provided assistance in other assigned areas such as ESF-11, Agriculture, in the disposal of animal carcasses, and ESF-13, Public Safety and Security, by providing security for its own first responders during search and rescue activities. The LDEQ also incorporated the management and disposal of unwanted ammunition, firearms and explosives as part of the ESF-10 debris mission; these were not handled by law enforcement.

F. Emergency Response Activities – Health and Safety Plan (HASP) for Hurricane Katrina Response & Recovery

The HASP outlined the basic safety & health requirements for federal workers and contractors involved in response and recovery operations related to Hurricanes Katrina and Rita. HASP provides overarching requirements and sets a baseline for worker safety & health protection. Individual agencies and contractors were responsible for developing HASPs specific to their operation for the protection of their own employees **(Exhibit 4)**.

HASP was developed using basic risk management principles to provide for the greatest level of protection for the greatest number of workers at risk. Specific operations or locations that contain actual or potential hazards not considered in the basic plan may require greater levels of protection. It was incumbent on each agency or contractor to have a competent person to conduct a job hazard analysis prior to commencing work.

HASP follows the basic principles outlined in the Occupational Safety and Health Administration's (OSHA) Safety & Health Program Management Voluntary Guidelines, which are as follows:

- Management commitment and employee involvement
- Worksite analysis
- Hazard prevention and control
- Safety & health training

HASP also addressed the tasks identified in the Worker Safety and Health Support Annex to the National Response Plan.

Because of the many hazards facing response and recovery workers in previously flooded areas, Interim Safety and Health Precautions (**Exhibit 5**) were distributed along with daily safety-grams (**Exhibit 6**).

G. Environmental Sampling Plan

It is important to recognize that the basic premise of both the National Response Plan and the National Incident Management System is that incidents are generally handled at the lowest jurisdictional level possible. However, when both local and state resources and capabilities are overwhelmed, states may request federal assistance. Given the circumstances following Hurricanes Katrina and Rita, LDEQ requested assistance from the EPA to help with several tasks related to management and disposition of hazardous materials and with environmental sampling and assessment.

EPA and LDEQ, along with other federal and state agencies, coordinated to gather environmental samples, analyzed these samples, interpreted the results, and communicated the results to the public. Much of the sampling done was specifically tailored to address the concerns of local governments and the public in the areas affected by the hurricanes, as follows:

- A comprehensive investigation addressed the soils and sediments of the parishes that flooded; samples were analyzed for over 200 metals and organic chemicals. The study concluded there was no cause to anticipate any adverse health impacts to individuals, including children.
- Non-scientific catch phrases such as “toxic soup” and “toxic gumbo” used to describe flood waters in the impacted area raised public concern. The LDEQ and EPA conducted extensive sampling and determined that while the waters were unsanitary, they were not toxic and presented no long-term health hazard. The agencies then issued a joint press release communicating to the public the analytical results and their conclusions.
- Fears about the safety of flood waters and Lake Pontchartrain led to fears about the safety of consuming seafood. Finfish and shellfish were sampled in Lake Pontchartrain, and in offshore and near shore gulf waters to confirm that seafood was safe to eat and no advisory against seafood consumption was warranted.
- Air sampling began immediately after Katrina and continued through November 13, 2005. Elevated concentrations of benzene were detected in the area affected by the release from Murphy Oil (Chalmette) shortly after Katrina; however, subsequent sampling showed results below screening levels. Particulate sampling (Orleans and St. Bernard parishes) and air toxics (Kenner) found concentrations well below any level that would raise health concerns.

H. Environmental Sampling - Results

1. Soil/Sediment

Beginning in September 2005, LDEQ and the EPA along with other federal and state partners conducted a comprehensive investigation to characterize any potential environmental effects to the parishes that were flooded by water from Lake Pontchartrain and the Mississippi River Gulf Outlet (MRGO). Since early September 2005, the agencies have collected approximately 2,000 sediment and soil samples in Jefferson, Orleans, Plaquemines, and St. Bernard parishes in four discrete phases. Samples were analyzed for more than 200 pollutants such as volatile organic compounds, semi-volatile organic compounds, total metals, pesticides and petroleum hydrocarbons. The overall chemistry of soils and sediments post-Katrina had changed little from pre-Katrina conditions and levels of contaminants were similar to other older urban centers around the country.

As each phase of sampling was completed, the results were compared to conservative health-based screening levels for residential exposure developed by EPA and LDEQ. On Dec. 9, 2005, summaries and general assessments of the data were developed by LDEQ and EPA with input from the Centers for Disease Control (CDC), the Agency for Toxic Substances and Disease Registry (ATSDR), LDHH and FEMA (**Exhibit 7**).

The sample results indicate that the sediments left behind by the flooding from the hurricanes are not expected to cause any adverse health impacts to individuals, including children. A few localized areas were re-assessed due to elevated levels of arsenic, lead, benzo(a)pyrene, and diesel oil range organic petroleum chemicals. The results of these re-assessments indicated that: 1) the highest concentrations of arsenic were likely associated with herbicides used at or near golf courses; 2) benzo(a)pyrene was found in a 1-acre section of the Agriculture Street Landfill Superfund site and will be addressed as the Housing Authority of New Orleans finalizes plans for badly damaged town homes in the area; 3) diesel and oil range organic chemicals diminished over time and are now below residential levels; and 4) the elevated levels of lead detected in samples collected by EPA are not the result of the hurricane. The lead results obtained by EPA are comparable to the historical concentrations of lead in New Orleans soil found in studies conducted by local university researchers before the hurricanes.

2. Surface water

LDEQ worked with EPA, USGS, the Louisiana Department of Agriculture and Forestry (LDAF), and the Lake Pontchartrain Basin Foundation to monitor the quality of flood and surface waters in the Hurricane Katrina impact area. From September 2005 through March 2006, a total of 62,989 quality control and sample results have been produced, recorded and evaluated for Hurricane Katrina. This represents 497 sampling events

from 64 sites sampled. Results for organic compounds and metals were mostly non-detect.

Of the more than 40,000 results for organic compounds analyzed, only two exceeded non-drinking water human health criteria. Of the approximately 1,984 analytical results for metals, only 3 exceeded chronic aquatic life standards. Most impacts observed were a result of the hurricane and not a result of the pump down of floodwaters into Lake Pontchartrain. The quantity of floodwaters pumped from the New Orleans area into Lake Pontchartrain was estimated to be less than 5 percent of the lake's volume. The analytical data clearly shows that Lake Pontchartrain's water quality was largely unaffected by the pumping of floodwaters from New Orleans.

Overall, more than 6,200 water samples were analyzed for nearly 200 chemical constituents. It was determined that the floodwaters were unsanitary because of raw untreated sewage. However, there was no "toxic soup," a phrase that was inaccurately reported during the aftermath of Hurricane Katrina.

Total water samples

Katrina:	Floodwater	694 samples
	Lake Pontchartrain	3,452 samples
	Mississippi River Intakes	90 samples
	Groundwater samples	73 samples
	Remaining water samples	434 samples
Rita:	Water Samples	1,415 samples

3. Biota

Along with initial concerns about the health of Lake Pontchartrain came fears regarding the quality of the seafood found there. The results of sampling of flood waters and ambient Lake Pontchartrain waters helped mitigate these fears, revealing no chemicals above levels of concern. However, with added prudence, the LDEQ and the United States Food and Drug Administration (USFDA) embarked upon a five-week effort to sample and analyze tissues from commercially and recreationally important finfish and shellfish species. The USFDA laboratories analyzed 416 tissue samples for a wide variety of chemicals. The results confirmed that the seafood in Lake Pontchartrain is healthy and edible.

The analytical data showed that no advisory against seafood consumption was warranted. As an added precaution, fish and shellfish tissue will be sampled over the next few years to confirm the absence of chemical contamination in Lake Pontchartrain seafood. In addition, the EPA and NOAA Fisheries have conducted offshore and near shore fish and shellfish tissue sampling in the Gulf of Mexico and found no

contaminants at levels of concern. This is an important issue in the recovery of Louisiana, demonstrating and supporting the safety of the seafood, and therefore the viability of the seafood industry, as the seafood industry infrastructure (fishing vessels, docks, ice houses, processors, and restaurants) struggles to overcome the physical impacts of Hurricane Katrina.

4. Air

In order to evaluate air quality while pre-Katrina air monitoring stations were being re-established, LDEQ collected twenty-three grab air sample canisters in the Katrina affected area. All samples were analyzed for a total of 59 target volatile organic analytes. In addition, a Photochemical Assessment Monitoring Stations (PAMS) hydrocarbon analysis was performed to quantify total non-methane hydrocarbons and identify 56 common hydrocarbon species. The majority of the grab samples had reported volatile organic compound (VOC) concentrations at or slightly above normal ambient background levels. All of the detected VOC concentrations were well below the Louisiana ambient air standards and the ATSDR Minimal Risk Levels (MRL).

EPA conducted air sampling in New Orleans and the surrounding areas following Katrina. The EPA TAGA results indicated that there were elevated concentrations of benzene in the area affected by the release from Murphy Oil (Chalmette) shortly after the storm. Subsequent air sampling in this region indicates that benzene concentrations have decreased and are now below screening levels. Sampling in other areas indicated that the chemical concentrations present in the air were below ATSDR screening levels. EPA also collected several sets/rounds of total particulate samples in Orleans and St. Bernard parishes. This data indicates that the particulate concentrations were well below the level of health concern for Particulate Matter (PM 10).

In November 2005, LDEQ prepared a report on air toxics based upon data collected from the established Kenner air monitoring site. A total of 47 samples were collected and analyzed on the 24-hour sampler between September 11, 2005 and November 13, 2005. The most abundant compounds found in these samples were propane, ethane, acetone, isopentane, toluene and n-butane. All of these compounds were detected within the normal concentration range for an urban area. The general profile of compounds detected was very typical of an area dominated by mobile source emissions. The total hydrocarbon reading averaged 147 ppbC (parts per billion carbon) which is slightly below the normal range for an urban area. None of the average concentrations for any of the targeted VOCs were above the annual average Louisiana Ambient Air Standards, nor were any of the individual sample concentrations above the 8 hour ambient air standards.

Overall, more than 12,500 air samples were taken. All concentrations of the toxic air pollutants were below EPA's one-year screening levels and below the Louisiana toxic air pollutant standards.

I. Environmental Sampling - Reporting of results to the public

EPA worked with OSHA and the Department of Health and Human Services to disseminate health advisory information to field responders. These advisories provided guidance on the proper health and safety measures that should be taken to address any potential areas of concern (**Exhibit 8a**).

LDEQ and EPA worked in a joint effort, in the same office which was manned nearly 24 hours a day, to develop protocols and get information out as quickly as possible. Information on health risks was provided through press releases, media interviews, flyers and presentations to various groups shortly after Katrina made landfall, and before people were allowed to return to many areas of the devastated city.

On Sept. 2, a press release was sent out and media told about the sampling results of a smoke plume resulting from a fire at a warehouse (**Exhibit 8b**). Press releases were sent on Sept. 9 concerning possible fish kills and vegetative effects of Katrina (**Exhibit 8c**). On Sept. 9, the first household hazardous waste pickup site was announced in a press release (**Exhibit 8d**). On Sept. 9, the first press release to give details on floodwater sampling was released (**Exhibit 8e**). On Sept. 12 more floodwater data was released (**Exhibit 8f**) and was followed by air sampling results on Sept. 13 (**Exhibit 8g**) and sediment sampling results on Sept. 16 (**Exhibit 8h**).

Barely two weeks after the storm, before people were allowed to return to some areas, LDEQ and EPA had issued several press releases and given numerous media interviews on the sampling efforts and the effects of the storm to southeast Louisiana. People who stayed in the impacted area were warned not to drink the floodwater and to minimize contact with the unsanitary water. Also, people were told that proper hygiene was the best way to prevent any health issues that could be related to contact to floodwaters (**Exhibit 8i**).

On Sept. 15, EPA, LDEQ and other state and federal agencies made information available warning those who were returning to the area of the dangers of broken gas lines, mold, asbestos and household hazardous waste.

As for providing generic information for those returning to the area, on Sept. 16, with the help from the Department of Health and Hospitals, brochures were posted on the LDEQ web site and a press release sent to national media concerning mold, food and water and what people could expect and what they should do when they return to a flooded home/area.

As the record demonstrates, information was provided to the national media, posted on web sites, and more than 3.8 million flyers were distributed by EPA, LDEQ and many others to provide people with information they needed on a variety of topics. This information was being provided before people were allowed to return home.

J. Environmental Sampling - Results by Zip Code on Web Site

On February 15, 2006, LDEQ posted sediment sampling points and results from the New Orleans area on its Web site, www.deq.louisiana.gov. At that time, LDEQ and EPA jointly collected nearly 1,000 sediment samples following Hurricanes Katrina and Rita (**Exhibit 9a**). The maps and summaries of the results were made available by clicking a particular zip code (**Exhibit 9b**).

The zip code files contained three categories of information – a regional map, a zip-code map and a written environmental assessment summary of the zip code (**Exhibit 9 c & 9d**).

None of the sediment data showed any short-term health risks. EPA and LDEQ's goal throughout the sampling effort was to ensure that levels in residential areas meet residential standards. LDEQ developed these comprehensive maps and summaries to provide accurate environmental information to people returning to or visiting the New Orleans area.

K. Environmental Sampling – Bureau of National Affairs article touts joint sampling effort in Nov. 6, 2006 report

In the wake of Hurricane Katrina in August 2005, concerns over a potential “toxic gumbo” in New Orleans and concerns for public safety were paramount for state and federal agencies. These concerns were evidenced by the unprecedented nature of the investigation of residential floodwater sediment contamination. Looking at the EPA's residential sediment and soil sampling results, the article's authors attempted to place these results in the appropriate scientific context, to provide some preliminary suggestions concerning the lessons learned, and to examine policy issues that arose in this situation and that may arise in a future disaster. The authors believe the compressed risk management approach used by EPA may be useful in other large scale contamination events (**Exhibit 10**).

III. CONCLUSION

In closing, LDEQ would like to note that, at the request of the Senate Committee on Environment and Public works, LDEQ put together a report entitled, “Some Observations and Recommendations for Those Planning for and Responding to Environmental Challenges Presented by Major Disasters”. This report (**Exhibit 11**) addresses issues relevant to this hearing and is a good source for lessons learned in responding to Hurricanes Katrina and Rita.