

HEALTH CONSULTATION

CIRCLE LEAD PRODUCTS

ST. PETERSBURG, PINELLAS COUNTY, FLORIDA

EPA FACILITY ID: FLD984248005

Prepared by:

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

Summary and Statement of Issues

The principal purposes of this St. Petersburg, Florida, Circle Lead Products health consultation are first, to determine whether blood-lead levels of area children are likely to cause illness. Second, whether water from the on-site well is a public health threat, and finally, whether soil and dust lead levels are a public health threat.

Between July 1999 and December 2000, the Pinellas County Health Department tested 295 children within 3 miles of this site. Their measured blood-lead levels were below guidelines and are not likely to cause illness.

In June 2000, the U.S. Environmental Protection Agency (USEPA) tested soil, water and indoor dust at the site. In October 2000, USEPA removed the lead-smelting shed and removed lead-contaminated soil from the site and adjacent alley. USEPA also cleaned the owner's house and garage. The owner replaced the contaminated shallow irrigation well.

It is unlikely that the site owner suffered illness from lead in the irrigation well. And because the owner replaced the contaminated irrigation well with one that is not contaminated, well water at the site is currently not a public health concern.

Since the USEPA removed the lead- contaminated soil in 2000, the Florida DOH does not expect any illness from current exposure to soil at the site. However, because USEPA did not use a HEPA filter and did not take confirmatory dust samples, the Florida DOH is unable to determine the remaining risk, if any, from lead-contaminated dust inside the house on the site. The Florida DOH recommends USEPA collect confirmatory dust samples inside the house on the site should there be a need to estimate the this risk.

Currently, Florida DOH can not estimate the likelihood of illness from breathing lead fumes from the Circle Lead Products site since information concerning air monitoring at the site is not available.

Site Description and History

The Circle Lead Products site is at 4303 46th Street North in a residential area of St. Petersburg, Pinellas County, Florida (APPENDIX A, Figures 1 and 2). The 90 by 122-foot site included a three-room house, garage, carport, and shed (APPENDIX A, Figure 3 and APPENDIX B, Photos #1-8). Access to the site is via an alley off of 43rd Avenue.

Between 1982 and 1999, the property owner operated Circle Lead Products, smelting scrap lead into weights for the scuba diving and fishing industry. The owner smelted lead in a vat housed in a small, 10 by 11-foot metal shed equipped with an electric exhaust fan. He also used the garage for other production activities. USEPA estimates Circle Lead Products produced 95,000 pounds of scuba-diving weights per year. USEPA also estimates Circle Lead Products produced 2,100 pounds of waste "dross" per year. Dross is the scum that collects on the surface of the liquid in the smelting vat.

The Florida Department of Environmental Protection (DEP) began investigating this site in 1992. DEP found lead scraps and production waste outside the smelting shed and lead splatter on the floor, walls and ceiling inside the shed. In addition, DEP noted a fume stack and ventilation louvers in the shed. The owner claimed to have disposed of all the contaminated soils but did not test the remaining soils to confirm that lead concentrations in the soils were at acceptable levels. In 1999, the Florida DEP collected six soil samples near the shed to test for lead contamination. The highest lead soil concentration was 19,300 milligrams per kilogram (mg/kg). Lead concentrations in all six soil samples were above the Florida DEP's guidance level of 400 mg/kg.

In May 2000, the Florida DEP referred this site to the USEPA. In June 2000, contractors for USEPA collected 31 soil samples from the site and three from the adjacent alley. They found lead in all the soil samples. The highest lead concentration was 102,000 mg/kg in the adjacent alley. The highest concentration on site was 61,600 mg/kg, near the shed. DEP also found arsenic, chromium and silver in some of the soil samples. The USEPA contractors noted children playing in the adjacent alley.

USEPA contractors also collected 11 wipe samples from inside the shed, the back of the house, the bathroom sink, the doorway in the hall, and the bedroom floor. USEPA found the highest lead concentration on the shed floor (261,000 micrograms per wipe). The highest lead concentration in the house was on the floor near the back door (3,640 micrograms per wipe). USEPA contractors cleaned the house by light vacuuming, mopping, and wet vacuuming.

In July 2000, the Pinellas County Health Department (CHD) went door-to-door in a nearby apartment complex. Department representatives distributed flyers and encouraged parents to have their children screened for lead poisoning and to keep their children away from the Circle Lead Products site. Of the children screened, the Pinellas CHD did not find any elevated blood-lead levels in the children living in the apartment complex or attending the nearby Circle of Friends Day Care center.

In September 2000, USEPA contractors tested soil at nearby properties but found that contamination was limited to the site and adjacent alley. They tested soil at a nearby house where the owner of Circle Lead Products had previously lived, but did not find any contamination.

Also, in September 2000, USEPA contractors found 350 micrograms per liter (ug/L) of lead in the on-site shallow irrigation well. This concentration exceeded the drinking water standard of 15 ug/L. Although this irrigation well was not used for drinking, to eliminate any lead contamination Circle Lead Products installed a new, deeper irrigation well. Drinking water for the area around Circle Lead Products is supplied by the city.

In October and November 2000, USEPA contractors removed the carport and shed. They decontaminated the garage by replacing the flooring and washing the walls to remove any respirable lead dust. They removed the top 12 inches of lead-contaminated soil on the site and in the adjacent alley (approximately 350 tons). After soil removal they found lead in two areas and removed 6 more inches of soil. They then backfilled with clean soil (Figure 4).

In April 2002, the Pinellas CHD confirmed that the owner's daughter and two teenage grandchildren were living in the house on the site.

Discussion

Lead Production

Lead is produced from both primary (i.e., mined ore) and secondary (i.e., scrap metal and wastes) sources. Of lead used in 1997, 86.9% was used for storage batteries, 7.8% was used in metal products, and 5.3% was used in miscellaneous applications. Because of the adverse health effects associated with exposure to lead, its use in paints, ceramic products, gasoline additives (now banned), and solder has declined dramatically in recent years (ATSDR 1999).

Lead Smelting Sites

Lead is usually smelted (melted) at large industrial facilities. Circle Lead Products, however, was a small scale operation in a residential neighborhood. Lead and lead compounds are the principal contaminants of concern. When lead is used in industrial applications, cadmium, copper, arsenic, antimony and selenium are often present, but usually below hazardous concentrations (USEPA 1992).

Environmental Lead Exposure

In addition to workers, other groups are at risk of exposure to high levels of lead. These groups include fetuses, preschool-age children, white males between 40 and 59 years of age, and those who purposely inhale leaded gasoline vapors (so-called "sniffers").

Individuals living near lead production or disposal sites are also at risk of exposure to lead. USEPA has found lead at 1,026 of the 1,467 National Priorities List (NPL) hazardous waste sites. Lead is the metal most frequently found at hazardous waste sites. People living near hazardous waste sites could be exposed to lead by breathing contaminated air, drinking contaminated water, eating contaminated foods, or swallowing or touching contaminated dust or dirt (ATSDR 1999).

Exposure of the general population to lead is most likely to occur through the ingestion of contaminated food and drinking water, and by the inhalation of lead particulates in ambient air. Direct inhalation of lead accounts for only a small part of the total human exposure. Lead that is adsorbed to soil, however, can be inhaled as dust and coughed up and swallowed (ATSDR 1999).

Lead is extremely persistent in both water and soils. Workers occupationally exposed to lead can carry it home on their clothing, bodies, and tools. Lead dust is likely to be found in places where lead is mined or smelted, where car batteries are made or recycled, where electric cable sheathing is made, where fine crystal glass is made, or where certain types of ceramic pottery are made. Pets can also bring lead into the home in dust or dirt on their fur or feet if they spend time in

places that have high lead levels in the soil. Once lead falls onto soil, it usually sticks to soil particles, and it can remain stuck to soil particles in water for many years (ATSDR 1999).

Human exposure to lead above baseline levels is common. Baseline refers to the naturally occurring level of lead in soil or dust that is not due to human activity. Some of the lead exposures that most exceed baseline levels occur in urban environments.

Lead in Soils and House Dust

Because USEPA removed the lead-contaminated soil at the Circle Lead Products site, the Florida DOH does not expect any illness to occur from current or future exposure to soil at this site.

Because USEPA did not use a High Efficiency Particulate Arresting (HEPA) filter and did not take confirmatory dust samples, Florida DOH is unable to determine the remaining risk, if any, from lead-contaminated dust inside the house on this site.

Lead in Water

USEPA contractors found 350 micrograms per liter (ug/L) of lead in the on-site shallow irrigation well. This concentration exceeded the drinking water standard of 15 ug/L. Although this irrigation well was not used for drinking, to eliminate any lead contamination Circle Lead Products installed a new, deeper irrigation well. It is unlikely that the site owner suffered any illness from the lead in the irrigation well and is not considered to be a current public health concern. Drinking water for the area around Circle Lead Products is supplied by the city.

Lead in Air

Currently, Florida DOH can not estimate the likelihood of illness from breathing lead fumes that may have occurred in the past at the Circle Lead Products site since information concerning air monitoring at the site is not available.

Lead in Blood

Most of the lead that enters the body comes from what one eats and drinks. Some lead enters the body from breathing in dust or chemicals that contain lead. Shortly after lead gets into the body, it travels in the blood to the “soft tissues” such as the liver, kidneys, lungs, brain, spleen, muscles, and heart. After several weeks, most of the lead moves into the bones and teeth. In adults, about 94% of the total amount of lead in the body is contained in the bones and teeth.

About 73% of the lead in children’s bodies is stored in their bones. Some of the lead can stay in their bones for decades. Some lead can, however, under certain circumstances leave the bones and reenter the blood and organs. This can occur during pregnancy and periods of breast feeding, after a bone is broken, and during advancing age. The half-life of lead in the blood is 28-36 days. This means after 28-36 days, the amount of lead in the blood is ½ the amount it was on the first

day of exposure. This also means that higher blood-lead levels will generally reflect recent more exposures (ATSDR 1999).

Centers for Disease Control and Protection (CDC) studies show blood-lead levels of U.S. children have dropped dramatically since the late 1970s. This is because lead is banned from gasoline, residential paint, and solder used for food cans and water pipes. Still, about 900,000 U.S. children between the ages of 1 and 5 years are believed to have blood-lead levels equal to or greater than 10 micrograms per deciliter (ug/dL)—the CDC level of concern (ATSDR 1999).

The CDC considers children to have an elevated level of lead if the amount of lead in the blood is at least 10 ug/dL. Medical evaluation and environmental investigation and remediation should be done for all children with blood-lead levels equal or greater than 20 ug/dL. Medical treatment might be necessary in children if the lead concentration in blood is higher than 45 ug/dL (ATSDR 1999).

Blood-lead levels of children in households of occupationally exposed workers are almost twice those of children whose parents were not occupationally exposed to lead (10–14 and 5–8 ug/dL, respectively) (ATSDR 1999).

Blood-Lead Testing

The Florida DOH checked the state lead database to determine the blood-lead levels of children 0-6 years of age who lived within about 3 miles of the site between July 1999 and December 2000 (Figure 4). Florida DOH found that none of the 65 children within 1 mile of the site, or the 295 children within 3 miles of the site, had measured blood-lead levels consistently greater than 10 micrograms per deciliter (ug/dL). Six children within 3 miles of the site had initial blood-lead levels between 10 and 19 ug/dL, but when the children were retested, blood-lead levels of these children were less than 10 ug/dL. Levels less than 10 ug/dL are not expected to cause illness.

Child Health Initiative

Children are more sensitive to the effects of lead than adults. Lead affects children in different ways, depending how much lead a child swallows. It is important to remember children are not small adults. A child's exposure can differ from an adult's exposure in many ways. Children drink more fluids, eat more food, and breathe more air per kilogram of body weight than do adults. Children also have a larger skin surface in proportion to their body volume. A child's diet often differs from that of an adult's. A child's behavior and lifestyle also influence exposure. Children—especially small children—crawl on the floor, put things in their mouths, and might ingest inappropriate items such as dirt or paint chips. Children also spend more time outdoors than do adults. Finally, children are closer to the ground than are adults and do not have the judgment of adults for avoiding hazards (ATSDR 1999). That said, however, as discussed in the previous section, because of the measured blood-lead levels found in children near the Circle Lead site, Florida DOH does not expect those children to experience adverse health effects .

Conclusions

Before 2000—because of high surface soil lead concentrations—the Circle Lead Products site was considered a public health hazard. Because of USEPA’s remediation in 2000, however, the site is currently categorized as a **no apparent public health hazard**. Also,

1. The measured blood-lead levels of the children tested within 3 miles of the Circle Lead Products site from July 1999 to December 2000 are not likely to cause illness.
2. Florida DOH does not expect any illness from current or future exposure to soil at the Circle Lead Products since the USEPA removed lead-contaminated soil from the site.
3. The owner replaced the contaminated irrigation well with one that is not contaminated with site-related chemicals. Since this well was not used for drinking purposes, it is unlikely that the site owner suffered illness from lead in the original irrigation well at the Circle Lead Products site. Thus well water at the Circle Lead Products site is not a public health concern.
4. Since the USEPA removed the lead-contaminated soil in 2000, the Florida DOH does not expect any illness from current exposure to soil at the site. Still, because USEPA did not use a HEPA filter and did not take confirmatory dust samples, Florida DOH is unable to determine the remaining risk, if any, from lead-contaminated dust inside the house on the site.
5. Currently, Florida DOH can not estimate the likelihood of illness from breathing lead fumes that may have occurred in the past at the Circle Lead Products site since information concerning air monitoring at the site is not available.

Recommendations/Public Health Action Plan

1. Should there be a need to determine the remaining risk, if any, from lead-contaminated dust that may remain in the on-site house, the Florida DOH recommends USEPA collect confirmatory dust samples inside the house on the site.
2. The Florida DOH will make this health consultation available to the public.

References

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

Centers for Disease Control and Prevention (CDC). 2001. National report on human exposure to environmental chemicals (NHANES Survey 1999). Atlanta: National Center for Environmental Health/Division of Laboratory Sciences.

Preparer of the Report

Susan Bland
Biological Scientist IV
Florida Department of Health
Bureau of Environmental Epidemiology

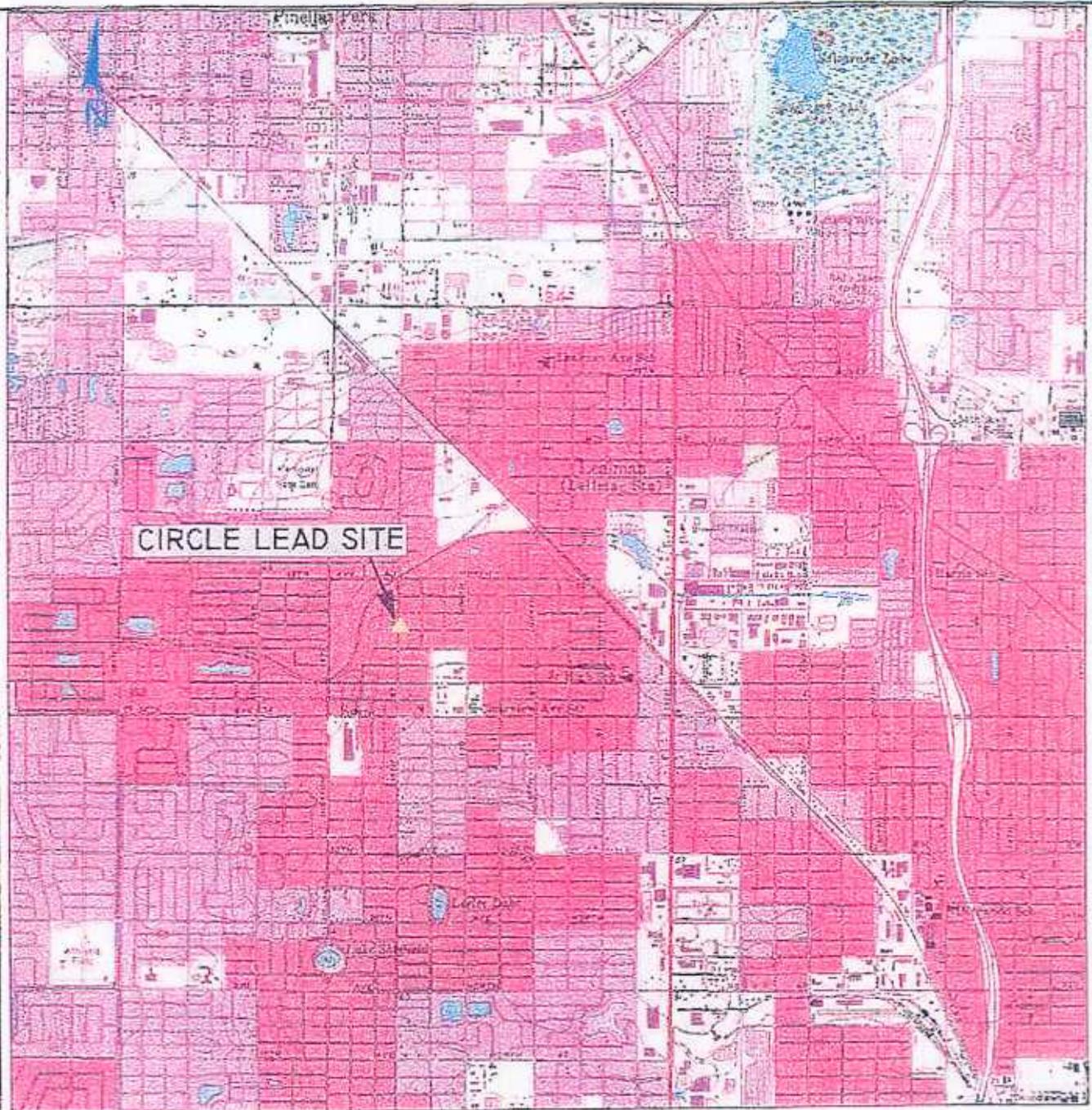
Florida DOH Designated Reviewer

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

ATSDR Designated Reviewer

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

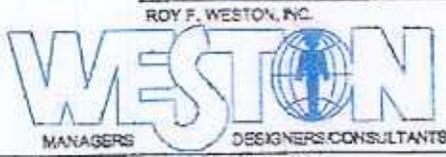
APPENDIX A: Figures



MODIFIED U.S.G.S. QUAD ST. PETERSBURG MAP (7.5 SERIES). DATED 1956, PHOTOREVISED 1987

FIGURE 1
SITE LOCATION MAP
CIRCLE LEAD PRODUCTS

FIGURE 1
GENERAL SITE LOCATION MAP



DRAWN: M. SNEED	DATE: 6/19/01	W.O. NO.: 12587-001-002-0015
SCALE: N.T.S.	EPA ID NO.: N/A	TDD NO.: 4W-01-10-B-021

Map of Florida



FIGURE 2
FLORIDA COUNTY MAP
CIRCLE LEAD PRODUCTS

SOURCE: FLORIDA DOH FILES

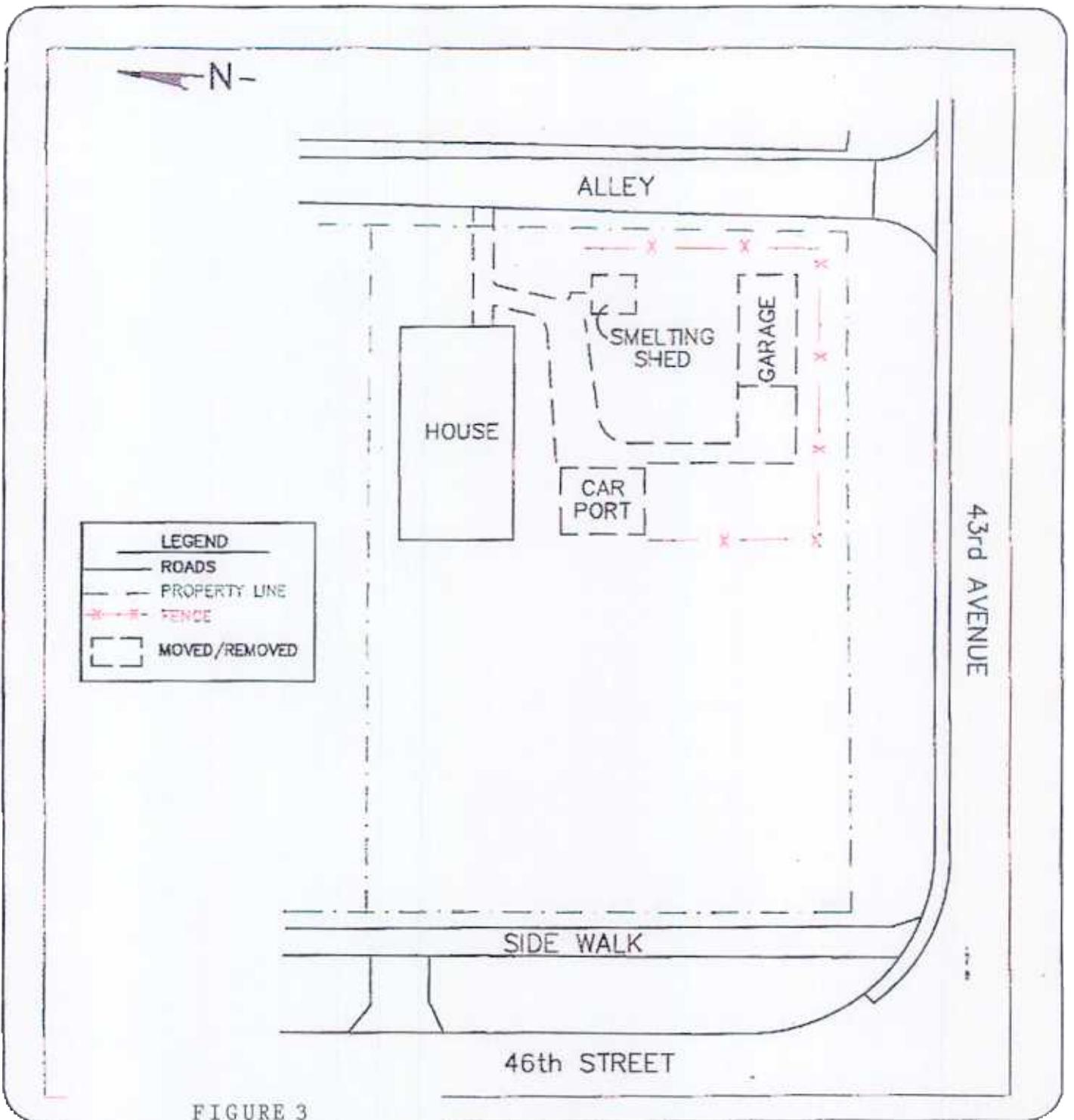


FIGURE 3
SITE LAYOUT MAP
CIRCLE LEAD PRODUCTS

FIGURE
SITE LAYOUT MAP



DRAWN: M. SNEED	DATE: 6/19/01	W.O. NO.: 12557-001-002-0015
SCALE: N.T.S.	EPA ID NO: N/A	DD NO: 4W-01-10-B-021

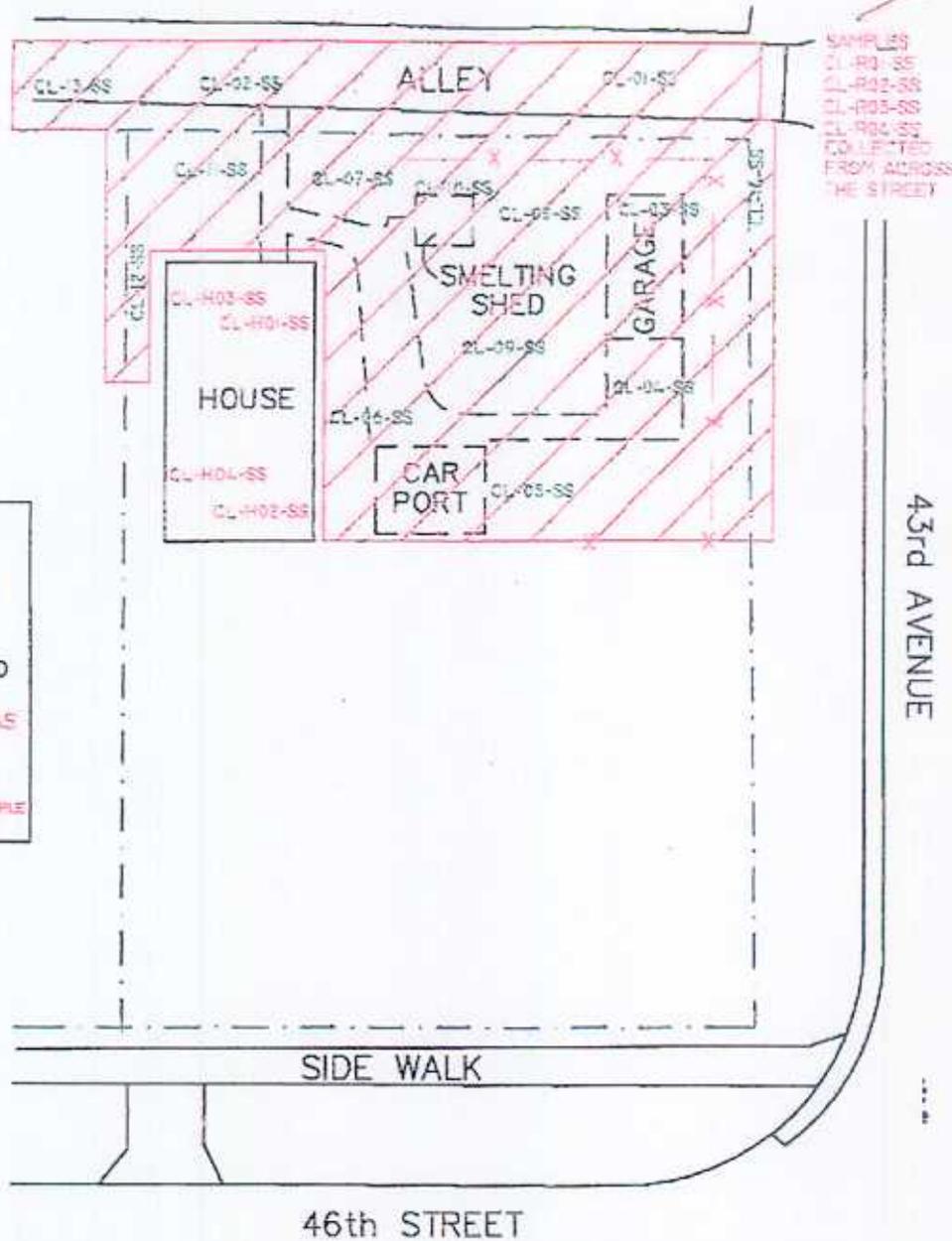


FIGURE 4

SAMPLE LOCATIONS AND EXCAVATED AREAS
CIRCLE LEAD PRODUCTS

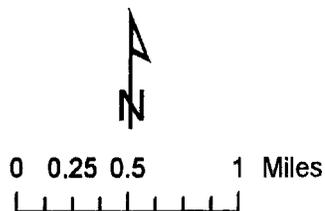
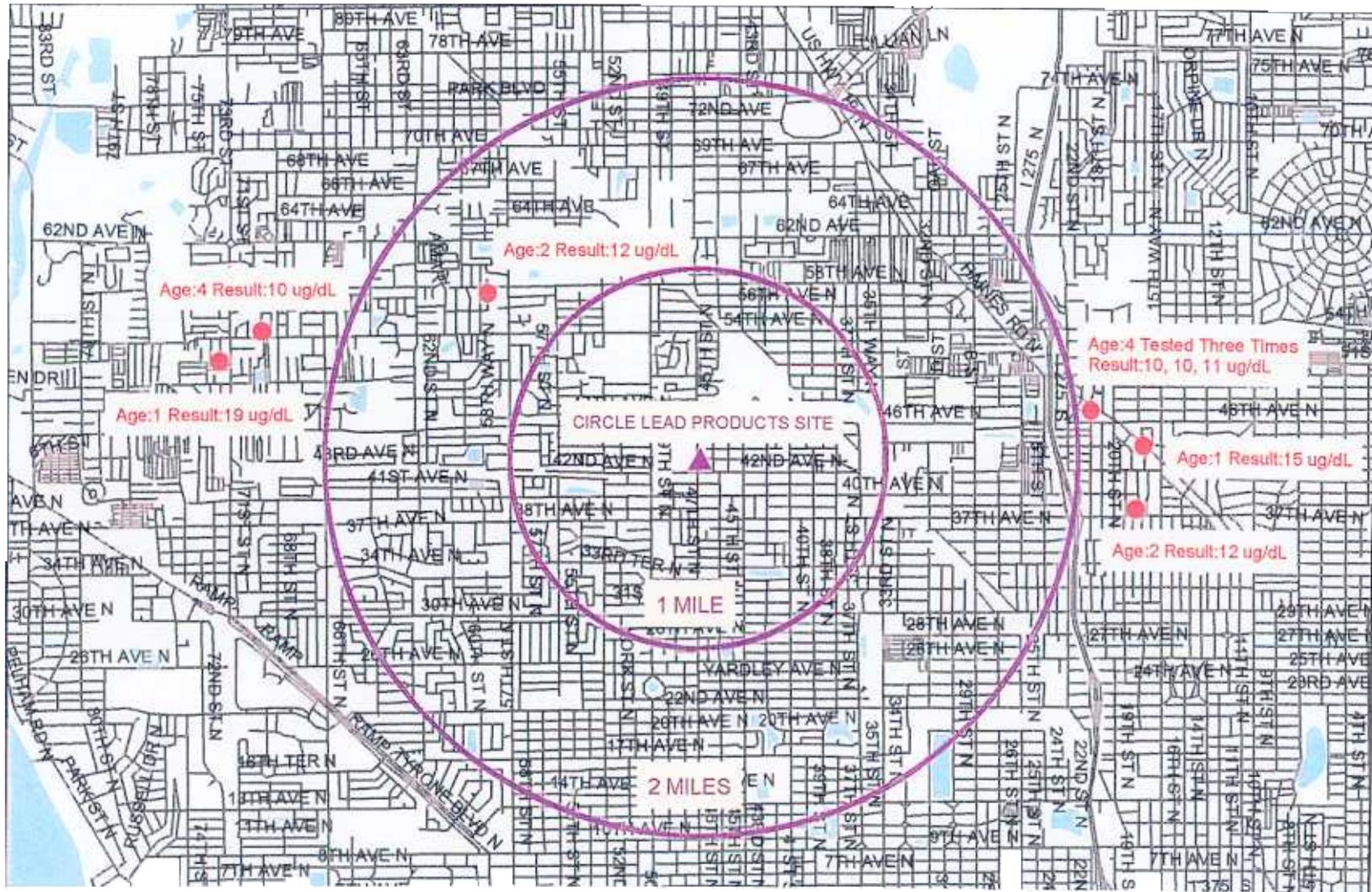
FIGURE 3
SAMPLE LOCATIONS AND EXCAVATED AREAS



DRAWN: M. SNEED	DATE: 6/19/01	W.O. NO.: 12587-001-002-0015
SCALE: N.T.S.	EPA ID NO: N/A	TDD NO: 4W-01-10-B-021

FIGURE 5
ELEVATED BLOOD LEAD RESULTS:
CIRCLE LEAD PRODUCTS

Elevated Blood Lead Results Circle Lead Products Site - St. Petersburg, Florida Pinellas County



Legend

- Location of children with elevated blood lead levels (≥ 10 mcg/dL) collected by Pinellas County Health Department, 1999-2000
- All Streets

Disclaimer:

This product is for reference purposes only and is not to be construed as a legal document. Any reliance on the information contained herein is at the user's own risk. The Florida Department of Health and its agents assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

APPENDIX B: Photographs



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 1**

Subject: Front yard of residence prior to removal action

Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

October, 2000

Orientation: North

Photographer: Unknown, CMC

Witness: Unknown

B-1

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 2**

Subject: Rear of house prior to removal action

Circic Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

October, 2000

Orientation: West

Photographer: Unknown, CMC

Witness: Unknown

B-2

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 3**

Subject: Carport, sheds, and lawn inside the fence. The majority of the excavated material was removed from this area.

Site: Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

Date: October, 2000

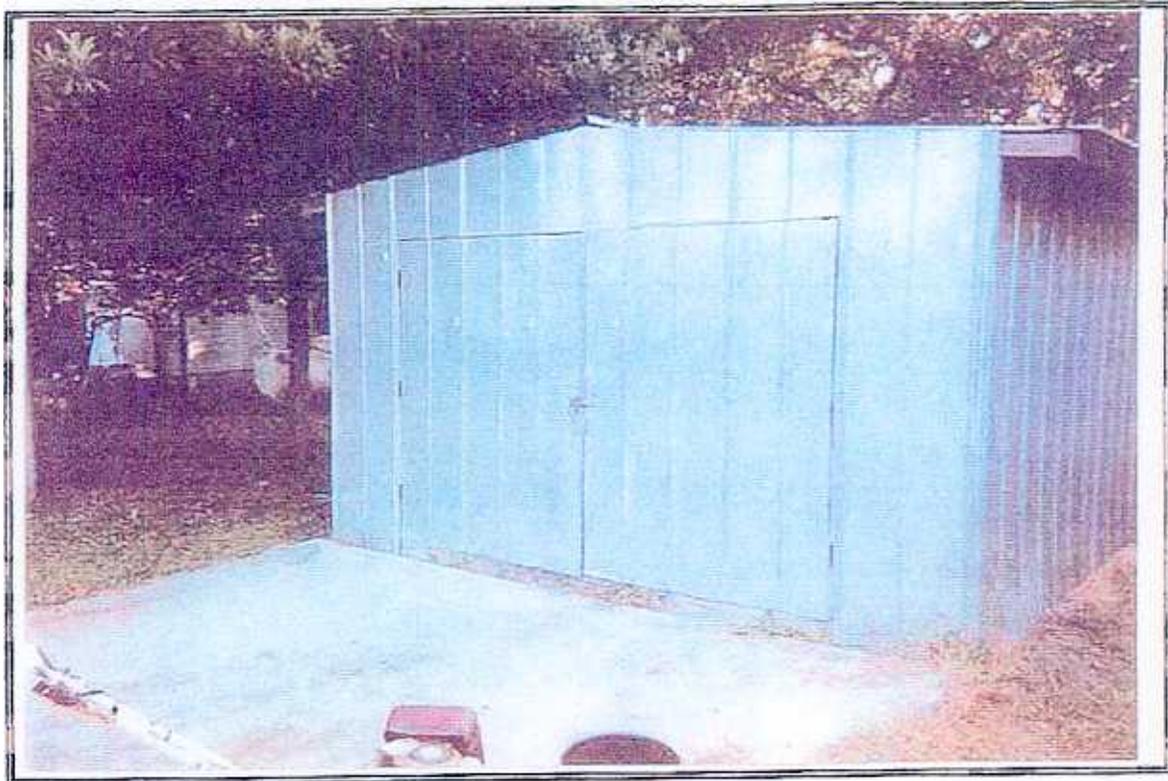
Orientation: Southeast

Photographer: Unknown, CMC

Witness: Unknown

B-3

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 4**

Subject: Metal shed, inside of which occurred most of the lead products were made

Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

October, 2000

Orientation: Northeast

Photographer: Unknown, CMC

Witness: Unknown

B-4

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 5**

Subject: Excavation of the alley behind the residence

Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

October 23, 2000

Orientation: Northwest

Photographer: Alexis Ande, START

Witness: Bill Jaekel, CMC

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 6**

Subject: Extent of excavation at rear of house

Site: Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

Date: October 26, 2000

Orientation: North

Photographer: Alexis Ande, START

Witness: Bill Jaekel, CMC

B-6

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 7**

Subject: Contaminated soil stockpiled prior to off-site transport

Circle Lead Site
St. Petersburg, Pinellas County, Florida
TDD No. 4W-01-10-B-021

October 23, 2000

Orientation: North

Photographer: Alexis Ande, START

Witness: Bill Jaekel, CMC

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SITE PHOTOGRAPH 8**

Subject: Metal shed prior to replacement

Circle Lead Site
St. Petersburg, Pinellas County, Florida
IDD No. 4W-01-i0-B-021

October 27, 2000

Orientation: East

Photographer: Alexis Ande, START

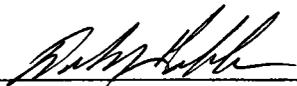
Witness: Bill Jaekel, CMC

B-8

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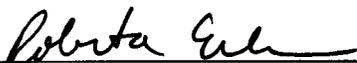
CERTIFICATION

The Circle Lead Products 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.



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