

PUBLIC HEALTH ASSESSMENT
EASTWOOD GOLF COURSE
FORT MYERS, LEE COUNTY, FLORIDA
CERCLIS NO. FLD984170944

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Prepared by

Florida Department of Health
Bureau of Environmental Toxicology
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Agency for Toxic Substances and Disease Registry
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Summary

The Eastwood Golf Course covers about 220 acres east of Fort Myers, Florida. In 1987, county environmental inspectors discovered that chemical wastes, such as oil, parts cleaners and solvents were being improperly disposed of on the ground south of the golf course's maintenance area. On two separate occasions in 1988 and 1989, contaminated soils were removed from the site.

Sampling of soil, sediment, surface water and groundwater in 1998 indicated contamination by heavy metals. However, except for groundwater, these levels are below human health concern. There is no completed groundwater exposure pathway.

Because the groundwater exposure pathway is not complete, this site does not represent a public health threat. The Florida Department of Health recommends no further public health activities at the Eastwood Golf Course.

Purpose and Health Issues

In January 1999, the U.S. Environmental Protection Agency (EPA) asked the Florida Department of Health (Florida DOH) to evaluate the potential health threat posed by contamination at the Eastwood Golf Course (Eastwood). This evaluation is part of EPA's Archive Pilot Program, which determines whether low hazard ranking sites require further activity or involvement by EPA. EPA has asked Florida DOH to assess the health threat to people on the site from exposure to chemicals in soil, sediment, surface water, and groundwater. Currently, there are no community health concerns associated with this site.

This health consultation will assess the public health threat from contaminants found in soil, sediment, surface water, and groundwater at the Eastwood Golf Course. The interpretation, advice, and recommendations presented in this report are site-specific and should not be considered applicable to any other sites.

Background

The Eastwood Golf Course is at 4600 Bruce Herd Lane, in a rural area about 3 miles east of Fort Myers, Lee County, Florida (Figures 1 and 2). The golf course covers about 220 acres. The site is bordered on the south by highway 884, on the east by Ortiz Avenue, on the north and northwest by the City of Fort Myers wellfield, and on the west by forest and a drainage canal. Located in the central part of the golf course is a 10,000 square-foot fenced maintenance area. South of this is a wooded area where waste oil, parts cleaners, mineral spirits, and other solvents were reportedly disposed of on the ground (Figure 3). In July 1987, Lee County environmental inspectors discovered that chemical wastes were being improperly disposed of on the ground. In October 1987, the Florida Department of Environmental Protection (DEP) found levels of benzene in groundwater samples that exceeded the Maximum Contaminant Level (MCL) for drinking water. In December 1987, a preliminary contamination assessment found contamination in groundwater and soil samples. As a result of these findings, the City of Fort Myers removed and treated contaminated soil in early 1988. A subsequent contamination assessment in May 1989 showed additional soil contamination. This soil was removed and treated in August 1989. Employees allegedly continue to dispose of solvents on the ground (1).

According to 1990 census data, about 150 people live within a one half-mile radius of the site. Median family income in this area is about \$23,500 per year. Racial makeup of the population is about 56% white and 43% black (2). A mental hospital and a detention facility are within one mile of the site. Homes in the area are supplied with municipal drinking water.

Soil, sediment, surface water, and groundwater have been sampled at the site. In March 1998, contractors for EPA collected five surface (depth not specified) and five subsurface (depth not specified) soil samples, three sediment samples, three surface water samples, and five groundwater samples (15-29 feet deep) from the site. They analyzed the samples for polycyclic aromatic hydrocarbons (PAHs), pesticides, and metals. According to EPA contractors, groundwater flow direction beneath the site is not known, but is generally expected to flow toward surface water bodies (south to southwest at the site) (1).

On April 6, 1999, Bob Safay, ATSDR Regional Representative, toured the site. All residences near the site are supplied by public water. The city's municipal wellfields are to the north of the site. During the visit, Mr. Safay observed the wooded area south of the maintenance buildings where solvents had been dumped. He also observed a mental hospital and detention facility within one mile of the site. A residential development is under construction south of the site.

Tables 1 and 2 show the maximum level of each chemical of potential health concern in surface soil, subsurface soil, sediment, surface water, or groundwater samples collected at the site. Groundwater levels shown are for test wells on the site. Chemicals not shown in the tables are below levels of human health concern. We selected the chemicals of concern by comparing the maximum concentration found 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. Those contaminants that are known or suspected human carcinogens were evaluated for both carcinogenic and non-carcinogenic adverse health effects.

Table 1. Maximum Contaminant Levels in Surface and Subsurface Soil Samples and Sediment Samples

CONTAMINANT	SURFACE SOIL	SUBSURFACE SOIL	SEDIMENT	COMPARISON VALUE (mg/kg)
ARSENIC	18 mg/kg	7.5 mg/kg	1.7 mg/kg	20 (CHILD RMEG)
MANGANESE	650 mg/kg	50 mg/kg	NA	7000 (CHILD RMEG)

mg/kg - milligrams per kilogram of soil
 RMEG - Reference Dose Media Evaluation Guide
 NA - not analyzed
 Source: (1)

Table 2. Maximum Contaminant Levels in Surface Water and Groundwater Samples

CONTAMINANT	SURFACE WATER	GROUNDWATER	COMPARISON VALUE (µg/L)
ARSENIC	6 µg/L	31 µg/L	3 (CHILD EMEG)
MANGANESE	38 µg/L	1100 µg/L	50 (CHILD RMEG)

µg/L - micrograms per liter
 EMEG - Environmental Media Evaluation Guide
 RMEG - Reference Dose Media Evaluation Guide
 NA - not analyzed
 Source: (1)

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 developed MRLs 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. The U.S. Environmental Protection Agency (EPA) has developed reference doses (RfDs) to evaluate non-cancer health effects resulting from exposure to chemicals at Superfund sites.

Both MRLs and RfDs 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.

To evaluate possible adverse health effects from incidental ingestion of chemicals in water, we used a standard ingestion rate for water of 1 liter per day (L/day) for children and 2 L/day for adults. To evaluate possible adverse health effects from incidental ingestion of chemicals in soil, we used a standard incidental ingestion rate of 200 milligrams per day (mg/day) for children and 100 mg/day for adults. We also used a standard body weight of 15 kilograms (kg) for children and 70 kg for adults.

To estimate exposure from incidental ingestion of contaminated surface water during swimming, we made the following assumptions: 1) children between the ages of 6 and 18 swim in the canal, 2) they ingest 0.05 liters of water per hour during swimming, 3) each swimming event lasts 1 hour, 4) they swim 72 times per year (3 times/week and 24 week/year), 5) the average weight is 35 kg, and 6) they were exposed to the maximum concentration measured for each contaminant.

Arsenic

The maximum estimated daily dose of arsenic for children and adults from incidental ingestion of soil and sediment at this site is less than ATSDR's chronic oral MRL (3). This dose is about 100 times less than the lowest level that has been found to cause illness in humans or animals. Arsenic is a known human carcinogen. However, lifetime exposure to the maximum estimated daily dose of arsenic in soil and sediment would result in no apparent increase in the risk of cancer. Therefore, no illnesses are likely from incidental ingestion of arsenic in soil and sediment at this site.

The maximum estimated daily dose of arsenic for children from incidental ingestion of surface water is less than ATSDR's chronic oral MRL (3). This dose is about 10,000 times less than the lowest level that has been found to cause illness in humans or animals. Lifetime exposure to the

maximum estimated daily dose of arsenic in surface water would result in no significant increase in the risk of cancer. Therefore, no illnesses are likely from incidental ingestion of arsenic in surface water at this site.

Arsenic also occurs in the groundwater at the site. The maximum estimated daily dose of arsenic from ingestion of groundwater exceeds ATSDR's chronic oral MRL in both adults and children (3). Lifetime exposure to this amount of arsenic could increase the risk of lung and skin cancer. However, homes within one-half mile of the site are supplied with municipal drinking water. Therefore, illnesses are not likely in children or adults from exposure to arsenic in groundwater.

Manganese

Manganese is an essential nutrient in the diet. Children and adults need between 1-5 mg of manganese per day for good health (4). The maximum estimated daily dose of manganese from incidental ingestion of soil at this site is at least 100 times less than this amount. Therefore, it is not likely that illnesses will occur in children or adults from incidental ingestion of manganese in soil at this site. Eastwood sediments were not analyzed for manganese.

ATSDR has not established an MRL for manganese. However, there is an EPA RfD for manganese in water (4). The maximum estimated daily dose of manganese in children and adults from incidental ingestion of surface water at the Eastwood site is less than the RfD. Therefore, no illnesses are likely from exposure to manganese in surface water.

Manganese also occurs in groundwater at the site. The maximum estimated daily dose of manganese from groundwater exceeds EPA's RfD for manganese in both children and adults. However, homes within one-half mile of the site are supplied with municipal drinking water. Therefore, illnesses are not likely in children or adults from exposure to manganese in groundwater.

Child Health Considerations

Because children may be present at the Eastwood site, the health effects from exposure to chemicals in young 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 also smaller, resulting in higher doses of chemical exposure per body weight. Children are often more sensitive to the effects of chemical exposures than adults and can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

As detailed in the discussion section above, children are not likely to be exposed to chemicals at this site at a level sufficient to cause any illnesses.

Community Health Concerns

As indicated in the Purpose and Health Issues section, there are currently no community health concerns associated with this site.

Conclusions

Based upon the information reviewed, we conclude that illnesses are not likely in adults and children from exposure to arsenic and manganese in soil, sediment, surface water, and groundwater at this site. If additional information becomes available concerning chemical exposures at this site, 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 at this site.

Public Health Action Plan

The public health action plan for the Eastwood Golf Course site contains a description of actions to be taken by the Florida Department of Health and other government agencies at the site after the completion of this public health assessment. The purpose of this Public Health Action Plan is to ensure that this public health assessment not only identifies public health hazards but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

Since no adverse health effects are likely from exposure to chemicals at this site, no further public health actions are needed at this time. Florida DOH will evaluate any new environmental data for this site to determine what actions, if any, are needed.

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References

- 1 B & V Special Projects Corp. Final Site Inspection Report, Eastwood Golf Course Site, Fort Myers, Lee County, Florida. December 16, 1998.

2. Bureau of the Census, U.S. Department of Commerce, Washington, DC, 1990 Census Data Files.
3. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Arsenic (Update). ATSDR: Atlanta, April 1993.
4. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Manganese (Draft Update). ATSDR: Atlanta, September 1997.

Figure 1. State Map Showing Location of Lee County

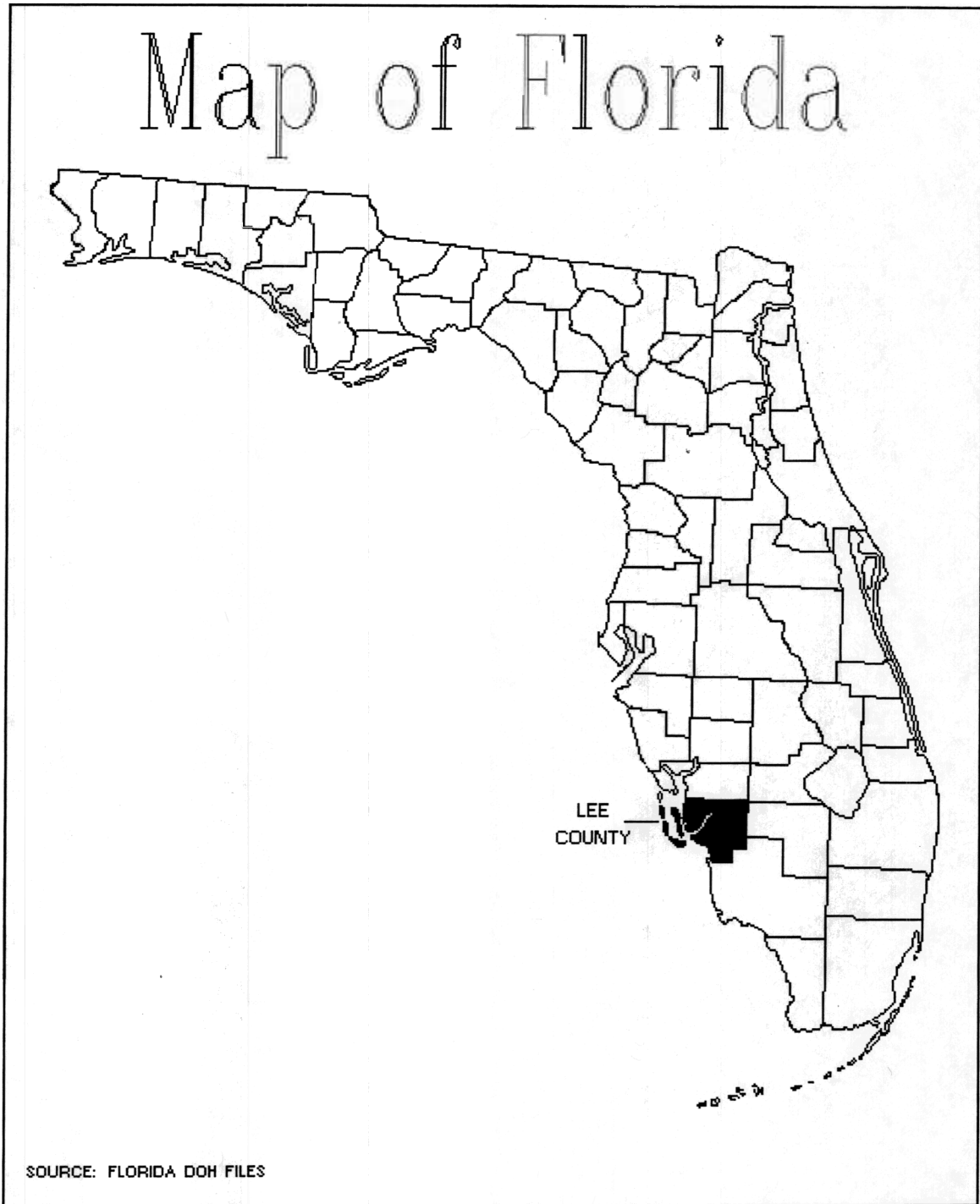


Figure 2. Location of Eastwood Golf Course in Lee County



SOURCE: FDOH FILES

Figure 3. Detail of Eastwood Golf Course

