Health Consultation

TOWN & COUNTRY LAKE ESTATES

SPRINGFIELD, BAY COUNTY, FLORIDA

CERCLIS NO. FLD984171678

FEBRUARY 3, 1999

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

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.

You May Contact ATSDR TOLL FREE at
1-888-42ATSDR
or
Visit our Home Page at: http://atsdr1.atsdr.cdc.gov:8080/

HEALTH CONSULTATION

TOWN & COUNTRY LAKE ESTATES

SPRINGFIELD, BAY COUNTY, FLORIDA

CERCLIS NO. FLD984171678

Prepared by:

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

Background and Statement of Issues

In September 1998, the Florida Department of Environmental Protection (FDEP) asked the Florida Department of Health (Florida DOH) to evaluate the potential health threat to residents of Town and Country Lake Estates from exposure to chemicals in soil, sediment, and groundwater (1). FDEP is concerned that chemicals in this residential neighborhood may pose a health risk to children and adults who live there.

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

Town and Country Lake Estates is located at the corner of Eleventh Street and Bob Little Road (SR 22A) in Springfield, Bay County, Florida (Figs. 1, 2, 3 and 4). The site consists of about 45 acres that was the location of a former uncontrolled sanitary landfill. The landfill operated from the early 1960's to the early 1970's and is alleged to have received various wastes from a number of papermill and petrochemical companies. The Town and Country Lake Estates subdivision was subsequently built on top of the landfill. About 100 single family homes are in the subdivision (1).

According to 1990 census data (2), about 6,000 people live within a one-mile radius of the site. Family income in this area ranges from about $12,000-$35,000 per year. Racial makeup of the population is about 76% white and 19% black. There are nine daycare centers, two public schools, a foster care home, and a nursing home within one mile of the site. There are about 160 private wells within this same area.

Soil, lake sediments, groundwater, and surface water have been sampled at the site. In June 1993, contractors for FDEP collected seven surface soil and three subsurface soil (depths not specified) samples from the site. They also collected five sediment samples, six groundwater samples, and three surface water samples. They analyzed the samples for metals, volatile organic chemicals (VOCs), and pesticides (3). In April 1998, FDEP contractors collected fourteen surface soil (depth 0-12 inches) and nine subsurface soil (depth > 12 inches) samples from the site. They also collected six sediment samples and seven groundwater samples. They analyzed the samples for metals, VOCs, pesticides, polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol, dioxins, and furans (1).

On October 16, 1998 Bruce Tuovila, Florida DOH, visited the Town and Country Lake Estates community. The neighborhood consists of

middle income residential housing, mostly single-story ranch-style houses. Access to the neighborhood properties is unrestricted. Most of the yards are covered with well-maintained grass, shrubs, and trees. At the southern end of the neighborhood, just north of Seventh Avenue (Fig. 4), there is an open field with large areas of exposed soil. Mr. Tuovila observed several dozen children playing in yards and on street sidewalks. Lake Charles forms the western border of the former landfill. Mr. Tuovila observed a small pier on the eastern side of the southern part of the lake. However, there was no other evidence of recreational use of the lake such as fishing or swimming.

Table 1 shows the maximum level of each chemical of potential health concern in the surface and subsurface soil samples collected at the site. Table 2 shows the maximum level of each chemical of potential health concern in sediment and groundwater samples. No chemicals were found at a level of health concern in surface water at the site. Chemicals not shown in the tables are below levels of human health concern. We selected these chemicals 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

CONTAMINANT	MAXIMUM CONCENTRATION-SURFACE SOIL	MAXIMUM CONCENTRATION-SUBSURFACE SOIL
ARSENIC	6.2 mg/kg	ND
BENZENE	NA	NA
DIOXIN (TEQ)	0.0000094 mg/kg	ND
LEAD	95 mg/kg	35.2 mg/kg
MANGANESE	37.2 mg/kg	62.9 mg/kg

mg/kg - milligrams per kilogram of soil
TEQ - Toxic Equivalents
ND - not detected
NA - not analyzed
Sources: (1, 3)

Table 2. Maximum Contaminant Levels in Sediment and Groundwater Samples

CONTAMINANT	MAXIMUM CONCENTRATION-SEDIMENT	MAXIMUM CONCENTRATION-GROUNDWATER
ARSENIC	14 mg/kg	10.5 µg/L
BENZENE	NA	5 µg/L
DIOXIN (TEQ)	0.000026 mg/kg	NA
LEAD	73.4mg/kg	25.3 µg/L
MANGANESE	29 mg/kg	176 µg/L

mg/kg - milligrams per kilogram of soil
µg/L - micrograms per liter
TEQ - Toxic Equivalents
ND - not detected
NA - not analyzed
Sources: (1, 3)

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

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 (4). This dose is at least 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. Arsenic also occurs in the shallow groundwater at the site. However, this water is not used for household consumption. Therefore, illnesses are not likely in children or adults from exposure to arsenic in groundwater.

Benzene

FDEP only analyzed groundwater at this site for benzene. They did not analyze any soil or sediment samples for benzene. However, benzene is very volatile and is not likely to remain in the soil (5). Since groundwater at this site is not used for household consumption, no illnesses are likely to occur in children or adults from exposure to benzene in groundwater.

Dioxin

ATSDR has established a chronic oral MRL for dioxin (6). The maximum estimated daily dose of dioxin for children and adults from incidental ingestion of soil and sediment at this site is at least 10 times less than the MRL. Therefore, it is not likely that illnesses will occur from incidental ingestion of dioxin in soil and sediment at this site. FDEP did not analyze water samples for dioxin. However, dioxins have a low solubility in water and adhere very strongly to soil particles (6). Therefore, it is not likely that significant levels of dioxin are present in groundwater or surface water at the site.

Lead

ATSDR has not established an MRL for lead. However, a No Observed Adverse Effect Level (NOAEL) has been developed based on observations of impaired blood production and changes in liver

enzymes in rats (7). The maximum estimated daily dose of lead for children and adults from incidental ingestion of soil and sediment at this site is less than the NOAEL. Therefore, it is not likely that illnesses will occur from incidental ingestion of lead in soil and sediment at this site. Lead also occurs in the shallow groundwater at the site. However, this water is not used for household consumption. Therefore, illnesses are not likely in children or adults from exposure to lead 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 (8). The maximum estimated daily dose of manganese from incidental ingestion of soil and sediment 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 and sediment at this site. Manganese also occurs in the shallow groundwater at the site. However, this water is not used for household consumption. Therefore, illnesses are not likely in children or adults from exposure to manganese in groundwater.

Child Health Considerations

Because children are present in this neighborhood, 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 often more sensitive to the effects of chemical exposures than adults.

Children are especially sensitive to the effects of exposure to lead (7). They may also be at increased risk from exposure to benzene (5) and manganese (8). However, as detailed in the discussion section above, exposure to these chemicals in young children, at the levels found at this site, is not likely to cause any illnesses.

Conclusions

Based upon the information reviewed, we conclude that illnesses are unlikely in adults and children from exposure to contaminants in soil, sediments, groundwater and surface water at this site. The site poses no apparent health threat. 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 regarding soil, sediments, groundwater, or surface water at the Town and Country Lake Estates site.

References

1. Florida Department of Environmental Protection. Letter to Tillman McAdams, U.S. Environmental Protection Agency, from James McCarthy, Florida Department of Environmental Protection, requesting a health assessment of contamination at the Town and Country Lake Estates site, Bay County, Florida.

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

3. Florida Department of Environmental Protection. Letter to Bruce Tuovila, Florida Department of Health, from James McCarthy, Florida Department of Environmental Protection, transmitting sampling analysis results for the Town and Country Lake Estates site, Bay County, Florida.

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

5. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Benzene (Update). ATSDR: Atlanta, September 1997.

6. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Chlorinated Dibenzo-p-Dioxins (Draft Update). ATSDR: Atlanta, September 1997.

7. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Lead (Draft Update). ATSDR: Atlanta, August 1997.

8. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Manganese (Draft Update). ATSDR: Atlanta, September 1997.

Health Consultation Author

Bruce J. Tuovila
Biological Scientist
Bureau of Environmental Toxicology
(850) 488-3385

CERTIFICATION

This Town and Country Lake Estates 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.

Roberta Erlwein
Technical Project Officer
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.

for Lisa C. Hayes
Richard Gillig
Section Chief, SPS, SSAB, DHAC, ATSDR

Figure 1. State Map Showing Location of Bay County

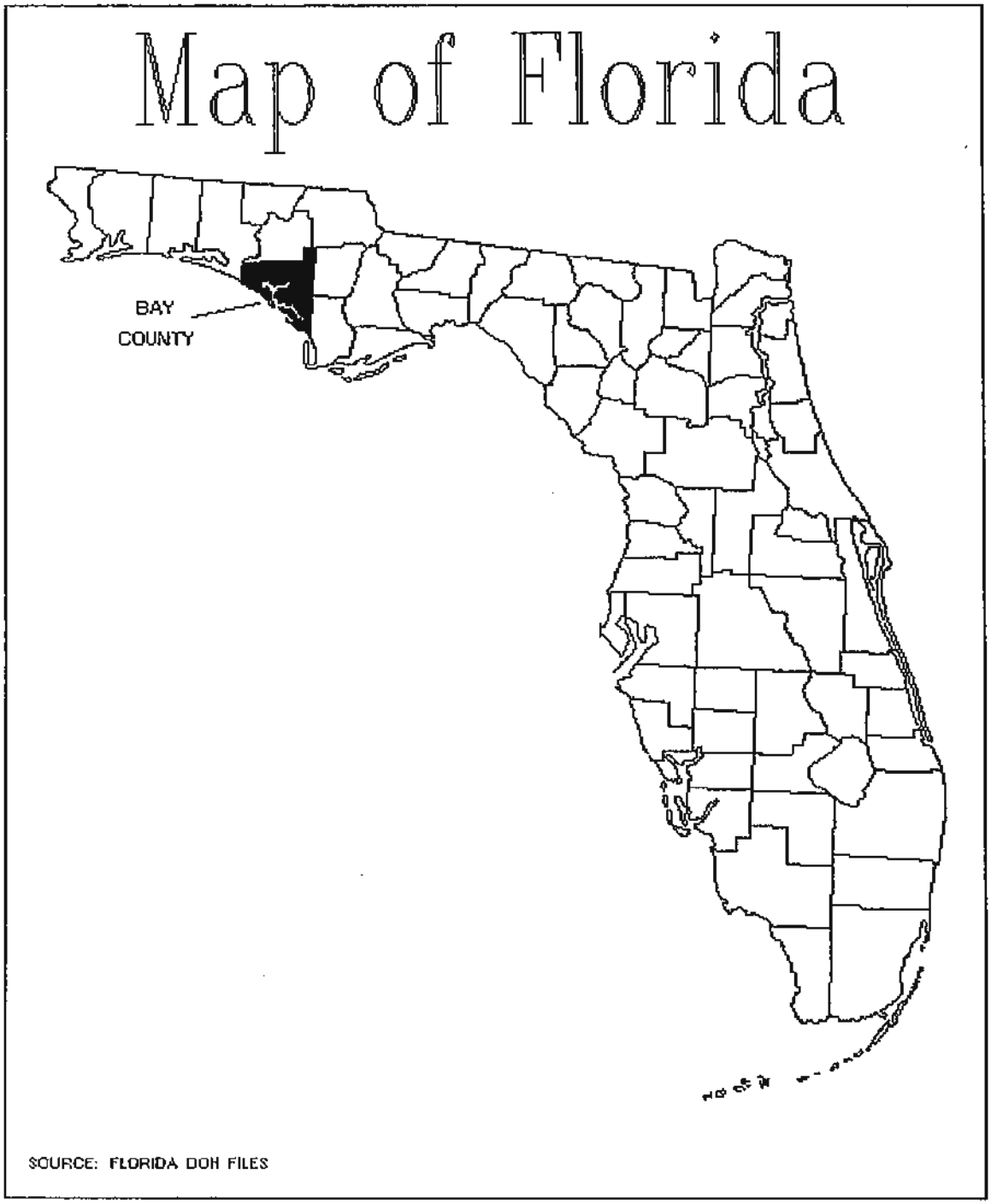

Figure 2. Location of Town and Country Lake Estates in Bay County

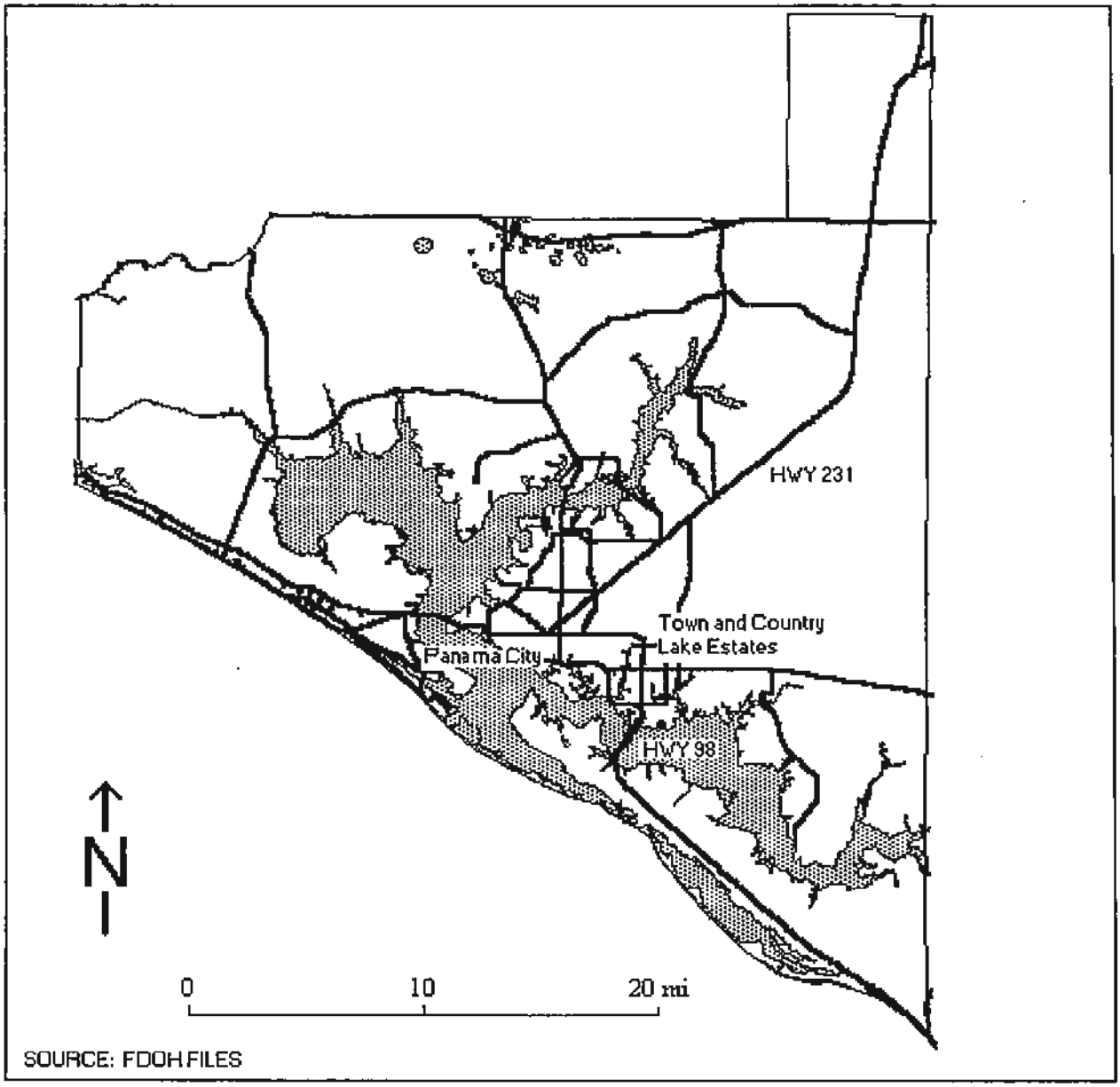

Figure 3. Location of Town and Country Lake Estates in Springfield

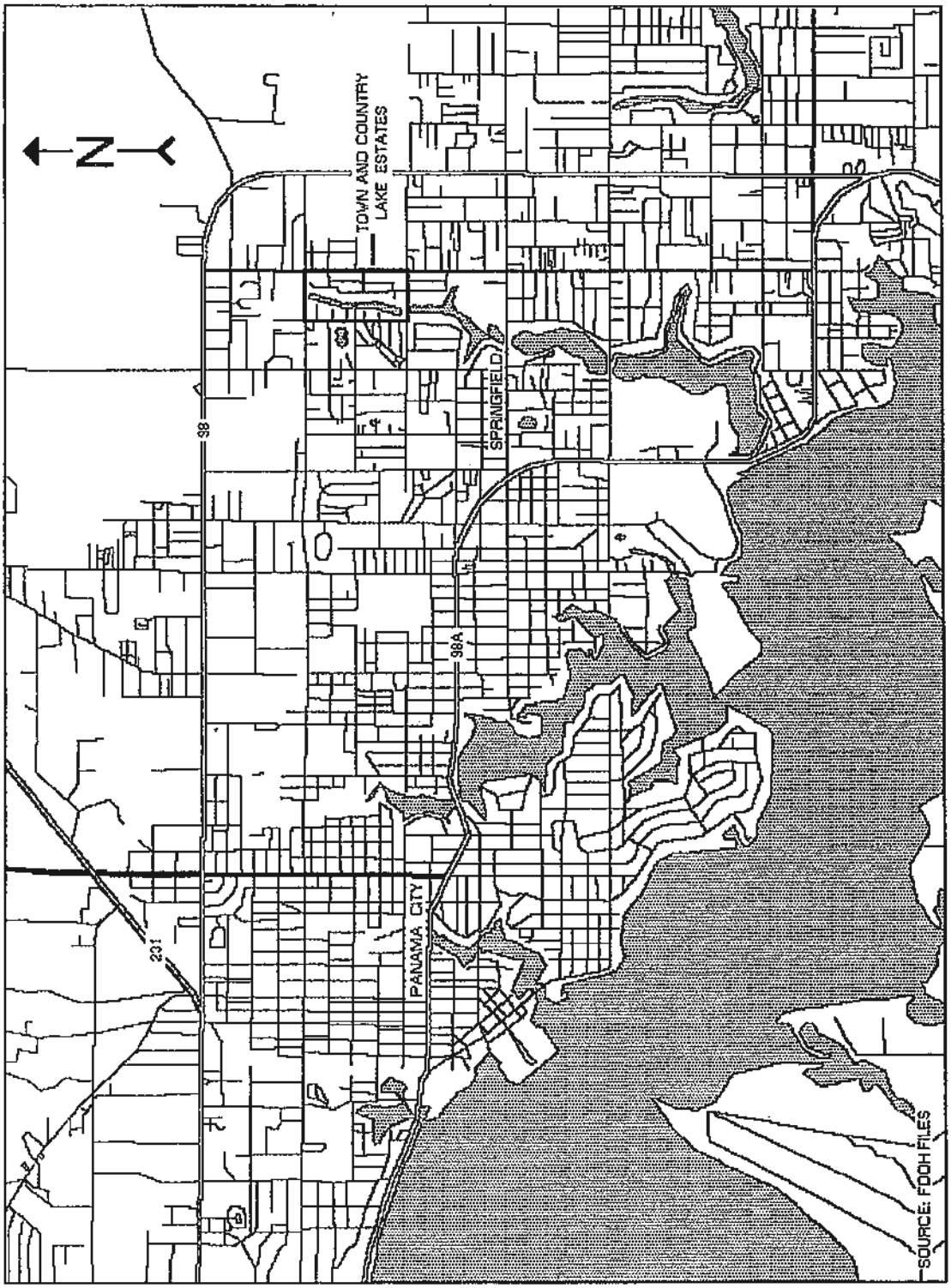

Figure 4. Detail of Town and Country Lake Estates Site