

Public Health Assessment for

INTERIM

YELLOW WATER ROAD DUMP

BALDWIN, DUVAL COUNTY, FLORIDA

CERCLIS NO. FLD980844179

JULY 9, 1992

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry



THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i)(6)(F) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term "health assessment" shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessment, risk evaluations, and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR prepared this Interim Health Assessment using available data and information. ATSDR will re-evaluate this site and prepare an updated health assessment as warranted by the availability of additional data and information and as resources permit.

INTERIM PUBLIC HEALTH ASSESSMENT

YELLOW WATER ROAD DUMP

BALDWIN, DUVAL COUNTY, FLORIDA

CERCLIS NO. FLD980844179

Prepared by:

Florida Department of Health and Rehabilitation Services
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

SUMMARY

The Yellow Water Road National Priorities List (NPL) site is located 1 mile south of Baldwin in Duval County, Florida. Soil and stockpiled materials known to contain high levels of contaminants were removed from the site prior to August 1989. Following this removal, site media were resampled to ascertain levels of contaminants remaining on site. Soil, sediments, surface water, and ground water at the site were found to be contaminated with low levels of polychlorinated biphenyls (PCBs). Various halogenated and non-halogenated solvents, phthalate esters and polycyclic aromatic hydrocarbons (PAHs) were identified at low concentrations but were found to be representative of ambient background conditions. Low levels of methylene chloride, acetone and bis(2-ethylhexyl)phthalate present in samples and corresponding blanks were attributed to laboratory or field contamination.

Distribution of contaminants is limited to the former operational area and areas immediately west and north. Additional monitoring wells are being installed to better define the ground-water contamination plume. Off-site contamination was limited to surface-water drainage courses.

Sixty-eight homes are located within a 1-mile radius of the site; 56 residences are located east (hydrologically upgradient), 6 residences are located north, and 5 residences are located northwest (hydrologically downgradient). Exposure pathways of concern involve future residential use of the site, exposure via ingestion of on-site ground water, and migration of contaminated ground water off site. On-site exposure pathways of current concern include ground water and soil exposures for the 2 on-site residences which have private potable wells. PCB levels in the on-site private potable wells are below levels of health concern. Based on the available information, this site is considered to be an Indeterminate Public Health Hazard because insufficient data are available to determine the potential for current or future human exposure.

The data and information developed in the Yellow Water Road site have been evaluated for appropriate follow-up health activities. Although exposure may have occurred in the past, contaminants were below levels of public health concern. The Health and Rehabilitative Services (HRS) Duval County Public Health Unit should continue ongoing health education activities with residents living in the site vicinity. This site is not being considered for additional health follow-up activities at this time.

BACKGROUND

A. SITE DESCRIPTION AND HISTORY

The Yellow Water Road site occupies approximately 14 acres of predominantly forested land in Duval County (Figure 1), about 10 miles southwest of Jacksonville (Figure 2). Prior to its purchase in the late 1940s and subsequent development, the site was part of a dairy farm. In 1981, the owner formed the American Environmental Energy Corporation (AEEC) on the premise that dielectric fluids contaminated with PCBs could be removed from transformers which could then be salvaged. AEEC planned to dispose of PCB-contaminated fluids via an on-site incinerator, through a joint venture with the American Electric Corporation (AEC). For approximately 2 years, AEEC collected and stored a variety of transformers, drums and other PCB contaminated materials on site. PCB-containing oils drained from capacitors and transformers at the AEC Ellis Road site were also transferred to the Yellow Water Road site for ultimate incineration. PCB-contaminated fluids were not burned because neither company was issued a permit for on-site incineration.

The United States Environmental Protection Agency (EPA) On-Scene-Coordinator requested authorization to proceed with an immediate removal at the site in November 1984, based on information indicating that there were 150,000 gallons of PCB-contaminated fluids on site. The site owner indicated that he was financially unable to comply with the removal orders in December 1984, and the EPA, Region IV initiated an Emergency Response. Fluids from PCB-contaminated containers were drained into on-site storage tanks. The transformers and containers were rinsed with an alkaline solution (Penetone), and staged in, and adjacent to, an on-site warehouse. Rinsate fluids were treated on site by activated carbon prior to discharge, and approximately 3,000 cubic yards of PCB-contaminated soil were excavated and stockpiled.

The EPA proposed incineration of the PCB-contaminated fluids and soil. The City of Jacksonville conditionally approved incineration of this material in January 1985 but in February 1985 vetoed the City Ordinances amendment allowing PCB incineration due to public opposition. The EPA secured the site by covering the stockpiled soil with a synthetic protective covering and locking the gate on the fence around the former production area.

The site was added to the NPL list in June 1986. Since that time, the EPA has contacted many of the generators of hazardous waste which was accepted at the site. These Potentially Responsible Parties (PRPs) oversaw the remediation work that occurred to date, including a Remedial Investigation, Feasibility Study, and an interim removal. During this removal, the on-site warehouse was destroyed, all the warehouse debris, stockpiled soil, and capacitors were disposed of at SCA, Chicago and Chemical Waste Management's Emelle Alabama landfill, and 78,854 gallons of PCB-contaminated wastes were incinerated off site.

The Agency for Toxic Substances and Disease Registry issued a Preliminary Health Assessment for the Yellow Water Road site in April 1989 which

identified ingestion of contaminated ground water and direct dermal contact with contaminated soil and ground water as potential pathways of human exposure (1).

B. SITE VISIT

A site visit was conducted by staff from the Florida Department of Health and Rehabilitative Services (HRS) Toxicology and Hazard Assessment office and the Department of Environmental Regulation (DER) project manager for the Yellow Water River Road site in January 1990. The site is bordered on the north and east by a 3-strand, barbed-wire fence with wood posts that stand 4 feet high. A metal gate and NO TRESPASSING signs block the roadway entrance to the site off Yellow Water Road. The southern and western borders of the site are not fenced but dense vegetation present on much of the site continues off site along these borders, making site access difficult from these directions.

The former operations area is surrounded by an 8-foot chain-link fence with a padlocked gate. At the time of the site visit, dead vegetation effectively screened the former operations area, making it impossible to discern the location of the warehouse foundation, or any objects remaining within the fence.

HRS Duval County Public Health Unit personnel were on the site in August 1990 to sample the potable wells and HRS Toxicology and Hazard Assessment staff attended a public meeting on the site in September 1990.

C. DEMOGRAPHICS, LAND USE, AND NATURAL RESOURCE USE

The city of Jacksonville has incorporated Duval County; therefore even though Baldwin is 10 miles southwest of the Jacksonville suburbs, it is considered part of the city proper for governmental purposes (Figure 2). Interstate 10 runs east-west less than a mile north of the site. The terrain around the site is relatively flat and densely vegetated. The property immediately surrounding the site on the west side of Yellow Water Road is sparsely populated and relatively undeveloped (Figure 1). The Florida Steel Company plant and an auto shredding plant are located approximately 0.8 mile northwest and west of the site, respectively. The Valley Green subdivision contains 57 modular and mobile homes within a mile east of the site boundary.

Water within a mile of the site is supplied by industrial and private potable wells. The residential wells, and Florida Power and Light Company's well, are all between 80 to 125 feet deep. Florida Steel Company's well is 800 feet deep.

There are 2 occupied residences on site with potable wells, a house and a mobile home. The house and mobile home on the site both have lawn areas around them, although the area around the former operations area and the remainder of the site are not maintained and were overgrown with tall weeds at the time of the site visit. When the site was part of a dairy farm, 4 wells were present on site. It is not known what became of these wells.

If they have not been not properly abandoned they could provide a conduit between surface contamination and water-bearing underground strata.

Surface features in the area include a borrow pit 0.5 mile north of the site that is used for sport fishing. This borrow pit is not connected with the small wetlands area located just north of the western portion of the site (Figure 3). The water in this small wetlands is from areal drainage and supports no food fish.

D. HEALTH OUTCOME DATA

Local and State Health Data - No pathways for human exposure are known to be completed; therefore, there are no outcomes of concern to search for in health data bases. In addition, no data indicate that human exposures at levels of health concern have occurred in the past.

COMMUNITY HEALTH CONCERNS

Based on comments from community representatives at the Yellow Water Road site public meeting on September 4, 1990, there is continuing community concern over ground water quality.

Initial community concern over ground water quality resulted from the detection of trace amounts of PCBs in 2 drinking-water wells adjacent to the site in December 1984. Following the detection of PCBs in these wells, the Yellow Water Road site owner was issued a Notice of Violation by DER and the site received an EPA site hazard ranking. The Yellow Water Road site was proposed for inclusion on the NPL in June 1986 because of its high hazard ranking score. Ground-water testing has also shown trace levels of PCB contamination in an additional potable well in 1986. None of the PCB levels detected have been sufficiently elevated to preclude their acceptable use as potable supplies. The HRS Duval County Public Health Unit has continued to monitor these wells. The latest round of sampling occurred in August 1990 and detected a trace amount of tetrachloroethene in only 1 well. Confirmatory sampling did not detect this contaminant. The occurrence of PCBs and tetrachloroethene hydrogeologically upgradient of the site production area may be attributable to undisclosed spills involving degreasers and PCB-contaminated oils.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

HRS Toxicology and Hazard Assessment personnel searched the 1987, 1988, and 1989 Toxic Chemical Release Inventory (TRI) databases to identify facilities that could contribute to the air and ground water contamination near the Yellow Water Road site. TRI databases are developed by the EPA from chemical release air, water, and soil information provided by certain industries. TRI databases contained information on the toxic chemical releases of Florida Steel Company and Southern Wood Piedmont Company which are the only reporting industries located in the Baldwin zipcode area.

This zipcode area encompasses the area immediately around the site. All releases from these companies to air were copper, chromium compounds, nickel, zinc, manganese, lead, and aluminum oxide. Ethylene glycol was released to water. Chromium compounds, lead, manganese, nickel, zinc, aluminum oxide, antimony and copper were released to land.

A. ON-SITE CONTAMINATION

The preliminary public health assessment listed PCB and lead in on-site ground water (1), however sampling carried out for the Remedial Investigation (RI) failed to replicate previously reported sampling results (2).

Air, ground water, surface water, soil, and sediments were sampled to determine levels of contaminants remaining on the Yellow Water Road site after the contaminant source removal (2). PCBs are contaminants of concern in all these media except air. Other analytes identified at levels of concern in ground water, surface water, and soil samples have been attributed to laboratory and/or field contamination.

Because of the limited number of monitoring well clusters, the area of PCB-contaminated ground water has not been well characterized. There are 6 monitoring well clusters and each cluster has 3 wells for a total of 18 wells. PCBs have only been detected in 3 monitoring well clusters. The 3 depths correspond to levels in the Surficial Aquifer System: one above a clay layer that occurs from between 40 and 50 feet below land surface, one below this clay layer, and one in the porous limestone "rock aquifer" that forms the local water-producing zone in the Surficial Aquifer System. PCBs have been detected at each depth with the highest concentration occurring at the intermediate depth. There are also 2 on-site wells that are used as potable sources. All but one of these wells were sampled twice for the Remedial Investigation for a total of 39 samples. The latest sampling of the on-site residential wells did not detect PCB contamination (August 1990). The clusters with wells that have shown PCB contamination include the one in the former production area, the cluster just northwest of the former production area and the cluster at the northwestern boundary of the site. Additional monitoring wells are being installed as part of the post remedial investigation. Sampling of these new monitoring wells should help to better define the ground water contamination plume.

ON-SITE CONTAMINATION

<u>Ground Water Concentration</u> <u>Contaminant</u>	<u>Level (µg/L)</u>	<u>Positives/Total*</u>
Total PCBs	ND - 8.7	5/39
<u>Soil Concentration**</u> <u>Contaminant</u>	<u>Level (mg/kg)</u>	<u>Positives/Total*</u>
Total PCBs	ND - 9.4	47/120
<u>Surface Water Concentration</u> <u>Contaminant</u>	<u>Level (µg/L)</u>	<u>Positives/Total*</u>
Total PCBs	ND - <10	12/25
<u>Sediment Concentration</u> <u>Contaminant</u>	<u>Level (mg/kg)</u>	<u>Positives/Total*</u>
Total PCBs	ND - 60.5	12/25

ND-Not Detected. Contaminant was not found at or above detection level.

* Number of positive samples/Total number of samples.

** Soil samples were collected at depths from 0 to 2 feet.

B. OFF-SITE CONTAMINATION

Soils, ground water, and surface water are the only media that have been sampled off-site. Although off-site wells had trace levels of PCBs in the past, in the most recent samples (August 1990) PCBs were not detected (2). One sample did show a trace amount of tetrachloroethene and is undergoing confirmatory sampling. Because contaminants have been detected in nearby potable wells in the past, further periodic monitoring of these wells is warranted. Off-site soil samples were all collected at the northwest boundary of the site where truck unloading activity was concentrated. PCBs occur there at levels greater than some of the highest levels found on site. Only 1 off-site surface-water sampling station was included in the Remedial Investigation, and no PCBs were detected in that sample.

Ground-water samples were collected from the 12 nearest wells in the Valley Green Subdivision in August 1990 by an HRS Duval County Public Health Unit representative. One well showed a trace of tetrachloroethene; however, resampling did not confirm the presence of tetrachloroethene.

OFF-SITE CONTAMINATION

Soil Concentration <u>Contaminant</u>	<u>Level (mg/kg)</u>	<u>Positives/Total*</u>
-Total PCBs	ND - 2.2	10/19

ND-Not Detected. Contaminant was not found at or above detection level.
* Number of positive samples/Total number of samples.

C. QUALITY ASSURANCE AND QUALITY CONTROL

All data included in the RI were assessed according to approved methodology in the RI/FS Work Plan and Project operations Plan and Laboratory Data Validation Functional Guidelines. Biased results that may have resulted from exceeding sample holding times were flagged with data qualifiers, as were all positive and negative results for volatile organic chemicals due to outlying surrogate spike recoveries.

Laboratory contaminants were identified as methylene chloride, acetone, di-n-butyl phthalate, bis(2-ethylhexyl) phthalate and lead. Field contaminants from the impurities in the isopropanol used for cleaning the sampling equipment in the field were identified as toluene, 2-butanone, 1,1,1-trichloroethane, 4-methyl-2-pentanone and trichloroethene. The consistent detection of these compounds in field and sample blanks contributes to the acceptance of the RI data as accurate and complete with specific qualifications.

D. PHYSICAL AND OTHER HAZARDS

No physical hazards for trespassers or remediation workers were observed at the site.

PATHWAYS ANALYSES

A. ENVIRONMENTAL PATHWAYS (FATE AND TRANSPORT)

PCBs are the contaminants of concern on-site. Although PCBs tend to adsorb to soil particles, they have been found at levels of concern in on-site ground water, surface water, and sediments, in addition to soil. PCBs have also been found in off-site soils, northwest of the site. DER has requested additional sampling of the surface water and sediments in this area to address the possibility that surface-water runoff may be a pathway for migration of soil contaminants to other off-site areas. Although movement of dust and volatilized contaminants are considered a route of contaminant movement, air testing did not detect any contaminants above detection levels.

Monitoring well data indicate the presence of PCBs and low levels of cadmium and benzene in the cluster of wells located in the northwestern

portion of the former operations area. PCBs have also been found in on-site monitoring wells and at trace levels in off-site potable wells upgradient of the former operations area, but not on a consistent basis. These data indicate PCBs have entered the surficial aquifer producing zone. The RI indicates the direction of ground-water flow in the surficial aquifer is northwestward, which suggests there may have been a contaminant source east of the site (which is upgradient), perhaps a spill from the trucks that brought the contaminants on the site, for example. An alternative explanation for PCBs in wells east of the former production area could be an alternate ground-water flow direction.

The 2 discrete sets of well depths mentioned in the Demographics Section correspond to the Surficial and Floridan Aquifer Systems which supply the drinking water for area residents. Because the depth to the Floridan Aquifer System is locally approximately 800 feet, private potable wells do not tap this source. The monitoring wells are completed in the Surficial Aquifer System. The limestone unit which forms the producing zone for most of the potable water used in the area (well depths vary from 80 to 125 feet) is 1 of the 4 sedimentary units that comprise the Surficial Aquifer System. This limestone unit is 20 to 40 feet thick and is locally referred to as the "rock aquifer" (3). Off-site potable ground water from this unit was found to contain very low levels of PCBs in 1984, thus initiating concern for adverse health effects for well users. Although this would suggest that a ground-water pathway from the contaminated rock aquifer to off-site potable wells has been established, PCBs have not since been detected in these wells, and these wells are located upgradient of the former operations area.

The surface water sample taken from the drainage area 10 yards north of the site showed no PCBs above the detection level.

B. HUMAN EXPOSURE PATHWAYS

The following potential pathways of exposure were identified: inhalation of volatilized PCBs, inhalation and ingestion of airborne soil particulates, ingestion of and direct dermal contact with contaminated soil; and ingestion of, inhalation of, and dermal contact with, contaminants in ground water. Other potential exposure pathways include dermal exposure to on-site surface water, ingestion of sediments, and ingestion of surface water on site.

PUBLIC HEALTH IMPLICATIONS

A. TOXICOLOGICAL EVALUATION

The current population at risk of low-level exposure to PCBs in soil, surface water, and sediments includes site residents, trespassers and remediation workers. The complexity of relating specific mixtures of PCBs for which data are available, to exposure in the general population has resulted in a tendency to regard all PCBs as having similar health hazard

potentials, although these assumptions may not be true. Future health concerns associated with long-term exposure to contaminants involves residential use of the property, and the development of new wells, especially in, or downgradient of, the former operations area. Users of wells east of the site may have been exposed to trace levels of PCBs in the past. These trace levels were lower than the Maximum Concentration Levels (MCLs) that have been proposed by the EPA for drinking water. MCLs are set for long-term exposure and are therefore protective for short-term exposure as well.

Human exposure to low levels of PCBs via ingestion of drinking water or soils at levels similar to those in on-site ground water have not been studied. However, the estimated minimal risk level for ingestion of PCBs, which are based on currently available animal studies, are less than the highest levels detected in soil and ground water in monitoring wells on the site. Therefore harmful noncancer effects as well as cancer effects from exposure to PCBs at these soil and ground water levels could occur in persons having long-term exposures (4).

PCB mixtures have been reported to suppress immune responses and alter host defense mechanisms. The most common findings in laboratory animals exposed orally or cutaneously to sub-lethal levels of various PCB mixtures have been severe atrophy of primary and secondary lymphoid organs, lower circulating immunoglobulin levels, and decreased specific antibody responses following immunization with antigens. Oral, human, PCB exposures have been linked to chloracne, increased susceptibility to respiratory infections, and decreased efficacy of the immune system (5).

At high exposure concentrations in humans, PCB exposures have been associated with liver cancer. Combined long-term exposures to on- and off-site media are likely to result in a moderate increased lifetime cancer risk.

B. HEALTH OUTCOME DATA EVALUATION

No adverse health effects are believed to have occurred in on-site or off-site receptor populations. When indicated by public health needs, and as resources permit, the evaluation of available additional relevant health outcome data and community health concerns is recommended.

C. COMMUNITY HEALTH CONCERNS EVALUATION

Environmental Health personnel from the HRS Duval County Public Health Unit addressed concerns that sampling of nearby potable wells had not been carried out recently; private potable well sources were sampled in August 1990. None of the sampled wells contained PCBs, although 1 contained a trace of tetrachloroethene which was not confirmed by resampling.

In December 1991, the Florida HRS mailed a one page fact sheet to the local residents, media, and elected officials summarizing the preliminary findings of this public health assessment. This fact sheet announced the

availability of the draft public health assessment at the local document repository and solicited public comment until January 31, 1992. No inquiries or comments were received.

CONCLUSIONS

Based on the available information, this site is considered to be an indeterminate public health hazard. The limited available data do not indicate that humans are being or have been exposed to levels of contamination that would be expected to cause adverse health effects; limited data show trace exposures. In addition, available data is inconclusive regarding the source of PCBs. Data are not available for all environmental media to which humans may be exposed; however there is no health-specific data that indicates the site has had an adverse impact on human health that requires intervention.

Ground water could be a potential exposure route for residents within 0.5 mile of the site because: 1) trace amounts of PCBs have been found in potable wells off site, upgradient of the areas of soil contamination on the site, 2) the ground-water plume has not been adequately defined, nor has local ground-water flow direction been adequately characterized, and 3) all residents within 0.5 mile depend on ground water as their only source of drinking water.

Human exposure to trace levels of PCBs via ground water may have occurred in the past, based on the detection of very low levels of PCBs in wells used for drinking and other purposes off site. These levels were all lower than the level EPA has proposed as acceptable in drinking water; therefore, these wells were not abandoned. PCBs were not detected in these wells in the latest analyses.

Soils on site are contaminated with low levels of PCBs. These levels, however are not of public health concern.

RECOMMENDATIONS

1. Duval County HRS County Public Health Unit personnel should routinely monitor private potable wells on site and adjacent to the site for PCBs.
2. The EPA contractors should use water level measurements and contaminant concentrations from additional monitoring wells being installed in the vicinity of the former operations area to determine the local direction of ground-water flow, confirm previously measured contaminant concentrations, and accurately delineate the extent of ground-water contamination.
3. Determine if additional PCB sources are in the vicinity. The EPA may want to look into this because trace amounts of PCBs have been found in wells that are supposedly upgradient of the source; therefore, there may be other local sources of PCBs.
4. The data and information developed in the Yellow Water Road Public Health Assessment have been evaluated for appropriate follow-up health activities. Although exposure may have occurred in the past, contaminants were below levels of public health concern. The Health and Rehabilitative Services (HRS) Duval County Public Health Unit should continue ongoing health education activities with residents living in the site vicinity.
5. This site is not being considered for additional health follow-up activities at this time. However, if data become available suggesting that human exposures to hazardous substances at levels of public health concern is currently occurring or has occurred in the past, ATSDR will reevaluate this site for health follow-up activities.

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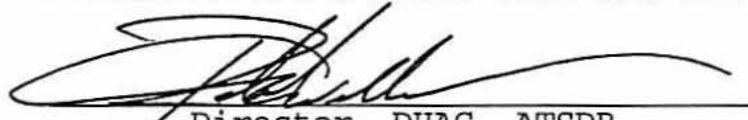
CERTIFICATION

This interim public health assessment was prepared by the Florida Department of Health and Rehabilitative Services (HRS) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in agreement with approved methodology and procedures existing at the time the public health assessment was initiated.



Technical Project Officer, SPS, RPB, DHAC

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



Director, DHAC, ATSDR

REFERENCES

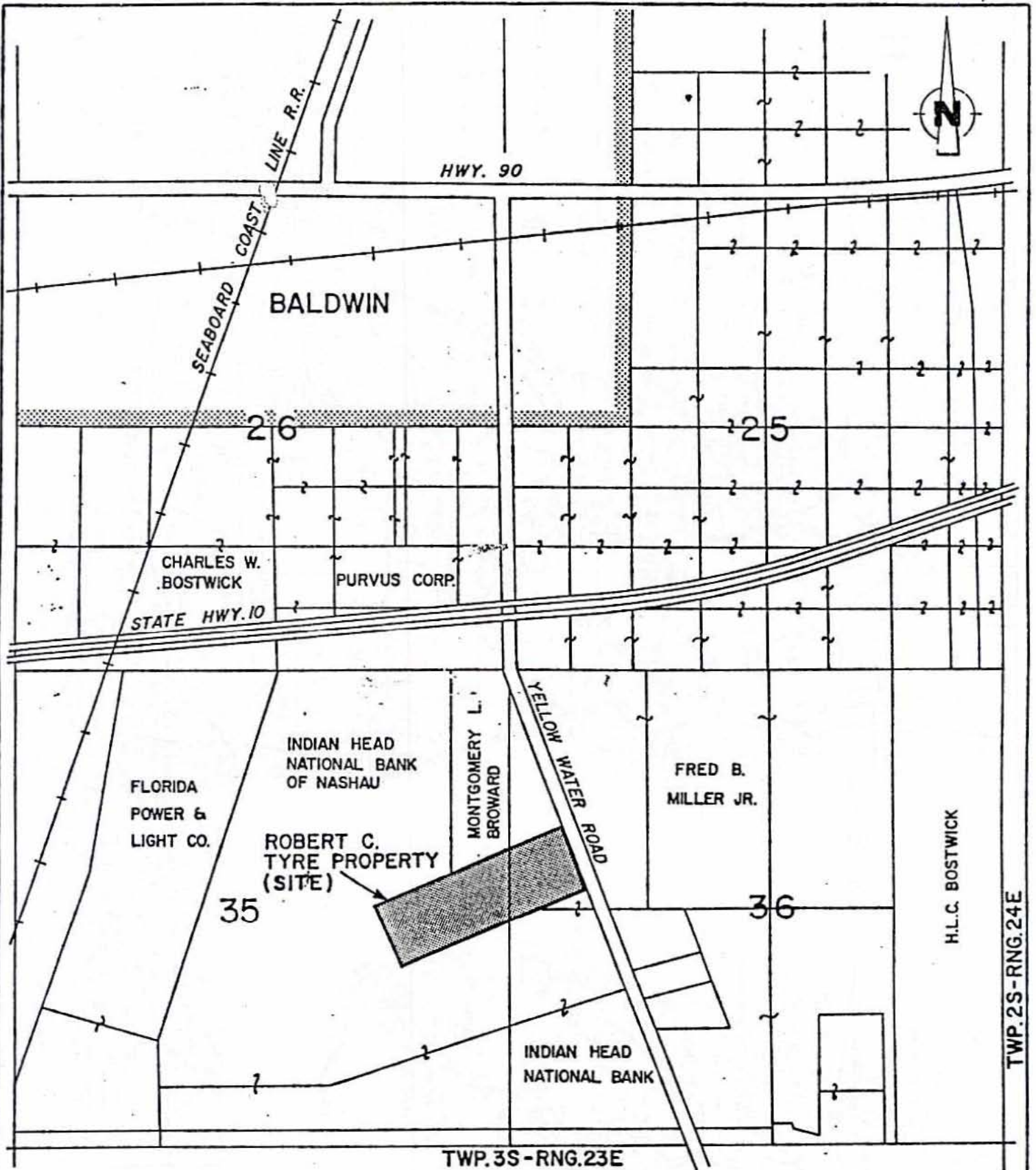
1. Agency for Toxic Substances and Disease Registry (ATSDR). Preliminary Health Assessment for Yellow Water Road Site. Duval County, Baldwin, Florida. Atlanta: ATSDR, April 1989.
2. Conestoga-Rovers & Associates, 1990. Yellow Water Road Site, Baldwin, Florida; Draft Remedial Investigation Report, June 1990
3. Leve, G.W., 1966. Ground Water in Duval and Nasseau Counties, Florida. prepared by the U.S. Geological Survey in cooperation with the Division of Geology and Duval County and the City of Jacksonville, Florida State Board of Conservation
4. Agency for Toxic Substances and Disease Registry (ATSDR), 1989. Toxicological Profile for Selected PCBs, ATSDR/TP-88/21
Environmental Protection Agency, 1986. Guidelines for the Health Risk Assessment of Chemical Mixtures, Environmental Criteria and Assessment Office, Cincinnati, OH 45268
5. Weisberger, J.H. and G.M. Williams, 1986. Chemical Carcinogens in Casarett and Doull's Toxicology, 2nd edition, C.D. Klaassen, M.O. Amdur, and J. Doull, editors. MacMillan Publishing Co., Inc. New York

APPENDICES

Figure 1: State Highway 10 and the area surrounding the Yellow Water Road site.

Figure 2: Key map of site location in state.

Figure 3: Physical details of Yellow Water Road site.



NOTE: BASED ON 1984 DUVAL COUNTY OWNERSHIP PLAT

NOT TO SCALE

figure 1
 ADJACENT PROPERTIES
 YELLOW WATER ROAD SITE

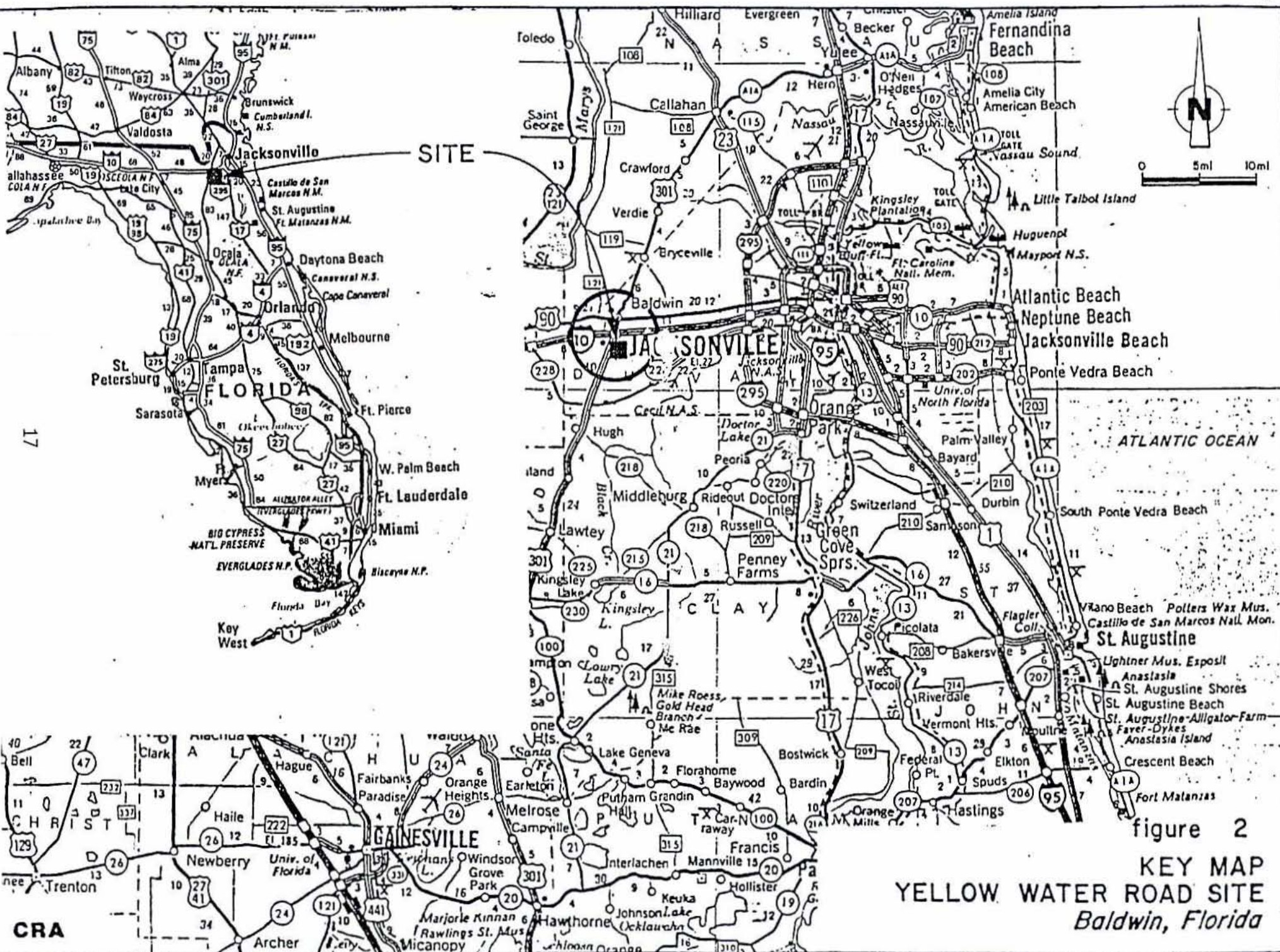


figure 2
 KEY MAP
 YELLOW WATER ROAD SITE
 Baldwin, Florida

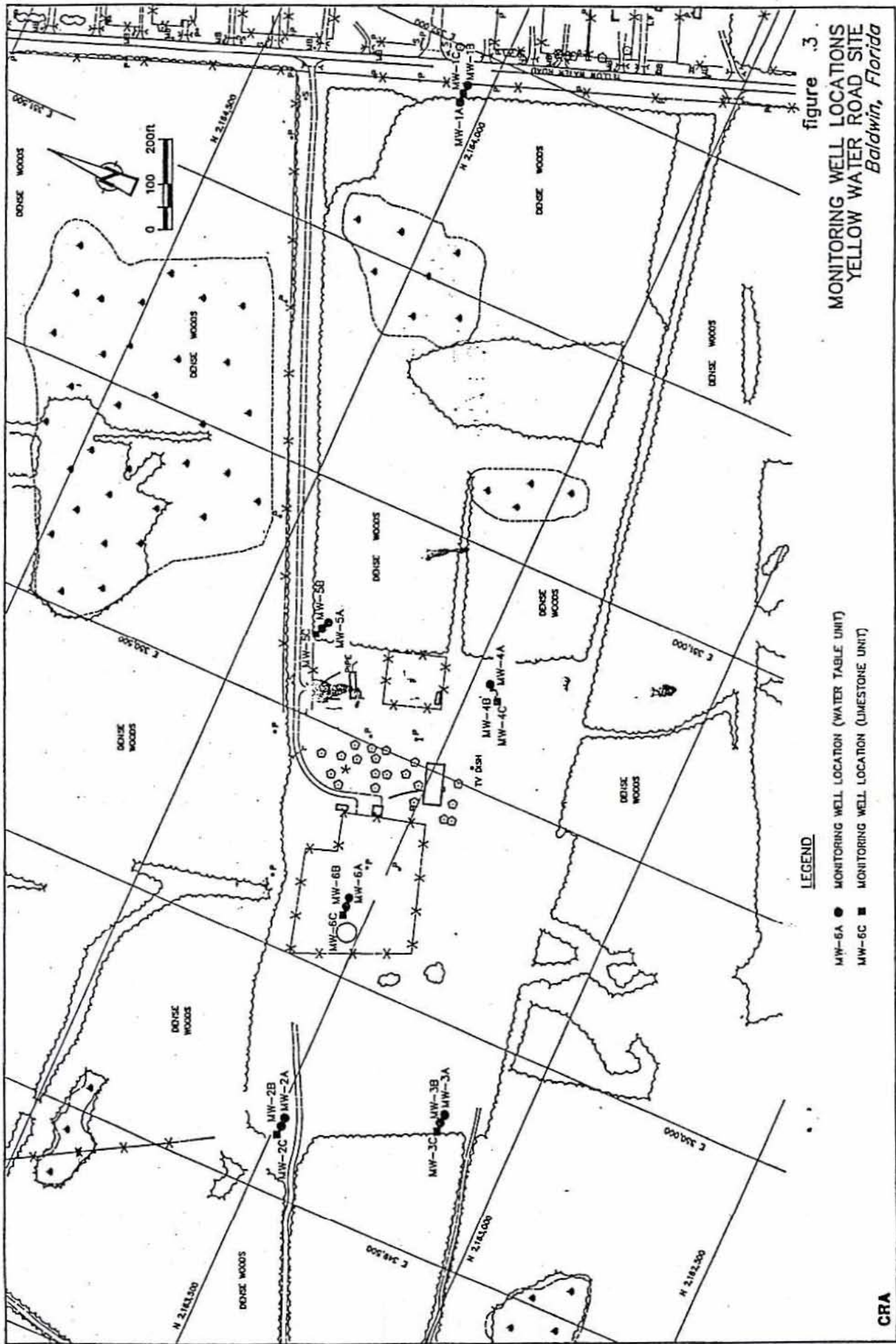


figure 3.
MONITORING WELL LOCATIONS
YELLOW WATER ROAD SITE
Baldwin, Florida

LEGEND

- MW-6A ● MONITORING WELL LOCATION (WATER TABLE UNIT)
- MW-6C ■ MONITORING WELL LOCATION (LIMESTONE UNIT)