

Site Review And Update

ROCKAWAY TOWNSHIP WELLS

ROCKAWAY TOWNSHIP, MORRIS COUNTY, NEW JERSEY

CERCLIS NO. NJD980654214

JULY 16, 1993

**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**

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

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Prepared by:

**New Jersey Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**

SUMMARY OF BACKGROUND AND HISTORY

The Rockaway Township Wellfield Site is located in Rockaway Township, in the center of Morris County, in the north-central portion of the State of New Jersey (see Figure 1; site location map and Figure 2; site vicinity map). The Rockaway Township Wellfield Site occupies 185 acres. Many commercial businesses and light industries are located within this area. Near the center of the site are the three municipal wells (#4, #6 and #7), which are located on the northeast side of Green Pond Road, south of Meadow Brook, and west of the railroad tracks (See Figure 3; Site Map and Potential Contaminant Sources).

Contamination was first discovered in Rockaway Township well water in November 1979. A sample taken from the distribution system contained 180 ppb (180 $\mu\text{g/l}$) of trichloroethene (TCE).

The New Jersey Department of Environmental Protection and Energy (NJDEPE) decided to remove the most contaminated municipal well #6 from service and rely on well #7 as the sole water source for approximately 12,000 residents in Rockaway Township.

In October 1980, the water developed an unpleasant taste and odor. Analysis showed it to be contaminated with methylene chloride, di-isopropyl ether, and methyl tertiary butyl ether.

On October 10, 1980, the Township declared a water emergency and advised residents to avoid consumption of the municipal well water. An activated carbon adsorption treatment system was installed on the municipal water distribution system in November 1980.

In 1981, industrial survey investigations by NJDEPE indicated that ether compounds were migrating in groundwater from the Shell service station located 1,000 ft. southwest of the wellfield, while the TCE was apparently emanating from the area of a technical park southeast of the wellfield.

The carbon adsorption system became less efficient as ether concentrations increased in groundwater. In November 1981, Shell Oil Company agreed to install an air-stripping column to treat the municipal water supply.

The site was placed on the National Priorities List (NPL-a.k.a. Superfund) in 1983.

Between 1981 and 1988, TCE levels in municipal well #7 generally remained below 100 ppb in untreated water, while levels in well #6 generally fluctuated between 100 and 300 ppb in untreated water.

Prior to the initiation of the Phase I RI, analysis of untreated water from the Township's primary production well #7 showed the presence of trichloroethene (TCE), methyl tertiary butyl ether (MTBE), and 1,1,1-trichloroethane (TCA) as primary contaminants. This sample was collected

on January 13, 1987. The Rockaway Township Wellfield is located in a developed area, and several companies have been documented to have spilled organic chemicals on nearby properties. These potential groundwater contamination sources were identified at the initiation of the Remediation Investigation (RI) in 1987. Phase I and Phase II Remedial Investigations have been completed by NJDEPE at the site (November, 1988 and September 1991 respectively). The "deep aquifer" is a sole source aquifer that supplies potable water to 12,000 residents in Rockaway Township. A "shallow aquifer" occurs in some areas of the site which is also contaminated but not used as a water supply source. A baseline risk assessment was performed during the RI to evaluate the significance of potential exposure to this contamination.

The Final Feasibility Study Report was completed in December, 1992. The final remedial design has not yet been selected. The Record of Decision (ROD) is expected to be signed in fall of 1993.

In June 1990, the NJDOH completed a Health Assessment for the site. The primary completed exposure pathway identified involves the past exposure of residents to volatile organic compounds (VOCs) in municipal well water through ingestion, inhalation, and direct contact. It also concluded that the Rockaway Township Wellfield Site is a potential public health concern, based upon past exposure to VOCs in municipal water supplies.

The 1990 Health Assessment identified the following community health concerns:

- (1) The residents complained of unpleasant taste and odors in the municipal water supply.
- (2) The potential adverse health effects of past exposure to contaminated municipal well water prior to the installation of an air-stripping column.

The NJDOH identified the following public health concerns in the 1990 Health Assessment:

The Rockaway Township residents using municipal well water have probably been exposed to VOCs in the past at concentrations that may result in adverse health effects.

In Summary, the NJDOH categorized the site in 1990 as a potential public health concern because human exposure to VOCs in groundwater is likely to have occurred in the past. In addition, NJDOH concluded that further information is needed to adequately assess the impact of the site on public health. Recommendations were made to conduct the following activities:

- (1) Continued and frequent monitoring of the efficacy of municipal well water treatment system.
- (2) An identification and characterization of the sources of the contamination.

- (3) A description of the population that was exposed to the drinking water contamination before 1980, including information on the existence and size of sensitive subpopulations.

In addition, the health assessment recommended the site be considered by NJDOH for inclusion in a larger scale epidemiological study of VOCs in drinking water. In April, 1992 the New Jersey Department of Health (NJDOH) completed and published a report on Public Drinking Water Contamination and Birthweight, Fetal Deaths, and Birth Defects (Cross-Sectional Study). In May, 1992 the New Jersey Department of Health (NJDOH) completed and published a report on Public Drinking Water Contamination and Birthweight, and Selected Birth Defects (Case-Control Study). These studies were initiated in cooperation with Centers for Disease Control (CDC) in response to considerable public health concern in New Jersey (NJ) about the quality of drinking water. The Rockaway Township was included in both studies to evaluate the potential relationship between public drinking contamination and adverse reproductive outcomes. The studies utilized data from birth certificates, fetal death certificates, New Jersey Birth Defects Registry forms, and data obtained from NJDEPE's A-280 Program which requires all public water purveyors to sample their water distribution system twice annually for 14 volatile organic chemicals (VOCs), polychlorinated biphenyls (PCBs), and chlordane. In addition, phone interviews were conducted of the mothers of the cases and controls for case-control study. The study period was January 1, 1985 to December 31, 1988, the four years commencing when the Birth Defects Registry was initiated and the New Jersey drinking water monitoring statute took effect.

In January, 1993 the New Jersey Department of Health (NJDOH) completed an analysis of incidence of childhood and female breast cancers in residents of Rockaway Borough and Township, Morris County by using Standardized Incidence Ratios (SIR) in response to community concerns. Based on this analysis it did not appear that cancer incidence in Rockaway Borough and Township are higher than the expected rate based upon state averages.

CURRENT CONDITIONS OF SITE

On April 28, 1993 Narendra P. Singh, and Jeffrey J. Winegar of the NJDOH conducted a site visit of the Rockaway Township wellfield accompanied by the ATSDR Regional Representative Steven Jones and Rockaway Township Health Officer.

The Rockaway Township wellfield area contains a cluster of three municipal wells (#4, #6, and #7) within 100 feet of each other. The municipal well #4 is no longer used. The wellfield consists of two operating wells (#6 and #7), which pump approximately 1.1 million gallons per day and serve approximately 12,000 residents.

During the site visit the following observations were made:

- The wellfield is located in a mixed commercial and light industrial area. The well #7 is the primary well, which is supplemented by well #6 during times of high water usage.
- Near municipal wells #4, #6, and #7 there is an additional test well that is not used.
- The municipal wells appeared to be secure and there was no evidence of any trespassing on the site.
- The air stripper that is currently in place has corroded near the base and was seen leaking.
- A new well was installed and connected to the existing water distribution system in October 1990. The new well is located approximately 2 miles north of Rockaway Township Wellfield at Hewlett Packard Company. The well water at Hewlett Packard is also treated with an air-stripping column.

According to the Rockaway Township Health Officer, the new well is connected to 3800 homes and a study of the water table in the area of a newly established Township well at Hewlett Packard has been initiated by the Rockaway Township Health Department. As a part of this study, in July 1992 water samples were taken from residents homes receiving water from this new well. The analysis results for VOCs indicated that all compounds tested were within the Maximum Contaminant Level (MCL) as set forth in the New Jersey Safe Drinking Water Act. The NJDEPE is also in the process of conducting a similar study of the groundwater in the vicinity of the Rockaway Township well located at Hewlett Packard.

CURRENT ISSUES

Based on the Phase I and Phase II Remedial Investigations, site-related contamination is present in groundwater, soil, surface water and sediments. However, groundwater remains as the primary media of concern.

The air-stripping system has been demonstrated to be effective in treating groundwater at the township wells.

In a conversation with the Rockaway Township Health Officer, he expressed concerns about: 1) the care and maintenance of the Rockaway Township wellfield and corrosion of the base of air-stripper which is in operation at present, and; 2) concern among residents who used the municipal water regarding the health risk associated with past exposure as it is not known precisely when the onset of contamination occurred prior to 1979.

CONCLUSIONS

1. Based on the Remedial Investigation (Phase I and Phase II) and Final feasibility Study Reports, site-related contamination is present in groundwater, soil, surface water, and sediments.
2. Conclusions that were made, in the 1990 Health Assessment, regarding the site being of potential public health concern remain valid. This conclusion was made because residents may have been exposed to contaminants in the past at levels that may cause adverse health effects. ATSDR and NJDOH currently consider the site to have posed an indeterminate public health hazard in the past as a result of exposure of chronic duration to contaminated groundwater. No data are available indicating the nature and extent of contaminants from which to evaluate the public health significance of potential exposures prior to November 1979. This information is needed to completely evaluate the community health concerns about past exposures to contaminated drinking water.
3. Under present site conditions there are no completed exposure pathways associated with the Rockaway Township wellfield municipal wells as a result of well water being treated with an air stripper system since 1981.
4. The recommendation that the site be considered for inclusion in the NJDOH epidemiological study on contamination of public drinking water was satisfied.
5. NJDOH conducted an analysis of childhood and breast cancer incidence in Rockaway Township during the period of 1979 - 1988 in response to community concerns.
6. The recommendation from the 1990 Health Assessment for periodic monitoring of contaminant levels of the township drinking water supply source is satisfied by the specific testing requirements of the New Jersey Safe Drinking Water Act.
7. As recommended in the 1990 Health Assessment, the Phase II RI generated sufficient data to adequately characterize the source and extent of groundwater contamination.

RECOMMENDATIONS

After a review of the most recent documents and the current site conditions for the Rockaway Township Wellfield Site, the ATSDR and NJDOH have determined that, while no current human exposures are occurring at present time, there is concern about past exposures. It is, therefore recommended that the Rockaway Township Wellfield Site be considered as a candidate for ATSDR Exposure Dose Reconstruction. After the exposure dose is determined, then a Health Consultation should be performed to determine the public health significance of past exposure to contaminated drinking water.

Future environmental, toxicological, health outcome data or changes in the conditions as a result of implementing the proposed plan, may determine the need for additional actions at this site.

Except for the concern for past exposures, remedial activities specified in the Final Feasibility Study Report, when implemented, are sufficient to address remaining concerns of the ATSDR, the NJDOH, and the community regarding the site and are consistent with protection of the public health.

The data and information developed in the Site Review and Update have been evaluated to determine if follow-up actions may be indicate. Further site evaluation is needed to determine appropriate public health actions.

DOCUMENTS REVIEWED

1. Environmental Health Service , NJDOH - Analysis of Childhood Cancer Incidence (1979-1988) of Rockaway Borough and Township, Morris County, New Jersey. January 1993
2. Environmental Health Service , NJDOH - Analysis of Breast Cancer incidence (1979-1988) of Rockaway Borough and Township, Morris County, New Jersey. January 1993
3. ICF Kaiser Engineers, Inc. Final Feasibility Study Report Rockaway Township Wellfield Site, Morris County, New Jersey. December 1992
4. Dept. of Health & Welfare, Township of Rockaway. Results of analysis of water table of a newly constructed township well at Hewlett Packard. August 1992
5. Dept. of Health & Welfare, Township of Rockaway. Results of analysis of residential water supply. June 1992
6. Environmental Health Service , NJDOH - Report on Phase IV-B: Public Drinking Water Contamination and Birthweight, and Selected Birth Defects, a Case-Control Study. May 1992
7. Environmental Health Service , NJDOH - Report on Phase IV-A: Public Drinking Water Contamination and Birthweight, Fetal Deaths and Birth Defects, a Cross-Sectional Study. April 1992
8. ICF Kaiser Engineers, Inc. Phase II Remedial Investigation Report for Rockaway Township Wellfield Site, Morris County, New Jersey. September 1991
9. Environmental Health Service, NJDOH Public Health Assessment document for Rockaway Township wells, Rockaway Township, Morris County, New Jersey. June 1990
10. ICF SRW Associates, Phase I Remedial Investigation Report, Rockaway Township wellfield site, Morris County, New Jersey. November 1988
11. NJDEPE, Community Relations plan for Rockaway Township wells, Rockaway Township, Morris County, New Jersey. August 1988
12. ATSDR Site Summary, Rockaway Township well, Rockaway Township, Morris County, New Jersey. June 1988

INTERVIEWS / PERSONAL COMMUNICATIONS :

1. Site Remediation Program/NJDEPE:

Site Manager
Community Relations Manager

2. Rockaway Township:

Director of Health and Welfare
Senior Sanitary Inspector
Asst. Water & Sewer Utilities Superintendent

PREPARERS OF REPORT

Preparers of Report:

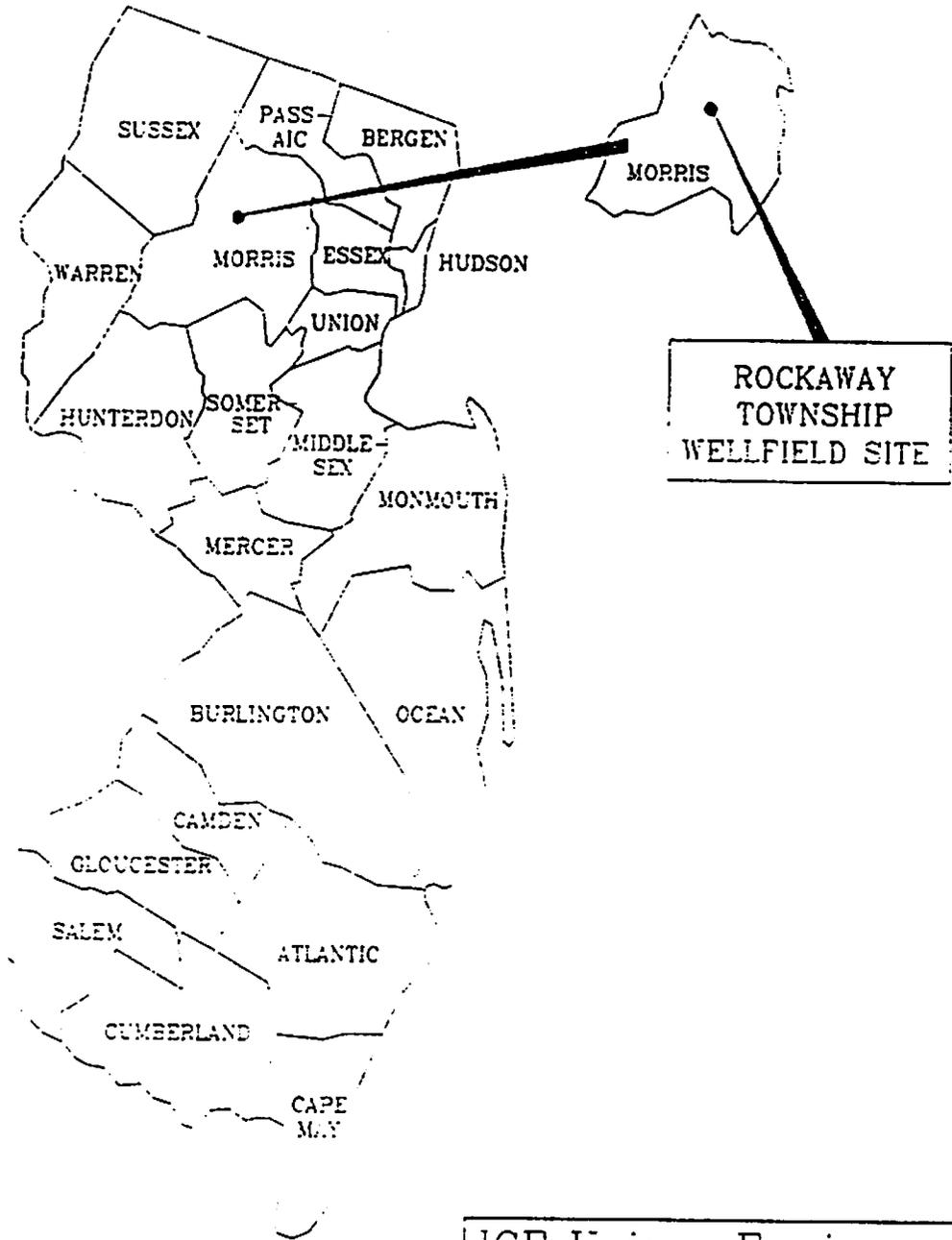
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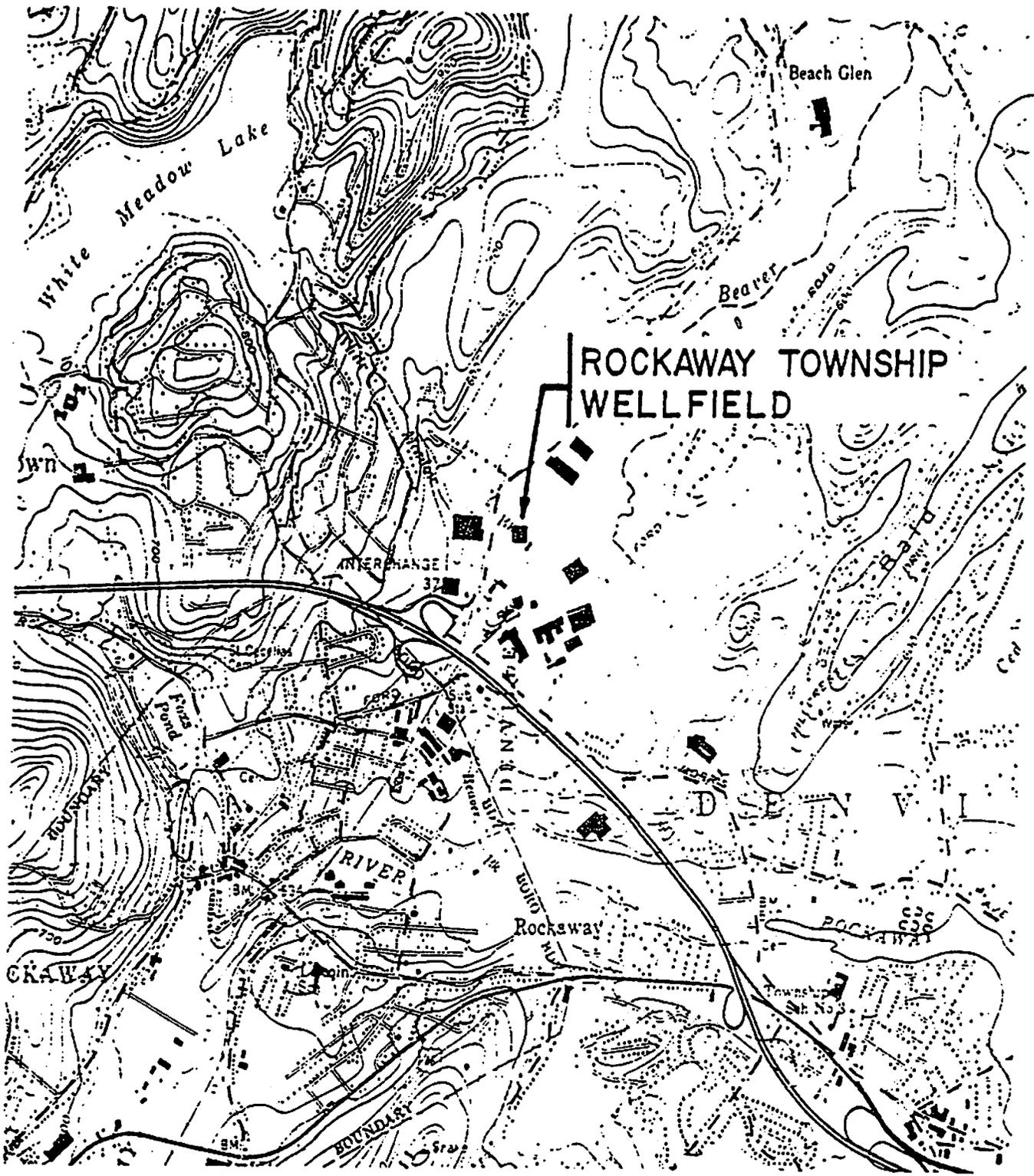
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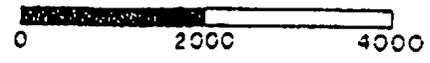
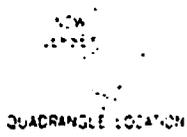


ICF Kaiser Engineers
 ROCKAWAY TOWNSHIP
 WELLFIELD SITE
 FEASIBILITY STUDY
 FIGURE 1. SITE LOCATION MAP



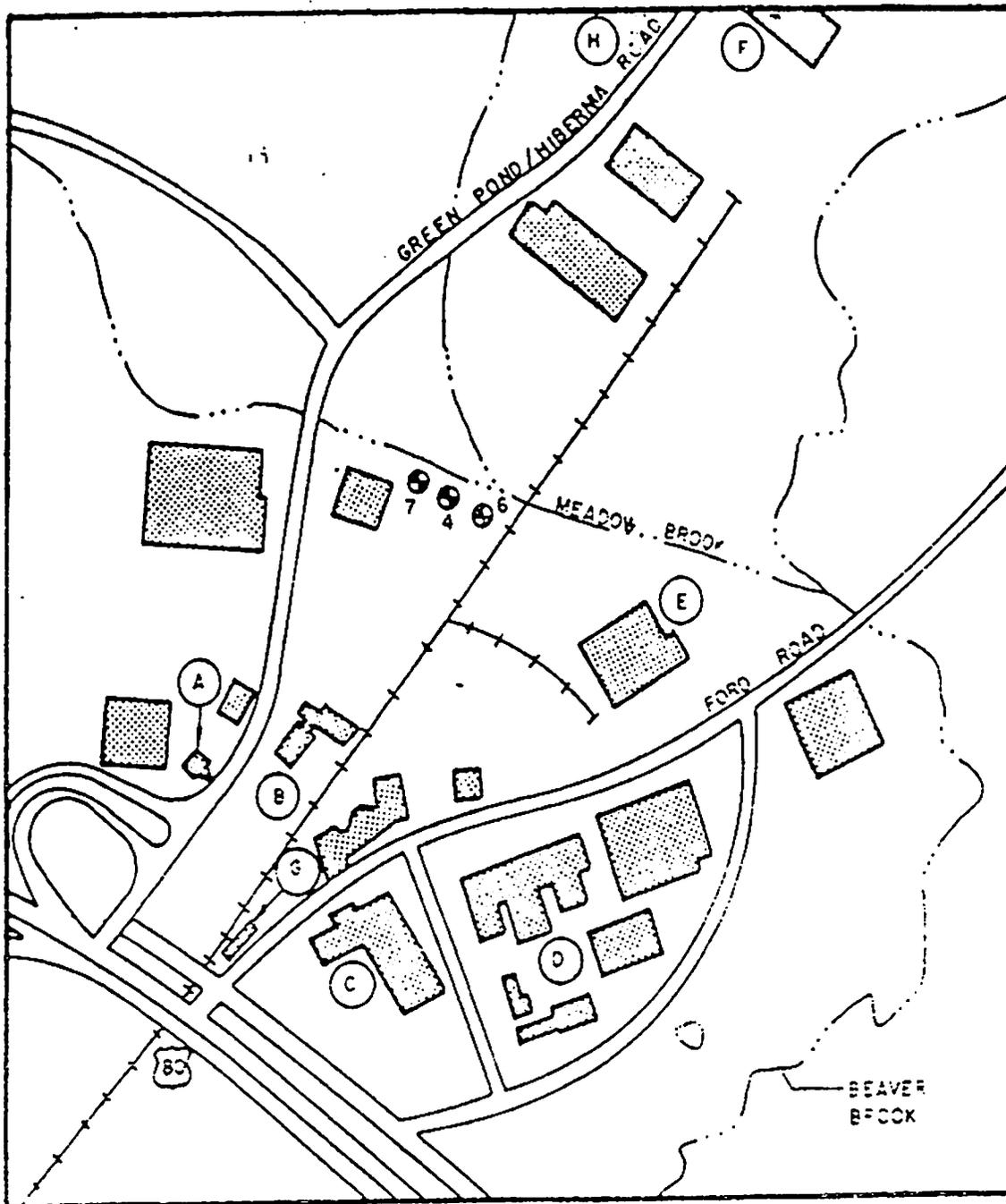
SOURCE

BASE MAPS ARE U.S.G.S. 7 1/2 MINUTE
 QUADRANGLE MAPS, DOVER AND BOONTON,
 DATED: 1954, PHOTOREVISED: 1981



SCALE IN FEET

FIGURE 2.
 SITE VICINITY MAP
 ROCKAWAY TOWNSHIP WELLFIELD SITE
 MORRIS COUNTY, NEW JERSEY



IMPORTANT PROPERTIES

- A EXXON SERVICE STATION
- B SHELL SERVICE STATION
- C WILLIS B PAUL REALTY
- D FORMER MORTON - THICKOL PLANT
- E KEUFFEL B ESSER
- F JERRY JONES MACK
- G GARDEN STATE TRANSIT LINES
- H YELLOW FREIGHT SYSTEM

LEGEND

- == ROAD
- RAILROAD
- - - STREAM
- ⊙ 7 MUNICIPAL WELL



FIGURE 3.
 SITE MAP AND
 POTENTIAL CONTAMINANT SOURCES
 ROCKAWAY TOWNSHIP WELLFIELD SITE
 MORRIS COUNTY, NEW JERSEY