

HEALTH CONSULTATION

NORTHVIEW HIGH SCHOOL

BRATT, ESCAMBIA COUNTY, FLORIDA

Prepared by:

Florida Department of Health
Bureau of Environmental Toxicology
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 Escambia County School Board (Escambia CSB) and the Escambia County Health Department (Escambia CHD) have requested that Florida DOH evaluate the health effects of exposure to contaminants in soil at the Northview High School in Escambia County, Florida. The Florida Department of Environmental Protection (FDEP), Escambia CSB, and Escambia CHD collected soil samples on and off of the site. They analyzed these samples for pesticides, polychlorinated biphenyls (PCBs), and metals. This health consultation will assess the public health threat from contaminants found on the Northview High School grounds. The interpretation, advice, and recommendations presented in this report are site-specific and should not be considered applicable to any other sites.

The Northview High School Site (Northview) is at 4100 West Highway 4, about one mile east of the town of Bratt, Escambia County, Florida (Figs. 1 & 2). Northview was built in 1995 on about 80 acres in a rural farmland area of the county. The site is bordered by Highway 4 on the south, Pine Barren Road on the east, and cultivated fields on the north and west (1). The school property contains the school buildings, athletic fields, a pecan grove, woodlands, and cultivated land (Fig. 3). The school opened in August 1995. There are about 500 children enrolled at the school. They range in age from 13 to 18 years in grades 9-12. The student population is about 52% male, 48% female and about 78% white, 22% black (2).

According to 1990 census data (3), about 1,200 people live within about four miles of the school. Median family income in this area is about \$28,000 per year. Racial makeup of the population is 100% white. There are no facilities with sensitive populations within four miles of the school. There are about 25 private drinking water wells within this area. A search of EPA's Toxics Release Inventory indicated there are no facilities within the zip code area of the school that have reported releases of the same chemicals found on the school grounds (4).

In October 1994, FDEP requested that we evaluate the public health implications from exposure to pesticides in soil and surface water at Northview. We evaluated the results of soil and surface water samples analyzed by FDEP for pesticides. We concluded there were no adverse health effects likely from exposure to these chemicals (5).

On April 1, 1998, Bruce Tuovila, Florida DOH, conducted a site visit at the Northview High School. With him were Bob Dubose and Robert Merritt, Escambia CHD, school administrators, contractors for the school board, and local residents. The school and school grounds are completely secured by chain-link fencing. Most of the grounds are covered with grass, landscaping, or mulch groundcover. There are large areas of bare soil on the baseball and softball fields. Grass does not completely cover the soil around the outside of the track. We did not observe any children on the athletic fields during the site visit.

On April 21, 1998 FDEP collected 15 surface soil (0-3 inches) samples from the school grounds and 5 off-site surface soil samples. They analyzed the samples for volatile organic compounds (VOCs), pesticides, and metals (1). On April 23, 1998 contactors for the Escambia CSB and Escambia CHD collected a total of 32 surface soil samples from the school grounds. They analyzed these samples for pesticides, polychlorinated biphenyls (PCBs), and metals (6, 7). All soil sampling events focused on the athletic fields at the school.

We selected chemicals of potential health concern by comparing the maximum concentration in the soil samples to standard comparison values. A comparison value is used as a means of selecting environmental contaminants for further evaluation to determine whether exposure to them has public health significance. Contaminants that are known or suspected human carcinogens were evaluated for both carcinogenic and non-carcinogenic adverse health effects. Arsenic was the only chemical of potential health concern. It was found at a maximum concentration of 8.1 milligrams per kilogram (mg/kg) in surface soil on the school property. All other chemicals were below levels of human health concern.

Discussion

To evaluate 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 has developed an MRL for each route of exposure, such as ingestion, inhalation, and dermal contact, 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.

MRLs are health guideline values that are usually derived from experimental animal data, based on broad assumptions, and corrected by a series of uncertainty factors. Thus, the values serve only as guidelines and not as absolute values that explicitly divide ranges of safety from ranges of risk. Additional medical or toxicological information must be evaluated to determine what adverse health effects are likely from exposure to chemicals of concern at a site.

Exposure in Children--Because this is a high school, the health effects from exposure to chemicals in children are a special concern. Children are generally exposed to greater levels of contaminants in soil because their activities bring them into greater contact with the soil. They are often more sensitive to the effects of chemical exposures than adults.

For children at the school we assumed a soil ingestion rate of 200 milligrams per day (mg/day) to calculate their exposure. We assumed a body weight of 59 kilograms (kg) (about 130 pounds) (8). We also assumed exposure was to the maximum level of each chemical in soil on the school grounds.

Arsenic--The maximum estimated daily dose of arsenic from incidental ingestion of soil at the school by children is less than ATSDR's chronic oral MRL (9). Therefore, illnesses in children exposed to arsenic in school soil are not likely. Arsenic is a known human carcinogen. However, lifetime exposure (70 years) to the maximum estimated daily dose of arsenic in soil at the school would result in no apparent increase in the risk of cancer.

Arsenic is not readily absorbed through the skin. Skin contact with the low levels of arsenic in the soil at the school is not likely to cause any irritation. Therefore, no illnesses are likely from skin contact with arsenic in the soil.

Exposure in Adults--Adult employees of the high school who come in contact with the soil on the school grounds may be exposed to the chemicals found there. For adults at the school, we assumed a soil ingestion rate of 100 mg/day to calculate their exposure. We assumed a body weight of 70 kg (about 150 pounds). We also assumed exposure was to the maximum level of each chemical in soil on the school grounds.

Arsenic--The maximum estimated daily dose of arsenic from incidental ingestion of soil at the school by adults is less than ATSDR's chronic oral MRL (9). Therefore, illnesses in adults exposed to arsenic in school soil are not likely. Arsenic is a known human carcinogen. However, lifetime exposure (70 years) to the maximum estimated daily dose of arsenic in soil at the school would result in no apparent increase in the risk of cancer.

Arsenic is not readily absorbed through the skin. Skin contact with the low levels of arsenic in the soil at the school is not likely to cause any irritation. Therefore, no illnesses are likely from skin contact with arsenic in the soil.

Conclusions

Based upon the information reviewed, we conclude that illnesses are unlikely in children and adults exposed to contaminants in soil at the Northview High School. If additional information becomes available concerning chemical exposures at the Northview High School, Florida DOH will evaluate that information to determine what actions, if any, are necessary.

Recommendations

The Florida Department of Health recommends no further public health actions regarding the soil at the Northview High School.

References

1. Florida Department of Environmental Protection. Northview High School Site Draft Environmental Assessment, Escambia County, Florida. SIS Report 98-04. June 1998.

2. The School District of Escambia County. Memorandum to Robert Merritt, Escambia CHD, from Greg Gibbs, Escambia CSB, regarding the student population at Northview High School. June 17, 1998.
3. Bureau of the Census, U.S. Department of Commerce, Washington, DC, 1990 Census Data Files.
4. U.S. Environmental Protection Agency. Toxics Release Inventory. Washington, DC. June 1998.
5. Florida Department of Health. Letter to Jeff Newton, FDEP, from Bruce Tuovila, Florida DOH, regarding the public health implications of exposure to pesticides at Northview High School. November 2, 1994.
6. Law Engineering and Environmental Services, Inc. Transmittal of a Laboratory Report, Arsenic and Lead Analysis, Soil Contamination Assessment, Northview High School, Bratt, Florida. June 10, 1998.
7. V.O.C. Analytical Laboratories, Inc. Letter to Robert Merritt, Escambia CHD, from Steve Walton, V.O.C., regarding results of soil analyses for pesticides and PCBs. May 29, 1998.
8. U.S. Environmental Protection Agency. Exposure Factors Handbook, Volume I, General Factors. EPA/600/P-95/002Fa. August 1997
9. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Arsenic (Update). Atlanta. ATSDR, April 1993.

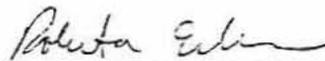
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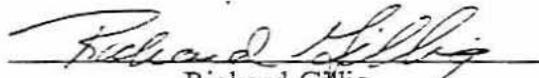
CERTIFICATION

This Northview High School 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.



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Technical Project Officer
Division of Health Assessment and Consultation (DHAC)
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The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.



Richard Gillig
Chief, SPS, SSAB, DHAC, ATSDR

Figure 1. State Map Showing Location of Escambia County



Figure 2. Location of Northview High School in Escambia County

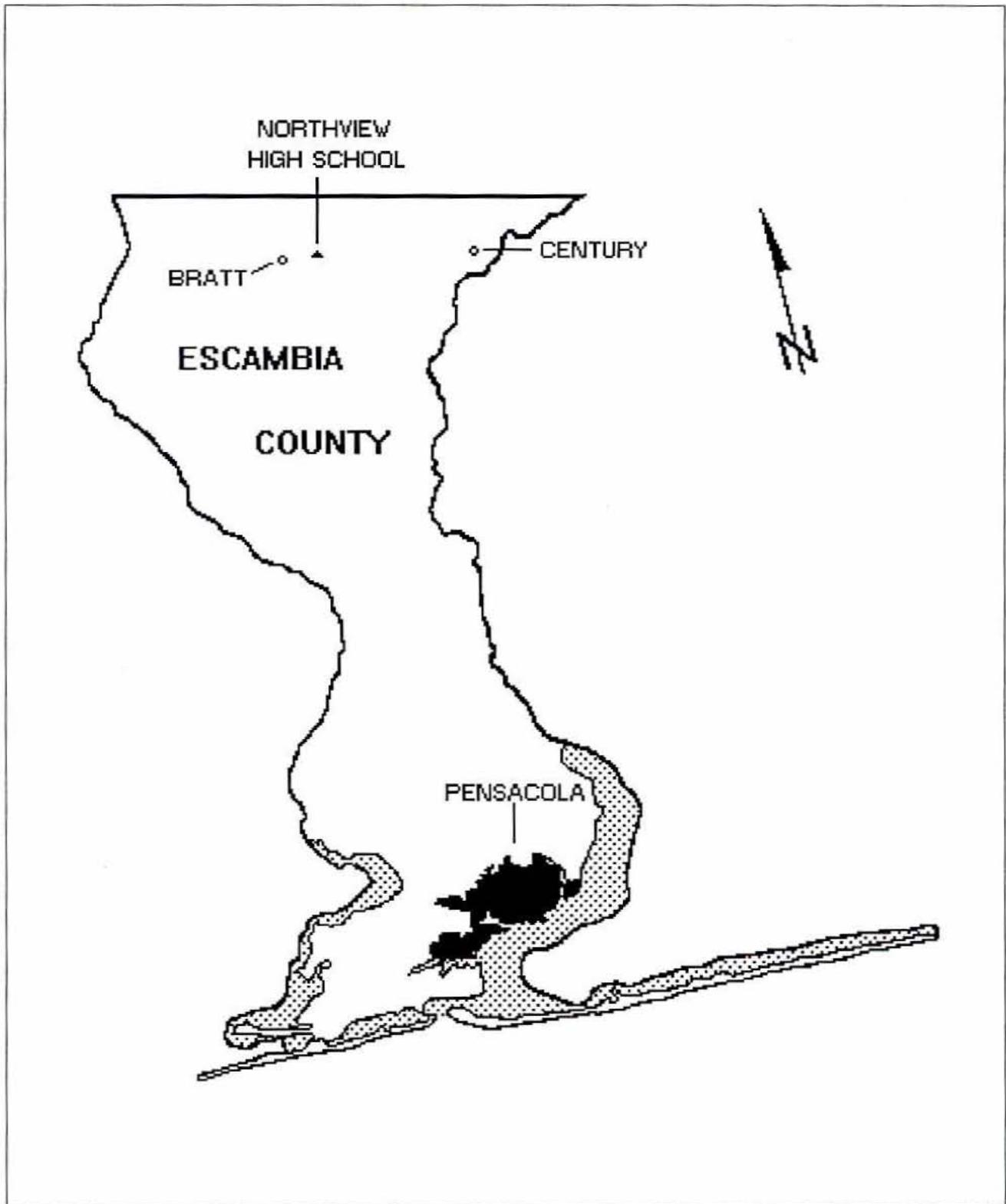


Figure 3. Detail of Northview High School Site

