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New Orleans Area Environmental Quality Test Results

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Sediment Contamination

This section of NRDC's sampling results summarizes data collected by NRDC, other independent testers and the EPA; it was cowritten by NRDC and Advocates for Environmental and Human Rights (AEHR).

The flood waters that inundated New Orleans carried a mixture of soil, sewage and industrial contaminants. When the flood receded, it left behind a layer of sediment -- in some places up to 4 inches thick -- that still covers the ground and even coats the interiors of peoples' homes. Testing by Wilma Subra, a Louisiana-based chemist, by NRDC and by the Environmental Protection Agency (EPA) and others reveals that this sediment is contaminated with heavy metals, petroleum, pesticides, industrial chemicals and polyaromatic hydrocarbons (PAHs), which are cancer-causing chemicals from soot and petroleum-based products.

The test results so far reveal that sediment contamination by certain substances, such as arsenic and diesel fuel, is widespread in the neighborhoods of Mid-City, Lakeview, New Orleans East, Uptown/Carrollton, the Garden District, Bywater, the Ninth Ward, Gentilly and beyond. Arsenic and diesel fuel contaminants were found in all of these areas at levels that exceed the soil cleanup guidelines for residential neighborhoods issued by the EPA's Region 6 office, which is responsible for five states including Louisiana, and the Louisiana Department of Environmental Quality (LDEQ). This widespread contamination from arsenic and diesel fuel is primarily a long-term health concern if residents move back into the city

CLEANUP AND SAFETY PRECAUTIONS

What Government Agencies Should Do

Hurricanes Katrina and Rita left contamination in their wake in both low-lying and higher elevation areas. The necessary technology to clean up the contamination in all affected areas is readily available to the government, and residents have a right to return to safe homes and neighborhoods. To ensure that they can return safely, government agencies must immediately begin cleanup in every contaminated area.

How Individuals Should Protect Themselves

People returning to once flooded neighborhoods and homes should wear protective clothing, such as Tyvek suits or coveralls, covers for boots and shoes, vinyl or nitrile gloves and respirators (such as N95 masks). This protective gear can be purchased at most hardware and home-improvement stores and is fairly inexpensive.

Many cleanup workers have not been supplied with this protective equipment, and many who do have the equipment have not been properly instructed about its importance, so they often fail to wear it. Workers who do not wear protective equipment are not a signal that such gear is unnecessary -- it is critical.

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and the problem is never cleaned up. Many years of exposure to these contaminants could increase the risk of cancer, neurological damage or other chronic health problems.

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In addition, the testing identified some 'hot spots' where there are potentially very serious problems created by contamination carried by the hurricanes from toxic sites into residential neighborhoods. For example, we identified high levels of banned pesticides traveling from an industrial site toward a residential neighborhood in Mid-City, and high levels of PAHs traveling onto the grounds of a senior citizens' center near a toxic waste site in Bywater.

Until it is cleaned up, contamination such as this is a serious health concern for residents returning to these neighborhoods. Contaminated sediment can pose a health hazard in both the short-term and the long-term. In the short-term, residents and workers may be exposed to toxic materials by inhaling dust from sediment they are trying to clean up -- and that is blowing around the city -- or getting it on their hands or in their eyes or mouths. This kind of exposure can cause cough, irritation of the eyes, nose, and throat and skin rashes. In the long-term, children playing in yards and families living in once flooded neighborhoods may be at significant health risk from exposure to contaminated soil unless it is removed and replaced before people move back to these areas.

The city of New Orleans, the LDEQ and the EPA have the technical know-how to clean up harmful sediment in streets and yards to make the city safe for returning residents. They must make this cleanup the highest priority.

How NRDC and Others Sampled for Sediment Contamination

On October 11, 2005, NRDC worked with Wilma Subra of Subra Company, New Iberia, Louisiana, to conduct independent testing of sediment at nine sites in New Orleans and one site in Plaquemines Parish. Ms. Subra and Altamont Environmental Inc. of Asheville, North Carolina also collected two samples on October 1, 2005, in the Bywater neighborhood, near the Agriculture Street Landfill, a Superfund hazardous waste cleanup site. These two samples were funded by the Panta Rhea Foundation and the Jenifer Altman Foundation as part of a larger sampling effort that encompassed flooded areas of three Gulf Coast states. The samples were analyzed by Pace Analytical Services, Inc, in St. Rose, Louisiana. Other independent sediment testing in New Orleans was conducted by the [Louisiana Environmental Action Network \(LEAN\)](#), which collected five sediment samples in Bywater, Little Woods and St. Bernard Parish on September 16, 2005, and the [Louisiana Bucket Brigade](#), which collected 14 samples on September 19 and September 29, 2005, in St. Bernard Parish.

All of these independent sediment testing results for Orleans and St. Bernard Parishes -- including the LEAN and LA Bucket Brigade data, which have been previously released and reported separately by those groups -- are summarized below in the sections for the neighborhoods where they were collected.

In addition, the neighborhood sections include information derived from NRDC's review of the data from more than 100 EPA sediment samples collected across Orleans and St. Bernard Parishes. In reviewing these EPA samples NRDC focused on the results for arsenic, because it has frequently been found at levels above applicable regulatory standards in the sediment and because it poses a serious health concern.

Results of Sampling for Sediment Contamination

NRDC scientists compared the levels of contamination in the sediment with the levels that generally trigger government soil cleanup requirements in residential areas. Both EPA's Region 6 office and the Louisiana Department of Environmental Quality have soil

remediation guidelines that apply to the flooded areas of the Gulf Coast.

Arsenic

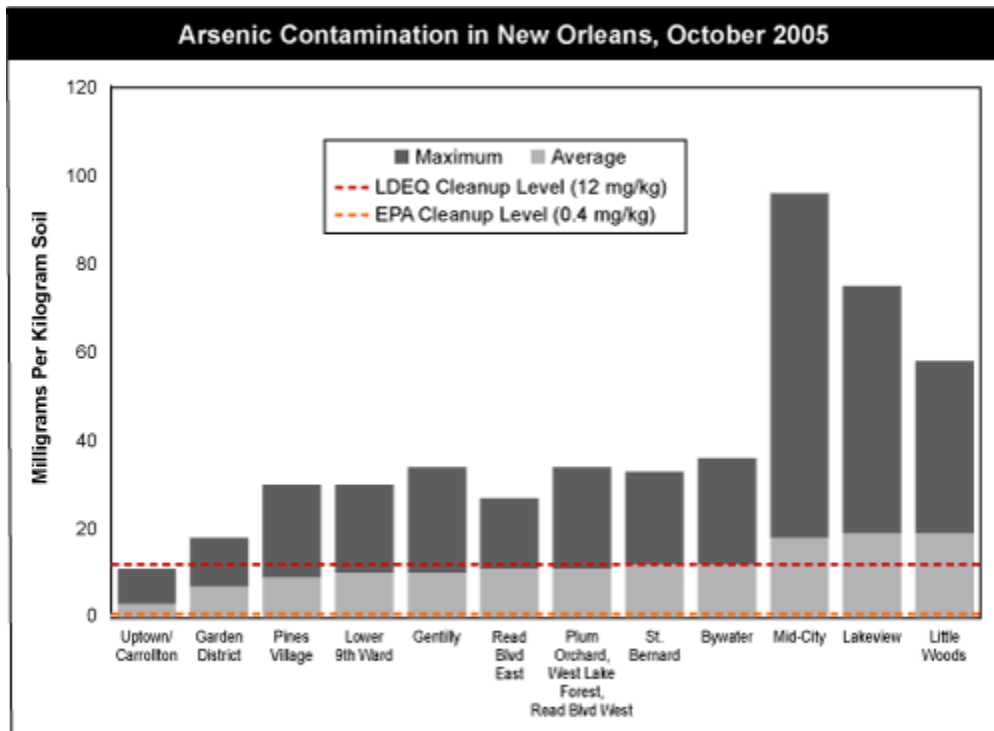
The levels of arsenic in all of the independent samples collected by NRDC and others would trigger soil remediation in residential areas, according to the Region 6 EPA guidelines. The average level of arsenic found in our testing in Orleans Parish was 12.2 milligrams per kilogram (mg/kg) of soil. This is more than 31 times higher than the Region 6 EPA soil cleanup level for residential areas, which is set at 0.39 mg/kg to protect against cancer. The highest arsenic level in our samples -- nearly 20 mg/kg -- was in the Marlyville/Fontainebleau neighborhood of Uptown/Carrollton, near Gert Town. The lowest arsenic level in our urban samples -- slightly over 4 mg/kg -- was in the St. Bernard Development Housing Project in the Gentilly neighborhood; the arsenic level was lower (1.7 mg/kg) at the site NRDC sampled in Oakville, Plaquemines Parish.

Arsenic may have been in the soil for a number of reasons before it was brought to the surface and spread around by the hurricane: past use of arsenic-based pesticides, past trash incineration, leakage from industrial sites and the use of building materials treated with chromium-copper arsenate. According to the LDEQ, the "background" arsenic levels in soil in these areas may be as high as 7 mg/kg, and this agency has set a cleanup level for arsenic at 12 mg/kg, which does not consider the long-term cancer risk. The sites we sampled, however, showed levels significantly higher (up to threefold), than this possible background level, and many samples exceeded the LDEQ cleanup standard as well. What's more, the arsenic is now on the surface, where people can easily touch it, breathe it or get it in their eyes and mouths.

It is clear that the levels of arsenic in the sediment are unacceptably high for residential neighborhoods. Arsenic is toxic to humans and causes cancer, and for this reason, no amount of arsenic is considered fully safe. Many scientific studies, including numerous reviews by the National Academy of Sciences, have determined that arsenic is known to cause cancer of the bladder, skin and lungs; likely causes other cancers; and is responsible for a variety of other serious health ailments.

The EPA has also conducted testing for arsenic throughout New Orleans. The EPA data are publicly available [here](#) and were analyzed by NRDC. The agency's findings on arsenic are fully consistent with the independent test results obtained by NRDC and others. NRDC scientists conducted a survey of more than 100 of the EPA sediment samples from across the city as well as St. Bernard Parish. The average arsenic level in these samples was 13.3 mg/kg, which is about the same as the average arsenic level found in our own samples, and is above both the Region 6 EPA and the LDEQ soil standards. When we looked at the EPA samples according to neighborhoods, Uptown/Carrollton had the lowest neighborhood average arsenic level, St. Bernard Parish the highest. Of the EPA samples we reviewed, the single highest arsenic level was in the Mid-City area (Euprosine and South Lopez) at 78 mg/kg. This is 200 times higher than the Region 6 EPA soil cleanup standard, and more than 6 times higher than the weak LDEQ standard. Other neighborhoods with high average arsenic levels included the Little Woods area of New Orleans East, Lakeview, and Mid-City.

Sediment, Figure 1



Source: Compiled by NRDC from a stratified random selection of EPA sediment data, including eight sample points from each neighborhood. <http://www.epa.gov/enviro/katrina/emkatrina.html>

Pesticides

NRDC's testing detected elevated levels of several pesticides next to an abandoned industrial facility known as the Thompson-Hayward facility. This facility, located on Earhart Boulevard in a residential neighborhood (the facility is in Gert Town at the border of the Marlyville/Fountainebleau neighborhood), once housed a pesticide-blending company. It has been vacant for years. One of NRDC's samples, collected outside the fence at the western corner of the Thompson-Hayward facility, near some homes, revealed high levels of a variety of banned pesticides. The level of DDT and one of its breakdown products exceeded the Region 6 EPA soil cleanup levels by approximately twofold. Two other organochlorine pesticides, dieldrin and heptachlor epoxide (a breakdown product of heptachlor) were also found at levels significantly above the cleanup levels. In fact, the dieldrin level was nearly sevenfold higher than the regulatory cleanup level. All of these pesticides have been banned in the United States for more than 25 years, and they are now also banned worldwide by international treaty because of their serious toxicity and environmental persistence.

The discovery of banned toxic pesticides that have traveled from an industrial facility toward a residential community is disturbing. These chemicals are suspected human carcinogens and have been linked to neurological problems and disruption of the endocrine system. People have already returned to clean up their homes in communities near the Thompson-Hayward facility, and more are returning. These people may be at risk of exposure to hazardous chemicals. The EPA did no sediment sampling around this facility, so we have no additional information about how far the contamination may extend.

Polyaromatic Hydrocarbons

The independent testing by NRDC and others revealed high levels of polyaromatic hydrocarbons (PAHs) at one site in New Orleans. PAHs are cancer-causing chemicals from soot and petroleum-based products. At the Agriculture Street Landfill Superfund site in the Bywater neighborhood, leachate was visibly leaking from the site and spreading across the street and onto the grounds of the local senior citizens' center. Testing of this oily-appearing

leachate revealed seriously elevated levels of PAHs. The sediment sample collected by Wilma Subra of Subra Company at Higgins Boulevard and St. Ferdinand Street demonstrated contamination that exceeded the Region 6 EPA and LDEQ soil cleanup standards for four PAHs. The level of benzo(a)anthracene exceeded the EPA and LDEQ standards by 50 percent, the benzo(k)fluoranthene contamination exceeded the agency standards by twofold, while the benzo(a)pyrene contamination exceeded the LDEQ standard by threefold, and the EPA standard by nearly twentyfold. These contaminants are likely due to the leachate from the landfill.

Other Contaminants

The independent soil sampling revealed a variety of other contaminants, including metals such as lead, cadmium, chromium and mercury; various pesticides; and chemicals known as phthalates, which are used in plastics as a softener. The lead level in one sediment sample taken on Treme Street was more than double the EPA Region 6 soil cleanup level. The EPA took a sediment sample in that same area, at Treme and St. Phillip, and found similarly high lead levels. These sampling results indicate a lead contamination problem in this area that requires immediate cleanup.

Many of the samples contained phthalates, particularly bis(2-ethylhexyl) phthalate (DEHP). Although the concentrations found in the sediment did not exceed EPA or LDEQ soil cleanup levels, these regulatory cleanup levels are not considered to be sufficiently health-protective. Recent scientific studies have found that DEHP has significant adverse effects on hormones, and can interfere with the normal development of the male reproductive system. Soil standards based on this new science have not yet been developed.

What People Can Do to Protect Themselves

Government agencies must clean up the contaminated sediment in every neighborhood as soon as possible so that people can safely move back into their homes. People entering their neighborhoods before the appropriate cleanup has been completed should also take precautions described below. Sediment is potentially contaminated in all flooded areas, so this advice applies to people re-entering any neighborhood that was flooded.

- **Avoid direct contact with the sediment.** Touching sediment with bare hands, getting it into your mouth or eyes, or breathing the dust could be hazardous.
- **Wear protective clothing, such as Tyvek suits or coveralls, covers for boots and shoes, vinyl or nitrile gloves, and respirators (such as N95 masks).** This protective equipment can be purchased at most hardware and home-improvement stores and is fairly inexpensive.
- **When you are finished with any work that puts you in contact with sediment -- either indoors or outdoors -- immediately discard your Tyvek suit, gloves and boot covers.** These are single-use items. Do not wear them in your car or bring them home. A respirator, however, can be re-used if the interior is kept clean.
- **If you have asthma, other respiratory or cardiac conditions, or immune system problems,** you would be safer staying out of flooded areas, due to the mold, particles, and sediment that are in the air.
- **Do not bring young children into flooded areas,** where they might touch sediment and put their fingers in their mouths.

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[Sediment Contamination Results by Neighborhood](#)

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