Health Consultation

PROCTOR & GAMBLE
(a/k/a BUCKEYE CELLULOSE)

PERRY, TAYLOR COUNTY, FLORIDA

CERCLIS NO. FLD004057105

DECEMBER 2, 1997

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

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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Prepared by:

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

Background and Statement of Issues

The Florida Department of Health (Florida DOH), through a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Georgia, evaluates the public health significance of Superfund hazardous waste sites in Florida. The U.S. Environmental Protection Agency (EPA) has requested that Florida DOH evaluate potential adverse health effects from exposure to contaminants in groundwater and surface water near the Buckeye Florida (Buckeye) site in Taylor County, Florida (1). EPA collected samples from surface water, monitoring wells on and off of the site, and from private wells off of the site. EPA analyzed samples for pesticides, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals, chlorinated hydrocarbons, dioxins, and furans (2). We have determined that a health consultation is an appropriate response to evaluate the groundwater and surface water sampling data. The interpretation, advice, and recommendations presented in this report are site-specific and should not be considered applicable to any other sites.

The Buckeye Florida, Limited Partnership site occupies 1500 acres along County Road 30 about four miles southeast of Perry in Taylor County, Florida (Figs. 1, 2, 3). The pulp mill, which is still active, has operated since 1954 producing purified cellulose fiber. The site consists of the pulp plant, two aeration lagoons, sludge lagoons, and waste areas. Wastewater discharges from the plant into the nearby Fenholloway River. The plant's 50 million gallon per day discharge comprises most of the river's flow during normal conditions, and 100 percent of the flow during drought conditions. About 1100 workers are employed on the site (2).

According to 1990 census data (3), about 1500 people live within one mile of the site. The site is in a largely rural area with households that are low-middle income. The population is about 61% white, 38% African-American, and 1% Hispanic. About 200 people within one mile of the site depend on private wells for drinking water (2).

The Buckeye plant is in a rural area. It is secured by fencing or natural boundaries, such as swamps and dense forest. The site is bordered by County Road 30 to the north, County Road 356 to the south, U.S. Highway 19 to the the west and the Fenholloway River to the west. There are a few private residences along County Roads 30 and 356 north and south of the site (2).

In August, 1989, the Florida Department of Environmental Protection (FDEP) initiated a study to determine the extent to which water from the Fenholloway River had migrated into the adjoining Floridan aquifer. During the year-long study, FDEP sampled monitoring wells and took water level measurements. They concluded that water migrating from the Fenholloway River had influenced the Floridan aquifer about 1.5 miles from the river (4).

Beginning in October, 1992, contractors for Buckeye sampled and analyzed the tissue of fish and crabs from the Fenholloway River for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Concentrations below a level of health concern were found in fish 10-12 miles downstream from the plant. No TCDD was found in fish and crab tissue at the mouth of the river or in the Gulf of Mexico within 1/4 mile of the mouth (5).

In January, 1994, FDEP began a study to define an area within which water from the Fenholloway River might be expected to interact with water in the adjoining aquifers. Using water level and water quality data, floodplain maps, and computer modeling, FDEP determined the likely maximum extent of effluent migration from the river into the aquifers. The study showed that water from the Fenholloway could potentially impact the adjoining aquifer for a distance of 1/4-1/2 mile south and 1/4-2 miles north of the river along an eight mile stretch downstream from the Buckeye plant (6).

In March 1995, contractors for EPA collected and analyzed 11 groundwater samples and 3 surface water samples near the Buckeye plant (Fig. 4). Well depths were not specified. However, the six monitoring wells were generally 20 feet deep and the five private wells were about 90-100 feet deep (2, ref. 3). Samples were analyzed for pesticides, PAHs, VOCs, metals, chlorinated hydrocarbons, dioxins, and furans. Arsenic, dieldrin, and manganese were found at a level of potential health concern in groundwater and surface water. The maximum arsenic level was found in an off-site private well. The maximum manganese level was found in an off-site monitoring well. Table 1, below, presents the highest level of each contaminant of concern.

Table 1. Maximum Level of Contaminants in Groundwater and Surface Water

	MAX. CONTAMINANT CONCENTRATION (µg/L)	
CONTAMINANT	GROUNDWATER	SURFACE WATER
ARSENIC	8	ND
DIELDRIN	ND	.088
MANGANESE	160	200

ND - not detected
µg/L - micrograms per liter
Source: 2

On December 10, 1996 Bruce Tuovila from Florida DOH, Bureau of Environmental Toxicology, visited the site. The plant is enclosed by fencing, heavy pine forest, and swampy areas. There is a wastewater spraying/aeration operation at the small lagoon south of county road 356A (Fig. 3). Mr. Tuovila observed numerous log trucks entering and leaving the plant property. Mr. Tuovila also observed a recreational area consisting of tennis courts and a children's playground in a small park on the plant property adjacent to the pulp mill. At the time of the site visit, no children or adults were observed using the recreational area.

Discussion

To screen for possible health effects, ATSDR has developed Minimal Risk Levels (MRLs) for contaminants commonly found at hazardous waste sites. The MRL is an estimate of daily human exposure to a contaminant below which non-cancer, adverse health effects are unlikely to occur. ATSDR developed MRLs for routes of exposure, such as ingestion and inhalation, and for the length of exposure, such as acute (less than 14 days), intermediate (15 to 365 days), and chronic (greater than 365 days). ATSDR presents these MRLs in Toxicological Profiles. These chemical-specific profiles provide information on health effects, environmental transport, human exposure, and regulatory status.

ATSDR has developed MRLs for arsenic and dieldrin. To evaluate possible adverse health effects from ingestion of these chemicals in drinking water, we used a standard ingestion rate for water of 1 liter per day (L/day) for children and 2 L/day for adults, and a standard body weight of 15 kilograms (kg) for children and 70 kg for adults.

The Fenholloway River is currently classified for industrial and navigational use. However, FDEP is considering reclassifying the river for recreational use. To evaluate possible adverse health effects from incidental ingestion of these chemicals in surface water, we assumed that children ages 6-18 would swim for one hour 3 times/week for 18 weeks/year. We also assumed they weighed 35 kg, ingested 0.05 L/hr while swimming, and ingested surface water containing contaminants at the maximum detected concentration.

Arsenic

The maximum estimated daily dose of arsenic from ingestion of contaminated groundwater only slightly exceeds the MRL for children. The maximum estimated exposure for adults is less than the MRL. Skin changes, including darkening and the appearance of 'corns' or 'warts', appear to be the most sensitive indicator of the effects of exposure. Epidemiological studies in human populations, and studies of individuals exposed to arsenic, have not detected adverse health effects at the maximum level found near this site (7).

Arsenic is a known human carcinogen (7). Chronic lifetime exposures to the maximum level of arsenic in groundwater near the site (8 ug/l) may result in a very low increase in the risk of skin cancer, however, epidemiological studies of people exposed to arsenic at levels fifteen to thirty times this level have not detected any dermal or other effects. Arsenic has been detected in only one private well near the site. Therefore, any potential health effects would be restricted to individuals consuming water from this one well.

Dieldrin

The maximum estimated daily dose of dieldrin from incidental ingestion of surface water is less than ATSDR's chronic oral MRL. Therefore, we do not expect any adverse health effects from incidental ingestion of dieldrin in the Fenholloway River near the site.

Dieldrin is a possible human carcinogen based on studies in animals (8). However, the maximum estimated dose of dieldrin is more than 1,000 times less than the lowest level that has been shown to cause cancer in mice. Therefore, lifetime exposure to dieldrin in surface water near the site would result in no significant increase in the risk of cancer.

Manganese

There is no ATSDR MRL for manganese. However, there is an EPA reference dose (RfD) for manganese (9). The maximum estimated daily dose from ingestion of manganese in groundwater and surface water near the site is less than the RfD. Therefore, we do not expect any adverse health effects from exposure to manganese.

Manganese is not known to be carcinogenic. Therefore, we do not expect any increased cancer risk from exposure to manganese at this site.

Conclusions

Based upon the information reviewed, Florida DOH concludes that adverse, non-carcinogenic and carcinogenic health effects from exposure to dieldrin and manganese in groundwater and surface water are not likely. The human health information for arsenic indicates that chronic exposure at the maximum estimated daily dose of arsenic from ingestion of groundwater may slightly increase the risk of changes in the skin. However, epidemiological studies in human populations and studies of individuals exposed to arsenic site have not detected adverse health effects at the levels found near the site. If additional information becomes available indicating exposures at levels of concern, Florida DOH will evaluate that information to determine what actions, if any, are necessary.

Recommendations

We recommend that EPA resample the affected private well near the site to better determine the long-term arsenic level in the well water.

References

1. U.S. Environmental Protection Agency. Telephone conversation, Tillman McAdams, EPA, to Bruce Tuovila, Florida DOH requesting a health consultation for the Buckeye Florida Site. December 17, 1996.

2. Black & Veatch Waste Science, Inc. Draft Site Inspection Report, Buckeye Florida, Perry, Taylor County, Florida. March 15, 1995.

3. Bureau of the Census. 1990 Census Data Files. U.S. Department of Commerce, Washington, DC.

4. Florida Department of Environmental Protection. Draft Groundwater Investigation Report No. 91-05, Proctor and Gamble Cellulose, Perry, Taylor County. December 1991.

5. ENSR Consulting and Engineering. Dioxin Monitoring Study in the Fenholloway River, Florida. May 1993.

6. Florida Department of Environmental Protection. Delineation of Ground and Surface Water Areas Potentially Impacted by an Industrial Discharge to the Fenholloway River of Taylor County, Florida. May 1995.

7. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Arsenic (Update). ATSDR: Atlanta. April 1993.

8. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Aldrin/Dieldrin (Update). ATSDR: Atlanta. April 1993.

9. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Manganese. ATSDR: Atlanta. July 1992.

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CERTIFICATION

This Buckeye Florida 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 health consultation was begun.

David Hutchins
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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.

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

Figure 1. State Map Showing Location of Taylor County

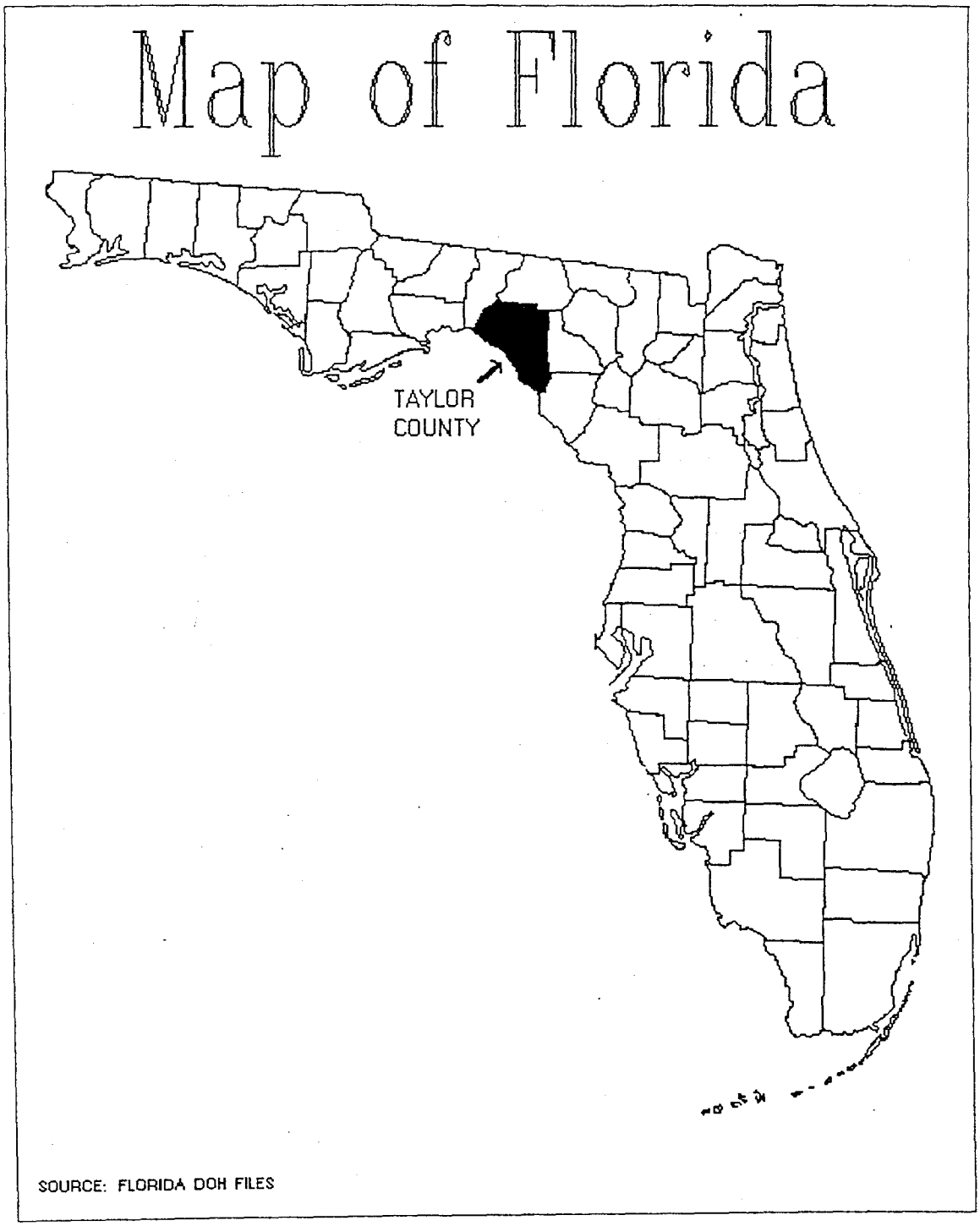

Figure 2. Location of Perry in Taylor County

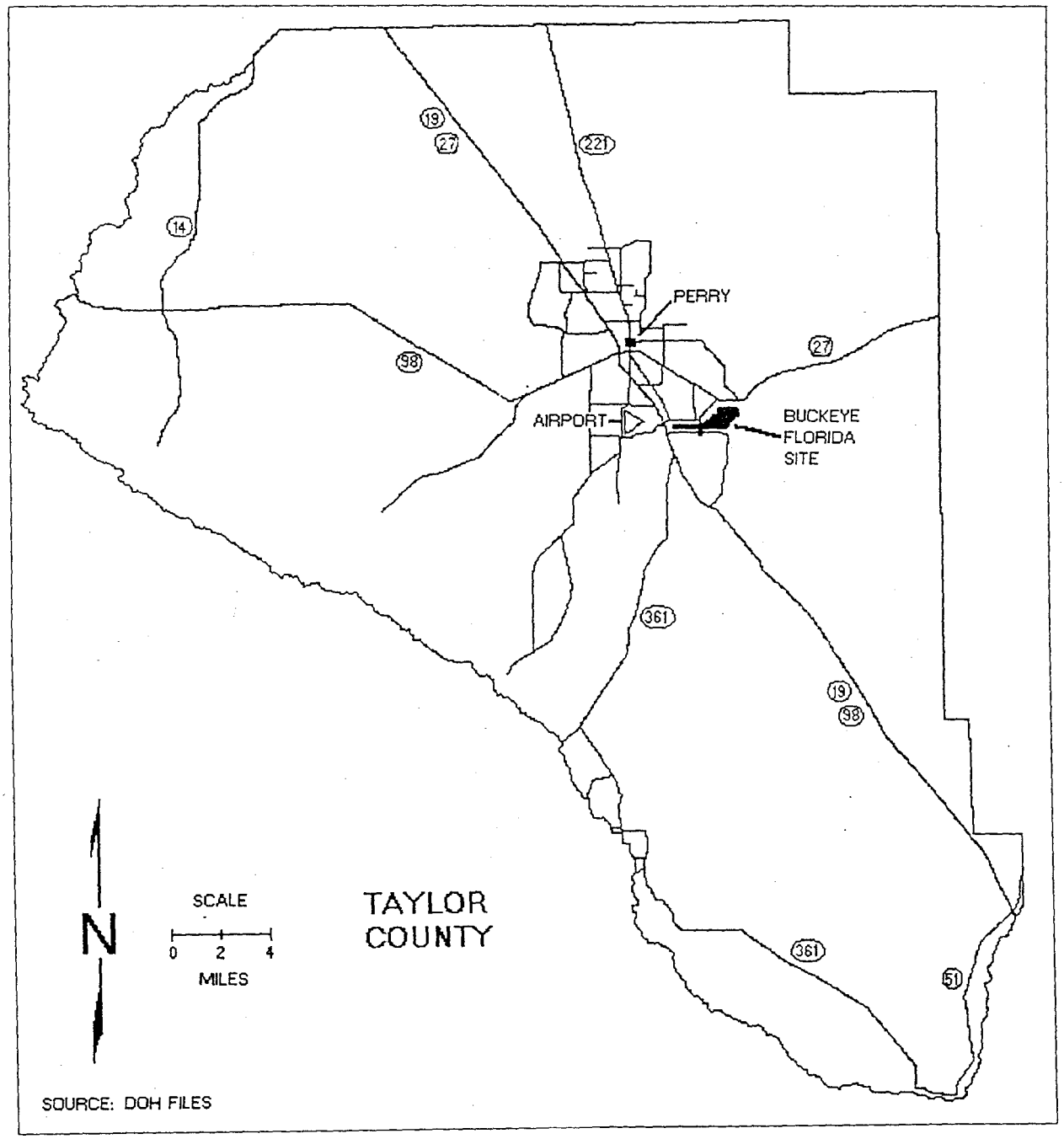

Figure 3. Location of Buckeye Florida Site in Perry

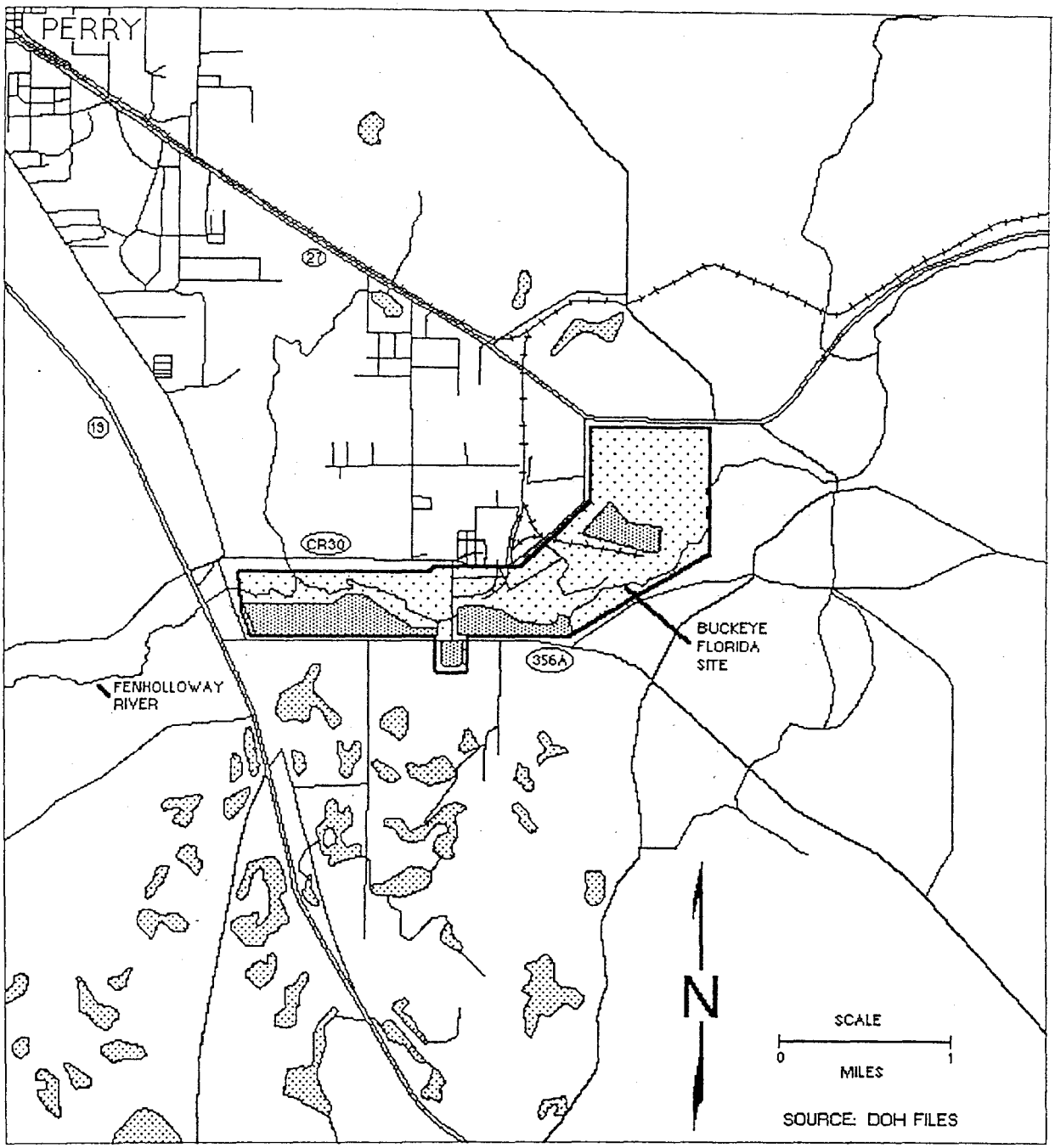

Figure 4. Detail of Buckeye Florida Site Showing Sample Locations