

HEALTH CONSULTATION

AMERICAN CREOSOTE WORKS INCORPORATED

PENSACOLA, ESCAMBIA COUNTY, FLORIDA

CERCLIS NO. FLD008161994

Prepared by:

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

## Background and Statement of Issues

On August 12, 1997, the Environmental Protection Agency (EPA) requested the Florida Department of Health to review and comment on the Draft Sanders Beach Community Area Study. The Sanders Beach Community is next to the American Creosote Works Superfund hazardous waste site in Pensacola, Florida. In this health consultation report we review residential soil contamination data from the above draft to decide if a public health threat exists.

The American Creosote site is within the Pensacola city limits in Escambia County, one mile southwest of downtown Pensacola Florida near the corner of Barrancas Avenue and "L" Street (Figures 1 and 2). An industrial/commercial area is on the north/west and a residential neighborhood is on the south/east of this level, 18-acre site. Pensacola Bay is about 2,000 feet south of the site.

The Sanders Beach community is between the American Creosote site and Pensacola Bay. Residential properties and a few businesses dominate the Sanders Beach community. In 1990, the total population in the block group the Sanders Beach community is in was 519 (Figure 3). The average age was 37. Whites made up 70% of this population, blacks 27%, and asians, hispanics, native americans 3%. The median annual household income was \$22,583. Most of the homes in this community (83%) were built before 1980 when American Creosote closed and are valued at less than \$50,000 (77%) (Census 1990).

American Creosote Works, Inc. (American Creosote) operated a wood preserving business at this site from 1902 to 1981. American Creosote used creosote to treat wood for telephone poles, railroad ties, fence posts, etc. After the 1950s, American Creosote used increasing amounts of technical grade pentachlorophenol. American Creosote treated wood under pressure in an airtight cylinder using diesel fuel as a carrier solvent for the preservatives. American Creosote discharged the excess diesel fuel, creosote, and pentachlorophenol into two wastewater lagoons in the southwest corner of the site (Figure 4). The soil under the site was porous sand that allowed rapid infiltration of the wastewater. American Creosote discharged about 14,000 gallons of wastewater per month to the lagoons (USGS 1984). Before 1970, the lagoons often overflowed due to heavy rains or too much wastewater. Wastewater from the lagoons flowed south to a drainage ditch and into Pensacola Bay near Bayou Chico. After 1970 when the lagoons were full, American Creosote pumped the wastewater to an "overflow" pond or other areas on the site and allowed it to soak directly into the ground.

In March 1980, while installing underground utilities south of the site, Escambia County employees discovered ground water contaminated with an "oily/asphaltic/creosote" substance (USGS 1984). The U.S. Geological Survey (USGS) installed nine monitor wells and found creosote-contaminated ground water. Further investigations by the USGS and the EPA delineated the extent of soil, sediment, and ground water contamination.

American Creosote closed in 1981 and filed for bankruptcy. The Environmental Protection Agency (EPA) has supervised site characterization and remediation since they added the site to the "Superfund" National Priorities List in 1983. In a 1983 emergency action, EPA de-watered the wastewater lagoons, added lime and fly ash to the remaining sludge, and covered the resulting solids with a clay cap. The EPA then conducted an initial Remedial Investigation/Feasibility Study (RI/FS) and signed a Record of Decision (ROD) in 1985, proposing to consolidate contaminated soil in an on-site landfill. The Florida Department of Environmental Regulation (DER) objected to the ROD since it did not address ground water contamination. In 1986, the EPA removed the former structures at this site and fenced the western three quarters of the property.

In 1986, the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR) prepared a health assessment report for this site. In this assessment, ATSDR concluded that removal of on- and off-site soils and extensive ground water recovery and treatment were not necessary for the protection of public health (ATSDR 1986).

After a "Post"-RI/FS and Risk Assessment, the EPA signed a second ROD in 1989 for clean up of on-site and off-site soils (Operable Unit I). In 1992, the Florida Department of Health ("Department") prepared a second public health assessment report. The Department judged this site a public health hazard because of the likelihood of past and current exposure to hazardous substances in the air, soil, and ground water. The Department recommended restricting site access, restricting ground water use, remediating on- and off-site surface soils, and controlling dust (ATSDR 1992).

In response to the Department's 1992 public health assessment report, the EPA investigated off-site soil contamination. In November 1996 and May 1997, EPA contractors collected more than 100 surface soil samples (0-3" deep) from a 22-block grid in the Sanders Beach Community (B&V 1997). Each grid was about the size of a city block. These samples were adequate to characterize the surface soil quality of the Sanders Beach Community (Figures 5 and 6). EPA contractors also collected five subsurface (two to three feet deep) soil samples southeast of the American Creosote site (B&V 1997).

EPA contractors analyzed the soil samples for dioxins/furans and extractable organics including polycyclic aromatic hydrocarbons (PAHs). Table 1 contains surface soil (0-3" deep) concentrations for the PAH and dioxin/furan toxicity equivalency factors (TEFs). Table 2 contains subsurface soil (two to three feet deep) concentrations for the PAH and dioxin/furan toxicity equivalency factors (TEFs).



## Discussion

Polycyclic Aromatic Hydrocarbons (PAHs) There are many individual polycyclic aromatic hydrocarbons (PAHs) in any PAH mixture. We consider the following PAHs to have the potential to cause cancer:

benzo[a]pyrene	benzo[b and/or k]fluoranthene	benzo[a]anthracene
chrysene	dibenzo[a,h]anthracene	indeno[1,2,3-cd]pyrene

To analyze the cancer causing potential of a PAH mixture, we convert the concentrations of the above PAHs to the equivalent concentration of benzo[a]pyrene. We use toxicity equivalent factors (TEFs) to make this conversion (ATSDR 1995). Benzo[a]pyrene is the most extensively tested of the PAHs.

We then estimate the equivalent amount (dose) of benzo[a]pyrene a resident is likely accidentally to eat each day (incidental ingestion). We assumed that an average 70 kilogram (150 pound) adult accidentally eats an average of 100 milligrams of soil per day. One-hundred milligrams are about 10% of the weight of one postage stamp. Although EPA contractors collected and analyzed many surface soil samples, we estimated a dose based on the highest measured concentration (8,507 micrograms per kilogram -  $\mu\text{g}/\text{kg}$ ). Using this dose, we estimate the increased cancer risk from accidentally eating small amounts of PAH-contaminated soil.

We estimate that daily incidental ingestion of surface soil with the highest PAH-TEF concentration (8,507  $\mu\text{g}/\text{kg}$ ) for 70 years may cause a low additional increased risk of cancer. We estimate that daily incidental ingestion of surface soil with the next highest PAH-TEF concentration (2,953  $\mu\text{g}/\text{kg}$ ) for 70 years would not cause any apparent additional increased risk of cancer.

EPA contractors noted that the two surface soil samples with the highest PAH-TEF concentrations were collected near the corner of K Street and Sonia Street (Figures 5 and 6). This intersection had recently been repaved with asphalt that is rich in PAHs. These two samples may be more indicative of asphalt than representative of area surface soil.

People are unlikely to contact subsurface soil (two to three feet deep). If, however, over a lifetime (70 years) people for some reason did accidentally eat small amounts of subsurface soil (subsurface soil location #1), they could have a low additional increased risk of cancer. Since the PAH-contaminated subsurface soil is two to three feet below the surface, however, people are unlikely accidentally to eat it and the public health risk is minimal.

Dioxins and Furans There are many individual dioxins/furans in any dioxin/furan mixture. We use toxicity equivalent factors (TEFs) to convert the concentrations of individual dioxins and furans to that of 2,3,7,8-tetrachlorodibenzo-dioxin (2,3,7,8-TCDD). 2,3,7,8-TCDD is the most extensively tested of the dioxins/furans. The highest

2,3,7,8-TCDD TEF concentration in the surface soil was 2.3 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) from a sample on Pine Street between "I" and "J" Streets (Figure 6). All of the other samples were below ATSDR's 2,3,7,8-TCDD TEF interim policy soil level of  $1\mu\text{g}/\text{kg}$  (ATSDR 1997). Soil concentrations of 2,3,7,8-TCDD TEF above  $1\mu\text{g}/\text{kg}$  do not necessarily represent a health threat. Because of the present day uncertainty in the toxicity of 2,3,7,8-TCDD, we are currently unable to completely assess the public health risk from exposure to 2,3,7,8-TCDD TEF in the surface soil.

People are unlikely to contact subsurface soil (two to three feet deep). The maximum measured concentration of 2,3,7,8-TCDD TEF in the subsurface soil ( $0.068\mu\text{g}/\text{kg}$ ) just south of the southwest corner of the site (Figure 5) is less than the ATSDR 2,3,7,8-TCDD TEF interim policy soil level of  $1\mu\text{g}/\text{kg}$  (ATSDR 1997). Since the dioxin/furan-contaminated subsurface soil is two to three feet below the surface, people are unlikely to accidentally eat it and the public health risk is minimal.

## Conclusions

The soil in the Sanders Beach Community south of the American Creosote site is not a public health threat.

1. The more than 100 samples collected and analyzed were adequate to characterize the surface soil quality in the Sander Beach Community south of the American Creosote site.
2. The estimated daily incidental ingestion of surface soil (0-3" deep) with the highest concentration of cancer causing polycyclic aromatic hydrocarbon (PAH) toxicity equivalency factor (TEF) over a lifetime may cause a low additional increased risk of cancer. The estimated daily incidental ingestion of surface soil with the next highest concentration of carcinogenic PAH-TEF would not cause any apparent additional increased risk of cancer. The two surface soil samples with the highest concentrations were collected near a corner recently repaved with asphalt. These two samples may be more indicative of asphalt than representative of area surface soil.
3. Only one surface soil (0-3" deep) sample (on Pine Street between "I" and "J" Streets) had a 2,3,7,8-TCDD TEF concentration greater than the ATSDR's interim policy soil level of  $1\mu\text{g}/\text{kg}$ . Soil concentrations of 2,3,7,8-TCDD above  $1\mu\text{g}/\text{kg}$  do not necessarily represent a health threat. Because of present day uncertainty in the toxicity of 2,3,7,8-TCDD, we are unable to assess the public health risk from exposure to 2,3,7,8-TCDD in the soil.
4. Lifetime accidental ingestion of PAH-contaminated subsurface soil (greater than 3" deep) just south of the southwest corner of the site could result in a low increased risk of cancer. People, however, are unlikely accidentally to eat subsurface soil. Therefore, the public health risk is minimal. The maximum measured concentration of

2,3,7,8-TCDD TEF in the subsurface soil is less than the ATSDR interim policy soil level.

### Recommendations

1. Remediate the surface soil on Pine Street between "I" and "J" Streets having 2,3,7,8-TCDD TEF concentrations greater than 1  $\mu\text{g}/\text{kg}$ .
2. Prevent long-term exposure to PAH-contaminated subsurface soil just south of the southwest corner of the American Creosote site (subsurface soil location #1).

The conclusions and recommendations in this report are based on the Draft Sanders Beach Community Area Study (B&V 1997). If additional information becomes available, we will evaluate it to decide what, if any, additional actions are necessary. The conclusions and recommendations in this report are site specific and are not necessarily applicable to other sites.

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## References

ATSDR 1986. Health Assessment for American Creosote Works: CERCLIS No. FLD008161994, Pensacola, Florida. Agency for Toxic Substances and Disease Registry. January 6, 1986.

ATSDR 1992. Public Health Assessment for American Creosote Works Inc. (Pensacola) Pensacola, Escambia County, Florida. CERCLIS No. FLD008161994. Prepared by the Florida Department of Health for the Agency for Toxic Substances and Disease Registry. July 29, 1992

ATSDR 1995. Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHS) (Update). Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, Atlanta, GA. August 1995.

ATSDR 1997. Soil Comparison Values (6/30/97). Agency for Toxic Substances and Disease Registry.

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B&V 1997. Draft Sanders Beach Community Area Study, Field Sampling Investigation Report, Pensacola, Escambia County, Florida. Prepared for Waste Management Division, US EPA Region IV by Black & Veatch Special Projects Corp. August 1997.

USGS 1984. Phenolic Contamination in the Sand-and -Gravel Aquifer from a Surface Impoundment of Wood Treatment Waste, Pensacola, Florida. U.S. Geological Survey, Water-Resources Investigation Report 84-4230. 1984.

Table 1. Contaminant Concentrations ( $\mu\text{g}/\text{kg}$ ) in Surface Soil Samples (zero to three inches deep)

Contaminant	Background			Sanders Beach Community		
	# of surface soil samples	# samples above detection limits	maximum concentration ( $\mu\text{g}/\text{kg}$ )	# of surface soil samples	# samples above detection limits	maximum concentration ( $\mu\text{g}/\text{kg}$ )
Cancer Causing PAH-TEF	2	1	17	118	83	8,507
Dioxins/Furans TEF	2	2	0.007	46	46	2.3

Table 2. Contaminant Concentrations ( $\mu\text{g}/\text{kg}$ ) in Subsurface Soil Samples (two to three feet deep)

Contaminant	Background			Sanders Beach Community		
	# of <u>subsurface</u> soil samples	# samples above detection limits	maximum concentration ( $\mu\text{g}/\text{kg}$ )	# of <u>subsurface</u> soil samples	# samples above detection limits	maximum concentration ( $\mu\text{g}/\text{kg}$ )
Cancer Causing PAH-TEF	1	0	below detection limit	5	3	346,450
Dioxins/Furans TEF	1	0	below detection limit	5	1	0.068

PAH-TEF: Polycyclic aromatic hydrocarbon toxicity equivalency factor

TEF: toxicity equivalency factor

$\mu\text{g}/\text{kg}$ : micrograms of contaminant per kilogram soil or parts per billion (ppb)



# Map of Florida



SOURCE: FLORIDA DOH FILES

Figure



Mag 12.00  
 Thu Oct 02 14:48 1997  
 Scale 1:87,500 (at center)

2 Miles

2 KM



- |  |                            |  |                       |
|--|----------------------------|--|-----------------------|
|  | Secondary SR/Road/Hwy Ramp |  | Large City            |
|  | Major Connector            |  | Summit                |
|  | State Route                |  | Geographic Feature    |
|  | Interstate/Limited Access  |  | Hospital              |
|  | US Highway                 |  | Park/Reservation      |
|  | Utility/Pipe               |  | Sched Service Airport |
|  | Railroad                   |  | Locale                |
|  | Small Town                 |  | Exit                  |

Figure 2.

1:15311

1.37 by 1.32 miles

30.24.10/- 87.14.00

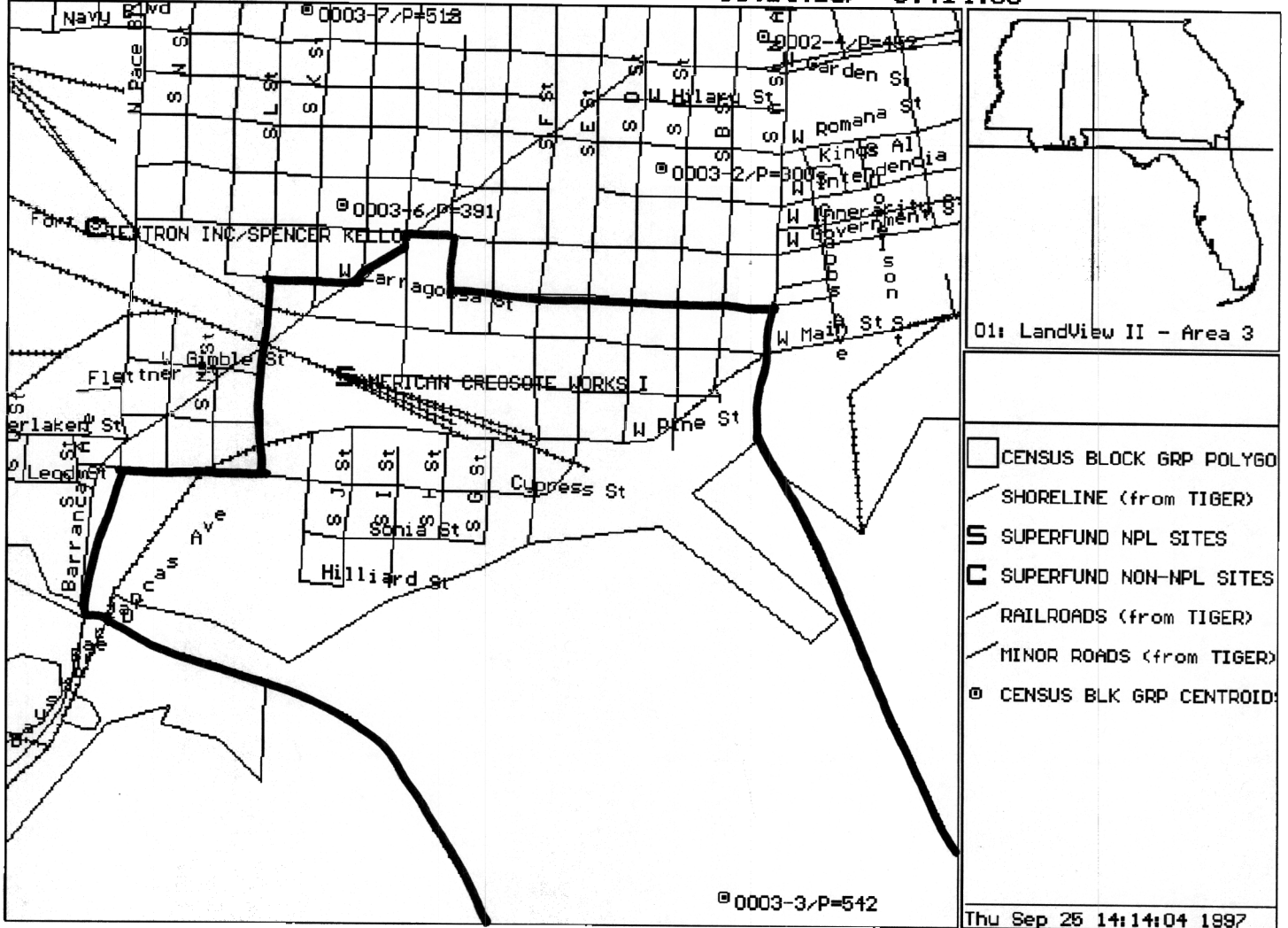
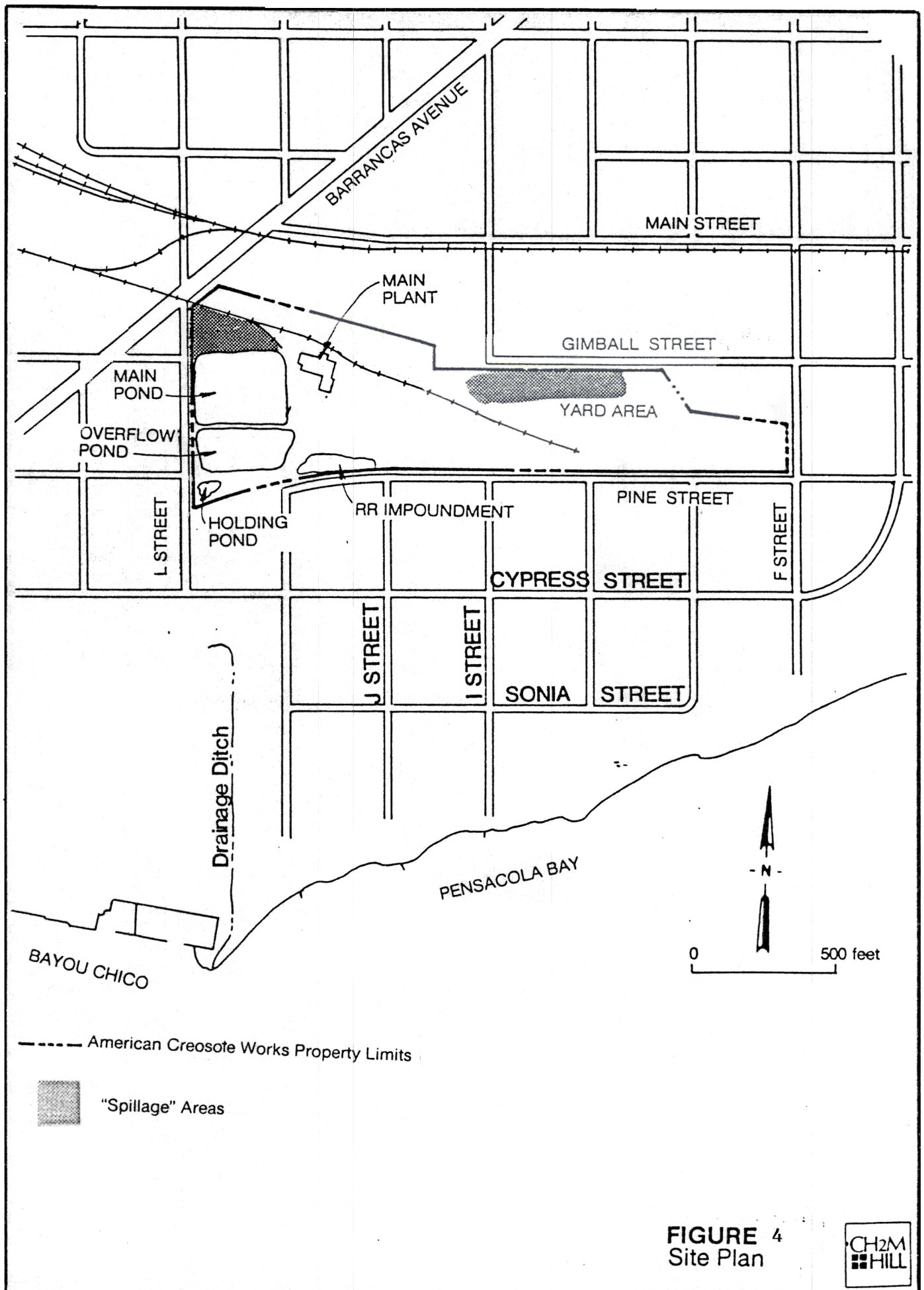


Figure 3. American Creosote/Sanders Beach Area Census Block Group Map





----- American Creosote Works Property Limits

■ "Spillage" Areas

**FIGURE 4**  
Site Plan



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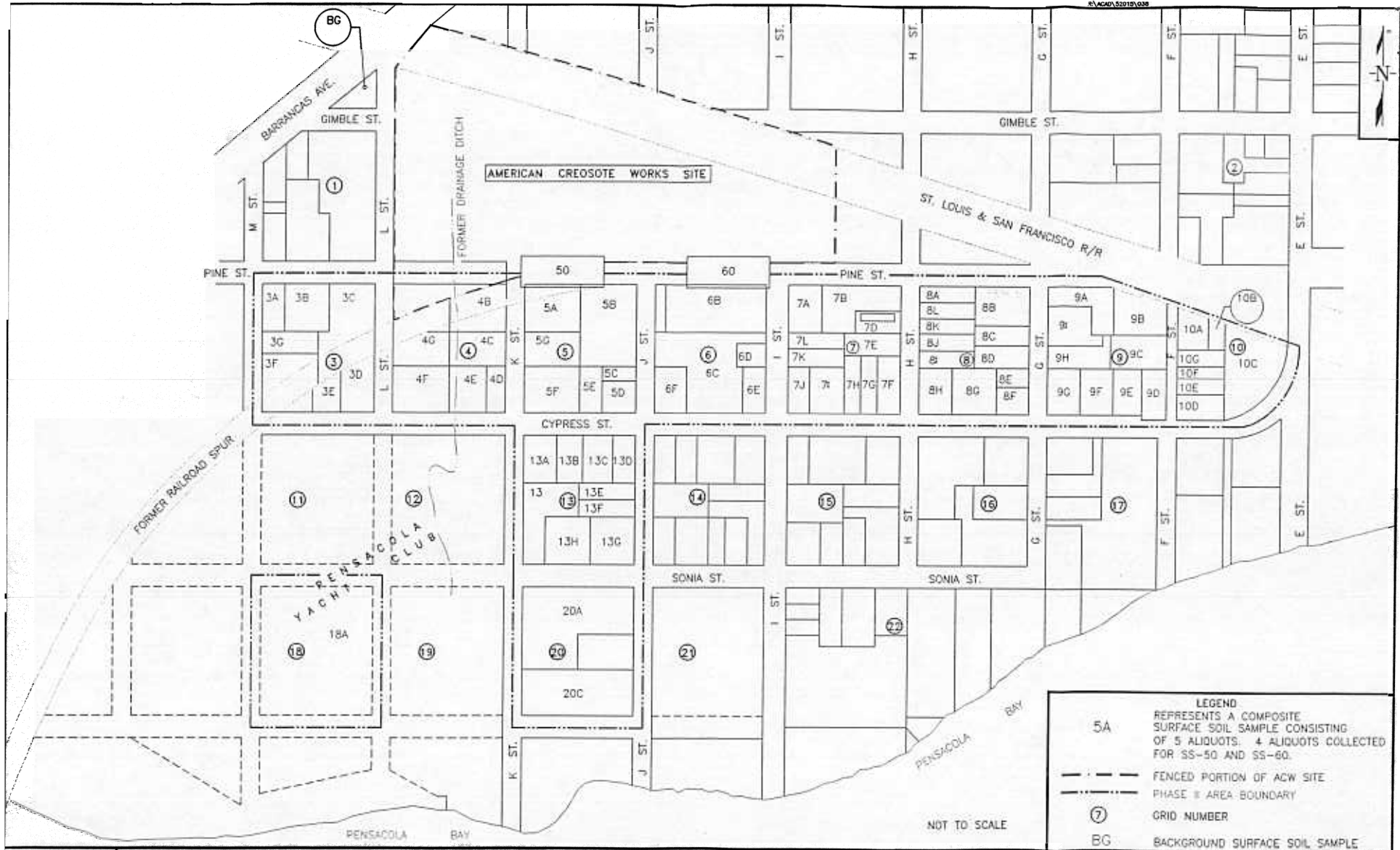


PHASE I SAMPLE LOCATION MAP  
 SANDERS BEACH COMMUNITY AREA STUDY  
 PENSACOLA, ESCAMBIA COUNTY, FLORIDA

FIGURE 5.1

Figure 5.

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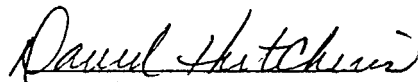
PHASE II SAMPLE LOCATION MAP  
 SANDERS BEACH COMMUNITY AREA STUDY  
 PENSACOLA, ESCAMBIA COUNTY, FLORIDA

FIGURE  
 6

Figure 6.

## CERTIFICATION

This Health Consultation was prepared by the 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 health consultation was begun.




Technical Project Officer

Superfund Site Assessment Branch (SSAB) .

Division of Health Assessment and Consultation (DHAC)

ATSDR

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



Chief, SPS, SSAB, DHAC, ATSDR

