

EXHIBIT NO. 1


24
6-12-07

City of Alexandria, Virginia

MEMORANDUM

DATE: JUNE 7, 2007

TO: THE HONORABLE MAYOR AND MEMBERS OF CITY COUNCIL

FROM: JAMES K. HARTMANN, CITY MANAGER 

SUBJECT: COMMUNITY ENVIRONMENTAL HEALTH ASSESSMENT

ISSUE: Community Environmental Health Assessment

RECOMMENDATION: That City Council receive the attached report and request staff to schedule a work session in the fall when City boards and commission comments can be presented as a part of the discussion.

DISCUSSION: In 2002, the Alexandria Health Department (AHD) applied for and received a Centers for Disease Control and Prevention (CDC) grant administered by the National Association of County and City Health Officials (NACCHO) to conduct a community environmental health assessment of Alexandria. The AHD's Environmental Health Division (EHD) and the Alexandria Department of Transportation and Environmental Services' (T&ES) Division of Environmental Quality (DEQ) then worked collaboratively to recruit an assessment team.

Over the last several years this team of 27 city residents and government officials conducted an assessment of the environmental factors affecting human health in the City of Alexandria. The assessment team reviewed available health and environmental data on the City of Alexandria and surveyed a representative cross-section of Alexandria residents about their concerns about environmentally-linked health issues. Eleven broad environmental health issues were identified for study.

After an extensive data gathering process, the assessment team ranked the health threat currently posed by these eleven broad issues based on the scientific evidence. Then, considering not only the scientific evidence, but also the concerns of Alexandria residents, the effectiveness of current programs to protect health and the environment, and the potential for effective new actions, the issues were prioritized for action. Staff wrote proposed action plans for all the issues.

The proposed action plans will be reviewed by other City staff and, where appropriate, implemented by the Environmental Health Division and the Division of Environmental Quality in cooperation with other City departments. This report should be particularly useful in providing some baseline data to help guide development of the City's Environmental Action Plan (Environmental Strategic Plan).

The Community Environmental Health Assessment report recommends that additional data on environmental health issues be collected to fill in the data gaps that were identified by the assessment. The report also recommends that an annual environmental health report for the City be written that will describe the progress made towards the goals identified in this report. The report also recommends that a follow-up community environmental health assessment be completed in 2011 to assess the progress the city has made on addressing the issues identified by this community environmental health assessment and to identify any new environmental health issues that have emerged.

ATTACHMENTS:

Attachment I. Powerpoint Presentation

Attachment II. Community Environmental Health Assessment Report

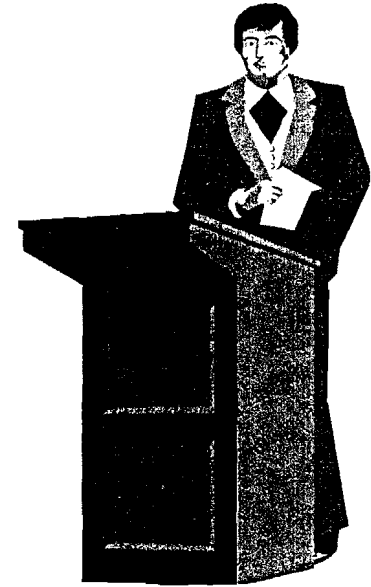
STAFF:

Charles Konigsberg, Jr., MD., M.P.H., Health Director, Alexandria Health Department

Bob Custard, R.E.H.S., Chief, Environmental Health Division, Alexandria Health Department

Bill Skrabak, Division Chief, Environmental Quality, T&ES

ALEXANDRIA COMMUNITY ENVIRONMENTAL HEALTH ASSESSMENT



Bob Custard, R.E.H.S.

Environmental Health Manager

Environmental Health Division

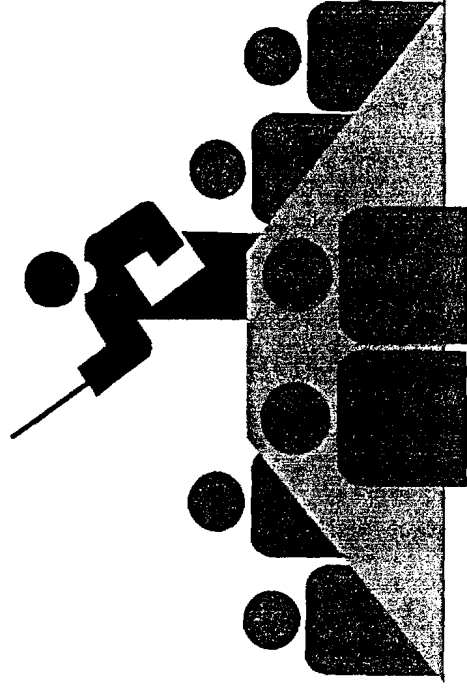
Alexandria Health Department

Project Goals



- » **Identify potential environmentally linked health threats in Alexandria**
- » **Develop measures and collect data to quantify the risk these threats pose to human health**
- » **Recommend priorities for community action**
- » **Develop plans to reduce the risks posed by environmentally linked health threats**
- » **Develop effective ways of measuring positive outcomes instead of just outputs**
- » **Improve community collaboration on environmental health issues**
- » **Educate Alexandria citizens about environmental health issues**

The Process



- 1. Environmental Health Assessment Team (EHAT) created**
- 2. Environmental health survey of 400+ Alexandria residents**
- 3. EHAT generates a list of EH issues identified by the community**
- 4. EHAT develops appropriate indicators to assess health risks**
- 5. EHAT selects standards to measure risk associated with issues**
- 6. EHAT ranks issues based on data available**
- 7. EHAT sets priorities for action**
- 8. EHAT develops action plans for issues identified**
- 9. EH Assessment report issued**
- 10. Action plans reviewed by City government and implemented**

Community Input



- » **Assessment Team (27 persons)**
Role: Conduct community EH assessment

- » **6 Community Focus Groups (~75 persons)**
Role: Test survey instrument

- » **475 Alexandria citizens**
Role: Complete survey on environmental health issues in Alexandria

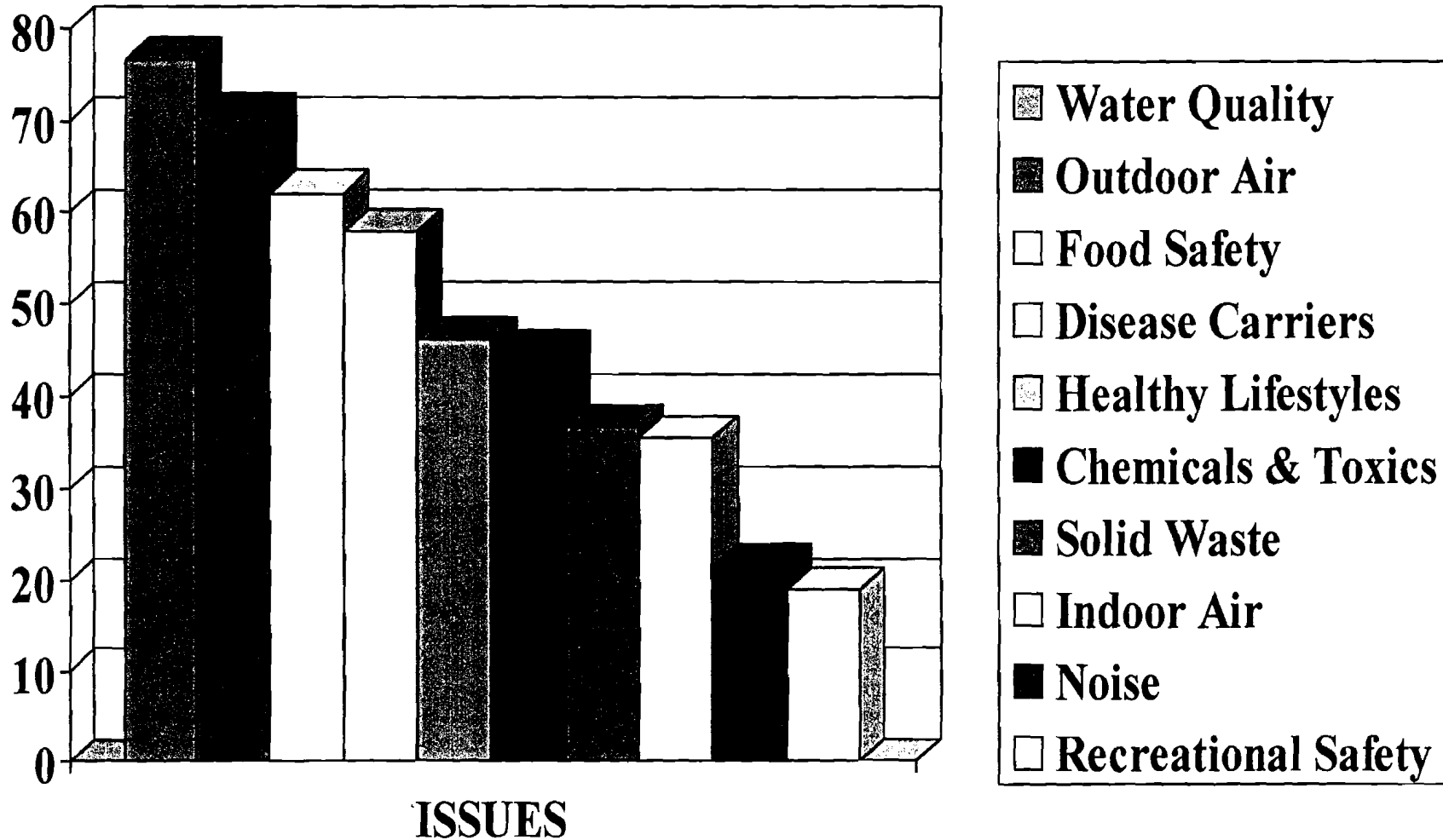
Partners



- » **CDC Demonstration Project Grant - \$20,000
Administered by National Association of
County and City Health Officials**
- » **CDC Public Health Prevention Specialist
Robin Annison (2 years) - Conducted a
broader scope Community Public Health
Assessment for AHD encompassing all
aspects of community health.**

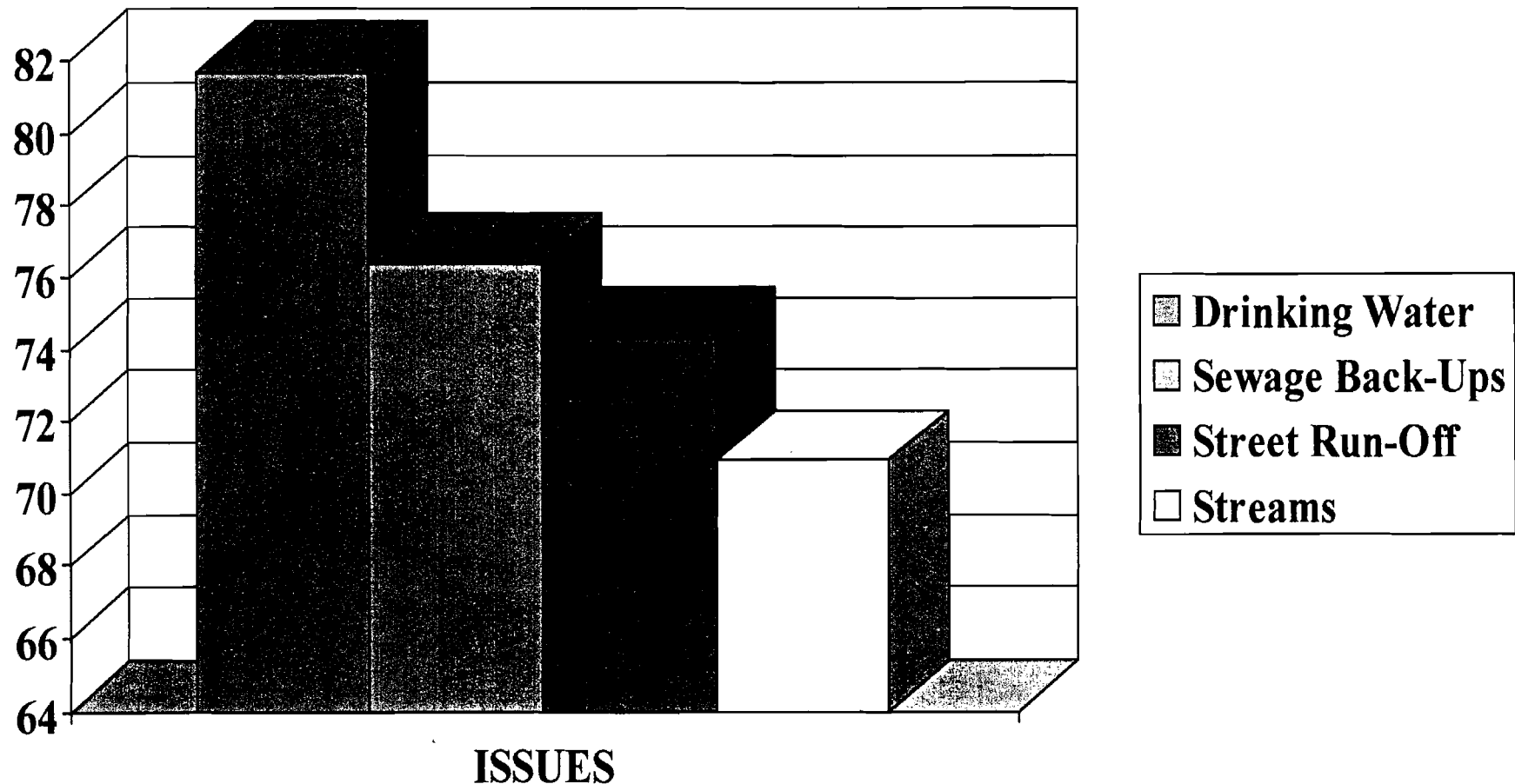
CITIZEN SURVEY RESULTS

Top Issues Identified



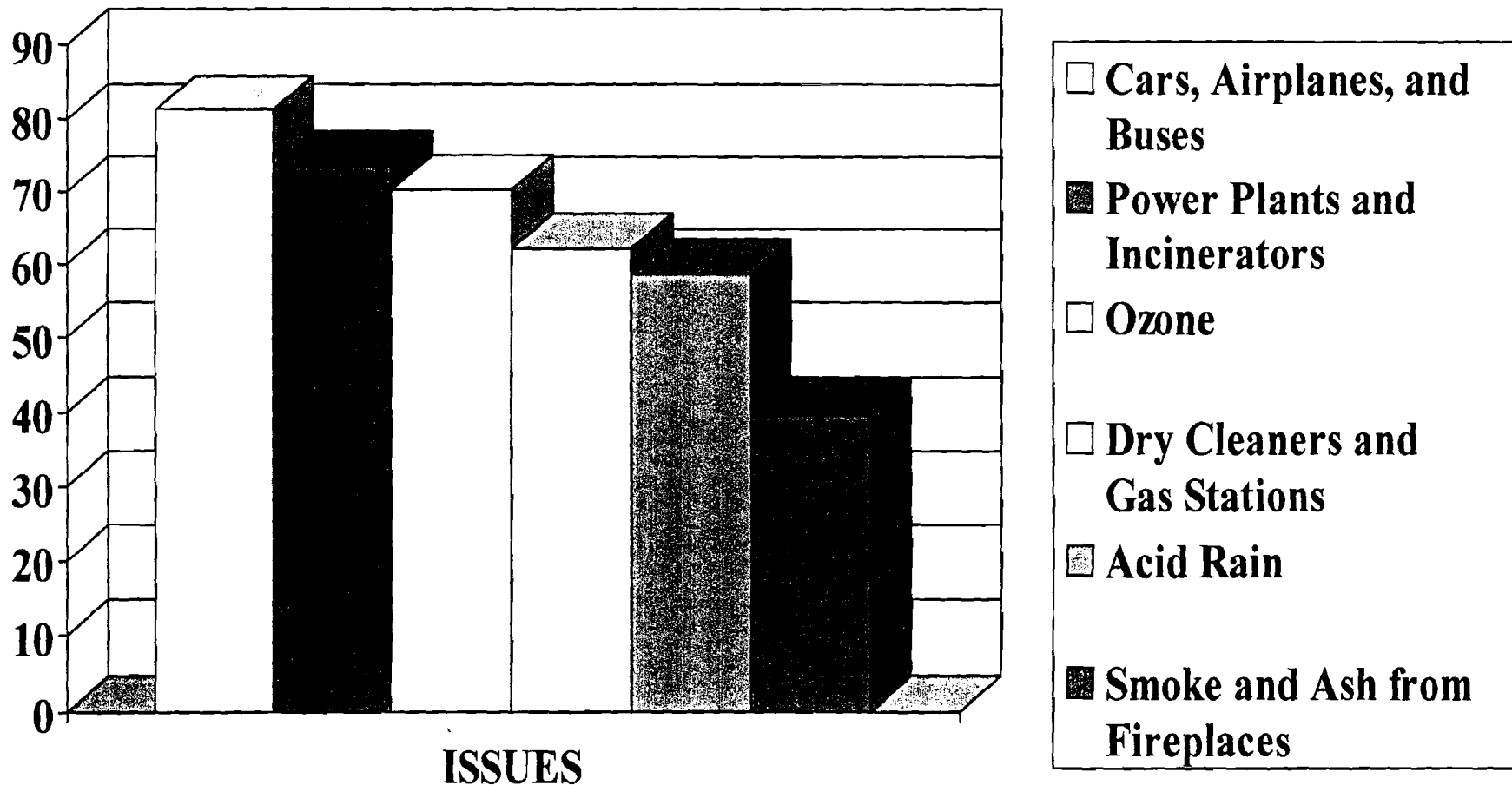
SURVEY RESULTS

Water Quality Issues



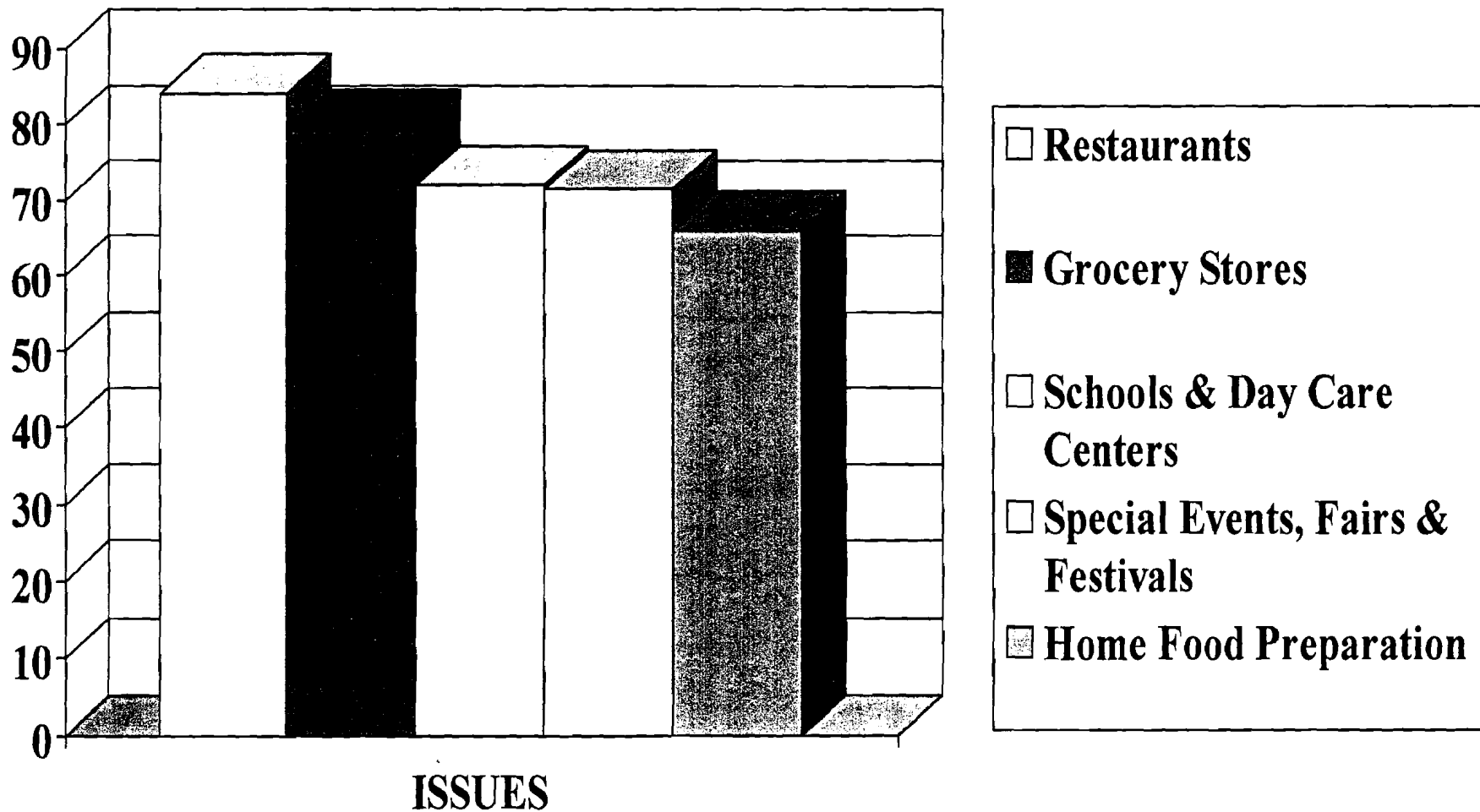
SURVEY RESULTS

Outdoor Air Quality Issues



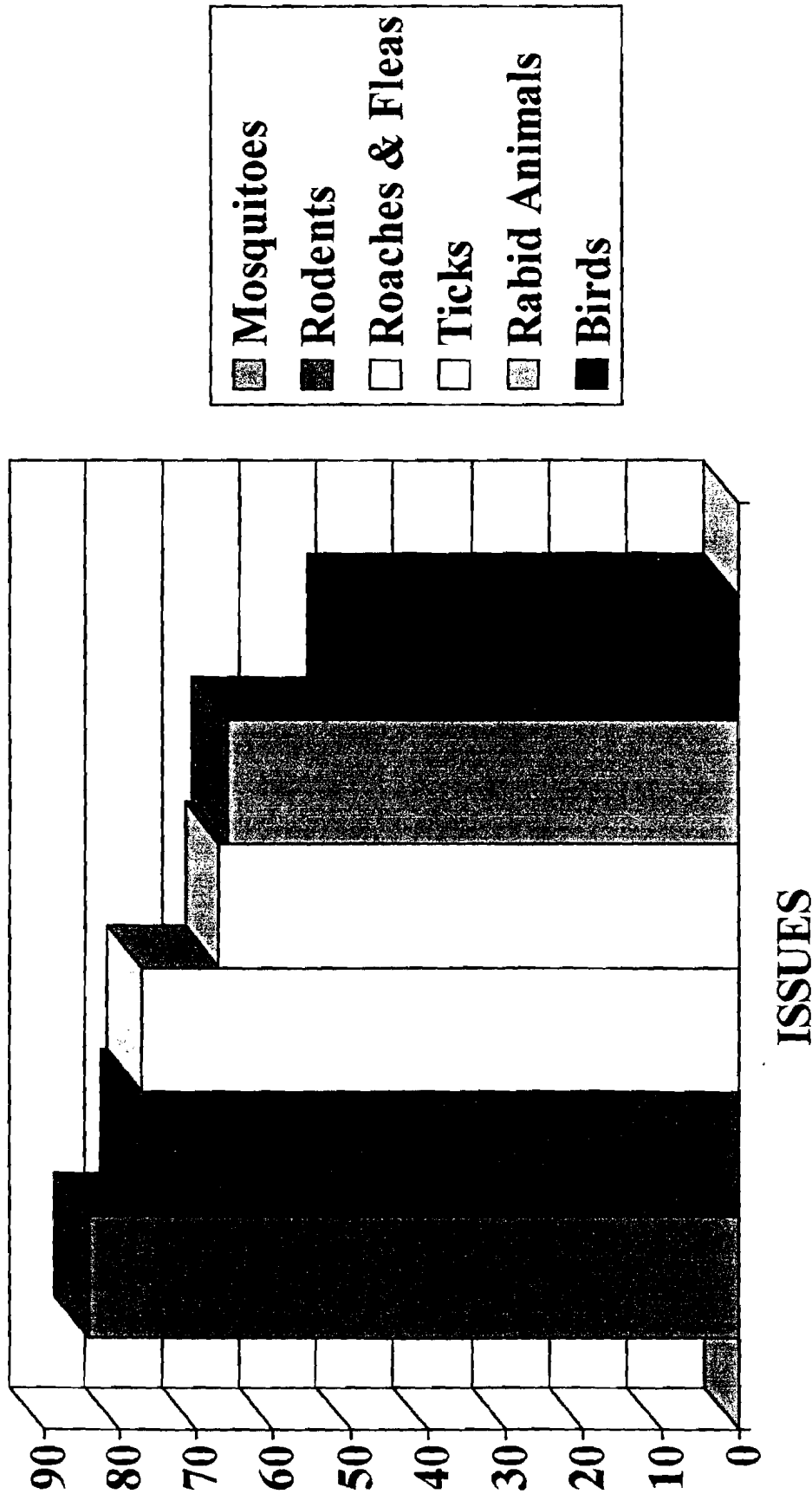
SURVEY RESULTS

Food Safety Issues



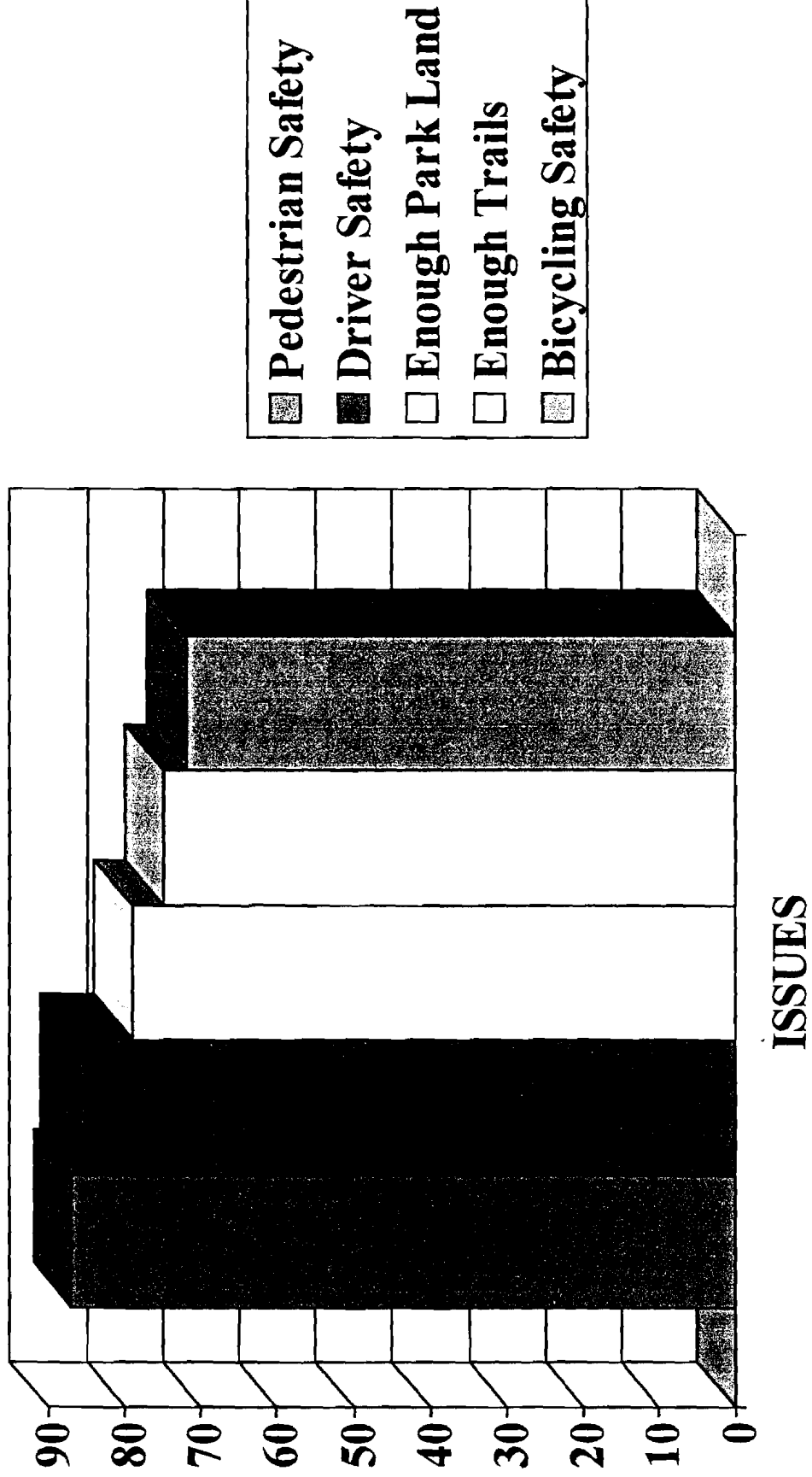
SURVEY RESULTS

Disease Carrier Issues



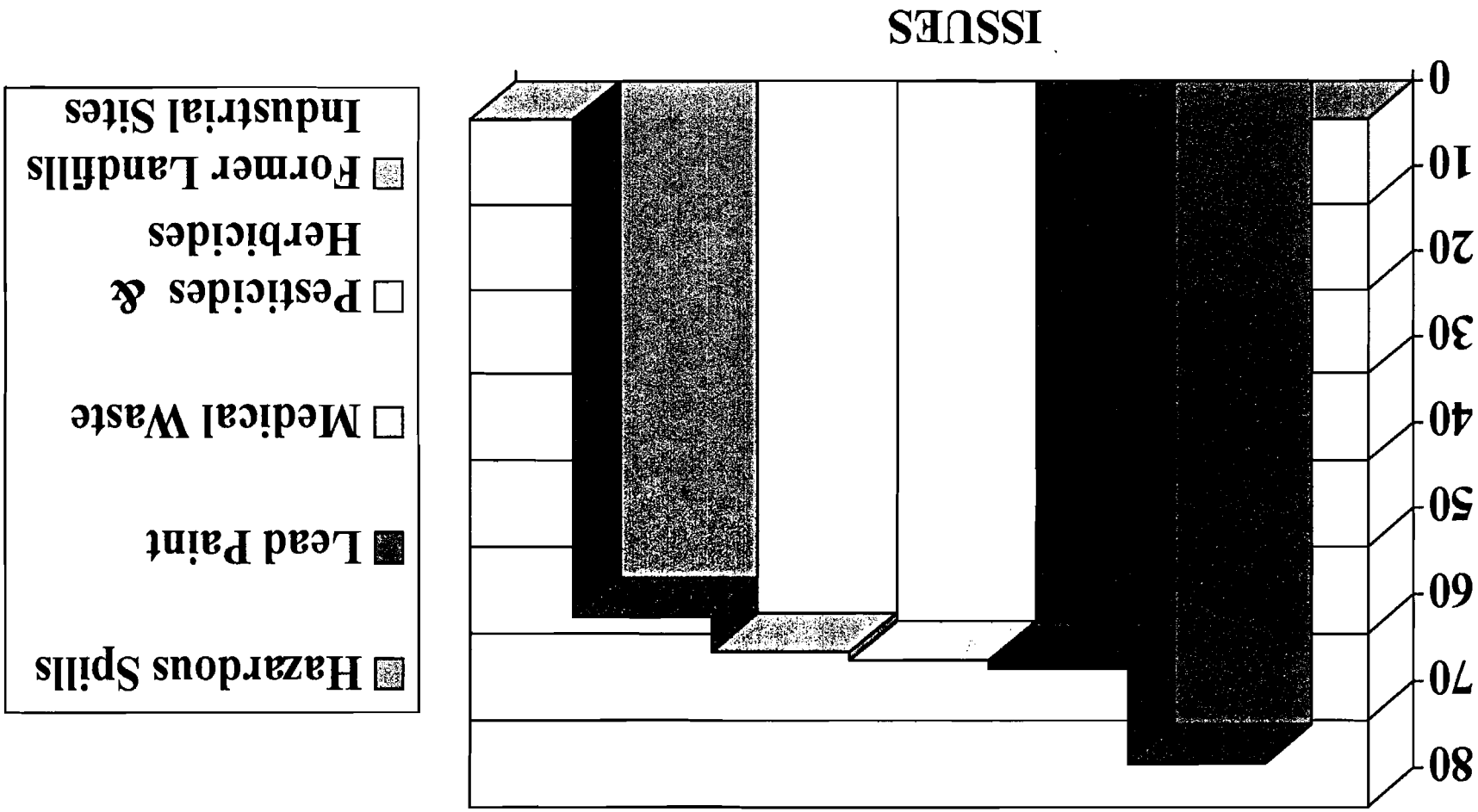
SURVEY RESULTS

Healthy Lifestyle Issues



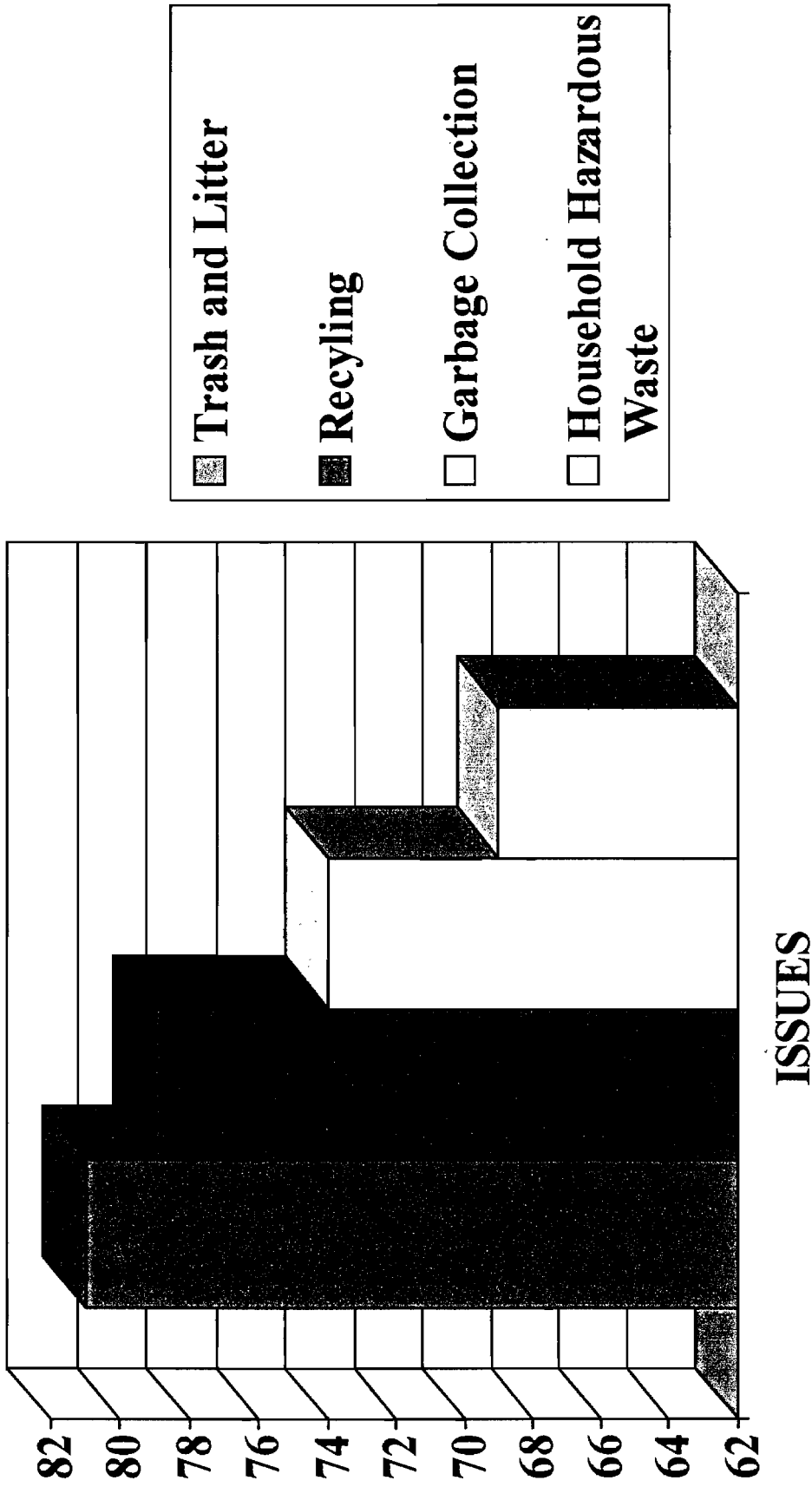
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Chemical & Toxics Issues



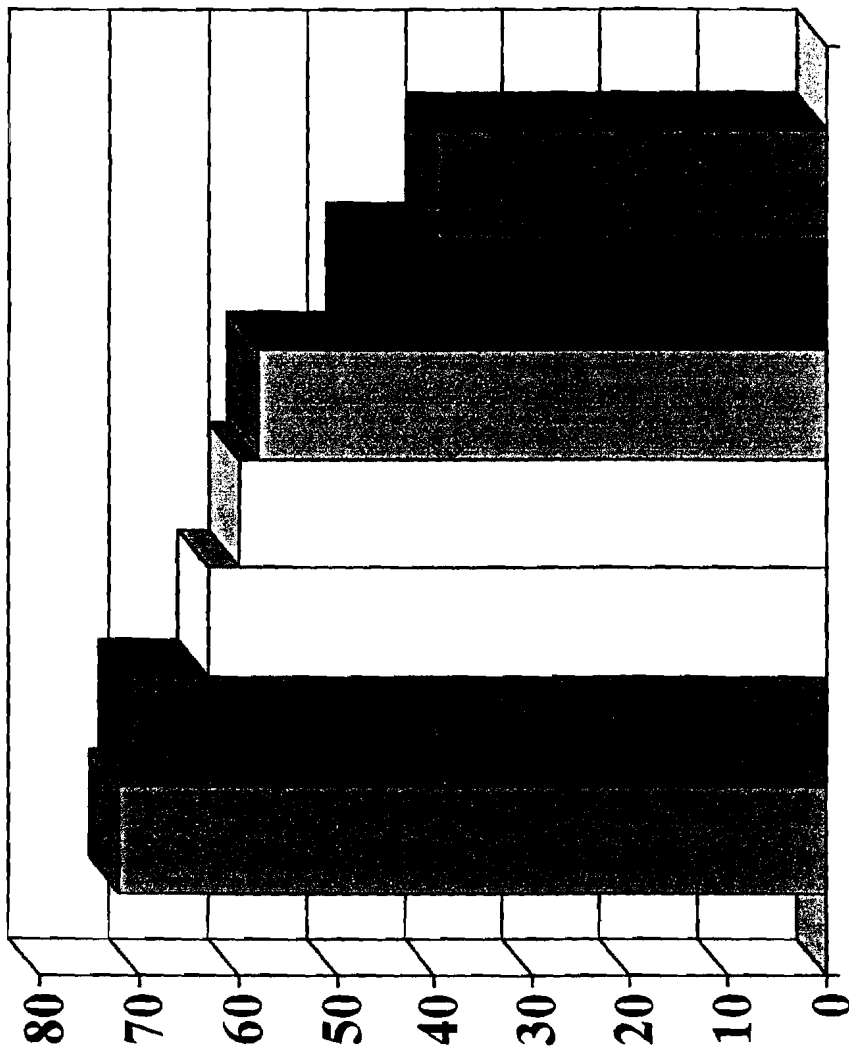
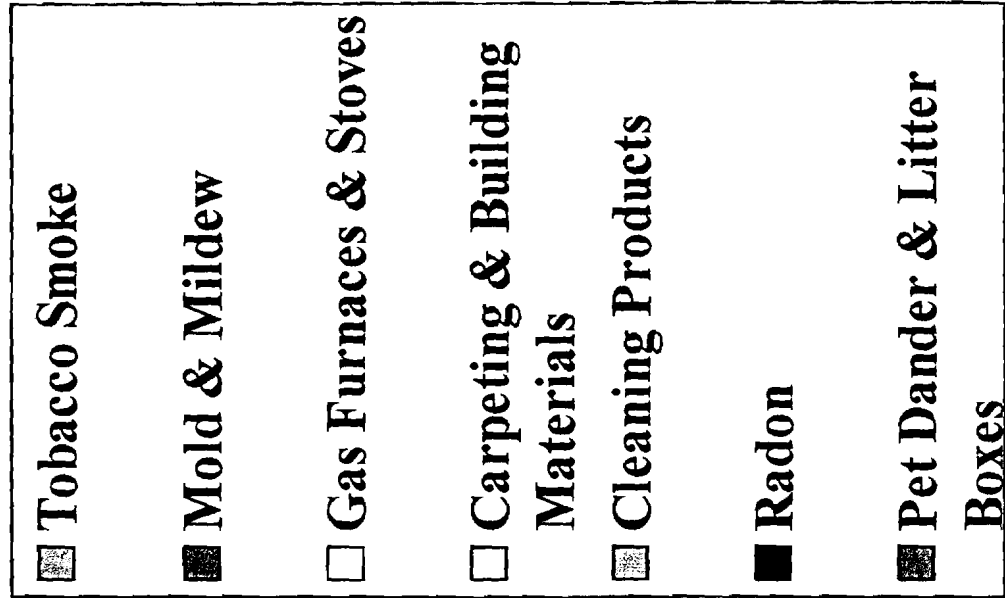
SURVEY RESULTS

Solid Waste Issues



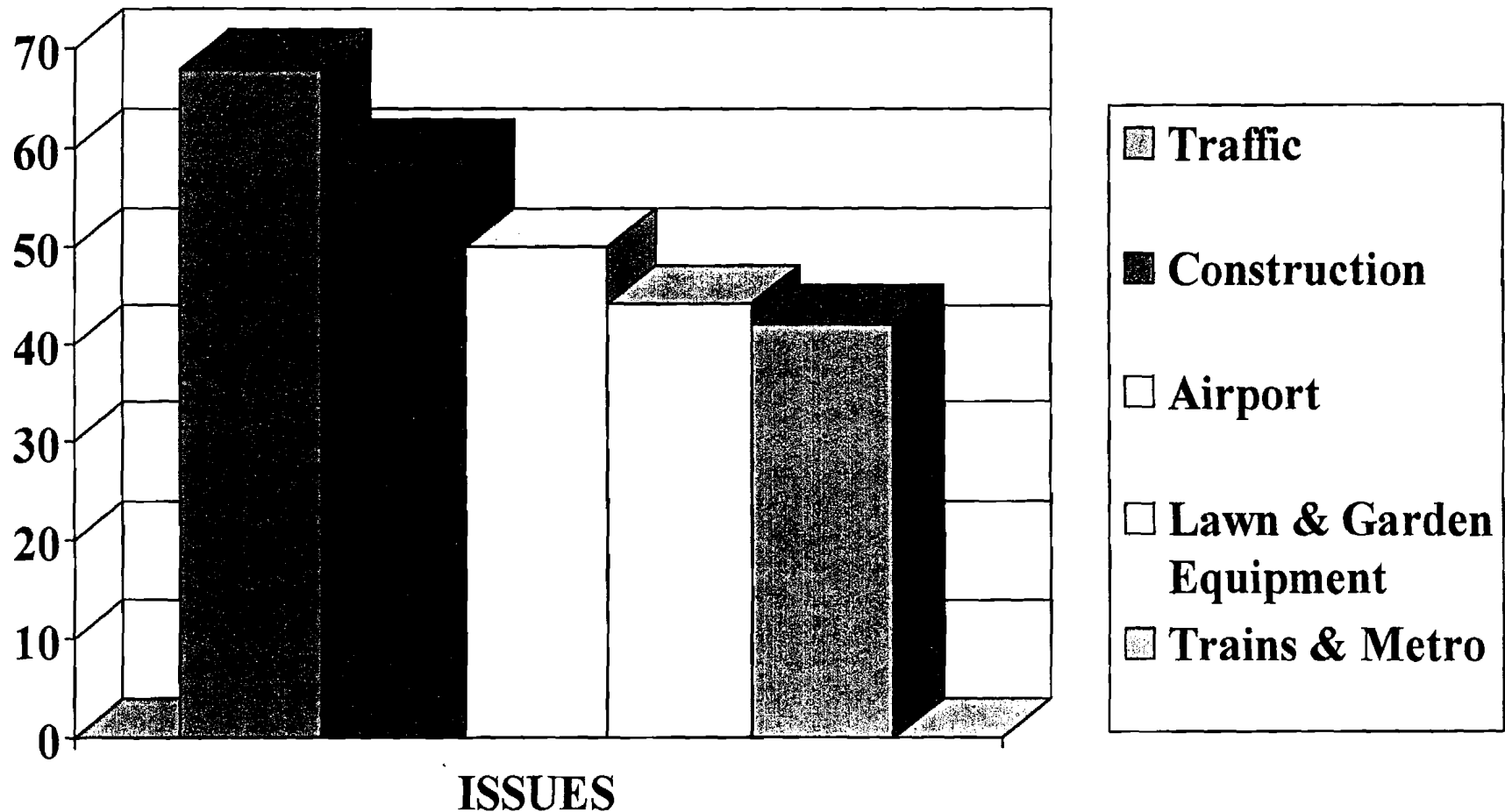
SURVEY RESULTS

Indoor Air Quality Issues



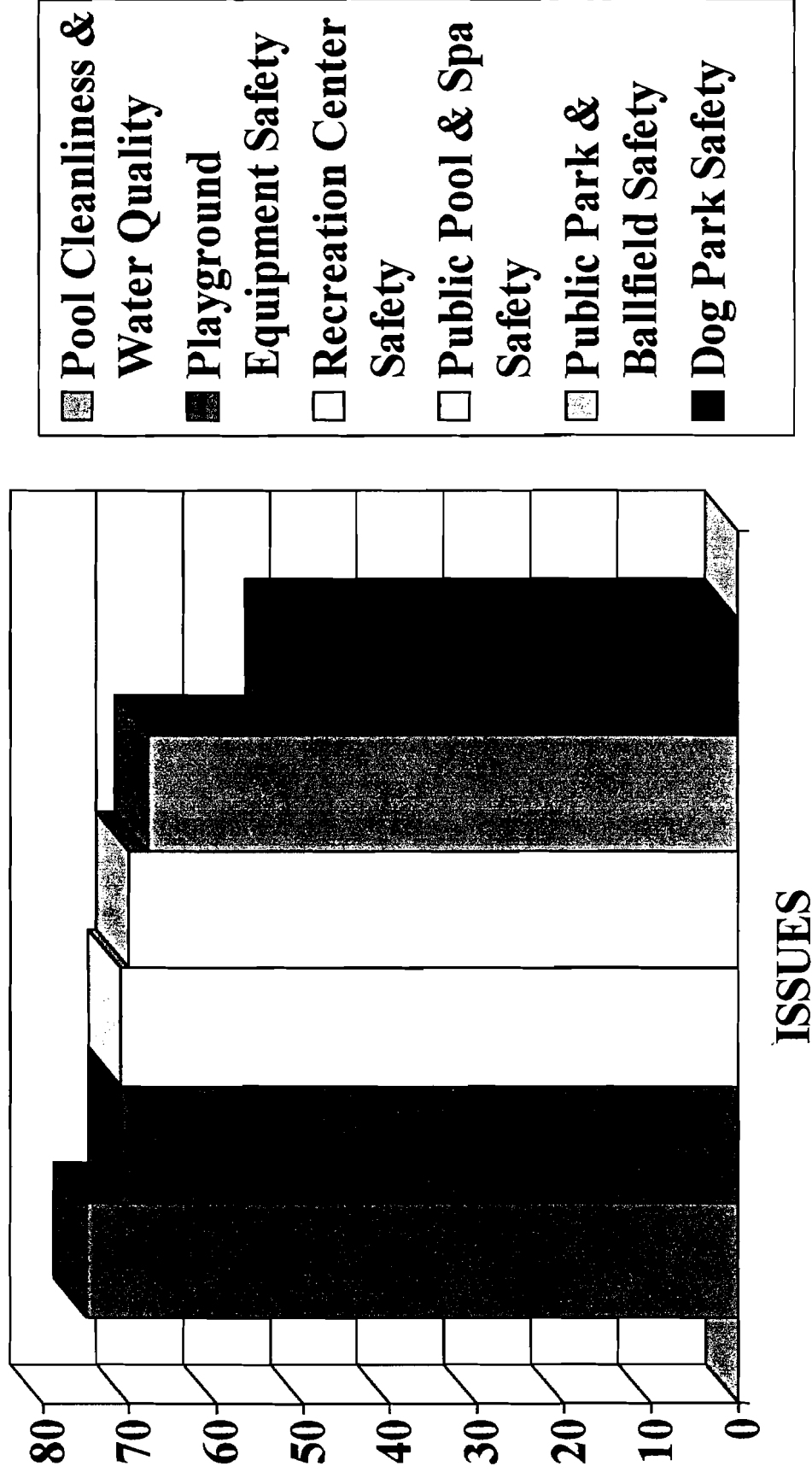
SURVEY RESULTS

Noise Pollution Issues



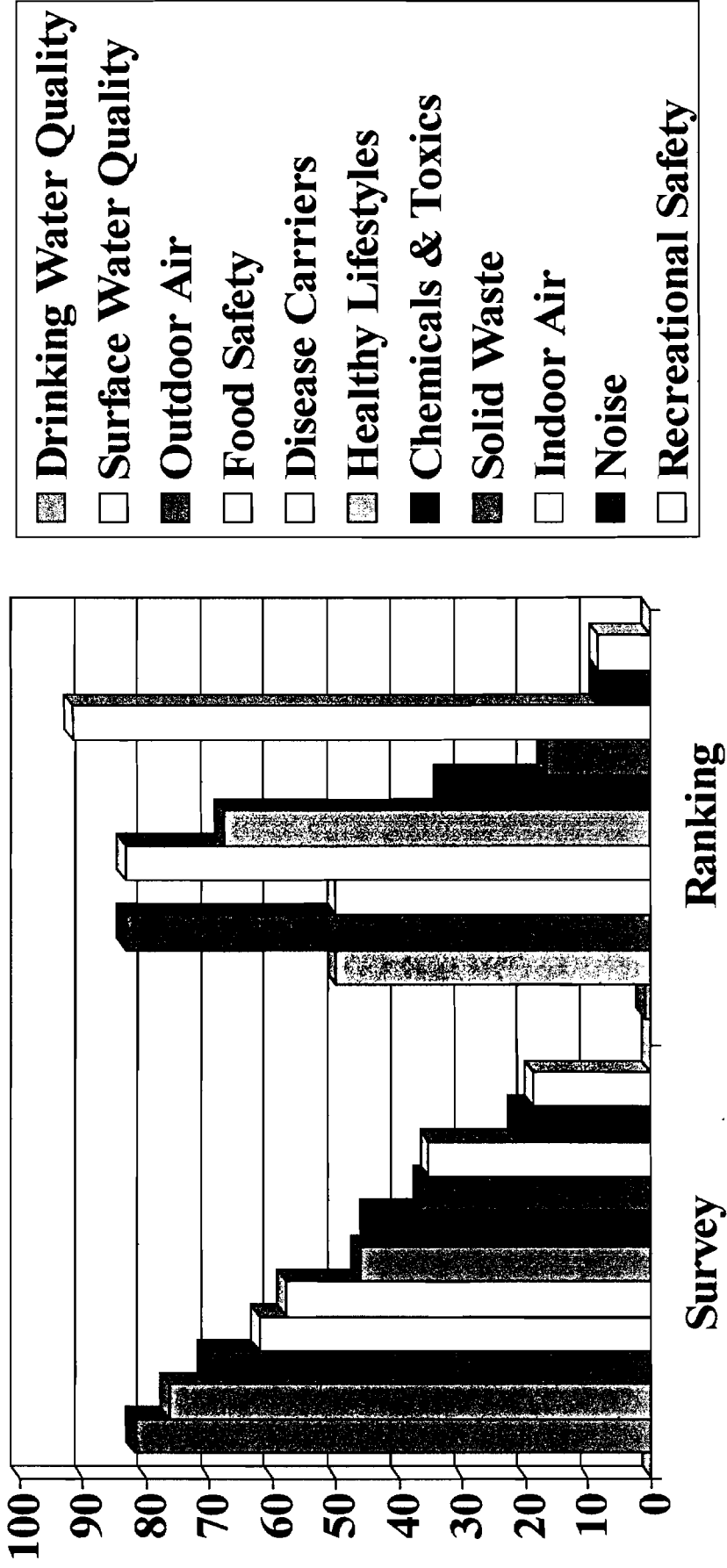
SURVEY RESULTS

Recreational Safety Issues



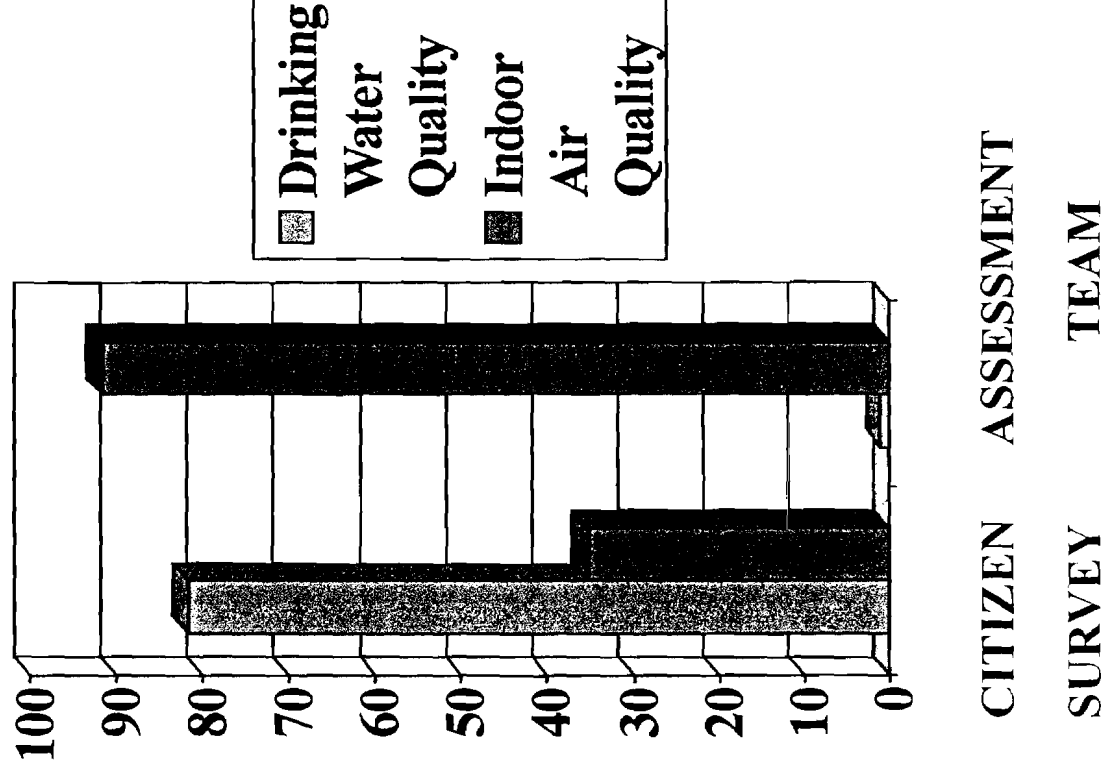
TEAM RANKING RESULTS

Based on Scientific Data



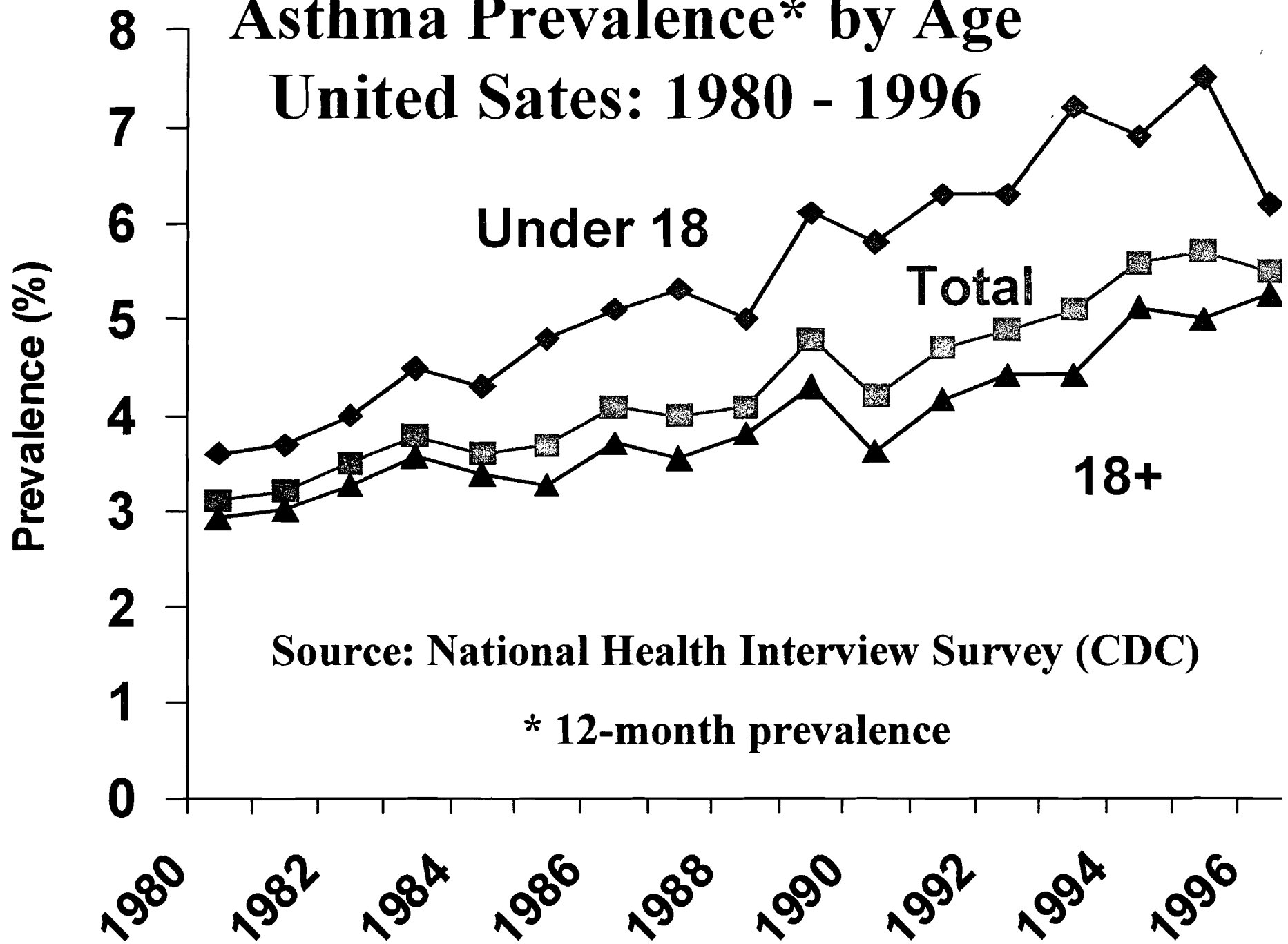
Public Perception vs. Real Data

- Although there had been no reported waterborne illnesses, the water outage caused by Hurricane Isabel and the DC issue with lead in drinking water skewed the survey data.
- Indoor air quality is not widely perceived to be a significant issue even though data on asthma and respiratory illness indicate that it is of greatest public health concern of all the issues that were considered.



Asthma Prevalence* by Age

United States: 1980 - 1996



Estimated Lung Disease **in Alexandria**

- **Asthma: 11,833 (including 2,365 kids)**
- **Chronic Bronchitis: 4,347**
- **Emphysema: 1,673**
- **TOTAL = 17,853**

More than 1 person in 8 !!

- **Lung Cancer: 83 new cases each year (2004)**

Data Source: "State of the Air, 2007", American Lung Association

Estimated Heart Disease and Diabetes in Alexandria

- **Diabetes: 7,386**

(people with Type II diabetes have a 55% higher incidence of asthma)

- **Heart Disease: 30,634**

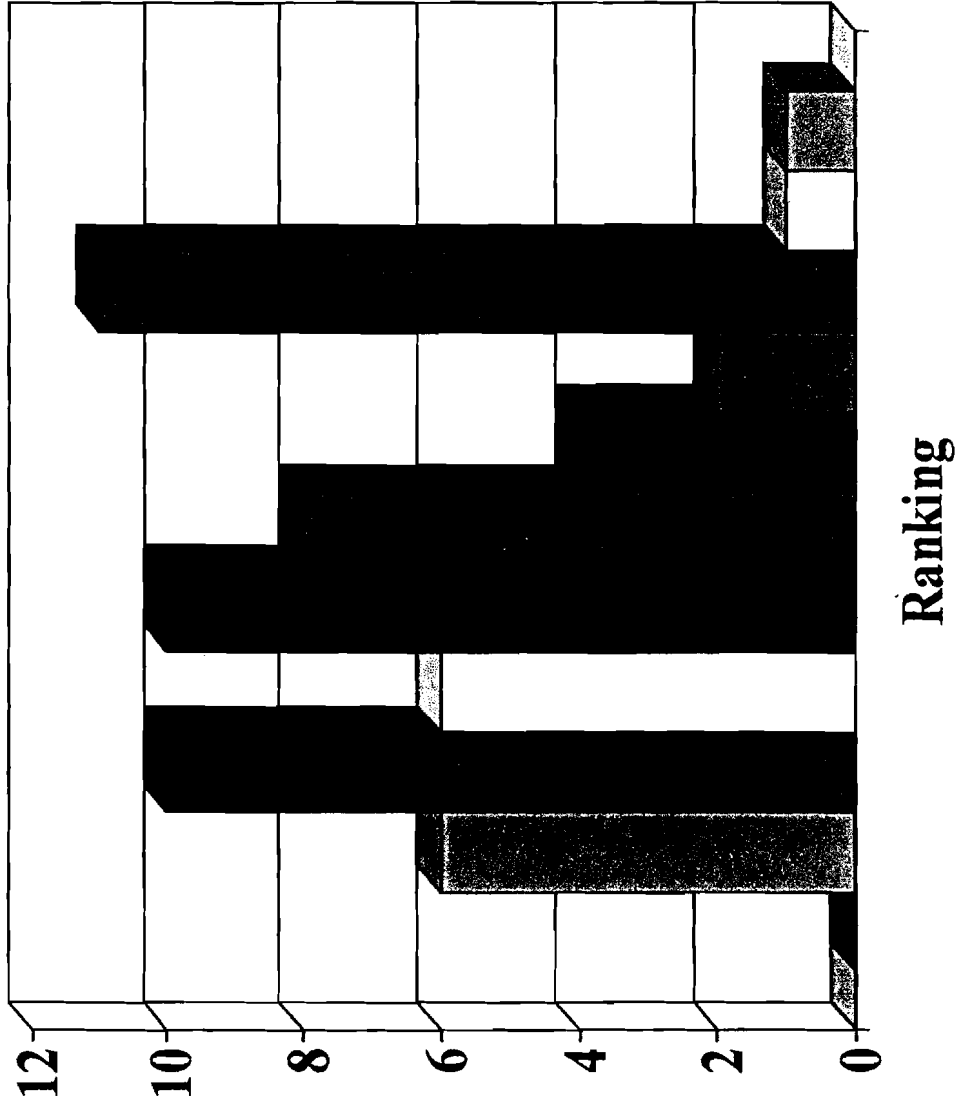
(people with asthma have a 33% higher incidence of heart disease)

More than 1 person in 4!

**Data Sources: “State of the Air, 2007”, American Lung Association
American College of Chest Physicians (Medical News Today)
American Heart Association**

TEAM RANKING RESULTS

Based on Scientific Data



PRIORITY SETTING

Priorities were set based on:

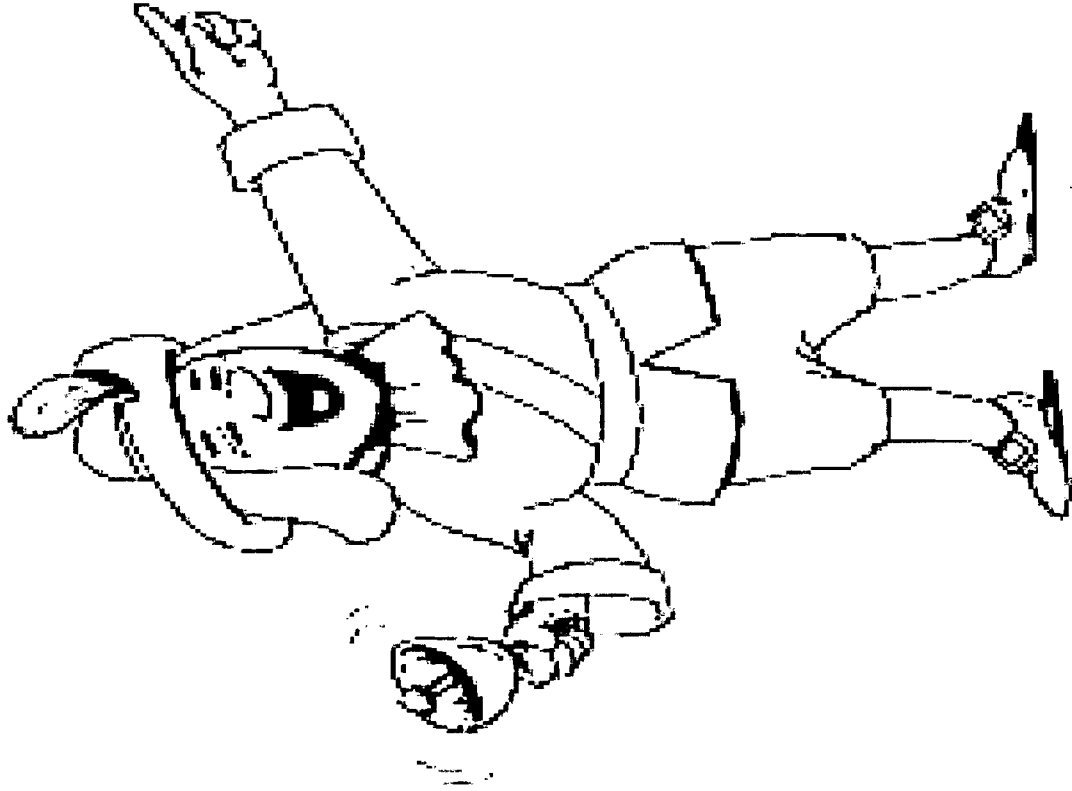
- **Scientific Data**
- **Community Survey Data**
- **Effectiveness of Current Programs**
- **Public Demand / Public Acceptance**
- **Preventability of Risk / Feasibility**
- **Economic Cost / Impact**
- **Political Climate**
- **Legal Authority**
- **Confidence in the Data**

PRIORITIES FOR ACTION



- **Tier I Issues**
 - (most important)
 - **Respiratory Health / Indoor Air Quality**
 - **Outdoor Air Quality**
 - **Surface Water Quality**
- **Tier II Issues**
 - **Healthy Lifestyles / Built Environment**
 - **Food Safety**
 - **Disease Carriers & Vectors**

PRIORITIES FOR ACTION



- **Tier III Issues**
(least important)
 - **Chemicals & Toxics**
 - **Drinking Water**
 - **Recreational Safety**
 - **Solid Waste**
 - **Noise**

KEY RECOMMENDATIONS

- **General Recommendations**
 - ✓ **Develop an annual City report to measure progress towards achieving the goals outlined in this assessment**
 - ✓ **Conduct a follow-up environmental health assessment beginning in 2010 when the *Healthy People 2020* goals and 2010 U.S. Census data are available**
 - ✓ **Work to fill the data gaps identified by this assessment**
 - ✓ **Include “Housing” as an environmental health study category in the next assessment**

KEY RECOMMENDATIONS

• Indoor Air Quality / Respiratory Health

(Tier I)

- ✓ Create a respiratory health program in the City**
- ✓ Increase the percentage of smoke-free restaurants and bars in Alexandria**
- ✓ Increase the percentage of smoke-free workplaces in Alexandria**
- ✓ Reduce percentage of Alexandria children exposed to tobacco smoke at home**
- ✓ Increase number of schools and child care centers with respiratory health programs**
- ✓ Reduce emergency department visits, hospitalizations and deaths in Alexandria due to asthma**

KEY RECOMMENDATIONS

- **Outdoor Air Quality (Tier I)**
 - ✓ **Continue development of Transportation Master Plan**
 (“Outdoor Air Quality – Cars, Planes & Buses” was the #6 sub-issue on the citizen survey)
 - ✓ **Support State Implementation Plan for attaining NAAQS for ozone and PM_{2.5}**
 - ✓ **Install PM₁₀ monitor in Cameron Station townhouse area**
 - ✓ **Seek participation in the initial and final New Source Review permitting process for facilities located within the City**
 - ✓ **Develop additional public outreach and education programs to encourage participation in the Air Quality Action Program**
 - ✓ **Redesign DEQ website to convey more air quality information**
 - ✓ **Continue efforts to close Mirant Power Plant and, until then, have plant operate as cleanly as possible**
 - ✓ **Encourage sustainable development in City through land use planning, “green buildings”, & “green roofs”, energy efficiency**

KEY RECOMMENDATIONS

- **Surface Water Quality (Tier I)**
 - ✓ Continue to implement the Water Quality Management Supplement to the Alexandria Master Plan
 - ✓ Continue implementing the small Municipal Separate Storm Sewer System (MS4) Program
 - ✓ Complete Stream Classification, Phase II project
 - ✓ Monitor and update Stream Assessment / Classification, Phase I project
 - ✓ Increase stream monitoring data consistency and breadth of information
 - ✓ Continue to implement and strengthen Environmental Management Ordinance to reduce nutrient loading into the Chesapeake Bay
 - ✓ Expand activities to reduce bacterial input into streams

KEY RECOMMENDATIONS

- **Surface Water Quality (Tier I) (continued)**
 - ✓ **Develop and implement Four mile Run and Cameron Run / Holmes Run restoration projects**
 - ✓ **Maintain compliance with the City's Combined Sewer System Permit**
 - ✓ **Implement the Area Reduction Plan requiring sewer separation for sites being developed so as to reduce (and eventually eliminate) combined sewer overflows**
 - ✓ **Continue to implement the Four Mile Run TMDL program**
 - ✓ **For development projects in the City, encourage the use of innovative "green building" technologies such as "green roofs" for storm water management**

KEY RECOMMENDATIONS

- **Healthy Lifestyles / Built Environment (Tier II)**
 - ✓ **Improve pedestrian and cyclist safety in the City**
(“Pedestrian Safety” was the #1 sub-issue on the citizen survey)
 - ✓ **Improve motor vehicle safety in City**
(“Driver Safety” was the #2 sub-issue on the citizen survey)
 - ✓ **Increase the amount of city-owned open space and park land**
(“Enough Park Land” was the #9 sub-issue on the citizen survey)
 - ✓ **Encourage development that makes the City more pedestrian and bicycle friendly**
(“Enough Walking and Cycling Trails” was the #15 sub-issue on the citizen survey)
 - ✓ **Encourage use of public transit and telecommuting**
 - ✓ **Encourage Health Department to be more engaged in “built environment” issues that promote healthy physical activity, walking and bicycling**

KEY RECOMMENDATIONS

- **Food Safety (Tier II)**
 - ✓ **Improve the reporting of foodborne illness by citizens, physicians, hospitals and laboratories**
 - ✓ **The AHD's food safety program should meet all nine FDA Model Food Safety Program standards by 2010**
 - ✓ **Focus AHD regulatory food safety program on reducing food establishment inspection violations related to CDC foodborne illness risk factors by 25%**
(“Restaurant Food Safety” was the #3 sub-issue on the citizen survey)
(“Grocery Store Food Safety” was the #8 sub-issue on the citizen survey)
 - ✓ **Develop an effective consumer food safety education program in the City**
 - ✓ **Develop more culturally competent food safety information programs**

KEY RECOMMENDATIONS

- **Disease Carriers / Vector Control (Tier II)**
 - ✓ **Continue development of a robust vector control program in the City**
 - ✓ **Keep mosquito-borne illnesses in the City under control through continued active mosquito control**
(“Mosquitoes” was the #4 sub-issue on the citizen survey)
 - ✓ **Reduce the number of persons requiring post-exposure rabies prophylaxis by increasing public awareness about rabies**
 - ✓ **Reduce the incidence of dog bites in the City through community outreach and education**
 - ✓ **Reduce the number of rodent complaints in the City through interdepartmental cooperation and increased control efforts** (“Rodents” was the #11 sub-issue on the citizen survey)

NEXT STEPS

- **Report printed and transmitted to Council**
- **Copies of report to:**
 - **Environmental Policy Commission**
 - **Public Health Advisory Commission**
 - **Partnership For a Healthier Alexandria**
- **Report posted on web**
- **Report presented to EPC, PHAC & PFHA**
- **EPC, PHAC and PFHA review report**
- **Comments from EPC, PHAC and PFHA to Health Department with recommendations**
- **Council receives briefing at June 12 meeting**
- **And then, *ACTION !!***



PRIORITIES FOR ACTION



- **Tier I Issues**
 - (most important)
 - **Respiratory Health / Indoor Air Quality**
 - **Outdoor Air Quality**
 - **Surface Water Quality**

- **Tier II Issues**
 - **Healthy Lifestyles / Built Environment**
 - **Food Safety**
 - **Disease Carriers & Vectors**

Contact Information:

Bob Custard, R.E.H.S.

Environmental Health Manager

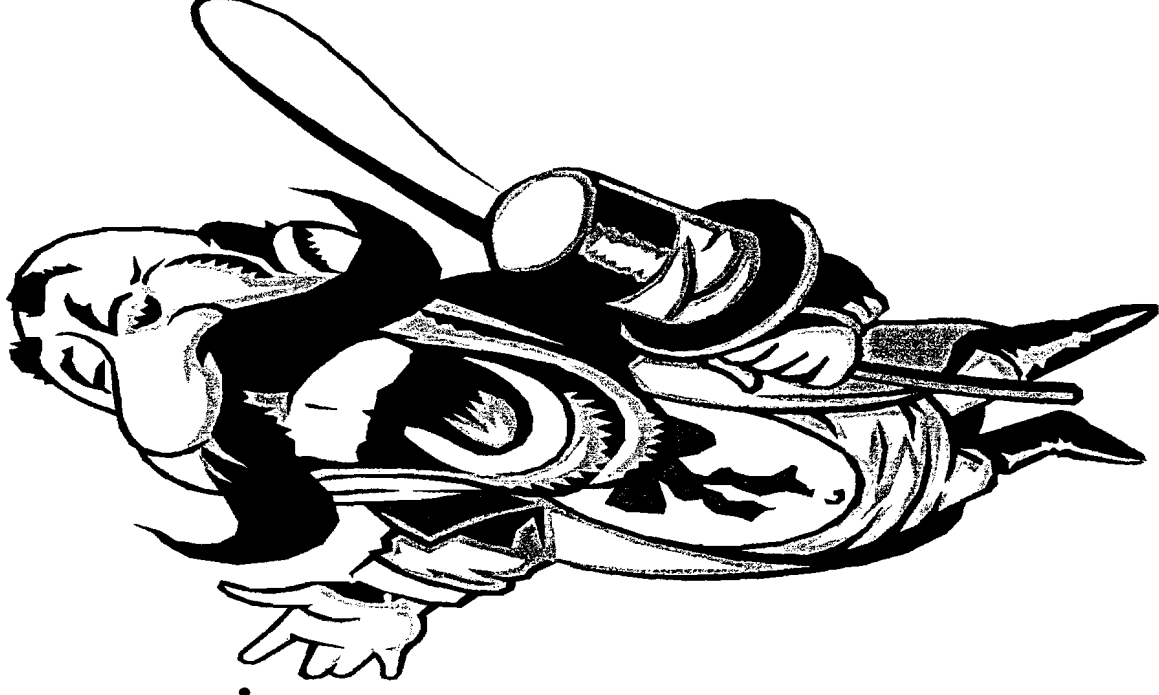
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An Environment for a Healthier Alexandria



A Community Environmental Health Assessment
Alexandria, Virginia
2007

Cover photograph by Shep Walker, T.C. Williams High School,
winner of the 2006 Alexandria Health Department Public Health Week Photography Contest.

Executive Summary

It has long been recognized that environmental factors have a significant impact on human health. Safe food, clean drinking water and good air quality are requisites for the good health of a city's residents. Conversely, toxic chemicals and hazardous materials can cause serious health effects, and pests such as mosquitoes and rodents can become vectors of disease.

Additionally, the design of the physical environment of our cities — buildings, roads, open space, sidewalks, recreational facilities — has the potential to either promote or discourage the physical exercise necessary for a healthy lifestyle. Noise, traffic, pedestrian safety, surface water quality, and outdoor air pollution can also potentially impact the health of a city.

In 2002, the Alexandria Health Department (AHD) applied for and received a U.S. Centers for Disease Control and Prevention (CDC) grant, administered by the National Association of County and City Health Officials (NACCHO), to conduct a community environmental health assessment of the City of Alexandria. The AHD's Environmental Health Division (EHD) and the Alexandria Department of Transportation and Environmental Services' Division of Environmental Quality (DEQ) subsequently teamed to recruit an assessment team.

Over the last several years, this team of city residents and government officials has conducted an assessment of the environmental factors affecting human health in Alexandria. The assessment team reviewed available health and environmental data on the City and surveyed a representative cross-section of Alexandria residents on their concerns about environmentally-linked health issues. Eleven broad issues were identified for study.

After an extensive data-gathering process, the assessment team ranked the health threat currently posed by these eleven issues based on the available scientific evidence. The issues were ranked in the following order:

RANKING OF ENVIRONMENTAL HEALTH ISSUES OF CONCERN

1. Indoor Air Quality
2. (tie) Outdoor Air Quality
Disease Carriers & Vector Control
4. Built Environment (Healthy Lifestyles)
5. (tie) Food Safety
Surface Water Quality
7. Chemical & Toxics
8. Solid Waste
9. (tie) Recreational Safety
Noise
11. Drinking Water

These issues were then re-ranked, taking into consideration not only the scientific evidence but also the concerns of Alexandria residents, the effectiveness of current programs to protect health and the environment, and the potential for effective new actions. The issues were then prioritized in three tiers:

PRIORITIES FOR ACTION

Tier I (Top Priority)

Indoor Air Quality
Outdoor Air Quality
Surface Water Quality

Tier II

Built Environment (Healthy Lifestyles)
Food Safety
Disease Carriers & Vector Control

Tier III

Chemicals & Toxics
Recreational Safety
Drinking Water
Solid Waste
Noise

The assessment team then wrote proposed action plans for all the issues. These action plans are included in the body of this report. Moving forward, it is anticipated that these proposed action plans will be implemented by the EHD and DEQ in cooperation with other City departments. Additional data on environmental health issues will be collected to fill in the data gaps that were identified by the assessment.

It is recommended that an annual environmental health report for the City be developed that will measure progress towards the goals identified in this report. It is also recommended that a follow-up community environmental health assessment be completed by 2011 to assess the progress that the City has made in addressing the issues identified by this report and to identify any new environmental health issues that may have emerged.

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Acknowledgements

The Alexandria Community Environmental Health Assessment Team (ACEHAT) would like to acknowledge the contributions of the following persons and organizations:

Dr. Charles Konigsberg, Health Director, City of Alexandria, **Lori Cooper**, former Chair, Alexandria Public Health Advisory Commission, and **Cindy Chambers**, former Chair, Alexandria Environmental Policy Commission, for their leadership in encouraging the Alexandria community and City government to undertake this assessment;

The Alexandria Community Environmental Health Assessment was supported by a \$20,000 grant from the National Center for Environmental Health of the U.S. Centers for Disease Control and Prevention (CDC). The grant was administered by the Environmental Health Program of the National Association of County and City Health Officials (NACCHO). The ACEHAT would like to thank **John Sarisky** and **Jonathan Drewry** of CDC, and **Jennifer Li** and **Jonathan Schwartz** of NACCHO for their assistance with this project;

Angela Crawford, **Kathy DeSnyder**, and **Sherrine Eid**, Epidemiologists with the Alexandria Health Department, for their roles in providing epidemiological data and logistical support to this project;

Rebecca Parkin, PhD, MPH, Professor, Department of Environmental and Occupational Health, George Washington University, and her MPH students, for their support of this project, especially: **Bridget Ambrose**, who was a tremendous help in collecting community survey data, entering the data, and producing statistical analyses of the data, **Clara Nussbaum**, who conducted in-depth telephone interviews about environmental health issues with 35 Alexandria residents, and **Dan Okagaki**, who participated in several ACEHAT meetings;

Darhyl Jasper, Public Health Nursing Supervisor, Alexandria Health Department, for her role in helping to identify community resources for testing and administering the community environmental health survey;

Dr. Charlene Douglas, Associate Professor, College of Nursing and Health Science, George Mason University, and her nursing students for their assistance in beta-testing the community environmental health survey;

Jimmi Barnwell, Director of Counseling, T.C. Williams High School, and the T.C. Williams High School students, for their assistance in beta-testing the community environmental health survey;

Amalia Quinones, Health Educator, Alexandria Health Department, and the Hispanic community at Grace Episcopal Church, for their assistance in beta-testing the Spanish language version of the community environmental health survey;

Jane Crowley, Senior Public Health Nurse, Alexandria Health Department, for providing the data on child lead poisoning in the Indoor Air Quality section of this report;

Tara Blot, Executive Director, Alexandria Animal Welfare League, and **Roger Townsend**, Supervisor, Animal Control, for assisting in the development of the rabies prevention goals in the Disease Carriers & Vector Control section of this report;

Staff from the T&ES Division of Environmental Quality, including **Erica Bannerman**, Air Pollution Control Specialist, and **Claudia Hamblin-Katnik**, Watershed Program Administrator, for their assistance in writing the parts of this report dealing with Surface Water Quality, Outdoor Air Quality, Noise, and Chemicals and Toxics; and

Dean Bryant, Executive Assistant, Alexandria Health Department, for his assistance in the editing and design/layout of this report.

Foreword

This *Community Environmental Health Assessment* for the City of Alexandria represents an important recognition of the relationship between our City's environment and the health of its residents and visitors. In a larger sense, the report is a reflection of the concept of healthy cities; that the environment in which we live affects virtually every aspect of our lives.

The understanding of the critical role that environmental conditions play in human health is really not new. Even ancient civilizations came to an understanding that separating waste from people was a good idea. In more recent times, starting in the late 19th century, the sanitary movement was truly the start of modern public health. Clean drinking water, safe supplies of food and milk, proper disposal of human waste, control of disease-carrying vectors such as rats and mosquitoes, and improved housing conditions have been responsible for dramatic reductions in infectious diseases that had afflicted people for thousands of years.

In more recent years, it has become recognized and accepted that air pollution, surface water contamination, toxic wastes, and other concerns were also capable of affecting human health. Even more recently, the so-called "built environment" involving how our communities were and are designed (or not designed) to allow walking, pedestrian safety, and less reliance on automobiles has come to the forefront of our understanding of the interaction of the environment and public health. The World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) have characterized environmental problems as among the most important health issues and global threats.

This report, together with the *Alexandria Community Health Assessment* released in 2004, represents a comprehensive picture of the health status of and potential health threats to the City of Alexandria. While the processes for the development of these reports were separate, it is my recommendation and hope that we can bring about a convergence and integration of the planning and actions based on these reports. Both of these reports present a challenge to our entire community to move toward what the Institute of Medicine (IOM), in its landmark 1988 report, *The Future of Public Health*, stated was a primary mission of public health, "...assuring conditions in which people can be healthy."



Charles Konigsberg, Jr., MD, MPH
Health Director

1. The PACE EH Process

Development of the PACE EH Tool

In the 1990s, the National Association of County and City Health Officials (NACCHO) developed a method for assessing community environmental health, the Protocol for Assessing Community Excellence in Environmental Health (PACE EH). PACE EH is a community-based assessment tool that utilizes a team comprised of citizens and government officials to assess the environmental health status of a community and to develop action plans to address its most important environmental health threats.

Formation of the PACE EH Assessment Team

The Alexandria PACE EH process began in 2003 with the creation of a community environmental health assessment team. Citizens and representatives of interested City departments and state agencies were invited to be team members. The Alexandria Health Department and the City's Division of Environmental Quality provided staff support for the team. The team defined its goals and objectives and the scope of the proposed assessment.

Development of Issue List and Citizen Survey

The team then generated a list of community-specific environmental health issues and crafted that issue list into a draft citizen survey. The survey was piloted by several focus groups representing a variety of demographic groups. Based on this feedback, the survey was refined by the assessment team.

Survey of Alexandria Citizens

The community environmental health survey (see Appendix A) included both open-ended and closed-ended questions concerning ten general issues of concern about environmental health threats to the community. Within these general areas of concern were questions about 53 sub-issues. The ten general issues of concern were:

- Chemicals and Toxics
- Disease Carriers
- Food Safety
- Built Environment (Healthy Lifestyles)
- Indoor Air Quality
- Noise
- Outdoor Air Quality
- Recreational Area Safety
- Solid Waste
- Water Quality (both drinking water and surface water)

Between August 2003 and April 2004, 475 Alexandria residents completed the survey. Some surveys were mailed out to community leaders, while others were completed by individuals or groups chosen to produce a sample that was demographically balanced and representative of all areas of the community. The survey was available in both English and

Spanish. A synopsis of the responses is contained in Section 4 of this report.

Selection of Standards and Indicators

While the citizen survey was being conducted, the assessment team began collecting as much scientific data as possible on the factors that influence community environmental health. Using the data available, the team chose locally appropriate indicators to use to measure the environmental health status of the community. The assessment team then selected standards against which the local indicators could be compared. In some cases, there was a lack of hard data; the team noted these data gaps that needed to be closed in the future.

Creation of Issue Profiles

Using the scientific data available and their knowledge of the community, the assessment team created issue profiles for each of the eleven general areas of concern (the team chose to split the water quality issue into two profiles: drinking water quality and surface water quality). These profiles are discussed at length in Section 6 of this report.

Ranking of Environmental Health Issues

The assessment team then ranked the eleven issues based on the scientific data. The ranking of issues, and the disparities found between the community survey data and the team's ranking of the issues, is discussed in Section 5 of this report.

Selection of Priorities for Action

Based on the scientific data, the community survey results, the strength of existing City programs addressing the issues, and the potential for cost-effective intervention, the assessment team then set priorities for action. Three general issues — Indoor Air Quality, Outdoor Air Quality, and Surface Water Quality — were selected as the Tier 1 (top priority) issues. Three additional issues — Food Safety, the Built Environment (Healthy Lifestyles), and Disease Carriers & Vector Control — were selected as Tier 2 (secondary priority) issues. The remaining five issues — Chemicals and Toxics, Recreational Safety, Drinking Water, Solid Waste, and Noise — were designated Tier 3 (lowest priority) issues.

Creation of Action Plans

Proposed action plans to address the issues were then written (see Section 6). Successful implementation of these plans will ultimately be the test of whether the PACE EH process can be an effective tool for the City of Alexandria.

Annual Environmental Health Report

It is recommended that an annual environmental health report for the City be developed that will measure progress toward the goals identified in this report. Specifically, the report should document progress toward accomplishing the objectives in the issue action plans.

Follow-Up Assessment

The PACE EH protocol recommends that a follow-up assessment be done in 3-5 years to evaluate progress on addressing the priority issues identified in this report. It is proposed that a follow-up community environmental health assessment be launched in 2010 to coincide with the publication of the *Healthy People 2020* objectives.

2. Alexandria Community Profile

History

Alexandria, Virginia, was established in 1749. Its location on the Potomac River, just downstream from Great Falls, VA, helped it quickly become a major shipping port on the eastern seaboard, from which tobacco, grain, wheat, and produce were shipped to Europe. Among the city's original trustees were George Washington, George Mason and Lord Thomas Fairfax.

Alexandria's location has historically been one of military importance. During the French and Indian War, General Edward Braddock planned his war strategy and launched his campaign from Alexandria. George Washington, hero of the Revolutionary War and our first president, was one of the City fathers. During the War of 1812, the City was occupied by British forces. Robert E. Lee's boyhood home was in Alexandria. During the Civil War, Alexandria was occupied by Union troops, and forts constructed around the city helped defend the approaches to Washington, DC.

Since the creation of the District of Columbia in 1801, Alexandria's growth and history have been closely tied to the growth of the federal government on the opposite side of the Potomac River. Construction of the Pentagon in the 1940s and the Capital Beltway and Woodrow Wilson Bridge in the 1960s substantially spurred the City's growth. Annexation of the western part of the City (from Fairfax County) in 1952 almost doubled the size of the City, to 15.75 square miles.

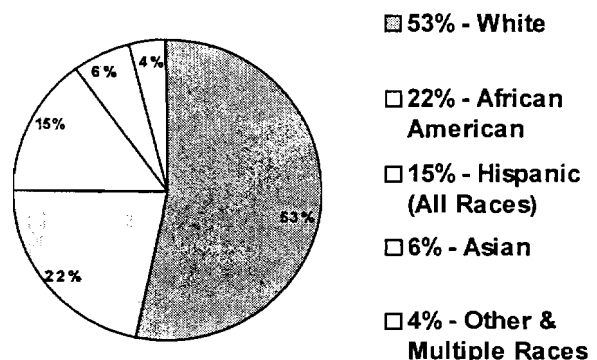
Today, Alexandria has become an affluent urban city. The Old Town area of the City has experienced renewal as historic buildings have been renovated and fine restaurants and shops have opened along the city's charming tree-lined streets. A high proportion of the City's residents either work for the federal government or for national organizations or federal contractors who have opened headquarters here due to the City's proximity to our nation's capital.

Demographics

Alexandria is a highly mobile, culturally diverse community of approximately 135,000 residents (2003 estimate) with a rapidly growing ethnic population. According to the 2000 Census, over half (53%) of the City is white.

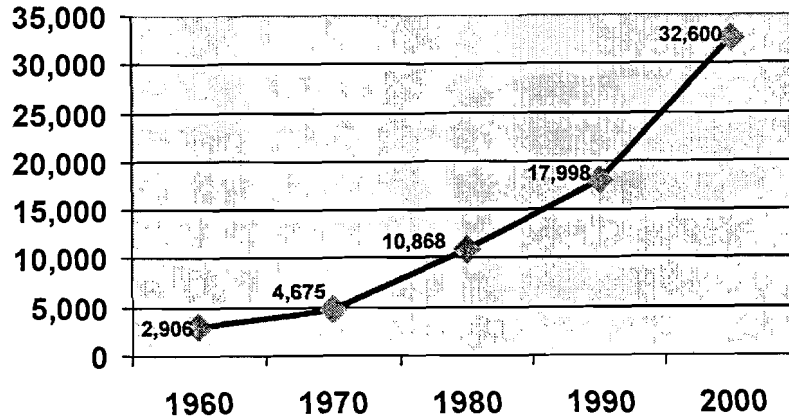
Twenty-two percent of the population is African American and fifteen percent is Hispanic. Six percent of the population is Asian, while four percent are of other races or of multiple races.

**2-1: CITY of ALEXANDRIA
RACE and ETHNICITY**



The number of foreign-born Alexandria residents approximately tripled in the twenty years between 1980 and 2000. In 2000, 25.4% of the population was foreign-born. Thirty percent of City residents did not speak English in their homes, and over twenty percent (20.4%) did not speak English well.

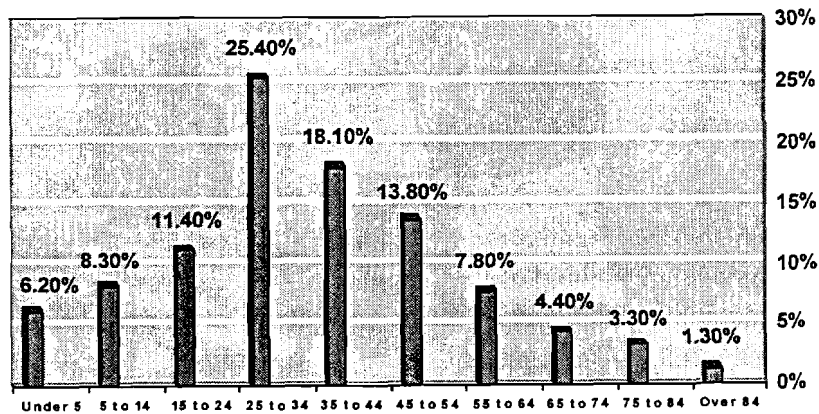
**2-2: CITY OF ALEXANDRIA
FOREIGN-BORN POPULATION**



The largest number of foreign-born residents in the City come from South America and Central America. This Hispanic population is concentrated in the Arlandria and western parts of the city. There is also a growing Muslim population in the western end of the city, and a sizeable Korean population in the Landmark area.

Alexandria is a city with many young adults; the median age of residents is 34.4 years. Over half of the City's population (51.2%) is between 20 and 44 years of age. Only 18.2% of the population is under the age of twenty.

**2-3: CITY OF ALEXANDRIA
AGE DISTRIBUTION OF RESIDENTS**



Quality of Life

Alexandria is a beautiful and historic city. There are many cultural opportunities in the area. In general, there is a high standard of living and low unemployment. More than half (54.3%) of the adult population (25 years and over) has earned a four-year college degree, and nearly a quarter of the population (24.8%) has earned a graduate or professional degree.

Almost three-quarters (74.4%) of Alexandria residents over the age of 16 are employed; most of these are employed in white collar jobs. Management, professional and related occupations comprise 56.2% of the work force. Sales and office occupations comprise 21.2% of the work force, while service occupations comprise 11.9%. Only 10.6% of the work force is employed in construction, maintenance, production, transportation, or material moving occupations. The local jobless rate as of June, 2003, was 2.7%.

The estimated 2002 median household income for Alexandria residents was \$74,091. This is lower than the average for Northern Virginia (\$90,129), but considerably higher than the state (\$51,305) and national (\$56,054) averages. However, the high cost of local housing tends to make comparisons with other areas less meaningful. Nearly nine percent (8.9%) of Alexandria residents live below the poverty line. Families with children, however, have a higher poverty rate (14.3%).

Of the 3,141 jurisdictions in the United States, Alexandria is the tenth most densely populated, with 8,452 persons per square mile (2000 U.S. Census). The average household size, however, is the third lowest in the country, with an average of 2.04 persons per household, and 43.4% of the city's households are just one-person households (fourth in the nation).

Traffic is a pervasive problem throughout the Washington, DC, metropolitan area. The average travel time to work for Alexandria residents is 29.7 minutes. Seventy-six percent of Alexandria workers drive to work, and more than four-fifths of these (82.6%) drive alone. Only 16.4% of Alexandria workers use public transportation to get to work.

Crime in Alexandria is considerably lower than in Washington, DC. Over the ten years from 1993 to 2002, Alexandria saw a 46% decrease in violent crime.

3. The PACE EH Assessment Team

CITIZENS

Marsha Ansel

Alexandria Citizen and Environmental Health Specialist,
Fairfax County Health Department

Cindy Chambers

Former Chair, Alexandria Environmental Policy Commission

Jerome Cordts

Alexandria Public Health Advisory Commission

Don Fowler

Alexandria Citizen and
Member of the Alexandria Commission on Aging

Dave Levy

Alexandria Citizen and EPA Employee

Dave Lovins

FoodSense, Inc. (Food Safety Consulting Firm)

Jen McDonnell

Alexandria Seaport Foundation

Rita Mullen

Alexandria Public Health Advisory Commission

Rebecca Parkin, MD

Associate Research Professor,
Department of Environmental and Occupational Health,
George Washington University

Ellen Pickering

Taylor Run Civic Association

CITY GOVERNMENT

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Department of Recreation, Parks and Cultural Activities,
City of Alexandria

Mary Bryant, Art Dahlberg and Janine Pennell
Code Enforcement Division,
City of Alexandria

Libby Busenlehner and Bob Custard
Environmental Health Division,
Alexandria Health Department

Bill Hicks, Lalit Sharma, Bill Skrabak and Ken Whitlock
Division of Environmental Quality,
Department of Transportation and Environmental Services
City of Alexandria

Rachael Kennedy
Health Educator, Alexandria Health Department

Karen Pallansch
Director of Environmental Services,
Alexandria Sanitation Authority

OTHER GOVERNMENT AGENCIES

Robin Annison
CDC Disease Prevention Specialist,
Assigned to Alexandria Health Department

Glen Rutherford
Environmental Health Manager,
Arlington County Health Department

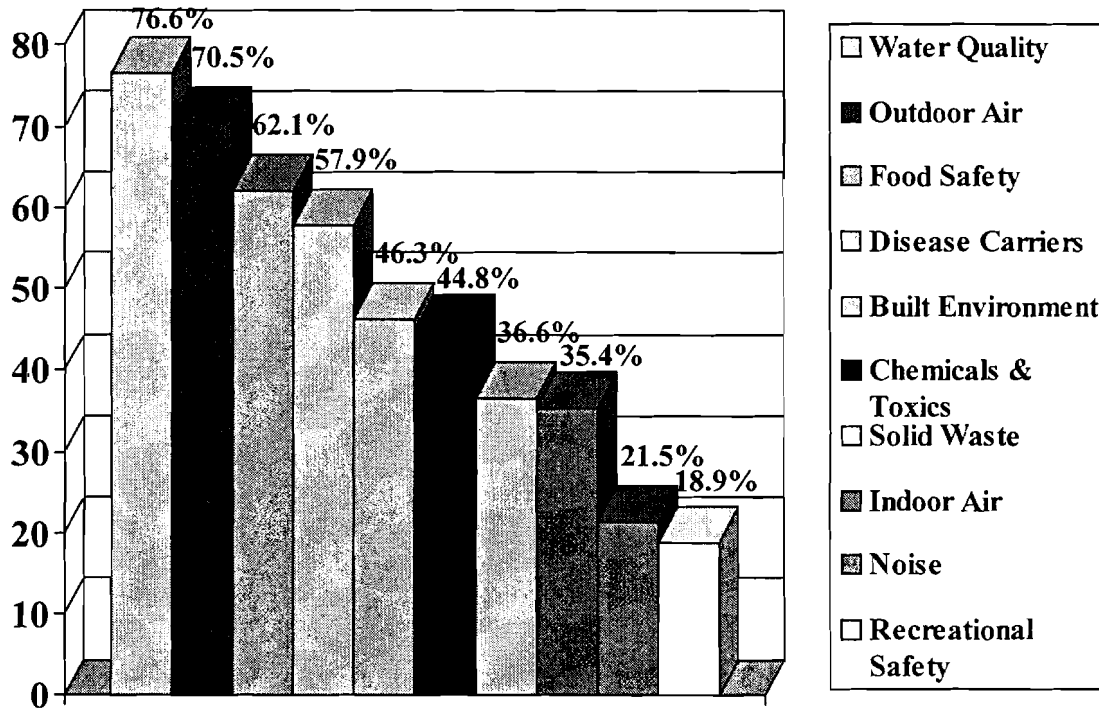
Jeff Steers
Director, Northern Region,
Virginia Department of Environmental Quality

4. Community Environmental Health Survey

In the fall and winter of 2003-04, a survey was conducted to identify the environmental health concerns of City residents. The survey was administered to a demographically and geographically representative sample of 475 Alexandria residents (a copy of the survey can be found in Appendix A. Data on the demographics of those surveyed can be found in Appendix B).

The 475 respondents were asked to identify five of the ten environmental health issues addressed in the survey that were most important to them. The bar chart below presents the results in order of greatest to least frequency:

**4-1: CITY OF ALEXANDRIA
RANKING OF EH SURVEY ISSUES**



Survey respondents were also asked to comment regarding 53 sub-issues. Their responses about these sub-issues are shown in the chart on the following page (in descending order of concern):

4-2: Ranking of Environmental Health Sub-Issues

SUB-ISSUES	%
Pedestrian Safety	87.4
Driver Safety	85.5
Restaurant Food Safety	84.2
Mosquitoes	84.0
Drinking Water	81.7
Outdoor Air — Cars, Planes & Buses	81.1
Trash & Litter	81.1
Grocery Store Food Safety	79.4
Enough Park Land	79.4
Recycling	78.5
Rodents	77.9
Roaches & Fleas	76.8
Sewer Back-Ups	76.4
Pool Cleanliness & Water Quality	75.2
Enough Walking & Cycling Trails	75.2
Hazardous Chemical Spills	74.7
Street Runoff	74.3
Garbage Collection	74.3
Power Plants & Incinerators	73.5
Tobacco Smoke	72.2
School & Day Care Food Safety	72.0
Cycling Safety	72.0
Food Safety at Fairs, Festivals & Special Events	71.4
Playground Safety	71.4
Mold & Mildew	71.2
Streams	70.9
Recreation Center Safety	70.5

SUB-ISSUES	%
Ozone	70.3
Pool & Spa Safety	69.5
Household Hazardous Waste	69.1
Park & Ball Field Safety	68.4
Traffic Noise	67.6
Ticks	66.9
Rabid Animals	66.3
Food Safety in the Home	65.9
Lead Paint	64.2
Medical Waste	62.9
Gas Furnaces & Stoves	62.7
Insecticides, Herbicides & Rodenticides	62.3
Dry Cleaners & Gas Stations	62.1
Carpeting & Building Materials	59.8
Construction Noise	59.2
Acid Rain	58.7
Household Cleaning Products	58.3
Former Landfills & Industrial Sites	58.3
Dog Park Safety	54.5
Birds	51.1
Airport Noise	50.1
Radon	48.2
Noise from Lawn & Garden Equipment	44.0
Train & Metro Noise	41.5
Pet Dander & Litter Boxes	40.4
Fireplace Smoke & Ash	37.5

5. Ranking of Issues & Priority Setting

As the assessment team assembled the scientific data available on local environmental health conditions, it became clear that on two issues there was a significant disparity between the community's level of concern as shown by the survey and the level of risk to the community indicated by the scientific data. These two issues were Drinking Water and Indoor Air Quality.

- *Water Quality* was rated as the area of greatest concern by the community survey, and the sub-area of Drinking Water Quality was rated as the issue of highest concern in this category by survey respondents. The assessment team's data showed no human illnesses linked to the public water supply over the last five years, and no major violations of the Safe Drinking Water Act during this same period by the City's water utility.

However, during the period when the community survey was conducted, there was a massive water outage caused by Hurricane Isabel. Also, near the end of the survey period, there was a major news story about lead in drinking water in nearby Washington, DC (there was not a problem with lead contamination of drinking water in Alexandria). It is believed that these two high profile events caused the public to perceive that their drinking water might not be safe and thus significantly skewed the community survey data.

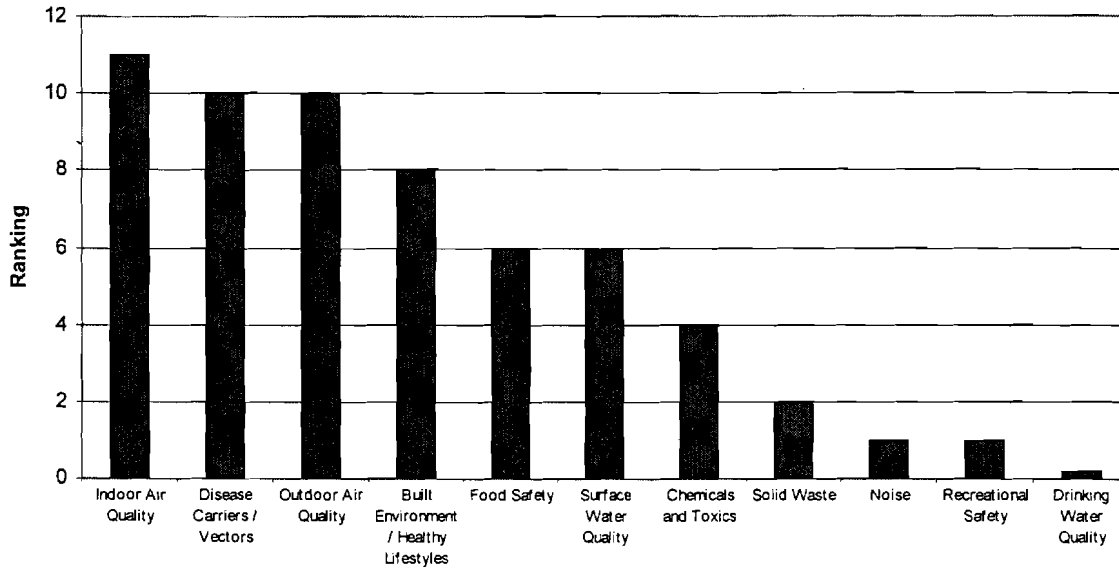
- *Indoor Air Quality* was rated as the ninth most important of eleven major environmental health issues of which citizens were surveyed. Smoking ranked twentieth of 53 sub-areas of concern. Indoor air quality is not widely perceived to be a significant issue even though data on asthma and other respiratory illnesses and smoking-related illnesses indicate that it is of great public health concern. Since most air contaminants are invisible, tasteless and odorless, the role of air contaminants in causing human illness often goes unnoticed. The assessment team believes that this factor causes the public to perceive less risk from indoor air quality problems than actually exists.

Ranking the Issues

The assessment team collected all data available on local environmental health conditions. This included epidemiological data; data on the number of citizen complaints registered with the City on specific issues; data on contaminant levels; and data on the City's performance as measured against various regulatory standards and national public health goals.

After this extensive data-gathering process, issue profiles were written for each of the eleven major environmental health issues studied. These issue profiles are contained in Section 6 of this report. The assessment team then ranked the health threat currently posed to City residents by each of these eleven issues based on the best scientific data available. The issues were ranked in order of importance as shown in the following graph:

5-1: Team Ranking of Issues Based on Scientific Data



Setting Priorities for Action

The issues were then prioritized for action, taking into consideration not only the scientific evidence, but also the concerns of Alexandria residents, the effectiveness of current programs to protect health and the environment, and the potential for effective new actions. The three tiers of priority are shown below:

Tier I (Top Priority)

Indoor Air Quality
Outdoor Air Quality
Surface Water Quality

Tier II

Built Environment/Healthy Lifestyles
Food Safety
Disease Carriers/Vectors

Tier III

Chemicals and Toxics
Recreational Safety
Drinking Water
Solid Waste
Noise

Action Plans Written

Proposed action plans were then written for each issue in the above three tiers. These action plans are included in Section 6 of this report. In the future, it is anticipated that these proposed action plans will be implemented by the Environment Health Division and Division of Environmental Quality, in cooperation with other city departments.

6. Issue Profiles and Action Plans

This section contains a synopsis of the profiles and action plans for each of the eleven issues studied by the Alexandria Community Environmental Health Assessment Team. In alphabetical order, these issues are:

- A. Built Environment (Healthy Lifestyles)
- B. Chemicals & Toxics
- C. Disease Carriers & Vector Control
- D. Drinking Water
- E. Food Safety
- F. Indoor Air Quality
- G. Noise
- H. Outdoor Air Quality
- I. Recreational Safety
- J. Solid Waste
- K. Surface Water Quality

A. Built Environment (Healthy Lifestyles)

Background

A recent study indicates that about one-sixth of all deaths in the United States are caused by physical inactivity and poor diet. Regular physical activity plays an important part in preventing or treating obesity, cardiovascular disease and diabetes. These factors represent three of the top six community health priorities identified in Alexandria's Community Health Assessment (CHA). Time for exercise, access to convenient recreational facilities, and safe environments in which to be active are the major barriers most people face when trying to increase physical activity.

In Alexandria, barriers to regular outdoor physical activity include loss of free time due to long commute times, pedestrian and bicyclist safety concerns, outdoor air pollution, and lack of nearby open space, parks, bicycle lanes, and trails. These barriers all promote sedentary lifestyles and inhibit the healthy lifestyles necessary for a healthy community population. If the environment does not provide safe opportunities for physical activities such as walking and bicycling, adults and children likely will spend more time engaging in sedentary activities indoors. Such activities, such as watching television, playing video games, and using personal computers, have contributed to an increase in the number of overweight individuals.

Between 1980 and 2003, the total annual vehicle miles traveled in the U.S. increased by 89 percent. As people drive more, they tend to walk or bicycle less. Walking is one of the most popular forms of physical activity in the U.S. However, people need the opportunity to walk safely. In 1995, over 75% of all trips less than one mile in the U.S. were made by automobile. In addition, the number of walking trips as a percentage of all trips taken (of any distance) has declined over the years. This decline has negative implications for the health of both adults and children. Bicycling is a form of transportation that may be used for distances that may not be feasible, practical or efficient to cover by walking.

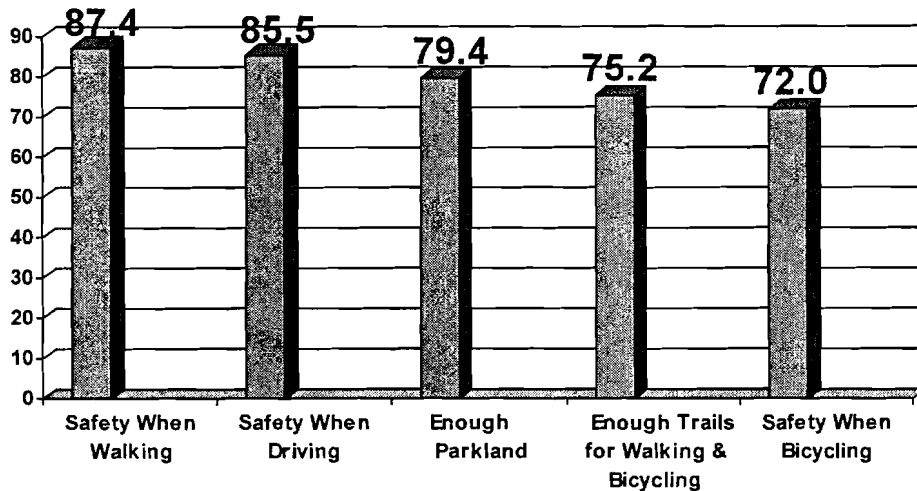
Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive the built environment (healthy lifestyles) to be the fifth most important of ten environmental health issues in Alexandria. However, of the 53 sub-areas of which survey respondents were asked their concerns, pedestrian safety and driver safety were the first and second most frequent responses. Enough parkland and enough walking and bicycle trails were the ninth and fifteenth most frequent response, respectively. Bicycling safety was the twenty-second most frequent response.

Summary of Local Conditions

In 2000, Alexandria was the 10th most densely populated city in the U.S. Due to its long history and dense development, very little undeveloped land remains in the city and intense debates occur over new development projects, as citizen needs and business needs often compete. There are 127 parks and open spaces in the city, totaling 964 acres. This equates to about

6-1: Percentage of Citizens Surveyed Who Were Concerned About Various Built Environment Issues



9.5% of the city's land area and about 7 acres of open space for every 1,000 city residents. There are approximately 40 miles of walking and bicycle trails in Alexandria. There are also ten indoor recreation centers.

As urban sprawl has continued to expand into outlying counties, both drive-through and drive-in traffic have increased. This has negatively affected traffic safety, commute times, and outdoor air quality, and has resulted in conflicts between citizen and commuter needs. In 2003, there were 2,188 total traffic accidents in Alexandria, resulting in 689 personal injuries and one fatality. The average commute time for Alexandria residents was 29.7 minutes. This, however, does not account for driving time spent on other daily errands.

Additionally, elevated levels of ground-level ozone during the summer months make Northern Virginia a "non-attainment area" with respect to national air quality standards. Vehicle emissions are one of the major causes of these unhealthy ozone levels.

Data Gaps

- Percentage of Alexandria children who walk to school (1 mile or less)
- Percentage of Alexandria adults who walk (trips 1 mile or less)
- Percentage of Alexandria children who bicycle to school (2 miles or less)
- Percentage of Alexandria adults who bicycle (trips 5 miles or less)
- Pedestrian and bicyclist injury data for Alexandria

Current Programs and Public Health Protection Factors

- The AHD funded pedestrian and bicycle safety and physical activity initiatives at public schools, recreation centers and after school programs until July 2006, when grant funding for that project ran out.

- The AHD established a *Safe Routes to School* initiative in 2003. T&ES's new Bicycle and Pedestrian Program Coordinator, Yon Lambert, now coordinates this project.
- The Department of T&ES has established neighborhood traffic calming procedures. T&ES actively works with schools to improve transportation safety around school yards. Recently, T&ES began an Ad Hoc Transportation Committee working group. They have been meeting with community members to discuss transportation issues and to create a Comprehensive Transportation Program and Plan. T&ES also facilitated a "Walkable Communities" workshop.
- The Parks & Recreation Department maintains parks and trails. It has published a "Recreation Facilities and Trail Map" for residents. They completed an extensive community assessment and strategic planning project in 2003, and are working toward labeling all trails with mile markers for emergencies.
- The Police Department provides crossing guards at each school during mornings and afternoons.
- The Alexandria City Public Schools are teaching students bicycle safety in middle school physical education classes.
- The Alexandria City Council has partnered with the Metropolitan Washington Council of Governments (COG) on a pedestrian safety media campaign.
- An Open Space Trust Fund was established in 2003.
- In July 2004, funds were appropriated for a Bicycle and Pedestrian Coordinator, now filled by Yon Lambert.
- The Alexandria Be Safe Coalition provides bicycle helmets at cost during community events and distributes bicycle and pedestrian safety literature at community events and schools. They also provide classroom instruction in elementary schools.
- Old Town Alexandria is completely developed with sidewalks.
- The city has included parks, open spaces, bicycle trails, and walking trails in its planning process. Relevant planning documents include the Bicycle Master Plan (1988), the Strategic Master Plan for Recreation, Parks and Cultural Activities (2003), the Open Space Plan (2003), and the Northern Virginia Regional Trails Plan (in draft).
- The city also participates in several programs to encourage the use of mass transit, including free Metro and bus service on days with predicted high ozone levels, and monthly subsidies of city employee use of mass transit.
- The City is beginning a Mobility Needs Assessment for Persons with Disabilities, Pedestrians and Bicyclists.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked the built environment (healthy lifestyles) as the fourth most important environmental health issue in the city. Traffic and development density make the issues related to built environment especially difficult to address.

Of particular concern were traffic issues. Reducing the number of cars on the road would improve driver, pedestrian and bicycle safety, reduce commute times, improve regional air quality, and hopefully increase the number of persons engaging in regular outdoor physical activity. Because a significant percentage of Alexandria's traffic is drive-in or drive-through, re-

gional solutions must be sought that address the high volume of commuter traffic created by non-residents of the city. In addition, Alexandria should continue to pursue programs that improve safety for pedestrians and bicyclists.

Also of concern is the density of development in Alexandria. Although there is little that can be done to reduce the current development density, acquisition of additional open space by the city for parks and trails would create a healthier living environment. New development in Alexandria should be planned so as to create neighborhoods that encourage walking and bicycling.

PROPOSED ACTION PLAN:

GOAL #1

Decrease the percentage of persons who drive alone to work.

Baseline: 62.8% (2000 Census)

Goal: 56.5% (10% reduction by 2010)

ACTIONS

- City government should offer incentives to employers who provide transit and telecommuting options for employees.

GOAL #2

Decrease the number of injuries and deaths due to motor vehicle incidents.

Baseline: 510 injuries per 100,000 population (2003)

Goal: 459 injuries per 100,000 population (10% reduction by 2010)

ACTIONS

- Police Department should install more automated ticketing machines for speeding and red light running.
- Police should increase enforcement of seatbelt and child restraint laws.
- Implementation of a collaboratively-funded media campaign targeting driver behavior with respect to seatbelt and child restraint use.

GOAL #3

Increase trips made by walking.

ACTIONS

- City government should require that all further development be done

with pedestrian issues in mind.

- The city should make it a priority to install sidewalks where there currently are none. Top priority should be given to connecting existing sidewalk segments.
- Priority should also be given to connecting existing walking trails to regional trails.
- Parks and Recreation and T&ES should work together to ensure that the Pedestrian/Bicycle Coordinator is empowered to carry out local, regional and state standards and guidelines, to coordinate conversion of Recreation parkland to multi-use trails, and to pursue grant opportunities.

GOAL #4

Decrease number of pedestrian injuries and deaths.

ACTIONS

- Police and Fire Departments should train staff on importance of recording when a pedestrian is involved in a motor vehicle incident. Pedestrian injury reports should be compiled yearly.
- Increase neighborhood streets with ways to slow traffic.
- Develop more off-road pedestrian routes and continue Master Plan implementation of multi-use trails.
- Implementation of a collaboratively-funded media campaign targeting driver behavior with respect to pedestrians.
- Implementation of a collaboratively-funded campaign targeting immigrants, Hispanics and African-Americans regarding pedestrian safety.

GOAL #5

Increase trips made by bicycling.

ACTIONS

- City government should require that all further development be done with bicycle issues in mind.
- Where possible, bicycle lanes should be added to city streets.
- Priority should be given to connecting existing bicycling trails to city park trails and regional trails.
- T&ES should ensure that the Pedestrian/Bicycle Coordinator is empowered to carry out local, regional and state standards and guidelines and has the support to pursue grant opportunities.

GOAL #6

Decrease the number of pedal cyclist injuries and deaths.

ACTIONS

- Police and Fire Departments should train staff on the importance of recording when a bicyclist is involved in a motor vehicle incident. Bicyclist injury reports should be compiled yearly.
- Implementation of a collaboratively-funded campaign targeting immigrants, Hispanics and African-Americans regarding bicycle safety.
- Recreation should continue to offer Bicycle Safe classes for citizens.
- Development of more off-road bike routes.
- Implementation of a collaboratively-funded media campaign targeting driver behavior with respect to bicyclists.

GOAL #7

Increase city-owned acreage devoted to open space and parks.

Baseline: 946.7 acres (2003 City Statistical Snapshot)

Goal: 100.0 acres of new park open space by 2013 (10.5% increase)

ACTIONS

- Purchase open space for recreation. Priority should be placed on acquisition of properties that link existing open spaces and allow for development of walking and bicycling trails.
- City government should make every effort to actively uphold existing local, regional and state standards and guidelines. At present, local guidelines include the Bicycle Master Plan (1988), the Strategic Master Plan for Recreation, Parks and Cultural Activities (2003), the Open Space Plan (2003), and the Northern Virginia Regional Trails Plan (in draft).
- City agencies should apply for grant monies for the acquisition and development of parks and walking and bicycling trails.

GOAL #8

The Health Department should take a more active role as an advocate for public health in the city's planning process and should work to build community partnerships that promote regular outdoor physical activity such as walking and bicycling.

ACTIONS

- The AHD should take a more active role as an advocate for initiatives that address built environment issues.
- The AHD, city agencies and non-profits should apply for grant monies to work on marketing and educational programs that promote regular outdoor physical activity like walking and bicycling.

- Collaboration and sharing of information between city agencies addressing built environment issues should be formally initiated.
- Outreach should be initiated to non-profits (local and regional) who work on built environment issues.

B. Chemicals & Toxics

Background

Information on the levels of exposure to hazardous substances in the environment and their associated health effects often is lacking. Toxic and hazardous substances deposited on land can contaminate the soil at the site of their release. However, these substances can also be carried far from their sources by air, groundwater and surface water runoff into streams, lakes and rivers, where they can contaminate the air, groundwater, and surface water, or accumulate in underwater sediments. Decisions about the clean-up and management of these outdoor sites must be made keeping public health concerns in mind.

Lead-based paint poses a particular risk to children under the age of six. Ingestion of even small amounts of lead can have profound developmental effects on these children. Paint containing lead was commonly used in housing constructed before 1978.

Hazardous household chemicals, such as cleaning products and pesticides, can affect health. Children are the population most vulnerable to accidental poisoning. In 1996, more than 2 million poison exposures were reported to poison control centers in the U.S. More than 90% of these poisonings occurred in homes.

Exposure Factors

- Persons working in industries that use toxic chemicals or lead are at an increased risk of exposure.
- Painters and remodeling contractors who remove peeling paint from older homes or buildings are at an increased risk of lead poisoning.

Contributing Factors and Behaviors

- Persons who use home remedies containing lead are at a greater risk of lead poisoning.
- Persons who use cosmetics containing lead are at a greater risk of lead poisoning.

Most Affected Populations

- Children under five years of age are most susceptible to lead poisoning.
- Children are most frequently the victims of accidental poisonings.
- Persons living in substandard housing built before 1978 are more likely to be exposed to lead paint hazards.
- Immigrant populations are more likely to use illegally imported home remedies or cosmetics containing lead.

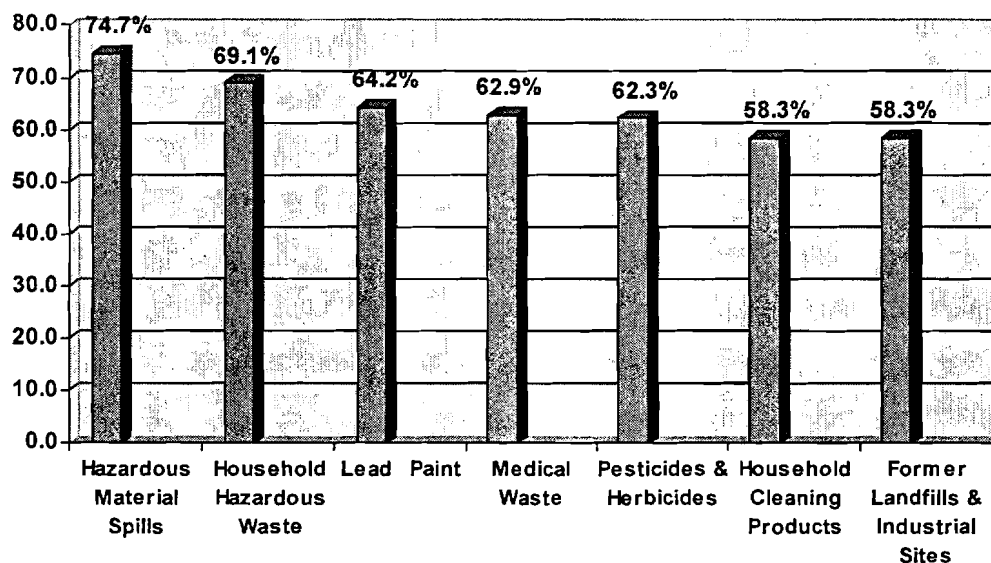
Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive hazardous and toxic chemicals to be the sixth most important issue facing the city

of the ten broad issues identified. Of those surveyed, 44.8% listed this issue among their top five most important environmental health issues. Additionally, of the fifty-three sub-areas of concern mentioned in the survey:

- Hazardous material spills ranked 16th
- Household hazardous waste ranked 30th
- Lead paint ranked 36th
- Medical waste ranked 37th
- Insecticides and herbicides ranked 39th
- Household cleaning products ranked 44th
- Former landfills and industrial sites ranked 45th

6-2: Percentage of Citizens Surveyed Who Were Concerned About Various Toxic and Hazardous Waste Issues



Current Programs and Public Health Protection Factors

Lead: The Alexandria Health Department's Well Baby and Well Child clinics screen infants and toddlers for elevated blood lead levels. A venous blood sample is taken from those children with elevated blood lead levels on the screening test. An environmental survey is then initiated by the Environmental Health Division for households of children whose venous blood sample confirms elevated lead levels. An EPA Certified Lead Risk Assessor is currently on the staff of the EHD. The Division maintains an x-ray fluorescence lead analyzer to conduct lead paint assessments in homes and day care centers.

Over the last decade, the number of children confirmed to have elevated blood lead levels has steadily fallen. Over the last three years, there have only been three children confirmed

to have elevated blood lead levels in Alexandria. The Health Department's existing child blood lead screening and environmental lead survey programs are adequate to protect public health and address the cases of child lead poisoning identified in the City.

Alexandria Household Hazardous Waste Program: In an effort to reduce and minimize exposure of the public to household hazardous waste, the City has implemented a household hazardous waste program that is free of charge to residents of Alexandria. Originally, the program involved providing a drop-off center on two Saturdays a year for the public to dispose of their hazardous waste, such as pesticides, herbicides, oil-based paints and solvents, household cleaners, and similar waste products.

Beginning in 2001, the City began the Stop Throwing Out Pollutants (STOP) Program. This program expanded the opportunities for the public to dispose of hazardous waste by providing drop-off service every Monday, from 10am to 6pm. Providing this service frequently and free of charge encourages the proper disposal of these types of materials and reduces the likelihood of illegal dumping or improper disposal.

Contaminated Land Programs: The Virginia Department of Environmental Quality has a variety of programs targeted at preventing contamination of land and requiring sites to be cleaned up if needed. The Underground Storage Tank (UST) Program regulates most large USTs in Virginia and the City. This program requires that the tanks be maintained so that they do not leak. If it has been confirmed that tanks have resulted in a release to the environment, VADEQ requires the site to be remediated. There are numerous cases in the City where USTs have leaked and VADEQ has required remediation. VADEQ also regulates the disposal of solid and hazardous waste and regulates generators of hazardous waste under the Resource Conservation and Recovery Act (RCRA).

VADEQ also has a Voluntary Remediation Program (VRP) that allows owners of contaminated sites that are not regulated under any of the programs above, or pre-date any regulations, to remediate those sites. Several sites in the City have entered into this program. Some of these remediation projects are complete; others are ongoing. The VRP consists of six key elements:

- Determination of eligibility;
- Submittal of registration fee;
- Report submittals, including a site characterization, documentation of public notice, remedial action work plan, and demonstration of completion report;
- Establishment of remediation goals based on current and/or future land use;
- Public participation to provide a forum for affected residents; and
- A Certification of Satisfactory Completion documenting that the clean-up standards have been achieved.

Voluntary Remediation Program/Oronoco Outfall-Alexandria Town Gas Site: In May 2000, the City entered Virginia's Voluntary Remediation Program (VRP), administered by

VADEQ, to remediate and clean up the Oronoco Outfall-Alexandria Town Gas Site. A manufactured gas plant (MGP) facility, which was located two blocks from the waterfront, was owned and operated by the City for 79 years of its 95-year existence (1851-1946). Due to plant operations, the site became contaminated with waste and by-products and, as a result, oily wastes have been intermittently discharging into the Potomac River.

Over the last 25 years, the City has taken numerous measures to prevent further discharges of plant-related wastes into the river. However, the extent and complexity of the problem has made the development of an effective and lasting solution a difficult challenge. The EPA and the U.S. Coast Guard requested the City to immediately address the issue of ongoing releases into the Potomac River. In response, the City applied for and was accepted into the Voluntary Remediation Program (VRP) in May 2000.

The City implemented Interim Corrective Actions that included installing and maintaining a floating oil containment boom, with an additional oil absorbent boom. The City also installed and is operating a free product removal system that includes recovery wells installed in the source area. The removal of free product from the subsurface will make future remedial efforts more efficient.

The City has completed a thorough characterization of the site and continues to address issues identified by VADEQ. The City has developed a Corrective Action Plan that includes relining a portion of the storm sewer and installing a groundwater recovery and treatment system designed to intercept coal tar migrating toward the Potomac River through backfill surrounding the Oronoco Street storm sewer. It is expected that construction for the pipeline relining project will begin in 2006. The City plans to begin negotiating with VADEQ for the clean-up of contaminated sediment at the outfall. However, the implementation of this phase will depend on the success of the other measures to prevent further releases at the outfall.

City Contaminated Land Program: As an added layer of protection beyond the VADEQ's requirements, the City of Alexandria adopted its Administrative Procedures for the Development of Contaminated Land, which identified certain types of remediation for a variety of contaminants. Since that time, the City has incorporated language into its Zoning Ordinance that requires contaminated sites to be remediated as part of the development process. The Zoning Ordinance requires any contaminated site to be identified as part of the preliminary site plan submittal, while the final site plan must include plans indicating how the site will be remediated. In an effort to ensure these sites are identified, the City maintains a contaminated land site map, which includes information on old landfills, underground storage tanks, and some former industrial sites.

Other City Programs Targeting Illegal Dumping: The City also has established an Environmental Offenses Ordinance prohibiting illegal dumping or discharges to the sewer systems, streams, or onto the ground. To assist in administering and enforcing this ordinance and to better investigate these types of releases, the City has created an Environmental Crimes Task Force, with representatives from the Police, Fire, Health, T&ES, Code Enforcement, and Recreation & Parks.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked chemicals and toxics as the seventh most important environmental health issue of the eleven broad issues considered. Based on the strength of existing City programs and the lack of data on human exposures to hazardous and toxic materials in the City, the ACEHAT ranked this as a Tier III issue.

PROPOSED ACTION PLAN:

GOAL #1

Eliminate elevated blood lead levels in children caused by lead paint.

ACTIONS

- The Health Department will maintain its existing Child Lead Poisoning Prevention Program.

GOAL #2

The City will maintain and enhance its contaminated land program.

ACTIONS

- The City will continue to maintain its existing contaminated land program.
- The City will continue its existing STOP Program to encourage residents to properly dispose of household hazardous waste.
- City staff will update and maintain the contaminated sites map and develop and incorporate that data into a GIS layer.
- The City will continue to implement the Corrective Action Plan for the Oronoco Outfall-Alexandria Town Gas Site.

C. Disease Carriers & Vector Control

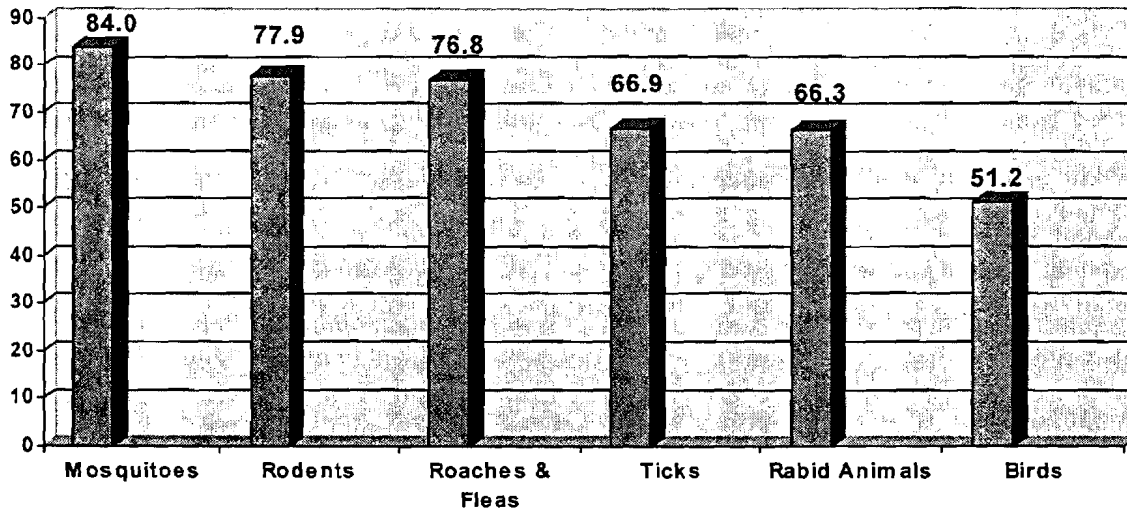
Background

The control of disease vectors is a basic public health function. In the 20th century, vector control programs and improved housing eliminated many of the public health problems associated with mosquitoes and rodents. Additionally, the vaccination of dogs and cats greatly reduced the number of human rabies cases. However, as demonstrated by the recent spread of West Nile virus in the United States, and the death of two Virginia men of rabies in the last eight years, continued efforts are needed to control vector-borne diseases.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive disease carriers such as mosquitoes, rodents and rabid animals to be the fourth most important environmental health issue facing the city (after water quality, outdoor air quality and food safety).

6-3: Percentage of Citizens Surveyed Who Were Concerned About Various Disease Carrier Issues



“Mosquitoes” was the fourth most commonly named sub-area of concern of the fifty-three mentioned in the survey. Of the residents surveyed in zip codes 22305 (Arlandria-Potomac Yards) and 22314 (Old Town), the areas nearest the Potomac River, more than 90% expressed concern about mosquitoes.

“Rodents” was the eleventh most commonly named sub-area of concern. Of the residents surveyed in zip codes 22302 (Braddock-King east of Quaker), 22305 (Arlandria-Potomac Yards) and 22314 (Old Town), the older parts of the city, more than 80% expressed concern about rodents.

Summary of Local Conditions

Animal Bites: Over the last two years, there have been 140 or more animal bites reported to the Alexandria Animal Welfare League (AAWL) annually. Of these, 87 persons received hospital treatment for dog bites, and 27 persons received post-exposure prophylaxis for rabies.

6-4: Human Animal Bite Exposures

	2002	2003	2004	2005	2006
Animal Bites Reported by AAWL	121	123	119	147	140
Persons Treated at Hospital Emergency Department for Dog Bites	Data Unavailable	Data Unavailable	Data Unavailable	52	35
Persons Receiving Post-Exposure Rabies Prophylaxis	4	0	0	10	17

Rabid Animals: Thirty-five rabid animals have been found in Alexandria in the last eight years, including 25 raccoons, nine bats, and one skunk. Eighteen of the rabid raccoons were found during a period in 2003 and 2004 when rabies in the city spiked. Fortunately, no humans or domestic animals have become infected.

6-5: Rabid Animals Found in Alexandria

	1999	2000	2001	2002	2003	2004	2005	2006
Raccoons	2	2	1	0	12	6	1	1
Other Wild Animals	3 bats	1 bat 1 skunk	2 bats	0	0	1 bat	1 bat	1 bat
Domestic Animals	0	0	0	0	0	0	0	1 feral cat (from Fairfax)

Rodents: In 2006, the Code Enforcement Division received 285 complaints about rodents (primarily rats) in the community, and the Environmental Health Division received 20 complaints about rodents in or adjacent to restaurants. The older areas of the city, e.g., Old Town and Del Ray/Arlandria, have the most issues with rodents.

6-6: Complaints About Rodents

	2003	2004	2005	2006
Complaints about Rodents in Restaurants received by Health Department	15	20	20	20
Complaints about Rodents received by Code Enforcement	134	197	144	285

Roaches, Fleas, Bedbugs, and Other Indoor Insects: In 2006, the Environmental Health Division investigated 30 complaints about insects (primarily cockroaches) in restaurants, and 30 complaints about insects in other types of businesses. Of particular concern is a sudden increase in the number of complaints about bedbugs in hotels and apartment buildings. In 2006, there were 22 complaints about bedbugs. This reflects the more than ten-fold increase in bedbug complaints nationwide over the last five years.

6-7: Complaints About Insects Received by Health Department

	2003	2004	2005	2006
Complaints about Insects in Restaurants	38	16	25	30
Complaints about Bedbugs	Data Unavailable	Data Unavailable	12 (9 in hotels)	22 (3 in hotels)
Complaints about Mosquitoes	Data Unavailable	Data Unavailable	113	133
Complaints about Other Insects in Other Locations	Data Unavailable	Data Unavailable	2	8

Mosquitoes: The spread of West Nile virus to our area in 2001 brought a heightened awareness of mosquito-borne disease. There was one human case of West Nile virus in both 2002 and 2003. Aggressive public health control measures have helped reduce mosquito populations in Alexandria and have prevented further human cases of West Nile virus in the last three years. However, West Nile virus positive mosquitoes continue to be found in some parts of the city. In July through September 2006, 39 pools of West Nile virus positive mosquitoes were found in the city, the highest number since the City began testing mosquitoes in 2002. In 2006, there were 133 complaints about mosquitoes by city residents.

6-8: West Nile Virus Positive Mosquito Pools

	2002	2003	2004	2005	2006
West Nile Virus Positive Pools of Mosquitoes in Alexandria	0	26	7	24	39
West Nile Virus Positive Pools of Mosquitoes in Virginia	180	431	432	301	564

Ticks: There have been 16 cases of Lyme disease contracted by city residents over the last five years. It is believed that in many cases the disease was contracted outside the city while the resident was engaged in outdoor sports such as camping or hiking.

Current Programs

The Environmental Health Division (EHD) began a Mosquito Control Program in 2002 to deal with the spread of West Nile virus. Mosquito surveillance and control services were purchased from a private contractor; the EHD managed the contract. In 2005, EHD brought the Mosquito Control Program in-house and hired a program supervisor, an environmental health

biologist, two seasonal environmental health specialists, and two summer interns to implement the program. The scope of the program was expanded to include all aspects of public health vector control.

The Code Enforcement Division (CED) has a robust Existing Structures Program that enforces building maintenance, solid waste and rodent control ordinances within the city. Rental housing units are inspected every one to four years, depending on their compliance history, for compliance with the building maintenance code. The CED also investigates citizen complaints about housing, solid waste and rodents. Alexandria Pest Control Services, a private pest control company, is under contract with CED and provides rat control services to the city.

The Alexandria Animal Welfare League (AAWL) provides animal control services for the city. Animal control officers enforce the city ordinances requiring vaccination and licensing of pets. Animal control officers investigate animal bites and potential cases of animal exposure to rabies. When necessary, animals are confined or quarantined. The EHD coordinates submission of animal specimens for rabies testing to the state Consolidated Laboratory in Richmond and investigates potential human rabies exposures.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked disease carriers as one of the top six environmental health issues in the city. Although the city has a low incidence of vector-borne illness, citizens expressed high concern about mosquitoes, rodents and indoor insects like roaches and fleas. Of particular concern to the team were the permanent establishment of West Nile virus as a vector-borne disease in our area and the significant increase in 2003 and 2004 in the number of rabid wild animals found in the city.

PROPOSED ACTION PLAN:

GOAL #1

Develop a robust vector control program in the Environmental Health Division (EHD) capable of assisting citizens with mosquito, rabies, insect, rodent, and nuisance bird problems.

ACTIONS

Community Surveillance

- Track the number, type and location of vector-borne disease cases in the city.
- Track the number, type and location of complaints about insects, rodents, ticks, and birds in the city.

Community Education and Outreach

- Provide information on vector-borne disease and vector control to Alexandria citizens through the AHD website, the EHD complaint line, and through printed publications.
- Engage the community with information on vector control and disease prevention at special events and festivals, recreation centers, dog parks, and other public venues.
- Provide information on insect control for food establishments in EHD's *FoodTalk* newsletter inserts.
- Provide information about vector-borne diseases to physicians so as to encourage their reporting.

Interdepartmental Cooperation and Coordination in the City

- Create a Vector Control Working Group in the city composed of representatives EHD, AHD epidemiologists, the Code Enforcement Division's rodent control and housing programs, the Animal Welfare League's animal control officers, Citizens' Assistance, Recreation and Parks, the Transportation and Environmental Services (T&ES) Maintenance Division, local veterinarians, and Inova Alexandria Hospital's Emergency Department.
- Improve coordination between EHD and Code Enforcement on rodent control issues.
- Coordinate an effort between the EHD and Recreation and Parks to identify ways of reducing tick populations and human tick exposures in city parks.

GOAL #2

Reduce the number of persons requiring rabies post-exposure prophylaxis by 35% by 2010.

ACTIONS

Community Surveillance

- Develop baseline data on rabies post-exposure prophylaxis administered to persons exposed to potentially rabid animals in the city.
- Track data on rabies post-exposure prophylaxis administered to persons exposed to potentially rabid animals in the city.

Community Education and Outreach

- Increase the public's awareness of rabies through:
 - Dog/cat vaccination clinics
 - Summer kids programs at Animal Shelter
 - Posters in parks, recreation centers and other public places

- Press releases
- Displays at special events and festivals

GOAL #3

Reduce dog bites treated at hospital emergency room in Alexandria by 15% by 2010.

ACTIONS

Community Surveillance

- Develop baseline data on dog bites and other animal bites treated at Inova Alexandria Hospital's Emergency Department.
- Track data on dog bites treated at Inova Alexandria Hospital's ED.
- Track data on dog bites and other animal bites reported to EHD or Animal Control to assess proportion of persons bitten by animals in the city who are treated at the Inova Alexandria Hospital's ED.

Community Education and Outreach

- Increase public's awareness of the danger of dog bites through:
 - Dog/cat vaccination clinics
 - Summer kids programs at Animal Shelter
 - Posters in parks, recreation centers and other public places
 - Press releases
 - Displays at special events and festivals
 - Information to hospital and physicians on reporting of dog bites.

GOAL #4

Mosquito Control Program limits human West Nile virus cases to not more than one case annually.

ACTIONS

Create a robust Mosquito Control Program internal to the EHD (instead of relying on contractors) that includes:

- Medical Surveillance for human cases of mosquito-borne disease
- Mosquito trapping, identification and testing
- Citizen education and outreach
- Mosquito habitat reduction
- Larviciding of storm water catch basins and areas of standing water
- Adult mosquito control activities, if needed

Interdepartmental Cooperation and Coordination in the City

- Coordinate efforts of EHD with those of Code Enforcement Division on issues involving stagnant swimming pools and trash or debris that provides mosquito habitats.
- Coordinate efforts of EHD with those of Recreation and Parks Department on issues involving reduction of mosquito habitats and mosquito control measures.
- Coordinate storm water basin larviciding efforts of EHD with T&ES Maintenance Division's storm water system maintenance.
- Coordinate EHD's mosquito control efforts around the wastewater treatment plant with the Alexandria Sanitation Authority.

GOAL #5

**Reduce number of rodent complaints in Alexandria by 10% by 2010.
The number of rodent complaints investigated by the Code Enforcement Division in 2006 was 285.**

ACTIONS

Community Education and Outreach

- Provide information on rodent control to Alexandria citizens through the AHD website, the EHD complaint line and through printed publications.

Interdepartmental Cooperation and Coordination in the City

- Improve reporting of observations of rodent activity by employees of all city departments to the Code Enforcement Division.
- Improve enforcement of cleanliness of dumpster areas at restaurants by the EHD.

D. Drinking Water

Background

Providing safe drinking water free of disease-causing agents, whether biological or chemical, is the goal of all public water systems. Today, most disease outbreaks in the United States associated with drinking water are caused by protozoa like *Giardia intestinalis* or *Cryptosporidium parvum*, viruses like the Norovirus, chemicals such as lead, copper, nitrates, and industrial chemicals, or bacteria like *Escherichia coli* 0157:H7, *Campylobacter jejuni*, or *Salmonella*.

Most outbreaks involve only a few persons, but outbreaks involving large public water supplies can effect thousands of people. For example, in 1993, more than 400,000 people became sick during a single episode of water-borne cryptosporidiosis in Milwaukee.

With the exception of a few residents in the Fairlington and Shirlington areas of the city, all of Alexandria's residents get their water from the Virginia American Water Company (VAWC), Alexandria's water treatment and distribution utility. VAWC purchases all their water from the Fairfax County Water Authority (FCWA). FCWA's primary sources of water are the Potomac River and the Occoquan Reservoir.

Exposure Factors

Every member of the community is *potentially* exposed to waterborne pathogens and toxins from drinking water on a daily basis. Because virtually everyone in Alexandria is on the same public water system, contamination of the water supply could have a catastrophic effect on the community.

Most Affected Populations

The very young, the elderly, diabetics, and immunocompromised persons are most susceptible to waterborne disease and are most likely to die or have long-term effects from a waterborne illness. Children under the age of six who drink water containing dissolved lead may suffer neurological and developmental problems, including diminished IQ. Persons living in homes built before 1945 are most likely to have lead water service lines. Persons living in homes built before 1986 are most likely to have copper water pipes connected with lead-based solder.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive water quality (including both drinking water and surface water quality) to be one of the most important environmental health issues in the city. Over eighty-one percent (81.7%) of survey respondents listed drinking water quality as one of their top five concerns. Drinking water was the fifth most commonly cited sub-area of concern (after pedestrian safety, driver safety, restaurant food safety, and mosquitoes).

It should be noted that during the period that the survey was taken, two events involving drinking water received a lot of media attention in the area. The first event was the loss of water pressure in much of the city and the issuance of a boil water notice as a result of the damage to power lines and FCWA treatment facilities during Hurricane Isabel (September 2003).

The second event was the disclosure that many homes in Washington, DC, had elevated lead levels in their drinking water (February 2004). In this second event, no homes in Alexandria were affected. However, both of these events may have biased the survey results.

Summary of Local Conditions

Alexandria has very good drinking water quality; the water meets all of the Safe Drinking Water Act (SDWA) standards established by the EPA.

The bacteriological quality of Alexandria's water is tested over a hundred times per month from various points in the distribution system. To meet SDWA standards, at least 95% of the samples must be negative for coliform bacteria and there can be no repeat positive samples from the same area of the system. There have been no Maximum Contaminant Level (MCL) violations of the EPA bacteriological quality standard in the last five years.

A Boil Water Notice is issued if sampling or other events lead regulatory personnel to believe that there may be bacteriological contamination of the drinking water. The only Boil Water Notice issued in Alexandria in the last five years was during Hurricane Isabel, when power outages at the water treatment plants in Fairfax County were thought to have allowed inadequately treated water to be pumped to the city.

The Alexandria Health Department (AHD) investigates every complaint it receives concerning water quality and alleged waterborne illnesses. With the exception of a few construction-related complaints received about turbid water and a period following heavy rains in the summer of 2006 when manganese discolored the water, the only complaints received about the quality of our public drinking water supply were during Hurricane Isabel in late 2003, when the AHD received more than 200 complaints about lack of water or low water pressure.

All laboratory-confirmed cases of enteric disease in Alexandria are investigated. No cases of waterborne illness have been linked to the public water system during the last five years. Typically, Alexandria residents suffering from enteric illnesses that are commonly waterborne have recently immigrated to this country, traveled overseas, or engaged in outdoor sports such as camping. The AHD collects and analyzes data on waterborne illness so that it can spot outbreaks and trends in disease incidence and transmission.

Alexandria's water is regularly tested for over 100 possible contaminants. Currently, none of the organic or inorganic chemicals or physical parameters VAWC tests for exceed EPA's MCLs. Lead is the contaminant of greatest concern. EPA standards require that at least 90% of the "high risk" homes (with lead service lines or copper pipes joined with lead solder) tested must meet the EPA 15 parts per billion standard for lead. In the most recent round of sampling (in the summer of 2005), all of the homes tested met this standard.

Current Programs and Public Health Protection Factors

The Virginia Department of Health's Office of Drinking Water (ODW) enforces the provisions of EPA's Safe Drinking Water Act regulations in Virginia. The engineers and environmental inspectors in ODW's Culpeper field office serve the Northern Virginia area, including Alexandria and Fairfax County. The ODW field office reviews water facility construction plans and water quality testing reports submitted by FCWA and VAWC. This office also conducts periodic sanitary surveys of FCWA and VAWC treatment facilities, water storage facilities and water distribution systems.

The AHD investigates all laboratory-confirmed enteric illnesses and complaints about water quality and possible waterborne illnesses. The EHD also reviews the water quality testing reports submitted by FCWA and VAWC.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked this issue eleventh out of the 11 issues considered. The high concern expressed by citizens who responded to the Environmental Health Survey was believed to be related to the water supply problems the city experienced during Hurricane Isabel in 2003, and the problems Washington, DC, experienced with lead in drinking water in 2004.

Alexandria currently meets all EPA drinking water standards and there has not been a confirmed case of waterborne illness associated with the public drinking water supply in the last five years. The most recent lead/copper sampling showed 100% of the homes sampled to be in compliance with the standard.

PROPOSED ACTION PLAN:

GOAL

No waterborne illnesses in the City related to the public drinking water supply.

ACTIONS

- The AHD's Environmental Health Division will continue to monitor water quality test results from the VAWC and FCWA.
- The AHD's Environmental Health Division will work to improve emergency communications between the VDH Office of Drinking Water, AHD, VAWC, FCWA, other local health departments, and city officials.

E. Food Safety

Background

Food-borne illnesses in the U.S. impose a burden on public health and contribute significantly to the cost of health care. According to the U.S. Centers for Disease Control and Prevention (CDC), 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year may be associated with microorganisms in food.

A recent Food and Drug Administration (FDA) report estimates that hospitalizations due to food-borne illnesses cost this country over \$3 billion annually. The same report estimates the cost of lost productivity due to food-borne illness at between \$20 billion and \$40 billion each year.

Exposure Factors

Every member of the community is potentially exposed to food-borne pathogens on a daily basis.

Contributing Factors and Behaviors

Persons who eat raw, undercooked or unpasteurized meat, poultry, fish, shellfish, milk, cheese or eggs are at greater risk of food-borne illness, as are those who do not practice good personal hygiene, including hand washing.

Also at greater risk are persons who do not use good food safety practices in their homes, such as washing food contact surfaces often, separating raw animal foods from ready-to-eat foods, cooking foods to proper temperatures, and refrigerating foods promptly.

Most Affected Populations

The very young, the elderly, diabetics, and immunocompromised persons are most susceptible to food-borne disease and are most likely to die or have long-term effects from a food-borne illness.

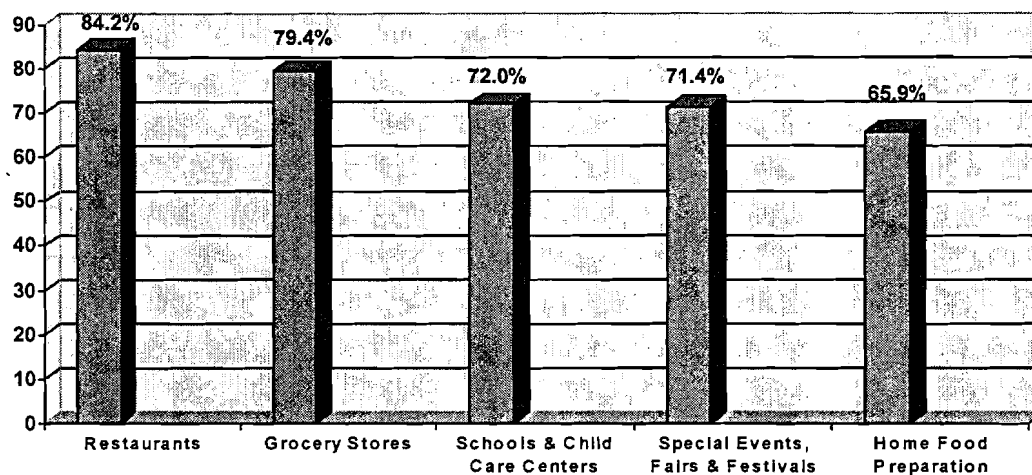
Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive food safety as the third most important environmental health issue of the eleven major issues studied. Of the fifty-three sub-issues identified in the survey, restaurant food safety was the third most common concern, and grocery store food safety was the eighth most common concern.

Summary of Local Conditions and Proposed Food Safety Indicators

Complaints Received by EHD About Food Establishments: The Alexandria Health

6-9: Percentage of Citizens Surveyed Who Were Concerned About Various Food Safety Issues



Department investigates every complaint it receives concerning alleged food-borne illnesses and unsanitary conditions in retail food service establishments in the city. In 2006, the EHD received 168 complaints about sanitation in food establishments and 41 complaints about possible food-borne illness.

Enteric Disease Cases Reported by Laboratories: All laboratory-confirmed cases of enteric disease in Alexandria are investigated by the AHD. However, it is believed that 80% or more of food-borne illnesses are unreported because specimens are not collected for laboratory analysis. Due to the low number of reported cases of food-borne illness recorded annually in the city, these statistics vary widely from year to year and would not be good metrics to use as indicators to evaluate food safety.

6-10: Laboratory Confirmed Cases of Probable Foodborne Illness*

ILLNESS	2002	2003	2004	2005	2006
<i>Campylobacter</i>	13	16	14	7	20
<i>Cyclospora cayetanensis</i>	0	0	0	2	0
<i>Escherichia coli</i> 0157:H7	2	1	0	1	2
Post-diarrheal hemolytic uremic syndrome (HUS)	0	0	0	0	0
<i>Listeria monocytogenes</i>	0	0	0	0	0
<i>Salmonella</i> , non-typhoidal	21	12	12	19	18
<i>Vibrio vulnificus</i>	0	1	0	1	0

* It is believed that the seven illness types listed above account for more than 87% of the deaths in the U.S. related to foodborne illness. *Toxoplasma gondii* has not been selected as a local indicator since it is not a reportable disease in Virginia, and most cases are not contracted in public settings, but rather in homes where there are cats. *Vibrio vulnificus* has been added to the list proposed by *Healthy People 2010* since it has an approximate 40% case fatality rate and is commonly associated with raw shellfish, a popular food in this area. The only death in the last five years in Alexandria attributed to foodborne illness was caused by *Vibrio vulnificus*.

Foodborne Disease Outbreaks: The number of foodborne illness outbreaks in a community can be used as one indicator of progress in improving food safety, but should not be the sole measure, especially when the number of outbreaks is very low. Over the last five years, there have been only three small food-borne outbreaks in Alexandria.

6-11: Number of Foodborne Outbreaks

	2002	2003	2004	2005	2006
Number of Foodborne Illness Outbreaks	2*	0	0	0	1**

* 2002: One *Campylobacter* outbreak, and one *Salmonella* outbreak.

** 2006: One *Salmonella* outbreak.

Norovirus is estimated to cause two-thirds of all foodborne illness. However, many norovirus outbreaks are not foodborne and it is often difficult to establish if food caused a norovirus outbreak. There have been ten norovirus outbreaks in Alexandria in the last five years. Six of these outbreaks occurred in 2006. Of great concern, eight of these outbreaks occurred in nursing homes and assisted living facilities where some of Alexandria's most vulnerable residents live. The remaining two outbreaks were at a preschool program and a restaurant. The norovirus outbreak at the restaurant was probably foodborne.

6-12: Confirmed Norovirus Outbreaks

	2002	2003	2004	2005	2006
Number of Confirmed Norovirus Outbreaks	1	0	3*	0	6**

* 2004: Three adjacent nursing homes had outbreaks of Norovirus at the same time. There were more than 80 cases reported.

** 2006: Four nursing homes and assisted living facilities, one Head Start program, and one restaurant had outbreaks of Norovirus. The outbreak associated with the restaurant was probably foodborne.

Program Assessment

Alexandria has enrolled in the voluntary FDA National Retail Food Safety Program Standards program. In 2004, the Health Department's EHD completed its program self-assessment and determined that the Alexandria Food Safety Program met only two of the nine FDA standards. The FDA standards are good indicators that can be used to evaluate the strength of Alexandria's food safety program. In 2006, the Alexandria Food Safety Program met four of the nine FDA standards.

6-13: FDA Model Food Program Standards Met

	2003	2004	2005	2006
Number of FDA Model Food Program Standards Met (of 9)	1	2	3	4

In 2004, a baseline survey was conducted to determine compliance levels with the provisions of the FDA Food Code related to the food safety risk factors identified by the CDC. The seven

areas of focus are shown below:

6-14: Percent of Out of Compliance Baseline Survey Observations[#] Related to CDC Food Safety Risk Factors by Establishment Type^{*}

CDC Food Safety Risk Factor	Full Service Restaurants (n=76)	Fast Food Restaurants (n=40)	Elementary Schools (n=19)	Nursing Homes (n=7)	Hospital (n=1)
Food from Unsafe Sources	10.9% (9.0%)	6.1% (3.0%)	5.3% (5.6%)	7.1% (2.8%)	50.0% (3.2%)
Inadequate Cooking	14.1% (15.3%)	2.5% (11.0%)	0.0% (5.6%)	40.0% (6.4%)	0.0% (6.7%)
Improper Holding Temperatures or Times	42.0% (63.2%)	49.5% (49.2%)	29.0% (39.5%)	34.8% (32.0%)	25.0% (39.6%)
Contaminated Equipment	62.6% (43.6%)	58.5% (14.6%)	7.1% (11.0%)	50.0% (15.0%)	50.0% (16.3%)
Poor Personal Hygiene	35.6% (53.4%)	35.8% (36.6%)	17.1% (25.8%)	21.2% (20.6%)	0.0% (18.7%)
Chemical Storage	26.6% (20.0%)	34.9% (18.5%)	10.5% (14.6%)	28.6% (9.9%)	0.0% (12.3%)
Employee Health Policy	97.3%	97.5%	100.0%	100.0%	100.0%

^{*} Baseline compliance data is not yet available for grocery store meat, produce, deli, or seafood departments. It should be available by March 2008.

[#] Percentages of observations out of compliance from nationwide FDA baseline survey are shown in parentheses.

Current Programs and Public Health Protection Factors

The EHD's Food Safety Program in many respects leads the state. Alexandria was the first locality in the Commonwealth to adopt the FDA Food Code. Alexandria also meets the state standard for frequency of inspection a higher percentage of the time than any other Virginia jurisdiction. Additionally, the city was one of the first Virginia localities to enroll in the FDA National Retail Food Safety Program Standards program and was the first to complete an FDA baseline survey of its restaurants. Alexandria has a low number of cases of food-borne illness and a low number of food-borne illness outbreaks.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked food safety as one of the top six environmental health issues in the city. This ranking reflects the high priority the public puts on food safety, the need to correct the deficiencies noted in the FDA National Retail Food Safety Program Standards self-assessment, and the need to educate consumers as well as food service establishments on proper food safety.

PROPOSED ACTION PLAN:

GOAL #1

The AHD will work to improve the reporting of food-borne illness.

ACTIONS

- The EHD should partner with physicians and the hospital to improve data collection on food-borne illness and the collection of samples for laboratory analysis from patients with suspected food-borne illness.
- A method should be developed to collect data on the incidence of *Toxoplasma gondii* in Alexandria.

GOAL #2

The EHD's Food Safety Program will meet all nine of the National Retail Food Safety Program Standards by 2010.

ACTIONS

- The EHD should actively pursue meeting the nine standards in the National Retail Food Safety Program Standards by 2010.
- The EHD should update its food safety ordinance by adopting the 2005 FDA Food Code.
- All EHD Food Safety Program staff should become certified as either Certified Food Managers (minimum) or Certified Food Safety Professionals (preferred), and should meet the training and education criteria in National Retail Food Safety Program Standard #2.
- A baseline food safety survey of Alexandria grocery store meat, seafood, deli, and produce departments should be completed by March 2008.
- The EHD should complete a follow-up food safety survey of all food establishment types by 2010.

GOAL #3

Food establishment inspection violations directly related to CDC food-borne illness risk factors will be reduced by 25% by 2010.

ACTIONS

- The EHD should survey food service managers and food service workers to assess the knowledge areas where food safety training is most needed and partner with other groups to provide innovative training that meets those needs.
- The EHD should develop a campaign to promote hand washing by

- restaurant employees
- The EHD should partner with the industry to help develop employee health policies that exclude ill food service workers from food preparation and that encourage food service workers to report their illnesses.
- The EHD should develop a campaign to promote hand washing at facilities serving highly susceptible populations, e.g., schools, child care centers, nursing homes, jails, and hospitals.

GOAL #4

By 2010, the EHD will develop an effective program to educate consumers about food safety.

ACTIONS

- The EHD should transform its Food Safety Program from a strictly regulatory approach focused solely on the food service industry to a balance of regulatory and educational approaches with more educational outreach to consumers.
- The EHD should develop a program to actively educate consumers about food safety practices, such as temperature control, cleanliness, hand washing, and prevention of cross-contamination. The EHD should partner with schools, grocery stores, restaurants, consumer groups, and the Extension Service in this effort.
- The EHD should create an Alexandria Food Safety Advisory Council representing retail food service establishments, food manufacturers, state and federal food safety agencies (FDA, VDACS, VDH), food safety consultants, and consumers. The purpose of this group should be to help the EHD build partnerships to improve food safety in the community.
- To assess consumer knowledge and practice of food safety, a baseline survey of the food safety knowledge and practices of Alexandria residents should be conducted.

GOAL #5

By 2010, the EHD will develop culturally competent food safety information programs.

ACTIONS

- The EHD should create or obtain food safety materials in a variety of languages that reach out to the various ethnic communities within the city.
- The EHD should actively recruit bilingual staff.

F. Indoor Air Quality

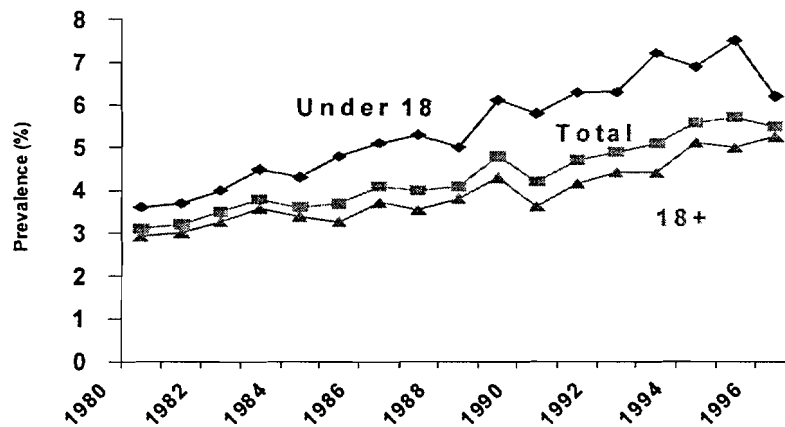
Background

Indoor air quality has a major impact on human health. Many air pollutants are tasteless, odorless, and colorless. As a result, people often do not know when they are being exposed to air contaminants that may impact their health.

In a recent study, tobacco was found to be the number one actual cause of death in the United States. Approximately 38,000 of the 440,000 annual deaths attributed to tobacco are caused by second-hand smoke. These include numerous deaths of non-smokers from lung cancer, respiratory illness, heart disease, and stroke. Tobacco use places a heavy economic and social burden on the community. Co-workers of smokers, children living in homes with smokers, and patrons and employees of bars and restaurants all are often exposed to second-hand tobacco smoke.

Asthma is a growing problem in the United States; the incidence rate in the U.S. doubled between 1982 and 2003. The economic cost of asthma in the United States is more than \$16 billion. Although the causes and environmental triggers for asthma are not well understood, air pollutants, including second-hand smoke, dust, mold, and animal dander, may trigger asthma attacks.

**6-15: Asthma Prevalence by Age
United States: 1980-1996**
(Source: CDC National Health Interview Study — 12-month prevalence)



Exposure to airborne toxic chemicals may cause serious health effects. Among these is carbon monoxide, produced by motor vehicles, faulty furnaces, and other combustion appliances in enclosed spaces. Also, volatile organic compounds (VOCs) used in industrial settings, dry cleaners, and nail salons may have unhealthy effects if used in areas without adequate ventilation. Some cleaning products, building materials, and carpeting may also create indoor air problems. Older buildings may contain asbestos.

Radon is the number two cause of lung cancer in the United States. This naturally-occurring, colorless, odorless, radioactive gas is found in the soil and seeps into homes through their foundations. In the United States, an estimated 21,000 people a year die from radon-induced lung cancers.

Exposure Factors

Every member of the community is exposed to airborne toxins, pathogens and allergens on a daily basis.

Contributing Factors and Behaviors

Smokers are at a much greater risk of lung disease than non-smokers.

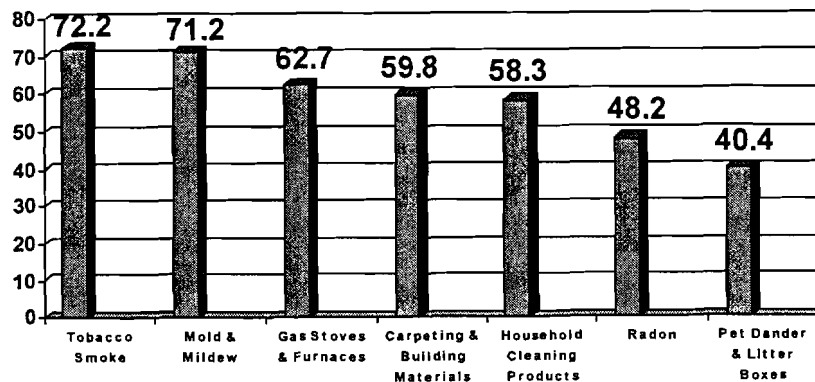
Most Affected Populations

- Blacks are 38.9% more likely to have asthma than whites.
- Women are 35.0% more likely to have asthma than men.
- Children are 14.3% more likely to have asthma than adults.
- Children of smokers are at greater risk of having lung disease.
- Employees working in bars and restaurants are at greater risk of lung disease.
- Those living on the lower floors of houses with high radon levels are at greater risk of lung cancer.
- Persons working with VOCs in poorly ventilated areas are at greater risk of lung disease.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive indoor air quality to be the eighth most important environmental health issue (of ten issues) in Alexandria. Of the fifty-three sub-areas that survey respondents were asked if they were concerned about, tobacco smoke ranked twentieth and mold and mildew ranked twenty-fifth. The remaining five sub-issues all ranked in the bottom third.

6-16: Percentage of Citizens Surveyed Concerned About Various Indoor Air Quality Issues



Summary of Local Conditions

In Virginia, 20.8% of adults smoke. More disturbing, however, is that 21.0% of students in grades 9-12 and 6.0% of students in grades 6-8 smoke. The American Lung Association estimates that 83 new cases of lung cancer are diagnosed in Alexandria each year. The same report estimates that there are 1,296 persons in Alexandria who have emphysema and 4,063 persons who have chronic bronchitis.

In 2003, 7.6% of Virginia's adults and 8.3% of Virginia's children had an active asthma condition. In the Washington, D.C, metropolitan area, 6.9% of adults had an active asthma condition. The American Lung Association estimates that 1,960 children and 7,870 adults in Alexandria suffer from asthma.

In 2003, there were 21 carbon monoxide incidents to which the Alexandria Fire Department responded.

Because of local geology, less than 15% of the homes in Alexandria have elevated radon levels (> 4 picocuries/liter). The highest radon levels are in the western part of the city.

Current Programs

The Alexandria Health Department sponsors the city's "Proud To Be Smoke-Free" program for restaurants. Approximately 120 restaurants currently participate in this program. Unfortunately, the grant for this program has now run out. The AHD's Environmental Health Division (EHD) also enforces the city's Smoking Ordinance.

The EHD investigates environmental conditions that may cause or trigger respiratory illnesses such as asthma, allergies, Legionnaire's disease, psittacosis, histoplasmosis, bronchitis, emphysema, and lung cancer. The EHD has staff trained in radon risk assessment and the assessment of indoor air quality problems and has a certified lead paint risk assessor. The industrial hygienist attached to the Virginia Department of Health's regional office assists in these investigations when requested to do so by AHD. The EHD responds to citizen complaints about unhealthy environmental conditions and toxic chemical exposures and provides information about mitigating these conditions.

The T&ES Environmental Quality Division (EQD) provides assistance to citizens with concerns about asbestos, odors, toxic fumes, and other indoor air quality issues. The EQD also coordinates the process for permitting asbestos abatement in the city with the Code Enforcement Division.

The Code Enforcement Division reviews the mechanical ventilation plans for new construction in the city and investigates complaints about ventilation or moisture in rental housing units.

The Fire Department responds to incidents involving hazardous materials or elevated levels of carbon monoxide.

The Virginia Department of Labor and Industry enforces regulations governing workplace safety and investigates worker accidents and injuries related to indoor air quality. The Alexandria City Public Schools have an indoor air quality program for city school buildings.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked indoor air quality as the most important environmental health issue in the city. Of particular concern were second-hand smoke and environmental triggers for asthma. The city's lack of an integrated, proactive respiratory health program made this a high priority for action. Current indoor air quality efforts in the city are a patchwork of low-priority programs that are primarily complaint-driven and do not focus on the critical issues of second-hand smoke and asthma.

The team felt that respiratory health should have the highest priority for action, since one in nine City residents suffers from lung disease. It is recommended that a Respiratory Health Program be created.

PROPOSED ACTION PLAN:

GOAL #1

Create a Respiratory Health Program in the City that focuses on issues related to second-hand smoke and asthma.

ACTIONS

- An environmental health educator should be hired to work on respiratory health issues in the city and to provide coordination between the various city agencies working on indoor air quality issues. This person's emphasis should be on the goals outlined in this action plan.
- The current indoor air quality programs in the city's various agencies (as described above) should be maintained.
- A public information campaign that will provide information to the public about respiratory health issues should be developed.
- The EHD, T&ES, and Code Enforcement should provide information to the public about the remediation and prevention of mold in buildings.
- The EHD, TES, and Code Enforcement web sites should contain information on mold and its remediation.
- The EHD should work with Code Enforcement to help evaluate the health implications of mold problems in rental housing and public buildings.
- The EHD should continue to provide information to the public about radon and lead paint.
- The Environmental Quality and Code Enforcement Divisions should continue to provide information about asbestos removal and remediation to contractors.
- The VDH regional industrial hygienist should help evaluate the health implications of exposure to indoor air contaminants.

GOAL #2

Increase the percentage of smoke-free restaurants to 50% and the percentage of smoke-free bars to 25% by 2010.

ACTIONS

- The AHD should actively recruit restaurants to join its “Proud to Be Smoke-Free” program.
- The AHD should actively promote its “Proud to Be Smoke-Free” program through the city website, brochures in hotels and public places, and emblems on the entry doors of participating restaurants.
- The AHD should seek a new source of funding for its “Proud to Be Smoke-Free” program.
- The city should support state legislation that will enable localities to adopt more stringent ordinances regarding smoking in bars and restaurants.

GOAL #3

Increase the proportion of worksites with formal policies that prohibit smoking or limit it to separately ventilated areas.

ACTIONS

- The AHD should develop a voluntary “Smoke-Free Workplace” recognition program.
- The EHD should continue active enforcement of the city’s Smoking Ordinance.
- The AHD should develop baseline data on the percentage of workplaces that are smoke-free.
- The city should support state legislation that will enable localities to adopt more stringent ordinances regarding smoking in the workplace.

GOAL #4

Reduce the percentage of Alexandria children who are regularly exposed to tobacco smoke at home to no more than 10% by 2010.

ACTIONS

- The AHD should work with schools and child care centers to provide parents of children with information on the effects of second-hand smoke.
- The AHD should increase smoking prevention efforts directed at junior high and high school students.
- The AHD should partner with non-profit organizations on their smoking cessation campaigns.

- The AHD should develop baseline data on the percentage of children in Alexandria exposed to tobacco smoke at home.

GOAL #5

Reduce the asthma incidence rate and the number of emergency department visits, hospitalizations and deaths due to asthma in Alexandria.

ACTIONS

- The AHD should work with child care centers and elementary schools to provide information to parents about asthma triggers (molds, dust mites, rodents, cockroaches, pet dander, and second-hand tobacco smoke exposure) and indoor air quality issues affecting children.
- The AHD should work with the hospital and local physicians to identify persons in the city with respiratory problems and provide them with information about improving air quality in their homes.
- The AHD should develop baseline data on the incidence rate of asthma among children and adults.
- The AHD should develop baseline epidemiological data on the number of emergency department visits, hospitalizations and deaths due to asthma in Alexandria.
- The AHD should partner with Code Enforcement to encourage better ventilation in public places.

GOAL #6

Increase the proportion of public and private schools and child care centers with respiratory health programs.

ACTIONS

- The Health Department and other city agencies should work with Alexandria City Public Schools by providing technical assistance as needed to implement a respiratory health program using the EPA's "IAQ Tools for Schools" and other tools.
- The Health Department and other city agencies should work with private schools and day care centers to initiate respiratory health programs using the EPA's "IAQ Tools for Schools" and other tools.

G. Noise

Scope

This profile addresses the issue of exposure to noise pollution in Alexandria. It identifies the most common sources of community noise such as traffic, construction, aircraft, trains, Metro, and lawn and garden equipment. Workplace noise exposure was not emphasized in this study since not a single survey respondent identified workplace noise as a problem and the City's ability to regulate workplace noise is very limited. Specifically, workplace noise is regulated by the Virginia Department of Labor and Industry

Exposure Factors

Hearing loss is related to the sound level, the person's proximity to the sound source, and the duration of the exposure. Persons exposed to sudden, traumatic noise impulses and persons exposed to long periods of high levels of noise are most at risk. Every member of the community is exposed to environmental noise on a daily basis. Those living or working near aircraft flight paths, major highways, railroad tracks, or industrial areas are more likely to be exposed to higher levels of environmental noise. However, exposure to the environmental noise levels typically found in the City are more likely to impact one's quality of life than actually cause any hearing loss.

Contributing Factors and Behaviors

Most of the noise complaints reported to the City Police are related to loud parties or sound systems in cars or apartments. The Alexandria Division of Environmental Quality handles complaints related to construction noise or noise from air conditioning equipment. These probably constitute more of a nuisance than a health hazard to all but those inside the offending residence or car. Those persons who listen to really loud music for prolonged periods of time are at greater risk of hearing loss.

Those who perform noisy jobs without wearing hearing protection put themselves at greater risk of hearing loss. Examples of such situations are lawn and yard maintenance workers, street vacuum/sweeper operators, and construction workers. Close proximity of residences or workspaces to active construction sites is another important factor and is often the biggest source of complaints to the Department of Transportation and Environmental Services (TES).

Most Affected Populations

Work-related noise is probably the greatest cause of hearing loss. Persons working in construction (carpenters and plumbers), auto body shops, lawn care (operating weed trimmers or lawnmowers) and in some noisy industrial settings are at greatest risk. Because of the predominance of men in these occupations, men of working age (age 20 to 60) are at greater risk as a group for noise exposures leading to hearing loss. However, only 10.6% of the Alexandria work force is employed in construction, maintenance, production, transportation, or material moving occupations.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive noise as less of a concern than many other environmental health issues. Only 21.5% of the survey respondents listed noise as one of their top five most important environmental issues. Traffic noise was the top sub-area of concern with about two-thirds of respondents listing it as a concern. However, this sub-area ranked thirty-second of fifty-three sub-areas of concern.

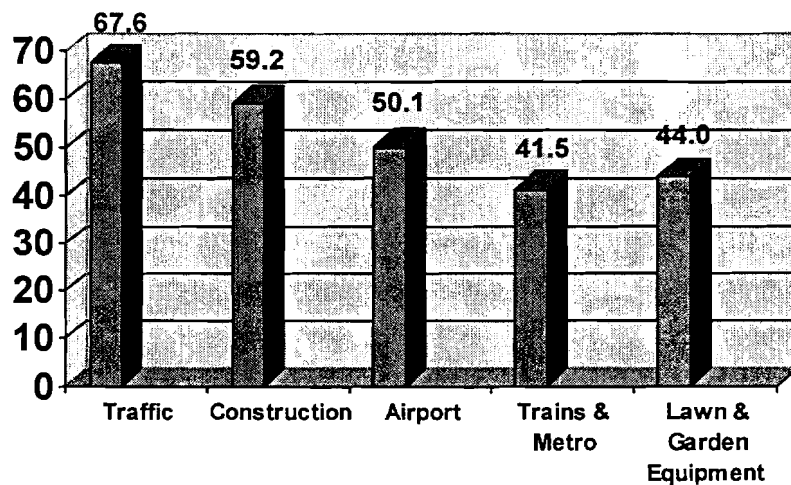
Surprisingly, respondents from zip code 22302 (Braddock/King east of Quaker Lane), a primarily residential area with no interstates, registered the most concern about traffic noise. Respondents from zip code areas adjacent to I-395 and I-495 (22304-Eisenhower/Duke St, 22311-North Beauregard, and 22312-South Beauregard) were among those who indicated the least concern about traffic noise. Respondents mentioned loud car radios, honking horns, car alarms, the bus barn, and motorcycles as specific issues.

Concern about construction noise was lowest in zip code 22305 (Arlandria/Potomac Yards) and fairly uniform throughout the rest of the city. Predictably, zip codes 22301 (Rosemont/Del Ray) and 22314 (Old Town) had more concern about airport noise than the rest of the city.

Very surprisingly, the respondents from the zip code areas with railroad and Metro tracks (22301-Rosemont/Del Ray, 22304-Eisenhower/Duke St, 22305-Arlandria/Potomac Yards, and 22314-Old Town) all indicated less concern about noise from trains and Metro than respondents from areas without train or Metro tracks (22311-North Beauregard, and 22312-South Beauregard).

The North Beauregard area (zip code 22311) registered the greatest concern about noise from lawn and garden equipment.

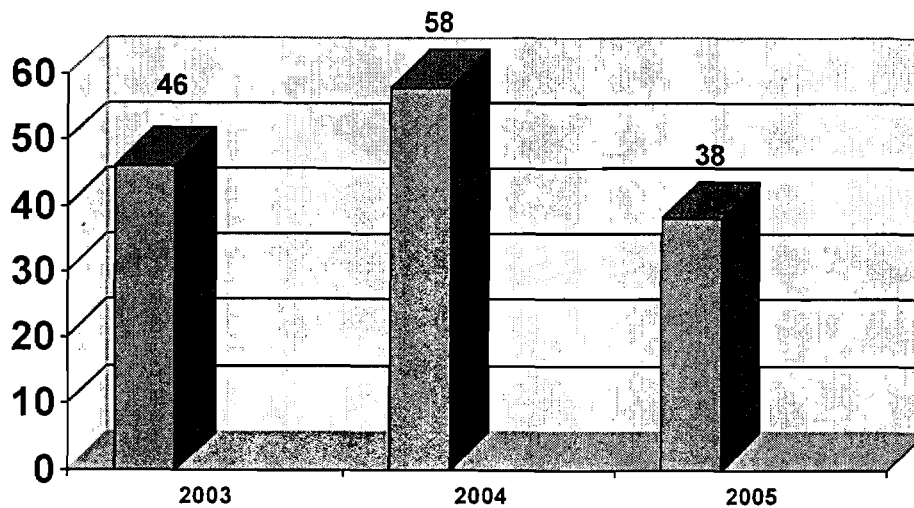
6-17: Percentage of Citizens Surveyed Who Were Concerned About Various Noise Issues



Summary of Local Conditions and Proposed Noise Indicators

City staff investigate every noise complaint they receive. Those complaints are enumerated in the graph below.

6-18: Noise Complaints Received by Division of Environmental Quality, T&ES**



**Complaints received by and responded to by Police Department are not included in this number

Data Gaps

- Data on noise complaints received by the Police Department
- Data from Workmen's Compensation claims for hearing loss

Current Programs and Public Health Protection Factors

The City's Noise Pollution Control Program consists of the following broad elements:

- Incorporating US Department of Housing and Urban Development (HUD) recommended guidelines in the construction of new residential and commercial developments to meet the indoor noise standards.
- The operation of a noise complaint telephone number to receive complaints from the citizens and to follow up on their concerns. The Alexandria Police Department and the Environmental Quality Division investigate every noise complaint they receive.
- Assessing the compliance and non-compliance of noise sources according to the City's Noise Code and taking enforcement actions where warranted.

City actions regarding specific noise abatement issues include:

Construction: Construction noise is regulated by hours of operation. The permitted hours are Monday through Friday from 7 AM to 6 PM and Saturday from 9 AM to 6 PM. The use of pile drivers is further restricted to Monday through Friday from 9 AM to 6 PM and Saturday from 10 AM to 4 PM. Construction is also prohibited on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

Train Noise: The City's ability to regulate train noise is severely limited due to interstate commerce issues and preemption by the Federal Railroad Administration. Trains are required to be operated consistent with Federal regulations. However, the City does work closely with railroad companies (Norfolk Southern and CSX) when they operate and service industrial facilities in the City. Through cooperation and coordination, the City has been able to achieve significant relief by limiting the hours during which some deliveries are made.

Traffic Noise (Truck Braking Noise and Motorcycle Noise): The City has signs posted on major truck routes that instruct drivers not to use "Jake Brakes." This reduces the traffic noise where these routes go through residential developments. The City is developing a public education and outreach effort targeting motorcycle operators that will involve Alexandria Police Department motorcycle cops contacting motorcycle operators visiting Old Town Alexandria and urging them to operate their vehicles in a manner that is considerate of the neighbors by reducing unnecessary noise such as revving their engines or excessive acceleration. The City Code and state law requires that vehicles operate with a functioning muffler system.

Lawn and Garden Equipment: The use of lawn and garden equipment including leaf blowers is regulated by the hours of operation in the City's Noise Control Code. The permitted hours are Monday to Friday from 7 am to 9 pm, and Saturday and Sundays from 9 am to 9 pm. Historically, the City receives one or two noise complaints regarding leaf blower noise a year. City staff encourages people to use rakes instead of gas powered leaf blowers. Public education and outreach regarding the use of leaf blowers will be expanded through the City's web page.

Aircraft Noise: Aircraft noise is not regulated under the City's Noise Control Code, but is regulated at the federal level by the Federal Aviation Administration (FAA). However, to address noise issues related to aircraft operations the City participates in the Metropolitan Washington Council of Government's Committee on Noise Abatement and Aviation at National and Dulles Airports (CONAANDA). This committee has a long history of organizing regional forums to address airport noise and aviation policy. It is the primary body for aircraft noise issues and it provides recommendations to the airport operators.

Over the years, because of the collective work of multiple jurisdictions and the cooperation of the Metropolitan Washington Airport Authority and other regulating agencies, National Airport has become one of the most stringently noise-controlled airports in the United States. Under the Airport Authority's regulations, aircraft may only be operated after 10 pm, if the noise level from the aircraft meets the Airport's strict noise standards, which are designed to minimize sleep interference. The City is also participating in a Part 150 study for National Airport, a study specifically examining solutions to noise along the Potomac corridor.

Workplace Noise: The Virginia Department of Labor and Industry enforces noise level standards in the workplace under Virginia's OSHA regulations. City staff provides information regarding noise exposure and also refers complaints regarding occupational noise to VA OSHA.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked noise among the least important environmental health issues in the City. Accordingly, the assessment team identified this issue as a low priority for additional action beyond what the City is already doing.

Proposed Standards and Goals

The number of noise complaints received by the City is a good measure of the noise issues in the general community although most of the complaints are more related to quality of life issues rather than a health hazard.

Data from Workmen's Compensation claims for hearing loss could be a measure of workplace related noise problems. It should be understood that this data may significantly underreport hearing loss, but may be useful in identifying trends in Alexandria workplaces.

PROPOSED ACTION PLAN:

GOAL

Expand the City's public education and outreach efforts on noise issues

ACTIONS

- Develop a web page dedicated to noise issues with the goal of increasing public awareness of the issue and providing information and resources that will allow and encourage the general public to take proactive measures to reduce environmental noise.
- Require that, prior to the issuance of a building permit, contractors and other permittees sign an affidavit that construction work will be performed in compliance with the City's Noise Code and within the permitted hours of construction.
- For very large construction projects and for projects that have sensitive receptors nearby, the City, through the Special Use Permit process, will require that extensive noise mitigation plans be developed prior to construction. These plans (as in the past) will typically include evaluating appropriate construction methods and equipment, selection of haul routes, employing noise inspectors to monitor and receive complaints, and, at times, also restrictions on the hours of construction.

H. Outdoor Air Quality

Scope

This profile addresses the interrelationship between elevated air pollution concentrations and human health problems. It addresses the various sources of air pollutants impacting the City, e.g., cars, airplanes, industrial and commercial facilities, etc., and the current and future control strategies employed by the City of Alexandria (City) and other governmental agencies to reduce air pollution.

Background

The Clean Air Act (CAA) of 1970 and the 1990 Amendments were enacted to protect public health, preserve property, and protect the natural environment. As prescribed by the Act, the Environmental Protection Agency (EPA) has the authority to regulate air emissions by establishing National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, regulating hazardous and toxic air pollutants, and requiring pollution control equipment to be installed for various industries.

In many cases EPA delegates responsibilities under the CAA to State governments. In Virginia this responsibility is delegated to the Virginia Department of Environmental Quality. Facilities regulated under the CAA include "stationary sources" such as asphalt plants, power plants, and municipal and commercial solid waste combustion facilities, as well as "mobile sources" such as cars, trucks, and buses.

The City of Alexandria is one of only a few local governments in Virginia that has a local air pollution control program and receives grants from the EPA that are passed through the Virginia Department of Environmental Quality (VADEQ) to the City. The City's program primarily consists of investigating air pollution and odor complaints, inspecting both large and small air pollution sources, and maintaining and operating an ambient air monitoring station.

The City's air monitoring program includes monitoring ambient concentrations of carbon monoxide (CO), sulfur dioxide (SO₂), ozone (O₃), nitrogen dioxide (NO₂), and particulate matter less than 10 micron (PM₁₀). The City is meeting the standards for all regulated pollutants except for O₃ and particulate matter less than 2.5 micron (PM_{2.5}). The City participates in regional planning efforts to develop and implement strategies to achieve attainment status for these pollutants.

Exposure Factors

Air pollutants such as CO, oxides of nitrogen (NO_x), PM, and SO₂ can cause birth defects, long-term injury to the lungs and breathing passages, and brain and nerve damage. Exposure to elevated levels of these pollutants for a prolonged period of time can lead to irreversible health ailments such as cancer and even death.

Air pollution can also damage the surrounding ecosystems by impairing water bodies.

Additionally, man-made structures i.e., buildings, monuments, and statues are eroded at an increased rate by acid rain. This causes an undue economic hardship on local businesses and other entities.

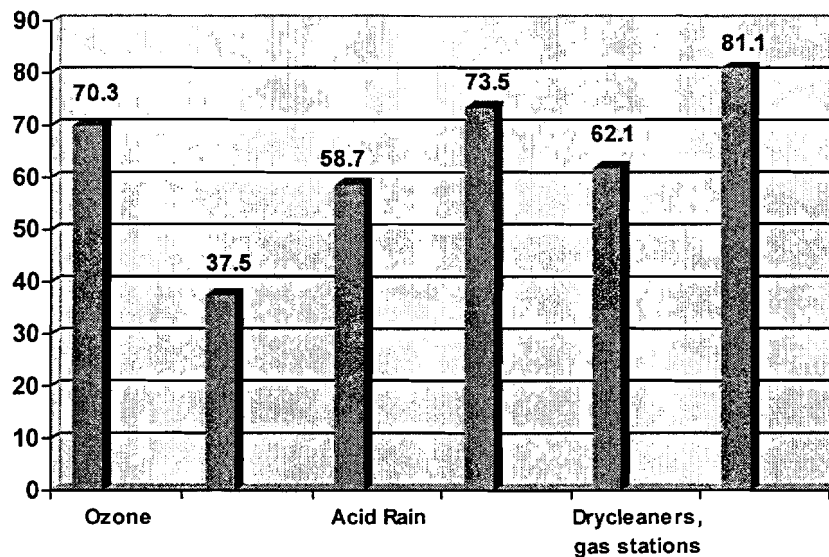
Most Affected Populations

The very young, the elderly, persons with existing heart or lung diseases, and asthmatics are most susceptible when exposed to elevated levels of air pollution and are most likely to experience an increased risk of admission to hospitals or emergency rooms.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive air quality as the second most important environmental health issue of the ten major issues studied. Of the six ambient air quality categories presented below, Alexandrians greatest concern is emissions from mobile sources such as cars, buses, and airplanes. This concern is validated by national statistics, which indicate that two-thirds of CO emissions and nearly half of ozone-forming emissions originate from mobile sources.

6-19: Percentage of Citizens Surveyed Who Were Concerned About Various Outdoor Air Quality Issues



National Indicators and Standards

Healthy People 2010 Air Quality Objectives

Healthy People 2010 discusses air quality issues relevant to local public health agencies.

Their objectives focus on reducing the number of persons exposed to unhealthy air conditions through the use pollution prevention strategies and technologies. The following air quality objectives were presented in the *Healthy People 2010* publication:

- o Reduce the proportion of persons exposed to air that does not meet the U.S. Environmental Protection Agency's health-based standards for clean air.
- o Increase the use of alternative modes of transportation to reduce motor vehicle emissions and improve the Nation's air quality.
- o Improve the Nation's air quality by increasing the use of cleaner alternative fuels.
- o Reduce air toxic emissions to decrease the risk of adverse health effects caused by airborne toxics.

National Ambient Air Quality Standards

The EPA classified the Metropolitan Washington, DC region (including Alexandria) as a serious non-attainment area for the 1-hour ozone standard. Due to the emergence of new scientific data, EPA enacted the 8-hour ozone standard and designated Alexandria and the DC region as a moderate non-attainment area. In June of 2005, EPA repealed the 1-hour standard; however, areas subject to the standard must continue the control strategies implemented under the 1-hour designation. Examples of those control strategies are the enactment of the Autobody Refinishing Rule, the Consumer Product Rule, Stage II Vapor Recovery Program, and the Non-Gasoline Engines Rule.

In 1997, the EPA established a particulate matter standard for particles with an aerodynamic diameter of less than 2.5 microns. On April 5, 2005, specific counties and cities within the Metropolitan Washington DC region (including Alexandria) were designated as non-attainment for the PM_{2.5} standard. In addition, EPA is currently reevaluating the PM_{2.5} standard and is considering lowering it.

The PM_{2.5} monitoring data indicate that the region is not meeting the annual standard, but remains below the 24-hour standard. Specific measures to address the area's non-attainment designation will be outlined in the 2008 implementation plan. Projected control strategies involve additional power plant controls, small boiler controls, voluntary airport emission reductions, and the transportation corridor strategy. The Metropolitan area will have until 2010 to meet the goals expressed in the plan and to achieve attainment status.

Summary of Local Conditions and Proposed Outdoor Air Indicators

The City investigates all complaints concerning alleged air quality matters. The City's Division of Environmental Quality (DEQ) internal policy requires personnel to respond to all complaints within 24 hours and attempt to resolve them within 10 days. DEQ has been successful in this approach; from FY2003 to FY2005, initial response to all air complaints did occur within 24 hours of receipt.

**6-20: Number of Air Complaints Received and
Air Pollution Inspections Performed by City DEQ**

	FY2003	FY2004	FY2005
Air complaints received in relation to fugitive dust, power plant emissions, smoke from fireplaces, odor, etc.	26	19	22
Number of air pollution sources inspected	15	13	13

Data Gaps

- There currently is not a PM_{2.5} monitor located within the City limits. However, there is one located just north of the City in Arlington County and one located south of the City in Fairfax County.

Current Programs and Public Health Protection Factors

The following highlights the ongoing outdoor air initiatives the City is currently spearheading or participating in with citizens and governmental entities:

Air Inspection Program: City staff currently inspect major and minor air pollution sources within the City. These sources are evaluated on an annual, semi-annual, or tri-annual basis to ensure compliance with State air permits and the City's SUPs.

Ambient Air Monitoring Program: The City maintains and operates an Ambient Air Monitoring station at 517 N. St. Asaph Street. The station monitors local concentrations of O₃, CO, SO₂, NO₂, and PM₁₀.

Air Quality Action Day Program: The City participates in a regional outreach program designed to encourage citizens and business to alter their behavior and reduce air pollution when the air quality forecast is for unhealthy air conditions (i.e., Code Red Days). The City's Program involves notifying City employees by email when MWCOG issues Code Red alerts, displaying an Air Quality Action Day Color Chart in the lobby of City Hall and a "code red" flag is flown in the Market Square area of City Hall.

Clean Air Partners: The City is currently a member of the clean air partner coalition established by MWCOG and the Baltimore Metropolitan Council (BMC). This organization is a public-private partnership which promotes easy and effective voluntary actions that individuals and employers can take to reduce the production of and exposure to air pollution.

Metropolitan Washington Air Quality Committee: The City participates in the Metropolitan Washington Air Quality Committee, which is the regional planning organization respon-

sible for the development of State Implementation Plans to attain the 8-hour ozone and PM_{2.5} NAAQS.

Phase out of the Mirant Power Plant and the Mirant Community Monitoring Group: In June of 2004, City Council adopted a policy that the Mirant Plant should eventually be shut-down and that prior to closing, the plant should be operated in as clean manner as possible. The City also established the Mirant Community Monitoring Group to track and receive progress reports on a variety of issues involving Mirant, including tracking regulatory issues, tracking compliance with the consent decree and consent order, and providing feedback to the City staff and the stakeholder community.

Hybrid Vehicle Procurement Program: The City has begun purchasing hybrid vehicles to reduce mobile emissions. The City currently has 10 Toyota Prius and two Ford Escape in its fleet. One additional Ford Escape will be purchased in 2006.

Transportation Management Plan: In May of 1987, the City Council passed the Transportation Management Plan (TMP) requiring developers to reduce the Single Occupant Vehicle (SOV) traffic associated with their projects. The City enforces the goals of this plan through the issuance of special use permits (SUP).

Transit Incentive Program: The City of Alexandria established this program for City employees as part of an effort to reduce air emissions from mobile sources, mitigate traffic congestion, and reduce on-street parking. The program encourages transit use and vanpooling by providing up to \$75 per month (plus an addition \$30 pre-tax option) for those using bus, rail, and qualified vanpool transportation.

DASH Projects: Dash has ordered 14 new clean diesel buses to replace older, high-polluting buses. The entire bus fleet will eventually operate on ultra-low-sulfur fuel and each will be equipped with Continuously Regenerating Technology (CRT) exhaust filters to control particulate matter emissions.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked outdoor air as one of the top eleven environmental health issues in the City. This ranking corresponds with the survey results in which Alexandrians designated outdoor air as their second most important environment health issue.

Proposed Standards and Goals

Local air issues related to a specific source are typically regulated through the City's SUP process. Examples of this process involves the issuance of SUPs with conditions insuring compliance with NAAQS and addressing local impacts such as odorous emissions, smoke/opacity and fugitive emissions.

PROPOSED ACTION PLAN:

GOAL

Reduce the number of persons exposed to harmful levels of air pollution by meeting the NAAQS for ozone and PM_{2.5} by 2010 consistent with the Clean Air Act requirements.

ACTIONS

- Continue to support the State Implementation Plan for attaining NAAQS for ozone and PM_{2.5}.
- Install a PM₁₀ monitor in the Cameron Station townhouse area to better understand and characterize emissions from adjacent industrial facilities.
- Seek participation in the initial and final New Source Review permitting process for facilities located within the City.
- Continue to develop additional public outreach and educational programs to encourage other businesses and organizations to participate in the Air Quality Action Program.
- Redesign website(s) to convey additional air quality information to residents.
- Continue efforts to achieve the closure of the Mirant Power Plant, and until then have the plant operate as cleanly as possible.
- Continue developing a Transportation Master Plan, which will include trying to reduce/minimize single occupant trips and vehicle miles traveled within the City, encourage the use of mass transit, improve pedestrian access, and improve the trail system.
- Encourage sustainable development in the City through land use planning, such as higher density near metro stations, and incorporating “green building” technologies, such as “green” roofs and the use of energy efficient building materials and appliances.

I. Recreational Safety

Background

Regular exercise is a key component in promoting cardiovascular health and in preventing and controlling heart disease, stroke, diabetes, and obesity. The availability of safe recreational facilities helps enable people to get the regular exercise they need.

More than 3.5 million children ages 14 and under suffer from sports- and recreation-related injuries each year. Injuries associated with participation in sports and recreational activities account for 21% of all traumatic brain injuries among children in the U.S.

More sports-related non-fatal injuries are treated in hospital emergency departments than any other type of unintentional injury. Approximately 4.3 million sports- and recreation-related injuries were treated in hospital emergency departments during July 2000-June 2001. This represents 15.7% of all non-fatal unintentional injuries, across all ages and genders. Among children aged 10-14 years, 46.3% of all non-fatal unintentional injury emergency department (ED) visits were a result of a sports- or recreation-related injury. Although this percentage was lower among adolescents 15-19 years old (31.4%), sports- and recreation-related injuries in this age group still represented nearly one-third of all ED visits.

Playground injuries are the leading cause of injury to children in childcare and to children ages 5 to 14 in schools. In 2003, playground equipment-related injuries in the U.S. caused more than 208,000 children, ages 14 and under, to require emergency room treatment. Of those, almost 75 percent were between the ages of 5 and 14. Most playground-related injuries occur when children fall to the ground (70 percent). Children under the age of ten are most likely to be injured by falls from playground equipment. In Virginia in 1993, falls from playground equipment accounted for about ten percent of injury hospitalizations for 1-4 year olds and thirty percent of injury hospitalizations for 5-9 year olds. Children ages 4 and under tend to suffer injuries to the face and head from playground-related injuries, while older children are more likely to injure their arms or hands.

In 1997, drownings accounted for over 4,000 deaths in the United States. Drowning is the second leading cause of injury-related death for children and adolescents aged 1 to 19 years, accounting for 1,502 deaths in 1995. Most deaths involving diving occur among persons aged 15 to 39 years, with the largest proportion (14.8 percent) occurring among persons aged 30 to 39 years. Many diving-related incidents result in spinal cord injury. Backyard swimming pools and spas represent the greatest risk to preschoolers, particularly those 18 to 30 months of age. Of the 600 annual drowning deaths of children from birth to 5 years of age, more than 300 occur in residential swimming pools. Annually, approximately 2,300 nonfatal injuries sustained in residential swimming pools occur in this age group.

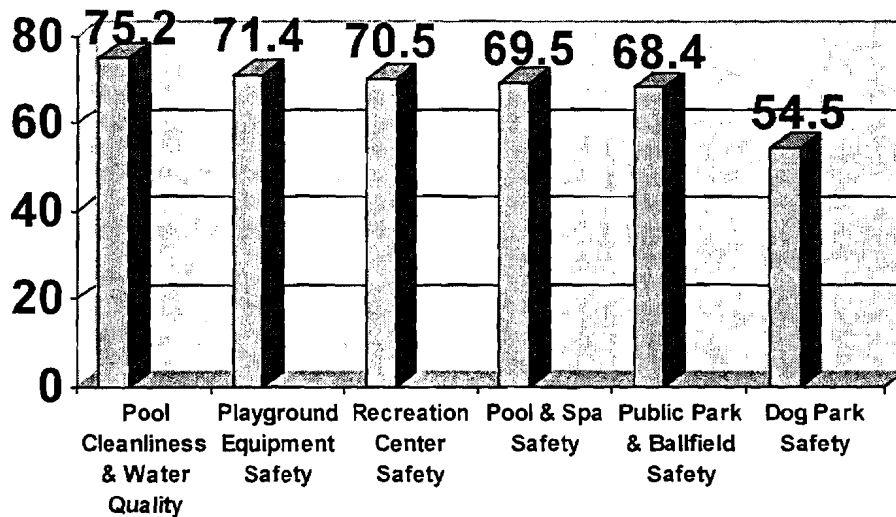
Of all drowning deaths, males are four and a half times more likely to drown than females. Children ages four and younger are almost twice as likely to drown as other people. African Americans are about 50% more likely to drown than whites.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive recreational safety to be the least important environmental health issue facing the city. Only 18.9% of those surveyed ranked recreational safety as one of the top five environmental health issues.

Of the fifty-three sub-areas of concern mentioned in the survey, pool cleanliness and water quality ranked fourteenth, with 75.2% of respondents indicating they were concerned about this issue. Playground equipment safety ranked twenty-fourth, with 71.4% of respondents indicating they were concerned about this issue. Recreation center safety ranked twenty-seventh, with 70.5% of respondents indicating they were concerned about this issue, and pool and spa safety ranked twenty-ninth, with 69.5% of respondents indicating their concern. Park and ball field safety ranked thirty-first (68.4%) and dog park safety ranked forty-sixth (54.5%).

6-21: Percentage of Citizens Surveyed Who Were Concerned About Various Recreational Safety Issues



Summary of Local Conditions and Proposed Recreational Safety Indicators

The AHD's Environmental Health Division investigates every water-borne illness and drowning reported in the city at a public pool or spa. In the last three years, there have been no outbreaks of waterborne illness and only one drowning in the city.

There are approximately twenty year-round pools and spas in the city. These are inspected every three weeks by the EHD. There are approximately 120 outdoor pools and spas in the city that are only open during the summertime, which are inspected every two weeks by EHD staff.

When an inspection reveals major safety hazards, poor water quality, or the lack of certified lifeguards, the pool or spa in question is closed until these violations can be corrected. In 2005, there were 39 temporary pool closures by the EHD for major health or safety violations. The EHD also investigates every complaint from the public about safety or sanitary conditions at these public pools or spas. There have been only 21 such complaints in the last four years.

Data Gaps

- Data on playground injuries in the City of Alexandria
- Data on sports injuries in the City of Alexandria

Current Programs and Public Health Protection Factors

The EHD has an active pool safety program. Every public pool in the city must have a certified pool operator and all lifeguards must be certified in CPR and lifesaving. Pools are required to be maintained so as to provide a safe swimming environment and must provide continuous disinfection and filtration of the pool water. There are approximately twenty year-round pools and spas in the city. These are inspected every three weeks by the EHD. There are approximately 120 outdoor pools and spas in the city that are only open during the summer-time, which are inspected every two weeks by EHD staff.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked recreational safety ninth out of the eleven areas of concern considered.

PROPOSED ACTION PLAN:

GOAL

Develop good data on recreation-related injuries in the city so that the next Community Environmental Health Assessment can consider what steps may need to be taken by the community to prevent these types of injuries.

ACTIONS

- The Health Department will attempt to locate sources for data on playground injuries.
- The Health Department will attempt to locate sources for data on sports injuries.
- The Health Department will attempt to find a student volunteer to assess the safety of playgrounds and playground equipment at schools, day care centers and parks in the City.

J. Solid Waste

Background

According to the EPA, U.S. residents, businesses, and institutions produced more than 229 million tons of solid waste in 2001, approximately 4.4 pounds of waste per person per day, up from 2.7 pounds per person per day in 1960. Currently, in the United States, 30 percent of solid waste is recovered and recycled or composted, 15 percent is burned at combustion facilities, and the remaining 56 percent is disposed of in landfills.

Recycling diverted 68 million tons of material away from landfills and incinerators in 2001, up from 34 million tons in 1990. By 1999, more than 9,000 curbside collection programs served roughly half of the American population.

Exposure Factors

Every member of the community is potentially affected by solid waste issues.

Contributing Factors and Behaviors

Persons who jog or are otherwise engaged in outdoor recreation are more likely to be injured by trash or litter, such as broken glass or jagged metal objects.

Most Affected Populations

- Refuse collectors may be injured through inappropriate disposal of hazardous waste.
- Inappropriate disposal of hazardous or toxic wastes such as household cleaners or solvents is more likely to impact children.

Community Survey Results

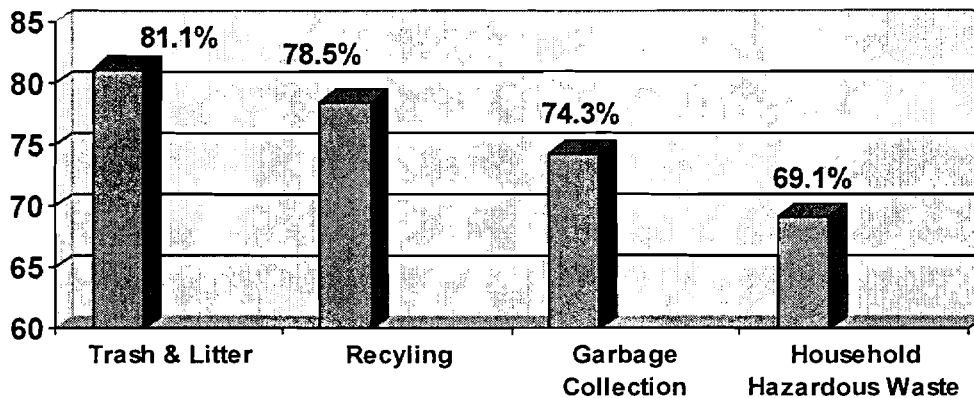
The Community Environmental Health Survey indicated that persons living in Alexandria perceive solid waste issues to be the seventh most important major area of concern of the ten areas on the survey. Trash and litter was the seventh most commonly identified sub-area of concern of the fifty-three sub-areas on the survey. Recycling was tenth and garbage collection was eighteenth.

National Indicators

The *Healthy People 2010* objectives include:

- Objective 8-15: Increase recycling of municipal waste
- Target: 38 percent
- Baseline: 27 percent of total municipal solid waste generated in the U.S. was recycled in 1996 (includes composting)

6-22: Percentage of Citizens Surveyed Who Were Concerned About Various Solid Waste Issues



Summary of Local Conditions

Recycling percentages in the city have fallen over the last several years, partly because sludge from the wastewater treatment plant is land applied and is waste that can no longer be considered recycled. In 2004, the city adopted a new Solid Waste Management Plan, the goal of which is to recycle 35% of the city's solid waste by 2009.

6-23: Overall Percentage of City's Solid Waste Recycled

	2001	2002	2003	2004
Overall Percentage of City's Solid Waste Recycled	31.4%	28.0%	26.3%	20.5%

Data Gaps

- Number of solid waste complaints investigated by the Code Enforcement and Solid Waste Divisions.

Current Programs and Public Health Protection Factors

The Code Enforcement Division investigates citizen complaints about solid waste disposal and takes action as necessary to resolve these complaints.

The Solid Waste Division of the Department of Transportation and Environmental Services (T&ES) provides residential garbage pickup for approximately 19,000 private residences in the city. Garbage pickup at many apartment buildings and condominiums is provided by private contractors. Commercial establishments in the city are required to contract with their own garbage haulers. Almost all of the garbage picked up in the city is taken to the waste-to-energy facility on Eisenhower Avenue and burned to produce electricity.

The Solid Waste Division of T&ES has an active recycling program and has a number of recycling drop-off points around the city. Curbside recycling pickup for all city residents is provided by private contractors. A proposed ordinance now under consideration will require commercial establishments to separate their recyclable waste from their garbage. The city also provides a free drop-off service for household hazardous wastes every Monday at their Wheeler Avenue facility.

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked solid waste as the eighth most important area of concern of the eleven environment health issues it ranked.

PROPOSED ACTION PLAN:

GOAL #1

Develop good data on solid waste complaints in the city so that the next Community Environmental Health Assessment can consider what steps may need to be taken by the community with respect to solid waste issues that affect health.

ACTIONS

- Develop data on the number and type of solid waste complaints investigated by the Code Enforcement and Solid Waste Divisions.

GOAL #2

Increase the percentage of waste recycled in order to meet the target in the Solid Waste Management Plan.

ACTIONS

- Recycle 35% of the city's solid waste by 2009.

K. Surface Water Quality

Scope

This profile addresses the various sources of water pollution in the City and their impact on public health, and describes the numerous programs being developed and implemented to improve the City's water quality. Many of these programs are required under various state and federal laws and regulations. In many cases, Alexandria is going above and beyond the minimum regulatory requirements. Water pollution comes from both point (for example, industrial discharge piles) and non-point (ex., parking lot runoff) sources. Biological and chemical pollution impacts aquatic ecosystems and reduces the value of surface waters (streams, lake and estuaries) for fishing, swimming and other recreational activities.

Background

The Water Quality Act of 1972 placed national attention on "end of pipe" solutions to water quality problems. By the late 1980s, water quality was still insufficient to ensure fishable and swimmable waters. It became clear that the fishing "take" from the Chesapeake Bay was declining, but the exact cause was unknown. In 1988, the Virginia General Assembly, recognizing that action had to be taken to preserve the Bay for future generations, enacted the Chesapeake Bay Preservation Act.

By the early 1990s, the focus of water actions shifted to improving stormwater quality and tempering flows. Virginia has been on the forefront of this effort, and Alexandria has been leading the way. In 1992, the City of Alexandria adopted a Chesapeake Bay Preservation Ordinance (CBPO), also known as the City's Environmental Management Ordinance, to manage land development in a way that was more harmonious with the environment. The waters of the Chesapeake Bay and its tributaries have been further protected by these regulations. The City is serious about protecting its streams and improving the water quality of the Chesapeake Bay through improved design and the use of best management practices (BMPs).

Exposure Factors

Water exposure occurs via both ingestion and skin contact. Ingestion of contaminated water, through drinking water or possible accidental ingestion while swimming or inhaling mist from the air, can lead to disease, e.g., dysentery, viral hepatitis, and respiratory illness. Contact illnesses include "swimmer's ear," rashes or other contact dermatitis (staph infections), leptospirosis, and many more. Also important are conditions or syndromes caused by the concentration of toxins in fish tissues, such as methylmercury, dioxins, PCB's, etc., which manifest themselves after repeated fish consumption.

Contributing Factors and Behaviors

- Point sources of pollution are those that can be tracked to a specific point or outfall. Some examples of point sources include National Pollutant Discharge Elimination System (NPDES) discharges (largely wastewater discharges), leaking sanitary sewer lines, combined

sewer overflows (CSOs), septic systems, and underground and above-ground storage tanks. Pathogens and hydrocarbons found in gasoline, benzene, kerosene, fuel oil, and used motor oil are pollutants of concern in urban waters.

- Non-point source pollution is pollution that originates from widespread, diverse sources that cannot be traced to a specific point or location. Some examples of non-point sources include atmospheric deposition; leaking automobiles; wildlife, waterfowl and pet waste; and misapplied lawn fertilizers and pesticides. Pollutants of concern are nutrients (nitrogen and phosphorous), heavy metals, pathogens, and toxics. Typically, the “sources” of many of these pollutants are impervious surfaces, such as roads, parking lots, etc., that accumulate these pollutants. During rain events, these pollutants are then carried in stormwater runoff to storm drains, which eventually lead to our streams.

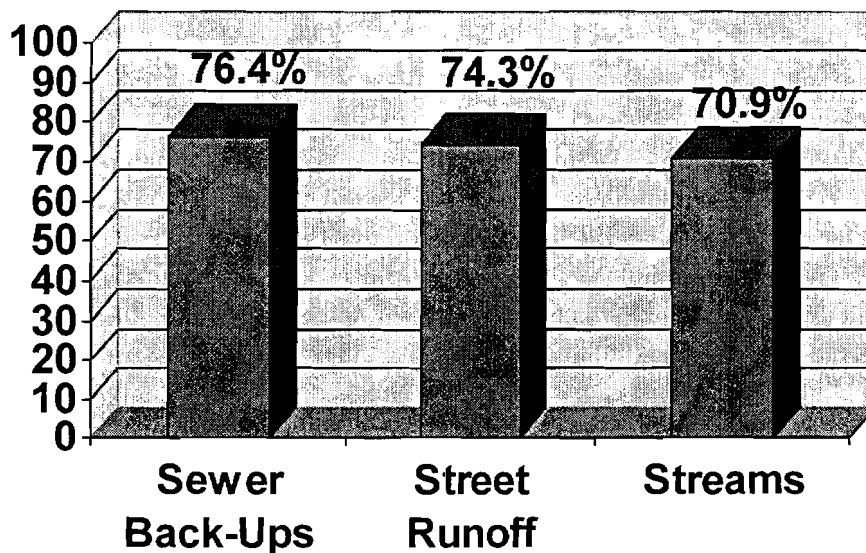
Most Affected Populations

Water pollution affects us all. The majority of our water bodies have no fishing or swimming restrictions. However, many people recreate on these waterways and some fish in these waters and eat the fish that they catch. These groups are most affected by urban water pollution.

Community Survey Results

The Community Environmental Health Survey indicated that persons living in Alexandria perceive water quality as one of the top issues of concern (76.6%). Drinking water, street runoff, stream conditions, and sewer back-ups are foremost in their minds. Other issues of concern include lawn fertilizer runoff impacts and pollutants in the Potomac River.

6-24: Percentage of Citizens Surveyed Who Were Concerned About Various Water Quality Issues



National Indicators and Standards

Healthy People 2010 Drinking Water Objectives

Healthy People 2010 includes:

8-8 (Developmental) Increase the proportion of assessed rivers, lakes, and estuaries that are safe for fishing and recreational purposes.

Summary of Local Conditions and Proposed Surface Water Quality Indicators

Water quality standards are established under the Federal Clean Water Act (CWA). In Virginia, the Virginia Department of Environmental Quality (VADEQ) administers these standards. All state waters are expected to be maintained to support recreational use and the propagation and growth of all aquatic life reasonably expected to inhabit them. These are known as the CWA “swimmable and fishable goals.”

The parameters used to measure these goals include dissolved oxygen content (DO), pH (alkalinity/ acidity), maximum temperature, and fecal coliform bacteria levels. Standards for these parameters are different for the tidal portions of Cameron Run and Four Mile Run (classified as Class II, tidal Coastal zone) and the remaining non-tidal tributaries within the City (Class III, non-tidal Coastal and Piedmont zones). The only difference between the two standards is that there is no established maximum temperature for Class II waters.

Fecal coliform levels are the most important from a human health standpoint. These organisms, while not necessarily harmful in themselves, are found in the intestinal tracts of warmblooded animals, including humans, and therefore act as indicators of fecal contamination and the possible presence of pathogenic organisms.

Temperature, DO and pH are the primary indicators of the health of an aquatic ecosystem. The presence of DO in water is essential for aquatic life, and the type of aquatic community is dependent to a large extent on the concentration of DO present. Strongly related to pH are biological productivity, stream diversity, and the toxicity of certain chemicals, as well as important chemical and biological activity. Temperature affects feeding, reproduction, and the metabolism of aquatic animals. A week of high temperatures each year can render a stream unsuitable for sensitive aquatic organisms even though temperatures are tolerable throughout the rest of the year.

In addition to the CWA swimmable and fishable goals, many of the City’s water quality programs are driven by the interstate Chesapeake Bay Agreement and the resultant Virginia Chesapeake Bay Preservation Act and the Potomac Tributary Strategy program. The primary focus of these efforts is to reduce the flow of nutrients entering the Potomac River and the Chesapeake Bay. While essential to healthy plant and animal growth, an overabundance of nutrients results in algae blooms, which block sunlight and consume oxygen when they decay.

Phosphorus is the primary nutrient of concern for fresh water systems such as the Potomac River, while nitrogen is the nutrient of concern for brackish water systems such as the Chesapeake Bay.

Water quality in Cameron Run and Four Mile Run generally meets the Clean Water Act's fishable and swimmable goals, with the notable exception of fecal coliform counts. While DO levels in Four Mile Run drop markedly from Columbia Pike to the George Washington Parkway (10.9 mg/l to 7.7 mg/l), they are still well within acceptable limits and consistently test above the minimum standard of 4.0 mg/l. The primary reason for this decline in DO is the slowing down of water as a result of tidal influences and reductions in topography.

While temperature measurements are within CWA goals, this information should be interpreted with caution. During summer months, stormwater runoff may become significantly warmer as it absorbs heat from impervious surfaces, such as parking lots, streets, and roof tops. The resultant pulse of warm water can cause thermal shock to many aquatic species. Because these pulses are typically short in duration, they are often not detected during monitoring. However, their impacts can be devastating. Volunteer monitoring in Four Mile Run has measured temperatures that have risen as quickly as 10°F in an hour. Thermal shock can occur with changes of 3°F or 4°F in an hour. Fecal coliform contamination continues to be a problem for Four Mile Run and Cameron Run.

Alexandria's situation is by no means unique, as most of Northern Virginia's streams show elevated levels of these contaminants. At the Cameron Run monitoring site, 57% of the samples tested in the "unhealthful" range (greater than 1,000 fc/100ml) for fecal coliform in 1999. Monitoring in Four Mile Run reveals similarly high levels of fecal coliform contamination. Results of testing at the Columbia Pike site from 1995 to 1999 show that 21% of the samples tested above the "unhealthful" level. Fecal contamination was slightly worse at the George Washington Parkway monitoring site, where 28% of the samples tested in the "unhealthful" range. Long-term monitoring results show that levels are consistently elevated, but fluctuate according to year and rainfall.

The sources of bacterial contamination have been debated for a number of years. In 2000, a joint effort between the Northern Virginia Regional Commission and Virginia Tech shed light on the subject by applying DNA analysis to bacteria strains from Four Mile Run. The study revealed that waterfowl account for over a third of all bacteria matches (37%), followed by humans (17%), raccoons (15%), and canines (9%). Equally of significance, the study found that the bacteria appear to regrow, through cloning, within storm drains and stream sediments, therefore perpetuating the problem. Having such information is critical to eventually managing the problem of bacteria in Alexandria's streams.

The Fairfax County Department of Public Works and Environmental Services tests for nitrate nitrogen, total phosphorus, and a variety of heavy metals. The log average for Cameron Run for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver is consistently below EPA contamination standards. In 1996, the average nitrate nitrogen level in Cameron Run was 0.8 mg/l, well below the maximum unhealthful level of 10 mg/l. For nitrogen levels, Cameron Run had 36% of samples in the good range and 64% in the fair range. However, lev-

els have risen, albeit slowly, from 0.6 mg/l in 1992. Average total phosphorus levels have remained stable at an acceptable 0.1 mg/l. The “1998 Virginia Water Quality Assessment,” which reports monitoring by VADEQ on a watershed-wide basis, found that all samples in that year for Cameron Run were “good” for total phosphorus.

In Four Mile Run, 94% of phosphorus samples were found to be in the good range, 4% in the fair range, and 2% in the severe range. Four Mile Run is the only watershed in the middle Potomac River basin to report severe conditions. For nitrogen samples, Four Mile Run reported 24% of samples in the fair range, 61% in the poor range, and 15% in the severe range, which is the second worst in the entire Virginia portion of the Potomac River watershed. The Commonwealth considers both watersheds as high priorities for the reduction of non-point source pollution.

Data Gaps

- There are limited data on how many people eat fish caught in local waterways. There is also a poor correlation between pathogen content in water and the incidence of some bacterial diseases.
- Systematic water quality monitoring data for City streams is limited, and consistent data is available only for Four Mile Run and Cameron Run. Water quality in the lower Cameron Run is tested by the Fairfax County Health Department at Fenwick Drive, where Cameron Run enters Fairfax County near Telegraph Road. VADEQ primarily tests water quality in the lower Four Mile Run, although some additional water quality data is available from other sources.
- The City is presently undertaking a multi-phase stream habitat assessment. This data will allow the City to identify potential pollution sources, utility crossing problems and illicit discharges, and help prioritize restoration efforts. Consistent systematic data on macro-invertebrate biota should be the next full-scale data gathering endeavor in order to utilize accepted methods of measuring stream health and evaluate restoration successes.

Current Programs/Activities and Public Health Protection Factors

- The City of Alexandria’s Master Plan has been amended with a Water Quality Supplement – the result of a long-term strategic planning effort. This document is to assist the City in its effort to gather background information to ensure that adequate data is available for making environmentally sound decisions. It is an informational as well as guidance document. It explores Alexandria’s existing water environment, pollution and other sources of water quality impacts, and inventories and analyzes existing City water quality management. Additionally, the supplement outlines new policies and action plans for the future.
- The City’s Municipal Separate Storm Sewer System (MS4) Program addresses efforts to minimize pollutants in discharges of storm water to the maximum extent possible. Activities include:

A. Public Education and Outreach:

- Provide signs designating waterway name and drainage basin name at road crossings. (Completed)
- Develop a bilingual brochure that provides information on non-point source water pollution and surface water quality. (Completed)
- Develop and broadcast a seasonal, scrolling text message on the City's government access cable television channel that provides viewers information on surface water quality and stormwater management considerations. (Continuing)
- Develop and implement, as a condition on new and redevelopment projects, a program to provide interpretive signs or labels identifying new surface\ structural stormwater BMPs. (Continuing)
- Develop and incorporate into the City's development standards a storm drain inlet marking program. (Continuing)

B. Public Participation and Involvement:

- Follow public notice requirements for City Council meeting(s) regarding the drafting/implementation of any City Code changes relating to the City's VPDES MS4 permit implementation or other water quality initiatives. (Continuing)
- Provide staff support to the City's Environmental Policy Commission (EPC) to provide ongoing citizen/stakeholder input into VPDES Phase II program implementation. (Continuing)
- Provide an annual update on water quality programming in the City of Alexandria, including material directly related to the implementation of the City's MS4 permit, to the EPC. (Continuing)
- Provide an avenue for citizen input on stormwater management issues, leveraging the City's website capability for e-mailing the City's department heads. (Continuing)
- Continue to participate as a sponsor at the City's annual Earth Day event. (Continuing)

C. Illicit Discharge Detection and Elimination

- Strengthen existing mechanisms for citizens and staff to report suspected illicit discharges. (Completed)
- Provide citizens with a Household Hazardous Waste drop-off and disposal service. (Continuing)
- Review the City Code prohibition against non-stormwater discharges to the storm sewer system to ensure Code meets the General Permit requirements concerning the detection and elimination of illicit discharges. (Completed)
- Develop a brochure for all City operational employees on the hazards associated with illegal discharges and improper waste disposal. (Completed)

D. Construction Site Runoff Control

- Maintain a consistently rated Erosion and Sediment (E&S) Control Program as defined by the Virginia Department of Conservation and Recreation. (Continuing)
- Incorporate language into the City's standard development E&S site plans that requires construction site operators to meet the conditions of 9 VAC25-750-50 Part II B 4 b(4) relating to construction site waste generation to the satisfaction of the City Director of T&ES or his designee. (Continuing)
- Provide City citizens a mechanism through which they can report E&S-based complaints. (Continuing)
- Develop a system to track the number of regulated land disturbing activities and total disturbed acreage to VADEQ. (Continuing)

E. Post-Construction Runoff Control

- Develop a data tracking system for all new BMPs installed for new and redevelopment projects meeting the General Permit's disturbed area criteria. (Continuing)
- Ensure proper recordation and distribution of executed stormwater BMP maintenance agreements to ensure long-term operation and maintenance of new stormwater BMPs. (Continuing)
- Maintain a consistently rated Chesapeake Bay Preservation Ordinance, as defined by the Chesapeake Bay Local Assistance Board, to meet the VPDES MS4 post-construction stormwater management requirements. (Continuing)
- Evaluate the City's BMP design guidelines to ensure consistency with leveraged post-construction stormwater management requirements in the City's Chesapeake Bay Preservation Ordinance. (Continuing)

F. Pollution Prevention and Good Housekeeping

- Establish a City Interdepartmental Environmental Coordination Group in accordance with the Water Quality Supplement of the City's Master Plan. (Completed)
- Continue to implement the City's comprehensive street sweeping and leaf collection programs. (Continuing)
- Continue to implement the City's comprehensive stormwater catch basin and inlet cleaning programs. (Continuing)
- Incorporate stormwater quality management information into the City's "All Eyes" program. (Continuing)
- Provide appropriate stormwater management and pollution prevention training to City operations employees in conjunction with any required training through the development of Stormwater Pollution Prevention Plans for City industrial facilities. (Continuing)

- The City of Alexandria owns and operates a combined sewer system (CSS) comprising about 540 acres located in the Old Town area east of U.S. Route 1. The City plans to reduce the overall area of the CSS by separating the storm and sanitary sewers over time as development opportunities arise. An *Area Reduction Plan* has been developed that identifies the system modifications, associated costs, and environmental impacts of separating certain portions of the CSS.
- In implementing the Chesapeake Bay Preservation Act, the City has classified streams and their tributaries according to their flow regimes – perennial, intermittent, or ephemeral. This activity was achieved through the Phase I Stream Assessment, which enabled the City to determine which streams warranted the greatest protection. The information was critical to the implementation of the Environmental Management Ordinance discussed below. The Phase II Stream Assessment is ongoing and investigates the habitat and health of the stream to provide the City information necessary to prioritizing maintenance, rehabilitation, etc.
- Article XIII of the Environmental Management Ordinance (adopted in 1992 and revised in 2004) was designed to ensure appropriate land use regulations and construction and maintenance practices that have the proven ability to reduce pollution that damages the water quality of the Chesapeake Bay and its tributaries. This amendment specifically addresses the requirements of the Chesapeake Bay Preservation Act:
 - It establishes controls for development in the resource protection and resource management areas.
 - It ensures protection of a 100-foot buffer around perennial stream (the buffer acts to screen and trap pollutants prohibiting them from entering waterways) and a 50-foot buffer around intermittent streams.
 - It requires that with each increase in impervious surface, a concomitant reduction in phosphorous loading be achieved. Phosphorus is the key nutrient targeted for reduction by the Chesapeake Bay Act and is primarily responsible for the eutrophication of the Bay.
- The VADEQ listed Four Mile Run on the Commonwealth's 1996 303(d) Total Maximum Daily Load (TMDL) Priority List of Impaired Waters (VADEQ, 1996) for exceeding the water quality standard for fecal coliform bacteria. The run was subsequently listed as impaired for fecal coliform bacteria in 1998 and 2002 (no such impaired waters list was published in 2000). A TMDL study and subsequent report, "Fecal Coliform TMDL (Total Maximum Daily Load) Development for Four Mile Run, Virginia," was prepared for VADEQ and was accepted by the EPA on May 31, 2002. Initial efforts are targeted toward decreasing human and canine waste contributions. Activities that support the effort to reduce bacterial input into Four Mile Run include:
 - Sanitary sewer rehabilitation due to infiltration and inflow problems
 - Sanitary sewer inspection and maintenance
 - Illicit discharge control
 - Proper pet waste disposal education

- Stormwater treatment and management
- Street and storm drain infrastructure development
- Stream corridor restoration
- Stormwater Runoff Reduction
- Outreach and education
- Interpretive and informational signs

Team Assessment and Ranking

The Alexandria Community Environmental Health Assessment Team (ACEHAT) ranked Surface Water Quality second out of the eleven issues considered.

PROPOSED ACTION PLAN:

GOAL

No waterborne illness outbreaks.

ACTIONS

- Continue to implement the City's Water Quality Management Supplement to the City of Alexandria Master Plan.
- Continue implementing the six critical components of the small Municipal Separate Storm Sewer System (MS4) Program.
- Complete Stream Classification Phase II, analyze data and set priorities for stream management and restoration activities.
- Continue to monitor and update the Stream Assessment/Classification Phase I.
- Increase stream monitoring data consistency and breadth of information by focusing on obtaining macro-invertebrate information.
- Continue to implement and strengthen the City of Alexandria Article XIII Environmental Management Ordinance to reduce nutrient loading into the Chesapeake Bay.
- Continue and expand activities to reduce the bacterial input into our streams.
- Develop and implement Four Mile Run and Cameron Run/Holmes Run Restoration Projects.
- Maintain compliance with the City's Combined Sewer System Permit by implementing the nine minimum controls. Begin to implement the Area Reduction Plan by requiring sewer separation for sites being developed, thus reducing and eliminating overflows.
- Continue to implement the Four Mile Run TMDL program.
- For City development projects, continue to use innovative "green building" technologies for stormwater management, such as "green roofs," and encourage their use in private development via the City development review process.

7. A Healthy Environment: The Foundation for Alexandria's Future

Maintaining a healthy environment in Alexandria is vital to both the physical health of its citizens and to the economic health of our city. We would like Alexandria to be known as one of the healthiest places in the United States in which to live, work and play.

Tier One Issues

Tobacco is the number one actual cause of death in the United States. Annually, as many as 435,000 deaths (18.1% of all deaths in the U.S.), including many deaths from heart disease, stroke and cancer, are attributed to tobacco. Approximately 38,000 of these deaths are believed to be caused by the effects of second-hand smoke. Asthma incidence in the U.S. population has almost doubled in the last 25 years. The American Lung Association has estimated that 1,960 children and 7,870 adults in Alexandria suffer from asthma. These grim statistics are what make *air quality*, both indoor and outdoor, the number one environmental health issue in Alexandria.

Indoor air quality issues include second-hand smoke, mold and mildew, toxic chemicals, lead dust, asbestos, and radon. Although the Environmental Health and Environmental Quality Divisions attempt to address these issues, much of their efforts are piecemeal and reactive. A coordinated and proactive respiratory health program is needed in the city. It is recommended that an environmental health educator be hired to initiate and coordinate proactive respiratory health programs within the city.

Outdoor air quality problems in Alexandria are primarily produced by motor vehicles, power plants, and other sources of combustion byproducts. The city's initiative to seek the closure of the Mirant Power Plant is a huge step in the right direction. However, it is recommended that significant steps be taken to reduce the local air pollution caused by motor vehicles.

Surface Water pollution is a major problem in Alexandria. Urban runoff, combined sewer overflows, and old industrial sites have significant impacts on stream water quality in the city. Most of Alexandria's streams probably do not meet the standards of the Clean Water Act. To preserve opportunities for healthy water recreation in Alexandria, it is important that the city continue to address the city's surface water quality issues. Holmes Run, Four Mile Run, Cameron Run, and the Potomac River are key geographic features that lend Alexandria much of its beauty and character.

Tier Two Issues

A *healthy lifestyle* is key to a healthy community. Poor diet and physical inactivity are thought to be the number two actual cause of death in the United States. As many as 400,000

deaths (16.6% of all death in the U.S.), including many from heart disease and stroke, are attributed to poor diet and physical inactivity.

Alexandria is a beautiful city with much to offer its residents. However, like many urban areas, Alexandria has difficult problems to overcome related to its *built environment*. The cost of real estate and the density of development make open space for parks and trails expensive to acquire. Motor vehicle traffic has a major impact on pedestrian safety, outdoor air quality, and the amount of leisure time residents have to engage in healthy exercise.

All of these factors affect the city's environment and the ability and desire of its residents to walk in the community and to get regular outdoor exercise. It is recommended that the Health Department become more actively engaged as an advocate for creating a healthier built environment in the city.

Food safety is vitally important to the physical health of Alexandria's residents and to the economic health of the city's restaurant industry. Although Alexandria has one of the best food safety programs in Virginia, there continues to be room of improvement. In particular, the Environmental Health Division should focus more of its resources on consumer food safety, outreach to Alexandria's ethnic communities, and the health of restaurant workers. The Health Department should also endeavor to meet FDA's Model Food Safety Program Standards.

Disease carriers, such as mosquitoes, rodents and raccoons, are a constant threat to the health of an urban population. The creation of a Vector-Borne Illness Prevention Program in the Health Department has been a huge step in helping to address these issues in a more specific and proactive way. As this program begins to mature, it is recommended that its focus be on mosquito control, prevention of animal bites, and improved coordination between the Environmental Health and Code Enforcement Divisions on rodent control issues.

Implementation of Action Plans

In order for Alexandria to make progress in addressing the most important environmental health problems facing the city, the action plans presented for the six Tier One and Tier Two issues in Section 6 of this report should be implemented.

Closing Data Gaps

Additional data on environmental health issues needs to be collected to fill in the gaps that were identified by the assessment. In particular, there is a need for better data on the number of persons requiring hospital treatment for asthma; the number of complaints about respiratory health and indoor air quality received by city agencies; the prevalence of food safety practices in the home environment; the number of dog bites requiring hospital treatment; and the number of injuries requiring hospital treatment that occurred while using recreational facilities.

Annual Report to Document Progress

It is recommended that an annual environmental health report for the city be developed

that will document progress toward the goals identified in the action plans in this report.

Follow-Up Assessment

It is recommended that a follow-up community environmental health assessment be started in 2010 (completed by 2011) to assess the progress the city has made in addressing the issues identified in this report and to identify any new environmental health issues that have emerged. It is recommended that the next assessment include a study of housing conditions, as this area was not considered in the current report.

A Foundation for the Future

Preserving the quality of life in our city is the foundation for our future. A healthy living environment is a key component of that quality of life. Taking active steps to preserve and promote a healthy environment is an important investment in Alexandria's future. Our vision should be of an Alexandria that is one of the healthiest places in the United States in which to live, work and play.

8. Appendices

- A. Community Environmental Health Survey Form
- B. Community Environmental Health Survey Demographics & Results
- C. Charts, Graphs and Sources

Appendix A: Community Environmental Health Survey

Date _____



Alexandria Health Department Community Environmental Health Survey



*You can make
Alexandria
a better place
to live!*

The Alexandria Health Department and the City of Alexandria want to know what environmental issues are most important to you. Your environment includes your home, work and other areas in the City of Alexandria. Your responses will help the City decide which environmental health issues need attention. Your name is not needed to answer this survey. Thank you for your time and comments.

1. Are the following issues important to you while living or working in the City of Alexandria? Check the appropriate boxes.

	Yes	No	Don't Know
a. Indoor air pollution			
Tobacco smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pet dander, litter boxes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smells or gases from carpeting, building materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smells or gases from gas furnaces and stoves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smells or gases from cleaning products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mold and mildew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Outdoor air pollution			
Acid rain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoke and ash from fireplaces, wood stoves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air pollution from sources like power plants, incinerators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air pollution from sources like drycleaners, gas stations, lawn equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaust from sources like cars, airplanes, buses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ozone (smog)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Disease carriers or pests			
Rodents (rats, mice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mosquitoes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roaches, fleas or other insects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ticks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rabid animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Birds (pigeons, crows, geese, starlings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Chemicals and toxic substances			
Hazardous material spills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead paint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bug sprays, weed sprays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former landfills, industrial sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

e. Solid waste disposal	Yes	No	Don't Know
Recycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trash and litter on roads and public areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Garbage collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household hazardous waste such as antifreeze, oil, batteries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Food safety	Yes	No	Don't Know
In the home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restaurants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special events, fairs, festivals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grocery stores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schools and day care centers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Recreational and play areas	Yes	No	Don't Know
Cleanliness and water quality of public pools and hot tubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public pools and hot tub safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playground equipment safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public parks and ballfield safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dog park safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreation center safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Water quality	Yes	No	Don't Know
Street run off, storm drain pollutants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Streams, rivers, lakes for swimming, boating, fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sewage backup and overflows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drinking water from your faucet (tap water)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Noise Pollution	Yes	No	Don't Know
Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Airport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trains and Metro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lawn and garden equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Healthy lifestyles/Human environment	Yes	No	Don't Know
Safety when driving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety when walking (safe places to cross streets)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enough trails for walking or bicycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycling safety (bike lanes provided)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enough parkland, open space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Please check the 5 most important issues for you:

- _____ Indoor air pollution
- _____ Outdoor air pollution
- _____ Disease carriers
- _____ Chemicals and toxics
- _____ Noise pollution
- _____ Food safety
- _____ Recreational Area safety
- _____ Water quality
- _____ Solid waste disposal
- _____ Healthy lifestyles/human environment
- _____ Other _____
- _____ Other _____

3. What environmental health issues do you wish you had more information about?

4. Are there environmental health conditions in your neighborhood that you feel may be contributing to any family illness within the last year?

- YES NO DO NOT KNOW

If YES, what? _____

5. Is there anything at your workplace that you feel may have harmed your health within the last year?

- YES NO DO NOT KNOW

If YES, what? _____

6. Are there environmental conditions in Alexandria that you feel need immediate attention?

- YES NO DO NOT KNOW

If YES, what? _____

7. Do you avoid outdoor recreation areas because you feel they are environmentally UNSAFE?

- YES NO DO NOT KNOW

If YES, what and why? _____

8. Are there any other environmental issues you feel are important to you while living or working in the City of Alexandria?

(over)

Please complete the following OPTIONAL information:

1. Highest level of education:

- some high school high school grad or equivalent some college or trade school
 college grad graduate school or higher

2. Are you: homeowner renter live with family or friends without rent

3. What is your home zipcode? _____

4. What is the name of the street you live on? _____

5. Number of people who live in your home: _____

6. Your age is:

- 19 or under 20 - 34 35 - 54
 55 - 64 65 - 74 75 - 84 85 or over

7. Your sex: Male Female

8. Your race/ethnicity is:

- White Black or African American
 American Indian or Alaska native Asian
 Hispanic or Latino Native Hawaiian or Pacific Islander
 Other

9. What language do you speak most often? _____

10. What is your present work status?

- Employed Unemployed Student Retired

11. Do you work in the City of Alexandria? Yes No

12. How often do you read newspapers? Daily Sometimes Never

13. How often do you watch TV news? Daily Sometimes Never

14. How often do you listen to news radio? Daily Sometimes Never

15. How often do you read the news from the internet? Daily Sometimes Never

***Thank you for taking the time to complete this survey;
it's most appreciated!***

Appendix B: Alexandria Community Environmental Health Survey Demographics

From August 2003 to April 2004, 475 residents of the City of Alexandria completed the Alexandria Community Environmental Health Survey. The table below shows comparisons between the demographics of the sample surveyed and the City of Alexandria as reported by the 2000 Census.

Overall, the survey sample consists of a lower proportion of males, fewer individuals aged 19 and under, and fewer individuals aged 20-34 than Alexandria's Census figures. An increased participation among Hispanics and Asians would improve representation within demographic categories. Geographically, residents of zip codes 22302, 22311 and 22312 are somewhat under-represented in the survey sample.

DEMOGRAPHIC	ALEXANDRIA (2000 Census)	ACEHAT (Survey Sample)
GENDER		
Male	61,974 (48.3%)	180 (38%)
Female	66,309 (51.7%)	252 (53%)
No Answer		43 (9%)
AGE		
19 or under	23,375 (18%)	51 (11%)
20-34	42,490 (33%)	98 (21%)
35-54	40,827 (31%)	162 (34%)
55-64	9,985 (8%)	75 (16%)
65-74	5,695 (4%)	38 (8%)
75-84	4,204 (3%)	17 (4%)
85 +	1,706 (1%)	4 (0.8%)
RACE		
American Indian / Alaskan Native	355 (0.3%)	5 (1.1%)
Asian	7,249 (5.7%)	20 (4.2%)
Black / African American	28,915 (22.5%)	109 (22.9%)
Hispanic / Latino	18,882 (14.7%)	55 (11.6%)
Native Hawaiian / Pacific Islander	112 (0.1%)	1 (0.2%)
White	63,889 (49.8%)	237 (49.9%)
Other	8,881 (6.9%)	16 (3.4%)
ZIP CODE		
22301	8.1%	36 (7.6%)
22302	12.0%	38 (8.0%)
22304	32.1%	120 (25.3%)
22305	12.0%	53 (11.2%)
22311	12.8%	41 (8.6%)
22312	21.9%	49 (10.3%)
22314	19.1%	99 (20.8%)
No Answer		39 (8.2%)

Appendix C: Charts & Graphs

2. Alexandria Community Profile:

Graph #2-1: “City of Alexandria Race and Ethnicity” — Source: 2000 U.S. Census Data.

Graph #2-2: “City of Alexandria Foreign-Born Population” — Source: U.S. Census Data.

Graph #2-3: “City of Alexandria Age Distribution of Residents” — Source: 2000 U.S. Census Data.

4. Community Environmental Health Survey:

Graph #4-1: “City of Alexandria Ranking of EH Survey Results” — Source: EH Community Environmental Health Survey, 2003/2004.

Chart #4-2: Ranking of Environmental Health Sub-Issues — Source: EH Community Environmental Health Survey, 2003/2004.

5. Ranking of Issues and Priority Setting:

Graph #5-1: “Team Ranking of Issues Based on Scientific Data” — Source: Alexandria Community Environmental Health Assessment Team.

6. Issue Profiles and Actions Plans:

A) Built Environment (Healthy Lifestyles)

Graph #6-1: “Percentage of Citizens Surveyed Who Were Concerned About Various Built Environment Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

B) Chemicals and Toxics

Graph #6-2: “Percentage of Citizens Surveyed Who Were Concerned About Various Toxic and Hazardous Waste Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

C) Disease Carriers and Vector Control

Graph #6-3: “Percentage of Citizens Surveyed Who Were Concerned About Various Disease Carrier Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

Chart #6-4: “Human Bite Animal Exposure” — Source: Alexandria Animal Welfare League.

Chart #6-5: “Rabid Animals Found in Alexandria” — Source: AHD Environmental Health.

Chart #6-6: “Complaints About Rodents” — Source: AHD Environmental Health; City of Alexandria Code Enforcement.

Chart #6-7: “Complaints About Insects Received by Health Department” — Source: AHD Environmental Health.

Chart #6-8: “West Nile Virus Positive Mosquito Pools” — Source: AHD Environmental Health; Virginia Department of Health.

E) Food Safety

Graph #6-9: “Percentage of Citizens Who Were Concerned About Various Food Safety Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

Chart #6-10: “Laboratory Confirmed Cases of Probable Foodborne Illness” — Source: AHD Environmental Health.

Chart #6-11: “Number of Foodborne Outbreaks” — Source: AHD Environmental Health.

Chart #6-12: “Confirmed Norovirus Outbreaks” — Source: AHD Environmental Health.

Chart #6-13: “FDA Model Food Program Standards Met” — Source: AHD Environmental Health.

Chart #6-14: “Percent of Out of Compliance Baseline Survey Observations Related to CDC Food Safety Risk Factors by Establishment Type” — Source: AHD Environmental Health; U.S. Food and Drug Administration.

F) Indoor Air Quality

Graph #6-15: “Asthma Prevalence by Age, United States: 1980-1996” — Source: U.S. Centers for Disease Control & Prevention, National Health Interview Study.

Graph #6-16: “Percentage of Citizens Surveyed Who Were Concerned About Various Indoor Air Quality Issues” — EH Community Environmental Health Survey, 2003/2004.

G) Noise

Graph #6-17: “Percentage of Citizens Surveyed Who Were Concerned About Various Noise Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

Graph #6-18: “Noise Complaints Received by Division of Environmental Quality, T&ES — Source: City of Alexandria Department of Transportation & Environmental Services.

H) Outdoor Air Quality

Graph #6-19: “Percentage of Citizens Surveyed Who Were Concerned About Various Outdoor Air Quality Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

Chart #6-20: “Number of Air Complaints Received and Air Pollution Inspections Performed by City DEQ” — Source: City of Alexandria Department of Transportation & Environmental Services.

I) Recreational Safety

Graph #6-21: “Percentage of Citizens Surveyed Who Were Concerned About Various Recreational Safety Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

J) Solid Waste

Graph #6-22: “Percentage of Citizens Surveyed Who Were Concerned About Various Solid Waste Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

Chart #6-23: “Overall Percentage of City’s Solid Waste Recycled” — Alexandria Recycling Coordinator, January 2006.

K) Surface Water Quality

Graph #6-24: “Percentage of Citizens Surveyed Who Were Concerned About Various Water Quality Issues” — Source: EH Community Environmental Health Survey, 2003/2004.

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