

Industrial Sources of Dioxin Poisoning in Mossville, Louisiana:

A Report Based on the Government's Own Data



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Dedication

This report is dedicated to the people of Mossville, Louisiana who love their community and are fighting for its survival.

Acknowledgements

This report is based on data obtained from the U.S. Agency for Toxic Substances and Disease Registry, the U.S. Environmental Protection Agency, and the Louisiana Department of Environmental Quality. Photographs were provided by Mossville Environmental Action Now, Inc. and Advocates for Environmental Human Rights.

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List of Abbreviations and Acronyms

U.S. Agency for Toxic Substances & Disease Registry - ATSDR

U.S. Environmental Protection Agency - EPA

Louisiana Department of Environmental Quality - LDEQ

Louisiana Department of Health & Hospitals - LDHH

parts per trillion - ppt

polychlorinated biphenyls - PCBs

Toxic Release Inventory - TRIs

toxicity equivalent quotieny - TEQ

Executive Summary

Since 1998, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) – which is a division of the Centers for Disease Control – has conducted an Exposure Investigation of dioxins in Mossville, Louisiana, an historic African American community located next to the city of Lake Charles. The Exposure Investigation, a collaborative effort involving the Environmental Protection Agency (EPA), documents that Mossville residents have an average level of dioxins that is 3 times higher than the average level of dioxins in the general U.S. population. However, the Exposure Investigation entirely fails to identify the sources of the dioxins harming the health and environment of residents. Dioxins are the most toxic chemicals known to science, and scientists have determined that there is no safe level of dioxin compounds. Dioxins can cause cancer, reproductive damage, and extensive harm to fetal and child development. Dioxin compounds build up in the human body where they are stored in fatty tissues, such as breast milk, and can be passed on to the unborn during pregnancy and lactation.

Mossville residents are surrounded by 14 toxic industrial facilities, several of which routinely release dioxins into the air, water, and land. Residents have long complained about health problems that a university health study has linked to industrial pollution. However, governmental agencies continue to issue permits which allow the industrial facilities to increase the amount of toxic pollution, including dioxins, that they release into the Mossville community.

Notwithstanding ATSDR's and EPA's obligation to protect human health and the environment, and Mossville residents' repeated demands that these agencies identify and eliminate the sources of the dioxin exposures, ATSDR and EPA have never attempted to investigate any link between the local industrial dioxin emissions and the dioxins detected in the blood and environment of Mossville residents. This report presents an analysis of the data collected by these very same agencies, which these agencies could have, but failed to analyze. As discussed in this report, the following local industrial facilities are the sources of the elevated dioxin levels in the Mossville community:

- Conoco Phillips oil refinery
- Entergy Roy S. Nelson coal-fired power plant
- Georgia Gulf vinyl manufacturing facility
- Lyondell chemical manufacturing facility
- PPG Industries vinyl manufacturing facility
- Sasol chemical manufacturing facility.

Furthermore, notwithstanding the incontrovertible fact that dioxin exposure is a serious threat to human life and health, ATSDR has not offered any meaningful assistance to Mossville residents in formulating an effective and expeditious method for addressing their situation, nor has ATSDR recommended that EPA or any other agency take action to prevent the critical public health threat of dioxin exposure in Mossville.

Against great odds, Mossville residents continue to struggle to protect their health and future generations from toxic exposures that threaten their very survival. This report provides recommendations for corrective governmental action that would protect the human right to a healthy environment which is being violated in Mossville and numerous communities across the United States that are severely burdened with toxic pollution.

Map of Mossville Area Industrial Facilities



- Key (revised)**
1. Air Liquide (oxygen, nitrogen, and hydrogen gas)
 2. Arch Chemical (hydrazine and specialty chemicals)
 3. Bio-lab (water treatment biocides and specialty chemicals)
 4. CertainTeed Corp (polyvinyl chloride polymer)
 5. Georgia Gulf (vinyl chloride monomer)
 6. Sasol North America Inc. (specialty chemicals)
 7. Conoco Phillips (petroleum products)
 8. Entergy - Roy S. Nelson Power Plant (electricity from coal and natural gas)
 9. Lyondell Chemical Worldwide Incorporated (toluene diisocyanate ("TDI") and nitric acid)
 10. Excel Paralubes ("Group II base oil," which is the primary base stock in motor oil)
 11. PPG Industries, Inc. (chlorine, vinyl chloride, and other chemicals)
 12. PHH Monomers (polyvinyl chloride polymer)
 13. Tessenderlo Chemical (sodium hydrosulfide)
 14. Tetra Chemical (calcium chloride)

Background

Mossville is an historic, African American community that was founded in the 1790s next to Lake Charles, Louisiana. Today, the community is surrounded by 14 industrial facilities, including the largest concentration of vinyl production facilities in the U.S., an oil refinery, a coal-fired power plant, and several petrochemical manufacturers.¹ These facilities release millions of tons of toxins into the air, water, and land each year² and are responsible for high levels of cancer-causing chemicals in the air,³ severely polluted water,⁴ contaminated fish,⁵ and toxic leaks into groundwater.⁶

A 1998 health study conducted by the University of Texas at Galveston Medical Branch revealed that Mossville residents suffer from a host of severe health problems associated with toxic industrial pollution.⁷ These health problems include cancer, respiratory ailments, and diseases affecting the kidney and liver.⁸ The high percentage of Mossville residents who have these health problems led the medical researcher, who has worked on the Love Canal environ-

A MATTER OF HEALTH

Although the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) downplays the significance of the dioxin concentrations in the blood of Mossville residents, a 1998 health survey shows that over ninety percent of Mossville residents have illnesses that ATSDR generally links to dioxin exposure.¹

"Mossville is a very sick community," said Dr. Marvin Legator, when he directed the Division of Environmental Toxicology at the University of Texas Medical Branch at Galveston.² Dr. Legator conducted a health survey in 1998 which found that Mossville residents are 2 to 3 times more likely to suffer health problems than a comparison control group.³ Most notably, the survey found that:

- 99% of residents reported ear, nose, and throat illness;⁴
- 84% of residents reported having headaches, dizziness, tremors, and seizures, which are symptoms related to the central nervous system;⁵
- 77% reported cardiovascular problems, such as irregular heart beat, stroke, heart disease, and chest pain;⁶
- 46% of nonsmokers reported respiratory illnesses, such as persistent bronchitis, shortness of breath, wheezing, and coughing up blood;⁷
- More than 50% of the residents reported skin problems, digestive illnesses, and symptoms related to immune deficiency; and
- 25% reported endocrine disorders, including diabetes and hormonal conditions.⁸

¹ Agency for Toxic Substance and Disease Registry, Toxicological Profile for Chlorinated Dibenzo-p-dioxins (CDDs), pp. 28, 31, 37, 41, 42, 49 (1998) <http://www.atsdr.cdc.gov/toxprofiles/tp104.pdf> [accessed 7/12/07].

² Liz Maples, Survey: Community is "Very Sick," American Press (Lake Charles, LA), p. B1 (October 21, 1998).

³ Dr. Marvin Legator, University of Texas Medical Branch at Galveston, Mossville Health Symptom Survey (1998).

⁴ Mossville Health Symptom Survey, p. 15.

⁵ Id. at 16-17.

⁶ Id. at 13.

⁷ Id. at 19.

⁸ Id. at 7, 11, 25, 26.

mental disaster and in numerous other communities impacted by environmental hazards, to declare that “Mossville is a very sick community.”⁹

One of the chief concerns of Mossville residents is their exposure to dioxins, which are deemed the most toxic substances known to science, and are a health-threatening by-product of at least eight nearby industrial operations.¹⁰ Their concern is fueled by the significant health problems they suffer which are associated with industrial pollution. In particular, the health effects of dioxins in humans include cancer, damage to the reproductive system, impairment of the immune system, and extensive disruption of normal hormone functions, including neuro-behavioral development.¹¹ Dioxins are bio-accumulative chemicals that increase in concentration through the food chain, and build up in the human body where they are stored in fatty tissues and fluids, including breast milk, and can be passed on to fetuses and infants during pregnancy and lactation.¹² Dioxins also persist in the environment for years.

Common sources of dioxins include waste and fuel combustion, refining processes, and chemical manufacturing.¹³ Several of these common sources are included among the fourteen industrial facilities located in extremely close proximity to the homes, playgrounds, and churches of Mossville.¹⁴

ATSDR’S 1998 Investigation of Dioxin Exposures in Mossville, LA

In response to the concerns of Mossville residents about their declining health and exposure to industrial emissions of dioxins and other toxic chemicals, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) launched a dioxin “Exposure Investigation” in December 1998. ATSDR collected blood samples from 28 Mossville



When I was growing up in the 1950s we didn't have all this sickness before the industrial facilities came to Mossville. Now, it's so common to know people who frequently go to the doctor for all kinds of health problems. It's really scary to find that so many of my relatives and neighbors are suffering from cancers, endometriosis, and asthma. I'm talking about teenage girls with endometriosis and young children who have asthma attacks all the time. I am concerned about the future for my family and my community.

– Dorothy Felix,
Mossville Resident



The Conoco Phillips oil refinery is one of several facilities that release massive quantities of pollution and dioxins in Mossville.

residents who volunteered to participate in the investigation, and analyzed these blood samples to determine whether residents were exposed to dioxin compounds. ATSDR conducted the Exposure Investigation in coordination with the U.S. Environmental Protection Agency (EPA), the Louisiana Department of Environmental Quality (LDEQ), and the Louisiana Department of Health and Hospitals (LDHH).

Over a period extending from April to November 1999, ATSDR reported the results of the 1998 dioxin testing of Mossville residents' blood. The test results revealed that Mossville residents have an average level of dioxins that is 3 times higher than the average level of dioxins detected in a national comparison group representing the general U.S. population.¹⁵ Specifically, ATSDR's dioxin exposure investigation found that:

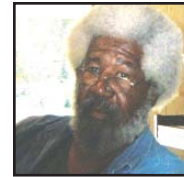
[b]lood dioxin levels were elevated in the Mossville [exposure investigation] participants. The . . . mean (68.3 ppt) concentrations of dioxin . . . in the [exposure investigation] participants exceeded the 95th percentile concentration (37.5 ppt) of the comparison population.¹⁶

ATSDR concluded that the sources of the dioxin exposure are not known.¹⁷ However, the 1998 dioxin testing showed that Mossville residents are exposed to a unique group of dioxin compounds that is different from the dioxin compounds found in the blood of ATSDR's national comparison group.¹⁸ The unique composition of the dioxin compounds in the blood of Mossville residents was noted by an ATSDR health consultant as an indication that local sources may be responsible for the elevated dioxin exposure.¹⁹ ATSDR never took any further steps to identify these local sources, and dismissed the demands by Mossville residents that the agency find the sources of the dioxins in their blood.

ATSDR'S 2001 Follow-up Investigation of Dioxin Exposures in Mossville, LA

In 2001, ATSDR decided to conduct a "Follow-up Exposure Investigation" in Mossville. However, that investigation once again involved only more sampling of the environment and blood of Mossville residents. Although ATSDR stated that one purpose of its 2001 study was "to evaluate potential current environmental sources of dioxin exposure," the agency's report shows no action whatsoever to determine the sources of the dioxin exposure in order to begin eliminating such sources.²⁰

ATSDR collected blood samples from 22 of the Mossville residents who participated in the 1998 dioxin exposure investigation, and analyzed those blood samples for dioxins. As part of this follow-up dioxin study, ATSDR also collected samples of fruits, vegetables, nuts, yard soil, indoor dust, and attic dust from the homes of the Mossville participants. In addition, ATSDR conducted dioxin testing of fish species from local waters that are typically eaten by Mossville residents.

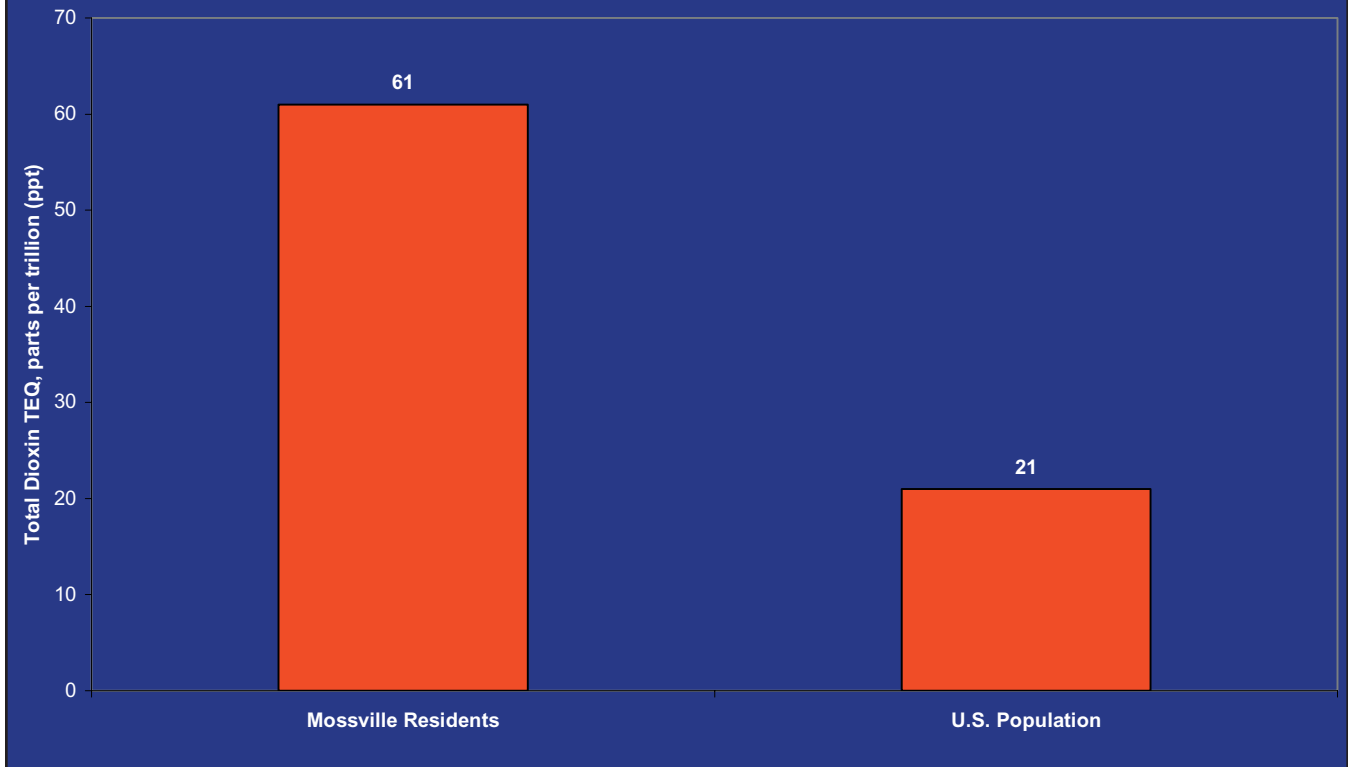


It was Mossville residents who demanded that EPA and ATSDR test our blood for dioxins because we thought that when the agencies had proof that we are being poisoned by the industries they would have to take action to protect our health. But, instead, the agencies have put their heads in the sand by saying they don't know what is causing our elevated dioxin levels when we have industrial smokestacks right next to our homes. Our African American community and people are being destroyed while EPA and ATSDR look the other way and continue to allow these industries to get more permits to release toxic chemicals. "Environmental protection" is a myth that covers up what really is going on, which is pollution protection.

– Delma Bennett,
Mossville resident

Fig. 1 Comparison of Average Dioxins in Mossville Residents & the U.S. Population

Source: ATSDR, 2006



ATSDR did not finalize the reporting of its 2001 follow-up dioxin investigation in Mossville until March 2006, without any explanation for the long period of delay. In the final report, ATSDR acknowledges that Mossville residents have elevated levels of dioxin in their blood, with an average concentration of 61.0 ppt, which is not a substantial change from that of the 1998 ATSDR test.²¹ Thus, average blood dioxin levels in Mossville continue to be 3 times higher than ATSDR's national comparison group.²² Notwithstanding the severe health effects of dioxins and the elevated dioxin levels among Mossville residents, ATSDR outrageously concluded in its report that "the health significance of the blood dioxin concentrations measured in this investigation is unclear."²³

ATSDR's 2001 report acknowledged that fish collected from local waters were unsafe to eat because they are contaminated with high levels of dioxins and PCBs.²⁴ Samples of yard soil and attic and indoor dust collected from the homes of Mossville residents who participated in the follow-up dioxin study contained dioxins that exceed EPA's established clean up goal for dioxin-contaminated soil.²⁵ In addition, the dioxins detected in the yard soil samples exceeded the regulatory clean up standards established by the state of Florida for dioxin-contaminated soil.²⁶ (The state of Louisiana has not established any clean up standard for dioxins in soil.) Further, each sample group of vegetables, fruits, and nuts grown in the yards of Mossville residents contained dioxins.²⁷

ATSDR'S 2002 Investigation of Dioxin Exposures in Locales Outside of Mossville, LA

In 2002, ATSDR conducted a first-time dioxin testing of people living in Calcasieu and Lafayette Parishes (Louisiana has “parishes” instead of “counties”), which the agency refers to as the “2002 Louisiana Dioxin Study.” With respect to Calcasieu Parish, which encompasses the Mossville community, the study included residents living in areas of the Parish **other than Mossville** – a total area of 1,0721.2 square miles which is largely non-industrial, and extends far beyond Mossville and its surrounding industrial facilities which produce dioxin emissions. In this study, ATSDR concluded that “[m]ost of the people tested [in Calcasieu and Lafayette Parishes] have dioxin blood levels similar to ATSDR’s [national] comparison group.”²⁸ However, “most of the people [in Calcasieu Parish]” does not include the resi-

BASIC FACTS ABOUT DIOXINS IN MOSSVILLE

What are dioxins?

Dioxins are a group of extremely toxic chemicals that can build up in the human body, and remain in the environment for years. Dioxins are formed when chlorine or a material containing chlorine is heated at high temperatures. The health effects of dioxins include cancer, damage to the reproductive system, weakened immune system, and disruption of hormone functions. Dioxins can be passed on to the unborn during pregnancy, and create serious disorders in normal child development.

Are the dioxins in Mossville residents' blood different from the U.S. population?

Yes. Mossville residents have average dioxin levels in their blood that is 3 times higher than the national comparison group, which ATSDR deems is representative of the U.S. population. In addition, the dioxin compounds detected in Mossville residents' blood are a unique group that is different from that of the national comparison group.

Which industrial facilities in Mossville emit dioxin compounds that have been detected in the blood and environment of Mossville residents?

- Conoco Phillips oil refinery
- Entergy – Roy S. Nelson coal-fired power plant
- Georgia Gulf vinyl manufacturing facility
- Lyondell chemical manufacturing facility
- PPG Industries vinyl manufacturing facility
- Sasol chemical manufacturing facility

What is total dioxin TEQ?

Although scientists have determined that there is no safe level of a dioxin compound, nevertheless scientists have developed a method of calculating the concentration of the various dioxin compounds based on their relative toxicity as compared to the most toxic of all dioxin compounds, which is 2,3,7,8-Tetrachlorodibenzo-p-dioxin. This calculation is known as the “toxicity equivalent quotient” or “TEQ.” Using this calculation, one gram of 2,3,7,8-Tetrachlorodibenzo-p-dioxin has a TEQ factor of 1, and one gram of 1,2,3,7,8-Pentachlorodibenzo-p-dioxin has a TEQ factor of 1. One gram of any other dioxin compound has a TEQ factor that is less than 1.

dents of Mossville whose average blood dioxin level is three times higher than ATSDR's national comparison group.

Throughout the seven years of ATSDR's dioxin testing, Mossville residents, organized as Mossville Environmental Action Now (M.E.A.N.), have urged ATSDR, EPA, LDEQ, and LDHH to protect their health by thoroughly investigating whether industrial facilities are contributing to the dioxin exposures suffered by Mossville residents. In response, these agencies have presented misleading information about the significance of the dioxin exposure in Mossville while failing to disclose data that show the direct links between industrial dioxin emissions and the dioxins detected in the blood and environment of Mossville residents. M.E.A.N. never gave up and decided to independently analyze governmental data to determine if there was a link between industrial dioxin emissions and the dioxins detected in their blood and environment.

This report is the result of a community's determination to find the truth: local industrial facilities are the sources of the dioxin poisoning in Mossville.







Links Between Mossville-Area Industrial Dioxin Emissions & Dioxins in the Blood and Environment of Mossville Residents

For seven years, ATSDR has generated scientific data that identify and measure the dioxins and dioxin-like compounds in the blood and environment of Mossville residents. For five years, EPA has collected data from industrial facilities, known as the Toxic Release Inventory or "TRI," that includes identification and measurement of the dioxins and dioxin-like compounds that industrial facilities annually release into the environment. However, these agencies apparently have never bothered to analyze the TRI data in terms of any connection to the dioxin exposure of Mossville residents, because they have never disclosed any information regarding any links between industrial emissions of dioxins and the dioxin exposure in Mossville. The authors of this report obtained the dioxin data generated by ATSDR, and accessed TRI databases compiled by EPA. This section presents the analysis of that data, which shows significant and direct linkages between industrial dioxin emissions and the dioxins to which Mossville residents are exposed.

Georgia Gulf & the Dioxins in the Blood of Mossville Residents

In its 2001 Follow-Up Exposure Investigation, ATSDR reported that the dioxins detected in the blood of Mossville residents are 3 times higher than the general U.S. population, with an average total dioxin TEQ con-

Industrial Links to the Majority of Dioxins in Mossville Residents' Blood

Dioxin Compound	In Mossville Residents' Blood	In Georgia Gulf Emissions
1,2,3,7,8-Pentachlorodibenzo-p-dioxin		
2,3,7,8-Tetrachlorodibenzo-p-dioxin		
Hexachlorodibenzo-p-dioxins (3 congeners)		

centration of 61.0 ppt. ATSDR's blood dioxin data shows that the following five dioxin compounds comprise 77% of the dioxins detected in the blood of Mossville residents: 1,2,3,7,8-Pentachlorodibenzo-p-dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin, and three Hexachlorodibenzo-p-dioxin compounds.²⁹ However, ATSDR failed to examine TRI reports compiled by EPA which reveal that 77% of the dioxin compounds emitted by Georgia Gulf, a vinyl production facility located across a tiny road from Mossville, are the same dioxin compounds that comprise 77% of the dioxins detected in the blood of Mossville residents.³⁰ These five dioxin compounds are deemed by scientists to be the most toxic of all dioxin compounds.

As shown in Figure 2, there is a direct link between the dioxin compounds in the blood of Mossville residents and the dioxin compounds released into the environment by the Georgia Gulf facility. The table also shows that the percentage of these dioxin compounds in Georgia Gulf's emissions increased to 80.04% in 2004.³¹ ATSDR and EPA have never disclosed this information to Mossville residents or the public.



View of the Georgia Gulf facility from the homes of Mossville residents located on VCM Road. "VCM" is the abbreviation for vinyl chloride monomer, a cancer-causing chemical whose manufacture releases dioxins into the environment. Most of the residents living in this section of Mossville had to relocate as part of a lawsuit settlement involving a toxic spill from this facility.

**Fig. 2 Links Between the Dioxins in Mossville Residents' Blood
and the Dioxins Emitted by Georgia Gulf**

Highest Contributors to the Total Dioxin TEQ Detected in Mossville Residents' Blood (2001 ATSDR)	% of Total Dioxin TEQ in Mossville Residents' Blood (2001 ATSDR)	% of Total Dioxin Emissions by Georgia Gulf (2001 TRI)	% of Total Dioxin Emissions by Georgia Gulf (2004 TRI)
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	42.70%	35.27%	38.88%
2,3,7,8-Tetrachlorodibenzo-p-dioxin	11.40%	34.75%	36.46%
Hexachlorodibenzo-p-dioxins (3 congeners)	23.10%	7.75%	4.70%
Total	77.20%	77.77%	80.04%

Industrial Facilities & the Dioxins in the Mossville Environment

As part of its 2001 Follow-Up Exposure Investigation, ATSDR conducted dioxin testing of the homes of Mossville residents who participated in the study. ATSDR also tested fruits, nuts, and vegetables grown on the properties of these residents as well as their yard soil, indoor dust, and attic dust. In addition, ATSDR conducted dioxin testing of fish from local waters that are typically eaten by Mossville residents. The test results show that all samples contain dioxins. Thus, as discussed below, adding to the burden of ongoing industrial releases of dioxins are the dioxins that are stored in Mossville residents' household dust and yard soil, and are bioaccumulating in the food they eat.

Dioxins Detected in Attic Dust, Indoor Dust & Yard Soil

The homes, like the bodies of Mossville residents, contain high concentrations of dioxins and dioxin-like compounds which are linked to the emissions of industrial facilities operating in close proximity to Mossville.

ATSDR reported that twelve samples of attic dust collected from Mossville homes had an average total dioxin TEQ concentration of 105.74.³² The lowest concentration of total dioxin TEQ in the attic dust was 0.32 ppt and the highest concentration of total dioxin TEQ was 922.77 ppt.³³ The attic dust samples had the highest concentrations of dioxins and dioxin-like compounds of all the environmental samples collected and analyzed by ATSDR.

ATSDR reported that 15 indoor dust samples (other than attic dust) had an average total dioxin TEQ concentration of 16.78 ppt.³⁴ The lowest concentration of total dioxin TEQ in the indoor dust was 0.26 ppt and the highest concentration of total dioxin TEQ was 83.13 ppt.³⁵

Fig. 3 Comparison of Dioxins in Mossville Soil & Dust and US Soil

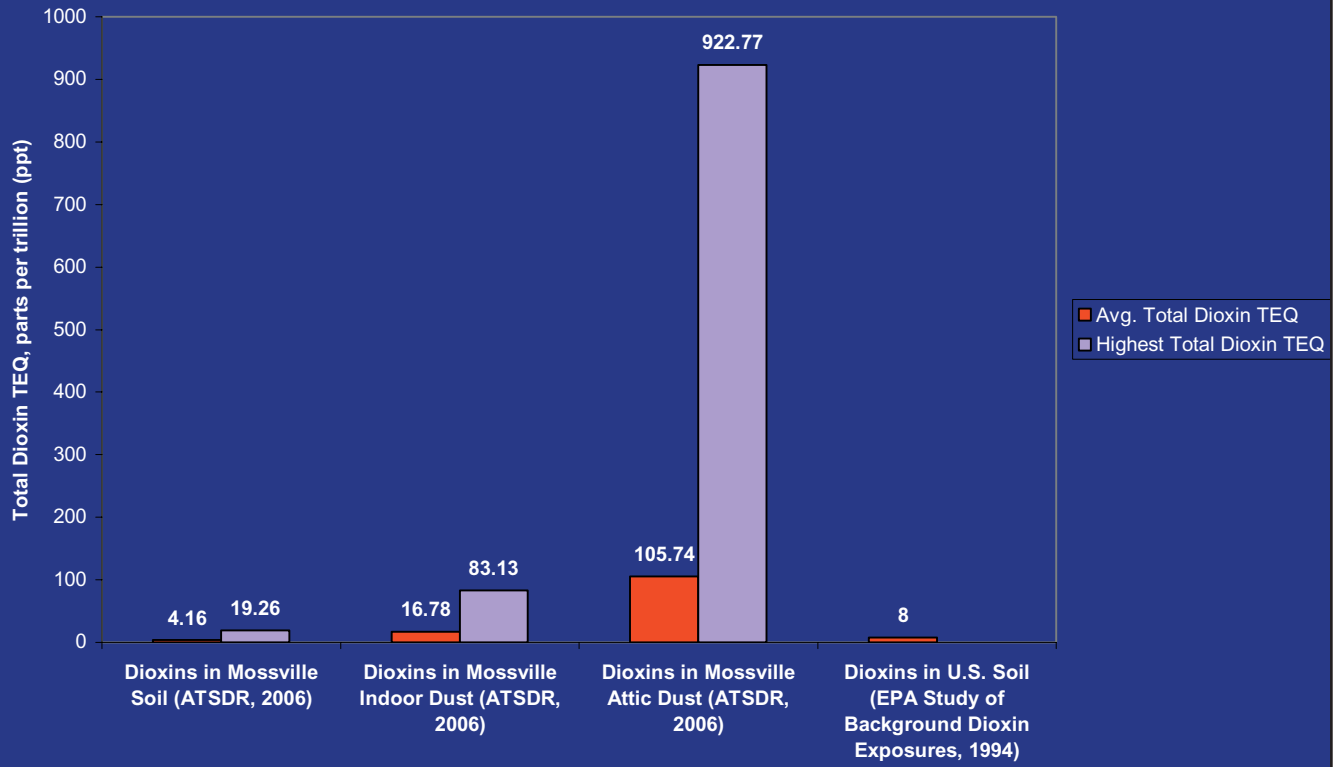
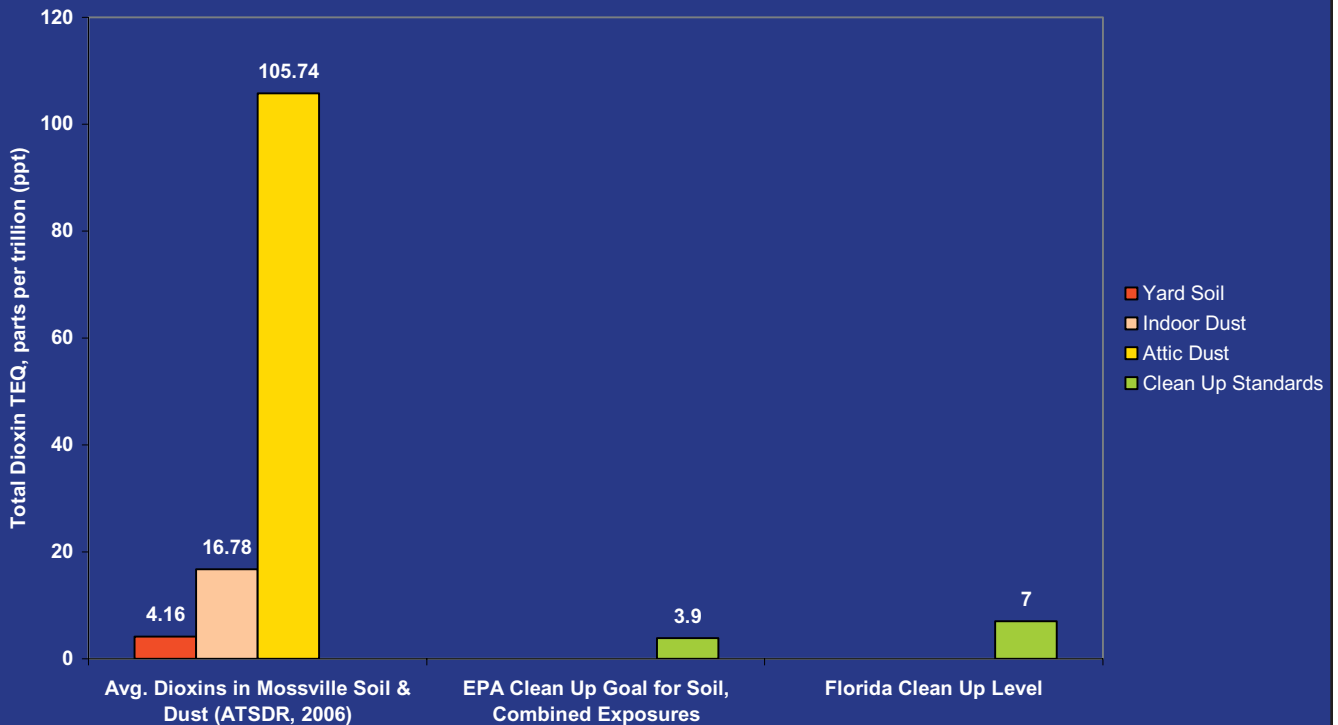
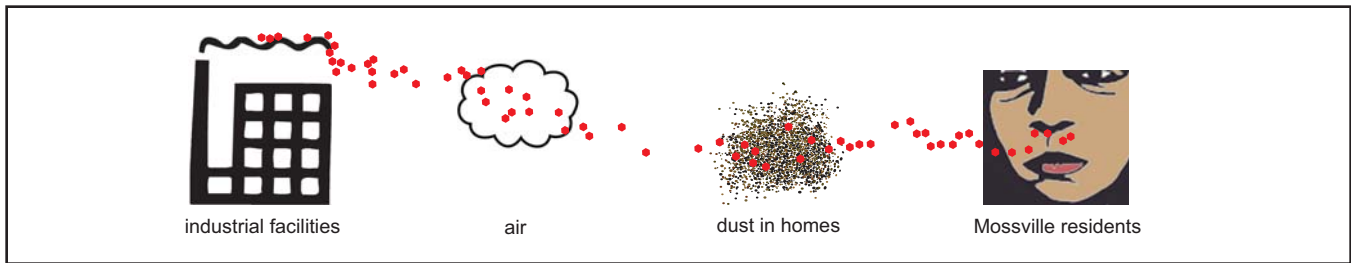


Fig. 4 Comparison of Average Dioxins in Mossville Soil & Dust and Clean Up Standards for Dioxins in Soil





ATSDR reported that 20 yard soil samples had an average total dioxin TEQ concentration of 4.16 ppt.³⁶ The lowest concentration of total dioxin TEQ in yard soil was 0.09 ppt and the highest concentration of total dioxin TEQ was 19.26 ppt.³⁷

EPA has established a clean up goal of 3.9 ppt for total dioxin TEQ concentration in residential soil based on the cancer risk from combined pathways of exposures involving inhalation, skin contact, and ingestion.³⁸ Eleven of the 15 samples of Mossville residents' indoor dust, 9 of the 12 samples of Mossville residents' attic dust, and 7 of the 20 samples of Mossville residents' yard soil contained dioxin levels that exceeded EPA's clean up goal by approximately 2 - 230 times.³⁹ Although these exceedences clearly warrant further evaluation of the potential health risks to Mossville residents, ATSDR concluded that "dioxin concentrations in surface soil [and] indoor dust . . . were not at levels of concern."⁴⁰

Further, the levels of dioxins in most of the Mossville household dust and yard soil samples exceeded the regulatory clean up standard – 7 ppt for total dioxin TEQ concentration in residential soil – that has been established by the state of Florida.⁴¹ (The state of Louisiana has not established any clean up standard for dioxins in soil.)

According to ATSDR's 2001 dioxin data, the largest contributor to the total TEQ of dioxins and dioxin-like compounds detected in the



For several generations, my family has grown our own vegetables and fruits. But now, because the industries have poisoned the soil, I grow my vegetables in pots using organic soil that I have to buy. Poisoned soil means poisoned food and poisoned bodies. I believe in healthy eating, but it is expensive to buy organic food. In Mossville, organic food was our way of life before the industries came.

– Haki Vincent,
Mossville resident



Yard sign in Mossville, LA protesting the industrial contamination of homes by the Vista facility that is now owned by Georgia Gulf.

Industrial Links to the Majority of Dioxins in Mossville Household Dust & Yard Soil

Dioxin Compound	In Mossville Homes (attic dust, indoor dust, and yard soil)	In Industrial Emissions (Georgia Gulf, Conoco Phillips, Entergy, PPG Industries, Sasol)
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin		

attic and indoor dust and yard soil samples is 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin.⁴² This dioxin compound comprises 35% of the total TEQ of dioxins and dioxin-like compounds found in attic dust, 45.9% of the total TEQ of dioxins and dioxin-like compounds found in indoor dust, and 22.9% of the total TEQ of dioxins and dioxin-like compounds found in yard soil.⁴³

The 2001 TRI reports collected by EPA show that this dioxin compound is emitted by Georgia Gulf, Conoco Phillips, Entergy, PPG Industries, and Sasol, which operate near the Mossville community.⁴⁴

ATSDR and EPA have never disclosed to Mossville residents or the public the linkage between the industrial emissions of 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin and other dioxin compounds, and the dioxin compounds detected in attic dust, indoor dust, and yard soil in Mossville.

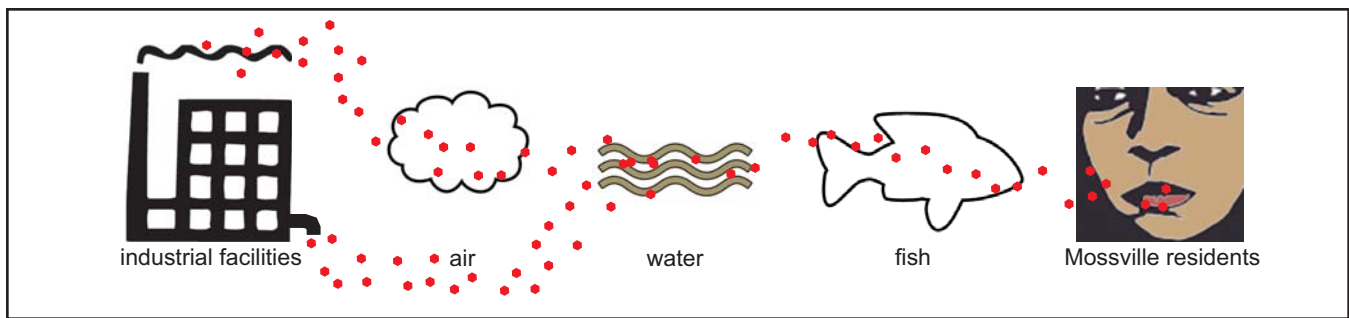
Dioxins, Dioxin-Like Compounds & PCBs Detected in Fish, Fruits, Vegetables & Nuts

For more than 200 years, the people in Mossville have relied on fishing from local waters and growing fruit trees and vegetable gardens as food sources. This is no longer safe because much of the food that Mossville residents typically eat contains high concentrations of dioxins and dioxin-like compounds which are linked to the emissions from industrial facilities operating in close proximity to their community.

Fish ATSDR analyzed fish (garfish, red fish, catfish, mullet, and black drum) that were collected from waters near the Mossville community, much of which were contaminated with unsafe levels of dioxins and PCBs.⁴⁵ These contaminated fish were collected downstream from the cluster of local industrial facilities.⁴⁶ ATSDR does acknowledge that people should not eat fish from local waters due to high levels of dioxins and PCBs,⁴⁷ and LDEQ routinely reports that fish in waters near the Mossville community should not be eaten due to toxic industrial discharges.⁴⁸ However, LDEQ has failed to post highly visible warning signs against fishing in the areas where the fish samples were collected. Some Mossville residents continue to fish in these waters because of the inadequate signage.

ATSDR reported that eight fish samples had an average total dioxin TEQ and PCB concentration of 20.55 ppt.⁴⁹ The lowest concentration of total dioxin TEQ and PCBs was 0.15 ppt and the highest concentration of total dioxin TEQ and PCBs was 65.48 ppt.⁵⁰

EPA recommends that fish containing a total dioxin TEQ concentration of 1.2 ppt or more not be eaten because of the cancer risk.⁵¹



Six of the eight samples of Mossville area fish exceeded the EPA fish consumption limit by approximately 1 to 55 times. Although ATSDR acknowledged that “some fish were at levels of concern,” the agency did no investigation whatsoever regarding the source of the fish contamination.

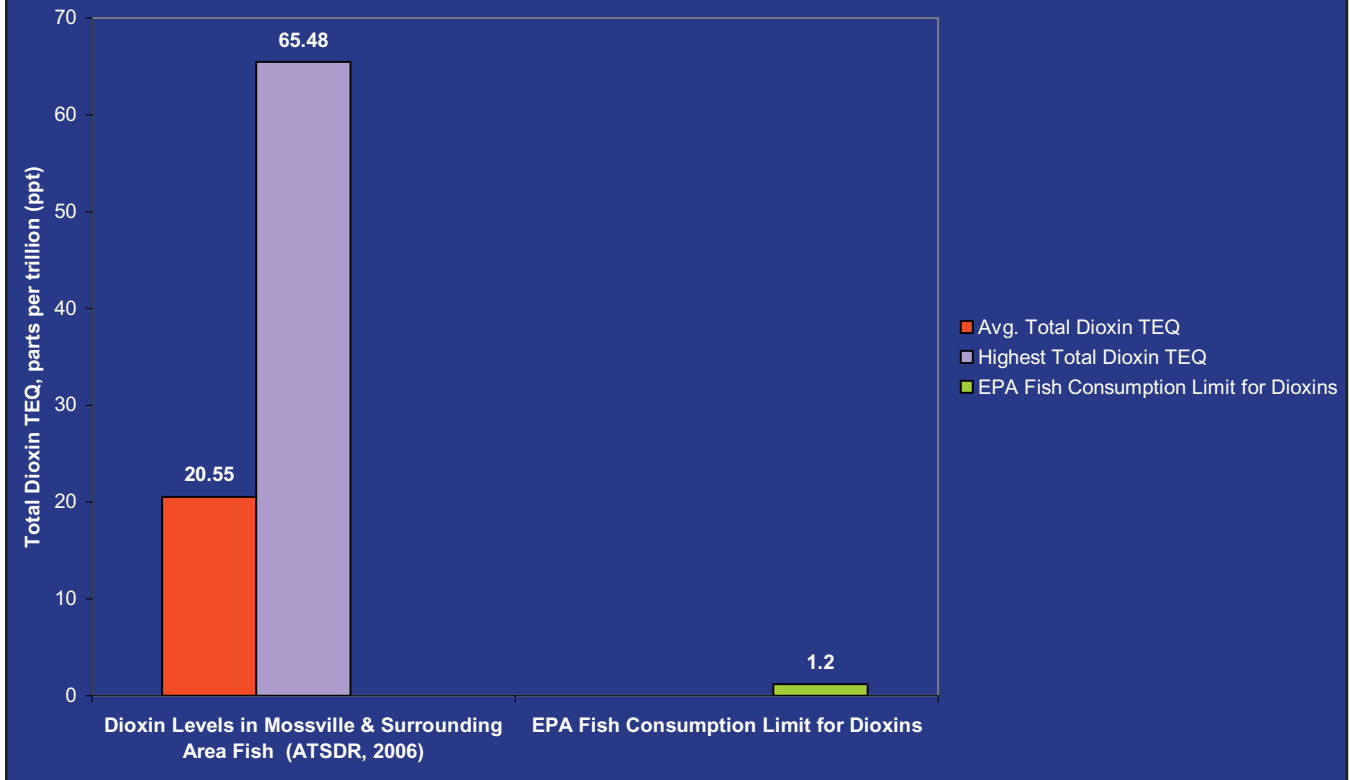
According to ATSDR’s 2001 dioxin and PCB data, the largest contributor of dioxins, dioxin-like compounds, and PCBs detected in two fish samples is 3,3,4,4,5-Pentachlorobiphenyl (PCB 126).⁵² This PCB compound comprises 87% of the total TEQ of dioxins, dioxin-like compounds, and PCBs in one fish sample, and 50% of the total TEQ of dioxins, dioxin-like compounds, and PCBs in another fish sample.⁵³

The 2001 TRI reports collected by EPA show that although no facility in the Mossville area report any emission of PCBs, Georgia Gulf does report that it transfers PCBs to PPG Industries for waste treatment. Several dioxin compounds were also detected in the fish samples.⁵⁴ The 2001 TRI reports collected by EPA show that Georgia Gulf, Conoco Phillips, Entergy, PPG Industries, and Sasol emit the same dioxin compounds that are contaminating the fish.⁵⁵

ATSDR and EPA have never disclosed to Mossville residents or the public the linkage between the dioxin and PCB contamination of local

Industrial Links to the Majority of Dioxins & PCBs in Mossville and Surrounding Area Fish				
Dioxin or PCB Compound	In Fish Collected Downstream	In Industrial Waste Transfers (Georgia Gulf and PPG Industries)	In Industrial Emissions (Georgia Gulf, Conoco Phillips, PPG Industries, Sasol)	In Industrial Emissions (Georgia Gulf, Conoco Phillips, Sasol)
PCB 126	✓	✓		
2,3,4,7,8-Pentachlorodibenzofuran	✓		✓	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	✓			✓
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	✓		✓	

Fig. 5 Comparison of Dioxins in Fish in Mossville & Surrounding Area and the EPA Health Risk-Based Consumption Limit for Dioxins in Fish



fish and the industrial transfers and waste treatment of PCB 126, as well as the industrial emissions of dioxin compounds.

Fruits, Vegetables & Nuts ATSDR reported that nine samples of yard crops (lemons, persimmons, red pepper, turnips, and pecans) contain dioxins, dioxin-like compounds, and PCBs.⁵⁶ Of these samples, three samples of homegrown fruit (two persimmons and one lemon) had an average total dioxin TEQ and PCBs concentration of 0.04 ppt.⁵⁷ The lowest total dioxin TEQ and PCBs concentration in the fruits was 0.01 ppt and the highest total dioxin TEQ and PCBs concentration was 0.06 ppt.⁵⁸

Three samples of vegetables (two turnips and one red pepper) had an average total dioxin TEQ and PCBs concentration of 0.03 ppt.⁵⁹ The lowest total dioxin TEQ and PCBs concentration in the vegetables was 0.01 ppt and the highest total dioxin TEQ and PCBs concentration was 0.06 ppt.⁶⁰

Three samples of pecans had an average total dioxin TEQ and PCBs concentration of 0.03 ppt.⁶¹ The lowest total dioxin TEQ and PCBs concentration in the pecans was 0.01 ppt and the highest total dioxin TEQ and PCBs concentration was 0.06 ppt.⁶²

According to ATSDR's 2001 dioxin and PCB data, the largest contributor to the sum of dioxins, dioxin-like compounds, and PCBs detected in the yard crops is 2,3,4,4',5-Pentachlorobiphenyl (PCB 114.)⁶³ This PCB compound comprises 66% of the total dioxin and PCB con-

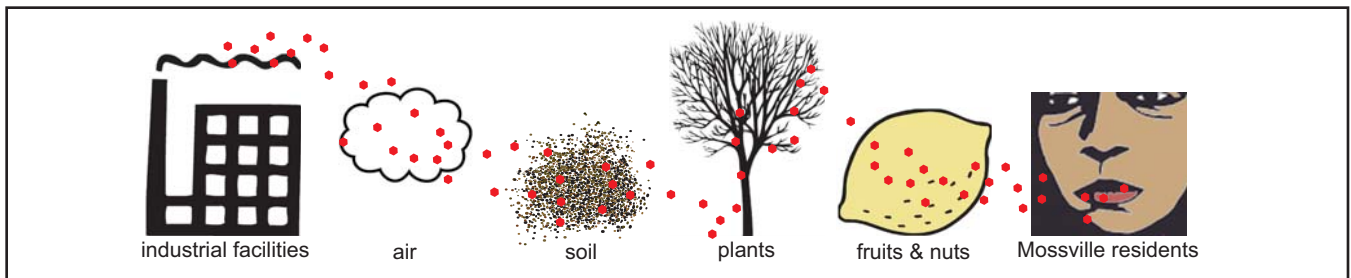
Industrial Links to the Majority of PCBs and Dioxins in Mossville Fruits, Vegetables and Nuts

PCB or Dioxin Compound	In Lemons	In Pecans	In Persimmon	In Turnip Greens	In Industrial Waste Transfers (Georgia Gulf and PPG Industries)	In Industrial Emissions (Georgia Gulf, Conoco Phillips, Entergy, PPG Industries, Sasol)
PCB 114	✓	✓	✓	✓	✓	
PCB 126	✓	✓	✓	✓	✓	
1,2,3,4,6,7,8-Heptachloro-dibenzo-p-dioxin	✓		✓			✓

centration found in lemons, pecans, persimmon, and turnips.⁶⁴ In addition, the data showed that 3,3,4,4,5-Pentachlorobiphenyl (PCB 126) comprises 90% of the total TEQ of dioxin and PCBs detected in a sample of persimmon, and was also present in samples of lemon, pecan, and turnip greens.⁶⁵

The 2001 TRI reports collected by EPA show that although no facility in the Mossville area reports any emission of PCB 114 or PCB 126, Georgia Gulf does report that it transfers PCBs to PPG Industries for waste treatment.⁶⁶ Several dioxin compounds were also detected in the yard crop samples. The 2001 TRI reports collected by EPA show that Georgia Gulf, Conoco Phillips, Entergy, PPG Industries, and Sasol emit the same dioxin compound, 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin, that contributed the most to the sum of dioxins and dioxin-like compounds detected in the lemon and persimmon samples.⁶⁷

ATSDR and EPA have never disclosed to Mossville residents or the public the linkage between the PCBs and dioxins found in the fruits, vegetables, and nuts grown by Mossville residents, and the industrial transfers and waste treatment of PCB 114 and PCB 126, as well as the industrial emissions of dioxin compounds.



Who's Protecting the Human Right of Mossville Residents to a Healthy Environment?

Although ATSDR, EPA, LDHH, LDEQ, and former Louisiana Governor Mike Foster (who was in office at the time of ATSDR's initial 1998 dioxin exposure investigation) have publicly stated their commitment to finding the source of dioxin exposures in Mossville and protecting the health and the environment of residents, the actions taken by these agencies entirely undermine their stated commitment to the people of Mossville.

This report demonstrates how an analysis of the data generated and collected by ATSDR and EPA clearly shows the linkages between industrial emissions of dioxins and dioxin-like compounds and the dioxin exposures suffered in the Mossville community. Although these agencies claim a commitment to investigating the source of this dioxin exposure, they have only focused resources on testing and re-testing for the presence of dioxins in the blood and environment of Mossville residents, without any diligent search for the sources of the dioxin. These agencies have never disclosed the information contained in this report, which points toward industrial facilities as the sources of the elevated dioxin levels in the Mossville community.

Furthermore, notwithstanding the incontrovertible fact that dioxin exposure is a serious threat to human life and health, ATSDR



My name is RaJohnna Jackson and I am 6 years old. I have trouble breathing all the time. When I am sleeping I have to use a breathing machine and the doctors are surprised that I can't get better. I live in Mossville and it has big plants that spit fire and toxins. I see lots of sick people, and I ask my mother 'why?'

– RaJohnna Jackson,
Mossville resident



Members of Mossville Environmental Action Now and staff of Advocates for Environmental Human Rights in front of the Organization of American States building in Washington, D.C. just moments after filing a human rights petition on March 7, 2005 that seeks health protections for Mossville residents and reform of the U.S. environmental regulatory system that has allowed the violation of the human rights to health, life, and racial equality in Mossville and numerous other similarly-situated communities of color.



We have tried every way to protect our community using environmental and civil rights laws, but the government has set it up so that we can't get justice. Because we are fighting for our human rights to live and see our children grow up in a healthy environment, we need a major change in our government that stops the environmental destruction of Mossville and other communities of color. U.S. laws allow environmental racism, but human rights law prohibits this injustice."

– Delma Bennett,
Mossville resident

has not offered any meaningful assistance to Mossville residents in formulating an effective and expeditious method for addressing their situation, nor has ATSDR recommended that EPA or any other agency take action to prevent the critical public health threat of dioxin exposure in Mossville.⁶⁸ In fact, ATSDR has repeatedly broken promises to assist the community in obtaining health services, and has failed to provide residents with a significant role in formulating any potential public health response to the toxic exposures.⁶⁹

State agencies were the first to receive complaints regarding dioxin exposures in the Mossville community, but refused to conduct an investigation.⁷⁰ In fact, LDHH has been openly hostile to research that links dioxin exposures in Mossville to industrial facilities.⁷¹ Meanwhile, LDEQ continues to approve permits for Mossville-based industries that allow them to increase their emissions of dioxin and other toxic pollutants.⁷²

Notwithstanding these considerable obstacles from the government, Mossville residents continue the struggle to protect their health and future generations from industrial toxic exposure that threatens their very survival. They have organized in defense of their basic human rights. In March 2005, Mossville Environmental Action Now brought the first ever environmental human rights legal challenge against the U.S. government for establishing an environmental regulatory system that deprives people of their fundamental human rights to life, health, racial equality, and a healthy environment. Advocates for Environmental Human Rights prepared the human rights petition on behalf of Mossville residents, and filed the petition with the Inter-American Commission on Human Rights of the Organization of American States, which investigates complaints of human rights violations occurring in the United States and 33 other countries in the Western Hemisphere.

The Mossville petition seeks remedies for these human rights violations, and requests that the Inter-American Commission on Human Rights recommend that the United States:

1. provide medical services to Mossville residents suffering from diseases and health problems associated with environmental toxic exposures, including health monitoring services;
2. offer appropriate relocation to consenting Mossville residents that allows them to live in healthier environs, away from toxic industrial facilities and contaminated sites;
3. refrain from issuing environmental permits and other approvals that would allow any increase in pollution by existing industrial facilities located in close proximity to the Mossville community, and refrain from issuing any environmental permits and other approvals that would allow the introduction of any new industrial facility in the Mossville area; and
4. reform its existing environmental regulatory system to:
 - a. require a safe distance between a residential population and a hazardous industrial facility so that the population is not located within the area where deaths or serious injury would

result in the event that a toxic or flammable substance stored, processed, or generated by the facility would be released to the environment through explosion, fire, or spill;

- b. establish in all regulatory programs pollution limits that prevent harm to human health and the environment from multiple, cumulative, and synergistic pollution exposures; and
- c. remedy past practices and prohibit future actions that intentionally or inadvertently impose racially disproportionate pollution burdens.

Advocates for Environmental Human Rights will request that the Inter-American Commission on Human Rights conduct an investigative, fact-finding mission in Mossville, Louisiana, and convene an adjudicative hearing on this human rights petition.

Recommendations

ATSDR is a federal governmental agency whose stated mission is “to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and disease related to toxic substances.” EPA is also a federal governmental agency whose stated mission is “to protect human health and the environment.” Clearly, both ATSDR and EPA have ignored these missions by conducting a dioxin exposure investigation in Mossville spanning seven years that fails to take into account the dioxin emissions of industrial facilities operating in close proximity to Mossville. Allowing industrial facilities to release massive quantities of harmful chemicals, including dioxins, into the environment without regard for the long-term effects on human health and the environment completely contradicts the missions of both ATSDR and EPA.

Agencies can and must take action to protect human health and the environment in Mossville as well as the numerous other people of color and poor communities that are disproportionately burdened with toxic pollution. Agencies must address the human health impacts of toxic chemicals as a first priority in their permitting, monitoring, and enforcement activities. Agencies should particularly target dioxins and dioxin-like compounds that last in the environment for several years and increase in concentration as they move up the food chain. This would require agencies to investigate sites that were previous sources of dioxins and dioxin-like compounds, as well as existing facilities that emit or transfer dioxins and dioxin-like compounds. Such investigations must involve analyzing dioxins and dioxin-like compounds in the blood of people who live in the surrounding area, as well as facility workers. Vegetation, fish and shellfish, animals, yard soil, and household dust must also be tested for dioxins and dioxin-like compounds.

Further, it is crucial that governmental agencies make every effort to inform test participants and the public of their investigations and results, which includes ensuring that the information is readily acces-

I was born in Mossville and lived most of my 73 years in this community. In the past, no one would go hungry in Mossville because the bayous and lake had lots of fish, and just about every family grew vegetables or fruits. But, the parish, state, and federal government have sacrificed Mossville to the big industrial companies that profit from poisoning our community. There is no place or person in Mossville that has not been harmed by the toxic chemicals spewed out by all of the industrial facilities. Instead of our government helping our community to become healthy, we see our government helping the industries to release more and more pollution.”

– Edgar Mouton, Jr.,
Mossville resident

sible and easily understood. Most importantly, agencies must use all available information to identify the sources of dioxin exposure and take action that protects human health and our environment from the dioxin sources. Such action should include the reduction of dioxin emissions, environmental remediation, residential relocation, health monitoring, and substitution of safe chemical manufacturing, storage, and transportation practices for unsafe industrial processes.

With respect to Mossville in particular, immediate action must be taken by ATSDR and EPA to eliminate the local sources of dioxins and dioxin-like compounds detected in the blood and environment of Mossville residents. As the primary sources of dioxins and dioxin-like compounds are identified and eliminated, all appropriate actions must be taken to reduce exposures from any remaining reservoir sources such as soils, sediments, and biota. The remediation of such reservoir sources should be adequate to protect and preserve the rights of Mossville residents to maintain their chosen levels of food self-sufficiency through gardening, animal husbandry, hunting, and fishing, without the threat of dioxins and dioxin-like compounds. All willing Mossville residents should be relocated and provided with long-term medical monitoring, and a moratorium should be issued immediately prohibiting any new permits for activities or enterprises that release dioxins and dioxin-like compounds in or near Mossville. ■



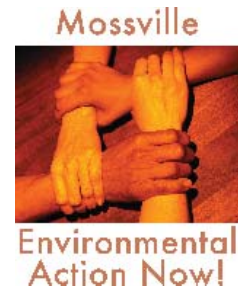
Who's in control? It's not the government, but it is industrial corporations. I and other Mossville residents have learned to use air monitors and brought the test results showing high levels of pollution to the agencies, but the agencies say they can't stop issuing permits to the facilities. I have tried to stop the government from cutting a road through my property so that more trucks loaded with the industries' toxic products can travel. It's up to us to take back control to save our community of Mossville.

– Haki Vincent,
Mossville resident

About the Authors

Mossville Environmental Action Now, Inc. is a volunteer community organization whose members are residents of Mossville, Louisiana. M.E.A.N. seeks to achieve environmental justice by educating local residents about the health and environmental impacts of toxic pollution, compelling federal and state environmental agencies to enforce existing laws, and advocating for health services, relocation, and pollution reduction to improve the lives and health of residents.

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Wilma Subra is a chemist who provides technical assistance to community groups which helps them to understand the harmful impacts of toxic pollution on their health and environment. She works hand-in-hand with community residents to take action to preserve their health and the health of their children.

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Advocates for Environmental Human Rights is a nonprofit, public interest law firm that provides legal services, community organizing support, public education, and advocacy campaigns focused on defending and advancing the human right to a healthy environment. AEHR concentrates on what is at the heart of the struggle for environmental justice – the protection of life, health, and racial equality – by applying human rights laws and mechanisms to remedy governmental systems that subject communities, especially communities of color, to severely toxic environments.

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Endnotes

¹The fourteen industrial facilities clustered within one-half mile of Mossville (and their products) are as follows:

- Air Liquide (oxygen, nitrogen, and hydrogen gas)
- Arch Chemical (hydrazine and specialty chemicals)
- Biolab (water treatment biocides and specialty chemicals)
- Certainteed (polyvinyl chloride polymer)
- Georgia Gulf (vinyl chloride monomer)
- Sasol (specialty chemicals)
- Conoco Phillips (petroleum products)
- Entergy – Roy S. Nelson Power Plant (electricity from coal and natural gas)
- Excel Paralubes (“Group II base oil,” which is the primary base stock in motor oil)
- Lyondell (toluene diisocyanate (“TDI”) and nitric acid)
- PHH Monomers (polyvinyl chloride polymer)
- PPG Industries (chlorine, vinyl chloride, and other chemicals)
- Tessenderlo Chemical (sodium hydrosulfide)
- Tetra Chemicals (calcium chloride)

²See EPA Toxic Release Inventory for facilities listed in Endnote 1.

³See Wilma Subra, Environmental Impacts in Communities Adjacent to PVC Production Facilities, available at http://www.pvcinformation.org/assets/pdf/Wilma_Subra_report_on_PVC_fenceline_communities.pdf [accessed 7/12/07]. (“In June 1999, EPA conducted ambient air monitoring The monitor detected vinyl chloride in the Mossville community. . . . All of the vinyl chloride concentrations in the ambient air exceeded the Louisiana Ambient Air Criteria [with some concentrations] as much as 102 times the vinyl chloride standard”)

⁴Louisiana Department of Environmental Quality, Water Quality Inventory Section 305(b) 2000.

⁵Id. See also Mark S. Curry et al, U.S. National Oceanic and Atmospheric Agency, Contamination Extent Report and Preliminary Injury Evaluation for Calcasieu Estuary, 56-DGNC-5-50107, Section A-4: “Toxic Water Pollution Threatening the Health of Mossville Residents” (1997).

⁶Sunny Brown, “DEQ Voices Its Concern about Aquifer,” AMERICAN PRESS (Lake Charles, LA), p. 8, Feb. 2, 1995.

⁷Dr. Marvin Legator, University of Texas at Galveston Medical Branch, Mossville Symptom Health Survey (1998).

⁸Id.

⁹Liz Maples, “Survey: Community Is ‘Very Sick,’” AMERICAN PRESS (Lake Charles, LA), p. B-1, Oct. 2, 1998.

¹⁰Sources of dioxin include waste and fuel combustion, refining processes, vinyl and chemical manufacturing. National Center for Environmental Assessment, Environmental Protection Agency, Inventory Sources and Releases of Dioxin-like Compounds in the United States (1999); EPA, The Inventory of Sources of Dioxins in the United States – External Review Draft, 2-1, EPA/600/P-98/002Aa (1998).

In Mossville, eight industrial facilities engage in these processes: Certainteed (vinyl chemical manufacturing), Conoco Phillips (oil refining), Entergy Roy S. Nelson Plant (fuel combustion), Georgia Gulf (vinyl chemical manufacturing), Lyondell (chemical manufacturing), PHH Monomers (vinyl chemical manufacturing), PPG Industries (vinyl chemical manufacturing), and Sasol (chemical manufacturing). These facilities, with the exception of Certainteed and PHH Monomers, are required by federal environmental law to annually report their emissions of dioxin into the environment.

¹¹B. Eskenazi et al., Serum Dioxin Concentrations and Menstrual Cycle Characteristics, 156 AMERICAN JOURNAL ON EPIDEMIOLOGY 383 (2002); M. Kogevinas, Human Health Effects of Dioxins: Cancer, Reproductive and Endocrine System Effects, 7 HUMAN REPRODUCTION UPDATE 331 (2001); P. Mocarelli et al., Paternal Concentrations of Dioxin and Sex Ratio of Offspring, 355 LANCET 1858 (2000); M. Warner et al., Serum Dioxin Concentrations and Breast Cancer Risk in the Seveso Women’s Health Study, 110 ENVIRONMENTAL HEALTH PERSPECTIVES. 625 (2000).

¹²ATSDR, Toxicological Profile for Chlorinated Dibenzo-o-dioxins (CDDs) (1998), available at <http://www.atsdr.cdc.gov/toxpro2.html#Final> [accessed 7/12/07].

¹³EPA, The Inventory of Sources of Dioxins in the United States, External Review Draft, 2-1, EPA/600/P-98/002Aa (1998).

See note 1.

¹⁴ATSDR, Division of Health Consultation, Health Consultation: Exposure Investigation Report, Calcasieu Estuary (a/k/a Mossville), Calcasieu Parish, Louisiana, CERCLIS No. LA0002368173 (Nov. 19, 1999). Without explanation, in 2006 ATSDR reported that the average level of dioxin in the blood of Mossville residents collected in 1998 was 68.5 ppt (see note 16, below), rather than the 68.3 ppt reported in its November 19, 1999 Health Consultation.

See also Pat Costner, Dioxin & PCB Contamination in Mossville, Louisiana: A Review of the Exposure Investigation by ATSDR, (Greenpeace: Feb. 23, 2000) available at <http://pvcinformation.org/assets/pdf/DioxinMossville.pdf> [accessed 7/12/07]. Without explanation, in 2006 ATSDR reported that the average level of dioxin in the blood of Mossville residents collected in 1998 was 68.5 ppt (see note 18, below), rather than the 68.3 ppt reported in its November 19, 1999 Health Consultation.

¹⁵ATSDR, Division of Health Consultation, Health Consultation: Exposure Investigation Report, Calcasieu Estuary (a/k/a Mossville), Calcasieu Parish, Louisiana, CERCLIS No. LA0002368173, p. 11 (Nov. 19, 1999).

¹⁶Id. at p. 7.

¹⁷Id.

¹⁸Dr. Peter Orris and Katherine Kirkland, Cook County Hospital, Division of Occupational and Environmental Medicine, Report on Consulting Activities Related to Mossville, LA (Nov. 4, 1999).

¹⁹ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 1 (March 13, 2006).

²⁰See ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 11, 37 (March 13, 2006) (first, noting on p. 11 that the mean dioxin concentration in the blood samples of all Mossville residents collected in 2001 (calculated in total toxic equivalents or "TEQs") is 61.0 parts per trillion or ppt, and stating that the mean dioxin concentration in the blood samples of all Mossville residents collected in 1998 was 68.5 ppt; and secondly, acknowledging on p. 37 that "mean dioxin concentrations . . . were elevated when compared to different reference populations.")

²¹See Pat Costner, Dioxin & PCB Contamination in Mossville, Louisiana: A Review of the Exposure Investigation by ATSDR, p. 1 (Greenpeace: Feb. 23, 2000), p. 1 available at <http://pvcinformation.org/assets/pdf/DioxinMossville.pdf> [accessed 7/12/07] (noting that the ATSDR dioxin study results show that "[t]he blood of . . . Mossville residents carries an average concentration of dioxins . . . that is more than the three times higher than the average concentration of the 'background' level represented by ATSDR's comparison group.")

²²ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 35 (March 13, 2006).

²³Id. at pp. 13, 38.

²⁴Id. at p. 12.

²⁵ EPA Region 9, User's Guide and Background Technical Document for US EPA Region 9's Preliminary Remediation Goal (PRG) Tables, October 2004, <http://www.epa.gov/region09/waste/sfund/prg/files/04usersguide.pdf> [accessed 7/12/07]; EPA Region 6, Human Health Medium-Specific Screening Levels, December 2006, http://www.epa.gov/earth1r6/6pd/rcra_cp/n/screen.htm [accessed 7/12/07].

²⁶See id. (ATSDR reporting that the highest total dioxin TEQ concentration in the Mossville surface soil samples was 19.26 ppt). The State of Florida has established 7 ppt as the target cleanup level for dioxin in soil. Florida Administrative Code, Chapter 62-77, Table II Soil Clean Up Target Levels.

²⁷ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, pp. 13-14 (March 13, 2006).

²⁸ATSDR, Media Announcement: "ATSDR to Release Preliminary Results of 2002 Louisiana Dioxin Study and 2001 Follow-Up Study Investigation at Public Meetings in Westlake and Lafayette, LA" (April 29, 2003) available at <http://www.atsdr.cdc.gov/NEWS/calcasieula042903.html#2001> [accessed 7/12/07].

²⁹ATSDR, Data Sheet: "Congener Concentrations for Exposure Investigation Participants,

2001 Sampling & 1997-1998 Sampling Results" (August 2, 2006).

³⁰EPA, Toxic Release Inventory (2001).

³¹EPA, Toxic Release Inventory (2004).

³²ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 13 (March 13, 2006).

³³Id.

³⁴Id.

³⁵Id.

³⁶Id.

³⁷Id.

³⁸EPA Region 9, User's Guide and Background Technical Document for US EPA Region 9's Preliminary Remediation Goal (PRG) Tables, October 2004, <http://www.epa.gov/region09/waste/sfund/prg/files/04usersguide.pdf> [accessed 7/12/07]; EPA Region 6, Human Health Medium-Specific Screening Levels, December 2006, http://www.epa.gov/earth1r6/6pd/rcra_cp/n/screen.htm [accessed 7/12/07].

³⁹Wilma Subra, Analysis of ATSDR, Data Sheet: "Mossville Exposure Investigation Lab Data, Environmental Sampling Results" (August 2, 2006) (on file with author).

⁴⁰ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 38 (March 13, 2006).

⁴¹Id. The State of Florida has established 7 ppt as the target cleanup level for dioxin in soil. Florida Administrative Code, Chapter 62-77, Table II Soil Clean Up Target Levels.

⁴²Wilma Subra, Analysis of ATSDR, Data Sheet: "Mossville Exposure Investigation Lab Data, Environmental Sampling Results" (August 2, 2006) (on file with author).

⁴³Id.

⁴⁴EPA, Toxic Release Inventory (2001).

⁴⁵ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 12 (March 13, 2006).

⁴⁶ATSDR, Fact Sheet: "Preliminary Results, 2001 Follow-Up Exposure Investigation" (March 2003).

⁴⁷ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 38 (March 13, 2006).

⁴⁸LDEQ, Water Quality Inventory Section 305(b) (2000).

⁴⁹ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 13 (March 13, 2006).

⁵⁰Id.

⁵¹EPA, Office of Water, Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, vol. 2 Risk Assessment and Fish Consumption Limits, Third Edition, November 2000 (EPA 823-B-00-008), <http://www.epa.gov/ost/fishadvice/volume2/v2ch4.pdf> [accessed 7/12/07].

⁵²Wilma Subra, Analysis of ATSDR, Data Sheet: "Mossville Exposure Investigation Lab Data, Biological Sampling Results" (August 2, 2006) (on file with author).

⁵³Id.

⁵⁴EPA, Toxic Release Inventory (2001).

⁵⁵Id.

⁵⁶ATSDR, Health Consultation: Follow-Up Exposure Investigation, Calcasieu Estuary (a/k/a Mossville), Lake Charles, Calcasieu Parish, Louisiana, EPA Facility ID: LA0002368173, p. 13 (March 13, 2006).

⁵⁷Id.

⁵⁸Id.

⁵⁹Id.

⁶⁰Id.

⁶¹Id. at p. 14.

⁶²Id. at p. 14.

⁶³Wilma Subra, Analysis of ATSDR, Data Sheet: "Mossville Exposure Investigation Lab Data, Environmental Sampling Results" (August 2, 2006) (on file with author).

⁶⁴Id.

⁶⁵Id.

⁶⁶EPA, Toxic Release Inventory (2001).

⁶⁷Id. Wilma Subra, Analysis of ATSDR, Data Sheet: "Mossville Exposure Investigation Lab Data, Environmental Sampling Results" (August 2, 2006) (on file with author).

⁶⁸See National Environmental Justice Advisory Council, Meeting Summary of the Joint Session of the Health & Research and the Waste & Facility Site Subcommittees, (discussion of the Mossville dioxin exposure investigation), May 25, 2000 available at <http://www.epa.gov/compliance/resources/publications/ej/nejac/nejacmtg/sum-wst-hlth-subcom-0500.pdf> [accessed 7/12/07].

⁶⁹Id.

⁷⁰"I have concluded that no further investigation is needed." Letter from Frank J. Welch, Medical Director, Environmental Epidemiology & Toxicology, Louisiana Department of Health and Hospitals, to Robert C. McCall (Oct. 8, 1997).

⁷¹David W. Hood, Secretary of Louisiana Department of Health and Hospitals, Letter to the Editor: "DHH Only Interested in Facts," AMERICAN PRESS (Lake Charles, LA), Oct. 17, 1999 (criticizing the findings of a health assessment conducted by an ATSDR consultant that linked dioxin exposures to industrial pollution as "unscientific opinions" that "unduly increase the fears and concerns of residents.")

⁷²LDEQ has approved permits that allow dioxin-generating facilities in Mossville to increase pollution after ATSDR's dioxin exposure investigation documented elevated levels of dioxin in the blood of Mossville residents. The following LDEQ permit decisions, which allow an additional 648,560 pounds of toxic pollution to be released each year, are examples of the continuing industrial pollution increases in the Mossville community:

- LDEQ, Public Notice, Conoco Phillips Company, Proposed Part 70 Air Operating Permit Renewal, May 26, 2005 (Permit issued July 6, 2005).
- LDEQ, Public Notice, PPG Inc., Vinyl Chloride Production Unit, Proposed Initial Part 70 Air Permit, May 2, 2005 (Permit issued July 7, 2005).
- LDEQ, Public Notice, Conoco Phillips Company, Proposed Modification of a Minor Air Permit, May 2, 2005 (Permit issued June 14, 2005).

**Industrial Sources of Dioxin Poisoning in Mossville, Louisiana:
A Report Based on the Government's Own Data**

revised July 2007

