

Health Consultation

Evaluation of Private Well Sampling Data

CALLAWAY AND SON DRUM SERVICE
LAKE ALFRED, POLK COUNTY, FLORIDA
EPA FACILITY ID: FLD094590916

MARCH 6, 2001

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.

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HEALTH CONSULTATION

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Prepared by:

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

STATEMENT OF ISSUES

On August 15, 2000, the Florida Department of Health (FDOH) held a public availability session regarding the Callaway and Son Drum Service hazardous waste site. At the meeting, FDOH announced the findings of their public health assessment and offered to test nearby potable private wells. FDOH determined that a Health Consultation is an appropriate means to present drinking water data from private wells surrounding a hazardous waste site. The interpretation, advice, and recommendations presented in this Health Consultation are site-specific and should not be considered applicable to any other site. The federal Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Georgia, provides 100% of the funding for these activities.

INTRODUCTION

The Callaway and Son Drum Service hazardous waste site is at 890 East Lake Drive (US 17-92) in Lake Alfred, Polk County, Florida (Figure 1). The site posts a "Callaway and Son Satellite Systems" sign, corresponding to the business that occupied the site after the drum service. The site covers approximately 9.5 acres and consists of a drum cleaning area, a sandblasting and painting area, and a drum storage area (Figure 2). A vacant office building occupies the southern portion of the site. The northern border of the site is a rail line, which separates the site from a University of Florida Agriculture Experiment Station. A plant nursery is south of the site and the Lake Alfred sewage treatment plant is due west. A cemetery and an apartment complex are east of the site.

Land use in this area is a mix of commercial and residential. The apartments east of the site are the nearest residential buildings. Across East Lake Drive (US 17-92) to the southeast and southwest within one-half of a mile of the site are communities with many homes. Residential properties are also northwest of the site. Commercial and nonresidential establishments exist west, north, and northeast of the site. Three schools are within one mile of the site. An elementary school and a career center are approximately 1 mile southwest of the site and another school is 0.3 miles northwest of the site. Each of these schools receives municipal water service. Based on the 1990 census, approximately 1300 people live within 1 mile of the site (Table 1).

Groundwater in this area is contained in two aquifers. The surficial aquifer extends from beneath the surface to about 50 to 75 feet deep. This aquifer provides a low yield of poor-quality water. Most private potable and municipal wells are drilled into the Floridan aquifer, which lies beneath the surficial aquifer and extends several hundred feet deep. Groundwater in both aquifers reportedly flows in a southerly direction.

Between 1977 and 1991, Callaway and Son Drum Service cleaned and recycled 55-gallon citrus and oil drums. The company cleaned the drums with a resin solution and then rinsed them in a 600-gallon fresh water tank. The facility processed about 20 drums per day, 5 days a week. During the citrus season, however, Callaway and Son Drum Service handled up to 500 drums per day (FDER, 1992). The company drained the rinse tank into the pond/wetland area on the eastern portion of the property every two weeks (EPA, 1994). Currently, no business operations exist on-site.

Private Well Testing

In February 2000, the federal Environmental Protection Agency (EPA) proposed the Callaway and Son Drum Service site to the National Priorities List (NPL) of hazardous waste sites. In response, FDOH reviewed all available environmental data and conducted a public health assessment on this site. In the public health assessment report, FDOH classified this site as an "indeterminate public health hazard" based on the limited amount of data. FDOH also made recommendations to area residents and environmental agencies to prevent exposure to site contaminants (FDOH, 2001). On August 15, 2000, FDOH presented the public health assessment report to area residents at a public availability session held at the Lake Alfred City Hall. Several residents expressed a concern about the effect of this site on the area groundwater and private water supplies. Therefore, FDOH, in cooperation with the Polk County Health Department (PCHD), offered to test private potable wells within 0.25 miles of the site, at the well owner's request. In the immediate area, most homes receive municipal water service, including the neighboring apartment complex. However, some homes use private or community wells as a source of potable water.

During the public availability session, FDOH and PCHD received requests from eight well owners to have their well water tested for contaminants from the Callaway site. FDOH and PCHD also tested the City of Lake Alfred municipal water supplies. On September 7, 2000, PCHD personnel collected water samples from the municipal well and eight private wells near the Callaway site. Of these eight wells, five are single household wells located southeast of the site. Another private well is also southeast of the site but serves a larger population (~75). Of the two remaining private wells, one is immediately south of the site. This well is in closest proximity to the site and reportedly is used for irrigation. The last of the eight private wells tested is approximately one mile southwest from the site. The municipal well is slightly less than one mile west of the site. The legend below Table 2 lists the location of these wells in relation to the site. Figure 1 shows the approximate location of the these wells. Reportedly, most area potable and irrigation wells are drilled into the Floridan aquifer, because of its high productivity (EPA, 1994).

Quality Assurance and Quality Control

PCHD adhered to collection methods that are applicable for samples where volatile compounds are to be analyzed. Appropriate chain-of-custody and data reporting procedures were followed and appropriate laboratory, equipment and sample controls were analyzed. The completeness and reliability of the referenced information determine the validity of the analyses and conclusions drawn in this health consultation. The laboratory analyzed each water sample for arsenic, lead, chromium, dichloroethylene, methyl-tert-butyl ether, tetrachloroethylene, trichloroethylene, and vinyl chloride, among other organic compounds. FDOH focused on these specific chemicals since EPA and FDEP had previously detected each of these in the groundwater beneath the Callaway site (FDER, 1984; 1986; 1992; EPA, 1994). In addition, FDOH had chosen these compounds as the chemicals of concern in the public health assessment (FDOH, 2001).

RESULTS

All nine water samples contained detectable levels of arsenic. However, none of the arsenic levels exceeded the Florida drinking water standard. The arsenic levels are also within the range of what can normally be detected in Florida groundwater. Arsenic is a metal that naturally occurs and can be found in numerous mediums, including groundwater and soil. Two of the nine water samples contained chromium and four of the nine samples contained lead. The levels of these metals, like arsenic, do not exceed the respective Florida drinking water standard. In addition, the levels of chromium and lead in these samples are consistent with background concentrations in Florida groundwater. Chromium and lead, like arsenic, are naturally occurring metals that are commonly found in soils and groundwater. Table 2 summarizes the analytical results for each sample.

Only one of the nine well water samples contained any of the organic compounds detected in the groundwater beneath the Callaway site. Well #7, immediately south of the site, contained *cis*-dichloroethylene, methyl-*tert*-butyl ether, tetrachloroethylene, and trichloroethylene (Table 2). The laboratory detected each of these chemicals at a level below its Florida drinking water standard.

CHILDREN AND OTHER UNUSUALLY SUSCEPTIBLE POPULATIONS

The unique vulnerabilities of infants and children demand special emphasis in communities faced with the contamination of their environment. Children are at a greater risk than adults from certain kinds of exposure to hazardous substances. They are more likely to be exposed because they play outdoors and because they often bring food into contaminated areas. They are shorter than adults, which means they breathe dust, soil, and heavy vapors close to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. In addition, the developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most important, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care. Children are a special consideration in regards to this site because children may be more sensitive to several of the contaminants that were previously detected. Children may absorb metals from the intestine more efficiently than adults and may be more sensitive to the toxicity of metals and chlorinated solvents. FDOH does not anticipate this site introducing a health risk specifically to children, since no completed exposure pathway is present. EPA has recently restricted access to the site and the levels of contaminants that are likely to migrate off of the site (i.e., solvents) are not likely to reach a potable well at a concentration that would likely result in a hazardous dose to a child.

CONCLUSIONS

- 1 The arsenic, chromium and lead in these well water samples are unlikely the result of contamination from the Callaway and Son site because:
 - a The concentrations of these metals are typical of Florida groundwater.

- b. In general, arsenic, chromium and lead tend to associate with soil particles and therefore, do not migrate with groundwater flow (ATSDR, 1998; 1999a; 1999b).
2. Since the concentrations of arsenic, chromium, and lead do not exceed the Florida drinking water standards, FDOH does not anticipate regular ingestion or residential use of well water containing low levels of these metals to cause illness.
3. The presence of the *cis*-dichloroethylene, tetrachloroethylene, trichloroethylene and methyl-*tert*-butyl ether in well sample #7, immediately south of the site, is likely the result of contamination from the Callaway and Son site because:
 - a. Unlike metals, these chemicals travel with groundwater flow.
 - b. Previous studies at this site suggest a southerly flow of groundwater in both the surficial and Floridan aquifers.
 - c. The profile of contaminants in the well south of the site is similar to the profile of contaminants in the groundwater beneath the Callaway and Son site.
4. Ingestion of these low levels of chlorinated solvents and methyl-*tert*-butyl ether from the well just south of the site is unlikely to cause illness because:
 - a. The level of each contaminant is well below its respective Florida drinking water standard.
 - b. This well is reportedly used for irrigation. The business at this property receives municipal water service.
5. Site contaminants appear to have migrated to the Floridan aquifer. Previous sampling from the on-site, Floridan well (~130 feet) showed no contamination (FDER, 1984). However, the well south of the site is drilled to a depth of approximately 100 feet, which is the upper Floridan aquifer. The Floridan aquifer provides much of the potable water for this area of Florida.
6. FDOH classifies the off-site groundwater contamination exposure pathway at the Callaway and Son site “no apparent health hazard”. It is not likely that hazardous concentrations of these contaminants will reach a potable water source.
 - a. Metals (i.e. arsenic, lead etc.) do not generally migrate well with groundwater flow and are therefore, unlikely to reach a potable water well. See conclusion #1 b.
 - b. The concentration of chlorinated solvents, which migrate very well with groundwater flow, is likely to be diluted by the groundwater to the extent that if these compounds did reach a potable well, the concentration would likely be too low to cause illness (FDOH, 2001).

RECOMMENDATIONS

To aid in identifying the extent of deep groundwater contamination, FDOH recommends that environmental agencies begin to regularly test the on-site Floridan aquifer well and the neighboring Floridan well immediately south of the site (Well #7). Although FDOH does not anticipate these solvents to cause illness in the future, regular testing of these deep wells will aid in monitoring the movement of the contaminants in the “potable” aquifer.

PUBLIC HEALTH ACTION PLAN

1. FDOH will provide each well owner a copy of the water sampling data corresponding to their well.
2. FDOH will provide a copy of this Health Consultation to each well owner, the PCHD, and Lake Alfred city officials.
3. FDOH will request that environmental agencies continue to test the well south of the site (Well #7) and if requested, FDOH will evaluate the results.
4. When available, FDOH will evaluate future data and the sampling plans to gather additional data.

REFERENCES

ATSDR (1998) Toxicological profile for chromium, Draft (Update). Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

ATSDR (1999a) Toxicological profile for arsenic (Update). Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

ATSDR (1999b) Toxicological profile for lead (Update). Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

EPA (1994) Expanded site inspection. Callaway and Son Drum Service. Lake Alfred, Polk County, Florida.

FDER (1984) Site Investigation Report #84-11. Callaway and Son Drum Reconditioning. Lake Alfred, Polk County, Florida.

FDER (1986) Groundwater investigation report number 86-15, Lake Alfred Fuel Spill, Polk County Florida.

FDOH (2001) Public Health Assessment: Callaway and Son Drum Service, Lake Alfred, Polk County, Florida. Cerclis No. FLD094590916.

FDER (1992) Phase II Site Inspection Report. Callaway and Son Drum Service. Lake Alfred, Polk County, Florida.

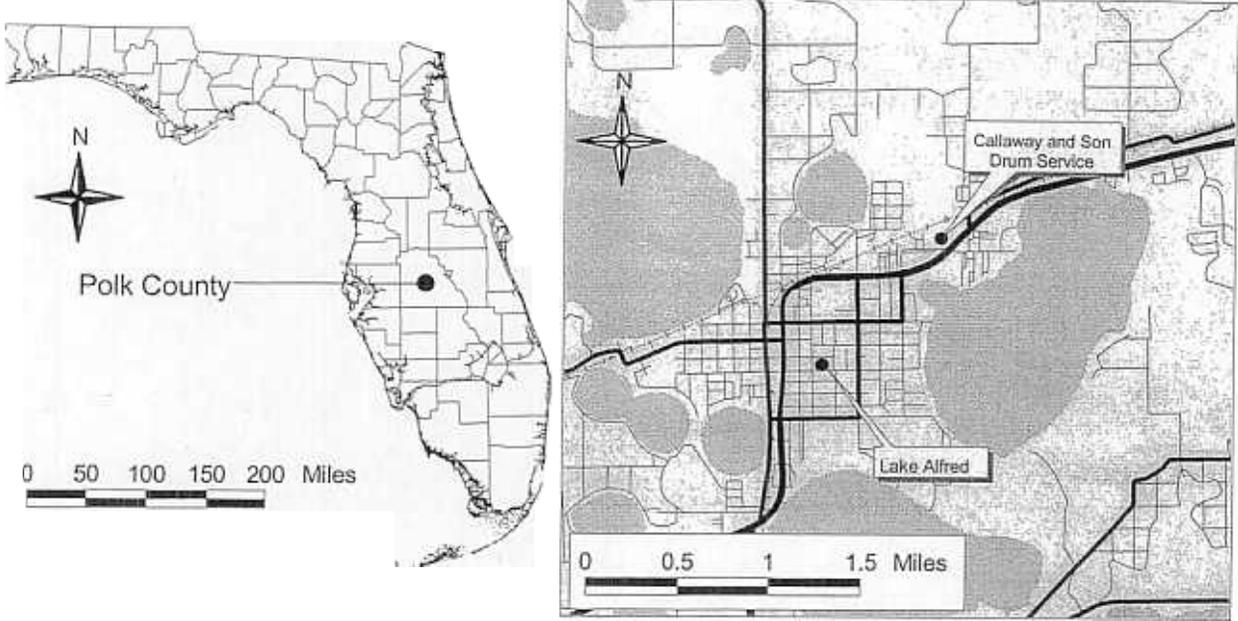
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⊙ Approximate well location

Figure 1. Site and Well Locations

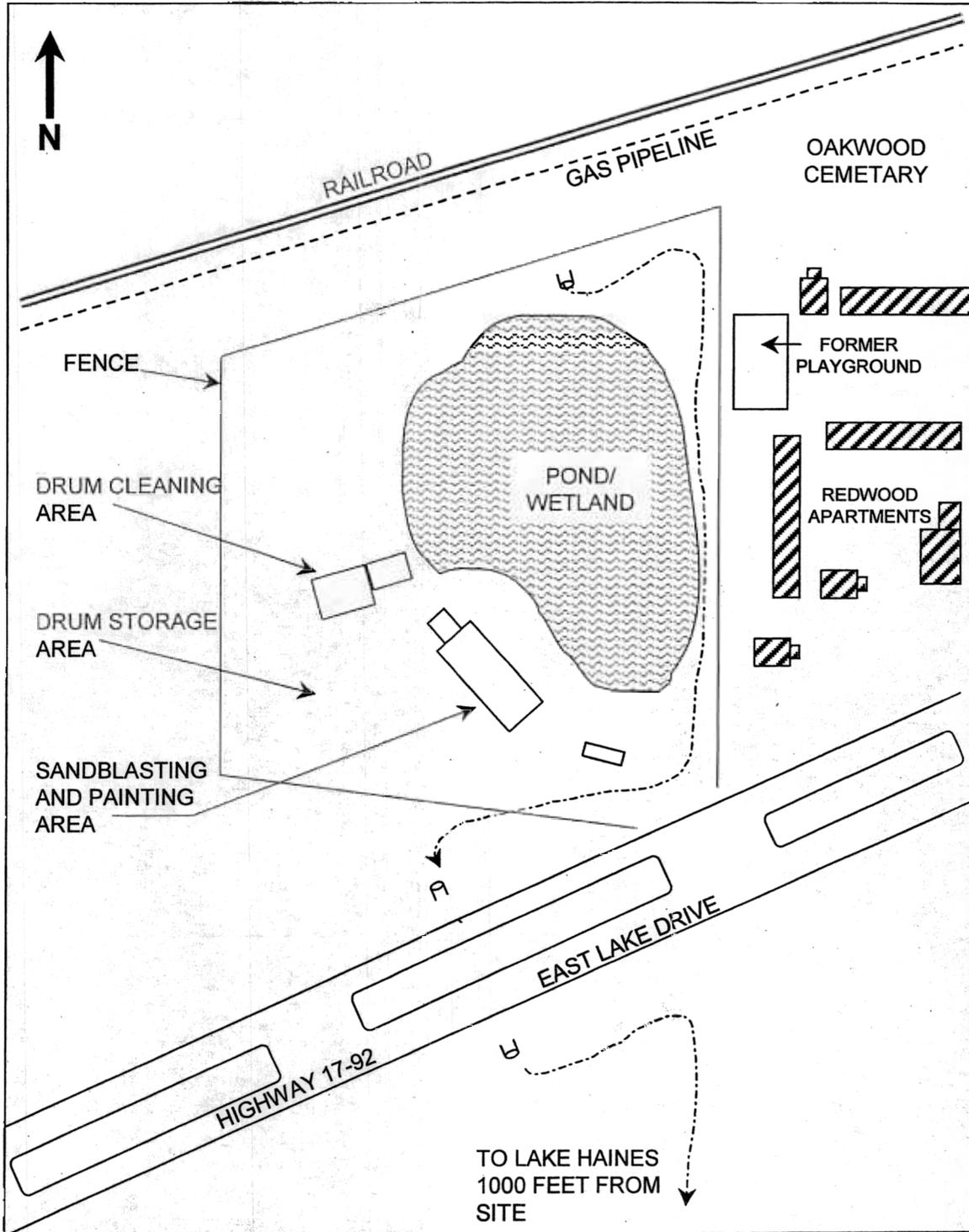


Figure 2. Site Layout

Table 1. Total Population Estimation Table

Pathway Types	Estimated Total Population in Potential Exposure Pathways*	Minimum Population*	Maximum Population*
Potential Pathways On-site	0	0	1-50
Potential Pathways Off-site	1300	0	501-2500
Total Potential On and Off-site	1300	0	501-2500
Completed Pathways On-site	10	0	1-50
Completed Pathways Off-site	0	0	0
Total Completed On and Off-site	10	0	1-50
Potential and Completed Pathways On-site	10	0	1-50
Potential and Completed Pathways Off-site	1300	0	501-2500
Total Potential and Completed On and Off-site	1310	0	501-2500

Table 2. Well Sampling Results (mg/L)

Contaminant	Std (mg/L) ^a	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6	Well 7 ^b	Well 8	Well 9
Arsenic	0.05	0.001	0.004	0.001	0.002	0.0008	0.0003	0.004	0.0009	0.001
Chromium	0.1	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	0.003	N.D.	N.D.
Lead	0.015	0.002	N.D.	0.002	0.002	N.D.	N.D.	N.D.	0.0017	N.D.
<i>cis</i> -Dichloroethylene	0.07	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0.002	N.D.	N.D.
<i>trans</i> -Dichloroethylene	0.1	N.D.	N.D.	N.D.						
Methyl- <i>tert</i> -butyl ether	0.05	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0.0007	N.D.	N.D.
Tetrachloroethylene	0.003	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0.001	N.D.	N.D.
Trichloroethylene	0.003	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	0.002	N.D.	N.D.
Vinyl Chloride	0.001	N.D.	N.D.	N.D.						

mg/L- milligrams per liter

N.D.- Not detected

^a - Florida Department of Environmental Protection drinking water standards

^b - Value shown is the average of two determinations

- Well 1 Heurman Road (southeast)
- Well 2 East Lane (southeast)
- Well 3 Mosley Road (southeast)
- Well 4 Mosley Road (southeast)
- Well 5 Mosley Road (southeast)
- Well 6 Mallard (southeast)
- Well 7 Lake Alfred Road (south)
- Well 8 Glencruiten (southwest)
- Well 9 Municipal Well (west)

ATSDR PLAIN LANGUAGE GLOSSARY OF ENVIRONMENTAL HEALTH TERMS

Revised -15 Dec 99

Adverse Health Effect: A change in body function or the structures of cells that can lead to disease or health problems.

ATSDR: The Agency for Toxic Substances and Disease Registry. ATSDR is a federal health agency in Atlanta, Georgia that deals with hazardous substance and waste site issues. ATSDR gives people information about harmful chemicals in their environment and tells people how to protect themselves from coming into contact with chemicals.

Background Level: An average or expected amount of a chemical in a specific environment. Or, amounts of chemicals that occur naturally in a specific-environment.

Cancer: A group of diseases which occur when cells in the body become abnormal and grow, or multiply, out of control

Carcinogen: Any substance shown to cause tumors or cancer in experimental studies.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): CERCLA was put into place in 1980. It is also known as **Superfund**. This act concerns releases of hazardous substances into the environment, and the cleanup of these substances and hazardous waste sites. ATSDR was created by this act and is responsible for looking into the health issues related to hazardous waste sites.

Dose: The amount of a substance to which a person may be exposed, usually on a daily basis. Dose is often explained as “amount of substance(s) per body weight per day”.

Environmental Contaminant: A substance (chemical) that gets into a system (person, animal, or the environment) in amounts higher than that found in **Background Level**, or what would be expected.

Environmental Media: Usually refers to the air, water, and soil in which chemicals of interest are found. Sometimes refers to the plants and animals that are eaten by humans.

Environmental Protection Agency (EPA): The federal agency that develops and enforces environmental laws to protect the environment and the public’s health.

Hazardous Waste: Substances that have been released or thrown away into the environment and, under certain conditions, could be harmful to people who come into contact with them.

MRL: Minimal Risk Level. An estimate of daily human exposure – by a specified route and length of time -- to a dose of chemical that is likely to be without a measurable risk of adverse, noncancerous effects. An MRL should not be used as a predictor of adverse health effects.

NPL: The **National Priorities List**. (Which is part of **Superfund**.) A list kept by the U.S. Environmental Protection Agency (EPA) of the most serious, uncontrolled or abandoned hazardous waste sites in the country. An NPL site needs to be cleaned up or is being looked at to see if people can be exposed to chemicals from the site.

PHA: **Public Health Assessment**. A report or document that looks at chemicals at a hazardous waste site and tells if people could be harmed from coming into contact with those chemicals. The PHA also tells if possible further public health actions are needed.

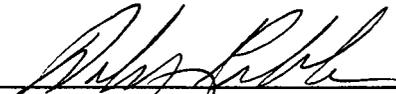
SARA: The **Superfund Amendments and Reauthorization Act** in 1986 amended CERCLA and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from chemical exposures at hazardous waste sites.

Toxic: Harmful. Any substance or chemical can be toxic at a certain dose (amount). The dose is what determines the potential harm of a chemical and whether it would cause someone to get sick.

Toxicology: The study of the harmful effects of chemicals on humans or animals.

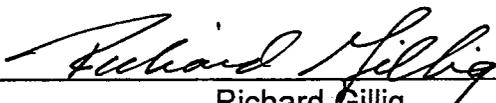
CERTIFICATION

This Callaway and Son Drum Service Health Consultation was prepared by the Florida Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was begun.



Debra Gable, Technical Project Officer
Division of Health Assessment and Consultation
ATSDR

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



Richard Gillig,
Section Chief, SPS, SSAB, DHAC, ATSDR