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ATSDR

# SITE SUMMARY

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LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH

DAVIS, CALIFORNIA

DECEMBER 1995

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**Public Health Service**

Agency for Toxic Substances and Disease Registry

Division of Health Assessment and Consultation

Federal Facilities Assessment Branch

Atlanta, Georgia 30333

## Introduction

Representatives of the Agency for Toxic Substances and Disease Registry (ATSDR) conducted a site visit to the Laboratory for Energy-Related Health Research (LEHR) on July 18, 1995, because LEHR was placed on the U.S. Environmental Protection Agency's (EPA) National Priorities List (NPL). The site visit was designed to identify public health issues related to contamination at the facility. ATSDR staff members met with personnel from the Department of Energy (DOE) and DOE contractors, the EPA, the University of California at Davis (UCD), the California Department of Health Services, the California EPA, and the state and regional water control boards. ATSDR staff members also met with local citizens to solicit citizens' concerns. As a result of these meetings, our site visit observations, and a preliminary survey of the data currently available, we identified one completed exposure pathway and two potential exposure pathways.

We will be focusing on the answers to the following questions when determining whether a public health hazard exists: Are people being exposed (or might they be exposed) to contamination? Do the levels of contaminants pose a public health hazard?

## Background

LEHR was a research facility on the campus of UCD from 1958 to 1988. DOE and its predecessor, the Atomic Energy Commission, funded the LEHR primarily to investigate the long-term effects of low levels of radium-226 (Ra-226) and strontium-90 (Sr-90) in beagles. The LEHR facilities were built adjacent to existing UCD landfills; a portion of the dog pens area was built over a part of the landfills. Property west, south, and east of the site is farmland; the main UCD campus lies north of the site. The South Fork of Putah Creek flows east approximately 250 feet from the southern boundary of the site. See maps attached. Today, UCD operates the Institute of Toxicology and Environmental Health (ITEH) at the site where they formerly operated the LEHR.

Animal wastes generated during LEHR activities were placed in holding tanks, trenches, boreholes, and the UCD landfills near the LEHR animal pens and laboratories. Restoration of the site, including the removal of some buildings, cages, and the contents of waste tanks, began in 1990. The site was listed on the NPL on May 31, 1994, because elevated levels of chloroform, carbon-14, and tritium were detected in on-site groundwater monitoring wells.

Completed exposure pathway: infants drinking private well water

*ATSDR staff are concerned that infants are drinking water from private wells in the area around UCD and that the water may contain high levels of nitrates.*

Nitrate levels in most of the private wells are frequently above levels of health concern for infants who drink the water. The nitrate levels do not show any particular spatial pattern and likely result from agricultural use of fertilizers throughout this part of the state. Although DOE and UCD began supplying bottled water to some area residents in 1989 after nitrates and hexavalent chromium were detected in private wells above MCLs, ATSDR scientists believe the nitrate contamination affects more than the 15 or so families that currently receive bottled water. *ATSDR staff members emphasize, however, that this hazard currently exists only for infants.* The nitrate levels measured in off-site private wells are not at levels of public health concern for adults. The hexavalent chromium measured in private wells is not at levels of health concern for anyone. Tritium measured in private wells is not at levels of health concern in any of the wells for any population.

Potential exposure pathway: eating fish from Putah Creek

*ATSDR scientists are concerned that people are eating contaminated fish from Putah Creek.*

People fish in Putah Creek. Putah Creek receives treated wastewater and stormwater drainage from all parts of the UCD campus. Putah Creek may have been, or is currently, impacted from soil runoff or sub-surface releases from LEHR leach fields, waste holes, tanks, trenches, and dog pens' soils. Also, Putah Creek might receive contamination from the three inactive landfill units and the current active landfill on the west campus.

ATSDR staff are aware that recent investigations by personnel from the State Water Resources Control Board indicate Putah Creek recharges the area groundwater and not the other way around. This means that, generally, Putah Creek would not be impacted by subsurface releases from the site. Nevertheless, ATSDR representatives are unaware of any fish sampling conducted to analyze the potential hazard from eating the fish from the creek.

Potential exposure pathway: drinking and bathing in private well water that may contain unsafe levels of organic compounds

*ATSDR representatives are concerned that local residents are drinking and bathing in the water from private wells that may be*

*contaminated with organic compounds.*

Chloroform was measured at levels of concern for drinking in one off-site irrigation well, although the levels are not a hazard for irrigation purposes. This well is downstream in the generally agreed direction of groundwater flow (east) from the most contaminated monitoring wells on site (e.g., UCD-12). However, since the dynamics of the groundwater flow (rate and direction) have not been fully characterized and since the private wells in the area have not been routinely analyzed for chloroform or other organic compounds, our concern is that contamination from organic compounds may be contaminating private wells in the area of the LEHR site.

#### Cobalt-60 Irradiator

From 1968 until 1985, a cobalt-60 irradiator located on top of a building on the southeast corner of the LEHR property was used to irradiate beagles in a separate fenced-in area. ATSDR scientists reviewed some radiation measurements collected near the cobalt-60 pen. The highest measurements we have were recorded at the fenceline of the irradiator pen in 1976.

We determined that residents at nearby farmhouses south of the cobalt-60 source would not have received enough radiation to cause adverse health effects. Also, people who fished in Putah Creek would not have received enough radiation to cause adverse health effects.

We are somewhat less certain about exposures to on-site workers. This is because we do not know where and when people worked on site (occupancy rates) and we do not know radiation levels at workstations such as the trailer north of the cobalt-60 irradiation pen. However, based on radiation measurements taken at the fenceline of the irradiation pen, we do not believe workers on-site received enough radiation to cause adverse health effects.

#### Community Health Concerns

ATSDR staff members identified some community health concerns during the site scoping visit. Concerns included identifying exposures to hazardous materials, identifying practices leading to environmental contamination, identifying locations and inventories of wastes produced by LEHR and the university, and assessing health impacts from exposures to contamination produced at the university. Some individuals told ATSDR representatives of their health problems or the health problems of their families and neighbors.

ATSDR scientists have reviewed information pertaining to some of these concerns. We will continue to review LEHR site information and will make recommendations, if warranted, in response to public health concerns.

### Recommendations

1. Families in the Yolo and Solano counties area should not give their infants private well water unless they have determined that nitrate levels are at or below 10 micrograms per liter (10 parts per billion).
2. The fish in Putah Creek should be sampled. Initially, fish should be screened for EPA's Recommended Target Analytes as described in *Guidance for Assessing Chemical Contaminant Data For Use in Fish Advisories, Volume 1, Fish Sampling and Analysis, Second Edition, September 1995*. Further actions, including additional sampling, may be appropriate depending on the initial screening results.
3. Private wells near the LEHR site should be monitored for contaminants detected in site monitoring wells.

### Further Information

If people have concerns they would like to relay to us, they should direct them to the following address:

Program Evaluation, Records, and Information Services Branch  
(LEHR Site)  
ATSDR, Division of Health Assessment and Consultation  
1600 Clifton Road NE, Mailstop E-56  
Atlanta, GA 30333

### Site Specific Information

**Site Name:** The Laboratory for Energy-Related Health Research.  
**Size:** 15 acres.  
**Activity Status:** Inactive.  
**Site Mission:** Investigate the long-term health effects of low levels of internal radiation and the long-term effects of external radiation.

### Persons Met With

James L. Littlejohn, DOE  
Salem Attiga, LEHR/PNL (DOE contractors)  
Dawn Mitchell, LEHR/PNL (DOE contractors)

Lida Tan, U.S. EPA  
Christine Judal, University of California at Davis (UCD)  
Jeffrey W. Wong, CA Department of Health Services, Radiologic  
Health Branch (CA DHS/RHB)  
Steve Hsu, CA DHS/RHB  
Michael Montes, CA DHS/RHB  
Susan Timm, Regional Water Quality Control Board (RWQCB)  
Dennis Parfitt, State Water Resources Control Board (SWRCB)  
Duncan Austin, CA EPA Department of Toxic Substances Control  
(Cal/EPA-DTSC)  
G. Fred Lee, G. Fred Lee & Associates (Technical Assistant Grant  
[TAG] advisor)  
Julie Roth, President, Davis South Campus Superfund Oversight  
Committee (TAG recipient)

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LEHR Documents Reviewed

Waste Discharge Requirements for the United States Department of Agriculture, University of California, Aquatic Weed Control Laboratory, Yolo County, NPDES CA0083364, California Regional Water Quality Control Board, Central Valley Region (partial).

Staff Report, General Information Update Regarding University of California, Davis Campus, Surface Water and Landfill Discharges, and Waste Discharge Requirements for United States Department of Agriculture, University of California, Aquatic Weed Control Laboratory, Yolo County (partial).

Administrative Supplement to the Academic Plan, Institute for Environmental Health Research (partial).

Radioactive Waste Burial at the Laboratory for Energy Related Health Research, University of California, Davis, Prepared by John Warren, Health Physics Section, Department of Environmental Health and Safety, University of California, Davis, December 27, 1985.

Environmental Survey, Preliminary Report, Laboratory for Energy-Related Health Research, Davis, California, U.S. Department of Energy, Environment, Safety and Health, Office of Environmental Audit, March 1988.

Letter regarding well water testing, from James F. Sullivan, Chair, Committee to Monitor the Groundwater Contamination Report at LEHR to Theodore L. Hullar, Chancellor, University of California, Davis, October 25, 1989.

Evaluation of On-Site Wells, Final Report, UCD LEHR Facility, Davis, California, Dames & Moore, February 1990.

CEQA Preliminary Study for Site Characterization Work at the Inactive UC Davis Landfill Prepared for the University of California, Davis, Dames & Moore, February 1990.

Minutes, Neighbors' Meeting, University of California at Davis, April 4, 1990.

SWAT Report, Final, Old UCD Landfill, University of California, Davis, Dames & Moore, July 1990.

Contaminant Pathway Analysis for the UC Davis Campus from the LEHR Study Site, University of California, Davis, Dames & Moore, July 1990.

Evaluation of Potential Nitrate and Hexavalent Chromium Sources in the Vicinity of the UCD LEHR Facility for University of California, Davis, Dames & Moore, November 1990.

Putah Creek Sediment and Water Sampling for University of California, Davis, Environmental Health and Safety, Dames & Moore, December 1990.

Waste Burial Trench Investigation, LEHR Facility, University of California, Davis, Environmental Health and Safety, Dames & Moore, July 1991.

Letter regarding discharges to Putah Creek from A. Sidney England, Environmental Planner, University of California, Davis, to Janet Hamilton, Acting Vice Chancellor, Business and Finance, University of California, Davis, July 15, 1991.

CPT Hydropunch Investigation, UCD South Campus, Inactive Disposal Sites, Additional Characterization, Davis, California, Draft Letter Report, Dames & Moore, September 1991.

SSI Summary Memo, Old Campus Landfill/U.C. Davis, Ecology and Environment, Inc. for EPA Region IX, September 23, 1991.

CPT/Hydropunch Investigation, September/October 1991, South Campus Inactive Disposal Sites, Report - Second-Round, Dames & Moore, November 1991.

Phase II Site Characterization Report for the LEHR Environmental Restoration, University of California at Davis, U.S. Department of Energy, February 1993.

Memorandum, Comments on Phase II Site Characterization for LEHR and Attachment, State Water Resources Control Board, October 19, 1993.

City of Davis 1994 Annual Water Quality Report.

1992-1993 Annual Report, Institute of Toxicology and Environmental Health, University of California, Davis, March 1994.

Quarterly Groundwater and Surface Water Monitoring Results, Winter Quarter 1994, DOE Phase II Characterization, LEHR Facility, Davis, California, Batelle, Pacific Northwest Laboratory, August 1994.

1993 Annual Water Monitoring Report, LEHR Environmental Restoration, University of California at Davis, U.S. Department of Energy, November 1994.

Notice of Violation, Cooling Tower Wastewater and Receiving Stream Characterization, University of California, Yolo County, California Regional Water Quality Control Board, November 1, 1994.

Letter, Comments on Phase II Site Characterization for LEHR, California Department of Health Services, November 23, 1993.

Surface Water Discharges, University of California, Davis Campus, Yolo County, December 1994.

Quarterly Groundwater and Surface Water Monitoring Results, Spring Quarter 1994, DOE Phase II Characterization, LEHR Facility, Davis, California, Batelle, Pacific Northwest Laboratory, January 1995.

Letter regarding LEHR Site waste management, to Julie Roth, Executive Director, Davis South Campus Superfund Oversight Committee, from Alice Tackett, Project Manager, University of California, Davis, Office of Environmental Health and Safety, January 9, 1995.

Preliminary Calculations of Human Health Risk from Groundwater Exposure at the Detection Limits of Analytes and Their Maximum Concentrations, University of California, Davis, Laboratory for Energy-Related Health Research Facility, Batelle, Pacific Northwest Laboratory, April 1995.

LEHR-ER Project Fact Sheets, University of California, Davis, February 1991 - April 1995.

Site conceptual model and summary notes from meeting, April 4 & 5, 1995, from S. Golian, Department of Energy, to LEHR Core Team, April 14, 1995.

Tour Information Sheet, University of California, Davis Campus, Yolo County, May 8, 1995.

Library Index, LEHR Site documents, Batelle, Pacific Northwest Laboratory, June 29, 1995.

Slide and Overhead Presentation, Status of Environmental Restoration Activities Presented to Agency for Toxic Substances and Disease Registry by Jim Littlejohn/Salem Attiga, July 18, 1995.

Library Index, LEHR Site documents, Batelle, Pacific Northwest Laboratory, August 3, 1995.

# Laboratory for Energy-Related Health Research

Davis, CA

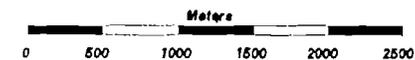
Solano and Yolo Counties

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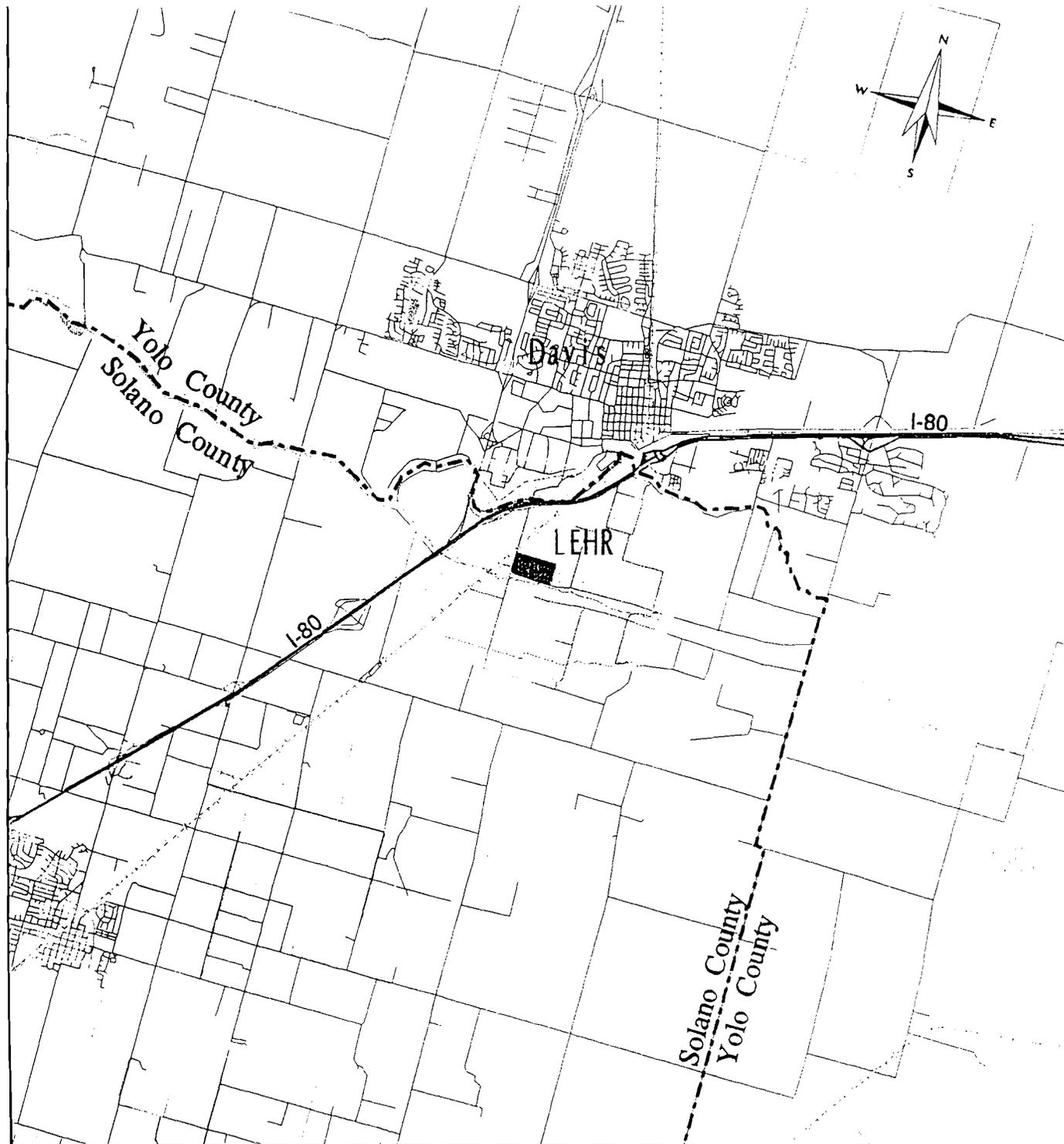
## Demographic Statistics

Black	14
White	620
Amerind	5
Asian	63
Hispanic	61
Other	37
Total Pop	739
Total Housing	321
Age Less Than or Equal to 6 years	131
Age Greater Than or Equal to 60 years	57
Females 15-44 years	241

 One-Mile Buffer



Source: 1992 TIGER & US Census

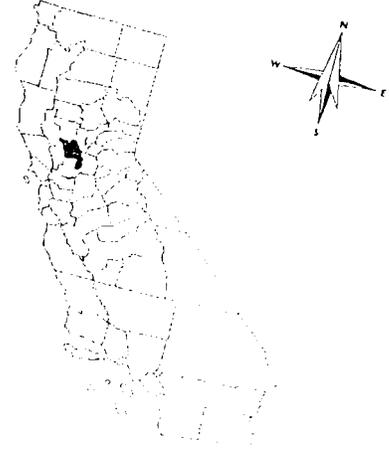
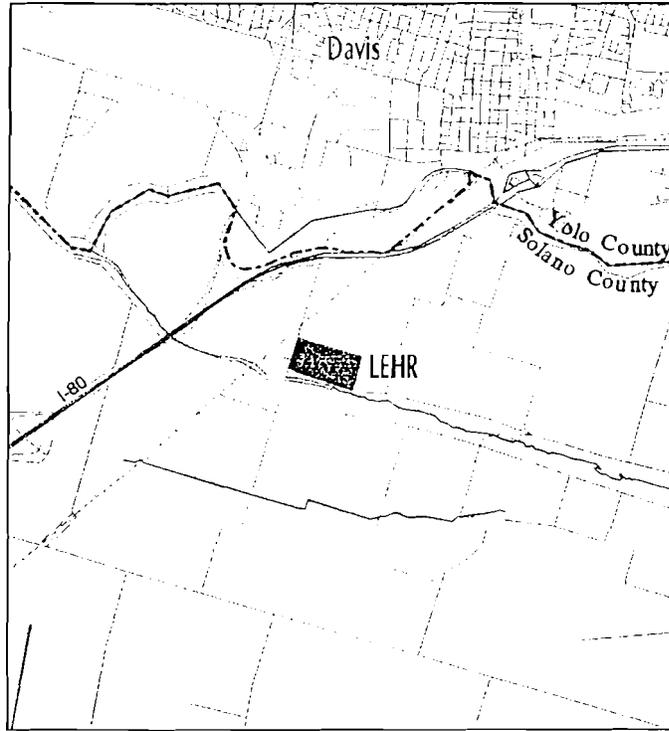


# Laboratory for Energy-Related Health Research

## Davis, CA

### Yolo and Solano Counties

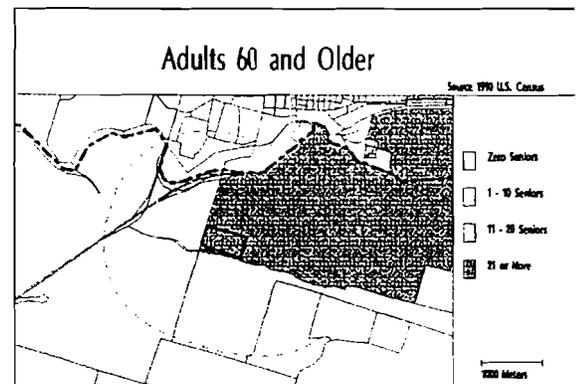
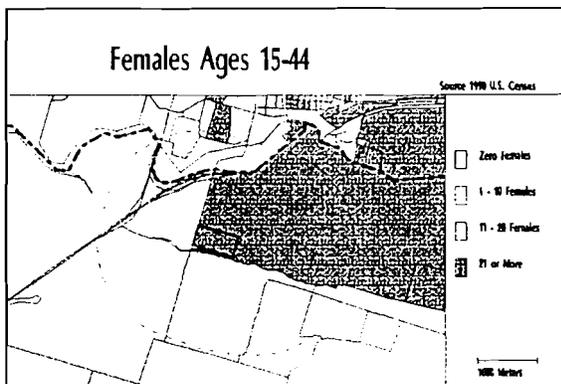
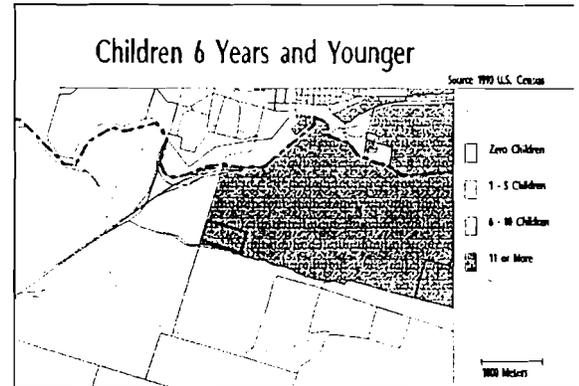
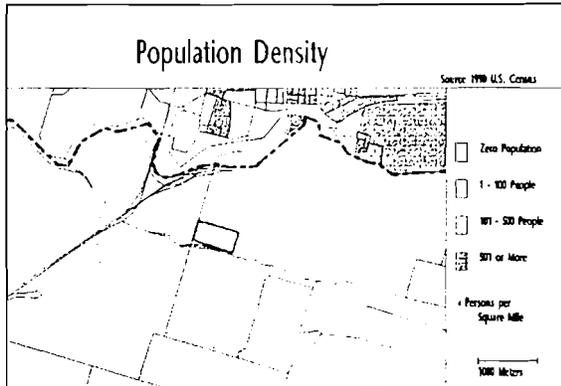
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