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Georgia Environmental Advocacy Groups Health Education Needs Assessment

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GEORGIA ENVIRONMENTAL ADVOCACY GROUPS HEALTH
EDUCATION NEEDS ASSESSMENT

By

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M.S., GEORGIA STATE UNIVERSITY

B.S., University of Georgia

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ABSTRACT

Georgia State University's Institute of Public Health along with the Georgia Department of Public Health's Chemical Hazards Program conducted a needs assessment survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. The purpose of the Georgia Environmental Advocacy Groups Health Education Needs Assessment was to better understand community concerns, to identify hazardous waste sites that might warrant some degree of public health evaluation, to find community leaders and personnel interested in assisting the Chemical Hazards Program in implementing public health interventions, to inform the community about the services offered to the public by the Georgia Department of Public Health and to better understand the best methods for distributing health education material. This is the first time the Chemical Hazards Program has conducted an environmental advocacy group leader needs assessment. The results of this pilot study will help the development of future needs assessments conducted by the CHP.

Survey development began in August of 2011 and Georgia State University Institutional Review Board approval was granted January 2012. Participants were selected due to their current leadership role of a Georgia environmental advocacy group/organization. Contact information was found for 137 environmental group leaders. Depending on available contact information, potential participants either received the survey through the mail or electronically via email. Surveys were distributed on January 13, 2012 and had to be returned by February 20, 2012.

Twenty-one Georgia environmental advocacy group leaders participated in the survey. A majority of participants cited protect/restore natural habitats as the main purpose of their organization, but the survey did reveal 10 environmental groups that focused on protecting human health. Seven of participants that were dedicated to protecting human health expressed interest in working further with the GDPH to develop or implement public health interventions. The survey was also successful in informing participants about the Chemical Hazards Program. Prior to the needs assessment, more than 80% of participants were not aware of the program. Many pertinent suggestions were also made to aid in the development of the brochure aimed at educating community members about the services offered by the CHP.

Although a variety of environmental health concerns were cited by the participants, water quality was most often mentioned. More participants reported they were very concerned about drinking water than any other environment. Ninety percent also reported being either concerned or very concerned about contamination in oceans, lakes and streams. A section of the survey also addressed hazards found within the home, unclean drinking water was selected by far the most often as being of greatest concern compared to all other indoor hazards. Many participants listed specific waste or industrial sites that are of concern among members of their community as a source of contaminants. A few contaminated environments were also listed including specific rivers and lakes. Though many did not list specific sources, the majority of participants cited water contamination as being a chemical contamination issue that has the greatest impact on human health.

The survey helped reveal specific community concerns regarding potential chemical contaminants and sites that may lead to the CHP conducting public health assessments/consultations and exposure investigations. The survey also revealed the need for general environmental health education and intervention activities based on concerns of the participants as well as the lack of concern by many. The survey was also successful in identifying individuals that may help the CHP gain future partnerships and identifying creative methods for distributing health education material. The CHP plans to follow-up with many of the participants and the survey will be further developed and used to survey other leaders, community members, and public health workers etc. to further investigate the needs and concerns of communities across Georgia.

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Chapter I Introduction

1.1 Purpose

The mission of the Georgia Department of Public Health's Chemical Hazards Program is "to prevent illness and promote quality of life through the reduction and elimination of exposures to hazardous chemicals in the environment" (Chemical Hazards Program, 2012). Their specific goals are to "identify people at risk for health problems as a result of exposure to hazardous substances in the environment, determine relationships between exposure to hazardous substances in the environment and human diseases and eliminate exposures of health concern and prevent negative human health outcomes related to hazardous substances in the environment." In order to accomplish these goals, the program conducts public health assessments, provides technical assistance, creates and distributes health education material, fosters community involvement, assists with health Studies and with the training of professional in public health disciplines (Chemical Hazards Program, 2012).

Georgia State University's Institute of Public Health and the Georgia Department of Public Health conducted a pilot needs assessment to primarily learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. The purpose of the Georgia Environmental Advocacy Groups Health Education Needs Assessment was to also inform the Georgia Department of Public Health about community public health concerns so they can help communities by conducting public health assessments and consultations, exposure investigation, community involvement/health education and other site-specific activities. The purpose of the needs assessment was to also identify new potential hazardous substances concerns among community members so the GDPH can conduct investigations into potential sources of chemical exposures. In addition to identifying community

environmental health concerns, the purpose of the needs assessment is to identify community leaders and personnel skilled in implementing public health interventions and to inform the community about the services offered to the public by the Georgia Department of Public Health. The results of the pilot survey also will help the CHP develop and conduct future community environmental health education needs assessment.

1.2 Project Goals

1. To understand community concerns pertaining to environmental hazards in their community and in the households in their community.
2. To identify individuals interested in forming community partnerships to assist the Chemical Hazards Program in implementing public health interventions.
3. To inform the community about the services offered to the public by the GDPH and the Chemical Hazards Program
4. To identify additional community health concerns about hazardous waste sites and other environmental pollution.
5. Better understand the best ways to get health information to community members.

Chapter II Literature Review

2.1 Environmental Protection Agency and ATSDR

The United States Environmental Protection Agency is a federal government agency with a mission to protect human health and the environment and “ensure that all Americans are protected from significant risks to human health and the environment where they live, learn and work” (EPA mission, 2012). In order to follow through with their mission, the EPA creates rules and regulations that are decided on by congress. Once passed, the EPA helps with regulating and enforcement of the laws.

The Toxic Substances Control Act of 1976 gave authority to the EPA for regulating and enforcing standards regarding the production, importation, use, and disposal of specific chemicals including new and existing chemicals. Examples of chemicals currently regulated in polychlorinated biphenyls (PCBs), asbestos, radon, lead-based paint etc. Chemicals are placed on the list of regulated chemicals if they are deemed potentially harmful with an “unreasonable risk of injury to human health or the environment” (EPA TSCA, 2012).

The Pollution Prevention Act passed in 1993 also gave authority to the EPA for creating programs aimed at reducing the amount of pollution through changing the practices of both private industries and the government. This includes “procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control” in order to reduce the amount of hazardous material that is released into the environment (EPA Pollution Prevention Act, 2012). Another Acts aimed at protecting the health of humans and the environment is the Federal Insecticide, Fungicide, and Rodenticide Act which allows the EPA to regulate pesticide distribution, sale, and use. The

Federal Food, Drug, and Cosmetic Act is mostly regulated by the U.S. Food and Drug Administration to ensure the safety of food, drugs, and cosmetics, but the EPA does assist in the regulation of pesticides on food (EPA OCSPP, 2012).

The Resource Conservation and Recovery Act (RCRA) also gave the EPA the authority to manage and regulate industries that deal with hazardous waste, including the generation, transportation, treatment, storage, and disposal of hazardous waste. Since its creation in 1976, RCRA has gone through many amendments which increased and specified its standards for hazardous waste management. This included amendments to specify standards for underground storage tanks, requirement for permits to store hazardous wastes, restrictions on waste disposal, as well as standards for air emissions from hazardous waste combustors (EPA RCRA, 2012).

2.2 CERCLA, Superfund Sites and the National Priority List

The Comprehensive Environmental Response, Compensation, and Liability Act provides funding for the “clean-up of uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment” (EPA CERCLA, 2012). CERCLA sites are hazardous waste sites that may need remediation due to the release of hazardous substances into the environment. Currently, there are over 500 identified sites within the state of Georgia (EPA Superfund Site Information, 2012).

CERCLA also provided the legal basis for the National Priority List. It provides the funding for site assessments, action plans, and remediation when a responsible party cannot be found. If a Superfund site is deemed a top priority it is placed on the National Priority List. A site may be nominated for the NPL if it receives a high rating from the EPA Hazards Ranking

System, a state designates it as a top priority site, or if the site meets all of the following the criteria:

1. The Agency for Toxic Substances and Disease Registry (ATSDR) has issued a health advisory that recommends removing people from the site.
2. EPA determines the site poses a significant threat to public health.
3. EPA anticipates it will be more cost-effective to use NPL authority rather than other methods of cleanup (EPA NPL, 2012).

As of February, 2012 the Environmental Protection Agency has listed 15 sites on the NPL that are currently undergoing remediation in Georgia (table 2.1).

Table 2.1 Georgia Hazardous Wastes Sites on National Priority List and Location

Site Name	City
Alternate Energy Resources	Augusta
Armstrong World Industries	Macon
Brunswick Wood Preserving	Brunswick
Camilla Wood Preserving Company	Camilla
Diamond Shamrock Corp. Landfill	Cedartown
Firestone Tire & Rubber Co. (Albany Plant)	Albany
Hercules 009 Landfill	Brunswick
LCP Chemicals Georgia	Brunswick
Marine Corps Logistics Base	Albany
Marzone Inc./Chevron Chemical Co.	Tifton
Mathis Brothers Landfill (South Marble Top Road)	Kensington
Peach Orchard Road PCE Ground Water Plume	Augusta
Robins Air Force Base (Landfill #4/Sludge Lagoon)	Houston County
T.H. Agriculture & Nutrition Co. (Albany Plant)	Albany
Woolfolk Chemical Works, Inc.	Fort Valley

(Environmental Protection Agency: Superfund site information: Georgia, 2012)

2.3 The Agency for Toxic Substances and Disease Registry

The Agency for Toxic Substances and Disease Registry is another government agency dedicated to protecting human health from environmental exposures. The ATSDR functions are

to conduct “public health assessments of waste sites, health consultations concerning specific hazardous substances, health surveillance and registries, response to emergency releases of hazardous substances, applied research in support of public health assessments, information development and dissemination, and education and training concerning hazardous substances” (ATSDR, 2012). In addition to the previously mentioned function, the ATSDR has created a list of 275 priority chemical contaminants. The current list of priority chemicals is available at ATSDR’s web site. The ATSDR ranks the substances “based on a combination of their frequency, toxicity, and potential for human exposure at NPL sites” (ATSDR Substance Priority List, 2011).

Anyone can petition for the ATSDR to investigate human health concerns regarding toxic chemicals in the environment released from a hazardous waste site or facility. After receiving a petition, the ATSDR’s team of environmental scientists, physicians, toxicologists and others investigate the request by evaluating current data including information about the contaminant and its impact on health, the communities threat of the exposure, and health outcome data (community-wide rates of illness, disease, and death compared with national and state rates). They also take into consideration community member’s concerns including the severity or extent of the contaminants impact. If the ATSDR decides that people are exposed to environmental contaminants, they will continue the investigation to determine whether the exposure is harmful or potentially harmful and what actions are necessary to mitigate potential health effects. ATSDR may recommend placing a site on the National Priority List (ATSDR Public Health Assessment Petition, 2012). The ATSDR’s 10 Regional Offices, along with the EPA, other federal and state agencies, individual citizens, and community groups, work to monitor and investigate current and potential hazardous waste sites or facilities. They are often the first to

assess community member's petitions for public health assessments and are involved in the preparation of many health evaluations known as health consultations. Their duties include attending public meetings to address community concerns, visiting important sites of interest, and maintaining contact with petitioners and responding to their requests appropriately (ATSDR Division of Regional Operations, 2012).

2.4 Bio-monitoring and National Health and Nutrition Examination Survey Data

The National Health and Nutrition Examination Survey collects health data from 7000 randomly selected U.S. residents. It is conducted by the CDC's National Center for Health Statistics every year. Through a physical examination, collection of medical history and biological specimens, researchers are able to gain a better understanding of the relationship between health behaviors, environment, and demographics including race/ethnicity and income level, and health outcomes. The biological samples are used for diverse research disciplines, including the assessment of pollutant exposures and resulting levels of internal exposure or body burden. Biological samples are examined for levels of 150 different chemicals that humans are commonly exposed, data indicates serious health effects can result due to their exposure and that current technology allows safe and cost efficient analysis methods (Calafat, 2011).

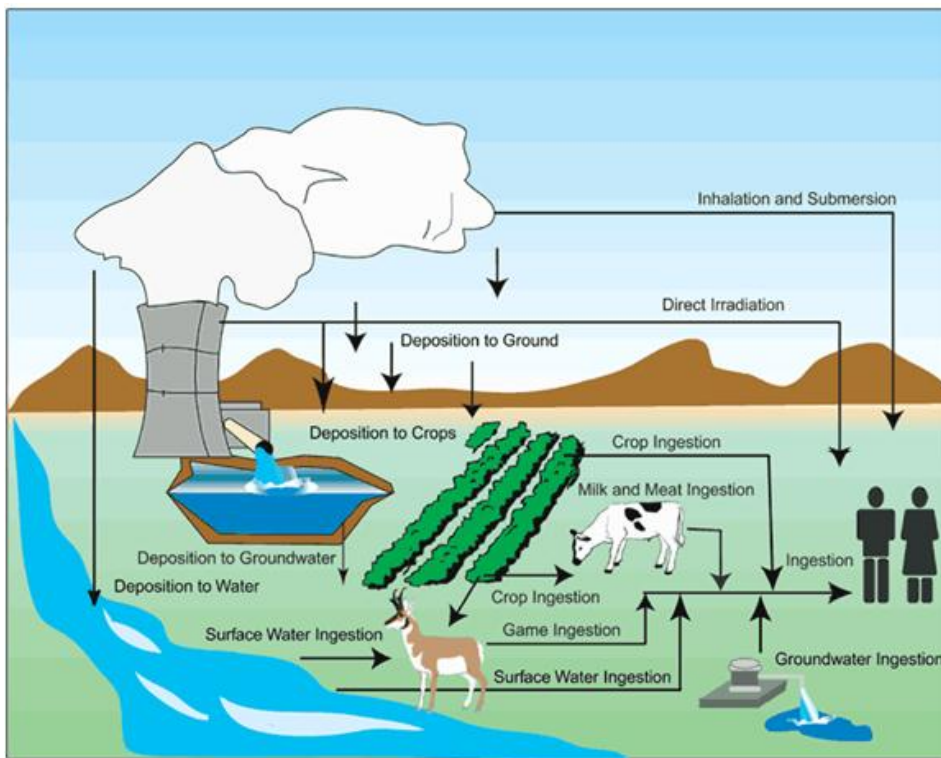
2.5 Exposure Pathways

The results of ATSDR and states' health investigations, NHANES data and other research have shown that people do come in contact with numerous chemicals that can be detected through blood and urine analysis and that high dose or prolonged exposure of particular chemicals can have impacts on health. Investigations and research is performed to better

understand the mechanisms and routes of exposure so that the exposure pathway can be interrupted and exposures stopped.

The EPA's National Exposure Research Laboratory main purpose is to assess human exposures of pollutants. Pollutants are released into the environment from numerous sources (industrial factories, vehicles, fuel combustion etc.) and are transported through soil, air, food, water and other environmental media (Furtaw, 2001). Risk of direct exposure occurs when humans come in contact with the media such as breathing contaminated air, swimming in contaminated water, eating contaminated food or dermal contacting through touching, inhalation or consumption of contaminated soil. Indirect contact can occur when humans eat the fish from a contaminated river or game meat or livestock that ate contaminated vegetation etc. (figure 2.2).

Figure 2.2 Human Exposure Pathways - An Illustration



(INEEL, 2003)

After exposure, the chemical may enter the body through multiple portals of entry (inhalation, ingestion, dermal absorption etc.). Within the body, absorbed chemicals are distributed to various organs and tissues where it is either metabolized or eliminated. If the pollutant is metabolized and absorbed, it may result in health effects. Health effects are also determined by the dose of the contaminant(s) and the duration of the exposure (Furtaw, 2001).

2.6 Industrial Emissions Impact on Health

Air

Many air pollutants are the result of industrial processes including electric utilities, industrial boilers, metal smelters, petroleum refineries, cement kilns, manufacturing facilities (table 2.2). Resulting pollutants include particulate matter (PM_{2.5} and PM₁₀), nitrogen oxides, sulfur dioxides, lead and their precursors. A number of health effects have been linked to both long term and short term exposure of these pollutants including asthma events, increased respiratory symptoms and infections, cardiovascular disease, renal disease, lung cancer, neurological impairment etc. (EPA Air Trends Report, 2011).

Table 2.2 Common Air Pollutants and Sources from EPA 2011 Air Trends Report

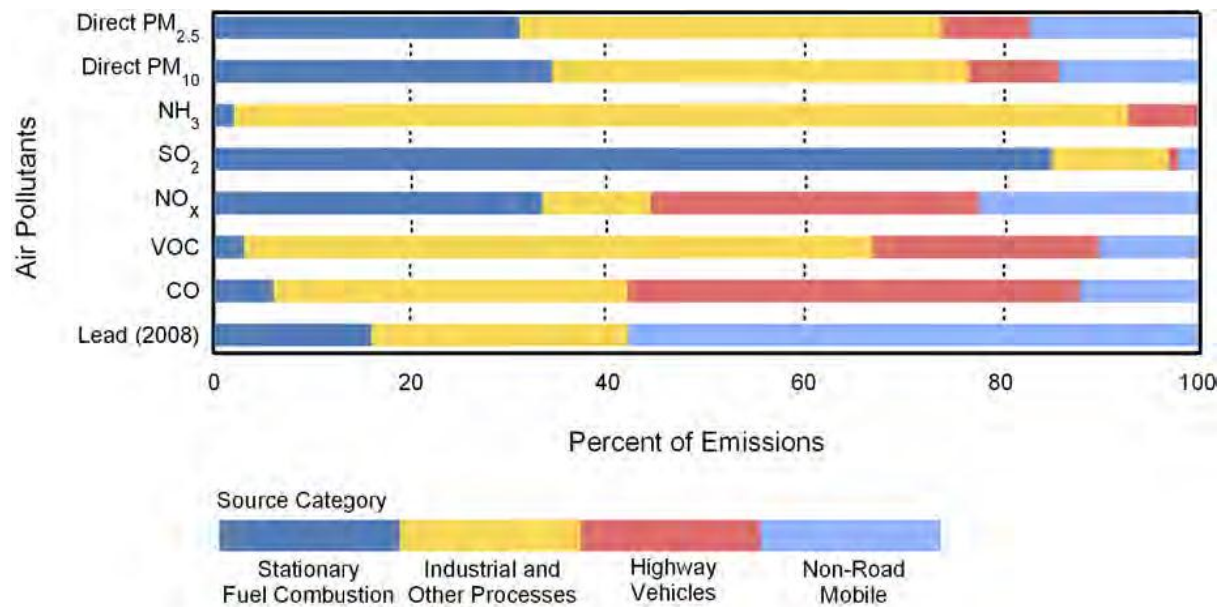
<u>Pollutant</u>	<u>Sources</u>	<u>Health Effects</u>
Ozone (O ₃)	Secondary pollutant typically formed by chemical reaction of volatile organic compounds (VOCs) and NO _x in the presence of sunlight.	Decreases lung function and causes respiratory symptoms, such as coughing and shortness of breath; aggravates asthma and other lung diseases leading to increased medication use, hospital admissions, emergency department (ED) visits, and premature mortality.

Particulate Matter (PM)	Emitted or formed through chemical reactions; fuel combustion (e.g., burning coal, wood, diesel); industrial processes; agriculture (plowing, field burning); and unpaved roads.	Short-term exposures can aggravate heart or lung diseases leading to respiratory symptoms, increased medication use, hospital admissions, ED visits, and premature mortality; long-term exposures can lead to the development of heart or lung disease .
Lead	Smelters (metal refineries) and other metal industries; combustion of leaded gasoline in piston engine aircraft; waste incinerators; and battery manufacturing.	Damages the developing nervous system, resulting in IQ loss and impacts on learning, memory, and behavior in children. Cardiovascular and renal effects in adults and early effects related to anemia.
Oxides of Nitrogen (NOx)	Fuel combustion (e.g., electric utilities, industrial boilers, and vehicles) and wood burning.	Aggravate lung diseases leading to respiratory symptoms, hospital admissions, and ED visits; increased susceptibility to respiratory infection.
Carbon Monoxide (CO)	Fuel combustion (especially vehicles).	Reduces the amount of oxygen reaching the body's organs and tissues; aggravates heart disease, resulting in chest pain and other symptoms leading to hospital admissions and ED visits.
Sulfur Dioxide (SO2)	Fuel combustion (especially high-sulfur coal); electric utilities and industrial processes; and natural sources such as volcanoes.	Aggravates asthma and increased respiratory symptoms. Contributes to particle formation with associated health effects.

(Environmental Protection Agency: Air Trends Report, 2011)

Overall, industrial emissions account for much of the total emissions in the United States. Since the early 1990s, the combined emissions of the six common pollutants and their precursors (PM_{2.5} and PM₁₀ , SO₂ , NO_x , VOCs, CO, and lead) dropped almost 60% on average. This has mostly been attributed to industrial regulations that have lowered emission levels (EPA Nation's Air - Status and Trends through 2010). Despite the decreases in industrial emission, industrial and other processed still account for much of the nation total emission estimates (figure 2.3) including particulate matter, NH₃, Volatile Organic Compounds, Carbon Monoxide and Lead (EPA Air Trends Report, 2011).

Figure 2.3 Distribution of National Total Emissions Estimates by Source Category for Specific Pollutants



(Environmental Protection Agency: Air Trends Report, 2011)

Water

To ensure the quality of drinking water and to protect the health of the public, the EPA has set a list of standards. The standards dictate the allowable contaminant levels that public water systems must not exceed. The contaminants are considered to cause potential health effects if individuals are exposed to drinking water that exceeds the minimum concentrations for a determined amount of time. Many of the most common contaminants including inorganic and organic chemicals have sources that include industrial emissions from discharge and runoff from various refineries, factories and mills. Side effects of exposure include kidney and liver damage, skin irritation, reproductive difficulties, cancer, neurological impairment, etc. (EPA drinking water contaminants, 2012).

Soil and Food

Soil contamination can result from the dumping of hazardous substances, pesticide and fertilizer use, and industrial or chemical processes and from the burial of these contaminants. The National Priority List (NPL) mentioned previously is the “list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories” (EPA NPL, 2012). Soil contaminants from sites like these can transfer to groundwater sources and into the air. Contaminants can attach to surface soil particles and become airborne as dust. Humans are exposed to the contaminants when they inhale the particles. Contaminants can also be taken up through the root systems of plants. This can harm the plant as well as the animals and humans that eat them. Common soil contaminants include arsenic, benzene, cyanide, lead and mercury (EPA soil contamination 2011). Pesticides can be found in soil due to spraying of agriculture during crop production as well as on vegetables, fruit, grains, and other foods. The EPA is responsible for determining and regulating pesticide tolerance levels (EPA OCSPP, 2012).

2.7 Household Toxins

Industrial emissions are not the only source of contaminants that cause health problems. Many other sources of chemicals are found within homes. Carbon monoxide, radon gas, second-hand smoke, lead, volatile organic chemicals, asbestos and contaminants found in drinking water are just a few of the potential chemical hazards found within the home. Other non-chemical hazards may also pose threats to human health such as mold, dust, rodents, insects, etc. Extensive research has been conducted by the EPA and other environmental health scientist that indicate a variety of factors that cause asthma in children as well as triggers that can directly cause asthma

attacks. Studies have shown dust mites can cause asthma in young children. Both outdoor allergens, such as ozone and particle pollution, as well as indoor contaminants such dust mites, molds, cockroaches, secondhand smoke and pet dander can trigger asthma attacks (Northridge et al, 2010). A study that evaluated housing quality found that living in a home with reported water leaks increased children's rate of asthma by 1.54 times, cockroaches presence by 1.29 times and rats increased it by 1.34 times (Northridge et al, 2010). More research is necessary to better understand causes and triggers of asthma, but evidence suggests homes without proper maintenance and construction can lead to poorer health outcomes. Individuals living in public housing and low income housing are at greatest risk.

Drinking water is another common means of exposure. Microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals and radionuclides are found in water due to industrial/manufacturing/refinery runoff and discharge, mining, water treatment practices, residual from farm pesticides, human and fecal waste, etc. (EPA drinking water contaminants, 2012). Even though there are strict regulations by the EPA on allowable contamination levels, studies show "hot spots" do occur where populations are at risk of exposure. According to the EPA, an estimated 15% of Americans (45 million people) get their water from private ground water wells that are not subject to EPA regulations. States can decide to regulate well water, but often it is the responsibility of the home owner to monitor for contaminants (EPA well water, 2012). A study in rural North Carolina tested and monitored 63,000 wells for arsenic, a known carcinogen. The study found that 7,712 of the wells showed detectable arsenic levels with 1,436 exceeding the EPA drinking water standard (Sanders et. al, 2012). This is just one of many occurrences of contaminated water that occur throughout the United States and pose threats to human health.

Indoor air pollution from second-hand smoke inhalation can result in lung cancer and heart disease in adults and can cause ear infections, more frequent and severe asthma attacks, respiratory symptoms and infections and an increased risk for sudden infant death syndrome in infants and children. The CDC estimates that 88 million nonsmokers in the United States were exposed to secondhand smoke with 53.6% of young children (aged 3–11 years) exposed in 2007–2008 (CDC, Second hand smoke, 2012). A prospective cohort study also found that 60% to 83% of non-smoker adults that were recently admitted to the hospital due to asthma related illnesses had been exposed to second hand smoke (Eisner, 2005).

Radon, a radioactive naturally occurring gas found in soil in many areas, may be an increased risk of lung cancer occurrence in individuals exposed in houses and other structures. Exposure occurs when individuals spend time in basements and underground structures that have cracks, allowing radon gas to enter and persist in homes (ASTDR Radon, 2012). A meta-analysis of radon studies was conducted and overall, evidence suggests exposure may account for 6,000 – 36,000 lung cancer deaths each year in the United States (Lubin, 1997), the second most important environmental cause of lung cancer. Although study results are variable, they indicate the need for radon exposure prevention methods.

Carbon monoxide is a colorless, tasteless, odorless gas found in indoor and outdoor air. According to the CDC the “levels in indoor air vary depending on the presence of appliances such as kerosene and gas space heaters, furnaces, wood stoves, generators and other gasoline-powered equipment... tobacco smoke also contributes to indoor air levels” (CDC carbon monoxide, 2011). Poisoning from carbon monoxide is one of the leading causes of death in the U.S. with effects additional effects including cardiac arrhythmias, myocardial ischemia, cardiac arrest, hypotension, respiratory arrests, seizures etc. Moderate carbon monoxide poisoning may

include confusion, syncope, chest pain, dyspnea, weakness, tachycardia and symptoms of mild carbon monoxide poisoning include headache, nausea, vomiting, dizziness, and blurred vision.

Lead is a naturally occurring metal that was used extensively in the past, but recently has been banned for many uses, including gasoline and paint, due to evidence of its toxicity.

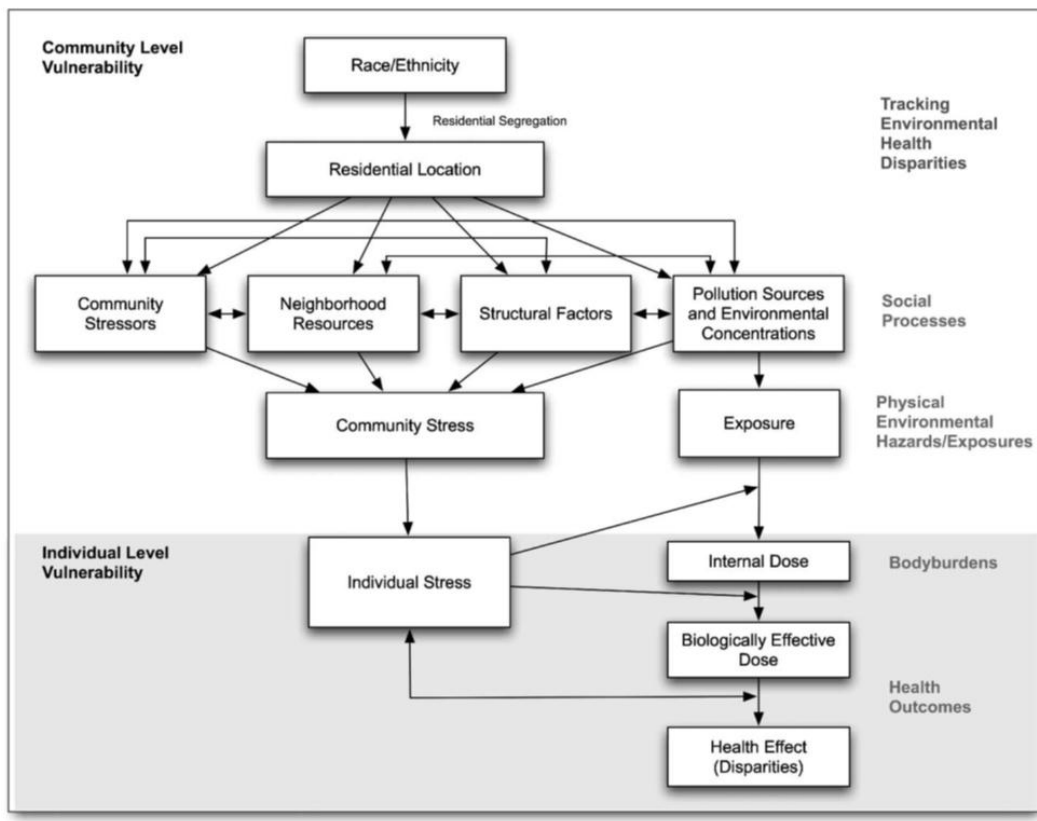
Hazards have been created from the burning of fossil fuels, mining, construction, and manufacturing processes. Exposures to lead most often happen in workplaces, when eating contaminated foods or drinking contaminated water. Children are at high risk of exposure since they are more likely to consume lead-based paint chips and through dermal contact/inhalation while playing in contaminated soil (ATSDR lead, 2011). Lead can cause several ailments, including anemia, kidney injury, abdominal pain, seizures, encephalopathy, and paralysis. In addition, chronic exposure to lead can affect blood pressure in adults and neurodevelopment in children. Overall, the rate of lead exposure has decreased significantly in the past twenty year. As a result of interventions and lead bans, the NHANES data has shown the “prevalence of Blood lead levels $\geq 10\text{g/dL}$ declined 84% from 8.6% in NHANES 1988–1991 to 1.4% in NHANES 1999–2004.” Blood levels of $\geq 10\text{g/dL}$ are deemed of concern to health outcomes by the CDC (Calafat, 2011). Though the rate of high BLLs is on the decline, many risk factors such low household income; minority race/ethnicity; urban residence; and residence in housing built prior to and throughout the 1970s indicate a disparity exists and the problem of lead exposures still exist.

2.8 Social Justice and Environmental Health Disparities

The social justice philosophy states that disparities should not exist between different members of society and that all people should be guaranteed not to endure a greater burden than

another. Individuals exposed to environmental contaminants or those concerned about potential contamination face an unfair burden. Current research indicates that vulnerable populations such as minorities and low SES individuals are at much higher risk of environmental contaminant exposure. This injustice has been well documented by scientific research and data on social processes such as residential segregation, environmental contaminants/exposures, body burden of environmental contaminants, and health outcomes (figure 2.4) Both community and individuals level vulnerabilities exacerbate each other causing extreme disparities as a result (Payne-Sturges, 2006).

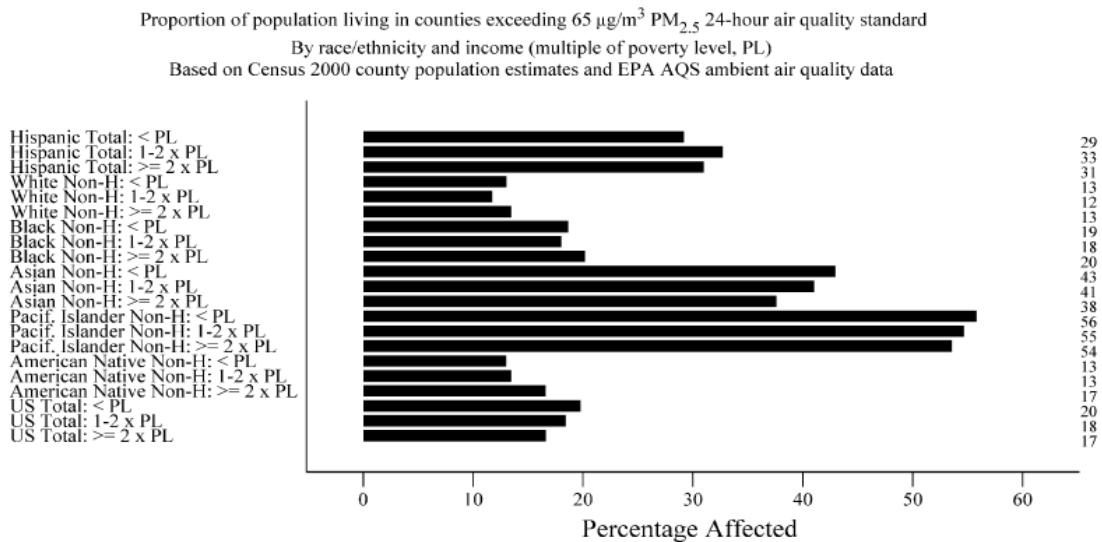
Figure 2.4 Framework for Understanding Racial/Ethnic Disparities in Environmental Health



(Payne-Sturges, 2006)

Studies indicate minorities and low SES individuals face higher risk of exposure to environmental contaminants. One specific study showed those with higher incomes have a slightly lower tendency to live in counties exceeding the PM_{2.5} standard and that race was an ever bigger indicator than poverty level (figure 2.5) (Payne-Sturges, 2006). Similar trends are seen for other criteria area pollutants.

Figure 2.5 Proportion of Population Living in Counties that Exceed Particulate Matter Standard by Race/Ethnicity



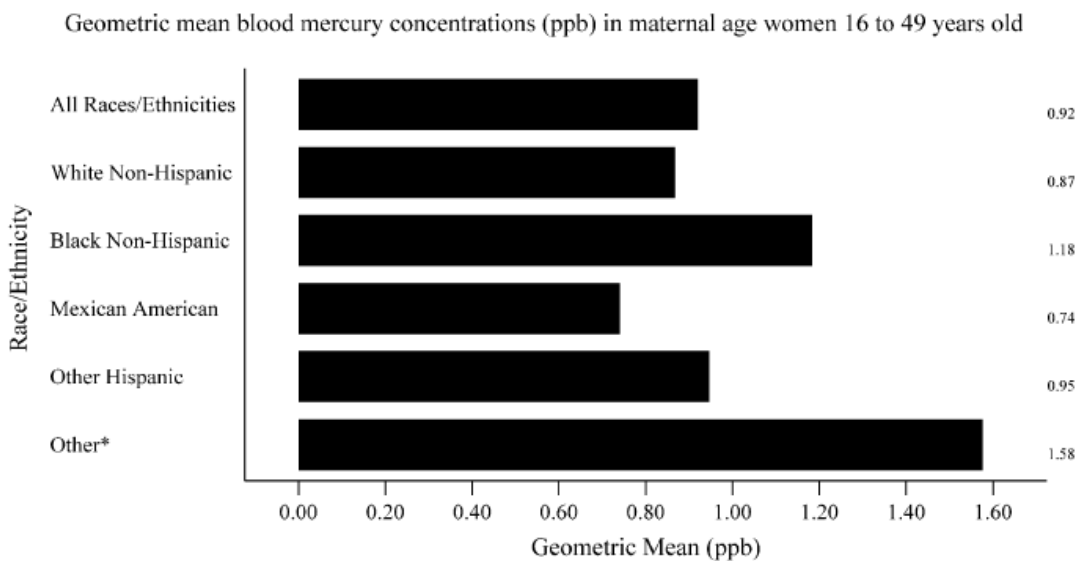
Based on family income and poverty levels for 1999.
 The Poverty Level (PL) depends upon total family size, number of children under 18, and, for families of 1 or 2, whether or not the Reference Person is under 65.
 Poverty Levels range from an average of \$8,501 for a family of one to \$34,417 for a family of nine or more.
 '< PL' = 'Income Below Poverty Level'
 '1-2 x PL' = 'Income Between 100 % and 200 % of Poverty Level'
 '>= 2 x PL' = 'Income At Least 200 % of Poverty Level'

(Payne-Sturges, 2006)

Body burden is another disparity indicator with current evidence showing minority groups face an unfair burden. Mercury body burden levels have been measured through the NHANES and are of great concern due to mercury's highly persistent, highly bioaccumulative and toxic nature. The evidence is also concerning, because it shows minority women of

childbearing age often present high body burden levels (figure 2.6). Mercury is especially harmful to fetuses and young children. The 1999–2002 NHANES survey showed that women who self-identified as Asian/Pacific Islander, Native American or non-Hispanics reporting multi-race without specifying a main race other than Black or White had the highest mean (1.58 ppb) of blood mercury concentrations of maternal age women 16–49 years. This is most likely due to common cultural and subsistent fishing practices. Disparities as evidence by the NHANES data also exist in exposures to lead (in children and adult workers), cadmium, arsenic, cotinine, OP pesticides, pyrethroid pesticides, PCBs and DDT/DDE (Payne-Sturges, 2006).

Figure 2.6 Blood Mercury Concentration by Race/Ethnicity



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey 1999-2002

* "Other" includes Asian; Pacific Islander; Native American; those non-Hispanics reporting multi-racial without specifying a main race other than White or Black; and those with a missing value for race/ethnicity.

Geometric mean blood mercury concentrations (ppb) in maternal age women 16-49 years old.

(Payne-Sturges, 2006)

Health outcomes are another indicator of contaminant exposure disparities. Asthma, cancer, cardiovascular disease, high blood pressure, birth defects and other health problems have been linked to environmental factors. According to the Office of Minority Health and Health Disparity of the CDC the infant death rate among African Americans is still more than double that of whites despite the fact the overall national average is on the decline. Heart disease death rates are also more than 40% higher and death from cancer rates 30% higher for African Americans than for whites. Hispanics also have higher rates of high blood pressure and obesity than non-Hispanic whites (Office of Minority Health and Health Disparity, 2012).

Higher rates of asthma, in low income and minority groups, as well as higher morbidity and mortality rates are often attributed to poorer living conditions that lead to asthma as well conditions that trigger asthma attacks. Current studies also show a current disparity exists in which minorities and low income households face much higher incidence of asthma, higher deaths rates and greater frequency of hospitalizations and emergency room visits due to asthma. African Americans have hospitalization rates 240%; emergency department visits 350%, and death rates 200% higher than Caucasians. Puerto Ricans and Hispanics also face disparities with rates of asthma 125% that of Caucasians. (World Asthma Foundation, 2012). More work is needed to better understand what needs to be done to lessen or possibly eliminate the current disparities and social injustices that exist.

2.9 Benefit and Challenges of Community Partnerships

To create a successful health program and reduce the risk of hazardous exposures it is important to foster communication and the gaining of trust of individuals in the community and other partners. Engaging community members will help public health workers gain further

insight into the community, ensure community ownership, and increase the sustainability of the project. A meta-analysis of current community partnership studies indicates a successful community partnership can result in population level health outcomes, community wide behavior changes, and community/system changes (Ruossos, 2000).

Though there are numerous benefits to community engagement, there are also many challenges when trying to form and maintain community partnerships. Many of the most affected populations of the health problem are the hardest to engage in community organization efforts. Collaborating with community leaders in sectors outside of the public health field and sharing risks, resources, and responsibilities among participating people and organizations are also great challenges. Sustainability of the partnership is also crucial since continuity of the intervention is necessary in order to make the greatest impact and improve health outcomes (Ruossos, 2000).

According to the World Health Organization risk communication is “an interactive process of exchange of information and opinion on risk among risk assessors, risk managers, and other interested parties.” Building and fostering community partnerships has shown to be a vital component for risk communication strategies. By having a risk communication strategy, stakeholders including community members are made aware of the process and decision making during the entire risk assessment. Through constant and open communication, community members potentially impacted by the investigated risk better understand the logic, outcomes, significance, and limitations of the risk assessment (World Health Organization, 2012).

Working with community members and with community partnership is beneficial since it allows public health workers to gain insight on community concerns and risk perceptions. The Health Belief Model, a health behavior change model, acts as both a means for better understanding why individuals follow through with certain behaviors and how best to implement

prevention programs to change those behaviors. The constructs the HBM include perceived susceptibility of being exposed to the contaminant and perceived seriousness if the exposure did occur. It also includes psychological and physical barriers as well as an individual's perception of the benefit they would get from following guidelines and taking the necessary precautions (Brewer, 2007). Forming community partnerships is vital to successful risk communication strategies as well as assessing and creating health program based on community's perceived risk to outdoor and indoor environmental hazard.

Chapter III

Methods and Procedures

3.1 Survey Development

Georgia State University's Institute of Public Health and the Georgia Department of Public Health conducted a needs assessment survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. Survey development began in August of 2011 and GSU Institutional Review Board approval was granted January 2012. Study participants completed an informed consent prior to completing the survey. The survey first inquired about participant's advocacy group/organization. These questions are important since they ask about the main purpose of their organization. When conducting the analysis it will give us an understanding of their goals as an organization as well as help the Chemical Hazards Program better understands which participants are better suited to assist with public health education programs and interventions. The survey also included a questions asking about the size of their organization. All other survey questions were directly related to one of the four research goals listed below.

1. To inform the community about the services offered to the public by the GDPH and the Chemical Hazards Program

The survey asked participants about their knowledge prior to completing the survey of the Georgia Department of Public Health's Chemical Hazard Program. It is significant that we better understand community member's knowledge of the program. Participants were selected due to their active role in the community as a leader of an environmental organization. Their rate of knowledge of the program is expected to be higher than other members in the community. This question is therefore a significant indication of the community's knowledge of the CHP.

Participants were asked about the effectiveness of the current Chemical Hazards Program Brochure in explaining the mission of the CHP and the services offered to community members. This evaluation of the brochure will help indicate areas of improvement.

2. To identify individuals interested in forming community partnerships to assist the Chemical Hazards Program in implementing public health interventions.

Another survey question asked participants if there was any “Superfund” or other known hazardous waste site in their community for which there were concerns. The survey also asked what chemical contamination issues posed the greatest risk to human health in the participant’s community, the sources of the chemicals they were most concerned about and if known or suspected toxic chemical contamination in the environment caused health concerns among individuals in their community. The survey also asked about whose health had been directly impacted as a result of the exposure.

This purpose of these questions are to identify potentially new waste sites that may need to be investigated by the CHP, to inform the community on current government site remediation actions on Superfund sites within their community, to educate the public on what they need to reduce/eliminate the chance of exposure or to inform residents that there are no health risks associate with the site of concern.

3. To understand community concerns pertaining to environmental hazards in their community and in the households in their community.

The survey inquired about toxic chemical contamination in a variety of environments (soil, air, food, drinking water etc.) to better understand the concerns of the participants and community members. Participants rated their level of concern (not at all concerned, somewhat concerned, concerned, very concerned) for each of the environments. It was important to ask a

broad question such as this at the beginning of the survey to get the participants to start thinking about all the potential routes of chemical exposure. Many of the questions that inquire about sources of chemical contaminants are not only to identify potential sites as stated in the previous goal, but also to educate residents about how to reduce/eliminate potential exposures and inform them about sites that have been investigated and shown to have no health impacts.

Not all chemical exposures are the result of contaminants that are present outside or come from outside sources. Many health problems are the result of hazards within the home. It is therefore significant to include questions on the survey that inquire about the level of concern and their perception of the likelihood of health hazards such as mold, asbestos, carbon monoxide, radon gas etc. within homes in their community. This would indicate the participants knowledge of the dangers associated with the specific hazards and their level of concern for its impact on health. Participants were selected due to their active role in the community as a leader of an environmental organization and within their community. If they do not believe a particular contaminant can cause health problems or is commonly found in households, there is a good chance others in their organization and community also have the same perspective. They are also less likely as an environmental group to target that specific hazard for remediation. This would be good evidence for the CHP to develop health education programs and material for distribution.

4. To identify individuals interested in forming community partnerships to assist the Chemical Hazards Program in implementing public health interventions.

Another goal of the survey is to identify environmental group leaders within the community that share the same goals as the CHP and are willing to assist with public health interventions. A well-established organization that shares the same goals of protecting human

health would be a great asset to the CHP. As previously discussed, participants were asked to state the goals of their organization. This will give the CHP a list of potential organizations that focus on protecting human health and that might be interested in forming community partnerships.

5. Better understand the best ways to get health information to community members.

The CHP often distributes health information to community members as an educational component of its health intervention. It is important to determine the best methods and to gain insight from community members on how to best distribute the information to specific groups and communities.

The needs assessment was intended to serve as a pilot study for future needs assessments. Validation of the survey consisted of administering the draft survey instrument to two individuals not involved with the project. According to the mock participants, the survey took approximately the intended 15 minutes to complete and its instructions and questions were clear and easy to understand. No adjustments were made to the survey per their feedback.

3.2 Participant Selection

Participants were selected due to their current leadership role of a Georgia environmental advocacy group/organization. Advocacy organizations/groups were selected from a current list obtained by the Georgia Department of Public Health as well as by recommendations from current environmental health leaders and community activists. Potential survey participants were also selected due their membership of Earth Share of Georgia, a non-profit organization that helps raise funds for environmental advocacy groups throughout the state. At least five of the environmental groups selected were concerned about environmental justice issues and disparities

within their community as stated by their website. This is especially significant considering the current disparities that exists in regard to environmental exposures, body burden and health as discussed in the literature review. Working with any of these organizations will help the CHP identify and assist vulnerable populations within the state. After compiling the list of potential participants, a database was created using Microsoft Excel. Each organization was researched online and contact information was compiled into the database. The database contains information such as selected contact, their position within the organization, address, phone number and email address. For each organization, the most senior individual (president, CEO, executive director etc.) was selected as the organization's contact. In the case that no senior individual was listed, the survey was sent to the contact person listed on their website. Contact information was found for 137 of the 149 organizations originally selected. All 137 organizations and environmental advocacy groups were selected to receive the invitation to participate in the study.

3.3 Distribution and Data Collection

Depending on available contact information, participants either received the survey through the mail or electronically via email. Thirty-four of the contacts did not have a publicly listed email address and were sent the cover letter (Appendix A), Chemical Hazards Program informational brochure (Appendix B), consent form (Appendix C) and survey (Appendix D) through the U.S. mail. Those completing the survey by mail were also provided a stamped and addressed envelope for returning the survey. They were also given the option of completing the survey online through accessing the link located on the GDPH Chemical Hazards Program website.

All other potential participants were sent an email with an adapted cover letter (Appendix

E) as the body of the email and an attached PDF of the Chemical Hazards Program informational brochure. The cover letter had to be adapted to reflect the differences between completing the survey manually and electronically. The email cover letter asked participants to complete the consent form and survey by accessing the link located on the GDPH Chemical Hazards Program website, www.health.state.ga.us/programs/hazards. The link on the CHP website sent participants to the survey that was created using the online PsychData service. PsychData is an IRB-preferred survey design website that protects the security and confidentiality of the respondents and their survey responses in order to comply with ethical principles (PsychData, 2012). Emailed participants were also given the option of requesting a mailed packet.

Mailed survey packets were sent out on Wednesday January 11, 2012, and emails were sent on Friday January 13, 2012. Participants were asked to complete and return the survey by Friday January 27, 2012. After sending the emails, 17 were returned due to an error with their email address. All addresses were verified by rechecking the organizations website. All were correct as listed on their websites. All organizations that did not successfully receive the email were sent a mailed packet if a mailing address was publicly available for the organization. All had mailing addresses available except one. The additional packets were mailed on Monday January 16, 2012. Five of the seven returned mail packets were to organizations that also had return to sender emails.

As of Wednesday January 25, 2012 ten (six electronically, four mailed) surveys had been completed and returned. A reminder postcard (Appendix F) was sent out to all potential participants on Thursday January 26, 2012. An electronic version of the postcard was sent to all participants receiving the survey through email. The survey completion date was extended to Friday February 3, 2012. As of Friday February 3, 2012 an additional six surveys were

completed online. A final reminder email was sent out to all participants contacted through email on Wednesday February 8, 2012 giving participants until February 20, 2012 to complete and return the survey. Three additional online surveys were completed and two more mailed surveys were received.

3.4 Analytical Methods

After the given deadline, the online data was exported from PsychData into MS Excel and the mailed survey responses were manually entered into the same MS Excel database for analysis. Descriptive statistics were prepared. Qualitative data was presented through tables and through directly quoting participant responses. It was also analyzed for reoccurring responses and survey themes. Quantitative data was presented through frequency histograms and other graphs. Many survey questions included Likert Scales or multiple choice questions. Many of these questions also allowed for free response answers and were also evaluated for qualitative data.

Chapter IV Results

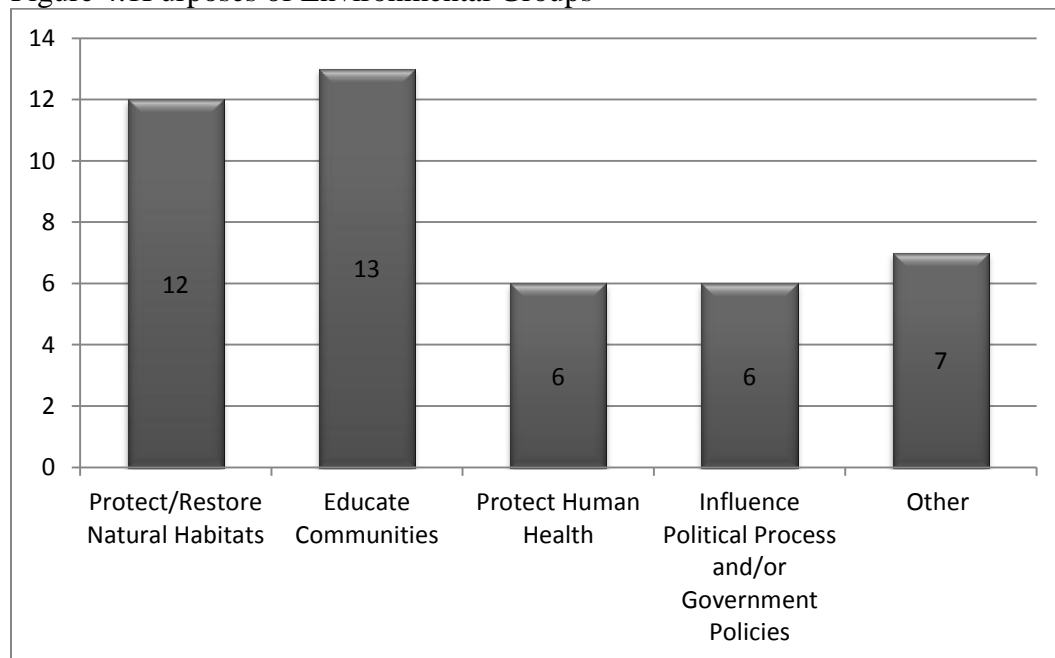
4.1 Responses

A total of 21 out of 129 (16.3%) potential participants completed the survey. Six mailed surveys were completed and 15 surveys were completed using PsychData. One of the five groups that did focus on environmental justice issues did complete and return the survey. Eight of the initial 137 participants were not included in the survey response calculations since their email and/or mailing packet was returned due to an incorrect address.

4.2 Group/Organization Characteristics

When asked the main purpose of their organization (question 1) respondents selected “Educate Communities” (62%) and “Protect/Restore Natural Habitats” (57%) most often (figure 4.1). The organization goals “Protecting Human Health” and “Influence Political Process and/or Government Policies” were selected by less than 30% of respondents each. Several other purposes were recorded, including those listed below.

Figure 4.1 Purposes of Environmental Groups



Participants were given the opportunity to select as many of the goals that were applicable as well as list any additional goals and purposes of their organization. Seven respondents listed additional goals (table 4.2). All of the additional goals listed by participants could be grouped into one of the provided categories for example; “educate farmers to grow food using minimal chemicals” could be considered a method for “Protecting Human Health” and “Protecting Natural Habitats.” Each additional response was assigned one or more of the goals provided in the survey and compared to the selections made by the participant. Many of the participants who selected “Other” did not make any selections from the provided goals. The numbers were adjusted to depict a more accurate depiction of participant’s goals.

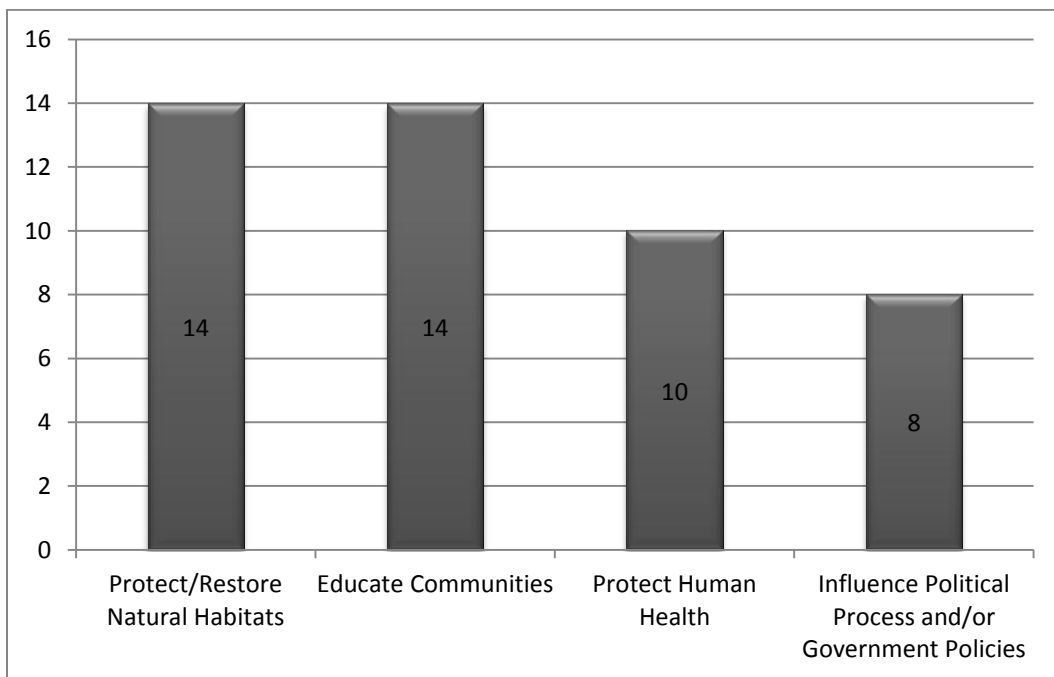
Table 4.2 Adjusted Purpose/Goals of Environmental Groups

Other	Adjusted Purpose/Goal	Comparison with Survey Results	Survey Adjustment/Additions
Protect human health with technical assistance for our 4 Superfund Sites, education about contaminated seafood, advocate for Georgia Hazardous Sites Response Act (HSRA) site cleanup, protective permitting of those using hazardous chemicals.	Protect/Restore Natural Habitats Educate Communities Protect Human Health Influence Political Process and/or Government Policies	Participant did not select any provided options	Protect/Restore Natural Habitats Educate Communities Protect Human Health Influence Political Process and/or Government Policies
We are a professional society of fisheries professionals that represents numerous interests.	Protect/Restore Natural Habitats	Participant did not select any provided options	Protect/Restore Natural Habitats
Educate farmers to grow food using minimal chemicals.	Protect Human Health Protect/Restore Natural Habitats	Selected all options	None
Emergency Management and planning	Protect Human Health	Participant did not select any provided options	Protect Human Health
To advocate for the remediation/ rehabilitation of vacant and derelict properties, earmarking many of the residential properties for conversion into durable, affordable housing for low to middle income families.	Protect Human Health Influence Political Process and/or Government Policies	Participant did not select any provided options	Protect Human Health Influence Political Process and/or Government Policies
Coordination of public safety and support agencies	Protect Human Health	Participant did not select any provided options	Protect Human Health

Protect birds and wildlife	Protect/Restore Natural Habitats	Selected Protect/Restore Natural Habitats and Educate Communities	None
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After modifying the results, “Educate Communities” and “Protect/Restore Natural Habitats” (both 67%) were still the most selected answers. “Protecting Human Health” however was selected by 48% of respondents compared to less than 30% prior to the adjustment.

Figure 4.2 Revised Purposes of Environmental Groups



When asked how many active members their organization had (question 2), more participants (48%) reported their Georgia organization as having more than 100 members than any other category. The remaining 52% of respondents were equally divided with 14% reporting 51 – 100 members, 19% reporting 11-50 members and 19% reporting fewer than 10 members.

4.3 Chemical Hazard Program Knowledge and Brochure Evaluation

When asked if aware of the Georgia Department of Public Health’s Chemical Hazards Program prior to being contacted to complete this survey (question 3) 17 of the 21 (81%) respondents responded they were not aware of the CHP. Of the 17 participants unaware of the program, 14 (67%) reported the brochure as helpful when asked “does the Chemical Hazards Program brochure help you understand the services that are available to community members (question 4)?” Suggestions and comments were made for improvements even though there was not a space provided for comments. A few participants who completed the survey manually wrote addition comments below the question. One individual stated the map was too small to read and the pictures were unnecessary, took up space and did not contribute to the effectiveness of the brochure. One participant made a very pertinent comment:

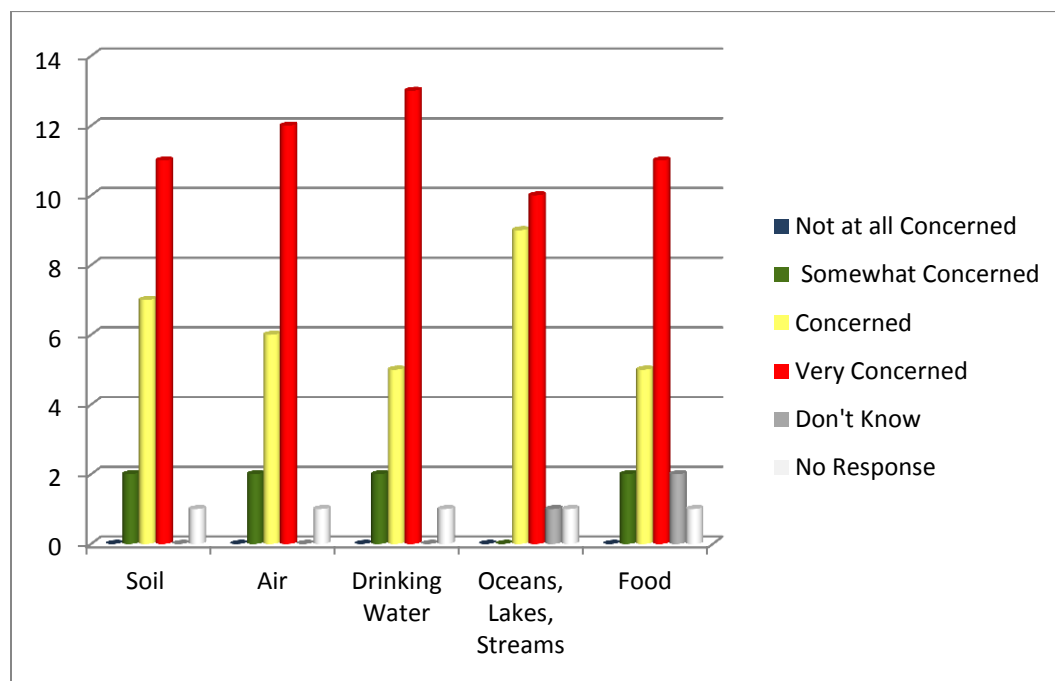
“Brochure referenced [them], but no email address or telephone numbers are listed to get more brochures or contact department”

4.4 Environment Contamination Concerns

Participants were asked how concerned there were about toxic chemical contamination in soil, air, drinking water, food and oceans, lakes, streams (question 5). They were asked to rate their level of concern for each environment (figure 4.3). The majority of participants listed that they were either concerned or very concerned about the level of chemical contamination in each environment. More participants reported they were very concerned about drinking water than any other environment. Every environment, except oceans, lakes, and streams had respondents indicate they were only somewhat concerned. Ninety percent of respondents reported being concerned or very concerned about contamination in oceans, lakes and streams. There were no

environments where participants indicated they were not at all concerned about toxic chemical contamination. All participants were able to rate their level of concern except for one participants who answered “Don’t Know” for their level of concern for oceans, lakes, streams and two participants who answered “Don’t Know” for their level of concern regarding food (figure 4.3)

Figure 4.3 Participants Level of Concern for Specific Environment Contamination



Six respondents reported additional environments. Four of the six environments listed referenced toxins found within the home including household products such as cleaning and pest control agents, and cosmetic products. One participant listed transportation and another listed local seafood contamination with PCBs and mercury as an environment of concern.

4.5 Impact on Human Health

Participants were asked to describe what chemical contamination issues pose the greatest risk to human health in their community and the sources of the chemicals (question 6) they are

most concerned about (table 4.3). Very few listed specific examples (names, locations) of the sources of chemical contamination. One participant however, did list a nuclear power plant in their community and another listed a known toxic waste site.

Another cited paper industries in their community as possible sources of contamination. A participant representing a community in South Georgia expressed multiple concerns regarding sources of the contaminants and populations at risk. He/she referenced a specific lake as being affected by the discharge of dioxins to the estuary with 60+ acres having hazardous wastes within the flood plain and cited a local pulp mill as the source. The same participant also expressed concern about schools within 1/4 mile of VOC emissions and industry in their community. He/she also cited pesticide manufacturing plants as the source of millions of pounds of waste being released into an estuary, wastes on school property, and a refinery that has emitted dioxin/furan, mercury, PCBs etc., which has contaminated seafood and drinking water aquifers. As the source of the contaminants the participant cited:

“Historical and ongoing industrial operations, unlined dumps, historical lack of permitting and monitoring of industrial operations, use of loopholes to allow ongoing pollution, etc.” as the sources and underlining causes of the contamination”

Table 4.3 Chemical Contamination Issues and Sources

Chemical Contamination Issues	Source(s)
Chlorine Anhydrous Ammonia	Manufacturing facilities
Groundwater contamination due to runoff, tank leakage and manufacturing operations (carpet industry) that have closed sites with potential groundwater issues.	Closed manufacturing facilities (carpet) abandoned underground tank storage.
Mercury air contaminants; orthophosphate, nitrate, E. coli water contaminants; UNKNOWN CONTAMINANTS from asphalt plants; water containing pharmaceuticals; pesticides	Coal-burning plants, run-off from roads and parking lots, asphalt plants, chemical and paper industries in <u>[a specific community's] water treatment plants</u> ; agricultural use of pesticides
Waste from historical industry - 1.) Toxaphene pesticide manufacturing resulting in 2 Superfund Sites, 2 1/2 million pounds in the estuary, and wastes on school property. 2.)	Historical and ongoing industrial operations, unlined dumps, historical lack of permitting and monitoring of industrial operations, use of

Refinery, Chloro-Alkali plant with PHAs, dioxin/furan, mercury, PCBs which have contaminated seafood and drinking water aquifer. 3.) <u>Pulp Mill discharge of dioxin to estuary, 60+ acre dump with hazardous wastes in flood plain, ongoing pollution to air and [a specific] river. 4.) Three schools within 1/4 mile of VOC emissions and industry.</u>	loopholes to allow ongoing pollution. Several very outrageous examples of regulatory misconduct and collusion with industry.
Mercury	Natural/atmospheric and industrial
Pesticide application is the most concerning, especially because of the lack of transparency in labeling the food that has been treated. The 2010 President's Cancer Report linked increased pesticide exposure to cancers as well as ADD and ADHD.	Chemicals in the food and leeching in to the soil and water after application.
Mercury contamination in fish, dioxins, airborne particulates, radioactive material (tritium, cesium, strontium)	Coal burning power plants, paper mills, chemical manufacturing facilities, [a specific] waste site, a [specific] nuclear power plant.
Pesticide use, air pollution, drinking water	Coal and other chemical plants
Drinking water and air contamination	Tier II facilities and illegal dumping
	Gas pipe lines, possible contamination from previous superfund sites.
Transportation of toxics on transportation corridors, toxic spills in our waterways	Industrial and illegally dumped chemicals
Water contamination through toxic chemical releases, oil spills, sewer spills/overflow, antibiotics and hormones in water supply	Sewage plants, other industrial plants (paper mills, etc.), oil tankers, and other cargo ships, storm runoff
Coal fired power plants	Coal fired power plants
Home burning of toxic plastics, burning fires, spraying cotton, lawn "professional" spraying of all the subdivision yards and steam banks, burning woods for several days, mixing large amounts of paint, electric company spraying roadside and stream banks	Regular retail stores, agriculture chemical stores
Chemical Contamination in air, soil and water are all of great concern in our community. Urban environments so densely concentrated are at risk of contamination having serious consequences to large populations.	Carbon emission, fine particulates in air, as well as "Nano particles" in everyday household products, e. Coli contamination in streams, sewer systems and industrial runoff, leachate from in landfills

Though many participants did not list specific sources, many did cite water contamination as being a chemical contamination issue that has the greatest impact on human health. They cited groundwater contamination due to runoff, tank leakage, manufacturing

operations, oil spills, pesticides, and sewer spills/overflow causing orthophosphates, nitrates, dioxin/furan, mercury, PCBs, pharmaceuticals, pesticides etc. in the water supply. Many were also concerned about the impact of mercury, carbon emissions and pesticide exposure through air and/or water contamination and its impact on health. Many respondents were also concerned about coal fired power plants as the source of contaminants.

When participants were asked if they were concerned about any Superfund or waste sites in their community (question 7), 48% responded that they did not know, 29% responded they were concerned, 19% were not concerned and one participant did not respond. Of those that responded yes to being concerned about a Superfund or waste site in their area, two participants described three sites and two participants listed how to access information regarding the sites in their community. One participant did make the comment:

“The public should have more information regarding these sites and the chemicals and contaminants associated with each”

Specific information provided by the participant will be given to the Chemical Hazards Program Director. As stated in the IRB application, the results of the survey will not contain any personal identifiers such as name or address. The Chemical Hazard Program will receive a detailed report of the results, but the information will not be linked to individual participants. The consent form, which all participants completed prior to taking the survey, informed participants that the results of the study would be released to the CHP. It also stated that the CHP would be conducting all future phases of the study.

When asked if suspected toxic chemical contamination in the environment caused health concerns among individuals in their community (question 8), 52% responded “Yes” and 33% responded they “Don’t Know” if contaminants caused health concerns (figure 4.4). Participants

were asked whose health has been affected by environmental exposures to chemicals (question 9). Participants most often selected vulnerable populations as being most impacted (figure 4.5).

Figure 4.4 Participants Belief Regarding Chemical Contaminants as Health Concerns in Their Community

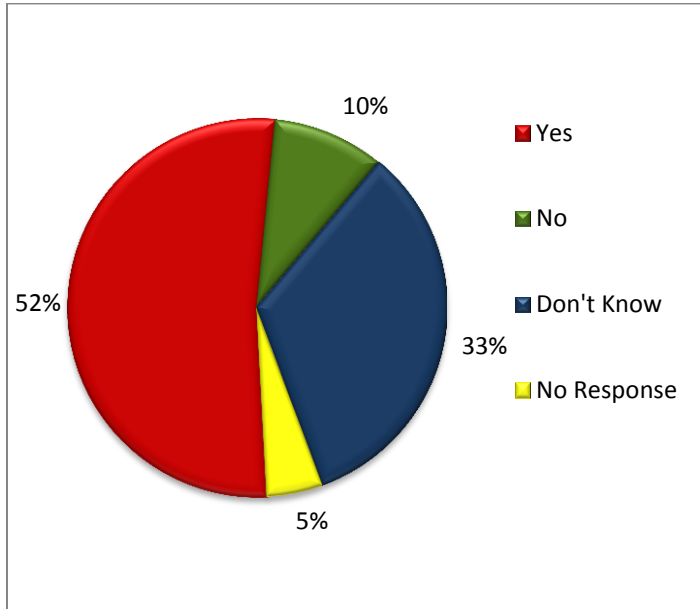
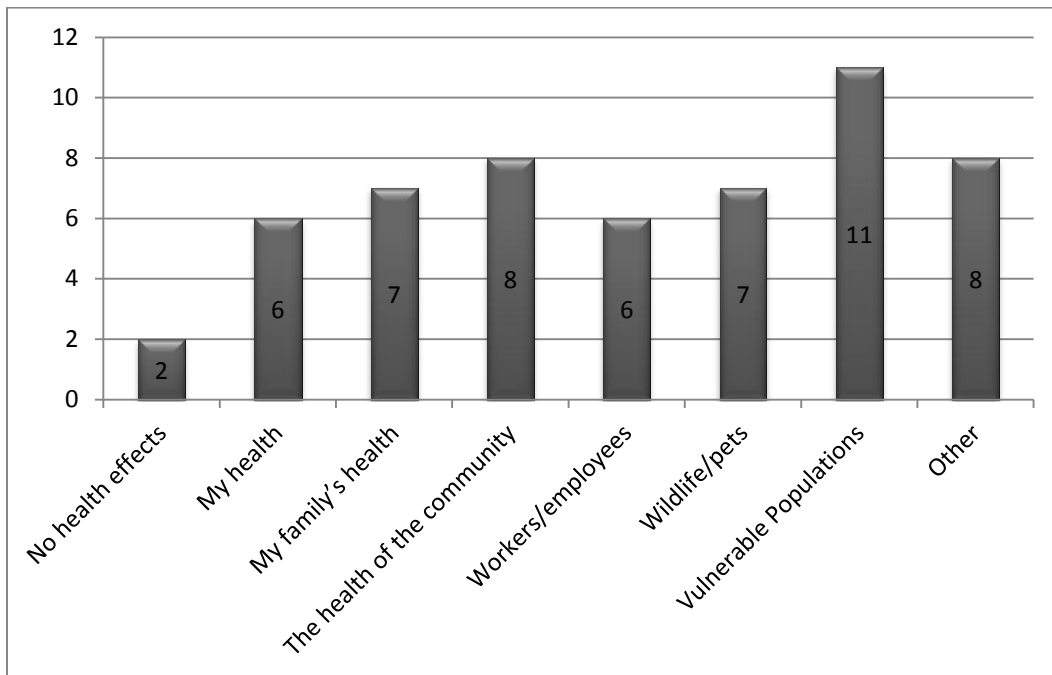


Figure 4.5 Participants Belief on Whose Health has been Affected by Environmental Exposures to Chemicals



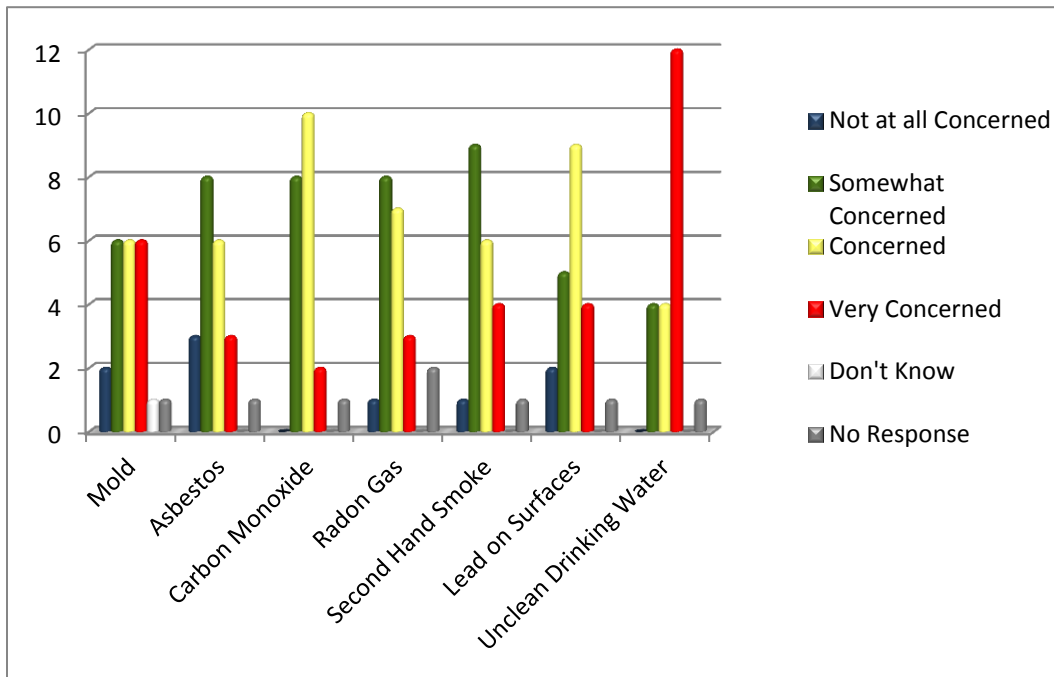
Only 2 participants indicated they believed “No Health Effects” were caused by chemicals. All other categories were selected by six – eight (28% – 38%) of the participants. When asked to specify what vulnerable population’s health was affected, participants listed groups such as “persons eating locally caught fish,” “subsistence fishers and their families,” “those living next to polluting industries,” “farm workers and their children,” “those in urban Atlanta have been effected by air quality,” and “children at schools with radon, asbestos.”

When asked what health problems or symptoms have been reported from environmental exposures to chemicals (question 10), all respondents listed a long list of health problems, but did not indicate which chemical contaminants or sources caused specific health problems. Health problems listed included kidney problems, liver damage, asthma, COPD, learning disabilities, reproductive disorders, low birth weight, shortness of breath, headaches, migraines, nausea, bad taste in mouth, skin irritations, vomiting and cancer.

4.6 Indoor Health Hazards

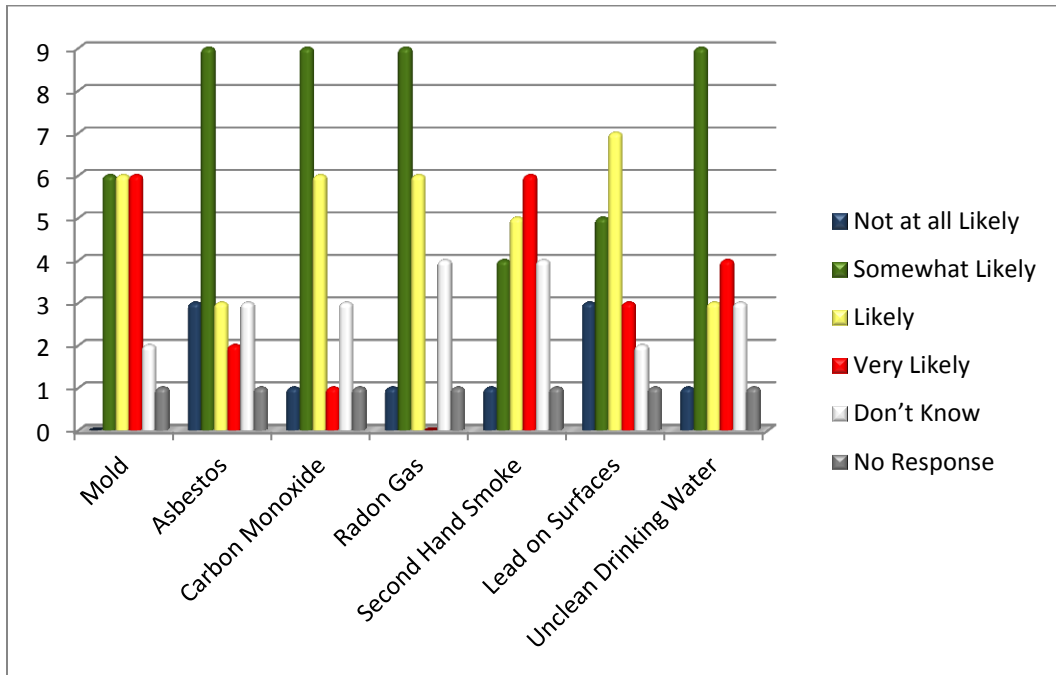
Participants were asked to rate their level of concern regarding common health hazards found within the home which include mold, asbestos, carbon monoxide, radon gas, second-hand smoke, lead on surfaces and unclean drinking water (question 11). The majority of respondents (57%) indicated they were very concerned about unclean drinking water; all other categories had less than 20% of respondents report being very concerned except for mold which had almost 30% of participants very concerned (figure 4.6). Each hazard had a few participants indicate they were not all concerned, except for carbon monoxide. Three people indicated they were not concerned about asbestos. Respondents listed other sources of concerns including volatile oils, paints, air fresheners, perfumes, cleaning compounds, particulate matter in the air etc.

Figure 4.6 Level of Concern for Indoor Health Hazards



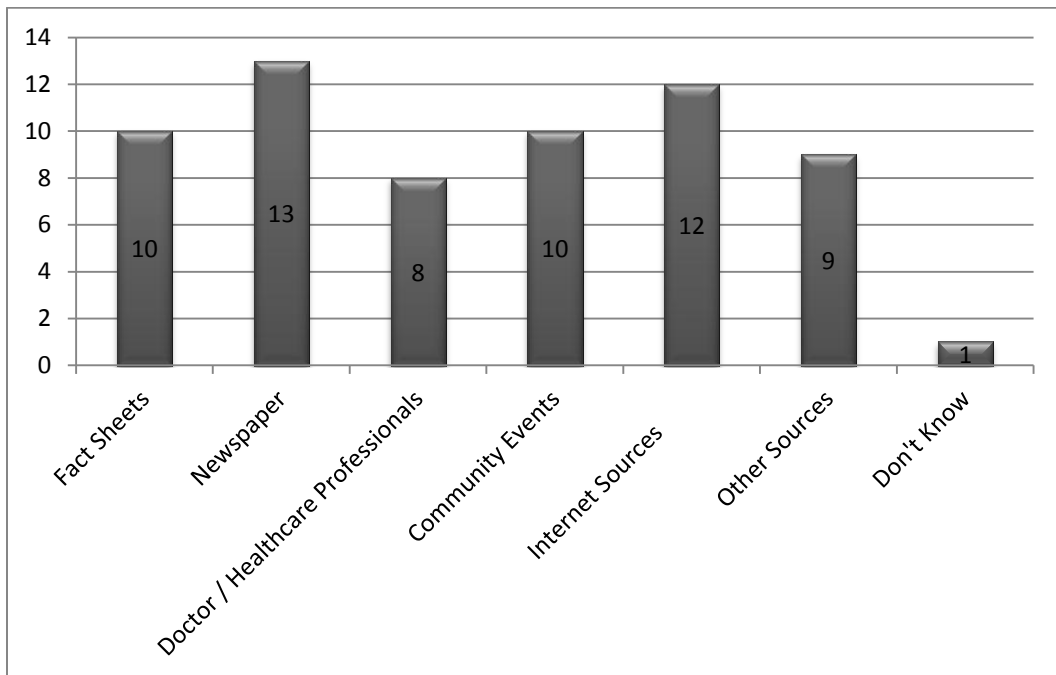
Participants were also asked to rate how likely the same hazards were to occur within the homes in their community (question 12). Respondents reported second-hand smoke and mold most often as very likely to occur (figure 4.7). Four participants answered “Don’t Know” to how likely radon and second-hand smoke occurred. One individual thought radon was “Not at all likely.” Three individuals also answered “Not at all likely” to occur for asbestos and for lead on surfaces and three participants answered “Don’t Know” to how likely asbestos, lead on surfaces and unclean drinking water were to occur.

Figure 4.7 Indoor Health Hazards Perceived Likelihood



4.7 Distributing Health Education Material

Figure 4.8 Best Methods for Providing Health Information



When asked the best ways to get health information to community members, more participants (62%) responded newspaper sources as the best method (figure 4.8). Doctors/Healthcare professionals were selected least often selected as a preferred method (38%). Participants listed many additional methods for distributing health information including doing presentations/providing literature to service/civic groups such (Rotary, Kiwanis), religious organizations, environmental and recreational groups (Sierra Club, hiking/cycling clubs), educational settings (schools, 4-H Clubs, Scouts) and through service providers such as water and sanitation services. One participant suggested using door to door organizing in the areas with the greatest risk to guarantee community members are aware of exposure threats. Another cited the importance of using multi-lingual literature in order to reach all community members.

CHAPTER V

DISCUSSION AND CONCLUSION

5.1 Implications of Findings

Completed Surveys

The survey was successful in identifying individuals interested in forming community partnership with the CHP, informing participants of the CHP, providing a better understanding community member concerns, indicating potential hazardous waste sites and helping the program better understand methods for educating communities. Twenty-one (16.3%) Georgia environmental advocacy group leaders participated in the survey. The response rate is acceptable for this type of study because the intent was to gain insight from environmental group leaders and not to make generalizations to a larger population. Currently, there is not a formed consensus on the acceptable rate for needs assessments of this nature. According to an article in the *Public Opinion Quarterly*, a journal that publishes work on research methodology, there has been an overall decline in survey participation across all survey types (mail, email, telephone) and that current discrepancies exist in which method yields the highest return rates. Their research however, indicates that sending a pre-notification letter and a reminder helped improve response rates (Kaplowitz, 2004).

In the future, it might be helpful to contact the advocacy group/organization prior to completing the study and ask them to identify an appropriate individual to contact. The method used for this needs assessment was to select one of the leaders of the organization as listed on their website. This might not have been the most effective method. Contacting organizations ahead of time will also identify currently active and interested groups and will allow the CHP to be more efficient with their time and resources and will most likely yield a higher response rate.

Group/Organization Characteristics

The majority of participants cited protect/restore natural habitats as the main purpose of their organization, but the survey did reveal 10 environmental groups that focused on protecting human health. Seven of the 10 participants that were dedicated to protecting human health expressed interest in working further with the GDPH to develop or implement public health interventions. One of the 5 groups identified prior to distribution of the survey that focused on environmental justice issues completed and returned the survey. The group also provided their information to be contacted in the future. It will be especially pertinent for the CHP to consider a partnership with this group due to their interest in helping vulnerable populations. As a follow-up to this pilot needs assessments, the CHP should contact all seven participants in addition to the four others who provided their contact information, but did not list protect human health as a core focus.

Chemical Hazard Program Knowledge and Brochure Evaluation

The survey was also successful in informing participants about the Chemical Hazards Program. Prior to the needs assessment, 81% of participants stated that they were not aware of the program. Though the program was successful in informing environmental group leaders of the services offered by the CHP, the finding indicates a high rate of environmental group activist and community members remain unaware of the program. More needs to be done by the CHP to promote awareness of their program so environmental group and other community member can contact the program and utilize its services.

The survey also allowed participants to evaluate the effectiveness of the CHP brochure. Many suggestions were made to improve the CHP brochure even though the survey did not ask participants to elaborate on what improvements were necessary. In the future, the survey should include a survey question where all participants indicate what is needed to improve the

effectiveness of the brochure. One participant made a very pertinent observation and indicated the brochure did not have the CHP contact information or website listed. When asked, the director of the program stated that the contact information had been on a previous version of the brochure, but was accidentally deleted when the brochure was updated. The brochure was immediately corrected and updated to include the CHP website and contact information.

Environment Contamination Concerns

Although a variety of environmental health concerns were cited by the participants, water quality was most often mentioned. Participants were asked how concerned they were about toxic chemical contamination in environments such as soil, air, drinking water, food and oceans, lakes, streams. The majority of participants listed that they were either concerned or very concerned about the level of chemical contamination in each environment. More participants however reported they were very concerned about drinking water than any other environment. Ninety percent also reported being either concerned or very concerned about contamination in oceans, lakes and streams. Water contamination concerns were a common theme cited multiple times by many of the participants. The result of the survey may reflect that many environmental groups included in the survey focus on protecting bodies of water and the surrounding wildlife. (This will be further discussed in the limitation section). The CHP should continue developing education material that addresses water quality and testing in response to community concerns.

Many participants listed specific waste or industrial sites that are of concern among members of their community as a source of contaminants. A few contaminated environments were also listed including specific rivers and lakes. Though many did not list specific sources, the majority of participants cited water contamination as being a chemical contamination issue that has the greatest impact on human health. They cited groundwater contamination due to runoff, tank leakage, manufacturing operations, oil spills, pesticides etc. causing contamination

of orthophosphates, nitrates, dioxin/furan, mercury, PCBs, pharmaceuticals, pesticides etc. in the water supply. The wide range of concerns as listed by participants indicates their knowledge about chemical hazards is quite extensive. The CHP should evaluate the facts about each site and determine if the concern warrants further investigation. Due to the provisions of the survey protocol submitted to IRB and consistent with ethical practices, the CHP will be unable to contact specific group leaders to further discuss their site concerns. The CHP should however, contact all individuals who agreed to be contacted to better understand their specific concerns.

Impact on Human Health

Many participants indicated they were concerned about chemical contamination issues especially in water with 52% reporting that they believed suspected toxic chemical contamination in the environment caused health concerns among individuals in their community. Once again, this might be due to the fact that many respondents were more concerned about protecting the environment and less concerned about protecting human health. Their lack of concern may be a significant indicator that more should be done to educate these individuals on the human health concerns regarding water contamination.

Almost 50% of participants listed they “Don’t know” if they were concerned about Superfund sites in their community. Future surveys should evaluate if many community members “Don’t Know” their level of concern because they are unaware of what a Superfund sites is, unaware of locations of sites in their community or if they are unaware of the sites potential human health impacts. The large number of individuals in the study not knowing indicates more should be done to make the public aware of what defines a Superfund site, the sites in their community, and the fact that Superfund sites should constitute concern due to their potential health impacts.

When asked what health problems or symptoms have been reported from environmental

exposures to chemicals, all respondents listed a long list of health problems, but did not indicate which chemical contaminants or sources caused specific health problems. The wording of the question may have been confusing and unclear. It also could indicate a low level of knowledge about toxicology and the health hazards posed by chemicals. The purpose of this question was to determine knowledge of whether community members had been exposed or suspected they had been exposed to a specific contaminant that caused health problems. Future surveys by the CHP may change the wording and inquire further about health outcomes. It is important that survey design is as specific as possible in order to guarantee participants understand the questions and respond in a manner that provides valuable information.

Home Health Hazards

The survey also addressed hazards found within the home, unclean drinking water was selected by far the most often as being of greatest concern compared to all other hazards (mold, asbestos, carbon monoxide, radon gas, second-hand smoke, lead on surfaces). The assessment also showed that many participants were unaware of how likely the hazards were to occur in homes in their community. Asbestos and lead on surfaces were most often believed by participants to be not at all likely found in homes. The needs assessment suggests more should be done to educate community members on the impact of hazards within the home. Hopefully, by educating environmental group leaders on these topics, they will gain a better understanding of the relationship between indoor environmental hazards and associated health problems. These group leaders are active and engaged members of their community. Through increasing their understanding on the topic and its impact, it may motivate them to begin advocacy work that focuses on these topics through educating and helping others in their community.

Distributing Health Education Material

Participants listed a variety of creative means for effectively providing health education

material to the community including conducting presentation and providing educational material for service/civic groups, religious organizations, environmental preservation groups and recreational groups, in an educational setting and through utility service providers. Many of the suggestions listed should be considered by the CHP as means to gain future community partnerships since they are often composed of a diverse group of individuals who are invested in their community. Their suggestions for reaching community members via door to door organizing in areas with the greatest risk to guarantee community members are aware of exposure threats and the importance of using multi-lingual literature in order to reach all community members were very pertinent. The CHP must better understand the target population in order to effectively provide public health services. Future partnerships will further reveal effective measures for engaging community members in specific communities.

The survey had several strengths that provided insight into the concerns of community groups and how to obtain useful information from them. Since the assessment was a pilot needs assessment, the main goal was to gain insight and aid in the development of future needs assessments conducted by the CHP. The survey revealed numerous suggestions for future needs assessments, as well as determining current environmental health concerns and community needs regarding potential chemical contaminants and sites, and these findings may lead to the CHP conducting public health assessments/consultations, exposure investigations, or other public health actions. The survey also revealed the need for general environmental health education and intervention activities based on concerns of the participants as well as the lack of concern by many. The survey was also successful in identifying individuals that may help the CHP gain future partnerships and identify creative methods for distributing health education material.

5.2 Follow-up and Future Survey Development

The CHP should follow-up with many of the participants and this survey, which acted as the pilot for future needs assessments, should be further developed and used to survey other leaders, community members, and public health workers etc. to further investigate the needs and concerns of communities across Georgia. As specified in the survey protocol, participants will be contacted for a follow-up if they chose to provide their contact information at the end of the survey. Contact will only be made through the contact information they provided, which will not be linked to their individual survey. The Georgia Department of Public Health will be conducting the future needs assessments based on the pilot phase of this study conducted by Georgia State University. As part of the follow-up, participants will be sent a summary of the survey results. The GDPH will also ask about the effectiveness of the survey and for any feedback. They may also ask participants to assist them with community health education programs and other site specific activities. Other plans for future needs assessments will be determined by the GDPH after the pilot phase of the survey is completed.

5.3 Survey Challenges

A number of challenges and unknown factors may have hindered the needs assessment. It is unknown if the response rate was due to lack of concern about chemical hazards and human health, if many participants did not receive the mailed packet or email, or if another factor hindered the response rate. As indicated by the large number of return to sender emails, many of the organizations listed incorrect or inactive mail accounts. There is no way of knowing if the environmental advocacy groups had become inactive or if the website listed incorrect email and mailing address due to their website not being regularly updated to reflect current leaders within the organization. It is very possible that a significant number of potential participants did not

even receive the mailed packet of email and the response rate was much higher than presented. In the future, it will be important to contact groups prior to completing the survey in order to identify the most appropriate contact.

Another limitation of the study was the broad range of environmental groups included in the needs assessment. The purpose of the assessment was to contact as many environmental advocacy group leaders as possible throughout Georgia to better understand their concerns about chemical toxins in the environment and their impact on human health. Many of the organizations selected did not focus on protecting human health, but instead were focused on protecting and restoring natural habitats. The result of the survey may have been skewed since many environmental groups in the survey focus on protecting bodies of water and the surrounding wildlife. At the same time however, there is a higher proportion of groups focused on water conservation/protection because there are a lot of individuals concerned about protecting water. In the future, the CHP should contact environmental groups focused on water conservation and educate them about the importance of water protection due to the impact contamination can have on human health. It might also be pertinent for the CHP to conduct future studies that only include individuals interested in protecting human health.

The scope of the needs assessment was very broad and was another limitation of the study. So many group leaders within numerous disciplines and experience levels were contacted making it difficult to design a survey that was appropriate for all of them. Some participants were very knowledgeable about environmental contaminants and their effect on human health while others were unaware of the hazards and their impact and focused on protecting natural resources and wildlife instead. As mentioned previously, future CHP should determine a more specific target population and design the needs assessment best suited for that group.

5.4 Conclusion

Overall, the pilot needs assessment fulfilled all of the research goals established at the onset of the project. The results provided valuable insight on the concerns of community environmental group leaders, identified additional waste sites that are the source of community health concerns, found individuals interested in forming community partnerships and informed group leaders of the services offered to the public by the GDPH and the Chemical Hazards Program. The results also indicted areas of improvement for the effectiveness of the CHP brochure and provided creative methods for providing the community with health education material.

The survey presented a wide variety of community concerns. Some were very specific and indicated the need for CHP to investigate exposures and contamination at precise locations. Others were very general and could be addressed through providing educational material on how to eliminate or mitigate potential chemical exposures. Water contaminants were a source of much concern. The program should continue developing and distributing health education material that addresses water quality, testing, health impacts, etc. Other contaminants (radon, asbestos, lead) were less of a concern to participants when in fact health problems can and do occur from exposures. Health intervention material should be distributed that informs community members of the risks and necessary preventative measures. The survey also revealed creative methods for distributing this material and they should be considered by the CHP. It also identified individuals as well as active environmental groups that can assist in distributing and developing health education material. Much was learned from the environmental advocacy group need assessment that will help develop future education and intervention activities as well as future environmental health need assessments conducted by the Chemical Hazards Program.

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Appendix A. Mailed Cover Letter



Brenda Fitzgerald, MD, Commissioner

Nathan Deal, Governor

2 Peachtree St NW, 15th Floor
Atlanta, Georgia 30303-5142
www.health.state.ga.us

January 13, 2011

Ladies and Gentlemen:

Georgia State University's Institute of Public Health and the Georgia Department of Public Health are conducting a survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. The Georgia Department of Public Health (GDPH) works with government agencies, elected officials, community leaders, businesses and industry, residents, and others to address environmental and public health issues and concerns. As an environmental advocacy group leader, we would like your opinions and suggestions about environmental health issues in Georgia. Please assist us by completing the enclosed brief survey. This survey is voluntary and offered at no cost.

Georgia residents have expressed concerns about the potential for exposures and resulting health effects that might be associated with chemical contamination of air, water, soil and food. Survey results will be used to assist GDPH with identifying and prioritizing environmental health concerns, developing appropriate community health education programs, and informing communities about GDPH services. Also enclosed is the GDPH Chemical Hazards Program brochure that describes the program and provides contact information.

If you would like to participate in this survey, please read the consent form prior to completing the survey. The survey and consent form can also be completed online by accessing the link located on the GDPH Chemical Hazards Program website, www.health.state.ga.us/programs/hazards. **Please return completed surveys by Friday, January 27, 2012.**

If you know other environmental advocacy leaders who may be interested in completing the survey, they can access the link on the website listed above. If they prefer a print copy of the survey, they can contact Laura Frame at LFrame1@student.gsu.edu or at the address listed below and provide their mailing address to receive a survey in the mail. They may also make a copy of the enclosed survey and consent form and mail the survey to the address listed below.

We will analyze the completed surveys and publish the results. No personal identifiers will be used in any reports created from the survey data. If you have any questions, please contact Laura Frame at LFrame1@student.gsu.edu at any time.

Thank you for your commitment and contributions to your community.

Sincerely,

Laura Frame
Georgia State University
Institute of Public Health
P.O. Box 3995
Atlanta, GA 30302-3995

Equal Opportunity Employer

Appendix B. Chemical Hazards Program Brochure

What is the Chemical Hazards Program?

The Georgia Department of Public Health works with other government agencies, elected officials, community leaders, business and industry, residents, organizations, and others to address public health issues in Georgia.

The Chemical Hazards Program is part of the Environmental Health Branch of the Georgia Department of Public Health. Chemical Hazards Program staff members address issues and concerns associated with human exposure to toxic chemicals in the environment.

The goals of the Chemical Hazards Program are to identify people at risk for health problems from exposure to toxic chemicals in the environment, determine relationships between exposure to toxic chemicals and human diseases, and to reduce or eliminate exposures of health concern.



The Chemical Hazards Program is staffed by Environmental Health professionals who perform hazardous waste site assessments, investigate health complaints, promote community involvement activities, and provide health education and professional training.

GEORGIA PUBLIC HEALTH DISTRICTS



1. Albany Health District	11. DeKalb Health District	17. Spaldow County Health District
2. Coastal Health District	12. Douglas County Health District	18. Wilkes County Health District
3. DeKalb Health District	13. Fayette County Health District	19. Wilcox County Health District
4. Gwinnett Health District	14. Forsyth County Health District	20. Yamacraw Island Health District
5. Hall County Health District	15. Fulton County Health District	
6. Hancock County Health District	16. Heard County Health District	

What services are provided by the Chemical Hazards Program?

To carry out its goals and to serve the needs of the public, the Chemical Hazards Program conducts activities in several areas:

- Public Health Assessments
- Technical Assistance
- Health Education
- Community Involvement
- Health Studies
- Professional Training
- Exposure Prevention

Public Health Consultations evaluate a site where there are toxic chemicals in the environment. They investigate possible past, current and future human exposure, and make recommendations to protect public health.

Technical Assistance provides specific information about a chemical release, known or potential exposure, or health concern.

Health Education is provided to individuals and communities through presentations, public meetings, publications, discussions, and the Chemical Hazards Program website.



Community Involvement helps and encourages community members to work together and gather community health concerns, and develop and carry out activities that address these concerns.

Health Studies involve human health and epidemiologic studies that evaluate known and potentially exposed people, and identify any relationships between exposure and adverse health outcomes.

Professional Training for district and local health department staff, health care providers, and others about how toxic chemicals in the environment may affect human health, and how to better communicate the risks of actual or potential exposure.

Exposure Prevention activities promote wellness and resource conservation, including hazardous household chemical reduction, illegal laboratory exposures, emergency preparedness, and fish and seafood consumption guidance.

Chemical Hazards Program Publications

DRAFT

BROCHURES

- Brownfields and Public Health
- Cancer and the Environment
- Chemical Hazards Program
- Chemical Hazards Program Internships
- Georgia Environmental Health Careers
- Health Effects of Odors
- Landfill Gas and Odors
- Naturally Occurring Asbestos in Georgia
- Potential Long-Term Health Effects of Carbon Monoxide
- Proper Well Abandonment
- Radium and Uranium in Public Drinking Water Supplies
- Radon and Public Health
- Recycle Your Analog Television
- Recycling and Reusing Scrap Tires
- Water Well Quality
- Women in Environmental Careers (WeCareers.org)
- Women's Guide to Eating Fish and Seafood

Fish Consumption Guidance (English and Spanish)

- Eating Fish from Coastal Georgia
- Eating Fish from the Coosa, Etowah, and Oostanaula Rivers
- Eating Fish from Mid and South Georgia
- Eating Fish from North Georgia

Hazardous Waste Reduction/Prevention

- Integrated Pest Management for Homes
- Neighborhood Chemical Swap Programs
- Safe Alternative to Common Household Chemicals

FACT SHEETS

- BP Deepwater Horizon Oil Spill
- Mercury in Air
- Propyl Mercaptan and Ethoprop in Air
- Lead in Soil
- Household Hazardous Waste Reduction
- Naphthalene Pest Control Products
- Common Health Concerns about Crematory Operations

Chemical Hazards Program
 Georgia Department of Public Health
 2 Peachtree Street NW, 13th Floor
 Atlanta, GA 30303-3142

CHEMICAL HAZARDS PROGRAM



Environmental Health Branch
 GEORGIA DEPARTMENT OF PUBLIC HEALTH



Appendix C. Consent Form

Georgia State University
Institute of Public Health
Informed Consent

Georgia Environmental Advocacy Groups Environmental Health Education Needs Assessment

Principal Investigator: John Steward
Student Principal Investigator: Laura Frame

I. Purpose:

You are invited to participate in a research study. Georgia State University's Institute of Public Health and the Georgia Department of Public Health are conducting a survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. Survey results will be used to assist the Georgia Department of Public Health with identifying and prioritizing environmental health concerns, developing appropriate community health education programs, and informing communities about their services.

II. Procedures:

If you decide to participate, you will be asked to complete a short survey. Survey questions will inquire about your advocacy group/organization and your knowledge of the Georgia Department of Public Health. The survey will also include questions about health concerns regarding exposure to toxic chemicals in your community. A total of 150 participants will be recruited for this study. Participation will require less than 30 minutes of your time.

III. Risks:

In this study, you will not have any more risks than you would in a normal day of life. In addition, participation in the study is not intended to address any personal hazards, so individual risks may not be reduced as a result of participation. Individuals with health concerns that they believe to be related to environmental exposures may wish to contact the Georgia Department of Public Health at 404-657-6534 or their personal health care provider.

IV. Benefits:

Participation in this study may not benefit you personally. The study is not intended to identify hazards to individuals. Overall, we hope to gain information that will help the Georgia Department of Public Health be better informed about environmental health concerns and public health interventions.

V. Voluntary Participation and Withdrawal:

Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip any questions you do not wish to answer.

VI. Confidentiality:

We will keep your records private to the extent allowed by law. John Steward and Laura Frame will have access to the information you provide. Information may also be shared with those who make sure the

study is done correctly (Georgia State University Institutional Review Board, Office for Human Research Protection, Office of Research Integrity). The information you provide will be stored on password- and firewall-protected computers to protect the data. All reports created using survey results will not contain any personal identifiers such as name or address. These reports will contain grouped information only.

VII. Follow-up

You will only be contacted for a follow-up if you choose to provide your contact information at the end of the survey. Contact will only be made through the contact information you provide and will not be linked to your individual survey. The Georgia Department of Public Health will be conducting the follow-up. Georgia State University will only be involved in the first phase of this study. As part of the follow-up, you will be sent a summary of the survey results. The GDPH will also ask about the effectiveness of the survey and for any feedback. They may also ask you to assist them with community health education programs and other site specific activities. Other plans for the follow-up will be determined by the GDPH after the first phase of the survey is completed.

VIII. Contact Persons

Contact John Steward at jsteward@gsu.edu or 404 -413-1137 if you have questions about this study. If you have questions or concerns about your rights as a participant in this research study, you may contact Susan Vogtner in the Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu.

IX. Copy of Consent Form to Subject:

You may keep this consent form for your records.

If you are willing to participate in this research, please continue with the survey.

Appendix D. Environmental Health Survey

COMMUNITY ENVIRONMENTAL HEALTH SURVEY

Please mail the completed survey to the address listed at the end of the survey. The survey can also be completed online at [enter link here]. Please complete only one survey.

INSTRUCTIONS

You can refuse to answer any question, but please answer all questions you choose to answer as completely as possible.

Organization /Advocacy Group _____
Street Address _____
P.O. Box _____ County _____
City _____ State _____ ZIP Code _____

1. What is the main purpose of your organization (check all that apply)?
 Protect/Restore Natural Habitats
 Educate Communities
 Protect Human Health
 Influence Political Process and/or Government Policies
 Other (Please Describe)

2. How many current members does your Georgia organization have?
 Fewer than 10
 10 - 50
 51 - 100
 More than 100
3. Were you aware of the Georgia Department of Public Health's Chemical Hazards Program prior to being contacted to complete this survey?
 Yes
 No
4. Does the Chemical Hazards Program brochure help you understand the services that are available to community members?
 Yes
 No

5. How concerned are you about toxic chemical contamination in each of the environments listed below? Rate each one with a category 1 - 4 by placing an X in the corresponding box.

	1. Not at all Concerned	2. Somewhat Concerned	3. Concerned	4. Very Concerned	Don't Know
Soil					
Air					
Drinking Water					
Ocean, Lakes, Rivers, Streams					
Food					
Other (Please Specify)					
Other (Please Specify)					

6. A. Describe what chemical contamination issues pose the greatest risk to human health in your community?

- B. What are the sources of the chemicals you are most concerned about?

7. Are there any "Superfund" or other known hazardous waste sites in your community that you are concerned about?

Yes
 No
 Don't Know

If yes, please describe these sites (name, location, chemicals, etc.)

8. Has known or suspected toxic chemical contamination in the environment caused health concerns among individuals in your community?

Yes
 No
 Don't Know

9. Whose health has been affected by environmental exposures to chemicals? Check all that apply.

No health effects
 My health
 My family's health
 The health of the community
 Workers/employees
 Wildlife/pets
 Vulnerable Populations (elderly, children, minority, women, etc.) (Please Specify)

Other (Please Specify)

10. What health problems or symptoms have been reported from environmental exposures to chemicals? (Please Specify)

11. In your **community**, how **concerned** are you about the following health hazards inside the homes? Rate each hazard with a category 1 - 4 by placing an X in the corresponding box..

	1. Not at all Concerned	2. Somewhat Concerned	3. Concerned	4. Very Concerned	Don't Know
Mold					
Asbestos					
Carbon Monoxide					
Radon Gas					
Second-hand Smoke					
Lead on Surfaces					
Unclean Drinking Water					
Other (Please Specify)					
Other (Please Specify)					

12. In your **community**, how **likely to occur** are the following hazards inside the homes? Rate each one with a category 1-4 by placing an X in the corresponding box.

	1. Not at all Likely	2. Somewhat Likely	3. Likely	4. Very Likely	Don't Know
Mold					
Asbestos					
Carbon Monoxide					
Radon Gas					
Second-hand Smoke					
Lead on Surfaces					
Unclean Drinking Water					
Other (Please Specify)					
Other (Please Specify)					

13. What are the best ways to get health information to members of your community? (Check all that apply)

- Fact Sheets
- Doctor / Healthcare Professional
- Newspaper
- Community Events
- Internet Sources
- Other Sources (Please Specify) _____
- Don't know

Please provide any comments below.

Please provide your contact information below if you consent to be contacted for a very brief follow-up evaluation survey, and to receive the results of this survey. The Georgia Department of Public Health will conduct follow-up and publish the survey results. Contact will only be made through the information you provide below and will not be linked to your survey responses.

Thank you for your commitment and contributions to your community.

If you have questions, please email Laura Frame at LFrame1@student.gsu.edu.

Please return completed surveys by Friday January 20, 2012 to:

Laura Frame
Georgia State University
Institute of Public Health
P.O. Box 3995
Atlanta, GA 30302-3995

Appendix E. Electronic Consent Form



Brenda Fitzgerald, MD, Commissioner

Nathan Deal, Governor

2 Peachtree St NW, 15th Floor
Atlanta, Georgia 30303-5142
www.health.state.ga.us

January 13, 2012

Ladies and Gentlemen:

Georgia State University's Institute of Public Health and the Georgia Department of Public Health are conducting a survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals. The Georgia Department of Public Health (GDPH) works with government agencies, elected officials, community leaders, businesses and industry, residents, and others to address environmental and public health issues and concerns. As an environmental advocacy group leader, we would like your opinions and suggestions about environmental health issues in Georgia. Please assist us by completing a brief online survey. This survey is voluntary and offered at no cost.

Georgia residents have expressed concerns about the potential for exposures and resulting health effects that might be associated with chemical contamination of air, water, soil and food. Survey results will be used to assist GDPH with identifying and prioritizing environmental health concerns, developing appropriate community health education programs, and informing communities about GDPH services. Attached is the Chemical Hazards Program brochure that describes the program and provides additional contact information.

If you would like to participate in this survey, please read the consent form prior to completing the survey. The survey and consent form can be completed online by accessing the link located on the GDPH Chemical Hazards Program website, www.health.state.ga.us/programs/hazards. **Please return completed surveys by Friday January 27, 2012.**

If you know other environmental advocacy leaders who may be interested in completing the survey, they can access the link on the website listed above. If they prefer a print copy of the survey, they can contact Laura Frame at LFrame1@student.gsu.edu or at the address listed below and provide their mailing address to receive a survey in the mail.

We will analyze the completed surveys and publish the results. No personal identifiers will be used in any reports created from the survey data. If you have any questions, please contact Laura Frame at LFrame1@student.gsu.edu at any time.

Thank you for your commitment and contributions to your community.

Sincerely,

Laura Frame

Laura Frame
Georgia State University
Institute of Public Health
P.O. Box 3995
Atlanta, GA 30302-3995

Equal Opportunity Employer

Appendix F. Survey Reminder Postcard

COMMUNITY ENVIRONMENTAL HEALTH SURVEY



**INSTITUTE OF
PUBLIC HEALTH**
Georgia State University

Thank You for Participating!

**Please take a moment to help us assess the health concerns and
education needs of your community**

DEADLINE EXTENDED TO February 3, 2012

Georgia State University's Institute of Public Health and the Georgia Department of Public Health are conducting a survey to learn more about the concerns of environmental advocates and other community leaders in Georgia regarding exposure to toxic chemicals in the environment.

Survey results will be used to assist the Georgia Department of Public Health with identifying and prioritizing environmental health concerns, developing appropriate community health education programs, and informing communities about our services.

Participation is voluntary and is offered at no cost.

You may complete the survey online at www.health.state.ga.us/programs/hazards or have a copy sent to you by contacting Laura Frame at lframe1@student.gsu.edu.

Thank you for your commitment and contributions to your community