

# Health Assessment for

MONTGOMERY TOWNSHIP HOUSING DEVELOPMENT

MONTGOMERY, NEW JERSEY

JULY 1988

Agency for Toxic Substances and Disease Registry  
U.S. Public Health Service

DRAFT

## SUMMARY

The Montgomery Township Housing Development National Priorities List (NPL) site is located on approximately 72 acres in Somerset County, New Jersey. In 1979 samples from private wells were taken and shown to be contaminated with high levels of trichloroethene (TCE) as well as other contaminants. Presently, the primary contaminants of concern are TCE and lead present in the private wells of the homes in the housing development. The first operable unit Record of Decision (ROD) will provide a permanent alternate water supply to all affected residents. An emergency response action was requested to provide an interim alternate water source to those residences that warranted it.

## BACKGROUND

### A. SITE DESCRIPTION

The Montgomery Township Housing Development NPL site is located on approximately 72 acres in Somerset County, New Jersey (see appendix A). (The study area has been expanded to include four homes along Canal Road to the east.) There are 77 homes in the housing development (which constitute the site), each with a lot of approximately 1 acre. The homes were initially provided private wells when they were built. In 1979 samples from the wells were taken and shown to be contaminated with elevated levels of TCE. Monitoring has continued on a periodic basis. All of the wells are located in the Brunswick Formation.

In 1984 the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) signed a cooperative agreement enabling NJDEP to conduct the Remedial Investigation and Feasibility Study (RI/FS). The RI initially identified 13 potentially responsible parties, 10 of which have been designated as unlikely sources of contaminants. The source has been identified as Princetown Gammatech. The FS, completed in January 1988, proposes alternatives for the remediation of the groundwater only. Additional alternatives will be proposed once the extent of the contamination has been determined. Drilling of new wells in the area was restricted by NJDEP Division of Water Resources in 1986.

The first operable unit ROD was signed September 29, 1987, (a subsequent ROD will address the results of the RI/FS). The selected remedy will provide a permanent alternate water supply, provided by the Elizabethtown Water Company Distribution System (System), to all affected residents. Of the 77 homes, 38 are currently connected to the System. The ROD also provides that the old wells will be sealed according to State law.

### B. SITE VISIT

ATSDR has not made a site visit to date.

## ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

### A. ON-SITE CONTAMINATION AND OFF-SITE CONTAMINATION

The primary contaminants of concern are TCE and lead present in the private wells of the homes in the housing development. The highest levels detected for TCE were: in the private wells, 237 ug/L; in the on-site monitoring wells, 650 ug/L; and in the off-site monitoring wells, 300 ug/L. The highest levels reported for lead were: in domestic wells presently in use, 740 ug/L; in domestic wells no longer in use, 2170 ug/L; in monitoring wells, 736 ug/L. Other volatiles such as 1,1-dichloroethane, trans-1,2-dichloroethene, and tetrachloroethene have been detected as well.

## B. PHYSICAL HAZARDS

There do not appear to be any physical hazards present at this site.

### DEMOGRAPHICS OF POPULATION NEAR SITE

There are 77 homes located in the 72-acre defined study area. The System supplies 38 of these homes their potable water. The remaining 39 homes are still using water from their wells. The estimated number of people in the 39 homes is 120, 6 of whom are under the age of 5, and 28 of whom are under the age of 17. Of the 39 wells, 20 have shown TCE contamination, from the information provided to ATSDR it was unclear how many of the wells have shown lead or other types of contamination.

The area surrounding the site is wooded and predominately agricultural. There is also an industrial research center in the area as well as some commercial development, all of which appear to use private water.

### EVALUATION

#### A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

##### 1. Environmental Media

There has been little sampling of the Millstone River and Bedden Brook (see appendix A). Sampling should be done to be certain that contamination in the aquifer has not reached either surface water feature.

Indoor air monitoring would indicate whether the TCE and/or the other volatiles present in the groundwater are volatilizing out of the water during activities like showering, etc. in homes where residents still use their wells, as well as detecting any contaminants that may be volatilizing through the soil-air.

##### 2. Land Use and Demographics

Information regarding the presence of pregnant women would be helpful as they are at high risk to the effects of lead exposure.

##### 3. Quality Assurance/Quality Control

Conclusions contained in this Health Assessment are based on the information received by ATSDR. The accuracy of these conclusions is determined by the availability and reliability of the data.

#### B. ENVIRONMENTAL PATHWAYS

The Brunswick Formation is composed of fractured bedrock covered with up to 30 feet of unconsolidated sediments. Within the Brunswick Formation the aquifer exists in two levels, a shallow unconfined aquifer located in the weathered portion of the formation (consisting of clay and rock fragments) and a deeper semi-confined aquifer located in the fractured

bedrock. The shallow aquifer flow is a subdued reflection of the topography of the area, discharging into nearby surface water features. The deeper aquifer flows northeast and is controlled by vertical fractures. There is movement between the aquifers because of differences in pressure and fractures in the bedrock that connect them. This movement is downward from the shallow aquifer to the deep aquifer.

Groundwater is the primary medium in which the contamination has been detected and is therefore the primary environmental pathway of concern. TCE is slightly water soluble and is quite stable in groundwater for several months to years (EPA, 1987). The plume has been defined as roughly 4,000 feet wide and 2,000 feet long. The plume has a leg on the west end of the plume that extends south (see appendix B) which is approximately 1,500 feet wide and 2,000 feet long. This plume may expand to the north and the east in the future.

There may be a potential for the contaminants to volatilize from the groundwater into the soil-air and from the soil-air into basements or crawl spaces of the homes. No conclusions can be made about this or other potential pathways, since the extent of the contamination cannot be determined from the information available to ATSDR at this time. Once more data on the site are available, ATSDR will address any additional potential public health concerns.

#### C. HUMAN EXPOSURE PATHWAYS

There is a potential for exposure by ingestion, dermal absorption, and/or inhalation to TCE and other volatile organic compounds (VOC's), and a potential for exposure to lead by ingestion of contaminated groundwater. Of the 20 wells contaminated with TCE, 14 are above the Maximum Contaminant Level (MCL) of 5 ug/L for TCE. Two wells presently used are above the MCL of 50 ug/L for lead. The action proposed in the ROD will provide a permanent solution to exposures via the contaminated wells. The Emergency Response and Coordination Branch of ATSDR has been notified about the excessively high levels of TCE and lead found in a few of the residential wells still in use. The Epidemiology and Medicine Branch has also been notified about the levels of TCE and lead.

#### PUBLIC HEALTH IMPLICATIONS

A maximal concentration of TCE (237 ug/L) was detected, prior to 1986, in one of the domestic wells presently in use. In the round of sampling in June 1986 TCE was not detected in that well. This level is much higher than the MCL of 5 ug/L and would be considered of health concern by ATSDR if chronic exposures were to occur. TCE has been designated as a potential human carcinogen. A cancer risk estimate was made using the maximum contaminant concentration detected in the domestic wells. The estimate was incorporated into ATSDR's assessment of potential health implications associated with exposure to contaminated groundwater and further substantiates the conclusion that the groundwater is unacceptable for drinking, bathing, and other domestic uses.

Lead was detected in the domestic wells still in use at a maximum level of 740 ug/L, well above the MCL of 50 ug/L and has been addressed by the Emergency Response and Coordination Branch of ATSDR. The detected level is of public health concern. Lead is known to cause neurological effects in young children and neonatal children. It can also cause peripheral neuropathy in adults. Other effects caused by lead include: hypertension, growth retardation, and affects on the enzymes of protoporphyrin synthesis and of the cell membrane.

## CONCLUSIONS AND RECOMMENDATIONS

### A. CONCLUSIONS

This site is of public health concern because of the risk to human health resulting from probable exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Environmental Pathways and Human Exposure Pathways Sections above, human exposure to contamination present in the groundwater may have occurred in the past or may be occurring now. The action proposed in the September 1987 ROD will address the concern with regard to ingestion and dermal absorption exposures to the contamination present in the wells still in use. It will not address the concern for inhalation of vapors potentially volatilizing from the groundwater into the homes.

At the public meeting to discuss the preferred alternative, there were reports of public concern about the quality of the water from the System. The information provided to ATSDR indicates that there is no need for concern on this issue. The water used in the System is not from the contaminated aquifer, but from the Delaware and Raritan Canal.

Contamination may exist in other media (soil, air, etc.). The on-going RI should help to provide information that can be used by ATSDR to determine if other potential public health concerns exist at the site.

### B. RECOMMENDATIONS

1. All of the residents with TCE and lead detected in their wells at concentrations above the MCL should be placed on alternate water as soon as possible.
2. Indoor air samples should be taken to determine if contaminants are volatilizing from showers, etc. (or migrating into the basements of the homes above the contaminated groundwater).
3. Water and sediment samples should be taken in Bedden Brook and Millstone River to determine whether any contamination has reached either of the surface water features.
4. The information requested in the Data Needs and Evaluation Section of this Health Assessment should be provided to ATSDR.

5. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act as amended, Montgomery Township Housing Development has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to off-site contaminants may be occurring, this site is being considered for follow-up health effects studies. After consultation with Regional EPA staff and State and local health and environmental officials, the Epidemiology and Medicine Branch, Office of Health Assessment, ATSDR, will determine if follow-up public health actions or studies are appropriate for this site.

PREPARERS OF REPORT

Environmental Reviewer: Susan L. Mueller, Environmental Health Specialist, Health Sciences Branch.

Regional Representative: Denise Johnson, ATSDR Regional Representative Region II.

## REFERENCES

1. Remedial Investigation/Feasibility Study for Montgomery Township Housing Development/Rocky Hill Municipal Wellfield Site, Volumes I and II, Woodward-Clyde Consultants, January 1988.
2. Remedial Investigation/Feasibility Study for Montgomery Township Housing Development/Rocky Hill Municipal Wellfield Site, Volumes I and II, Woodward-Clyde Consultants, June 1987.
3. Record of Decision, Montgomery Township Housing Development, September 1987.
4. Decision Summary for the Montgomery Township Housing Development Site, 1987.
5. Responsiveness Summary for the Montgomery Township Housing Development Site, 1987.
6. USEPA (1987) Office of Drinking Water Health Advisory--Lead.
7. Casarett and Doull's Toxicology, The Basic Science of Poisons, Ed. 3, Curtis D. Klaassen, Ph.D. et al., Macmillan Publishing Company, New York, 1986.
8. USEPA (1987) Office of Drinking Water Health Advisory--Trichloroethene.



**APPENDICES**

**Appendix A**

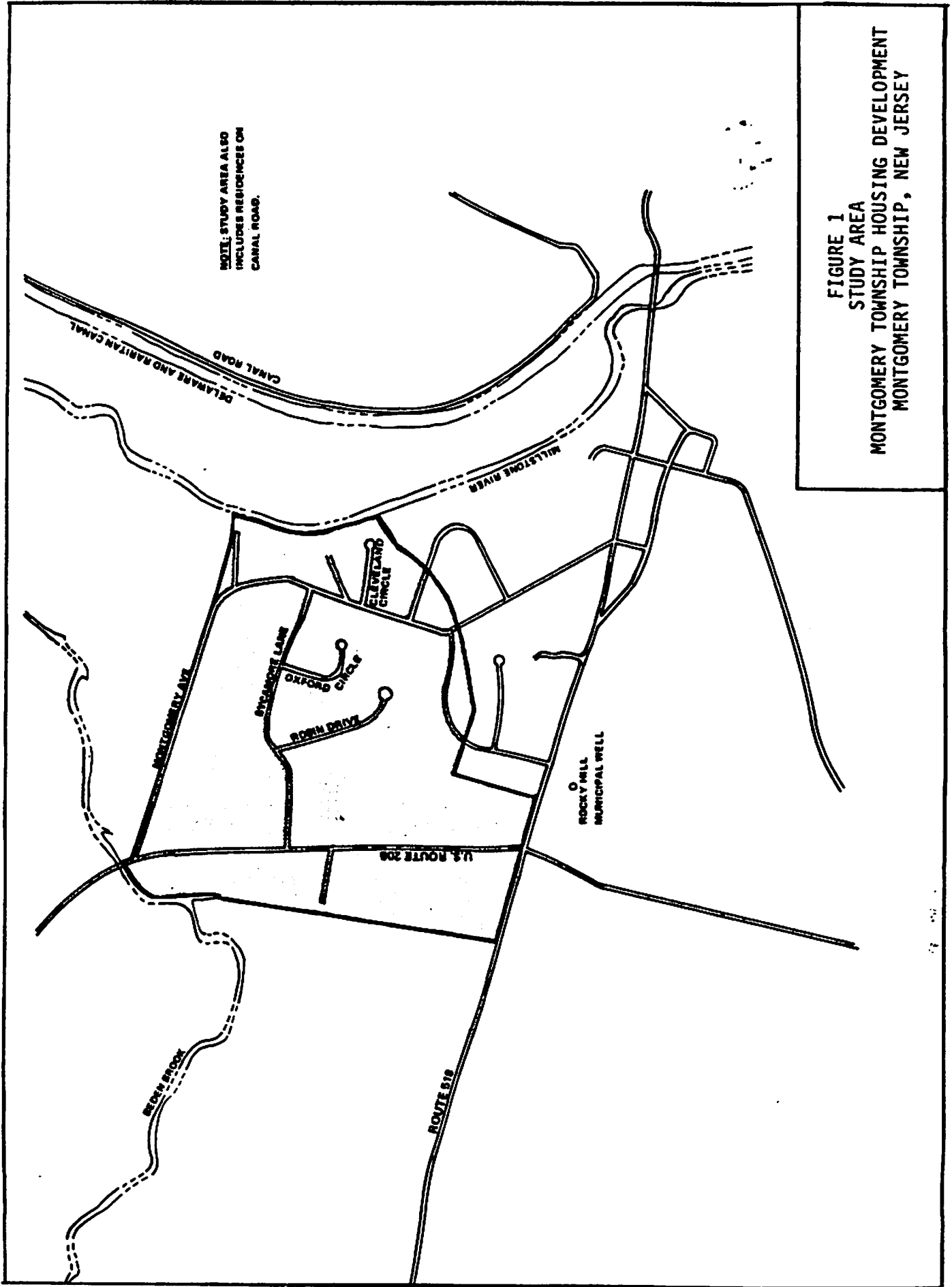


FIGURE 1  
STUDY AREA  
MONTGOMERY TOWNSHIP HOUSING DEVELOPMENT  
MONTGOMERY TOWNSHIP, NEW JERSEY

**Appendix B**

