DEPARTMENT OF HEALTH & HUMAN SERVICES

EXHIBIT 24

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta, GA 30341-3724

AUG 2 2006

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Ms. Patrice Simms
Senior Project Attorney
Natural Resources Defense Council
1200 New York Avenue, NW, Suite 400
Washington, DC 20005

Dear Ms. Simms:

Thank you for your letter dated May 4, 2006, expressing concerns about chemicals and contaminants potentially present in the sediment and soil of New Orleans, Louisiana. I apologize for my delayed response.

You mentioned concerns about what you perceive to be a lack of formal analysis and assessment of the risks posed by chemicals including arsenic, lead, polycyclic aromatic hydrocarbons, and petroleum hydrocarbons. In addition, you asked nine specific questions. Our responses to your concerns and questions are in the enclosure to this letter. Please note that we used all of the current information at our disposal, specifically the sampling results from Phase I, II, III, and IV, to develop our responses to your concerns.

Because so many of your questions relate to how the potential health hazards are being evaluated, we have provided a brief summary of how the Agency for Toxic Substances and Disease Registry (ATSDR) conducts reviews of environmental data. The summary is located in the enclosure after our responses to your questions. A more detailed description of the ATSDR review process can be found in our *Public Health Assessment Guidance Manual (Update),* January 2005 (http://www.atsdr.cdc.gov/HAC/PHAManual/). If you or anyone associated with the Natural Resources Defense Council (NRDC) would like to attend our next training course on how to conduct public health assessments, please let me know. Typically, the Public Health Assessment Training Course is given in the spring/summer each year.

As we point out in our attached responses, even though a formal risk assessment or public health assessment document has not been prepared, the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) believes that the appropriate science, science policies, and decision-making tools were used and are being used to assess and manage or interrupt hurricane-related exposures to response workers and returning residents. Although situation-specific information was not available

for individual areas of New Orleans, the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/Corrective Action Plan (RECAP) and US Environmental Protection Agency (EPA) soil screening values were sufficiently conservative to protect not only healthy workers and residents, but those who may be more vulnerable to environmental insults such as the very young, the very old, and persons with pre-existing health conditions.

Because the appropriate health and environmental regulatory agencies are conducting appropriate intervention activities, we believe that there are no unacceptable long-term health risks directly attributable to Hurricanes Katrina and Rita. However, considerable work remains to be done to address larger environmental health issues that face not only New Orleans, but other communities. I can assure you that CDC/ATSDR is committed to working with all stakeholders, including NRDC, to build and maintain urban communities that protect, enhance, and promote health and safety and prevent illness in all their members.

Thank you for the NRDC's continued interest in ensuring that the residents of New Orleans have a safe and healthy environment I am keeping Dr. Howard Frumkin updated on our discussions and he is available if you wish to discuss these issues further.

Please feel free to contact me at (404) 498-0004 or via email at ths2@cdc.gov if you wish to talk again or need additional information.

Sincerely,

William Cibulas, Jr.

for Thomas H. Sinks, Ph.D.
Deputy Director
National Center for Environmental
Health/Agency for Toxic Substances
and Disease Registry

Enclosure

cc:
Sam Coleman, EPA
Richard E. Greene, EPA
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Mike D. McDaniel, LDEQ
Mike Allred, CDC
Howard Frumkin, NCEH/ATSDR/OD
Sven Rodenbeck, ATSDR/CAPEB

ATTACHMENT

NRDC Specific Questions Regarding Post-flood Contamination in New Orleans Area Soil and Sediment

Question: Have the agencies concluded that the arsenic levels in soil and sediment were the same prior to the flooding as after the flooding? If so, on the basis of what data have they made that determination?

Response: The Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) believes that arsenic levels detected in soil and deposited sediments are similar to those found prior to Hurricanes Katrina and Rita. This conclusion is based on a review of published ranges of arsenic concentrations in soil for the New Orleans area and the results of the Phase I, II, III, and IV US Environmental Protection Agency/Louisiana Department of Environmental Quality (EPA/LDEQ) sampling program (almost 1,800 samples) that have been collected thus far from the New Orleans area. Studies by Dr. Howard Mielke of Xavier University indicate that arsenic concentrations in New Orleans prior to the hurricanes were as high as 20 milligrams of arsenic per kilogram of soil (mg/kg) (Mielke, H.W., G. Wang, C.R. Gonzales, B. Lee, V. Quach, and P.W. Mielke. 2001. PAH and Metal Mixtures in New Orleans Soils and Sediments. The Science of the Total Environment 281(1-3): 217-227). Average background concentrations of arsenic in soil for Louisiana are 12 mg/kg (Louisiana State University Cooperative Extension Service Background Total Metal Concentrations in Louisiana Surface Soils. 1990). The average arsenic concentration detected in New Orleans soil and sediment after the hurricanes was about 12 mg/kg.

The EPA/LDEQ sampling efforts identified localized areas in New Orleans where arsenic concentrations were greater than 20 mg/kg. The LDEQ noted elevated arsenic concentrations near golf courses and attributed them to use of arsenical weed control chemicals. CDC/ATSDR has found similar situations near and on golf courses outside of the New Orleans area. The results of focused sampling conducted in February 2006 also indicated that the elevated concentrations of arsenic found in samples collected immediately after the flood water receded were isolated and not indicative of large areas of concern.

Another likely potential source of arsenic in soil is from copper chromated arsenic treated wood. This type of treated wood has been used extensively in New Orleans to prevent termite damage. However, such arsenic contamination from treated wood will be present on a localized basis.

Question: Has a written hazard evaluation or risk assessment been conducted for any of the following scenarios for lead, arsenic, diesel-range organics, benz (a) pyrene, or any other contaminant? (1) a worker involved in clean-up who is handling or disturbing sediment, (2) an adult who is moving back into a home where there is sediment in the house and yard, and (3) a child who is living in a home where there is sediment in the house and yard, at the daycare center, and at the school. If such risk assessments or hazard evaluations have been done, may we see them?

Response: In the case of Hurricanes Katrina and Rita, the two hypothetical exposure scenarios of most concern are: (1) workers during the rescue and response phase of the hurricane response and (2) the most sensitive components of the returning residents which would be the very young, the very old, and those with pre-existing medical conditions who will potentially receive both short- and long-term exposures.

Phase I sampling data were collected to determine whether chemicals in the soil or sediment pose a threat to response personnel. Phase II, III, and IV sampling data were collected to evaluate the presence of chemicals in sediments in residential areas most severely impacted by sediment deposition. Phase II, III, and IV sampling data indicate that levels of chemicals in the New Orleans area are below levels of concerns for both short-term and long-term exposures with the exception the historical elevated levels of lead in the older parts of the city.

Members of the chemical risk assessment community have established conservative procedures for evaluating chemical exposures and default assumptions that can be used when site-specific exposure assessment information is not available. While the various organizations have promulgated procedures that vary somewhat in their assumptions and approaches, the assumptions and approaches remain in substantive agreement.

The LDEQ has developed the Risk Evaluation/Corrective Action Plan (RECAP) regulation to address chemical contamination in the environment. The RECAP website may be found at:

http://www.deq.louisiana.gov/portal/tabid/131/Default.aspx

As discussed above, ATSDR has developed public health assessment methods for reviewing available data, evaluating potential health effects, and making recommendations for follow-up action. These procedures may be found in the ATSDR Public Health Assessment Guidance Manual at:

http://www.atsdr.cdc.gov/HAC/PHAManual/

Most of the Health Comparison Values used to evaluate the acute and intermediate exposures were actually for long-term exposures. While exposure to carcinogens is of concern for long-term exposures, exposures during the response phase were of short duration and the small theoretical additional cancer risks posed from such exposures are below levels of health concern.

The Health Comparison Values ATSDR used to evaluate long-term, non-cancer health effects and cancer health effects come from several sources. ATSDR Minimal Risk Levels (MRLs) used to evaluate non-cancer effects may be found on the ATSDR website at:

http://www.atsdr.cdc.gov/mrls.html

EPA Reference Doses (RfDs) also used to evaluate noncancer effects and Cancer Slope Factors (CSFs) used to evaluate cancer effects may be found on the EPA website at:

http://www.epa.gov/iris/

Some Health Comparison Values for which MRLs or RfDs were not available (e.g. diesel range organics) were developed from data taken from ATSDR Toxicological Profiles (see Attachment 2 below) or from RECAP.

The data reviews that the ATSDR ERT performed were transmitted to EPA and were excerpted in the summaries they provided on their website at:

http://www.epa.gov/katrina/testresults/index.html

The summaries for each data set constitute the written assessments for lead, arsenic, diesel-range organics, benzoic (a) pyrene, and all other contaminants prepared by ATSDR in collaboration with EPA.

It is important to keep in mind that Health Comparison Values represent a level below which adverse health effects are not expected for healthy adults as well as sensitive subpopulations such as children. If estimated exposures do exceed Health Comparison Values, it does not mean the health effects will occur, only that further site- or situation-specific exposures should be conducted.

In the context of this question, a hazard evaluation is an evaluation of the chemicals that are present and the potential for these chemicals to cause adverse health outcomes (hazard is a property of a chemical). The chemical hazards associated with exposures to lead, arsenic, diesel-range organics, benzo (a) pyrene, and the many other chemicals and contaminants present in sediments left after Hurricanes and Katrina are very well understood as a result of the extensive toxicological databases available to ATSDR, LDEQ and EPA and the extensive and ongoing sampling efforts that have been undertaken.

Also in the context of this question, an assessment is a characterization of the likelihood of an adverse health effect occurring as a result of exposure to a chemical hazard. To perform such a characterization of the potential for adverse health outcomes, an exposure assessment must be made. An exposure assessment considers frequency and durations of exposures, exposure routes (e.g. inhalation, ingestion, dermal contact), sensitive subpopulations, bioavailability of chemicals, variability within and between individuals and among populations, variability within space and time, and uncertainty (e.g. lack of toxicological data).

Question: If no such hazard evaluation or risk assessment has been conducted, are there any plans to do so? If not, why not?

Response: With almost 1,800 samples taken to date, CDC/ATSDR believes that the data indicates that there is not any wide-spread contamination of the New Orleans area as a direct

result of the hurricanes. Localized elevations of some compounds were found and EPA and LDEQ are conducting follow-up activities at those locations (e.g., elevated PAHs found at the Agricultural Street Landfill). CDC/ATSDR is also assisting with addressing the historical elevated soil lead levels found in some portions of New Orleans. Based on this large data set and the lack of any widespread contamination, we do not believe it is necessary to conduct a formal risk assessment.

Question: EPA and DEQ recently re-tested ten of the sites in Orleans Parish previously found to have elevated arsenic levels in soil or sediment. However, there were 32 sites in Orleans Parish previously reported by EPA as having arsenic concentrations over 22 mg/kg (One of these sites, at 8130 Aberdeen Street, has since been cleaned up by collaboration between the Deep South Center for Environmental Justice and the United Steelworkers of America. One other site is noted to be at a golf course.), and 97 sites with arsenic concentrations previously measured over the LDEQ RECAP level of 12 mg/kg. Are there plans to re-test these sites? If not, why not?

Question: EPA and DEQ recently re-tested five sites in Orleans Parish for benzo (a) pyrene. According to the prior EPA sampling result, 66 sites exceeded the DEQ RECAP screening level of 330 ug/kg. Are there plans to re-test these sites? If not, why not?

Response to the two questions: For re-sampling to occur, the sediment depth at or near the previous sampling location had to exceed a depth of 0.5 inch. When EPA/LDEQ contractors visited most locations to conduct the re-sampling, the sediment at those locations was less than 0.5 inch thick. Therefore, samples were not collected at those locations.

Question: In the recent round of re-testing, EPA and DEQ did not test for diesel range organics. According to their prior results, there were 105 sites in Orleans Parish with concentrations of diesel range organics above the RECAP MO-1 level of 650 mg/kg. Are there plans to re-test these sites? If not, why not?

Response: Phase IV sampling included analyses for diesel and oil range organics. The results indicate that diesel and oil range organics were found in less than 4% of the samples. This indicates that there is not a wide-spread contamination of New Orleans with diesel and oil range organics. In addition, EPA evaluated the results of several samples collected from the same location over time. This evaluation found that the diesel and oil range organic chemical concentrations had decreased as much as 90% due to natural mechanisms, such as the biodegradation and photodegradation, and the removal of sediment by natural processes, such as rainfall, and human processes.

Question: Have ATSDR, EPA, and DEQ concluded that the concentrations of contaminants in the New Orleans area are safe for children? If so, what is the basis for that conclusion? In not, what is the plan to address the unsafe condition?

Response: Phases I, II, III, and IV sampling and assessment efforts to date indicate that there are no unacceptable long-term health risks or wide-spread contamination directly attributable to

Hurricanes Katrina and Rita. This applies to sensitive subpopulation such as children, as well as the very old, and those with pre-existing health conditions. The basis for making these statements comes from use of conservative, long-term health guidance values that include safety factors for human variability along with conservative default exposure assumptions. In addition, out of the 702 samples taken during the Phase IV sampling effort only 24 samples (almost 4% of the total) were found to contain arsenic, lead, benzo(a)pyrene, diesel range organics, or oil range organics above screening levels.

Results of the Phase III sampling indicated that there are elevated soil levels of lead in some areas of New Orleans. Unlike previous sampling rounds, the composite samples collected in Phase III, were not only of the sediment deposited by floodwaters, but also included samples of the underlying soil that existed prior to the Hurricane. The lead levels appear to be consistent with historic levels reported in a local university study conducted in New Orleans prior to the hurricane. Nationwide studies of older cities have shown similar findings of elevated lead levels in urban soil. CDC/ATSDR is continuing to work with our local partners to address the historical soil lead levels in New Orleans so we can prevent childhood lead poisoning.

Question: Who, at this point, is making decisions regarding whether or not to perform a more comprehensive assessment of risk with respect to the contaminants mentioned above? Can ATSDR undertake such an assessment on its own initiative? If not, why not?

Response: With almost 1,800 samples taken to date, CDC/ATSDR believes that the data indicates that there is not any wide-spread contamination of the New Orleans area as a direct result of the hurricanes. Localized elevations of some compounds were found and EPA and LDEQ are conducting follow-up activities at those locations (e.g., elevated PAHs found at the Agricultural Street Landfill). CDC/ATSDR is also assisting with addressing the historical elevated soil lead levels found in some portions of New Orleans. Based on this large data set and the lack of any wide spread contamination, we do not believe it is necessary to conduct a formal risk assessment.

Question: Has ATSDR, EPA, or LDEQ considered, in any formal or informal risk assessment, the fact that the National Academy of Science has concluded that arsenic may be significantly more toxic than current risk assumptions acknowledge? Should any risk assessment that is performed incorporate realistic risk assumptions that consider conflicting data on arsenic toxicity? If not, why not?

Response: ATSDR, EPA, and LDEQ are using the most recent scientific information and current science policies for arsenic in evaluating the potential for adverse health effects related to arsenic exposures in New Orleans. The ATSDR Division of Toxicology and Environmental Medicine, which is responsible for developing the Toxicological Profile for Arsenic, remains actively engaged in the review of available scientific information pertaining to arsenic. When the scientific and risk assessment communities determine that the science policies related to developing health guidance values for arsenic such as Minimal Risk Levels, Reference Doses, and Cancer Slope factors need to be changed, ATSDR will update its Toxicological Profile for

Arsenic and any new health guidance values that have been developed will be used by ATSDR in evaluating exposures. At this time, the information contained in the ATSDR Toxicological Profile and the EPA IRIS Summary Document for Arsenic is current and valid for conducting risk assessments.

The ATSDR Toxicological Profile for Arsenic may be found at:

http://www.atsdr.cdc.gov/toxprofiles/tp2.html

The EPA IRIS Summary Document for Arsenic may be found at:

http://www.epa.gov/iris/subst/0278.htm

If one was to assume that the information contained in National Research Council Arsenic in Drinking Water: 2001 Update (Table S-1 - http://darwin.nap.edu/books/0309076293/html/12.html), the lifetime 10^{-4} theoretical cancer risk appears to occur at an exposure of about 1.5 μg/L or about 0.00004 mg/kg/day (based on a 70 Kg person ingesting 2 liters of water a day for 70 years). An equivalent soil/sediment concentration for the lifetime 10^{-4} theoretical cancer risk estimate would be about 28 mg/Kg (assuming a person coincidently ingests 100 mg/day of soil/sediment for 365 days over 70 years and weighs 70 Kg and all of the arsenic in the soil/sediment matrix is absorbed into the blood stream - very worst case assumption).

Bioavailability of arsenic in a soil/sediment matrix has been studied at various Superfund sites throughout the country. Those studies indicate that arsenic in a soil/sediment matrix is not 100% bioavailable. The studies indicate that somewhere between <1% and 60% found in a soil/sediment matrix will be absorbed into the blood stream. The higher bioavailability of arsenic is associated with areas where arsenical herbicides have been used. Assuming a bioavailability of 60%, the lifetime 10^{-4} Theoretical Cancer Risk level in soil/sediment would be about 45 mg/Kg.

Using the data presented in the NRDC "Contaminants in New Orleans Sediment" report (Table 2 on Page 6 - http://www.nrdc.org/health/effects/katrinadata/sedimentepa.pdf), the upper 95% confidence interval of arsenic found in "sediment" is 24.4 mg/Kg. Therefore, all the districts have arsenic levels below the lifetime 10^{-4} theoretical cancer risk level presented in the 2001 NRC Arsenic in Drinking Water Update.

Brief Overview of How the Agency for Toxic Substances and Disease Registry (ATSDR) Reviews Environmental Sampling Data

ATSDR's process to review and provide public health interpretation of environmental sampling results differs from the more quantitative risk assessments conducted by regulatory agencies, such as US Environmental Protection Agency (EPA). Both types of assessments attempt to address the potential human health effects of low-level environmental exposures, but they are approached differently and are used for different purposes.

- *The quantitative risk assessment* is used by regulators as part of site remedial investigations to determine the extent to which site remedial action (e.g., cleanup) is needed. The risk assessment provides a numeric estimate of theoretical risk or hazard, assuming no cleanup takes place. It focuses on current and potential future exposures and considers all contaminated media regardless if exposures are occurring or are likely to occur. By design, it generally uses standard (default) protective exposure assumptions when evaluating site risk.

- *The ATSDR process* is used to identify possible harmful exposures and to recommend actions needed to protect public health. ATSDR considers the same environmental data as EPA, but focuses more closely on site-specific exposure conditions, specific community health concerns, and any available health outcome data to provide a more qualitative, less theoretical evaluation of possible public health hazards. It considers past exposures in addition to current and potential future exposures.

The general steps in the two processes are similar (e.g., data gathering, exposure assessment, toxicological evaluation), but our review provides additional public health perspective by integrating site-specific exposure conditions with health effects data and specific community health concerns.

Remedial plans based on a quantitative risk assessment represent a prudent public health approach—that of prevention. By design, however, quantitative risk assessments used for regulatory purposes do not provide perspective on what the risk estimates mean in the context of the site community. The ATSDR review process does. The process is more exposure driven. The process identifies and explains whether exposures are truly likely to be harmful under site-specific conditions and recommends actions to reduce or prevent such exposures.

The results of our reviews can be documented in several different forms: health consultations, public health assessments, or technical assists. Health consultations and public health assessments are more formal documents and require more time to produce. During emergency situations, ATSDR provides technical assists; which are rapid reviews of environmental data and situations. Technical assists are provided to EPA and other environmental or health governmental agencies and are documented in letters or e-mails. It is important to note that regardless of whether ATSDR documents its findings in a health consultation, public health assessment, or technical assists, the same review process is used.

The ATSDR review process involves two primary scientific evaluations—the exposure evaluation and the health effects evaluation.

- **Exposure Evaluation:** Exposure assessment is the hallmark of our process. ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by federal and state government agencies and/or their contractors, potentially responsible parties, and the public. When adequate environmental or exposure information is not available to evaluate exposure, ATSDR will indicate what further environmental sampling may be needed and may collect environmental and biologic samples when appropriate.

- **Health Effects Evaluation:** If the exposure evaluation shows that people have or could come into contact with hazardous substances, ATSDR scientists evaluate whether this contact may result in harmful effects. ATSDR uses existing scientific information, which can include the results of medical, toxicological, and epidemiologic studies and data collected in disease registries, to determine what health effects may result from exposures. ATSDR recognizes that children, because of their behavior, size and growing bodies, may be particularly vulnerable to site-related exposures. Developing fetuses also may be more vulnerable to such exposures. Thus, the impact to children is also considered when evaluating the health threat to a community. The health impacts to other potentially high-risk groups within the community (such as the elderly, the chronically ill, and people who may have higher exposure potential) also receive special attention during the evaluation.

During the review process, we typically need to review large volumes of environmental data and evaluate these data in the context of the site-specific exposure assessment. The *screening analysis* enables us to sort through the data in a consistent manner to identify substances within completed and potential exposure pathways that may need to be evaluated more closely. This is achieved through the use of health-based "comparison values."

The screening analysis is generally conducted in a step-wise manner:

- Step #1: The *environmental guideline comparison* involves comparing detected substance concentrations to medium-specific comparison values derived using standard exposure default values.
- Step #2: The *health guideline comparison* involves looking more closely as site-specific exposure conditions, estimating exposure doses, and comparing them to dose-based comparison values. (Some health assessors may begin with this step recognizing substance- or site-specific concerns.)

After completing a screening analysis, ATSDR will have divided substances identified at the site into two categories:

- Those not exceeding comparison values and usually requiring no further analysis.
- Those exceeding comparison values and requiring further analysis to evaluate the likelihood of possible harmful effects.

For situations where site specific situations may permit exposure to substances that exceed comparison values, we look more closely at substance-specific information in the context of site exposures. The goal of this analysis is to provide perspective on what it means when a health-based screening value has been exceeded, and in some cases, how to address specific community health concerns regarding that situation. The analysis will help answer two important questions health assessors face:

- Are public health actions needed to prevent exposures?

- Are site-related exposures expected to cause harm?

The ATSDR staff will likely then conduct the following steps:

- Evaluating the experimental or human study(ies) on which the exceeded health guideline value was based,

- Determining where site-specific dose estimates fall in relation to other dose-response data,

- Reviewing other substance-specific factors that could increase or decrease the potential for harmful effects, such as our understanding of the overall behavior of the substance within the human body and the mechanism by which it exerts its toxic effect, knowledge of substance-specific effects among susceptible populations, and multiple chemical exposures, and

- Determining whether relevant site-specific health effects data should be evaluated in the public health assessment, such as mortality and morbidity data (also called health outcome data), or biologic monitoring data.

Not all reviews will require us to consider all the elements of the in-depth analysis described above. The level of analysis will differ across sites and will depend on the scope and complexity of site-related issues, such as the magnitude of exposures, the substance(s) under evaluation, and specific community health concerns. Professional judgment is needed in weighing what is known and unknown, including uncertainties and data limitations.

As detailed below, the vast majority of analytical sampling results generated by the Greater New Orleans sediment sampling effort did not exceed comparison values. Therefore, we determined that a comprehensive public health assessment or health consultation is not necessary.