

Health Consultation

Evaluation of Lead in Vegetables

5TH AND CLEVELAND INCINERATOR

JACKSONVILLE, DUVAL COUNTY, FLORIDA

SEPTEMBER 25, 2003

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR TOLL FREE at

1-888-42ATSDR

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

HEALTH CONSULTATION

Evaluation of Lead in Vegetables

5TH AND CLEVELAND INCINERATOR

JACKSONVILLE, DUVAL COUNTY, FLORIDA

Prepared by:

Florida Department of Health
Bureau of Community Environmental Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Foreword

This document summarizes public health concerns from eating vegetables collected from three gardens sampled for polynuclear aromatic hydrocarbons (PAHs) and metals near the 5th and Cleveland Incinerator site in Jacksonville, Florida. It is based on a site evaluation prepared by the Florida Department of Health (DOH). A number of steps are necessary to do such an evaluation:

- **Evaluating exposure:** Florida DOH scientists begin by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it's found on the site, and how people might be exposed to it. Usually, Florida DOH does not collect its own environmental sampling data. We rely on information provided by the Florida Department of Environmental Protection (DEP), U.S. Environmental Protection Agency (EPA), and other government agencies, businesses, and the general public.
- **Evaluating health effects:** If there is evidence that people are being exposed - or could be exposed - to hazardous substances, Florida DOH scientists will take steps to determine whether that exposure could be harmful to human health. The report focuses on public health - the health impact on the community as a whole - and is based on existing scientific information.
- **Developing recommendations:** In the evaluation report, Florida DOH outlines its conclusions regarding any potential health threat posed by a site, and offers recommendations for reducing or eliminating human exposure to contaminants. The role of Florida DOH in dealing with hazardous waste sites is primarily advisory. For that reason, the evaluation report will typically recommend actions to be taken by other agencies - including the EPA and Florida DEP. However, if there is an immediate health threat, Florida DOH will issue a public health advisory warning people of the danger, and will work to resolve the problem.
- **Soliciting community input:** The evaluation process is interactive. Florida DOH starts by soliciting and evaluating information from various government agencies, the organizations responsible for cleaning up the site, and the community surrounding the site. Any conclusions about the site are shared with the groups and organizations that provided the information. Once an evaluation report has been prepared, Florida DOH seeks feedback from the public. *If you have questions or comments about this report, we encourage you to contact us.*

Please write to:

Susan Bland
Superfund Health Assessment and Education
Bureau of Environmental Epidemiology/Florida Department of Health
4052 Bald Cypress Way, Bin # A-08
Tallahassee, FL 32399-1712

Or call us at:

(850) 245-4299, or toll-free during business hours: 1-877-798-2772

Summary and Statement of Issues

This health consultation evaluates polynuclear aromatic hydrocarbons (PAHs) and metals (specifically lead) found in vegetables from three gardens near the 5th and Cleveland Incinerator property in Jacksonville, Florida. In March 2002, EPA asked the Florida Department of Health (DOH) to review and evaluate these vegetable data. The Florida DOH determined the levels of PAHs and metals found in collards and mustard greens in the three sampled gardens near the site are not likely to cause illness. In March 2002, the Florida DOH, with concurrence from ATSDR, sent a letter to EPA stating the measured levels in vegetables in all three gardens were not likely to cause illness. In May 2002, EPA sent letters to the three garden owners explaining the vegetable testing results.

Background

The 5th and Cleveland Incinerator site is in a residential neighborhood northeast of the intersection of 5th Street and Cleveland Street, approximately 1 mile north of downtown Jacksonville in Duval county. From approximately 1943 to 1969, the City of Jacksonville burned municipal waste in the incinerator and disposed incinerator ash on site. Disposal (buried or surface) information is unknown. In the 1970s the site was developed as a city park (Emmett Reed Park) (ATSDR 1996). Currently, this 9-acre site consists of two basketball courts, a baseball diamond, a picnic area, and two buildings. The site is used as a public park and Emmett Reed Community Center/Head Start School. A day-care is located east of the site and public housing units are located northwest of the site. The Mt. Herman Elementary School is located northeast of the site behind the community center and the H.R. Lewis Petroleum company and some residential properties are located on the south side of the site (EPA, 2003). The site was originally used as a cemetery. From the 1940s to the 1960s, the City of Jacksonville's municipal incinerator was operated on the site. The facility reportedly disposed of incinerator ash on-site, in several areas, including what is now Emmett Reed Park, behind Emmett Reed Community Center and along the eastern right-of-way of Francis Street. The disposed ash and clinker are visible in some areas of the site today (EPA 2003).

In February 1996, EPA contractor collected 14 soil samples from the site and analyzed them for metals. Levels of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver were found; mercury was not found.

In April 1996, the City of Jacksonville covered the incinerator ash with gravel, compost and grass. In November 1996, the Agency for Toxic Substances and Disease Registry (ATSDR) prepared a Health Consultation about the soils on the site. The ATSDR concluded lead levels in the ash are at levels of public health concern, however, more samples were recommended as data was limited. ATSDR recommended the ash remain covered to minimize potential exposures until permanent remedial action takes place. ATSDR also recommended characterization of the nature and extent of contamination in the ash (0-3 inches in surface soil).

On January 15, 2002, the Environmental Protection Agency (EPA) collected soil samples and vegetable samples of collard and mustard greens from three gardens in the area of the 5th and

Cleveland property. One of the gardens had maximum soil lead levels of 4400 milligrams per kilogram (mg/kg). The maximum lead levels in the greens were 0.30 mg/kg from this garden. The EPA lab analyzed the vegetable samples for the main contaminants of concern from the site (antimony, arsenic, lead and PAHs). Only lead was detected in the vegetables.

In March 2002, EPA asked the Florida DOH to review and evaluate the lead levels found in the collard and mustard greens from the three gardens. Susan Bland, Florida DOH reviewed this data and sent a letter to EPA dated March 26, 2002 with her findings.

In May 2002, EPA used an Integrated Exposure Uptake Biokinetics (IEUBK) model to determine if the lead levels detected in the vegetables would result in an unacceptable risk from eating the vegetables. EPA defines unacceptable risk as risk of adverse health effects from exposure to lead resulting in blood lead levels above CDC's guideline of 10 ug/dl. After running this model, with certain assumptions, EPA concluded average blood lead levels would only slightly increase even at the highest detected concentrations of lead in the collard and mustard greens. EPA also concluded there was no unacceptable risk associated from eating vegetables from gardens with soil lead levels less than 500 mg/kg.

Also in May 2002, EPA sent letters to the three garden owners explaining the results of the soil and vegetable testing. EPA stated the lead soil concentrations are well above the EPA's recommended residential clean up goal of 400 mg/kg and are an unacceptable health risk based on direct exposure to the soil. EPA also recommended good gardening and food preparation practices to lower risk and attached a fact sheet.

Discussion

Vegetables

EPA collected collard and mustard green samples from three gardens.

Garden #1 - samples GARD-09 and GARD-11

Garden #3 - samples GARD-01 and GARD-03

Garden #3: - samples GARD-05 and GARD-07

EPA's March 2002 soil/vegetable sampling report included the results from two vegetable samples from each of the three gardens. Garden 1 had a maximum vegetable lead level of 0.16 mg/kg. Garden 2 had a maximum vegetable lead level of 0.28 mg/kg. Garden 3 had a maximum vegetable lead level of 0.089 mg/kg. EPA chose collards and/or mustard greens because of their availability and most likely to bioaccumulate lead.

Results

In May 2002, the Florida DOH evaluated the vegetable results. Although antimony, arsenic, lead and PAHs were analyzed, only lead was detected in the vegetables. The maximum lead level found in collard and mustard greens from the three gardens was 0.28 milligrams per kilogram (mg/kg).

Using the maximum lead level of 0.28 mg/kg (Table I) and average consumption rates, the Florida DOH calculated a dose for a child and an adult eating collard and/or mustard greens from a garden near the site (Appendix A). The Florida DOH compared the calculated doses with ATSDR's MRL for lead (ATSDR 1999) and determined eating these vegetables with this maximum lead level, is unlikely to cause illness in children or adults.

On May 16 and 20, 2002, using EPA and DOH's conclusions, the EPA sent a letter to the City of Jacksonville stating the measured levels of lead found in the vegetables were unlikely to cause illness in children or adults. For the letters to residents of Gardens #1 and #3, EPA stated the lead levels found in soils are an unacceptable health risk based on direct exposure to the soil. In all three letters, EPA stated the amount of lead found in the vegetables was unlikely to cause illness. Also, EPA included "regardless of the soil lead level in the gardens, EPA recommends good gardening and food preparation practices to lower risk". For all three letters, EPA attached a gardening/food preparation fact sheet to distribute to nearby residents.

Therefore, the metals and PAHs tested in collard and mustard greens from the three sampled gardens are not likely to cause illness.

Child Health Considerations

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than adults; this means they breathe dust, soil, and vapors close to the ground (ATSDR 1999).

Even though children can absorb more lead and other metals from soils through hand-to-mouth behavior, the children living near the 5th and Cleveland Incinerator Florida DOH should not experience any health effects based on the levels of arsenic, antimony, lead and PAHs found in the tested vegetables.

Conclusions

The metals (arsenic, antimony and lead) and PAHs tested in collard and mustard greens from the three sampled gardens are not likely to cause illness. Therefore, exposure to measured contaminants in garden vegetables is categorized as a no apparent public health hazard.

Some of the lead soil concentrations measured in the three gardens tested were well above the EPA's recommended residential clean up goal of 400 mg/kg and could pose an unacceptable health risk based on direct exposure to the soil.

Recommendations/Public Health Action Plan

Florida DOH recommends the three garden owners whose gardens were tested use good gardening and food preparation practices to minimize exposure to lead in garden soils.

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 1999. Toxicological profile for lead. Atlanta: US Department of Health and Human Services

[ATSDR] Agency for Toxic Substances and Disease Registry. 1996. Health Consultation for 5th and Cleveland Street Incinerator. Atlanta: US Department of Health and Human Services

Other documents reviewed:

[EPA] Environmental Protection Agency. 2002. Memorandum to Mr. Alfano and Mr. Hardegree from Glenn Adams concerning sampling and review of vegetable garden data. Atlanta: Region IV South Site Management Branch

Report Prepared by:

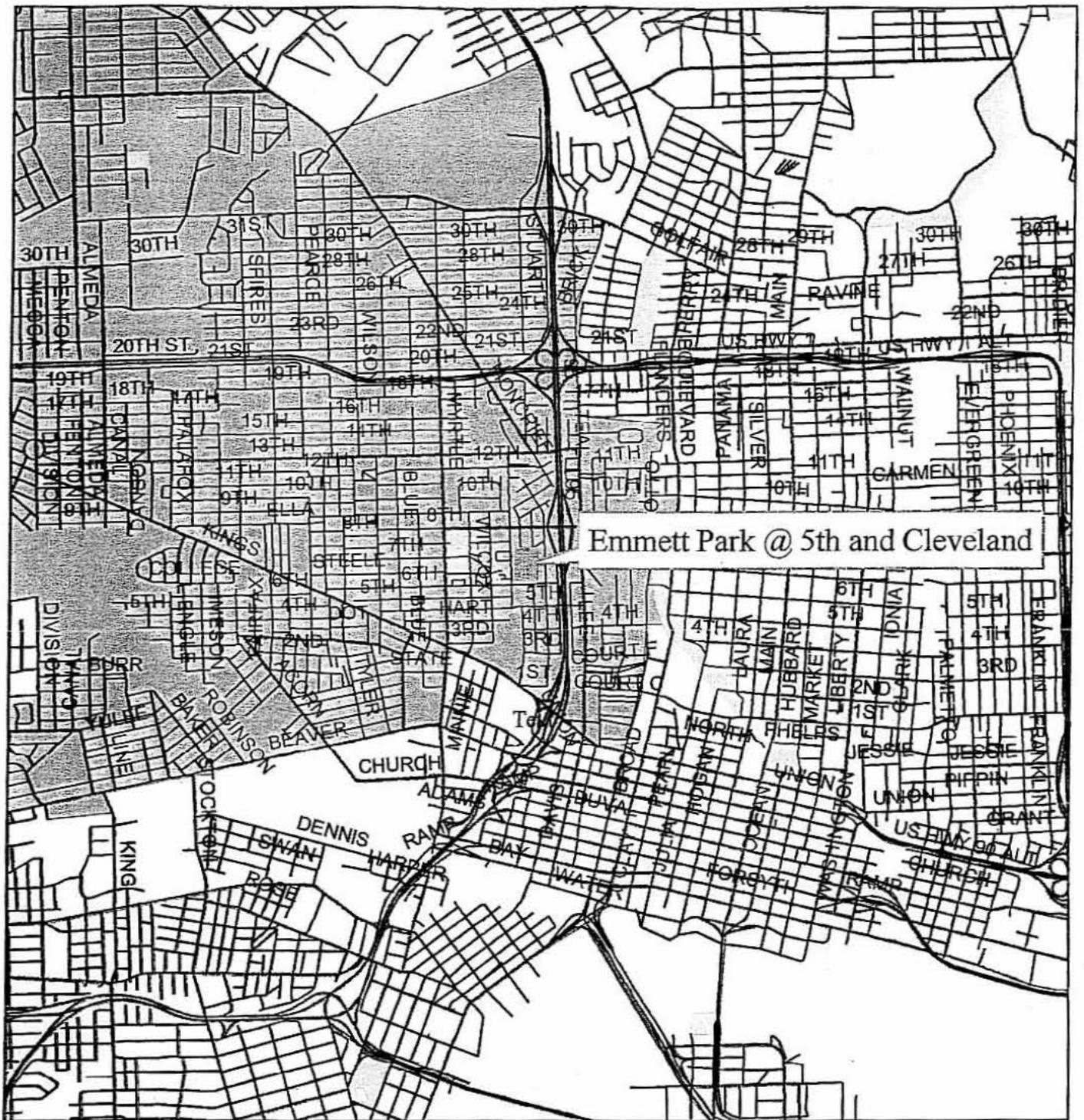
Susan Bland
Biological Scientist
Florida Department of Health
Bureau of Community Environmental Health

Florida DOH Designated Reviewer

Randy Merchant
Program Administrator
Florida Department of Health
Bureau of Community Environmental Health

ATSDR Technical Project Officer

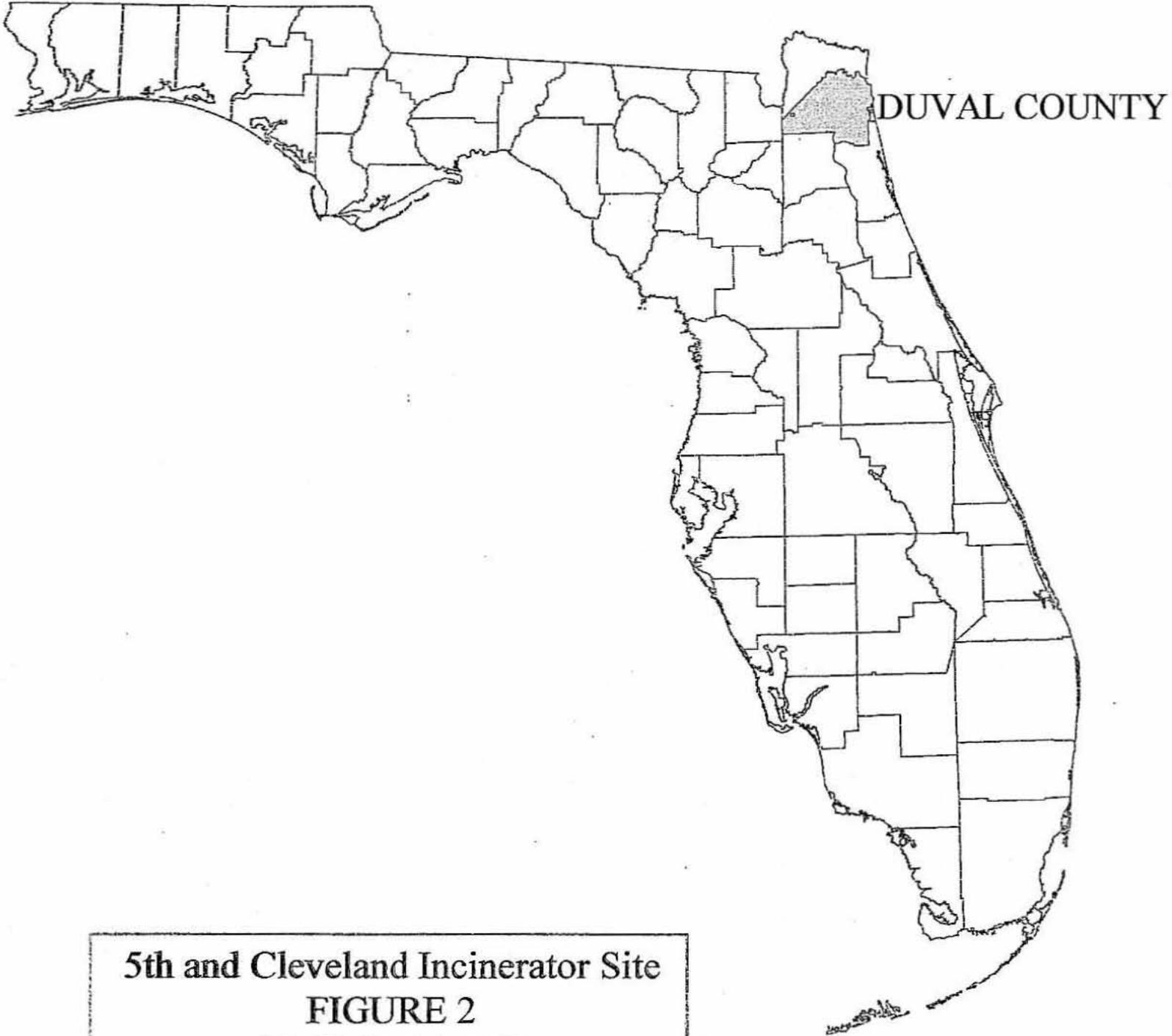
Debra Gable
Division of Health Assessment and Consultation
Superfund Site Assessment Branch
Agency for Toxic Substances and Disease Registry



5th and Cleveland Incinerator Site
 Figure 1
 Street Map

- Legend**
- All Streets
 - Highways
 - Parks
 - Zipcodes (Year 2000)
 - County Boundaries
 - All Streets
 - Highways
 - Parks

FLORIDA MAP



5th and Cleveland Incinerator Site
FIGURE 2
FLORIDA MAP

Source: ArcView 2000

Table I
Detected Results for Vegetable Metals
Jacksonville Garden Sampling
Near 5th and Cleveland Incinerator Site

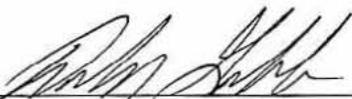
Substance (ppm) †	GARD-01	GARD-03	GARD-05	GARD-07	GARD-09	GARD-11	ATSDR Comparison Value
Lead	0.11†	0.16	0.20	0.28	0.038	0.089	None 400 (EPA guidance)

* parts per million

† = average value

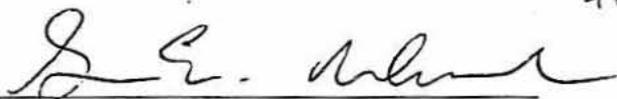
Certification

The 5th and Cleveland Incinerator Health Consultation was prepared by the Florida Department of Health, Bureau of Environmental Epidemiology, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.



Debra Gable
Technical Project Officer,
SPS, SSAB, DHAC
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.



for RE

Roberta Erlwein
Section Chief,
SPS, SSAB, DHAC,
ATSDR

Appendix A

Glossary of Environmental Health Terms

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. Unlike the U.S. Environmental Protection Agency (EPA), which is the federal agency that develops and enforces environmental laws to protect the environment and human health, ATSDR is not a regulatory agency.

This glossary defines scientific and other terms used in this health consultation. This glossary is not a complete dictionary of environmental health terms. If you have questions or comments, call ATSDR's toll-free telephone number, 1-888-42-ATSDR (1-888-422-8737).

Acute

Occurring over a short time [compare with chronic].

Acute exposure

Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with **intermediate duration exposure** and **chronic exposure**].

Adverse health effect

A change in body function or cell structure that might lead to disease or health problems.

Background level

An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

Biota

Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

Chronic

Occurring over a long time (more than 1 year) [compare with **acute**].

Chronic exposure

Contact with a substance that occurs over a long time (more than 1 year) [compare with **acute exposure** and **intermediate duration exposure**].

Comparison value (CV)

Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

No apparent public health hazard

A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

ppb

Parts per billion.

ppm

Parts per million.

Public health action

A list of steps to protect public health.

Public health hazard

A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or **radionuclides** that could result in harmful health effects.

Public health hazard categories

Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are **no public health hazard**, **no apparent public health hazard**, **indeterminate public health hazard**, **public health hazard**, and **urgent public health hazard**.

Registry

A systematic collection of information on persons exposed to a specific substance or having specific diseases [see **exposure registry** and **disease registry**].

Risk

The probability that something will cause injury or harm.

Sample

A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see **population**]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

Sample size

The number of units chosen from a population or environment.

Substance

A chemical.