WESTON

FINAL
SITE INSPECTION PRIORITIZATION REPORT
MONSANTO COMPANY
CAMDEN, CAMDEN COUNTY, NEW JERSEY

CERCLIS ID No.: NJD001700830

VOLUME 2 OF 2

EPA Contract No.: 68-W5-0019
TDD No.: 02-96-03-0021
Document Control No.: START-02-F-00811

AUGUST 1997

Prepared for:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
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458740

REFERENCE NO. 7

MONSANTO INDUSTRIAL CHEMICAL COMPANY
1500 PINE STREET
CAMDEN, CAMDEN COUNTY, NEW JERSEY
EPA ID# NJD 001700830

GENERAL INFORMATION AND SITE HISTORY

The Monsanto Chemical site is located on six acres on both sides of 1500 Pine Street in Camden, Camden County. It lies in a business section of Central Camden with the nearest residential area about one quarter mile away to the east on Park Boulevard. Monsanto is bordered on the north by the Cooper River and adjacent to Garden State Wholesale Inc., which is at the corner of Pine Street and Magnolia Avenue.

The property has been used for industrial purposes since 1899 and has had several owners since then. The first owner on record was Howard T. Justice who sold the property to the Wilckes Company, who inturn sold the property to either Swan Oil or Monsanto. The former operations and transactions are not clear but it is on record that Monsanto purchased the property on February 1, 1936.

SITE OPERATIONS OF CONCERN

Monsanto Industrial Chemical Company -

From 1936 to 1981, Monsanto was solely involved in the manufacture of Lampblack. Lampblack is composed of pure carbon and is formed from the burning of #6 fuel oil in an oxygen deficient atmosphere. It was used as a pigment in automobile tires and electrical wire brushes. The facility had a large above ground tank capacity to contain fuel oil and the Lampblack product.

The waste products from the operation included off-spec Lampblack, floor sweeping of soot, scrubber effluent (Lampblack and water), cinders, wood, and paper products.

An onsite, unlined landfill, adjacent to the Cooper River received all waste generated from the Lampblack operation until 1972 when it was closed and capped with soil. From 1972 to 1981, all Lampblack residues were transported off site as solid waste. In June 1981, the entire Lampblack operation was dismantled. All tanks were removed and the landfill was capped with an additional six inches of clay and 1 1/2 inches of clean fill.

From 1981 to the present, Monsanto has been operating a three shift, Monday thru Friday, 32 personnel business involved in the manufacture of specialty chemicals with three basic product categories:

1. Ammonium polyphosphate in powder form used mostly as a fire retardant additive in paint application.

2. Natural bone ash using calcined cattle bone meal as a raw material.

3. Synthetic bone ash using tricalcium phosphate as a raw material.

The bone ash products consist chemically of calcium phosphate and are used mostly in the metallurgical industry as a liner in troughs to prevent metallic parts from adhering to the mold.

There are no hazardous waste streams associated with these operations. The only wastes reported are paper bags which are compacted on site and disposed at a sanitary landfill. The only hazardous waste associated with the facility is drain oil from plant vehicles which is generated at a rate of five gallons every three months. The waste oil is serviced by Pittco periodically.

Monsanto did hold permits pursuant to RCRA prior to 1980 because of the tank storage associated with the Lampblack operation.

In 1980, they applied for interim status because their tank storage deminished and were considered a small scale generator in New Jersey with their waste oil. The facility was finally delisted by the DHWE in 1984 but retained their EPA ID in the event that a need arises for its use.

GROUNDWATER ROUTE

The site is situated within the Atlantic Coastal Plain physiographic province on a low lying, gently rolling plain approximately eighty feet above mean sea level. Underlying the site are unconsolidated sediments of Quaternary, Tertiary, and Cretaceous age, consisting of mostly alternating sands and confining units of silts and clays. The sediments dip to the southeast and are approximately forty feet deep at the site. Below the unconsolidated sediments is the Pre-Cretaceous crystalline bedrock. The major fresh-water aquifer is the Potomac-Raritan-Magothy Formation system. Three major aquifer units, lower, middle, and upper, have been defined within the system and are under artesian conditions. The site borders on the outcrop area of the system which contains leaky confining units between aquifers which allows recharge vertically. There is also chance of hydraulic connections between aquifers here.

The potable water supplied to Camden County is received from several sources. Most comes from the well fields in Pennsauken and Cherry Hill and is purchased from the New Jersey American Water Company. There is also a well as close as one mile away in northern Camden which can supply water to parts of the county. There are no private wells in the area used for drinking but many wells used for industrial purposes.

According to a report, Monsanto installed twelve monitoring wells on the site in August 1980. Four indicating parameters for Lampblack were tested which included naphthalene, acenaphthalene, phenanthrene, and pH. Initial samples taken in 1981 indicated total levels of the selected constituents of approximately 100 ppb and the most recent results of October 26, 1987 indicate levels of the parameters below detectable limits. The testing was done by Chemical Samples and Analytical SVCS Co. in Thorofare, New Jersey. The potential for groundwater contamination does exist for Lampblack as the initial sampling indicated the presence of the indicating parameters for Lampblack was detected at 100 ppb.

SURFACE WATER ROUTE

Surface water use includes industrial as well as recreational use of the Cooper River which is adjacent to the rear of the site.

The potential for surface water contamination via runoff is low since there are no hazardous waste streams associated with the process. There is no record of Monsanto ever possessing any discharge to surface water permits.

AIR ROUTE

In the past, Monsanto held several permits regulating the equipment and control apparatus from the Lampblack operation. Most of the equipment used was bag houses and scrubber systems. The emissions from the Lampblack operation was mainly nuisance dust. SO_2 gas was evolved from the burning of #6 fuel oil but was not a regulated emission. Presently, Monsanto holds similar permits on bag houses and scrubber systems. Nuisance dusts are a major concern along with ammonia given off from the ammonium polyphosphate process.

Several inspections were made on the equipment and control apparatus and there are no records of any permit violations.

The potential for air contamination does exist in the form of nuisance dust and ammonia releases.

SOIL

The only soil sampling on record occurred in November 1983 when it was confirmed that thirty-two tote bins contaminated with 2, 3, 7, 8-TCDD (dioxin) were stored at the facility in the warehouse complex. The bins were never used in any process at the site and were removed and landfilled by CECOS. These bins were acquired from the West Virginia and St. Louis Monsanto facilities.

Three 100 cm^2 wipe samples from the storage area and two soil samples adjacent to the warehouse were taken by Environmental Testing and Certification Corporation. 2, 3, 7, 8-TCDD was not detected in any of the samples. The potential for soil contamination does exist for Lampblack as the initial groundwater sampling indicated the presence of the indicating parameters for Lampblack at 100 ppb.

DIRECT CONTACT

The potential for direct contact is low. The entire facility is enclosed by a barbed wire fence and a ten foot high brick wall to prevent entry.

The nearest residence is approximately one quarter mile away on Park Boulevard.

FIRE AND EXPLOSION

There have been no reported fires or explosions. The potential is minimal due to the nature of the waste landfilled on site and the current materials used in Monsanto's manufacturing process.

ENFORCEMENT ACTION

In November 1983, the NJDEP directed Monsanto to test for 2, 3, 7, 8-TCDD when it was confirmed that it was stored at the facility at one time. All tests proved negative.

Several inspections were done on the equipment and control apparatus at Monsanto but there are no reports of any Notice's of Violation issued.

receives a low priority for inspection rating. Even though Lampblack is considered non-hazardous, in 1981 initial groundwater samples were collected and analyzed for the indicating parameters of Lampblack (namely the polycyclic aromatic hydrocarbons acenaphthene, anthracene, and phenanthrene). Total levels of the selected constituents were detected at ± 100 ppb. The most recent sample results of October 1987 indicate levels below detectable limits.

RECOMMENDATIONS

No further action is required by the Bureau of Planning and Assessment but it is recommended that the Bureau of Solid Waste Management review the case to determine if proper closure procedures for the landfill were followed.

Submitted by:

Frank Sorce, HSMS IV
NJDEP Bureau of Planning and Assessment

Preliminary Assessment

MONSANTO INDUSTRIAL CHEMICAL COMPANY
1500 PINE STREET
CAMDEN, NEW JERSEY
CAMDEN COUNTY

EPA ID NJD 001700830

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Monsanto Industrial Chemical Co.	1500 Pine Street				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Camden	NJ	08103	Camden		
09 COORDINATES LATITUDE	LONGITUDE				
39° 56' 20"	75° 06' 15"	Block 1262	Lot 17	Block 1261	Lot 2

10 DIRECTIONS TO SITE (Starting from nearest public road)

Route 130 south to Airport Circle, Route 30 west (Admiral Wilson Blvd.) to Baird Ave Exit west to Magnolia Rd. make a right to Pine Street. Make a right at Pine, Monsanto is there.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)		
Monsanto Company	800 North Lindberg Blvd.		
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
St. Louis	MO	63166	(314) 694-1000
07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)		
Monsanto Company	800 North Lindberg Blvd.		
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
St. Louis	MO	63166	(314 694-1000

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED ___/___/___ (MONTH DAY YEAR) ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES ☐ NO DATE 9, 15, 87 (MONTH DAY YEAR)

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

1900 (BEGINNING YEAR) | Present (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Lampblack was manufactured from 1900 to 1981. It was formed from the burning of #6 fuel oil in an oxygen deficient atmosphere. Ammonium polyphosphate, natural bone ash, and synthetic bone ash are produced by Monsanto at present.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

All materials are considered non-hazardous and no hazardous waste streams are generated.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
	NJDEP/DHWM/BHW SFO			(609) 346-8000
04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Frank Sorce, Jr.	NJDEP	DHWM/BPA	(609) 633-2215	11 23 88 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D001700830

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A SOLID
- [ ] B POWDER, FINES
- [ ] C SLUDGE
- [X] E SLURRY
- [ ] F LIQUID
- [ ] G GAS
- [ ] D OTHER _____ (Specify)

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS 1

03 WASTE CHARACTERISTICS (Check all that apply)

- [ ] A TOXIC
- [ ] B CORROSIVE
- [ ] C RADIOACTIVE
- [ ] D PERSISTENT
- [ ] E SOLUBLE
- [ ] F INFECTIOUS
- [ ] G FLAMMABLE
- [ ] H IGNITABLE
- [ ] I HIGHLY VOLATILE
- [ ] J EXPLOSIVE
- [ ] K REACTIVE
- [ ] L INCOMPATIBLE
- [ ] M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	1020	Gallon/year	Oil tank bottoms and drain oil
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	Lampblack		Landfill		
IOC	Ammonium Polyphosphate	12259926	BAG		
ACD	Phosphoric Acid	7664382	Drum		
IOC	Tricalcium Phosphate	7758-238	BAG		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. HAZARDOUS CONDITIONS AND INCIDENTS Continued

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The area was completely seeded as of December 1987. There is no evidence of any damage to flora.

01 ☐ K DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include names of species)

The potential for damage to fauna is low because lampblack, which was landfilled on site , is considered non-hazardous.

01 ☐ L CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The potential for damage to the food chain is low because lampblack, which was landfilled on site, is considered non-hazardous.

01 ☐ M UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

The on site landfill contains residues of a lampblack operation. The landfill is unlined.

01 ☐ N DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

There is no evidence of damage to offsite property.

01 ☐ O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

There are no reports of any contamination to sewers, storm drains, or waste water treatment plants.

01 ☐ P ILLEGAL UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Ther is no evidence of illegal or unauthorized dumping.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

In December 1983, testing was done for 2,3,7,8-TCDD because it was stored on site for a short period. All tests were negetive.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 XX A GROUNDWATER CONTAMINATION — 02 ☒ OBSERVED (DATE 1981) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

In August 1980, twelve monitoring wells were installed. Initial groundwater samples were analyzed for the indicating parameters of lampblack. The polycyclic aromatic hydrocarbons were detected at 100 ppb.

01 ☐ B SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

The potential for surface water contamination is low because lampblack,which is stored on site, is considered non-hazardous and there are no hazardous waste streams associated with the current manufacturing process.

01 ☐ C CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

No record of air releases or Notices of Violations although the potential does exist for nuisance dusts and ammonia.

01 ☐ D FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

There havebeen no reports of fire/explosion and the potential is minimal due to the nature of the waste landfilled on site and the current materials used in Monsanto's manufacturing process.

01 ☐ E DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

The potential for direct contact is low for workers and outside people. A barbed wire fence surrounds the property to prevent entry.

01 XF CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

The landfill on site contains residues from previous lampblack production. The landfill has been closed and capped as of 1982. The observed groundwater contamination potentially may contaminate soil also.

01 ☐ G DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

The potential for drinking water contamination is low because lampblack, which is stored on site, is considered non-hazardous and there are no hazardous waste streams associated with the current manufacturing process.

01 ☒ H WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

The potential does exist for worker exposure to nuisance dusts and ammonia fumes.

01 ☒ I POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

The potential for population exposure does exist if a release of ammonia was to occur.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D001700830

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A NPDES				
☐ B UIC				
☐ C AIR	See Stack Log Attachment			
☐ D RCRA	NJD001700830		1980	
☐ E RCRA INTERIM STATUS		1980	3/19/84	Delisted by DHWE 3/21/84
☐ F SPCC PLAN				
☐ G STATE (Specify)				
☐ H LOCAL (Specify)				
☐ I OTHER (Specify)				
☐ J NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A SURFACE IMPOUNDMENT		
☐ B PILES		
☐ C DRUMS, ABOVE GROUND		
☒ D TANK, ABOVE GROUND	10,000	Gallons
☐ E TANK, BELOW GROUND		
☒ F LANDFILL		12 ft. deep
☐ G LANDFARM		
☐ H OPEN DUMP		
☐ I OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ☒ A. BUILDINGS ON SITE

06 AREA OF SITE: 25 Acres

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Lampblack was placed in onsite unlined landfill until 1981 when it was capped. Waste oil stored on site in a closed metal container.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☐ YES ☐ NO

02 COMMENTS

Landfill containing waste from lampblack process is capped and is not accessable to workers or outside people.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D001700830

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A ☐	B. ☒
NON-COMMUNITY	C. ☐	D ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A ONLY SOURCE FOR DRINKING
☒ B DRINKING (Other sources available) COMMERCIAL INDUSTRIAL IRRIGATION (No other water sources available)
☐ C COMMERCIAL INDUSTRIAL, IRRIGATION (Limited other sources available)
☐ D NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER _____

03 DISTANCE TO NEAREST DRINKING WATER WELL 1 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
6' (ft)	Southwest	_____ (ft)	_____ (gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (including useage, depth, and location relative to population and buildings)

Camden County pulls its potable water supply from several sources. Most of the water supply comes from both the Pennsauken and Cherry Hill well field and is purchased from the New Jersey American Water Company. There is also a well in Northern Camden. The exact amounts cannot be determined.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS	☐ YES ☐ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A RESERVOIR, RECREATION, DRINKING WATER SOURCE
☐ B IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
☐ C. COMMERCIAL, INDUSTRIAL
☐ D NOT CURRENTLY USED

02 AFFECTED POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
Copper River	☐	Adjacent (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 200 NO OF PERSONS	B. 1000 NO OF PERSONS	C. 10,000 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION .25 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 250

04 DISTANCE TO NEAREST OFF-SITE BUILDING .1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Monsanto is located in a buisiness section of Camden. There are several small businesses in the immediate area, a high school .5 miles away, and areas of row homes as close as .25 miles away.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D001700830

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. 10^{-1} – 10^{-5} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☒ C. 10^{-4} – 10^{-3} cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE (10^{-4} – 10^{-6} cm/sec) ☒ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
40 (ft)	(ft)		

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
12 (in)	2.5 (in)	< 10 %		%

09 FLOOD POTENTIAL	10
100 to 500 SITE IS IN ____ YEAR FLOODPLAIN	☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre min.)		12 DISTANCE TO CRITICAL HABITAT (of endangered species)
ESTUARINE	OTHER	(mi)
A. 5 (mi)	B. (mi)	ENDANGERED SPECIES NA

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL INDUSTRIAL	RESIDENTIAL AREAS NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AG LAND
A. .25 (mi)	B. .5 (mi)	C. (mi)	D. (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Monsanto is located in a business section of Camden with the nearest residence about .25 miles away. It is bordered on the north by the Cooper River. The site is situated in a low lying plain about 80 feet above mean sea level.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	5	Chemical samples & analytical Svcs.	
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	5	Environmental Testing & Certification Corp.	
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS ☐ YES ☐ NO

04 LOCATION OF MAPS _____

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
Monsanto Company	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
800 North Lindberg Blvd.	

05 CITY	06 STATE	07 ZIP CODE
St. Louis	Mo	63166

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER
Swan Oil	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1500 Pine Street	

05 CITY	06 STATE	07 ZIP CODE
Camden	NJ	08103

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME: Monsanto Company	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 1500 Pine Street	04 SIC CODE:
05 CITY: Camden	06 STATE: NJ
07 ZIP CODE: 08103	
08 YEARS OF OPERATION:	09 NAME OF OWNER:

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME: Monsanto Company	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.): 800 North Lindberg Blvd.	13 SIC CODE:
14 CITY: St. Louis	15 STATE: Mo
16 ZIP CODE: 63166	

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:
10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:
10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:
10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NJ	D001700830

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Monsanto Company	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1500 Pine Street	

05 CITY	06 STATE	07 ZIP CODE
Camden	NJ	08103

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. PAST RESPONSE ACTIVITIES

01 ☐ A WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

NJ | D001700830

II PAST RESPONSE ACTIVITIES *Continued*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NJ	D001700830

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

1. In November 1983, the NJDEP directed Monsanto to test for 2,3,7,8-TCDD when it was confirmed that it was stored at the facility at one time. All tests proved negative.

2. Several inspections were done on the equipment and control apparatus at Monsanto but there are no reports of any Notices of Violation issued.

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA FORM 2070-13 (7-81)

ATTACHMENTS

MAPS

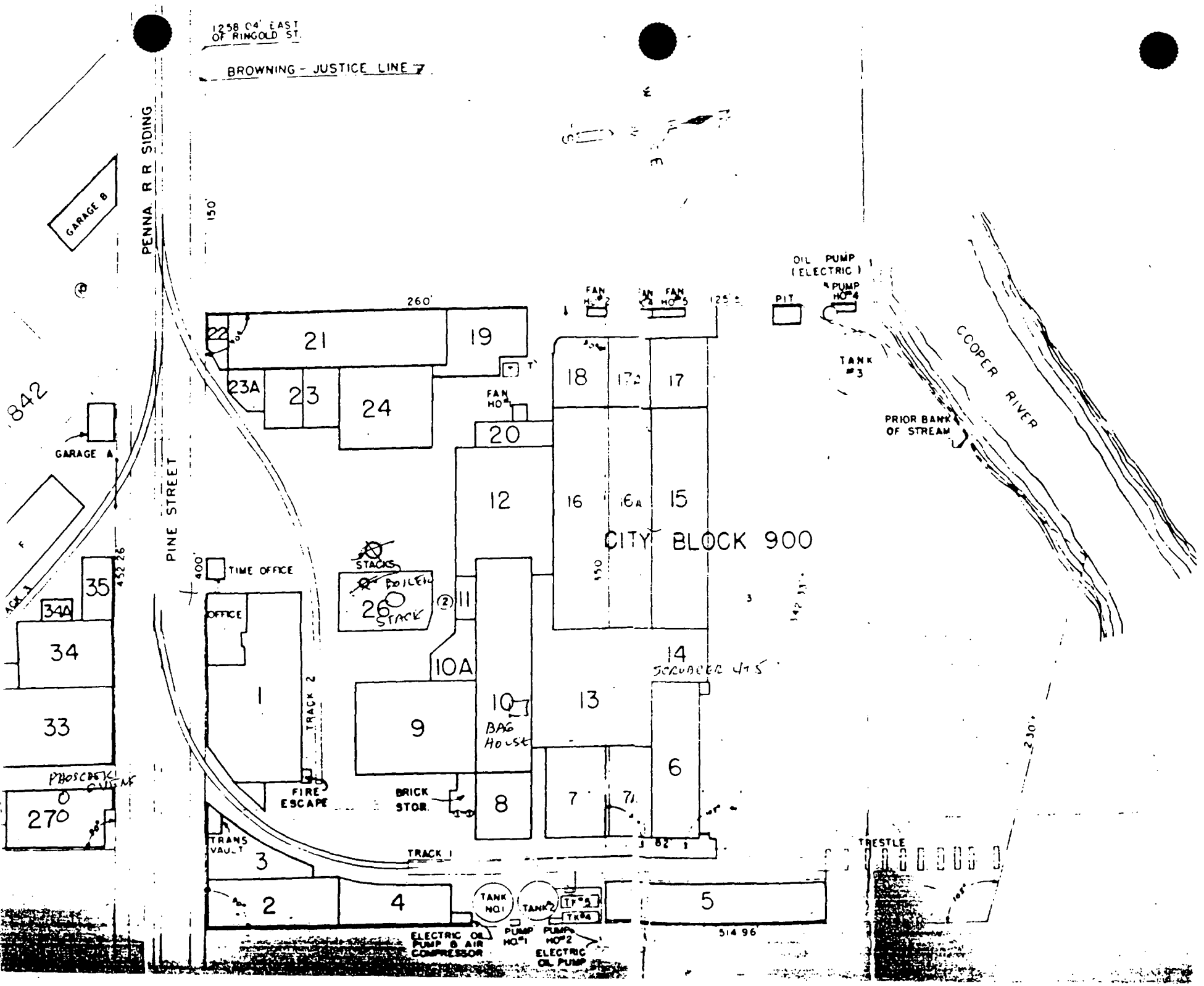
1. USGS QUADRANGLE MAP
2. SITE MAP
3. TAX MAP
4. N.J. ATLAS BASE MAP
5. GEOLOGIC OVERLAY
6. WATER SUPPLY OVERLAY
7. WATER WITHDRAWAL MAP

ATTACHMENTS

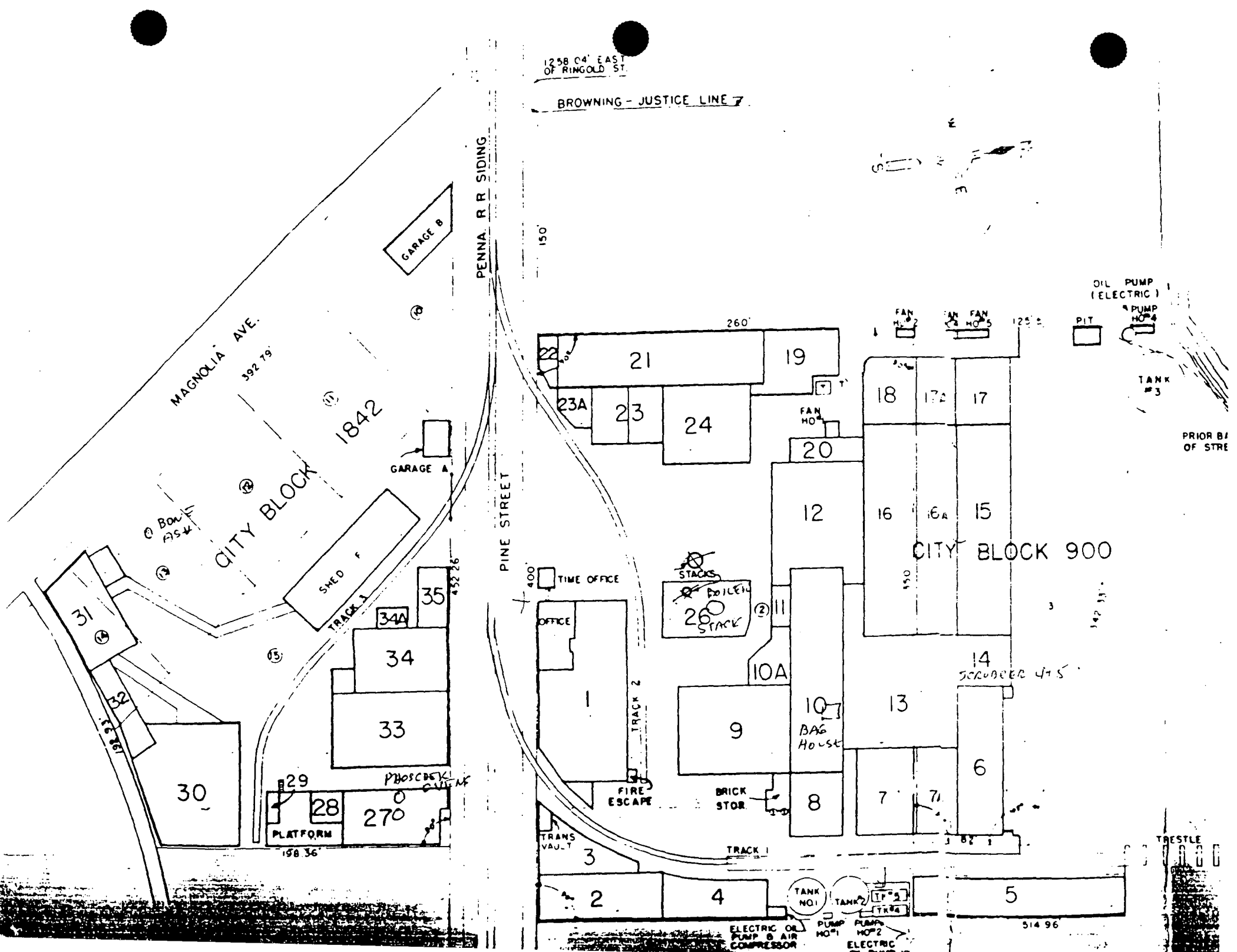
A. STACK LOG LISTING
B. LETTER RE: CLASSIFICATION OF LAMPBLACK
C. EPA SITE INSPECTION REPORT
D. EPA PRELIMINARY ASSESSMENT
E. MERCK INDEX DESCRIPTION OF LAMPBLACK
F. SAX DESCRIPTION OF LAMPBLACK
G. CHEMICAL SAMPLES & ANALYTICAL SVCS CO. ANALYTICAL DATA

PHILADELPHIA CO
CAMDEN CO
Cooper Point
Cooper Point
CORP
BACK
CHANNEL
Tidal Flat
Tidal Flat
Tidal Flat
Playground
East Camden
Pyne Poynt Jr HS
Pyne Poynt Park
Cooper's Poynt Sch
Cramer Hill
St Anthonys Sch
Washington Sch
Fairview Ch
Veterans Mem Sch
Pavonia
Dutto Sch
Dudley Pa
St Joseph Sch
Asbury Ch
Fire Sta
Cramer Sch
McGraw Sch
Congregation Beth Israel
St Stephens Ch
Burning Sch
FRANKLIN BRIDGE
TOLL
Tollgate
St Marys Sch
City Hall
Fire Sta
Park
Cooper Hospital
Playground
Tanning Sq Sch
Library
SS Peter and Paul Sch
Old Camden Cemetery
Camden High Sch
Parkside Sch
Whitman Park
Bergen Sq Sch
Fire Sta
CAMDEN
Camden Home for Children
Hatch HS
Parkside
Lourdes Hosp
West Jersey Hospital
Park
CAMDEN
Kaighn Point
Summer Sch
St Joseph High Sch
HARLEIGH CEMETERY
Whitman Park
Evergreen
New Camden Cemetery
Wood-Lynne
Fire Sta
BM 15
Sharp Sch
Childs Ch
ADMIRAL WILSON BLVD
RIVER
COOPER
FEDERAL
STATE
EAST
LINDEN
PENN
MARKET
MICKLE
KAIGHN AVE
VANHOOK
CHASE
MADDEN
BROADWAY
PENN CENTRAL
CLEVELAND
HOWELL
RANDOLPH
THOMPSON
FARNHAM
PARK
BARD BLVD
WOODLYNNE AVE
PENNSYLVANIA
CATTELL AVE
MADILL
BROWNING
READING
WHITMAN BRIDGE
PHILADELPHIA QUADRANGLE
PENNSYLVANIA–NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)
MONSANTO CHEMICAL
CAMDEN, NEW JERSEY
CAMDEN COUNTY
LAT. 39° 56′ 20″
LONG. 75° 06′ 15″
SCALE 1:24 000
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER
CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
CAMDEN QUADRANGL
NEW JERSEY–PENNSYLVA
7.5 MINUTE SERIES (TOPOGR

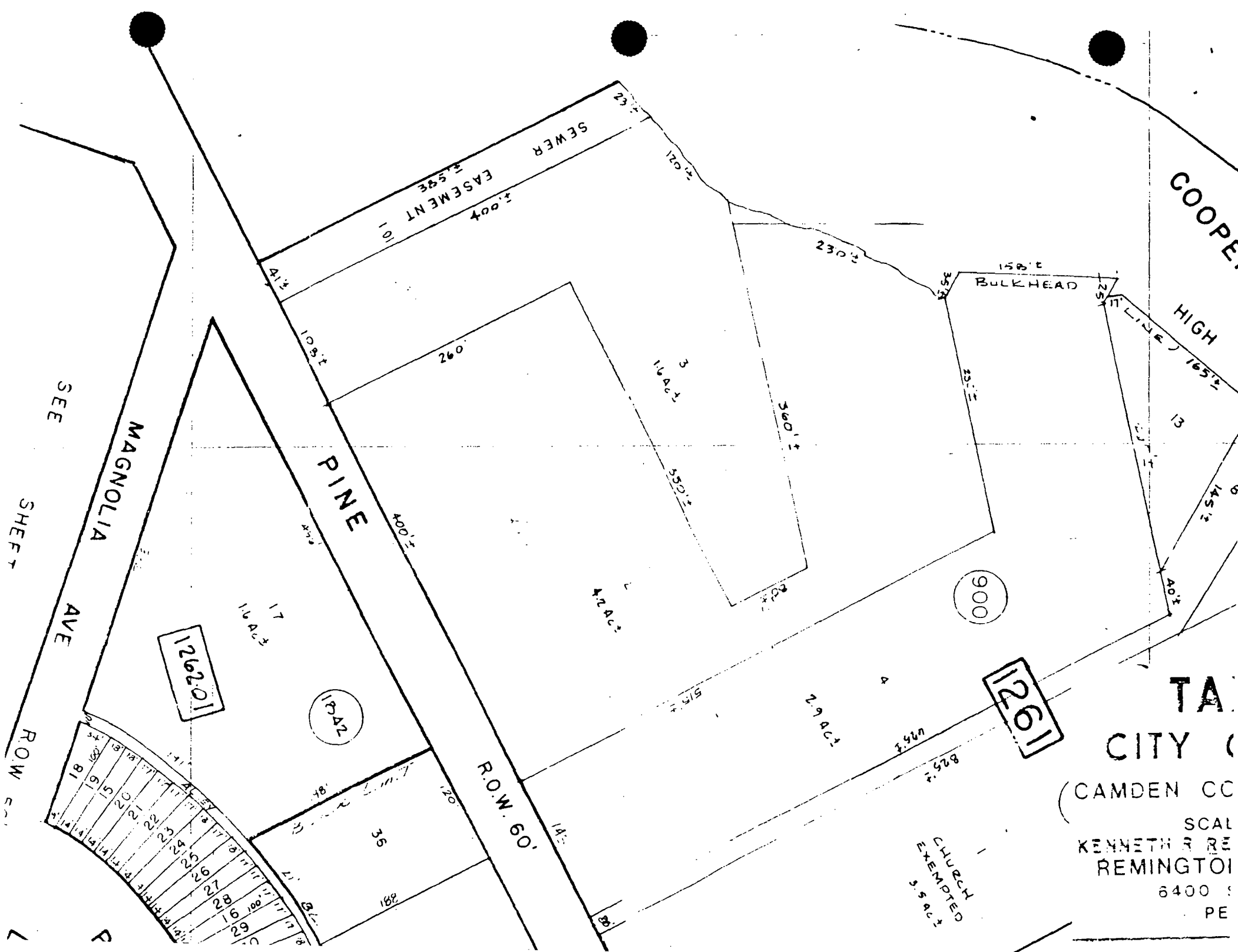
MAP 1



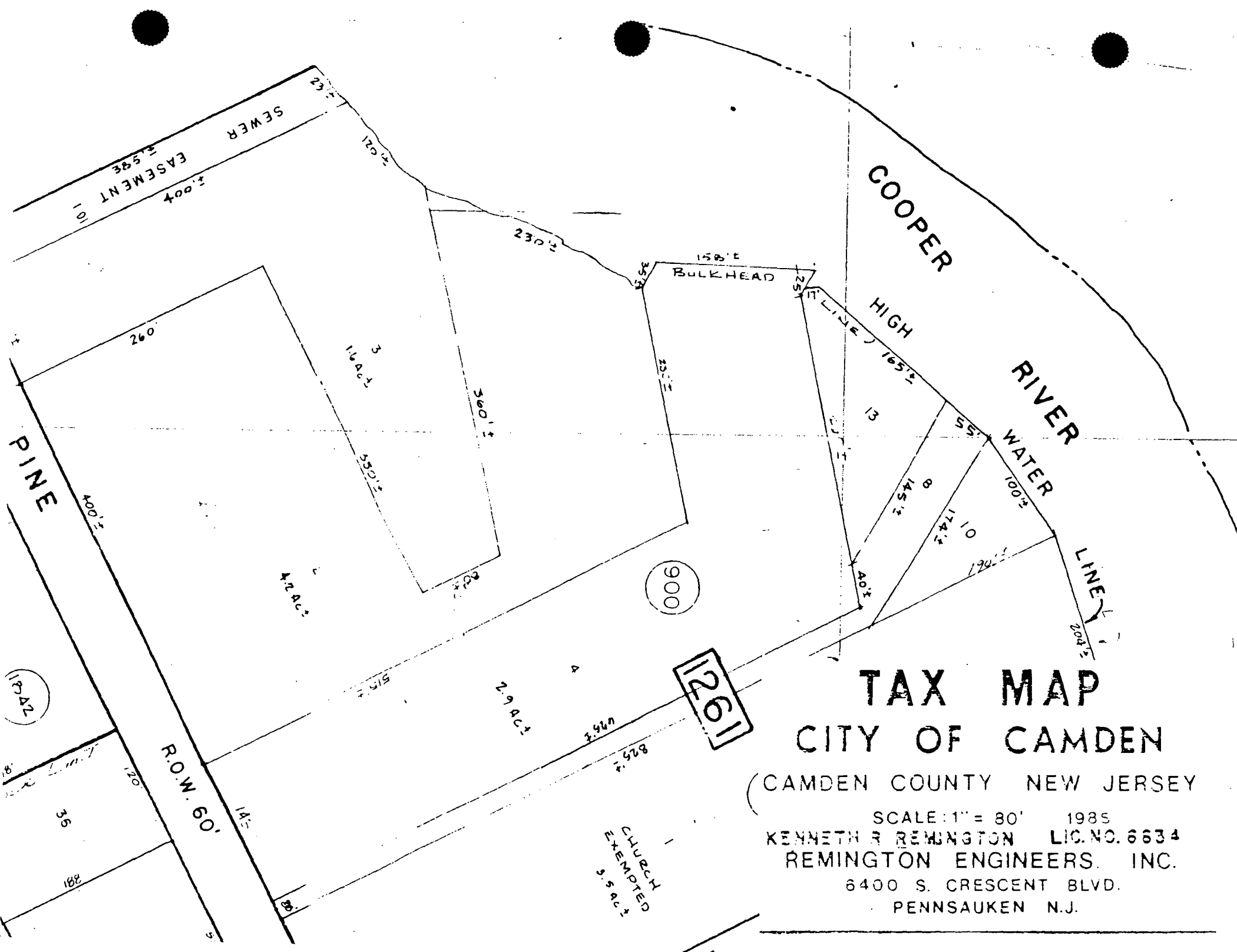
1258 04' EAST OF RINGOLD ST.
BROWNING - JUSTICE LINE
PENNA. R R SIDING
GARAGE B
GARAGE A
PINE STREET
150'
260'
400'
TIME OFFICE
OFFICE
STACKS
BOILER
STACK
TRACK 2
FIRE ESCAPE
BRICK STOR.
TRANS VAULT
TRACK 1
TANK NO.1
TANK 2
ELECTRIC OIL PUMP & AIR COMPRESSOR
PUMP HO #1
PUMP HO #2
ELECTRIC OIL PUMP
514 96
TRESTLE
OIL PUMP (ELECTRIC)
PUMP HO #4
PIT
TANK #3
PRIOR BANK OF STREAM
COOPER RIVER
CITY BLOCK 900
BAG HOUSE
SCRUBBER 4+5
PHOSCHEK OVENS
842



1258.04' EAST OF RINGOLD ST.
BROWNING - JUSTICE LINE
PENNA. R R SIDING
150'
GARAGE B
MAGNOLIA AVE.
392.79'
CITY BLOCK 1842
GARAGE A
BONE ASH
SHED F
TRACK 3
PINE STREET
400'
TIME OFFICE
OFFICE
STACKS
BOILER
STACK
TRACK 2
FIRE ESCAPE
BRICK STOR.
TRANS VAULT
TRACK 1
PLATFORM
198.36'
PHOSCHEK OVENS
260'
OIL PUMP (ELECTRIC)
PIT
PUMP HO#4
TANK #3
PRIOR BA OF STRE
FAN HO#2
FAN HO#5
FAN HO#1
CITY BLOCK 900
BAG HOUSE
SCRUBBER 4+5
TRESTLE
TANK NO.1
TANK 2
TK#5
TK#4
PUMP HO#1
PUMP HO#2
ELECTRIC OIL PUMP & AIR COMPRESSOR
ELECTRIC
514.96



SEWER EASEMENT
385'±
400'±
120'±
230'±
158'±
BULKHEAD
LINE
165'±
COOPE
HIGH
260'
3
1.6 Ac±
360'±
350'±
400'±
4.2 Ac±
900
13
145'±
40'±
PINE
R.O.W. 60'
MAGNOLIA AVE
SEE SHEET
R.O.W.
17
1.6 Ac±
126201
1842
36
120'
188'
2.9 Ac±
1261
CHURCH EXEMPTED
3.5 Ac±
TA
CITY
(CAMDEN CO
SCAL
KENNETH R RE
REMINGTO
6400
PE



TAX MAP
CITY OF CAMDEN
(CAMDEN COUNTY NEW JERSEY

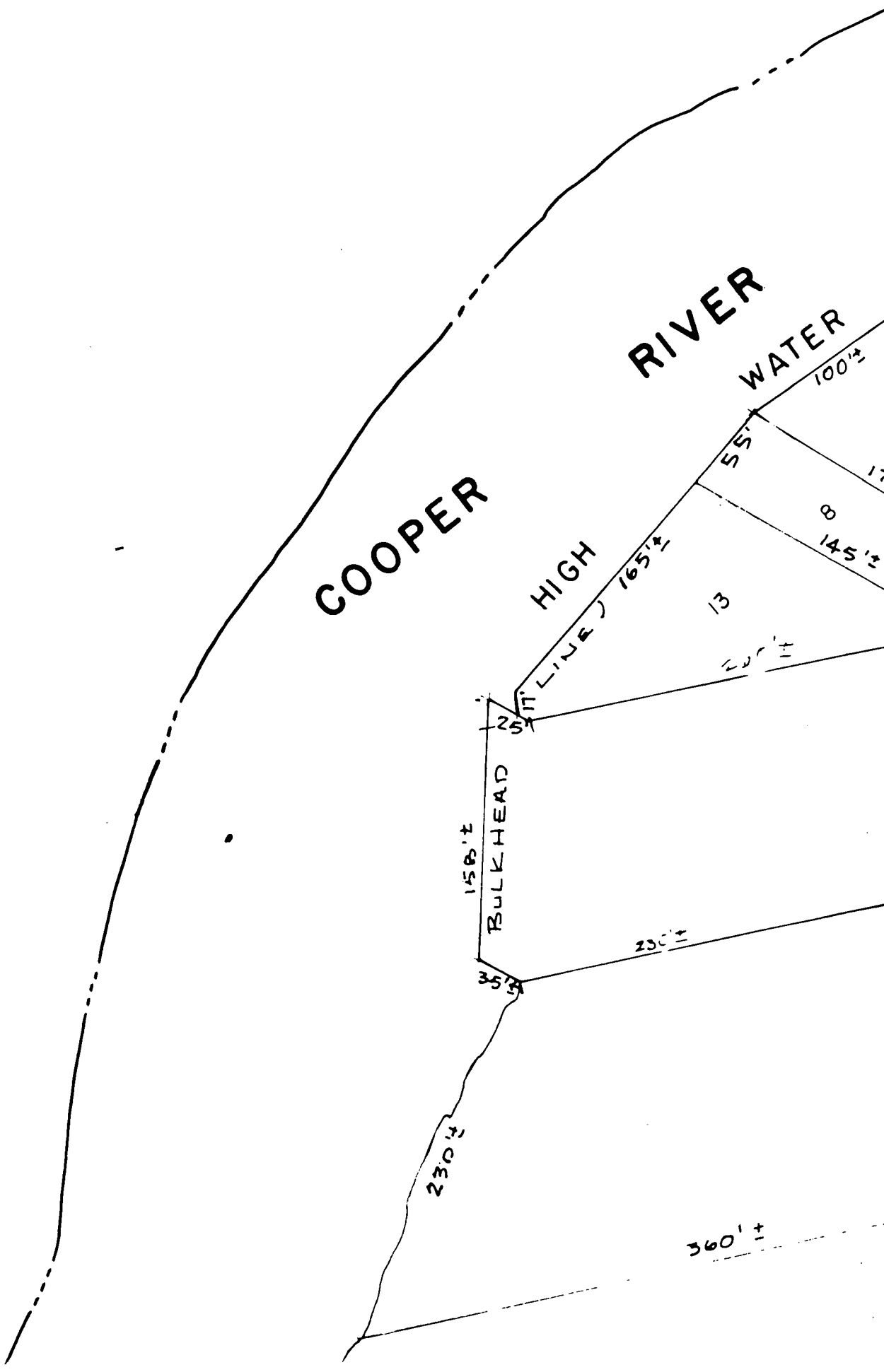
SCALE: 1" = 80' 1985

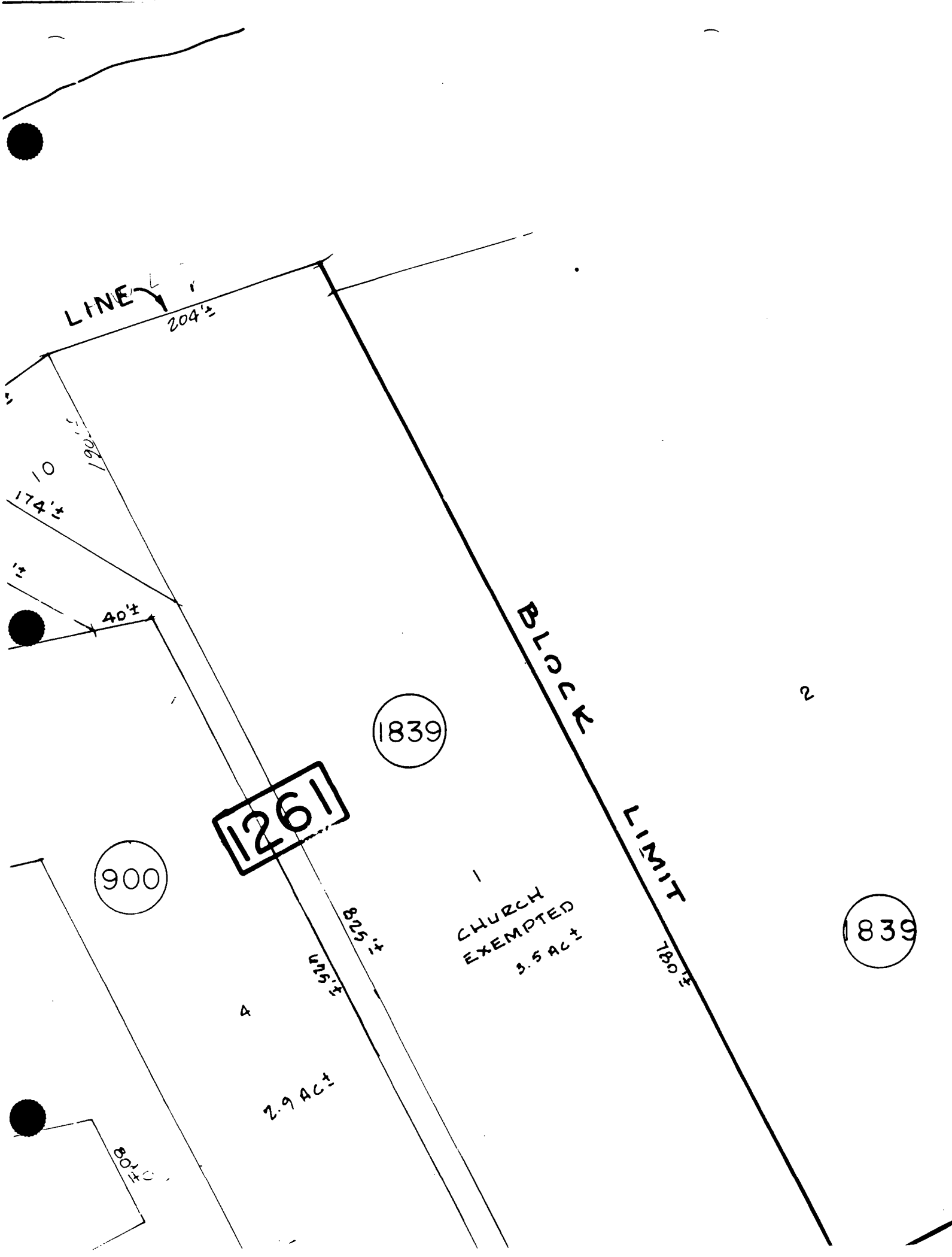
KENNETH R REMINGTON LIC. NO. 6634

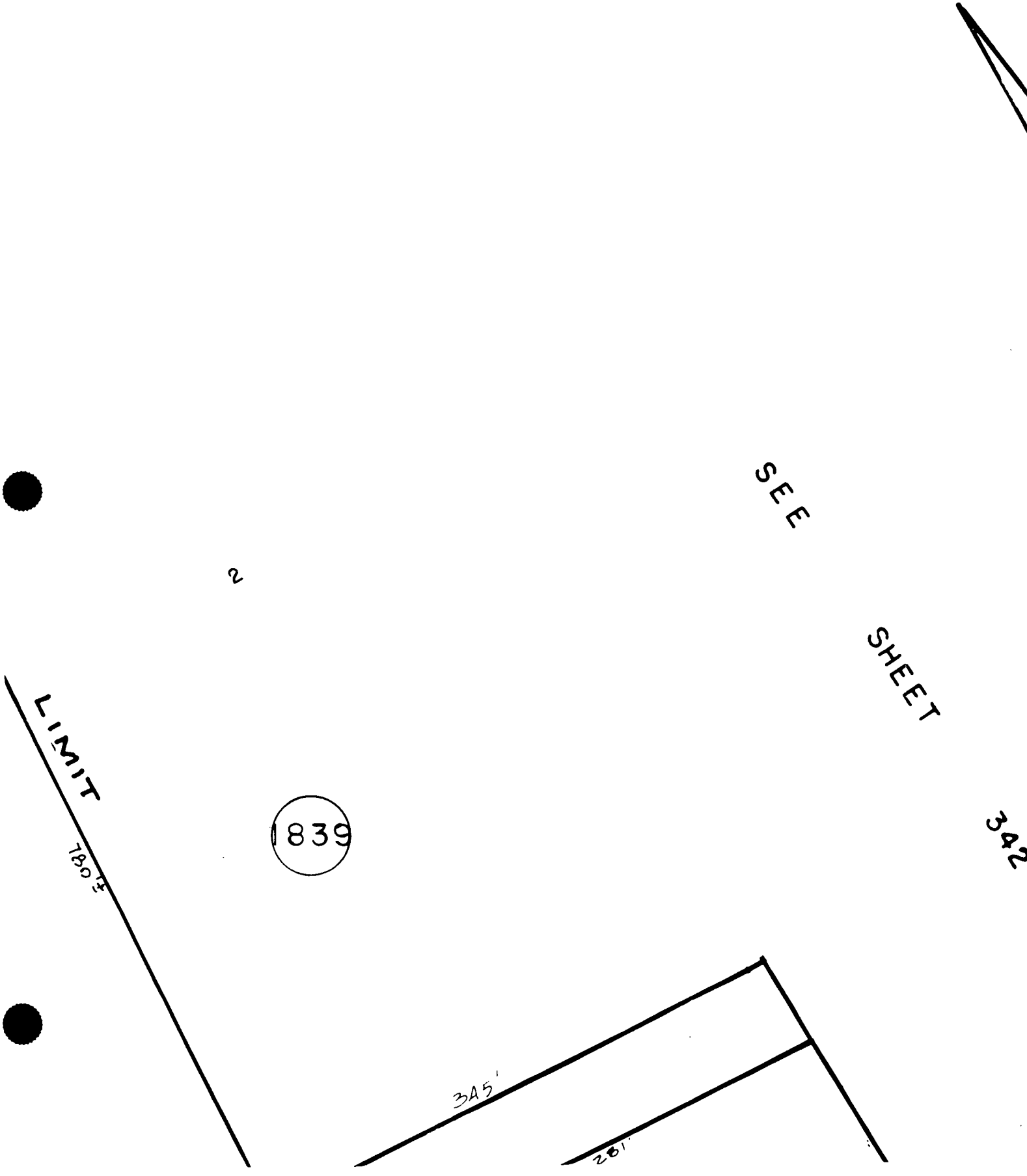
REMINGTON ENGINEERS. INC.

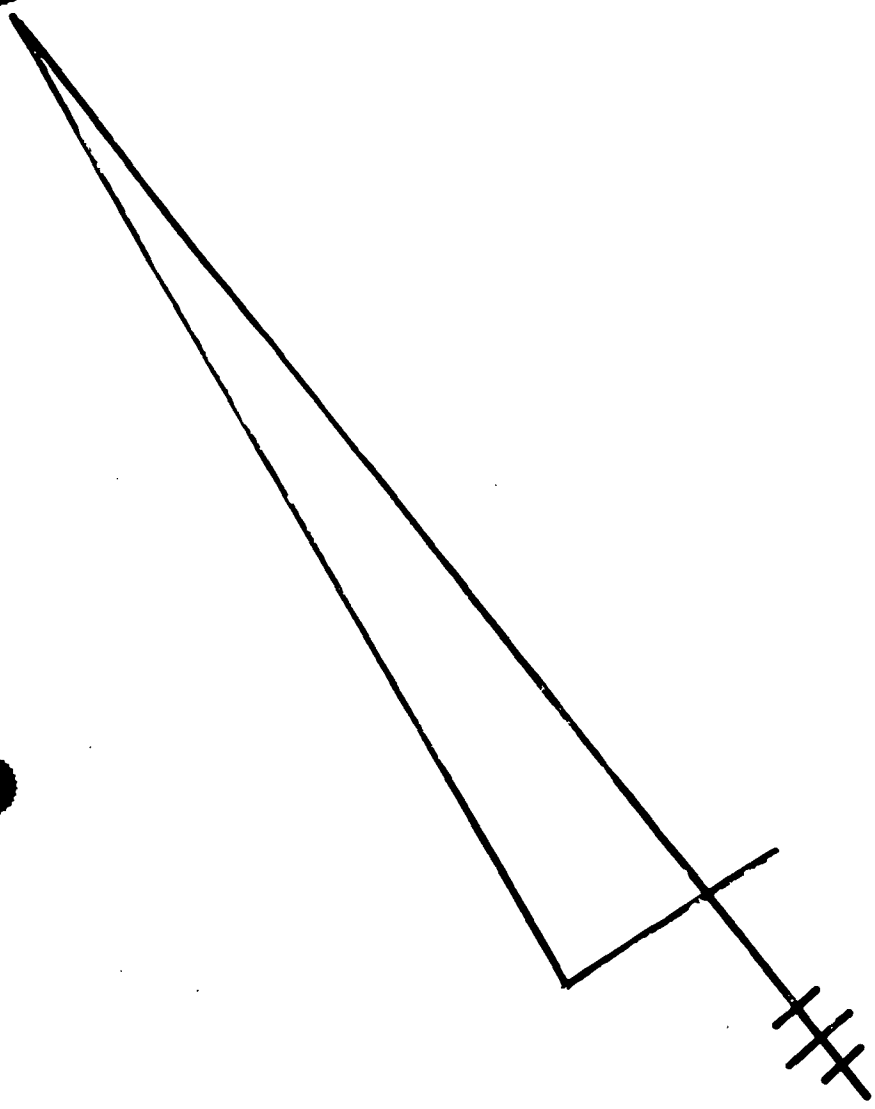
6400 S. CRESCENT BLVD.

PENNSAUKEN N.J.


COOPER
RIVER
HIGH
WATER
LINE
100'±
55'
165'±
8
145'±
13
25'
BULKHEAD
158'±
35'
230'±
360'±

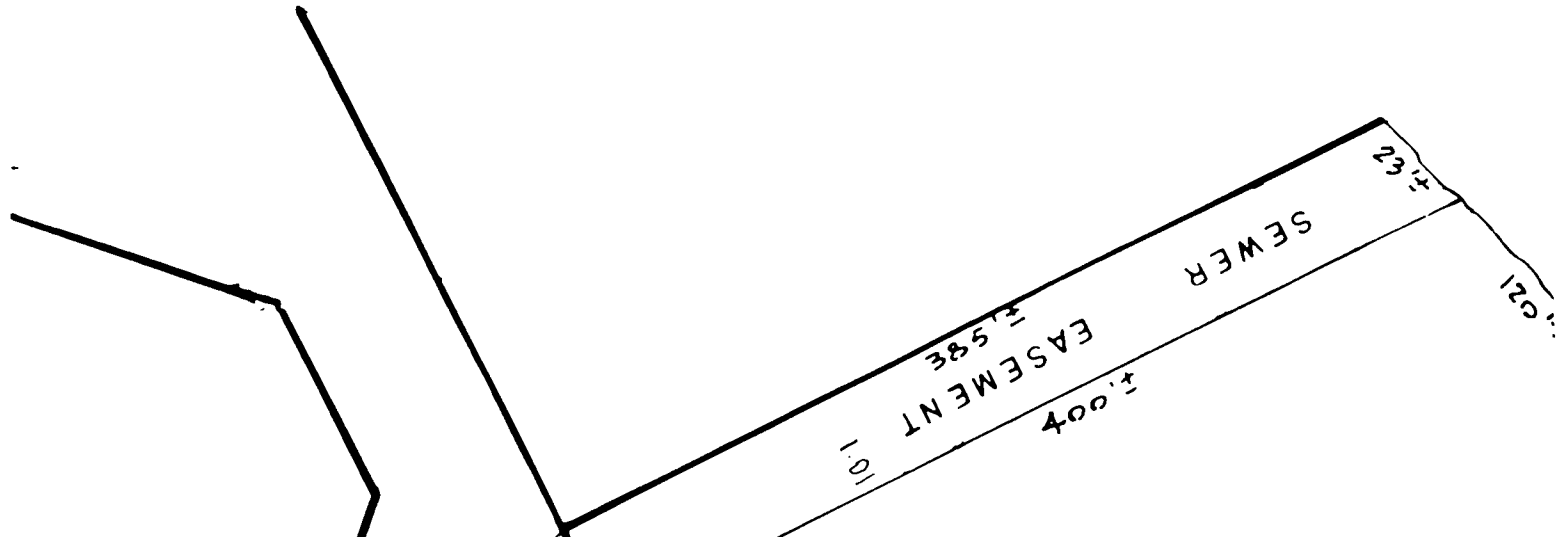

LINE
204'±
190'±
10
174'±
40'±
BLOCK
LIMIT
1839
1261
900
1
CHURCH
EXEMPTED
3.5 AC±
825'±
625'±
780'±
2
1839
4
2.9 AC±
80'±

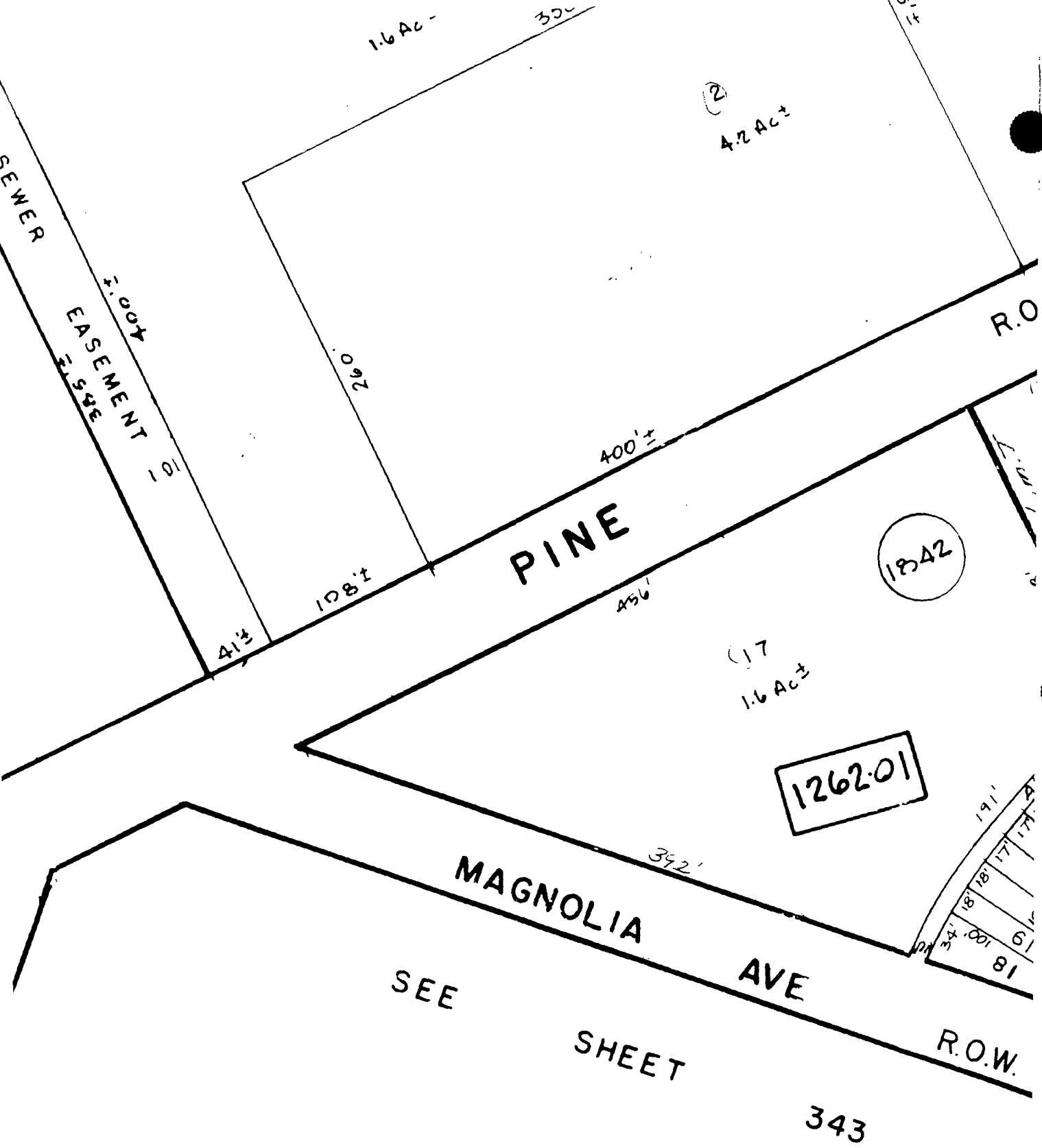

SEE
SHEET
342
2
LIMIT
1803
1839
345'
261'



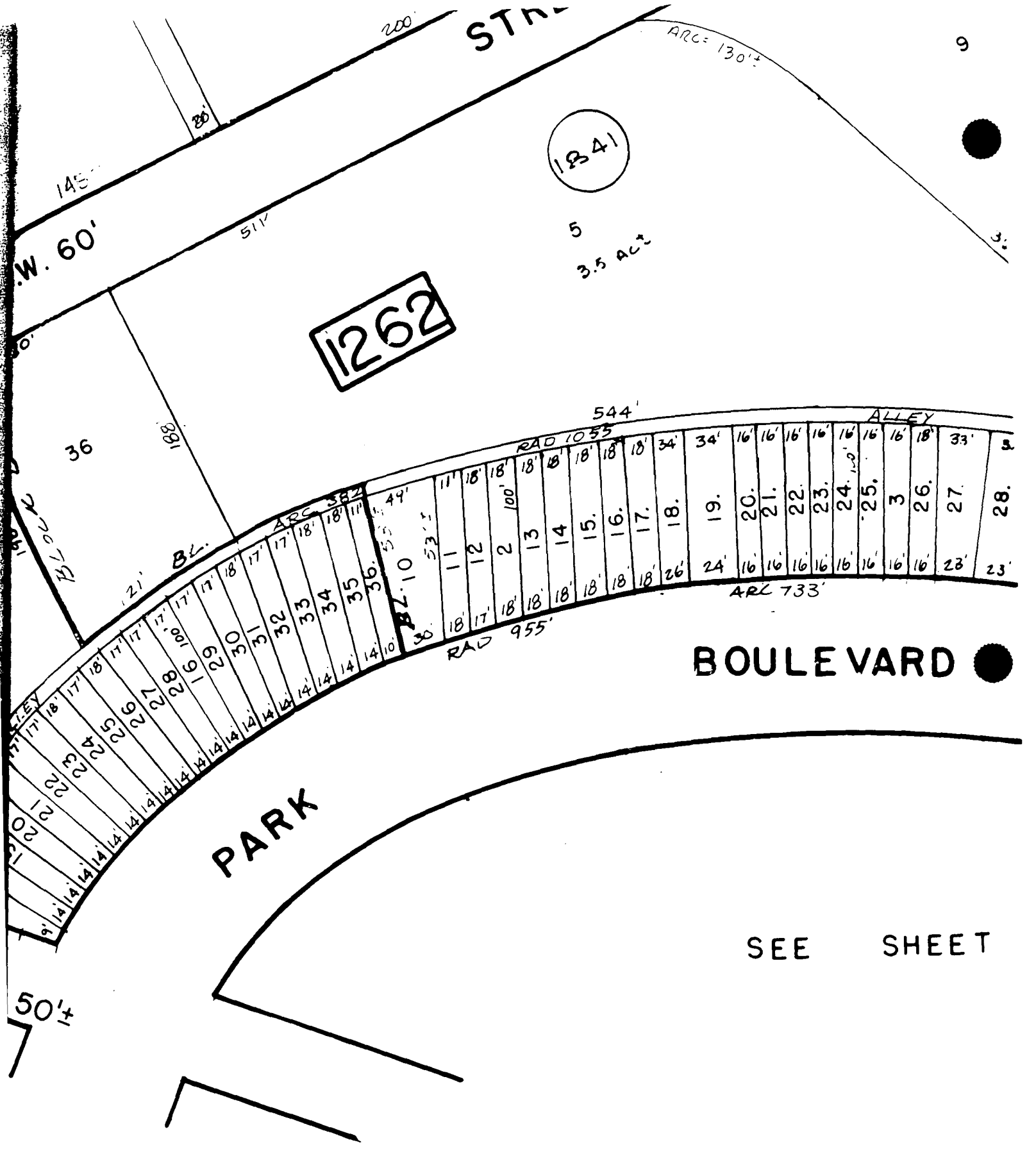
342

SEE KEY MAP 22

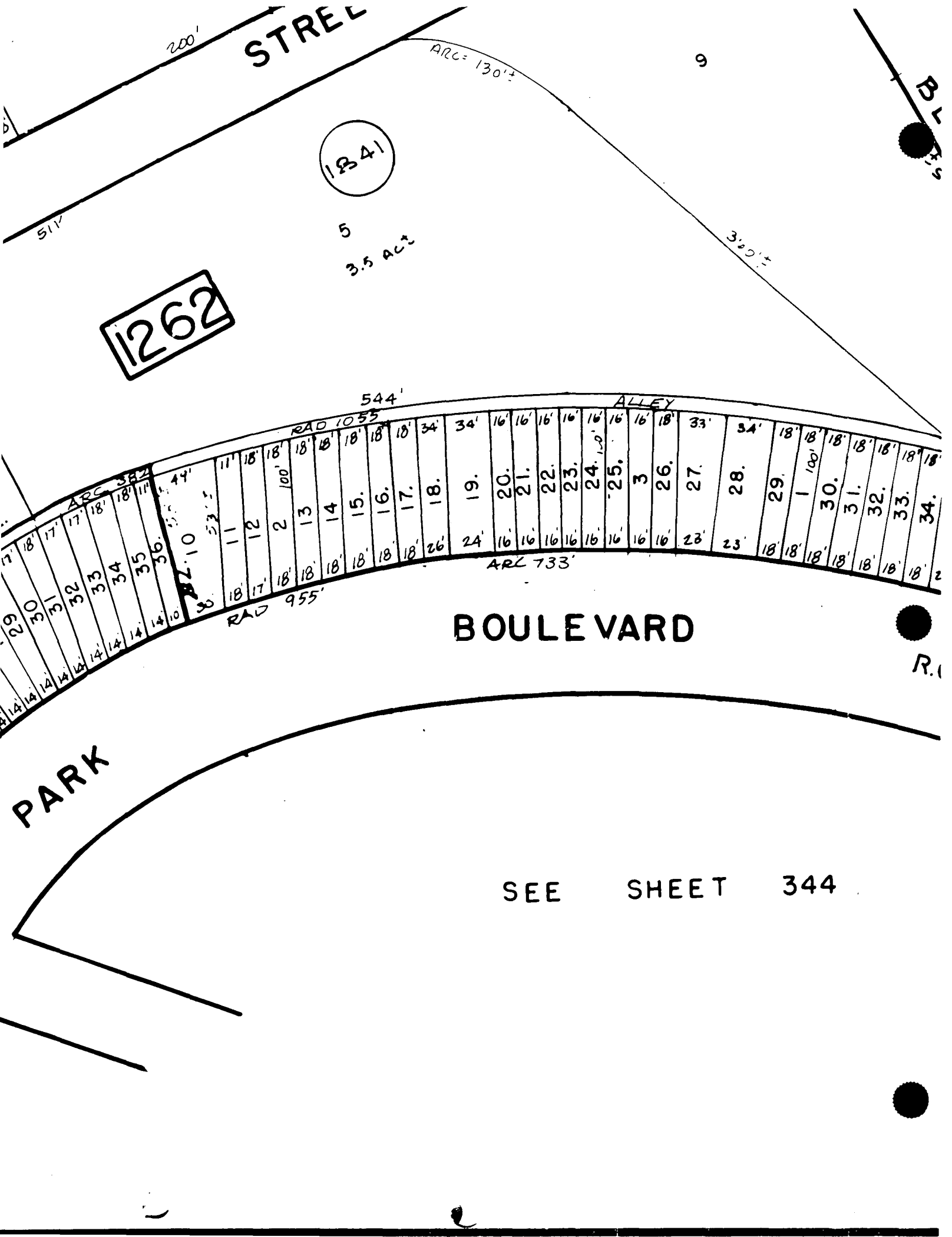


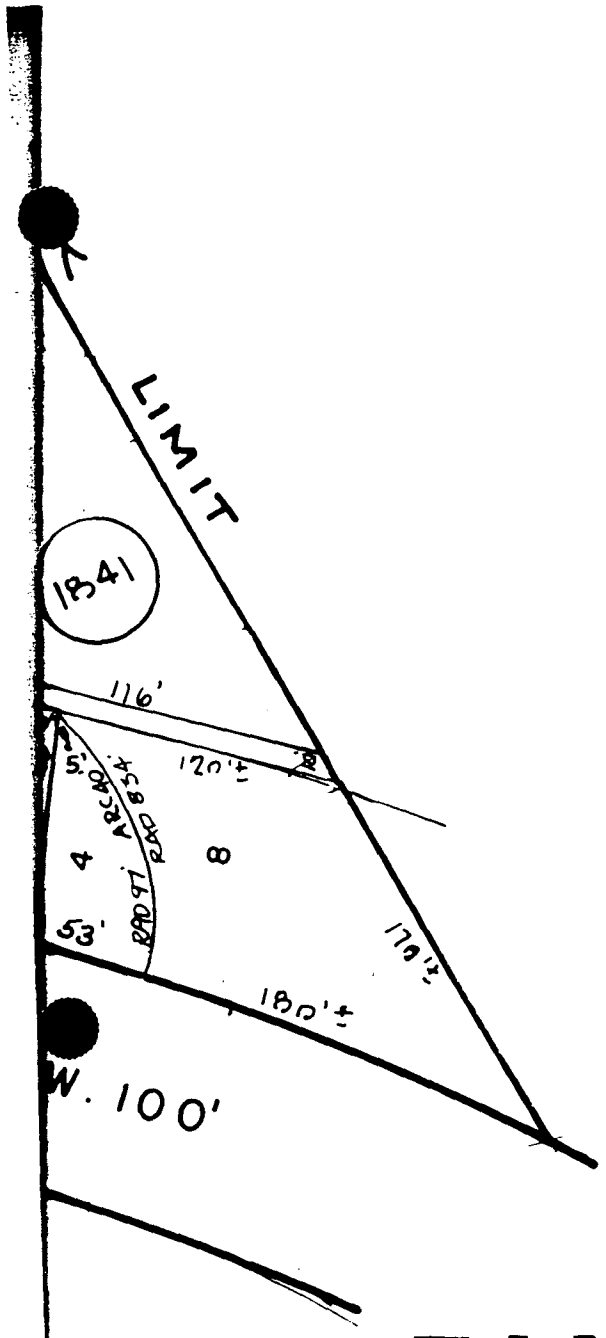


1.6 Ac
2
4.2 Ac±
SEWER
EASEMENT
400'±
260'
101
108'±
41'±
400'±
PINE
R.O
1842
456'
17
1.6 Ac±
1262.01
392'
191'
MAGNOLIA
AVE
R.O.W.
SEE
SHEET
343



STR
200'
ARC= 130'±
9
1841
145'
.W. 60'
511'
5
3.5 Ac±
1262
544'
ALLEY
RAD 1055
36
188'
BLOCK
BL.
ARC 382
49'
ARC 733'
RAD 955'
BOULEVARD
PARK
SEE SHEET
50'±


STREE
200'
ARC= 130'±
9
1841
5
3.5 Act
511'
1262
544'
ALLEY
RAD 1055
ARC 384
ARC 733'
RAD 955'
BOULEVARD
PARK
SEE SHEET 344



LIC. #15434 CHIEF ENGINEERING SECTION
DEC 16 1985
652

TAX MAP

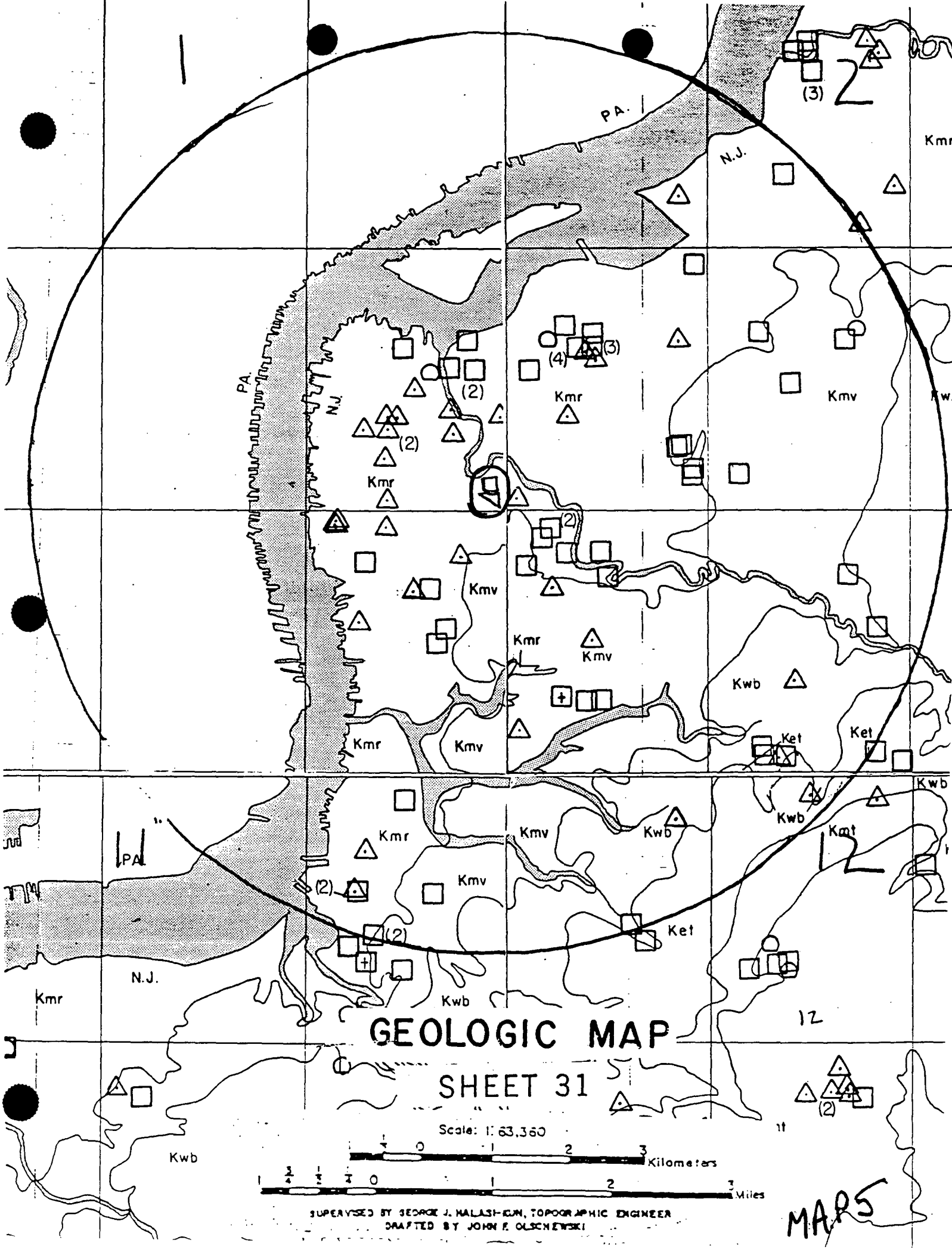
CITY OF CAMDEN

CAMDEN COUNTY NEW JERSEY

SCALE: 1" = 80' 1985

KENNETH R. REMINGTON LIC. NO. 6634
REMINGTON ENGINEERS, INC.
6400 S. CRESCENT BLVD.
PENNSAUKEN N.J.

Scale: 1 Mile to an Inch
Miles
Yards
Meters
Contour Interval: 10 feet
SHEET 31
TOPOGRAPHIC SERIE
MORRIS STA.
DELAIR STA.
Fisher Point Dike
PORT RICHMOND
PETTY ISLAND
COOPERS POINT
PENNSYLVANIA
FISHHOUSE STA.
MORRISVILLE
PAUDITZ
EAST CAMDEN
STOCKTON
BROADWAY
BERRY PARK STA.
GARDEN STATE PARK
CAMDEN
COLLINGSWOOD
CRESTMONT STA.
OAKLEN STA.
MUNICIPAL STADIUM
GLOUCESTER
NORTHMONT
EAGLE PT.
NEWBOLD
RED BANK
WASHINGTON PARK
U.S. RESERVATION
BELLMAWR
BARRINGTON
LAWNSIDE
MAGNOLIA STA.
CLEMENTON
PUMPING STA.


GEOLOGIC MAP
SHEET 31
Scale: 1:63,360
Kilometers
Miles
SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN F. OLSCHEWSKI
PA.
N.J.
Kmr
Kmv
Kwb
Ket
Kmt
(2)
(3)
(4)
MARS

LEGEND FOR ATLAS SHEET

△ INDUSTRIAL WELL YIELD OVER 70 GALLONS PER MINUTE

□ PUBLIC SUPPLY WELL YIELDING OVER 70 GALLONS PER MINUTE

⊕ UNSUCCESSFULL ROCK WELL YIELDING LESS THAN 70 GALLONS PER MINUTE

⊙ UNSUCCESSFULL SAND WELL YIELDING LESS THAN 70 GALLONS PER MINUTE

[T] NO TEST – NO DATA ON YIELD

——— — — FAULT (DASHED WHERE INFERRED)

——— — — CONTACT (DASHED WHERE INFERRED)

PIEDMONT / COASTAL PLAIN — PHYSIOGRAPHIC PROVINCE BOUNDARY

WATER SUPPLY TRANSMISSION LINE

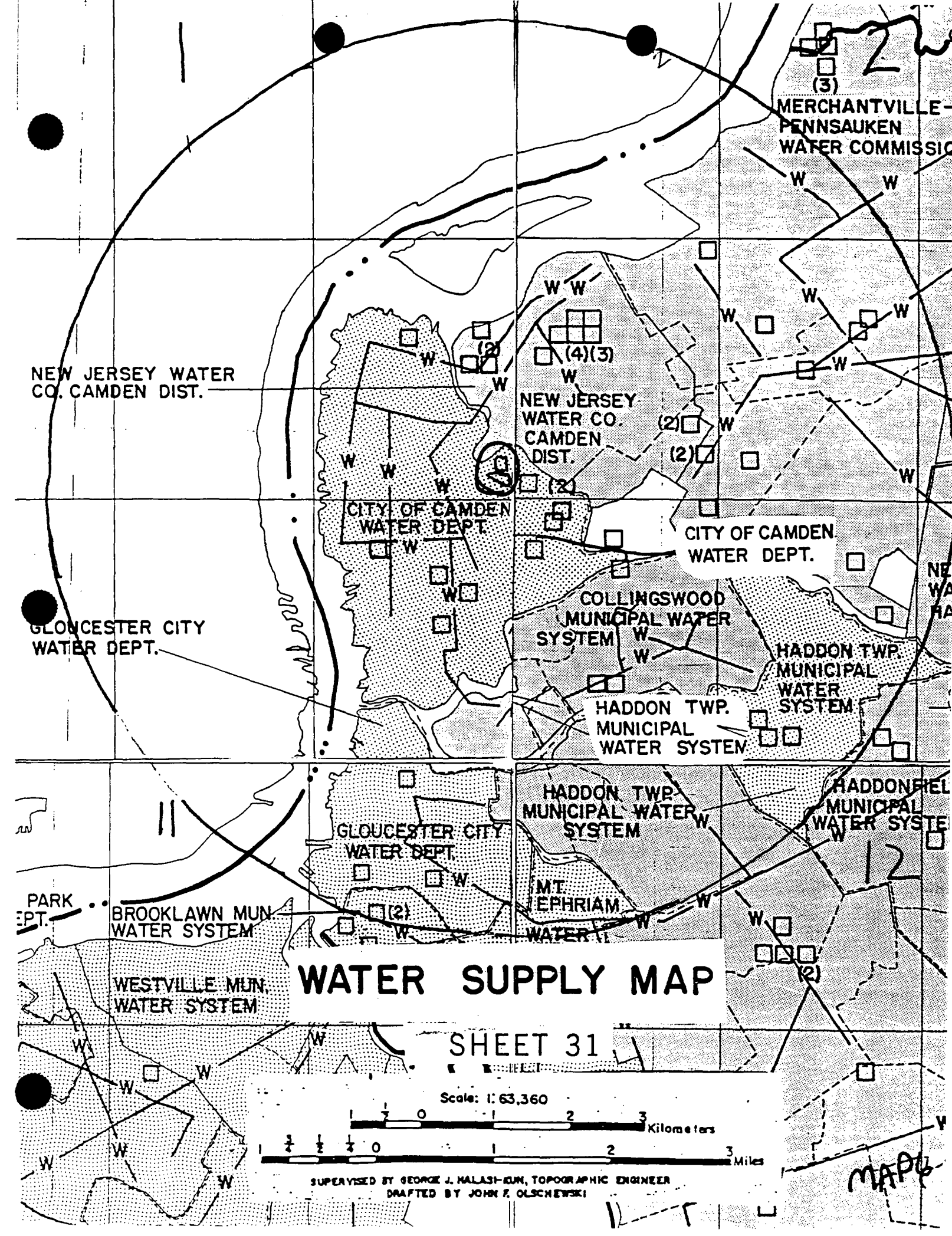
SEDIMENTARY ROCKS

TERTIARY

Tbh	BEACON HILL GRAVEL
Tch	COHANSEY SAND
Tkw	KIRKWOOD SAND
Tmq	MANASQUAN MARL
Tvt	VINCENTOWN SAND
Tht	HORNERSTOWN MARL

CRETACEOUS

Krb	RED BANK
Krbt	RED BANK (TRANSITIONAL UNIT)
Krbg	RED BANK (GLAUCONITE SAND UNIT)
Kns	NAVESINK MARL
Kml	MOUNT LAUREL SAND
Kw	WENONAH SAND
Kmt	MARSHALLTOWN FORMATION
Ket	ENGLISHTOWN SAND
Kwb	WOODBURY CLAY
Kmv	MERCHANTVILLE CLAY
Kmr	MAGOTHY AND RARITAN FORMATIONS
Km	MAGOTHY FORMATION
Kr	RARITAN FORMATION


WATER SUPPLY MAP
SHEET 31
Scale: 1:63,360
Kilometers
Miles
SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN F. OLSCHEWSKI
MERCHANTVILLE-PENNSAUKEN WATER COMMISSIO
NEW JERSEY WATER CO. CAMDEN DIST.
NEW JERSEY WATER CO. CAMDEN DIST.
CITY OF CAMDEN WATER DEPT.
CITY OF CAMDEN WATER DEPT.
GLOUCESTER CITY WATER DEPT.
COLLINGSWOOD MUNICIPAL WATER SYSTEM
HADDON TWP. MUNICIPAL WATER SYSTEM
HADDON TWP. MUNICIPAL WATER SYSTEM
HADDON TWP. MUNICIPAL WATER SYSTEM
GLOUCESTER CITY WATER DEPT.
MT. EPHRIAM WATER
BROOKLAWN MUN. WATER SYSTEM
WESTVILLE MUN. WATER SYSTEM
PARK
MAPS

LEGEND

WATER SUPPLY

- AREA SERVED BY PRIVATE WATER SERVICE COMPANIES
- AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANI
- AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANI
- AREA NOT PRESENTLY SERVED BY WATER SERVICE
- PUBLIC SUPPLY WELLS
- WATER MAIN ACROSS HIGHWA FOR FUTURE USE
- SURFACE WATER INTAKE
- —W— MAJOR WATER MAINS

SEWAGE, LANDFILL

- AREA SERVED BY PUBLIC SEWAGE SERVICE
- AREA NOT PRESENTLY SERVED BY SEWAGE SERVICE
- SANITARY LANDFILLS
- SEWAGE TREATMENT PLANTS (CAPACITY <0.3mgd)
- SEWAGE TREATMENT PLANTS (CAPACITY ≥0.3mgd)
- —S— MAJOR SEWAGE TRANSMISSION LINES

DRAINAGE BASIN

- DRAINAGE BASIN BOUNDARY
- RIVER BASIN BOUNDARY
- HUDSON DRAINAGE BASIN NAME
- STREAMS AND RIVERS
- FLOOD PRONE AREAS

POPULATION

- COUNTY BOUNDARY
- MUNICIPAL BOUNDARY
- ( ) POPULATION DENSITY IN PERSONS PER SQUARE MILE
- [ ] AREA IN SQUARE MILES
- % PERCENT AREA OF MUNICIPALITY ON BLOCK
- MARKET ROADS
- BUILT UP AREAS
- STATE BOUNDARY

BLOCK #31-01

9/76

A. Camden, Philadelphia

B. Delaware River-Newton Creek, Coopers Creek

C. 2.

Map No.	Location	Period of Record
449	Cooper River at Camden	1967-
3. 335	Newton Creek, North Branch, Woodlyne	1965

D. Magothy and Raritan Formations (Kmr), Merchantville Clay (Kmv)

E. 1. Physiographic Province: Coastal Plain
Subdivision: Inner Plain
Major Topographic Features: Delaware River, Clay and Marl Region
Elevations (ft. above sea level): hills 45, valleys 0
Relief (ft.): 45

2. a. Normal Year: 43"
Dry Year: 35"
Wet Year: 48"

b. January: 33°F
July: 76°F

c. 250 days. Last killing frost: 4/15; first killing frost: 11/5

G. Corps of Engineers (U.S.Army) - Petty Island

H. Camden:
Walt Whitman House
Benjamin Cooper House
Joseph Cooper House
Pomona Hall
Taylor House
Newton Friends Meeting House
Charles S. Boyer Memorial Hall

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
31-01-652	City of Camden, #5	1963	134-169	171	1000	Kmr
31-01-655	H. Kohnstamm & Co., Inc.	1954	116-136	136	150	"
31-01-656	U.S. Gasket, #1	1953	130-141	153	100	"
31-01-657	Savar Amusement Corp.	1950	82-113	113	500*	Kr
31-01-657	Stanley Corp. of America	1949	118-138	150	200*	"
31-01-662	City of Camden, #15	1954	116-136	155	1000	"
31-01-664	Camden Water Dept., #1-A	1953	135-170	175	1000	"
31-01-665	City of Camden, Test Well #1	1950	129-150	166	300	"
31-01-665	" #14	1953	105-145	164	1000	"
31-01-667	Sungil Co.	1947	147-157	157	100	"
31-01-669	Paris Produce Co.	1964	150-166	167	100	Kmr
31-01-673	Lintonia Pure Food Shop, Inc.	1950	102-123	128	315*	"
31-01-681	Savar Amusement Corp., #2	1950	110-130	130	500*	Kr
31-01-681	Camden Trust Co.	1949	93-123	127	430*	"
31-01-684	Stanley Corp. of America	1949	110-130	152	600*	"
31-01-687	Savar Amusement Corp.	1949	114-134	138	600.	"
31-01-691	Baltimore Markets, #2	1950	138-170	170	1200*	"
31-01-912	Public Service Elec.& Gas Co.	1950	120-146	149	600	"
31-01-912	"	1954	113-145	145	350	"
31-01-916	City of Camden, #2-B	1953	111-136	204	1000	"
31-01-921	Stanley Corp. of America	1949	86-150	163	250*	"
31-01-928	Samuel Adelson	1952	92-102	102	200	"
31-01-929	Camden Water Dept.	1948	111-136	165	1012	"
31-01-934	Liberty Theatre #1	1949	112-130	130	150	"
31-01-943	MacAndrews & Forbes Co.	1951	82-103	114	350	"
31-01-956	Camden Water Dept.,#7	1966	123-163	167	1023	"
31-01-961	City of Camden, #11	1942	124-154	166	1005	"

*Indicates use as a recharge well.

J. Geodetic Control Survey monuments described in Index Map 48; Adjacent Index Maps 44,54

BLOCK 31-02 9/76

A. Camden

B. Delaware River-Baldwin Run, Coopers Run, Newton Creek, Pennsauken

C. 1. Cherry Hill - Non-recording temperature and precipitation gauges

2.

Map No.	Location	Period of Record
194	South Branch Pennsauken Creek at Cherry Hill	1967-
196	Cooper River at Haddonfield	1963-
447	North Branch Cooper River at Marlton	1964-
448	North Branch Cooper River at Ellisburg	1964-
449	Cooper River at Camden	1964-
450	Newton Creek at Collingswood	1964-

3.

196	Cooper River at Haddonfield	1965-
334	Newton Creek at West Collingswood	
335	North Branch Newton Creek at Woodlyne	

Water Quality Standards: (explained in Atlas Sheet description) FW3, TW2

D. Mount Laurel and Wenonah Sands (Kmw), Marshalltown Formation (Kmt), Englishtown Sand (Ket), Woodbury Clay (Kwb), Merchantville Clay (Kmv), Magothy and Raritan Formations (Kmr)

E. 1. Physiographic Province: Coastal Plain
Subdivision: Inner Plain
Major Topographic Features: Delaware River, Clay and Marl Region
Elevations (ft.above sea level): hills 100, valleys 0
Relief (ft.): 100

2. a. Normal Year: 43"
Dry Year: 36"
Wet Year: 48"

b. January: 33°F
July: 76°F

c. 249 days. Last killing frost: 4/15; first killing frost: 10/30

F. Camden County:
Cooper River Park

G. Corps of Engineers (U.S.Army) - Petty Island

H. Griffin Morgan House, Pennsauken
1743 Samuel Cole House, Cherry Hill

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
31-02-195	Paragon Oil Co., #1	1961	51-61	61	100	Kmr
31-02-225	City of Camden, #4-A	1960	95-130	134	1585	"
31-02-227	" #5-NA	1960	79-114	121	1529	"
31-02-228	" #3	1953	73-107	136	1000	"
31-02-228	" #8	1953	89-124	141	1000	"
31-02-228	" #10	1960	75-115	118	1529	"
31-02-235	Kingston Trap Rock	1955	55-65	68	125	"
31-02-238	" #2	1966	115-123	127	200	"
31-02-238	Atlantic Blue Diamond Corp.	1958	100-110	110	180	"
31-02-281	City of Camden	1975	140-180	190	1200	"
31-02-293	Meadow Brook Swim Club	1963	97-107	107	200	"
31-02-297	H&H Industries	1959	71-81	81	100	"
31-02-331	Riverton-Palmyra Water Co.#16	1965	144-176	192	1034	"
31-02-331	" #13	1963	166-197	206	610	"
31-02-361	Delaware Valley Water Co.,#28	1969	225-260	264	1200	"
31-02-363	" #31	1970	215-261	267	1002	"
31-02-419	New Jersey Water Co.,#50	1958	139-170	176	1000	"
31-02-427	" #25	1961	305-367	399	1050	"
31-02-433	Merchantville-Pennsauken Water Co.	1968	109-139	139	882	"
31-02-442	City of Camden, Test #6	1954	153-175	181	210	Kr
31-02-443	New Jersey Water Co.,#44	1950	154-186	187	1400	Kmr
31-02-443	" #45	1950	141-173	173	955	"
31-02-443	" #46	1950	148-178	179	1400	"
31-02-443	" #48	1954	122-164	171	1412	"
31-02-444	City of Camden, #16	1954	149-179	181	1000	"
31-02-449	Savar Amusement Corp.	1949	169-189	189	450	"
31-02-451	H. Kohnstomm & Co.,Inc.,#5-A	1967	163-184	194	200	"
31-02-451	"	1959	133-158	158	250	"
31-02-451	New Jersey Water Co.,#52	1965	147-198	198	1404	"
31-02-451	" #38	1933	126-162	166	846	"
31-02-451	" #47	1953	159-175	177	1012	"
31-02-462	Parks Dairies	1958	154-170	172	200	"
31-02-477	Camden Co. Park Commission	1950	186-217	217	1200	"
31-02-492	Merchantville-Pennsauken Water Comm., #9	1956	107-137	141	875	"
31-02-492	" #10	1963	223-258	262	1000	"
31-02-496	" #2-A	1965	110-140	143	900	"
31-02-496	" #1-R	1971	132-152	159	875	"
31-02-519	" Test Well	1963	118-138	160	400	"
31-02-537	" Test Well #1	1956	247-268	293	317	"
31-02-554	" #2	1962	245-285	300	1040	"
31-02-561	" #6	1957	242-277	283	1020	"
31-02-575	Camden Co.Board of Ed.	1967	322-401	401	320	"
31-02-621	Merchantville-Pennsauken Water Comm., #7	1958	240-275	330	1000	"
31-02-692	" #8	1960	207-237	240	875	"
31-02-694	New Jersey Water Co.,#22	1960	371-453	497	1067	"
31-02-697	" #24	1961	112-167	186	1051	"
31-02-699	"	1967	376-427	430	1030	"

31-02-712	City of Camden, Test #5	1953	205-225	277	280	Kmr
31-02-712	"	1953	185-225	243	1000	"
31-02-712	" #17	1954	230-265	274	1000	"
31-02-714	"	1953	90-115	123	1000	"
31-02-716	Our Lady of Lourdes Hospital	1963	237-257	261	275	"
31-02-718	A. N. Stoll Werck, Inc.	1950	111-131	136	210	"
31-02-725	Boro.of Collingswood, #3-R	1960	257-287	294	1000	Kr
31-02-728	" #2-B	1960	248-278	308	1000	Kmr
31-02-754	Friendship Dairy, #1	1955	143-164	164	100	"
31-02-773	Boro.of Collingswood,Test #1	1964	307-333	370	-	"
31-02-774	A.M.Ellis Theatres,Inc.,#3	1961	83-103	115	250*	"
31-02-781	Boro.of Collingswood, "B"	1965	224-313	336	1034	"
31-02-782	" "A"	1965	219-312	331	1034	"
31-02-837	New Jersey National Guard	1956	96-111	111	150	"
31-02-857	Morgan Brothers, Inc.	1967	431-451	451	302	"
31-02-865	Joe's Trailer Camp	1955	112-122	122	70	"
31-02-879	Twp. of Haddon, #4	1965	417-448	455	1000	"
31-02-879	" #3	1956	432-469	490	800	"
31-02-887	" Bd.of Ed.,#1	1966	142-162	165	200	"
31-02-887	" New #1	1968	401-479	481	870	"
31-02-898	Boro.of Haddonfield,Test #1	1965	490-510	510	350	"
31-02-899	"	1967	307-372	380	1029	"
31-02-982	New Jersey Water Co.,#23	1960	321-378	405	1001	"
31-02-982	" #13	1953	491-527	527	1200	"
31-02-986	Hunt Tract Swimming Club	1957	232-243	243	90	"

NOT INCLUDED

*Indicates use as a recharge well.

J. Geodetic Control Survey monuments described in Index Map 48; Adjacent Index Maps 44,49,54,55

BLOCK #31-11

A. Camden, Philadelphia, Runnemede, Woodbury

B. Delaware River-Big Timber Creek, Mantua Creek, Newton Creek, Woodbury Creek

C. 3.

Map No.	Location	Period of Record
333	Woodbury Creek at Woodbury	1965-

Water Quality Standards: (explained in Atlas Sheet description)
FW2, TW1 except where classified FW3

D. Kirkwood Sand (Tkw), Hornerstown Marl (Tht), Navesink Marl (Kns), Mount Laurel and Wenonah Sands (Kmw), Marshalltown Formation (Kmt), Englishtown Sand (Ket), Woodbury Clay (Kwb), Merchantville Clay (Kmv), Magothy and Raritan Formations (Kmr)

E. 1. Physiographic Province: Coastal Plain
Subdivision: Inner Plain
Major Topographic Features: Delaware River, Clay and Marl Region
Elevations (ft. above sea level): hills 100, valleys 0
Relief (ft.): 100

2. a. Normal Year: 44"
Dry Year: 34"
Wet Year: 51"

b. January: 33°F
July: 76°F

c. 250 days. Last killing frost: 4/20; first killing frost: 10/30

H. Red Bank Battlefield, National Park
James Whitall House, National Park
Woodbury Friends Meeting House, Woodbury

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
31-11-319	Atlantic Ice Mfg. Co.	1962	205-240	242	200	Kmr
31-11-322	City of Gloucester	1965	225-265	270	1034	"
31-11-343	"	1961	221-261	280	1000	"
31-11-343	New Jersey Zinc Co.	1958	223-253	275	600	"
31-11-343	"	1958	249-279	285	600	"
31-11-348	Borough of Brooklawn	1961	307-327	327	400	"
31-11-349	"	1927	101-141	152	225	"
31-11-349	"	1927	114-157	165	225	"
31-11-353	City of Gloucester	1958	161-185	188	500	"
31-11-373	Borough of Brooklawn	1969	288-321	324	App.300	"
31-11-378	Borough of Westville	1957	286-313	323	1205	Kr
31-11-382	Borough of Bellmawr	1956	334-359	423	800	Kmr
31-11-422	Borough of National Park	1950	-	87	175	Qsd
31-11-422	"	1956	241-282	307	636	Kr
31-11-448	West Deptford Little League	1958	62-72	72	100	Qsd
31-11-497	Polyrez Co.	1959	134-166	166	503	Kmr
31-11-514	Texaco Co.	1973	266-306	329	1001	"
31-11-515	Twp. of West Deptford	1961	307-353	363	752	"
31-11-565	General Engines Co.	1954	38-43	43	100	Ket
31-11-612	Steinberger	1959	-	170	-	Km
31-11-628	Deptford Twp.	1971	282-361	361	752	Kmr
31-11-659	John G. Baleter	1960	-	200	-	Km
31-11-671	Child Care Center	1967	216-236	294	100	Kmr
31-11-678	Woodbury Asso.Market Co.	1966	201-221	221	400	"
31-11-744	Colonial Pipeline Co.	1963	127-137	137	150	Ket
31-11-751	Twp. of West Deptford	1973	388-345	480	1012	Kmr
31-11-754	"	1972	392-412	412	151	"
31-11-759	Greenfield Water Co.	1963	241-288	336	608	"
31-11-818	Lynn Const. Co.	1959	158-169	172	100	"
31-11-822	City of Woodbury	1960	405-457	462	1016	"
31-11-824	John Johanson	1953	-	148	-	"
31-11-857	Deptford Twp.Mun.Util.Auth.	1956	252-273	400	503	"
31-11-913	Albert Boginsky	1958	-	152	-	Ket

J. Geodetic Control Survey monuments described in Index Maps 48,54

BLOCK #31-12 9/76

A. Camden, Runnemede

B. Delaware River-Big Timber Creek, Coopers Creek, Newton Creek

C. 1. Audubon - Non-recording temperature and precipitation gauges

2. Map No.	Location	Period of Record
446	Cooper River at Kirkwood	1964-
447	North Branch Cooper River near Marlton	1964-
451	South Branch Newton Creek at Haddon Heights	1964-
452	South Branch Big Timber Creek at Blackwood	1964-
3. 334	Newton Creek at West Collingswood	1965-
336	South Branch Newton Creek at Mt.Ephriam	1965-
337	Big Timber Creek at Chews Landing	1965-
338	South Branch Big Timber Creek at Blackwood	1965-

Water Quality Standards: (explained in Atlas Sheet description) FW3

D. Kirkwood Sand (Tkw), Vincentown Sand (Tvt), Hornerstown Marl (Tht), Navesink Marl (Kns), Mount Laurel and Wenonah Sands (Kmw), Marshalltown Formation (Kmt), Englishtown Sand (Ket), Woodbury Clay (Kwb), Merchantville Formation (Kmr), Magothy and Raritan Formation (Kmr)

E. 1. Physiographic Province: Coastal Plain
Subdivision: Inner Plain, Outer Plain
Major Topographic Features: Clay and Marl Region, Pine Plains
Elevations (ft.above sea level): hills 140, valleys 0
Relief (ft.): 140

2. a. Normal Year: 44"
Dry Year: 35"
Wet Year: 51"

b. January: 33°F
July: 76°F

c. 249 days. Last killing frost: 4/20; first killing frost: 10/30

H. Whitman-Stafford House, Lindenwold (State owned)
Indian King Tavern, Haddonfield
Haddon Fortnightly, Haddonfield
Benjamin Clark House, Deptford

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
31-12-135	Imperial Gold & Silver Kid Co.	1948	140-170	170	250	Kmr
31-12-156	New Jersey Zinc Co.,#18	1958	144-191	201	708	"
31-12-167	" #33	1967	422-484	500	850	"
31-12-222	Green Valley Farms	1965	195-215	227	151	"
31-12-232	Haddon Ice & Coal Co.	1957	190-221	225	360	"
31-12-249	N. J. Water Co., #14	1954	506-598	606	1018	"
31-12-272	" #34	1967	288-377	390	1050	"
31-12-273	" #30	1965	224-275	279	811	"
31-12-281	" #15	1956	455-597	634	1100	"
31-12-281	" #1	1968	480-490	517	133	"
31-12-317	Borough of Haddonfield,#2	1956	206-246	254	1001	"
31-12-355	Tavistock Country Club	1968	219-246	246	300	"
31-12-414	Borough of Bellmawr	1966	380-557	580	1016	"
31-12-417	Miller International Co.	1963	250-260	263	150	"
31-12-428	Trap Rock Industries	1963	195-221	350	254	Ket
31-12-465	N. J. Water Co., #19	1958	297-339	340	1900	Kmr
31-12-499	RCA	1964	180-190	212	125	Ket
31-12-523	Weyerhauser Corp.	1969	243-273	285	243	Kmr
31-12-525	Owens-Corning Fiberglass Co., #2 Test	1964	563-618	685	900	"
31-12-526	#1 Test	1964	107-137	140	170	Ket
31-12-526	#3 Test	1964	-	515	500	Kmr
31-12-534	#1	1956	285-315	502	1045	"
31-12-534	#2	1946	290-320	344	1000	"
31-12-534	Laurel Springs Water Co.	1964	428-510	524	710	"
31-12-572	N. J. Water Co., #29	1965	612-712	722	1050	Kr
31-12-584	Owens-Corning Fiberglass Co.	1957	-	306	100	Kmr
31-12-646	Tracy Val Inc.	1972	294-303	303	100	"
31-12-652	Abbotts Dairies Inc.	1960	354-375	447	200	"
31-12-658	Laurel Springs Water Co.	1956	398-441	500	709	Kr
31-12-786	Gloucester Twp.Mun.Util.Auth.	1971	334-359	359	75	Kmr
31-12-938	Laurel Springs Water Co.,#13	1954	394-456	555	800	"
31-12-938	" #15	1964	395-473	481	650	"
31-12-974	Garden State Water Co., #1 Test	1970	457-467	514	75	"

J. Geodetic Control Survey monuments described in Index Maps 48,54; adjacent Index Maps 49,55

SUBJECT TO REVISION

WATER WITHDRAWAL POINTS AND NJGS CASE INDEX SITES WITHIN 5.0 MILES OF:

LATITUDE 395620
LONGITUDE 750615

DRAFT

SCALE: 1:63,360
(1 Inch = 1 Mile)

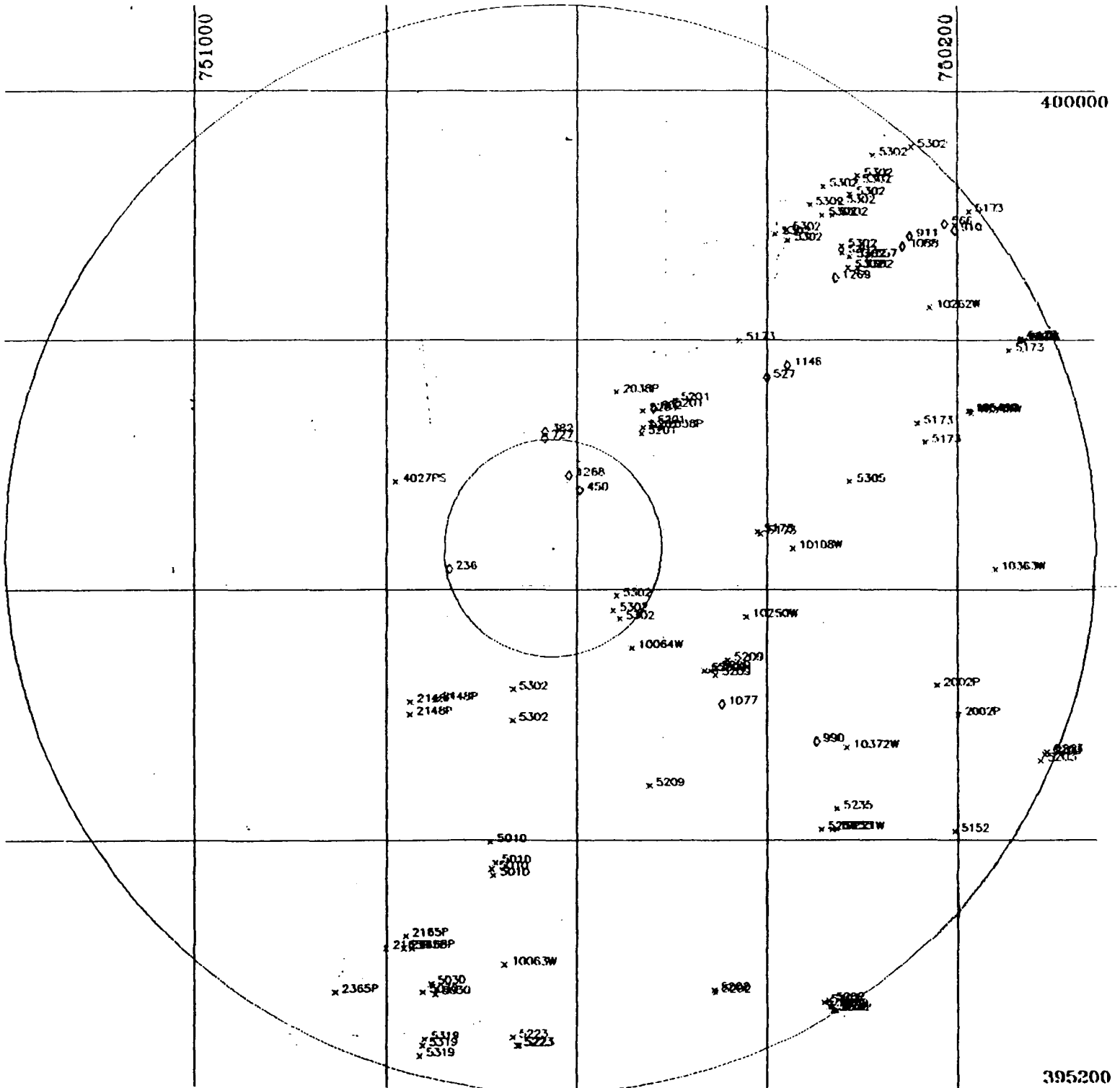
× WATER WITHDRAWAL POINTS
◊ NJGS CASE INDEX SITES
1 MILE AND 5 MILE RADII INDICATED

NJGS CASE INDEX DATA RETRIEVED FROM:
NEW JERSEY GEOLOGICAL SURVEY
ON 12/22/87

PLOT PRODUCED BY:
NJDEP
DIVISION OF WATER RESOURCES
BUREAU OF WATER ALLOCATION
CN-029
TRENTON, NJ 08625

DATE: 10/08/88

MAP 7



SUBJECT TO REVISION

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
10063W	GLOUCESTER CITY BD. OF ED.	3104482	1	395300	750645	F	3.9	07	14		GKMR		
10064W	OUR LADY OF LOURDES MED. CENT.	3104620	1	395532	750525	F	1.2	07	08	257	GKMR		250
10108W	CAMDEN CO VOC. & TECH. SCHOOLS	3105139	1	395620	750344	F	2.2	07	15	401	GKMR		
10221W	HADDON TOWNSHIP BOARD OF ED.	3104986	1	395405	750318	T	3.7	07	16	165	GKMR		100
10250W	BISHOP EUSTACE PREP SCHOOL	3117884	1	395547	750413	T	1.9	07	27	150	GKMR		200
10262W	SCHAEVITZ ENGINEERING	3103338	1	395816	750218	T	4.1	07	27		GKMR		
	SCHAEVITZ ENGINEERING	3103437	2	395816	750218	T	4.1	07	27		GKMR		
	SCHAEVITZ ENGINEERING	3103444	3	395816	750218	T	4.1	07	27		GKMR		
10363W	CHERRY HILL INN	UNKNOWN	1	395610	750136	T	4.1	07	16	179	GKMR		400
10372W	MORGAN BROTHERS, INC.	3105138	1	395444	750309	F	3.3	07	16	451	GKMR		300
10549W	SYCAMORE RIDGE APARTMENTS	3127629	3	395725	750151	T	4.0	07	27		GKMR		45
2002P	GARDEN STATE RACE TRACK, INC.	5100094	1	395514	750213	T	3.7	07	09	154	GKR		300
	GARDEN STATE RACE TRACK, INC.	5100095	2	395500	750200	M	4.0	07	09	150	GKR		400
2038P	H. KOHNSTAMM & CO.	3119275	7	395735	750535		1.5	07	08	194	GKR		150
	H. KOHNSTAMM & CO.	3105064	6	395718	750507		1.5	07	08	184	GKR		200
2148P	MACANDREWS & FORBES CO.	3102290	1	395507	750729		1.8	07	08	103	GKMR		200
	MACANDREWS & FORBES CO.	5100035	2	395500	750745		2.0	07		99	GKMR		350
	MACANDREWS & FORBES CO.	3123580	3	395500	750745	F	2.0	07	08	140	GKMR		350
	MACANDREWS & FORBES CO.	DELAWARE RIVER		395506	750745	U	1.9	07	08		SDDEL		
2165P	G & W NATURAL RESOURCES GROUP	3106642	1R	395314	750748	F	3.8	07	14	261	GKR		600
	G & W NATURAL RESOURCES GROUP	3103402	4	395308	750744	F	3.9	07	14	281	GKR		600
	G & W NATURAL RESOURCES GROUP	3104454	5	395308	750749	F	3.9	07	14	274	GKR		600
	G & W NATURAL RESOURCES GROUP	BIG TIMBER CR.		395308	750800	U	4.0	07	14		SDBIG		
2365P	SEE GLOUCESTER COMPANY, L.P.	DELAWARE RIVER	RM 95.2	395247	750832	T	4.5	20	15		SDDEL		
4027PS	GENERAL ELECTRIC AEROSPACE	DELAWARE RIVER		395652	750754	T	1.6	07	08		SDDEL		
5010	GLOUCESTER CITY	3104306	WELL #40	395349	750651		2.9	07	14	262	GKMR		1000
	GLOUCESTER CITY	3104903	WELL #41	395359	750654		2.8	07	14	269	GKMR		1000
	GLOUCESTER CITY	3105242	WELL #42	395343	750652		3.1	07	14	306	GKMR		1000
	GLOUCESTER CITY	3118822	WELL #43	395346	750653		3.0	07	14	260	GKMR		1000
5030	BROOKLAWN BOROUGH WATER DEPT.	3104325	1	395251	750732	F	4.2	07	07	327	GKMR		350
	BROOKLAWN BOROUGH WATER DEPT.	3114471	3	395246	750729	F	4.2	07	07		GKMR		350
	BROOKLAWN BOROUGH WATER DEPT.	3119765	4	395247	750737	F	4.2	07	07	293	GKMR		350
5152	HADDONFIELD BOROUGH	3105108	6	395404	750202		4.5	07	17	372	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105641	BROWNING1A	395627	750404		1.9	07	24	152	GKMR		875
	MERCHANTVILLE-PENNSAUKEN WATER	3101417	DEL GARD 2	395800	750417		2.6	07	27	147	GKMR		700
	MERCHANTVILLE-PENNSAUKEN WATER	3102915	MARION 1	395720	750225		3.5	07	27	279	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104641	MARION 2	395711	750220		3.6	07	27	262	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104836	BROWNING3A	395628	750406		1.9	07	27	140	GKMR		900
	MERCHANTVILLE-PENNSAUKEN WATER	3105110	NATL.HWY 1	395902	750153		4.9	07	27	231	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100010	PARK AVE 1	395800	750117		4.7	07	27	274	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	5100064	PARK AVE 2	395800	750118		4.7	07	27	262	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3103534	PARK AVE 3	395801	750119		4.7	07	27	277	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100011	PARK AVE 5	395800	750120		4.7	07	27	290	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	3114564	PARK AVE 6	395755	750127		4.6	07	27	270	GKMR		1000
5201	NEW JERSEY-AMERICAN WATER CO.	3103456	50	395726	750518		1.5	07	08	170	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3104780	51	395720	750513		1.5	07	08	192	GKMR		1300
	NEW JERSEY-AMERICAN WATER CO.	3104847	52	395715	750519		1.3	07	08	198	GKMR		1050
	NEW JERSEY-AMERICAN WATER CO.	3118947	53	395728	750502		1.7	07	08	194	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3118944	54	395731	750458		1.8	07	08	195	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3120270	55	395718	750518		1.4	07	08	176	GKMR		1050
5202	NEW JERSEY-AMERICAN WATER CO.	5100008	HADDON 11	395243	750320		4.9	07	18	272	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	5100009	HADDON 12	395240	750318		4.9	07	18	267	GKMR		700

Page 2 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 395630 LAT. 750615 LON. (IN ORDER BY PERMIT NUMBER) - 10/08/93

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
	NEW JERSEY-AMERICAN WATER CO.	3104798	HADDON 30	395238	750316		5.0	07	18	279	GMR		305
	NEW JERSEY-AMERICAN WATER CO.	3103308	EGBERT 16	395248	750433		4.3	07	18	190	GMR		700
	NEW JERSEY-AMERICAN WATER CO.	3105054	EGBERT 25	395247	750432		4.3	07	18	484	GMR		700
5203	NEW JERSEY-AMERICAN WATER CO.	3100684	ELLIS 13	395442	750103		4.9	07	09	527	GMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3103305	EMMUS 16	395441	750104		4.9	07	09	220	GMR		1180
	NEW JERSEY-AMERICAN WATER CO.	3104098	ELLIS 23	395438	750107		4.9	07	09	378	GMR		1200
5207	COLLINGSWOOD BOROUGH	3104053	3R	395519	750432		1.9	07	12	281	GMR		700
	COLLINGSWOOD BOROUGH	3104054	3R	395522	750432		1.9	07	12	290	GMR		800
	COLLINGSWOOD BOROUGH	5100030	4	395521	750435		1.8	07	12	304	GMR		870
	COLLINGSWOOD BOROUGH	3100079	5	395521	750439		1.8	07	12	311	GMR		650
	COLLINGSWOOD BOROUGH	5100031	6	395526	750424		1.9	07	12	281	GMR		1000
	COLLINGSWOOD BOROUGH	3104799	7	395521	750439		1.8	07	12	312	GMR		1000
	COLLINGSWOOD BOROUGH	3104797	8	395426	750514		2.4	07	12	318	GMR		1000
5223	BELLMAWR BOROUGH	5100032	1	395221	750636		4.6	07	04	164	GMR		500
	BELLMAWR BOROUGH	3102687	3	395221	750637		4.6	07	04	359	GMR		800
	BELLMAWR BOROUGH	3119218	6	395225	750640		4.5	07	04	386	GMR		1000
5225	HADDON TOWNSHIP WATER DEPT.	3105243	1R	395405	750315		3.7	07	16	481	GMR		870
	HADDON TOWNSHIP WATER DEPT.	3100432	2	395415	750315		3.6	07	16	470	GMR		1300
	HADDON TOWNSHIP WATER DEPT.	3102146	3	395405	750325		3.6	07	16	469	GMR		800
	HADDON TOWNSHIP WATER DEPT.	3104855	4	395405	750325		3.6	07	16	448	GMR		1000
5302	CAMDEN CITY, WATER DIVISION	3100945	MORRIS 3	395933	750229		4.9	07	27	107	GMR		1800
	CAMDEN CITY, WATER DIVISION	3104252	MORRIS 4	395929	750253		4.7	07	27	134	GMR		1600
	CAMDEN CITY, WATER DIVISION	5100051	MORRIS 6	395900	750318		4.0	07	27	138	GMR		1700
	CAMDEN CITY, WATER DIVISION	5100052	MORRIS 7	395916	750303		4.4	07	27	125	GMR		1680
	CAMDEN CITY, WATER DIVISION	3100944	MORRIS 8	395910	750307		4.3	07	27	128	GMR		1670
	CAMDEN CITY, WATER DIVISION	3104251	MORRIS 10	395919	750302		4.4	07	27	118	GMR		1400
	CAMDEN CITY, WATER DIVISION	5100076	MORRIS 9	395906	750313		4.1	07	27	148	GMR		1670
	CAMDEN CITY, WATER DIVISION	3116814	MORRIS 12	395914	750324		4.2	07	27	122	GMR		2030
	CAMDEN CITY, WATER DIVISION	3115745	MORRIS 11	395900	750325		3.9	07	27	149	GMR		2030
	CAMDEN CITY, WATER DIVISION	3116813	MORRIS 13	395905	750333		3.9	07	27	135	GMR		2060
	CAMDEN CITY, WATER DIVISION	5100053	DELAIR 1	395848	750347		3.6	07	27	141	GMR		1680
	CAMDEN CITY, WATER DIVISION	5100054	DELAIR 2	395851	750355		3.5	07	27	146	GMR		1830
	CAMDEN CITY, WATER DIVISION	5100055	DELAIR 3	395853	750348		3.6	07	27	135	GMR		1830
	CAMDEN CITY, WATER DIVISION	5100056	PUCHACK 1	395845	750312		3.8	07	27	141	GMR		1500
	CAMDEN CITY, WATER DIVISION	5100057	PUCHACK 2	395842	750312		3.8	07	27	169	GMR		1000
	CAMDEN CITY, WATER DIVISION	5100058	PUCHACK 3	395840	750307		3.8	07	27	176	GMR		1280
	CAMDEN CITY, WATER DIVISION	5100059	PUCHACK 5	395835	750308		3.8	07	27	186	GMR		1324
	CAMDEN CITY, WATER DIVISION	3108526A	PUCHACK 7	395835	750302		3.8	07	27	180	GMR		2260
	CAMDEN CITY, WATER DIVISION	5100060	CITY 7	395457	750640		1.6	07	08	163	GMR		1500
	CAMDEN CITY, WATER DIVISION	5100061	CITY 11	395512	750640		1.4	07	08	159	GMR		1010
	CAMDEN CITY, WATER DIVISION	3100904	CITY 13	395557	750535		0.7	07	08	230	GMR		1200
	CAMDEN CITY, WATER DIVISION	3101250	CITY 17	395546	750533		0.9	07	08	270	GMR		1500
	CAMDEN CITY, WATER DIVISION	3109574	CITY 18	395550	750537		0.8	07	08	185	GMR		1200
	CAMDEN CITY, WATER DIVISION	3104649	CITY 5	395457	750640		1.6	07	08	171	GMR		1100
5305	MERCHANTVILLE-PENNSAUKEN	3104642	WOODBINE 1	395652	750307		2.8	07	24	288	GMR		1000
	MERCHANTVILLE-PENNSAUKEN	3114563	WOODBINE 2	395652	750307		2.8	07	24	227	GMR		1000
5319	WESTVILLE BOROUGH	3103418	4	395221	750737	F	4.7	15	21	313	GMR		750
	WESTVILLE BOROUGH	3105689	5	395216	750739	F	4.8	15	21		GMR		1000
	WESTVILLE BOROUGH	3117923	6	395224	750736	F	4.7	15	21	317	GMR		1000

Number of Observations: 104

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	ULACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
2165P	SCS GLOUCESTER COMPANY, L.P.	DELAWARE RIVER	RM 95.2	395247	750832	T	4.5	20	15		SDDEL		
2165P	G & W NATURAL RESOURCES GROUP	BIG TIMBER CR.		395308	750800	U	4.0	07	14		SDBIG		
4027PS	GENERAL ELECTRIC AEROSPACE	DELAWARE RIVER		395652	750754	T	1.6	07	08		SDDEL		
2165P	G & W NATURAL RESOURCES GROUP	3104454	5	395308	750749	F	3.9	07	14	274	GWR		600
2165P	G & W NATURAL RESOURCES GROUP	3106642	1R	395314	750748	F	3.8	07	14	261	GWR		600
2148P	MACANDREWS & FORBES CO.	5100035	2	395500	750745		2.0	07		99	GWMR		350
2148P	MACANDREWS & FORBES CO.	3123580	3	395500	750745	F	2.0	07	08	140	GWMR		350
2148P	MACANDREWS & FORBES CO.	DELAWARE RIVER		395506	750745	U	1.9	07	08		SDDEL		
2165P	G & W NATURAL RESOURCES GROUP	3103402	4	395308	750744	F	3.9	07	14	281	GWR		600
5319	WESTVILLE BOROUGH	3105689	5	395216	750739	F	4.8	15	21		GWMR		1000
5070	BROOKLAWN BOROUGH WATER DEPT.	3119765	4	395247	750737	F	4.2	07	07	293	GWMR		350
5319	WESTVILLE BOROUGH	3103418	4	395221	750737	F	4.7	15	21	313	GWMR		750
5319	WESTVILLE BOROUGH	3117923	6	395224	750736	F	4.7	15	21	317	GWMR		1000
5070	BROOKLAWN BOROUGH WATER DEPT.	3104325	1	395251	750732	F	4.2	07	07	327	GWMR		350
2148P	MACANDREWS & FORBES CO.	3100290	1	395507	750729		1.8	07	08	103	GWMR		300
5070	BROOKLAWN BOROUGH WATER DEPT.	3114471	3	395246	750729	F	4.2	07	07		GWMR		350
5010	GLOUCESTER CITY	3104903	WELL #41	395359	750654		2.8	07	14	269	GWMR		1000
5010	GLOUCESTER CITY	3118822	WELL #43	395346	750653		3.0	07	14	260	GWMR		1000
5010	GLOUCESTER CITY	3105242	WELL #42	395343	750652		3.1	07	14	306	GWMR		1000
5010	GLOUCESTER CITY	3104306	WELL #40	395349	750651		2.9	07	14	262	GWMR		1000
10063W	GLOUCESTER CITY BD. OF ED.	3104482	1	395300	750645	F	3.9	07	14		GWMR		
5223	BELLMAWR BOROUGH	3119218	6	395225	750640		4.5	07	04	386	GWMR		1000
5302	CAMDEN CITY, WATER DIVISION	5100060	CITY 7	395457	750640		1.6	07	08	163	GWMR		1500
5302	CAMDEN CITY, WATER DIVISION	5100061	CITY 11	395512	750640		1.4	07	08	159	GWMR		1010
5302	CAMDEN CITY, WATER DIVISION	3104649	CITY 5	395457	750640		1.6	07	08	171	GWMR		1100
5223	BELLMAWR BOROUGH	3102687	3	395221	750637		4.6	07	04	359	GWMR		800
5223	BELLMAWR BOROUGH	5100032	1	395221	750636		4.6	07	04	164	GWMR		500
5302	CAMDEN CITY, WATER DIVISION	3109574	CITY 18	395550	750537		0.8	07	08	185	GWMR		1200
2038P	H. KOHNSTAMM & CO.	3119275	7	395735	750535		1.5	07	08	194	GWR		180
5302	CAMDEN CITY, WATER DIVISION	3100904	CITY 13	395557	750535		0.7	07	08	230	GWMR		1200
5302	CAMDEN CITY, WATER DIVISION	3101250	CITY 17	395546	750533		0.9	07	08	270	GWMR		1500
10064W	OUR LADY OF LOURDES MED. CENT.	3104620	1	395532	750525	F	1.2	07	08	257	GWMR		250
5201	NEW JERSEY-AMERICAN WATER CO.	3104847	52	395715	750519		1.3	07	08	198	GWMR		1050
5201	NEW JERSEY-AMERICAN WATER CO.	3103456	50	395726	750518		1.5	07	08	170	GWMR		700
5201	NEW JERSEY-AMERICAN WATER CO.	3120270	55	395718	750518		1.4	07	08	176	GWMR		1050
5209	COLLINGSWOOD BOROUGH	3104797	8	395426	750514		2.4	07	12	318	GWMR		1000
5201	NEW JERSEY-AMERICAN WATER CO.	3104780	51	395720	750513		1.5	07	08	192	GWMR		1300
2038P	H. KOHNSTAMM & CO.	3105054	6	395718	750507		1.5	07	08	184	GWR		200
5201	NEW JERSEY-AMERICAN WATER CO.	3118947	53	395728	750502		1.7	07	08	194	GWMR		1000
5201	NEW JERSEY-AMERICAN WATER CO.	3118944	54	395731	750458		1.8	07	08	195	GWMR		1000
5209	COLLINGSWOOD BOROUGH	3100079	5	395521	750439		1.8	07	12	311	GWMR		650
5209	COLLINGSWOOD BOROUGH	3104799	7	395521	750439		1.8	07	12	312	GWMR		1000
5209	COLLINGSWOOD BOROUGH	5100030	4	395521	750435		1.8	07	12	304	GWMR		870
5202	NEW JERSEY-AMERICAN WATER CO.	3103308	EGBERT 18	395248	750433		4.3	07	18	190	GWMR		700
5202	NEW JERSEY-AMERICAN WATER CO.	3105054	EGBERT 35	395247	750432		4.3	07	18	484	GWMR		700
5209	COLLINGSWOOD BOROUGH	3104053	2R	395519	750432		1.9	07	12	281	GWMR		700
5209	COLLINGSWOOD BOROUGH	3104054	3R	395522	750432		1.9	07	12	290	GWMR		800
5209	COLLINGSWOOD BOROUGH	5100031	6	395526	750424		1.9	07	12	281	GWMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3101417	DEL GARD 2	395800	750417		2.6	07	27	147	GWMR		700
10250W	BISHOP EUSTACE PREP SCHOOL	3117884	1	395547	750413	T	1.9	07	27	150	GWMR		200
5173	MERCHANTVILLE-PENNSAUKEN WATER	3104836	BROWNING2A	395628	750406		1.9	07	27	140	GWMR		900
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105641	BROWNING1A	395627	750404		1.9	07	24	152	GWMR		875
5302	CAMDEN CITY, WATER DIVISION	5100054	DELAIR 2	395851	750355		3.5	07	27	146	GWMR		1830

Page 2 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 395630 LAT. 750615 LON. (IN ORDER BY DECREASING LONGITUDE) - 10/05/88

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLADJ	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
5302	CAMDEN CITY, WATER DIVISION	3116813	MORRIS 13	395905	750333		3.9	07	27	135	GWR		2060
5235	HADDON TOWNSHIP WATER DEPT.	3102146	3	395405	750325		3.6	07	16	467	GWR		800
5235	HADDON TOWNSHIP WATER DEPT.	3104855	4	395405	750325		3.6	07	16	448	GWR		1000
5302	CAMDEN CITY, WATER DIVISION	3115745	MORRIS 11	395900	750325		3.9	07	27	149	GWR		2070
5302	CAMDEN CITY, WATER DIVISION	3116814	MORRIS 12	395914	750324		4.2	07	27	122	GWR		2030
5300	NEW JERSEY-AMERICAN WATER CO.	3101124	HADDON 14	395242	750323		4.9	07	18	598	GWR		805
5300	NEW JERSEY-AMERICAN WATER CO.	5100008	HADDON 11	395243	750320		4.9	07	18	272	GWR		700
5300	NEW JERSEY-AMERICAN WATER CO.	3103375	HADDON 20	395240	750320		4.9	07	18	267	GWR		100
10221W	HADDON TOWNSHIP BOARD OF ED.	3104986	1	395405	750318	T	3.7	07	16	165	GWR		100
5300	NEW JERSEY-AMERICAN WATER CO.	5100009	HADDON 12	395240	750318		4.9	07	18	267	GWR		700
5300	NEW JERSEY-AMERICAN WATER CO.	3104798	HADDON 30	395238	750318		5.0	07	18	279	GWR		805
5302	CAMDEN CITY, WATER DIVISION	5100051	MORRIS 6	395900	750318		4.0	07	27	138	GWR		1700
5300	NEW JERSEY-AMERICAN WATER CO.	3102434	HADDON 15	395238	750316		5.0	07	18	557	GWR		805
5235	HADDON TOWNSHIP WATER DEPT.	3105243	1R	395405	750315		3.7	07	16	434	GWR		870
5235	HADDON TOWNSHIP WATER DEPT.	3100432	2	395415	750315		3.6	07	16	470	GWR		1700
5302	CAMDEN CITY, WATER DIVISION	5100076	MORRIS 9	395906	750313		4.1	07	27	148	GWR		1670
5302	CAMDEN CITY, WATER DIVISION	5100056	PUCHACK 1	395845	750312		3.8	07	27	141	GWR		1500
5302	CAMDEN CITY, WATER DIVISION	5100057	PUCHACK 2	395842	750312		3.8	07	27	169	GWR		1000
10372W	MORGAN BROTHERS, INC.	3105138	1	395444	750309	F	3.3	07	16	451	GWR		300
5302	CAMDEN CITY, WATER DIVISION	5100059	PUCHACK 5	395835	750308		3.8	07	27	136	GWR		1324
5302	CAMDEN CITY, WATER DIVISION	3100944	MORRIS 8	395910	750307		4.3	07	27	139	GWR		1670
5302	CAMDEN CITY, WATER DIVISION	5100058	PUCHACK 3	395840	750307		3.8	07	27	176	GWR		1280
5305	MERCHANTVILLE-PENNSAUKEN	3104642	WOODBINE 1	395652	750307		2.8	07	24	288	GWR		1000
5305	MERCHANTVILLE-PENNSAUKEN	3114563	WOODBINE 2	395652	750307		2.8	07	24	227	GWR		1000
5302	CAMDEN CITY, WATER DIVISION	5100052	MORRIS 7	395916	750303		4.4	07	27	125	GWR		1620
5302	CAMDEN CITY, WATER DIVISION	3104251	MORRIS 10	395919	750302		4.4	07	27	118	GWR		1400
5302	CAMDEN CITY, WATER DIVISION	3108526A	PUCHACK 7	395835	750302		3.8	07	27	180	GWR		2260
5302	CAMDEN CITY, WATER DIVISION	3104252	MORRIS 4	395929	750253		4.7	07	27	134	GWR		1600
5302	CAMDEN CITY, WATER DIVISION	3100945	MORRIS 3	395933	750229		4.9	07	27	107	GWR		1800
5173	MERCHANTVILLE-PENNSAUKEN WATER	3102915	MARION 1	395720	750225		3.5	07	27	279	GWR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3104641	MARION 2	395711	750220		3.6	07	27	262	GWR		1000
10262W	SCHAEVITZ ENGINEERING	3103338	1	395816	750218	T	4.1	07	27		GWR		
10262W	SCHAEVITZ ENGINEERING	3103437	2	395816	750218	T	4.1	07	27		GWR		
10262W	SCHAEVITZ ENGINEERING	3103444	3	395816	750218	T	4.1	07	27		GWR		
2002P	GARDEN STATE RACE TRACK, INC.	5100094	1	395514	750213	T	3.7	07	09	154	GWR		300
5152	HADDONFIELD BOROUGH	3105108	6	395404	750202		4.5	07	17	372	GWR		1000
2002P	GARDEN STATE RACE TRACK, INC.	5100095	2	395500	750200	M	4.0	07	09	150	GWR		400
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105110	NATL HWY 1	395902	750153		4.9	07	27	231	GWR		1000
10549W	SYCAMORE RIDGE APARTMENTS	3127629	3	395725	750151	T	4.0	07	27		GWR		45
10363W	CHERRY HILL INN	UNKNOWN	1	395610	750136	T	4.1	07	16	179	GWR		400
5173	MERCHANTVILLE-PENNSAUKEN WATER	3114564	PARK AVE 6	395755	750127		4.6	07	27	270	GWR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3100011	PARK AVE 5	395800	750120		4.7	07	27	290	GWR		1005
5173	MERCHANTVILLE-PENNSAUKEN WATER	3103534	PARK AVE 3	395801	750119		4.7	07	27	277	GWR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	5100064	PARK AVE 2	395800	750118		4.7	07	27	262	GWR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3100010	PARK AVE 1	395800	750117		4.7	07	27	274	GWR		1005
5203	NEW JERSEY-AMERICAN WATER CO.	3104098	ELLIS 23	395438	750107		4.9	07	09	378	GWR		1200
5203	NEW JERSEY-AMERICAN WATER CO.	3103305	ELLIS 16	395441	750104		4.9	07	09	220	GWR		1180
5203	NEW JERSEY-AMERICAN WATER CO.	3100684	ELLIS 13	395442	750103		4.9	07	09	527	GWR		1000

Number of Observations: 104

Page 1 of NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 395620 LAT. 750615 LON. AS OF 12/22/87 (IN ORDER BY SITE NUMBER) - 10/06/88

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
236	MONK'S AMOCO, CAMDEN CO.	395610	750720	1.0	51	103	2080	5	
382	CAMDEN MUNICIPAL WELLS, CAMDEN CITY, CAMDEN CO.	395716	750630	1.1	00	0102	2080	1	
450	CONRAIL, PAVONIA YARD, CAMDEN, CAMDEN CO.	395648	750558	0.6	53	103	160	1	
527	SGL MODERN HARD CHROME SERVICE, PENNSAUKEN, CAMDEN CO.	395742	750400	2.5	39	2080	0	9	
566	SWOPE OIL AND CHEMICAL, PENNSAUKEN, CAMDEN CO.	395856	750208	4.7	00	2080	0	1	E
657	CAMDEN'S PUCHACK WELL FIELD, CAMDEN CO.	395840	750255	4.0	39	2080	0	1	
727	HARRISON AVE. LANDFILL, CAMDEN, CAMDEN CO.	395713	750620	1.0	0	2080	0	9	
802	LANGSTON DIV-MOLINS MACHINE CO., CAMDEN, CAMDEN CO.	395727	750511	1.6	00	2080		1	B
910	MERCHANTVILLE/PENNSAUKEN WATER COMMISION, PENNSAUKEN, CAMDEN CO.	395853	750202	4.7	00	0102	2080	1	C
911	PENJAR ANODIZING, PENNSAUKEN, CAMDEN CO.	395850	750230	4.4	00	2080	0	1	C
990	WESTMONT MOBIL, WESTMONT, CAMDEN CO.	395447	750328	2.0	0	0	0	3	
1077	BOB'S EXTRA STATION, COLLINGSWOOD, CAMDEN CO	395505	750428	2.1	51	2080	0	F	
1088	GARDEN STATE MOTORS, PENNSAUKEN, CAMDEN CO.	395845	750234	4.3	53	2080	0	1	B
1148	SHELL SERVICE STATION, RT 130 & BORWING RD, PENNSAUKEN, CAMDEN CO.	395748	750347	2.7	51			3	
1268	ADVANCED CHEMICAL TECHNOLOGY, CAMDEN CITY, CAMDEN CO.	395655	750605	0.7	68	0102	2080	1	B
1269	ADVANCED PROCESS SUPPLY, PENNSAUKEN, CAMDEN CO.	395830	750316	3.6	00	2080		1	B

Number of Observations: 16

 NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 395620 LAT. 750615 LON. AS OF 12/22/87 (IN ORDER BY DECREASING LONGITUDE) - 10/08/88

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
236	MONK'S AMOCO, CAMDEN CO.	395610	750720	1.0	51	103	2080	5	
382	CAMDEN MUNICIPAL WELLS, CAMDEN CITY, CAMDEN CO.	395716	750620	1.1	00	0102	2060	1	
727	HARRISON AVE. LANDFILL, CAMDEN, CAMDEN CO.	395713	750620	1.0	0	2080	0	9	
1268	ADVANCED CHEMICAL TECHNOLOGY, CAMDEN CITY, CAMDEN CO.	395655	750605	0.7	68	0102	2080	1	B
450	CONRAIL, PAVONIA YARD, CAMDEN, CAMDEN CO.	395648	750558	0.6	53	103	160	1	
802	LANGSTON DIV-MOLING MACHINE CO., CAMDEN, CAMDEN CO.	395727	750511	1.6	00	2030		1	B
1077	BOB'S EXTRA STATION, COLLINGSWOOD, CAMDEN CO	395505	750426	2.1	51	2080	0	F	
527	SOL MODERN HARD CHROME SERVICE, PENNSAUKEN, CAMDEN CO.	395742	750400	2.5	39	2080	0	9	
1148	SHELL SERVICE STATION, RT 130 & BORWING RD, PENNSAUKEN, CAMDEN CO.	395748	750347	2.7	51			3	
990	WESTMONT MOBIL, WESTMONT, CAMDEN CO.	395447	750328	3.0	0	0	0	3	
1269	ADVANCED PROCESS SUPPLY, PENNSAUKEN, CAMDEN CO.	395830	750316	3.6	00	2090		1	B
657	CAMDEN'S PUCHACK WELL FIELD, CAMDEN CO.	395840	750255	4.0	39	2080	0	1	
1078	CAMDEN STATE MOTORS, PENNSAUKEN, CAMDEN CO.	395845	750224	4.3	53	2080	0	1	B
911	PENLAR ANODIZING, PENNSAUKEN, CAMDEN CO.	395850	750230	4.4	00	2080	0	1	C
526	SUNOCO OIL AND CHEMICAL, PENNSAUKEN, CAMDEN CO.	395856	750208	4.7	00	2080	0	1	E
910	MERCHANTVILLE/PENNSAUKEN WATER COMMISION, PENNSAUKEN, CAMDEN CO.	395852	750202	4.7	00	0102	2060	1	C

Number of Observations: 16

MAP 7

PLANT CONTACT

AST INS	BY
2/22/83	046
9/09/87	046
3/06/87	042
3/06/87	042
3/06/87	042
3/06/87	042
3/06/87	042
3/06/87	042
3/06/87	042
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
2/22/83	046
3/06/87	042
2/22/83	046
2/22/83	046
3/06/87	042
2/22/83	046
2/22/83	046
2/22/83	046

VEMINSLS-1 09/15/88
23:06:09

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
STACK LOG LISTING

PLANT ID	COUNTY	MUNICIPALITY	BUSINESS NAME	PLANT NAME
50012	CAM	CAMDEN CITY	MONSANTO COMPANY	

STACK	CERT	COND	STATUS	EXP. DAT	COMPANY DESIGNATION
000			ZERO		MISCELLANEOUS INSPECTIONS
001			DELETE		#4 & #5 STOVE HOUSES TO BAGHOUSE
002			DELETE		#3 STOVE HOUSE TO BAGHOUSE
003			DELETE		MOLD COAT DRYER
004	078721		PERM	12/19/92	MOLD COAT CALCINER
005	034098		PERM	10/05/92	DUMP BOOTH & CALCINER FD
006	012232		PERM	06/11/89	ACM MILL
007			DELETE		BAGGING DUST COLLECTOR
008	034099		PERM	10/05/92	BLENDER & DISCHARGE CHUT
009	006680		PERM	10/04/92	DUMP & DRUM D C
010	033227		PERM	10/04/92	PHOSCHEK ACE MILL
011	009831		PERM	12/13/93	BLDG 27 MICROPULSAIRE D C
012	009942		PERM	12/13/93	THERMAL OXIDIZER
013			DELETE		BOILER NO1 ERIE CITY
014			DELETE		LX83 STORAGE TANK
015			DELETE		STORAGE TANK #1
016			DELETE		STORAGE TANK #2
017			DELETE		STORAGE TANK 3A
018			DELETE		LX830 STORAGE TANK 3B
019			DELETE		STORAGE TANK 3A
020			DELETE		STORAGE TANK 3B
021			DELETE		STORAGE TANK 5A
022			DELETE		STORAGE TANK 5B
023	045172		PERM	02/27/91	PHOS CHECK P30 EMERGENCY VENT
024			DELETE		#1C STORAGE TANK
025			DELETE		STORAGE TANK 2C EMPTY
026			DELETE		BONE ASH TANK #4 OIL
027			DELETE		ERIE WASH TANK #6 OIL
028			DELETE		BOILER SMITH
029			DELETE		BOILER COLUMBIA

TOTAL STACKS FOR REGIONAL OFFICE 3 29

TOTAL STACKS FOR THE COUNTY OF CAMDEN 29

**** DENOTES UNDEFINED STATUS

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOLID WASTE ADMINISTRATION
TRENTON, 08625

BEATRICE S. TYLUTKI
DIRECTOR

May 19, 1978

Mr. John T. Nolan
Production Supervisor
Monsanto Industrial Chemical Co.
1500 Pine Street
Camden, New Jersey 08103

Re: Disposal of Lampblack

Dear Mr. Nolan:

Pursuant to your request I have reviewed submitted data concerning physiological effects of carbonblack (similar to Lampblack). Although certain polycyclic aromatic hydrocarbons may be adsorbed on Lampblack, the data of Nau et al clearly suggests that prolonged exposure to carbon black (C3H mice; monkeys) through ingestion, dermal application and inhalation produced no significant physiological effects. Further said material appeard to be substantially wetted, would probably not create dust problems, and would be quickly covered in a landfill site. Therefore, Lampblack residues are not considered special waste and do not require a Manifest.

Should you have any additional questions regarding this matter, please contact me directly.

Very truly yours,

Ronald J. Buchanan, Ph.D.
Chief
Bureau of Hazardous & Chemical Wastes

RJB:hjg

ATT. B

EPA

INITIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

ed by HQ Rich

GENERAL INSTRUCTIONS. Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency, ~~Site Tracking System~~; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET (or other identifier)		
Monsanto (plant ID# 50012	1500 Pine Street		
C. CITY	D. STATE	E. ZIP CODE	F. COUNTY NAME
Camden	N.J.	08013	Camden

G. SITE OPERATOR INFORMATION

1. NAME		2. TELEPHONE NUMBER	
D.C. Dieterich Plane Manager		(609) 963-0243	
3. STREET	4. CITY	5. STATE	6. ZIP CODE
1500 Pine Street	Camden	N.J.	08103

H. REALTY OWNER INFORMATION (if different from operator of site)

1. NAME		2. TELEPHONE NUMBER	
3. CITY		4. STATE	5. ZIP CODE

I. SITE DESCRIPTION

25 Acre, Industrial Chemical

J. TYPE OF OWNERSHIP

[ ] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [ ] 4. MUNICIPAL [X] 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last) N/A

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.)	B. APPARENT SERIOUSNESS OF PROBLEM
	[ ] 1. HIGH [ ] 2. MEDIUM [ ] 3. LOW [ ] 4. NONE

C. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE (mo., day, & yr.)
Wayne Howitz Thomas Brady	(609)292-9368	3/7/80

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME	2. TITLE	
Wayne Howitz Thomas Brady	Env. Spec. & Principal Tech.	
3. ORGANIZATION		4. TELEPHONE NO. (area code & no.)
N.J. DEP Toxic & Hazardous Substances		(609)292-9368

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, resident(s))

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
D.C. Dieterich	Plant Manager	1500 Pine Street, Camden, N.J.

ATT. E

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

PHOTOS

1. TYPE OF PHOTOS: None

[ ] a. GROUND [X] b. AERIAL

2. PHOTOS IN CUSTODY OF:

SITE MAPPED?

[ ] 1. YES, SPECIFY LOCATION OF MAPS: No

COORDINATES

1. LATITUDE (deg.-min.-sec.): 40°56' 13" (UTM 490.8)

2. LONGITUDE (deg.-min.-sec.): 75°06' 31" (UTM 442.0)

V. SITE INFORMATION

SITE STATUS

[X] 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[ ] 2. INACTIVE (Those sites which no longer receive waste.)

[ ] 3. OTHER (specify) (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code): 2816

C. AREA OF SITE (in acres): 75 Acres

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES (specify): Monsanto's Plant Operations

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
2. SHIP		2. SURFACE IMPOUNDMENT	X	2. INCINERATION	X	2. LANDFARM
3. BARGE		3. DRUM		3. VOLUME REDUCTION		3. OPEN DUMP
4. TRUCK	X	4. TANK ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
5. PIPELINE		5. TANK BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
6. OTHER (specify)		6. OTHER (specify)		6. BIOLOGICAL TREATMENT		6. INCINERATION
				7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
				8. SOLVENT RECOVERY	X	8. OTHER (specify): Scrub Settling pond.
				9. OTHER (specify)		

SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this form.

[ ] 1. STORAGE [ ] 2. INCINERATION [X] 3. LANDFILL [X] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

WASTE TYPE

[ ] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[X] 9. OTHER (specify)

WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes, N.J. SWA's Manifest

2. Estimate the amount (specify unit of measure) of waste by category. mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT 1,3380	AMOUNT 167,740	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE Pounds	UNIT OF MEASURE Pounds	UNIT OF MEASURE	UNIT OF MEASURE
(1) PAINT, LIQUIDS	(1) OILY WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	(1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify)	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		X (3) OTHER (specify)	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER (specify)			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	X (5) OTHER (specify) Lamp Black
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			X (11) OTHER (specify) Amines Lacramators Imines		

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[ ] A. HUMAN HEALTH HAZARDS

No.

Continue On Page 5

C

[ ] B. NON-WORKER INJURY/EXPOSURE

None

[ ] C. WORKER INJURY/EXPOSURE

None

[ ] D. CONTAMINATION OF WATER SUPPLY

[X] E. CONTAMINATION OF FOOD CHAIN

Very likely, the plant is adjacent to the Cooper River.

[X] F. CONTAMINATION OF GROUND WATER

[X] G. CONTAMINATION OF SURFACE WATER

Monsanto's scrub settling pond is adjacent to the Cooper River.

C

[ ] H. DAMAGE TO FLORA/FAUNA

N/A

[ ] I. FISH KILL

None reported to date.

[ ] J. CONTAMINATION OF AIR

N/A

[ ] K. NOTICEABLE ODORS

[X] L. CONTAMINATION OF SOIL

Scrub settling pond is not lined

[ ] M. PROPERTY DAMAGE

None

Continue On Page 7

C

VIII. HAZARD DESCRIPTION (continued)

N. FIRE OR EXPLOSION

No

O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

No

P. SEWER, STORM DRAIN PROBLEMS

No

Q. EROSION PROBLEMS

No

R. INADEQUATE SECURITY

No

S. INCOMPATIBLE WASTES

No

VIII. HAZARD DESCRIPTION (continued)

[ ] 7. MIDNIGHT DUMPING

[ ] 8. OTHER (specify)

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. RESIDENTIAL AREAS	Less than 100	Less than 100	Housing development is 2 blocks away	
2. COMMERCIAL OR INDUSTRIAL AREAS				
3. PUBLICLY TRAVELLED AREAS				
4. PUBLIC USE AREAS (parks, schools, etc.)	Junior High is Adjacent to Plant			

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
6'	S.W.	
D. POTENTIAL YIELD OF AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)	F. DIRECTION TO DRINKING WATER SUPPLY

G. TYPE OF DRINKING WATER SUPPLY

[ ] 1. NON-COMMUNITY (15 CONNECTIONS) [ ] 2. COMMUNITY (specify town) (15 CONNECTIONS) Camden City

[ ] 3. SURFACE WATER [ ] 4. WELL

Continue On Page 9

C

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')

I. RECEIVING WATER

1. NAME
Cooper River

[ ] 2. SEWERS [X] 3. STREAMS/RIVERS

[ ] 4. LAKES/RESERVOIRS [ ] 5. OTHER (specify)

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

TidalWater II (According to the DEP surface water quality standards.

XI. SOIL AND VEGETATION DATA

LOCATION OF SITE IS IN

[ ] A. KNOWN FAULT ZONE [ ] B. KARST ZONE [ ] C. 100 YEAR FLOOD PLAIN [X] D. WETLAND

[ ] E. A REGULATED FLOODWAY [ ] F. CRITICAL HABITAT [ ] G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
X	1. SAND				
	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

[ ] A. UNKNOWN [ ] B. VERY HIGH (100,000 to 1000 cm/sec.) [ ] C. HIGH (1000 to 10 cm/sec.)

X D. MODERATE (10 to .1 cm/sec.) [ ] E. LOW (.1 to .001 cm/sec.) [ ] F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

1. YES [ ] 2. NO 3. COMMENTS

H. DISCHARGE AREA

1. YES [ ] 2. NO 3. COMMENTS

I. SLOPE

1. ESTIMATE % OF SLOPE
10%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

J. OTHER GEOLOGICAL DATA

Continue On Reverse

XIV. PERMIT INFORMATION

List all applicable permits held by [illegible] and provide the related information.

A. PERMIT TYPE (e.g., RCRA State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

[ ] NONE [ ] YES (summarize in this space)

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

C

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: II

SITE NUMBER (to be assigned by HQ): NJD0010043

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: MONSANTO

B. STREET *(or other identifier)*: 1500 Pine Street

C. CITY: CAMDEN

D. STATE: NJ

E. ZIP CODE: 08013

F. COUNTY NAME: CAMDEN

G. OWNER/OPERATOR *(if known)*

1. NAME: D.C. Dieterich

2. TELEPHONE NUMBER: (609)-963-0243

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION

25 acre Industrial Chemical complex

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*: NJDEP SITE VISIT

K. DATE IDENTIFIED *(mo., day, & yr.)*: 3-7-80

L. PRINCIPAL STATE CONTACT

1. NAME: Thomas Brady / Bob Reed

2. TELEPHONE NUMBER: (609)-292-9120

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED *(no hazard)*

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 4. SITE INSPECTION NEEDED *(low priority)*

C. PREPARER INFORMATION

1. NAME: Richard Ramon

2. TELEPHONE NUMBER: (212)-264-1573

3. DATE *(mo., day, & yr.)*: 6-12-80

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*

☐ 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

☐ 1. NO ☒ 2. YES *(specify generator's four-digit SIC Code)*: 2816

C. AREA OF SITE *(in acres)*: 25

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE *(deg.-min.-sec.)*: 40°56'13"

2. LONGITUDE *(deg.-min.-sec.)*: 75°06'31"

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES *(specify)*: [illegible] Plant [illegible] ATT. D

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet 1140 C

gallons _____

Total Facility Area

square feet 42,250 S

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None

Don't Know

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

(Attached)

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name D. C. Dieterich

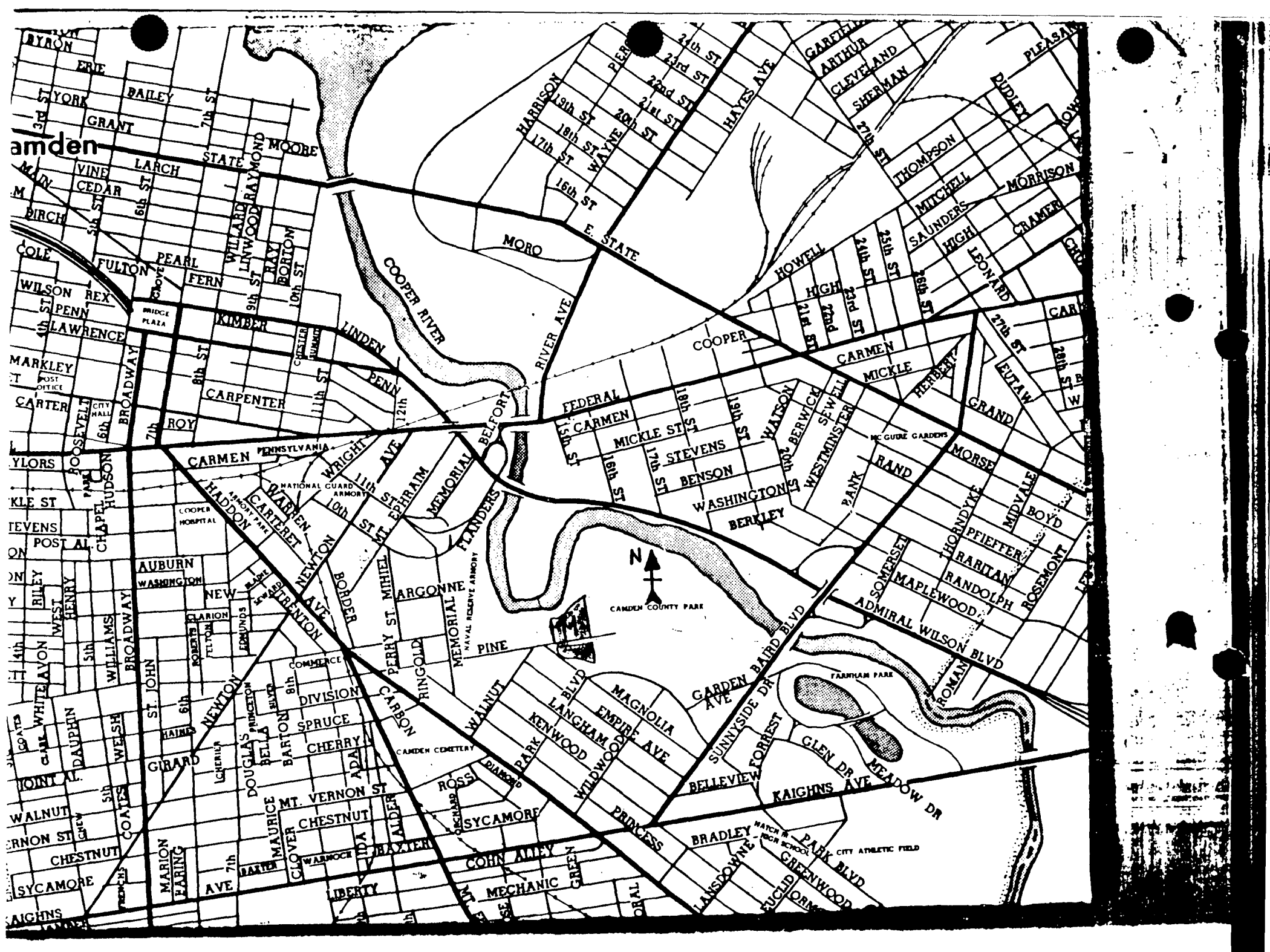
Street 1500 Pine Street

City Camden State NJ Zip Code 08103

Signature D C Dieterich Date 6/5/81

☐ Owner, Present
☐ Owner, Past
☐ Transporter
☒ Operator, Present
☐ Operator, Past
☐ Other

D


Camden
BYRON
ERIE
YORK
BAILEY
GRANT
STATE
MOORE
LARCH
VINE
CEDAR
BIRCH
COLE
FULTON
PEARL
FERN
WILLARD
LINWOOD
RAYMOND
BORTON
WILSON
REX
PENN
LAWRENCE
MARKLEY
POST OFFICE
CARTER
ROSEVELT
CITY HALL
BROADWAY
BRIDGE PLAZA
KIMBER
LINDEN
CHESTER
SUMMIT
CARPENTER
ROY
PENN
CARMEN
PENNSYLVANIA
WRIGHT AVE
NATIONAL GUARD ARMORY
WARREN
CARTERET
HADDON
ARMORY PARK
COOPER HOSPITAL
CHAPEL
HUDSON
POST AL
AUBURN
WASHINGTON
NEW
CLARION
EDMUNDS
ROBERTS
TELTON
NEWTON
TRENTON
BORDER
PERRY ST
MIHIEL
ARGONNE
MEMORIAL
NAVAL RESERVE ARMORY
FLANDERS
MEMORIAL
BELFORT
COOPER RIVER
RIVER AVE
MORO
E. STATE
HARRISON
WAYNE
HAYES AVE
GARFIELD
ARTHUR
CLEVELAND
SHERMAN
PLEASANT
DUDLEY
THOMPSON
MITCHELL
MORRISON
SAUNDERS
HIGH
CRAMER
LEONARD
HOWELL
COOPER
CARMEN
MICKLE
HERBERT
EUTAW
GRAND
FEDERAL
MICKLE ST
STEVENS
BENSON
WASHINGTON
BERKLEY
WATSON
BERWICK
SEWELL
WESTMINSTER
BANK
RAND
MC GUIRE GARDENS
MORSE
THORNDYKE
MIDVALE
BOYD
PFIEFFER
RARITAN
RANDOLPH
ROSEMONT
SOMERSET
MAPLEWOOD
ADMIRAL WILSON BLVD
ROMAN
N
CAMDEN COUNTY PARK
GARDEN BAIRD BLVD
FAIRNHAM PARK
SUNNYSIDE DR
FORREST
GLEN DR
MEADOW DR
KAIGHNS AVE
BELLEVIEW
PINE
WALNUT
RINGGOLD
CARBON
COMMERCE
DIVISION
SPRUCE
CHERRY
CAMDEN CEMETERY
ROSS
DIAMOND
PARK BLVD
KENWOOD
LANGHAM
WILDWOOD
MAGNOLIA
EMPIRE AVE
PRINCESS
BRADLEY
LANSDOWNE
HIGH SCHOOL
PARK BLVD
CITY ATHLETIC FIELD
EUCLID
GREENWOOD
GREEN
ORAL
MECHANIC
COHN ALLEY
SYCAMORE
CHESTNUT
MT. VERNON ST
MAURICE
CLOVER
WARNOCK
BAXTER
ALDER
ADA
LIBERTY
GIRARD
HAINES
DOUGLAS
BELLA
BARTON
PRINCETON
LCHERIER
ST. JOHN
COATES
WELSH
DAUPHIN
WHITE
CLAY
AVON
RILEY
WEST
HENRY
WILLIAMS
BROADWAY
MARION
FARING
AVE
JOINT AL
WALNUT
SYCAMORE
CHESTNUT
KAIGHNS

EPA Notification of Hazardous Waste Sites

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and must be mailed by June 9, 1981.

10 JUN 1981

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810605

NJS 000 001 03

A Person Required to Notify:
Enter the name and address of the person or organization required to notify.

Name: Monsanto Company
Street: 1500 Pine Street
City: Camden State: NJ Zip Code: 08103

B Site Location:
Enter the common name (if known) and actual location of the site.

Name of Site: MONSANTO CO. - Camden Plant
Street: 1500 Pine Street
City: Camden County: Camden State: NJ Zip Code: 08103

NJD001700830

C Person to Contact:
Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Dieterich, David Plant Manager
Phone: 609-963-0243

D Dates of Waste Handling:
Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1900 To (Year): 1972

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☒ Inorganics
3. ☐ Solvents
4. ☒ Pesticides
5. ☐ Heavy metals
6. ☒ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☒ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site located.

AW. D

Form Approved
OMB No. 2000-0138
EPA Form 8900-1

...d From Front

IV. CHARACTERIZATION OF SITE ACTIV...

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP	X	2. SURFACE IMPOUNDMENT	X	2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY	X	8. OTHER (specify): Scrub Settling Pond
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

V. WASTE RELATED INFORMATION

A. WASTE TYPE

☐ 1. UNKNOWN ☒ 2. LIQUID ☒ 3. SOLID ☐ 4. SLUDGE ☐ 5. GAS

B. WASTE CHARACTERISTICS

☐ 1. UNKNOWN ☐ 2. CORROSIVE ☐ 3. IGNITABLE ☐ 4. RADIOACTIVE ☐ 5 HIGHLY VOLATILE
☒ 6. TOXIC ☐ 7. REACTIVE ☐ 8 INERT ☐ 9. FLAMMABLE

☐ 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

Continue On Page 3

D

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

Lampblack

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATER	X			SCRUB settling pond is adjacent to the Cooper River
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL	X			Scrub settling pond is not lined
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				

Continue On Reverse

D

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [ ] 3. STATE PERMIT (specify): _____
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER (specify): _____

B. IN COMPLIANCE?

- [ ] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN
- 4. WITH RESPECT TO (list regulation name & number): _____

VIII. PAST REGULATORY ACTIONS

- [ ] A. NONE
- [ ] B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

- [ ] A. NONE
- [x] B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
SITE VISIT	3-7-80	State	

X. REMEDIAL ACTIVITY (past or on-going)

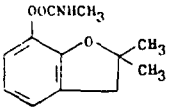
- [ ] A. NONE
- [ ] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

D

N 6.33%, O 21.69%. Prepn and use as insecticide: Orwoll, Sharpf, U.S. pats. **3,356,690**; **3,474,170-1** (1967, 1969, to FMC); Heiss *et al.*, U.S. pat. **3,470,299** (1969 to Bayer).



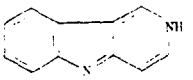
White crystalline solid, mp 150-153°. Soly in water at 25°: 700 ppm. Unstable in alk. LD_{50} orally in rats: 8 mg/kg. *Toxic Substances List*, H. E. Christensen, Ed. (1974) p 180.

USE: Systemic insecticide, acaricide, nematocide. *Caution:* Cholinesterase inhibitor.

1809. Carbohydrazide. *Carbonic dihydrazide;* 1,3-diaminourea. CH_6N_4O; mol wt 90.09. C 13.33%, H 6.71%, N 62.20%, O 17.76%. $NH_2NHCONHNH_2$. Prepd by refluxing diethyl carbonate with hydrazine hydrate: Mohr *et al.*, *Inorg. Syn.* **4**, 32 (1953).

Crystals from water + ethanol, dec 153-154°. Freely sol in water. pH of 1% aq soln about 7.4. Practically insol in alcohol, ether, chloroform, benzene. Forms salts with acids. With nitrous acid it forms the highly explosive carbonyl azide $CO(N_3)_2$.

1810. γ-Carboline. *5H-Pyrido[4,3-b]indole; 2H-pyrid-[4,3-b]indole;* 5-carboline. $C_{11}H_8N_2$; mol wt 168.19. C 78.55%, H 4.79%, N 16.66%. Prepn: Robinson, Thornley, *J. Chem. Soc.* **125**, 2169 (1924). Prepn of derivs: Hörlein, *Ber.* **87**, 463 (1954).



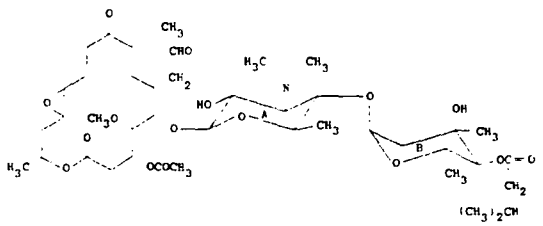
Monoclinic needles from water, mp 225°, d 1.352. Can be distilled at atmospheric pressure without dec. Strong base. Freely sol in methanol; somewhat less sol in ethanol. Slightly sol in benzene, water.

Picrate, yellow needles, mp 250°.

1811. Carbolineum®. A brand of chlorinated anthracene oil (coal tar fraction).

USE: To spray hen houses in the control of chicken mites; as wood preservative; against termites.

1812. Carbomycin A. *9-Deoxy-12,13-epoxy-9-oxoleucomycin V 3-acetate 4B-(3-methylbutanoate);* M-4209; Magnamycin. $C_{42}H_{67}NO_{16}$; mol wt 841.97. C 59.91%, H 8.02%, N 1.66%, O 30.40%. Antibiotic substance produced by *Streptomyces halstedii:* Tanner *et al.*, *Antibiot. & Chemother.* **2**, 441 (1952). Isoln: Friedman *et al.*, U.S. pat. **2,960,438** (1960 to Pfizer). Carbomycin A is a 16-membered lactone linked to a disaccharide, mycaminose *(q.v.)* and mycarose *(q.v.)*. The lactone and mycaminose form *carimbose*. Structure: Kuehne, Benson, *J. Am. Chem. Soc.* **87**, 4660 (1965); Woodward *et al.*, *ibid.* 4662. Absolute configuration: Celmer, *ibid.* **88**, 5028 (1966). *Reviews:* Vazquez, in *Antibiotics* Vol. 1, D. Gottlieb, P. D. Shaw, Eds. (Springer-Verlag, New York, 1967) pp 366-377; Keller-Schierlein in *Fortschr. Chem. Org. Naturst.* **30**, 314-460 (1973).



Blunt needles from ethanol, mp 214°. $[\alpha]_D^{25}$ −58.6° (chloroform). uv max (abs ethanol): 238, 327 nm ($E_{1cm}^{1\%}$ 185, 0.9). Carbomycin standard is the free base having a potency of 1080 units/mg. For stability of soln data *see Antibiot. & Chemother.* **3**, 865 (1953). Weak base, pKb 7.2. Solubilities determined by Weiss *et al.*, *Antibiot. & Chemother.* **7**, 374 (1957) in mg/ml at about 28°: Water 0.295; methanol > 20; ethanol > 20. LD_{50} i.v. in mice: 550 mg/kg.

THERAP CAT: Antibiotic.

THERAP CAT (VET): Antimicrobial.

1813. Carbon. C; at. wt 12.01115; at. no. 6; valence 4. Stable isotopes: 12 (98.892%); 13 (1.108%); radioactive isotopes: 9-11; 14-16. Abundance in earth's crust: approx 0.027%. Cosmic abundance: 6 atoms/atom Si. Occurs in 3 forms: (1) Diamond *(q.v.)*; (2) Graphite *(q.v.)* or black lead; (3) Amorphous carbon such as coal, lampblack, and the various forms of artificial carbon. Comprehensive reviews: P. L. Walker, *Am. Scientist* **50**, 259-293 (June 1962); Holliday *et al.* in *Comprehensive Inorganic Chemistry* **vol. 1**, J. C. Bailar, Jr. *et al.*, Eds. (Pergamon Press, Oxford, 1973) pp 1173-1294.

^{14}C isotope, continuously formed in the earth's atm by the bombardment of nitrogen with cosmic neutrons according to the reaction $^{14}_{7}N + ^{1}_{0}n \rightarrow ^{14}_{6}C + ^{1}_{1}H$. The ^{14}C is rapidly oxidized to CO_2, in this form it penetrates into animals and plants by photosynthesis and metabolism. The ^{14}C content of living matter is estimated at 15.3 disintegrations per minute and per gram of carbon, corresponding to the equilibrium reached between formation of ^{14}C and its exchange with ^{12}C. This equilibrium stops when the plant or animal dies, and the ^{14}C content begins to decrease, because the ^{14}C decays with a half-life of 5760 years. This fact can be used to date organic matter (not more than 40,000 years old) by comparison with the standard 15.3 disintegrations per min per gram: M. Haissinsky, J. P. Adloff, *Radiochemical Survey of the Elements* (Elsevier, New York, 1965) pp 30-32.

1814. Carbon, Amorphous. Carbon black; carbon, activated; carbon, decolorizing. A quasi-graphitic form of carbon of small particle size. By the term "carbon black" several forms of artificially prepared carbon or charcoal are designated, *e.g.*: (1) *Animal charcoal*, obtained by charring bones, meat, blood, etc.; (2) *Gas black; furnace black; channel black:* obtained by incomplete combustion of natural gas; (3) *Lamp black*, obtained by burning various fats, oils, resins, etc., under suitable conditions; (4) *Activated charcoal, e.g. Carboraffin, Norit, Opocarbyl, Ultracarbon*, prepd from wood and vegetables. Monograph: H. W. Davidson *et al.*, *Manufactured Carbon* (Pergamon Press, New York, 1968). *Reviews:* Cohan in *Science of Petroleum* **vol. V**, Pt 2, B. T. Brooks, A. E. Dunstan, Eds. (Oxford Univ. Press, 1953), pp 79-89; Smisek, Cerny, *Active Carbon* (Elsevier Publishing Co., Amsterdam, 1970).

USE: Number (4), *e.g.* Norit, Carboraffin, is used chiefly for clarifying, deodorizing, decolorizing and filtering. The others are used as a pigment for rubber tires; for printing, stenciling and drawing inks; for leather; stove polish, phonograph records, electrical insulating apparatus. Activated charcoal (from the destructive distillation of various organic materials) is used in medicine, *e.g.*, Opocarbyl; Norit; Ultracarbon.

THERAP CAT: Activated charcoal as antidote; adsorptive.

THERAP CAT (VET): Internally as an adsorptive in diarrhea; externally in foul wounds.

1815. Carbon Dioxide. Carbonic acid gas; carbonic anhydride. CO_2; mol wt 44.01. C 27.29%, O 72.71%. Occurs in the atms of many planets. In our solar system, e.g., on Venus, the optical layer thickness due to CO_2 is 100,000 cm/atm, but only 220 cm/atm on Earth. Analyses of air in the temperate zones of the Earth show 0.027 to 0.036% (v/v) of CO_2: G. P. Kuiper, *The Atmospheres of the Earth and the Planets* (Univ. of Chicago Press, 1949); Landolt-Bornstein, *Zahlenwerte* **vol. III** (Springer-Verlag, 6th ed., 1952) pp 59 and 585. Constituent of carbonate type of minerals and products of animal metabolism. Necessary for the respiration cycle of plants and animals. Obtained industrially as a by-product in the manuf of lime during the "burning" of limestone ($CaCO_3$). Also produced by burning coke or other carbonaceous material. In the U.S.A. large amounts are produced by fermentation (Backus process and Reich process). When glucose is fermented by yeast, the chief products are ethyl alcohol and CO_2. Prepd in the laboratory by dropping acid on a carbonate: E. H. Archibald, *The*

ATT. E

THR: HIGH scu. MOD ivn and ims.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

CARBON

CAS RN: 7440440 NIOSH #: FF 5250000
mf: C; mw: 12.01

Black crystals, powder or diamond form. mp: 3652°-3697° (subl), bp: approx 4200°, d(amorphous): 1.8-2.1, d(graphite): 2.25, d(diamond): 3.51, vap. press: 1 mm @ 3586°.

SYNS:

BLACK PEARLS	CHARCOAL BLACK
COLUMBIAN CARBON	C.I. 77266
CARBONE (ITALIAN)	PURIFIED CHARCOAL

TOXICITY DATA: 3-2	CODEN:
scu-rat TDLo:167 mg/kg (8D preg)	TJADAB 4,327,71
ivn-mus LD50:440 mg/kg	TXAPA9 24,497,73

TLV: Air: 3.5 mg/m3 DTLVS* 4,68,80.
OSHA Standard: Air: TWA 3500 ug/m3 (SCP-R) FEREAC 39,23540,74. Occupational Exposure to Carbon Black recm std: Air: TWA 3.5 mg/m3 NTIS**. "NIOSH Manual of Analytical Methods" VOL 3 S262. Reported in EPA TSCA Inventory, 1980.
THR: MOD ivn. Powder elemental C is mainly a nuisance dust and slightly irr in the form of graphite (one of the common forms of carbon), it can cause a dust irritation, particularly to the eyes. Carbon also occurs in the form of soot, carbon black. It can also cause conjunctivitis epithelial hyperplasia of cornea, as well as eczematous inflammation of eyelids. Some forms of carbon dust can cause irr of eyes and mu mem. See also carbon black, soot.
Fire Hazard: Slight, when exposed to heat.
Explosion Hazard: In the form of dust when exposed to heat or flame or (NH_4NO_3 + heat), (NH_4ClO_4 @ 240°), bromates, $Ca(OCl)_2$, chlorates, Cl_2, (Cl_2 + $Cr(OCl)_2$), ClO, F_2, iodates, IO_5, ($Pb(NO_3)_2$, $HgNO_3$, HNO_3, (oils + air), (K + air), Na_2S, $Zn(NO_3)_2$.
Incomp: air; metals; oxidants; unsaturated oils.

CARBON BLACK

A generic term applied to a family of high-purity colloidal carbons commercially produced by carefully controlled pyrolysis of gaseous or liquid hydrocarbons. Carbon blacks, including commercial colloidal carbons such as furnace blacks, lamp blacks and acetylene blacks, usually contain less than several tenths percent of extractible organic matter and less than one percent ash.

SYNS:

LAMP BLACK	FURNACE BLACK
ACETYLENE BLACK	

THR: LOW skn, ihl, orl. See also carbon. According to studies on laboratory test animals, as well as retrospective studies of employees in the carbon black industry, there are no physiologic effects from contact, inhalation or ingestion of carbon black. The only untoward effect of carbon black upon the environment is that in high concentrations it becomes a nuisance dust. While it is true that the tiny particulates of carbon black contain some molecules of carcinogenic materials, the carcinogens are apparently held tightly and are not eluted by hot or cold water, gastric juices or blood plasma.
Refs: Nau, C. A., Taylor, G. T., Lawrence, C. H., Properties and Physiological Effects of Thermal Carbon Black. *Journal of Occupational Medicine.* Nov. 1976, Vol 18, No. 11, pp. 732-734.
Nau, C. A., Neal, J., Stembridge, V. A., A Study of the Physiological Effects of Carbon Black. *Archives of Environmental Health,* Dec. 1960, Vol. 1, pp. 512-533, American Medical Association.

CARBONCHLORIDIC ACID PHENYL ESTER

CAS RN: 1885149 NIOSH #: FG 3850000
mf: $C_7H_5ClO_2$; mw: 156.57

SYNS:

FENYLESTER KYSELINY CHLORMRAVENCI (CZECH)	PHENYL CHLOROFORMATE

TOXICITY DATA: 3-2	CODEN:
skn-rbt 500 mg/24H MOD	28ZPAK -,163,72
eye-rbt 50 ug/24H SEV	28ZPAK -,163,72
orl-rat LD50:1410 mg/kg	AIHAAP 30,470,69
ihl-rat LCLo:44 ppm/4H	AIHAAP 30,470,69
skn-rbt LD50:3970 mg/kg	AIHAAP 30,470,69

Reported in EPA TSCA Inventory, 1980.
THR: HIGH ihl. MOD orl, skn. A skn, eye irr. See also esters.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

CARBON DIOXIDE

CAS RN: 124389 NIOSH #: FF 6400000
mf: CO_2; mw: 44.01

Colorless, odorless gas. mp: subl @ −78.5°, (−56.6° @ 5.2 atm), vap. d: 1.53.

SYNS:

ANHYDRIDE CARBONIQUE (FRENCH)	CARBONIC ANHYDRIDE
CARBONIC ACID GAS	DRY ICE
	KOHLENSAURE (GERMAN)

TOXICITY DATA: 3	CODEN:
ihl-rat TCLo:6 pph/24H (10D preg)	CIRUAL 8,1218,60
ihl-rbt TCLo:10 pph/(7-12D preg) TFX:TER	ZMOAAN 56,165,65
ihl-rbt TCLo:13 pph/4H (9-12D preg)	ZMOAAN 56,165,65
ihl-rat TCLo:6 pph/24H/(10D preg):TER	CIRUAL 8,1218,60
ihl-rbt TCLo:10 pph/(7-12D preg):TER	ZMOAAN 56,165,65
ihl-hmn LCLo:100000 ppm/1M	AOHYA3 17,159,74
ihl-rat LCLo:657190 ppm/15M	MRLR** No. 23,50
ihl-mam LCLo:90000 ppm/5M	AEPPAE 138,65,28

TLV: Air: 5000 ppm DTLVS* 4,69,80. *Toxicology Review:* EVHPAZ 11,163,75. OSHA Standard: Air: TWA 5000 ppm (SCP-R) FEREAC 39,23540,74. Occupa-

ATT. F

CHEMICAL SAMPLES & ANALYTICAL SVCS CO

CHEM SAMPES/ANALYTICAL SVCS.
1301 METROPOLITAN AVE. PO BX 514
THOROFARE, NJ 08086

PHONE (609) 848-7227
FAX # 1-609-848-9591

LABORATORY ANALYSIS REPORT #710120591

October 26, 1987

Monsanto Company
Attn.: R. Forsythe
1500 Pine Street
Camden, NJ 08103

Sample Date: 10/12/87
P.O. #K-1847-F
CSAS Job #710120591

Sample Designation:
#7101201 - Water/Well #2
#7101202 -Water/Well #4
#7101203 - Water/Well #6
#7101204 - Water/Well #13
#7101205 - Water/Well #14

Parameter	7101201	7101202	7101203
Polynuclear Arom. Hydrocarbons (Meth. 610):			
Naphthalene, ppb	<25	<25	<25
Acenaphthene, ppb	<26	<26	<26
Anthracene, ppb	<8.2	<8.2	<5.8
Phenanthrene, ppb	<17	<17	<12
pH	6.90	6.40	6.40
Depth (TopWell-Top Water/TopWell-Bot. Well)	33.1/ 38.3	24.8/ 58	23.2/ 45.4

	7101204	7101205
Polynuclear Arom.Hydrocarbons (Meth 610):		
Naphthalene, ppb	<25	<32
Acenaphthene, ppb	<26	<34
Anthracene, ppb	<7.2	<10.6
Phenanthrene, ppb	<15	<23
pH	7.0	6.90
Depth (TopWell-TopWater/ TopWell-Bot.Well)	39.5/ 85.6	39.7/ 81.7

Date: Oct 24 1987

Signed: [illegible]
Laboratory Director/Manager

ATT G

REFERENCE NO. 8

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Made in U.S.A.
200 PAGE 9 5/8"X 6 1/4"

RECORD BOOK

6th August 1996, Tuesday
0815: Left office for site of Monsanto Company, Camden NJ along with START D. FOERTER.
0945: Arrived on-site. Met Mr. Patrick Penders and Ms. Patti Burnes from Roux Associates. Ms. Burnes briefed START on the history of the site. START was informed the ROUX Associates was preparing a Remedial Action Plan for the site. Ms. Burnes stated that the groundwater flow was in the direction away from the Cooper river. No sampling was performed by Roux Associates inside the river. Roux took several soil and groundwater samples from the site. There were six monitoring wells installed in the site.
Weather: Clear and Sunny. Temperature 85°F Humidity 90%
1000: START performed air monitoring while performing the site walk and reconnaissance. No readings above background were observed. Along the six acres of the site START observed vegetation at almost the entire surface.
The ground was fairly even. One third of the site slopes to the North towards the Cooper River and approximately two thirds of the site slopes to the south towards Pine Street.
START took pictures of the site conditions. START observed the fence along the site to

be in fairly good condition. The fence is a chain-link fence and is approximately 12ft high.
The site is ~~for~~ bordered on the north by Cooper River, on the East by a vacant lot which is heavily wooded, on the south by Pine Street and on the West by Campbells Soup Company. Across the site Campbell Corporation, a manufacturing facility was observed.
Ms. Burnes she would mail all the site files within two weeks.
START's Ketha and Foerter drove around the site. Approximately 180 ft from the site, on the other side of Pine Street, there is an Early Childhood Development Center. START noted the storm drains on the site map. Drainage appeared to be flowing west on Pine Street.
1050 :- START's leave site for office
1245:- START arrived at office. Unloaded equipment and gear bags
Swamy S. Ketha

REFERENCE NO. 9

SUBJECT TO REVISION

100,000 GPD WATER WITHDRAWAL POINTS ONLY AND CONTAMINATED SITES WITHIN 5.0 MILES OF:

LATITUDE 395620
LONGITUDE 750615

DRAFT

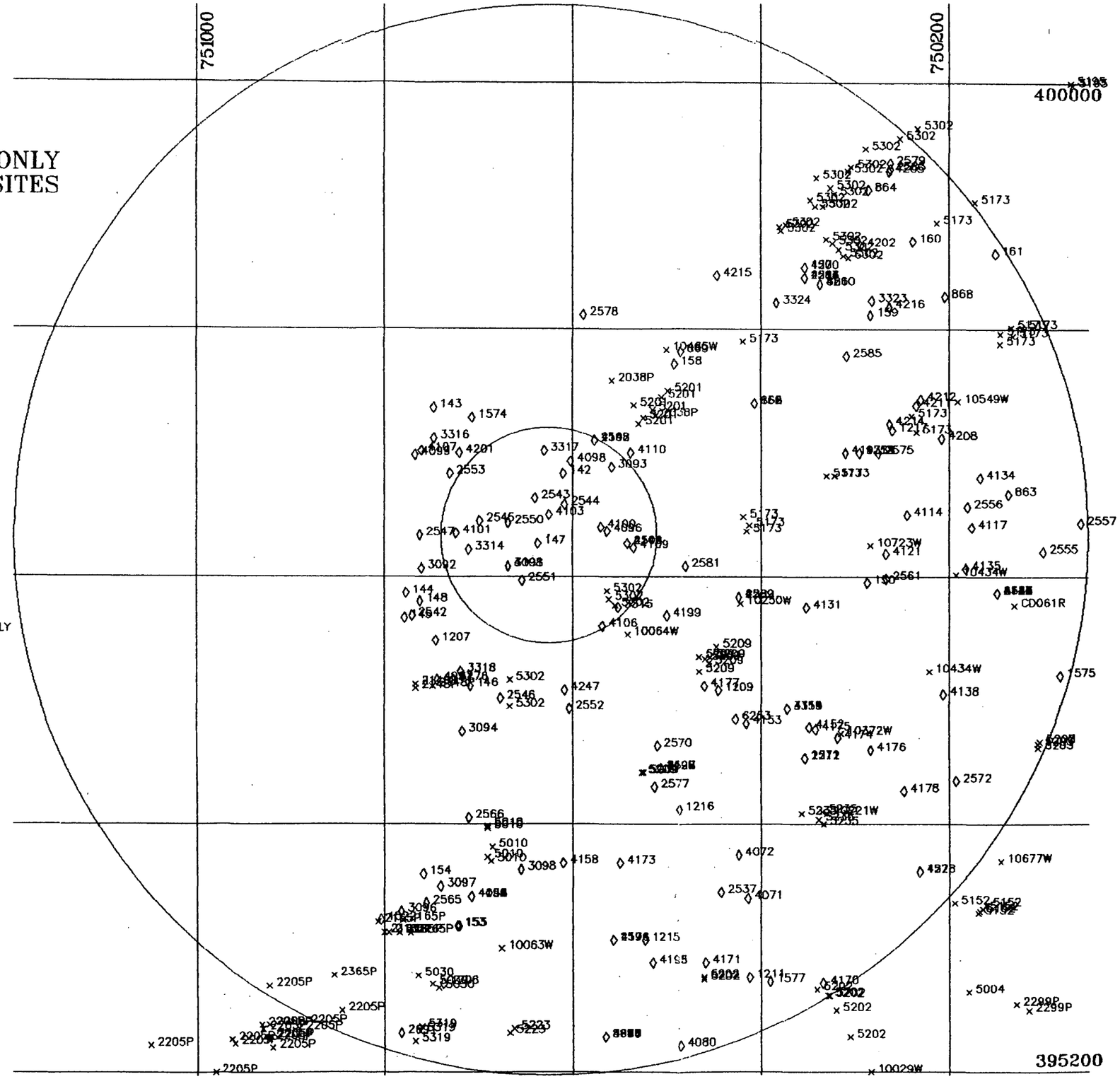
SCALE: 1:63,360
(1 Inch = 1 Mile)

× 100,000 GPD WATER WITHDRAWAL POINTS ONLY
◊ CONTAMINATED SITES
1 MILE AND 5 MILE RADII INDICATED

CONTAMINATED SITE LIST
AS OF 03/21/95

PLOT PRODUCED BY:
NJDEP
WATER SUPPLY ELEMENT
BUREAU OF WATER ALLOCATION
CN-426
TRENTON, NJ 08625

DATE: 11/05/96



SUBJECT TO REVISION

SITE#	NAME	ADDRESS	MUN	COUNTY	CSL#	CASE#	LAT	LON	DISTANCE	CONTAC
142	ADAMS OIL INCORPORATED	1435 RIVER AVE	CAMDEN CITY	CAMDEN	NJD981560725	E92102	395650	750606	0.6	BEECRA
143	CAMDEN SHIP REPAIR COMPANY INCORPORATED	POINT ST & ERIE AVE	CAMDEN CITY	CAMDEN	NJL500005723	E86052	395722	750728	1.6	BEECRA
144	GENSTAR GYPSUM PRODUCTS COMPANY	1101 FRONT ST	CAMDEN CITY	CAMDEN	NJD981140171	E86856	395552	750746	1.4	BEECRA
145	KRAMER CHEMICALS INCORPORATED	ATLANTIC AVE & DELAWARE RIVER	CAMDEN CITY	CAMDEN	NJD087098380	E90395	395540	750747	1.5	BEECRA
146	MOLINS MACHINE COMPANY LANGSTON DIVISION	2001 6TH AVE S	CAMDEN CITY	CAMDEN	NJD981490279	E84425	395507	750705	1.6	BEECRA
147	MONSANTO COMPANY	1500 PINE ST	CAMDEN CITY	CAMDEN	NJD001700830	E93162	395616	750622	0.1	BEECRA
148	VENUS STORM WINDOW COMPANY INCORPORATED	200 TO 210 KAIGHN AVE	CAMDEN CITY	CAMDEN	NJL500033816	E90002	395548	750737	1.3	BEECRA
150	HARMONSON BROTHERS INCORPORATED	908 NORTHWOOD AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJL500014451	9406143	395557	750252	3.0	BEECRA
152	GULF & WESTERN NATURAL RESOURCES GROUP	851 WATER ST	GLOUCESTER CITY	CAMDEN	NJD002347664	E85016	395314	750802	3.9	BEECRA
153	LIQUID CARBONIC SPECIALTY GAS CORP	560 S BROADWAY	GLOUCESTER CITY	CAMDEN	NJL500019351	E91294	395311	750713	3.7	BEECRA
154	PRODUCTS RESEARCH & CHEMICAL CORPORATION	410 JERSEY AVE	GLOUCESTER CITY	CAMDEN	NJD002329647	E89546	395336	750735	3.3	BEECRA
155	WOODLAND OXYGEN COMPANY INCORPORATED	560 S BROADWAY	GLOUCESTER CITY	CAMDEN	NJL500035068	E90729	395311	750712	3.7	BEECRA
156	AMERICAN BANK STATIONERY COMPANY	7980 NATIONAL HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJD053285763	E89640	395724	750404	2.3	BEECRA
157	CJ OSBORN COMPANY	820 SHERMAN AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600020622	0031835	395830	750332	3.4	BEECRA
158	ELF ASPHALT INCORPORATED	36TH ST & RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJL500010491	E89A19	395743	750455	2.0	BEECRA
159	MERCON INDUSTRIES INCORPORATED	7200 WESTFIELD AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL500020797	E84166	395807	750250	3.6	BEECRA
160	UNITED STEEL & WIRE COMPANY INCORPORATED	SUCKLE & NATIONAL HWYS	PENNSAUKEN TOWNSHIP	CAMDEN	NJD098159130	E89218	395843	750223	4.4	BEECRA
161	WALDMAN GRAPHICS INCORPORATED	9100 PENNSAUKEN HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJD058978040	E93419-BAC	395837	750131	4.9	BEECRA
162	WEST BANK OIL	36TH ST & RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD011636131	E87741	395724	750404	2.3	BEECRA
861	BELL HARBOR INCORPORATED LANDFILL	HARDING AVE (OFF CREEK RD)	BELLMAWR BOROUGH	CAMDEN	NJL900000084	941102210745	395217	750539	4.7	BFCM
862	EXXON SERVICE STATION CHERRY HILL TWP	RTE 70 & ELLISBURG CIR	CHERRY HILL TOWNSHIP	CAMDEN	NJD986608263	941137	395552	750130	4.2	BFCM
863	FIRESTONE STORE	266 CHERRY HILL	CHERRY HILL TOWNSHIP	CAMDEN	NJD986614188	950193	395640	750123	4.3	BFCM
864	ALUMINUM SHAPES INCORPORATED	9000 RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD002338267	NJD002338267	395908	750251	4.4	BFCM
865	GSM INCORPORATED	1435 MELROSE HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJD008913303	930897	395724	750404	2.3	BFCM
866	OVERNITE TRANSPORTATION COMPANY	1215 SHERMAN AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600247571	0025733	395822	750322	3.4	BFCM
868	SHOPE OIL & CHEMICAL COMPANY	8281 NATIONAL HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJD041743220	NJD041743220	395816	750203	4.3	BFCM
869	VINELAND CONSTRUCTION COMPANY LANDFILL	RIVER RD & 37TH ST	PENNSAUKEN TOWNSHIP	CAMDEN	NJD086423886	NJL600177687	395749	750451	2.1	BFCM
1206	D ANDREA TIRE INCORPORATED	100 NEW BROADWAY	BROOKLAWN BOROUGH	CAMDEN	NJL600104954	940883	395243	750722	4.3	BFCM-6
1207	CAMDEN CITY MUA WASTE WATER STP	200 JACKSON ST	CAMDEN CITY	CAMDEN	NJD030313407	940792	395529	750727	1.4	BFCM-6
1209	BOBS EXTRA SERVICE STATION	505 HADDON AVE	COLLINGSWOOD BOROUGH	CAMDEN	NJL600018436	9409138	395505	750427	2.1	BFCM-6
1211	HADDON HEIGHTS SEWER TREATMENT PLANT	GLOVER & N PARK AVES	HADDON HEIGHTS BOROUGH	CAMDEN	NJL600004964	0007517	395246	750407	4.5	BFCM-6
1212	A M BROWN FUEL COMPANY	310 CUTHBERT BLVD	HADDON TOWNSHIP	CAMDEN	NJL600186928	940373	395432	750332	3.1	BFCM-6
1215	BO BET MOTEL	310 BLACKHORSE PK N	MOUNT EPHRAIM BOROUGH	CAMDEN	NJL800122145	NJL800122145-001	395304	750514	3.9	BFCM-6
1216	THERMO-KOLD EQUIPMENT COMPANY	220 CLINTON AVE W	OAKLYN BOROUGH	CAMDEN	NJL600122592	950604	395407	750452	2.8	BFCM-6
1217	GRANATE FUEL & SUPPLIES COMPANY	4312 COVE RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986597789	9402103	395711	750236	3.3	BFCM-6
1218	PENNSAUKEN MARINE	5910 RTE 130	PENNSAUKEN TOWNSHIP	CAMDEN	NJD155427487	0182649	395660	750257	3.0	BFCM-6
1574	POETS ROW SANITARY LANDFILL	1000 5TH ST N	CAMDEN CITY	CAMDEN	NJL000057349	930249	395717	750704	1.3	BFO-CA
1575	CHERRY HILL ERLTON LANDFILL	920 MCGILL AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJD980529028	9303152	395512	750050	4.9	BFO-CA
1577	HADDON HEIGHTS BOROUGH SANITARY LANDFILL	DEVON AVE & RTE 295	HADDON HEIGHTS BOROUGH	CAMDEN	NJL900000589	9303202	395244	750354	4.6	BFO-CA
1578	HADDONFIELD BOROUGH SANITARY LANDFILL	S ATLANTIC AVE	HADDONFIELD BOROUGH	CAMDEN	NJL900001751	9303143	395337	750219	4.6	BFO-CA
2537	SUBURBAN PAVING	100 CUTHBERT BLVD	AUDUBON BOROUGH	CAMDEN	NJD982796211	911159	395327	750425	3.7	BFO-S
2542	CAMDEN IRON & METAL INCORPORATED	FRONT ST & ATLANTIC AVE	CAMDEN CITY	CAMDEN	NJD981081334	9003091549	395541	750742	1.5	BFO-S
2543	CAMDEN TRANSFER STATION	FEDERAL ST & ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJL000033191	9303100	395638	750624	0.4	BFO-S
2544	CLASSIC CHEMICAL	16TH & MICKLES STS	CAMDEN CITY	CAMDEN	NJD070280904	9303108	395635	750605	0.3	BFO-S
2545	COOPER HOSPITAL UNIVERSITY MEDICAL CTR	1 COOPER PLZA	CAMDEN CITY	CAMDEN	NJD069896165	9304231504	395627	750659	0.7	BFO-S
2546	INTERNATIONAL CUSTOMER CORPORATION	222 TO 230 LIBERTY ST	CAMDEN CITY	CAMDEN	NJL800071870	9107221651	395501	750646	1.6	BFO-S
2547	KELBROS INCORPORATED	537 2ND ST S	CAMDEN CITY	CAMDEN	NJD980642888	921210	395620	750737	1.2	BFO-S
2548	MAGNETIC METALS CORPORATION	21ST ST & HAYES AVE	CAMDEN CITY	CAMDEN	NJD002334084	890920SP01	395706	750546	1.0	BFO-S
2549	MOBIL SERVICE STATION CAMDEN CITY	2213 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJD981875321	950110151201	395616	750525	0.7	BFO-S
2550	NJ TRANSIT BUS OPERATIONS INCORPORATED	350 NEWTON AVE	CAMDEN CITY	CAMDEN	NJD981134836	941021155250	395626	750641	0.4	BFO-S
2551	PENN JERSEY RUBBER & WASTE COMPANY	1112 CHESTNUT ST	CAMDEN CITY	CAMDEN	NJL000051367	8910160928	395558	750632	0.5	BFO-S
2552	RELDON ENTERPRISES	2681 MT EPHRIAM AVE	CAMDEN CITY	CAMDEN	NJL800113466	950222160527	395456	750602	1.6	BFO-S
2553	US COURT HOUSE ANNEX	406 COOPER & 4TH STS	CAMDEN CITY	CAMDEN	NJD000536110	9501151	395650	750718	1.1	BFO-S
2555	320 CHERRY HILL BOULEVARD	320 CHERRY HILL BLVD	CHERRY HILL TOWNSHIP	CAMDEN	NJL000052217	921158	395612	750101	4.6	BFO-S
2556	325 THIRD AVENUE	325 THIRD AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJL000068486	9306280955	395634	750149	3.9	BFO-S

SITE#	NAME	ADDRESS	MUN	COUNTY	CSL#	CASE#	LAT	LON	DISTANCE	CONTAC
2557	CHURCH ROAD PLAZA	2431 CHURCH RD	CHERRY HILL TOWNSHIP	CAMDEN	NJL000046870	950317161719	395626	750037	4.9	BFO-S
2560	GOODYEAR AUTO SERVICE CENTER	1108 RTE 70 (MARLTON PK)	CHERRY HILL TOWNSHIP	CAMDEN	NJD136903267	9303101	395552	750130	4.2	BFO-S
2561	MARLTON PIKE PRECISION COMPANY	BEACHWOOD & OLIVE AVES	CHERRY HILL TOWNSHIP	CAMDEN	NJL000049957	930401	395559	750240	3.2	BFO-S
2562	NEW JERSEY AMERICAN WATER COMPANY	OAK AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJD986621084	930477	395552	750130	4.2	BFO-S
2563	NJ DEPARTMENT OF TRANSPORTATION	RTE 70 & OLD CUTHBERT RD	CHERRY HILL TOWNSHIP	CAMDEN	NJD982180275	901024SP01	395552	750130	4.2	BFO-S
2564	PLAZA 38	2442 RTE 38	CHERRY HILL TOWNSHIP	CAMDEN	NJL800011918	9402119	395552	750130	4.2	BFO-S
2565	FOGARTY INDUSTRIES	5TH & WALNUT & CHARLES & 7TH STS	GLOUCESTER CITY	CAMDEN	NJD986578169	930234	395322	750733	3.6	BFO-S
2566	INDCO INCORPORATED	RAILROAD AVE N & ESSEX ST	GLOUCESTER CITY	CAMDEN	NJL600156731	940826170106	395403	750706	2.7	BFO-S
2570	700 COLLINGS AVENUE	700 COLLINGS AVE	HADDON TOWNSHIP	CAMDEN	NJL800045254	940310102631	395438	750506	2.2	BFO-S
2571	A M BROWN FUEL COMPANY	310 CUTHBERT BLVD	HADDON TOWNSHIP	CAMDEN	NJL600186928	940373	395432	750332	3.1	BFO-S
2572	412 GROVE STREET	412 GROVE ST	HADDONFIELD BOROUGH	CAMDEN	NJL800100927	941128093426	395421	750156	4.4	BFO-S
2575	126 WOODLAWN AVENUE	126 WOODLAWN AVE	MERCHANTVILLE BOROUGH	CAMDEN	NJL800022006	931118081352	395660	750245	3.2	BFO-S
2576	MOUNT EPHRIAM BOROUGH	CLEVELAND AVE	MOUNT EPHRAIM BOROUGH	CAMDEN	NJL800023699	9302261028	395304	750534	3.8	BFO-S
2577	AUTOMATIC HEATING SERVICE	48 HILLCREST AVE	OAKLYN BOROUGH	CAMDEN	NJL800054231	940421204310	395418	750508	2.5	BFO-S
2578	CITGO PETROLEUM CORP(PETTYS ISLAND TERM)	36TH ST & DELAWARE AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJD043274471	9012101525	395807	750553	2.1	BFO-S
2579	DEVOE MARINE COATING COMPANY	9155 RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD000310417	9204061353	395921	750237	4.7	BFO-S
2581	HORNER MACK SALES & SERVICE INCORPORATED	7460 CRESENT BLVD	PENNSAUKEN TOWNSHIP	CAMDEN	NJL000056754	9302152047	395605	750448	1.3	BFO-S
2582	LIFE SUPPORT AMBULANCE	5050 CENTRAL HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600155782	0235424	395550	750414	1.9	BFO-S
2583	MPC INDUSTRIES	9111 RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD061845020	930473	395918	750237	4.7	BFO-S
2584	NJ DEPARTMENT OF TRANSPORTATION	RTE 130 & FEDERAL ST	PENNSAUKEN TOWNSHIP	CAMDEN	NJL000045104	901207SP03	395825	750332	3.4	BFO-S
2585	PURATEX COMPANY INCORPORATED	6714 WAYNE AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJD136929163	940519134111	395747	750305	3.2	BFO-S
2599	WOODLYNNE BOROUGH HALL	COOPER AVE	WOODLYNNE BOROUGH	CAMDEN	NJL800016644	9402118	395427	750504	2.4	BFO-S
2691	307 WOODBINE AVENUE	307 WOODBINE AVE	WESTVILLE BOROUGH	GLOUCESTER	NJL000060814	9304021505	395219	750749	4.8	BFO-S
3091	CAMDEN AMPHITHEATER	FOOT OF CLINTON ST	CAMDEN CITY	CAMDEN	NJ0000048983	NJ0000048983	395605	750641	0.5	BSCM
3092	CAMDEN COAL GAS (PSE&G)	2ND & SPRUCE STS	CAMDEN CITY	CAMDEN	NJD981083025	930149	395604	750736	1.2	BSCM
3093	CONRAIL PAVONIA ENGINE YARD	1516 RIVER AVE	CAMDEN CITY	CAMDEN	NJD980769095	NJD980769095	395653	750535	0.9	BSCM
3094	SOUTH JERSEY PORT CORPORATION	2500 BROADWAY	CAMDEN CITY	CAMDEN	NJD002504272	NJD002504272	395445	750710	2.0	BSCM
3096	AMSPEC CHEMICAL COMPANY	WATER ST	GLOUCESTER CITY	CAMDEN	NJD000312371	NJD000312371	395318	750749	3.7	BSCM
3097	GLOUCESTER COAL GAS (PSE&G)	JERSEY AVE & 6TH ST	GLOUCESTER CITY	CAMDEN	NJD981083058	NJD981083058	395330	750724	3.4	BSCM
3098	UNIVERSITY & MEMORIAL AVENUES	UNIVERSITY & MEMORIAL AVES	GLOUCESTER CITY	CAMDEN	NJL000031872	NJL000031872	395338	750633	3.1	BSCM
3314	AMOCO SERVICE STATION CAMDEN CITY	710 BROADWAY & PINE ST	CAMDEN CITY	CAMDEN	NJL000031633	NJL000031633	395613	750706	0.8	BSM
3315	CAMDEN CITY WD PARKSIDE WELLFIELD CONTAM	VESPER & PARK BLVD	CAMDEN CITY	CAMDEN	NJD077069581	NJD077069581	395545	750531	0.9	BSM
3316	CAMDEN LUTHERAN HOUSING CORPORATION	FRONT & ELM STS	CAMDEN CITY	CAMDEN	NJL000043000	920651	395707	750728	1.4	BSM
3317	HARRISON AVENUE LANDFILL	HARRISON AVE	CAMDEN CITY	CAMDEN	NJD980527956	940810	395701	750618	0.8	BSM
3318	MARTIN AARON INCORPORATED	1542 BROADWAY S	CAMDEN CITY	CAMDEN	NJD014623854	921163	395514	750711	1.5	BSM
3319	COLLINGSWOOD BOROUGH WD WELLFIELD CONTAM	COMLY & NEWTON AVES	COLLINGSWOOD BOROUGH	CAMDEN	NJL000049643	NJL000049643	395456	750343	2.7	BSM
3322	TEXACO SERVICE STATION OAKLYN BOROUGH	RTE 30 & COLLINGSWOOD AVE	OAKLYN BOROUGH	CAMDEN	NJL000042390	0159357	395427	750504	2.4	BSM
3323	CAMDEN CITY WD PUCHACK WELLFIELD CONTAM	RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD981084767	920930-I	395814	750249	3.7	BSM
3324	SGL MODERN HARD CHROME SERVICE	482 COVE RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD002356475	920940-I	395813	750350	3.0	BSM
3960	SOUTHLAND MID ATLANTIC BRANCH	CREEK RD	DELANCO TOWNSHIP	BURLINGTON	NJP000869321	0093756	395217	750539	4.7	BUST
4071	AUDUBON BOROUGH	OAK ST & OAKLAND AVE	AUDUBON BOROUGH	CAMDEN	NJC876027905	0001748	395324	750408	3.8	BUST
4072	METRO CAB SERVICE CENTER	21 WHITE HORSE PK S	AUDUBON BOROUGH	CAMDEN	NJL800021271	0000488	395345	750414	3.5	BUST
4076	BELLMAWR BOROUGH	KARR DR & CREEK RD	BELLMAWR BOROUGH	CAMDEN	NJD982744476	0123121	395217	750539	4.7	BUST
4077	CONSOLIDATED FREIGHTWAYS TERMINAL	651 BENIGNO BLVD	BELLMAWR BOROUGH	CAMDEN	NJL800110348	0128793	395217	750539	4.7	BUST
4080	SHELL SERVICE STATION BELLMAWR BOROUGH	132 BLACK HORSE PK N	BELLMAWR BOROUGH	CAMDEN	NJD986593077	0076250	395213	750451	4.9	BUST
4081	SUNOCO SERVICE STATION BELLMAWR BOROUGH	NORTH-SOUTH FREEWAY & BELL GARDEN AVE	BELLMAWR BOROUGH	CAMDEN	NJD000694117	0145514	395217	750539	4.7	BUST
4091	BROOKLAWN BOROUGH PUBLIC WORKS	HAAKON RD	BROOKLAWN BOROUGH	CAMDEN	NJL000036194	0121286	395325	750704	3.4	BUST
4092	MERIT SERVICE STATION BROOKLAWN BOROUGH	RTE 130 & BROOKLAWN CIR	BROOKLAWN BOROUGH	CAMDEN	NJD981556251	0091262	395325	750704	3.4	BUST
4093	MOBIL SERVICE STATION BROOKLAWN BOROUGH	BROOKLAWN CIR	BROOKLAWN BOROUGH	CAMDEN	NJL600047021	0072470	395325	750704	3.4	BUST
4094	MOBIL SERVICE STATION BROOKLAWN BOROUGH	KINGS HWY & BROWNING RD	BROOKLAWN BOROUGH	CAMDEN	NJL600152730	0231626	395325	750704	3.4	BUST
4095	TEXACO SERVICE STATION BROOKLAWN BOROUGH	KINGS HWY & BROWNING RD	BROOKLAWN BOROUGH	CAMDEN	NJD986580660	0074450	395325	750704	3.4	BUST
4096	AMOCO SERVICE STATION CAMDEN CITY	1901 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJL000064899	0016085	395622	750538	0.5	BUST
4097	CAMDEN PAPERBOARD CORPORATION	267 JEFFERSON AVE	CAMDEN CITY	CAMDEN	NJL600202543	0137009	395510	750726	1.7	BUST
4098	CAMDEN PROPERTIES CORPORATION	STATE ST & RIVER RD	CAMDEN CITY	CAMDEN	NJL000042952	0242255	395656	750601	0.7	BUST
4099	CAMPBELL SOUP COMPANY	CAMPBELL PL	CAMDEN CITY	CAMDEN	NJD001288042	0024734	395659	750740	1.4	BUST
4100	EXXON SERVICE STATION CAMDEN CITY	1839 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJD986610681	0078258	395624	750542	0.5	BUST

SITE#	NAME	ADDRESS	MUN	COUNTY	CSL#	CASE#	LAT	LON	DISTANCE	CONTAC
4101	LANNING SQUARE ELEMENTARY SCHOOL	5TH & BERKLEY STS	CAMDEN CITY	CAMDEN	NJL600218226	0245650	395621	750714	0.9	BUST
4102	MAGNETIC METALS CORPORATION	21ST ST & HAYES AVE	CAMDEN CITY	CAMDEN	NJD002334084	8909205F01	395706	750546	1.0	BUST
4103	MERIT SERVICE STATION CAMDEN CITY	1420 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJD982185316	0091307	395630	750615	0.2	BUST
4104	MOBIL SERVICE STATION CAMDEN CITY	2213 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJD981875321	950110151201	395616	750525	0.7	BUST
4106	OUR LADY OF LOURDES MEDICAL CENTER	1600 HADDON AVE	CAMDEN CITY	CAMDEN	NJD071457295	0108678	395536	750541	1.0	BUST
4107	PALKO DESIGNS & MANUFACTURING INC	5 LINDEN ST	CAMDEN CITY	CAMDEN	NJL600135487	0209423	395701	750736	1.4	BUST
4108	SHELL SERVICE STATION CAMDEN CITY	1033 KAIGHN AVE	CAMDEN CITY	CAMDEN	NJD986572873	0076214	395605	750641	0.5	BUST
4109	SHELL SERVICE STATION CAMDEN CITY	2361 ADMIRAL WILSON BLVD	CAMDEN CITY	CAMDEN	NJD986593481	0076223	395614	750521	0.8	BUST
4110	THE GARAGE	MARLTON PK & BAIRD BLVD (245 MARLTON PK)	CAMDEN CITY	CAMDEN	NJL600168504	0266998	395660	750523	1.1	BUST
4111	AMOCO SERVICE STATION CHERRY HILL TWP	1510 RTE 38	CHERRY HILL TOWNSHIP	CAMDEN	NJD986598183	0140456	395552	750130	4.2	BUST
4114	CASINO LIMOUSINE SERVICE	615 CHAPEL AVE E	CHERRY HILL TOWNSHIP	CAMDEN	NJL800053365	941185	395630	750227	3.3	BUST
4117	CITGO SERVICE STATION CHERRY HILL TWP	514 HADDONFIELD RD	CHERRY HILL TOWNSHIP	CAMDEN	NJL800058364	0301448	395624	750146	3.9	BUST
4121	DELCREST MEDICAL PRODUCTS & SERVICE CO	800 RTE 38	CHERRY HILL TOWNSHIP	CAMDEN	NJL600157135	0237026	395611	750240	3.1	BUST
4126	EXXON SERVICE STATION CHERRY HILL TWP	RTE 70 & SPRINGDALE RD	CHERRY HILL TOWNSHIP	CAMDEN	NJD981182512	0078267	395552	750130	4.2	BUST
4127	GARDEN STATE RACE TRACK	RTE 70 & HADDONFIELD RD	CHERRY HILL TOWNSHIP	CAMDEN	NJL600074652	0118668	395552	750130	4.2	BUST
4128	GE GOVERNMENT SERVICES	RTE 38 & HADDONFIELD RD	CHERRY HILL TOWNSHIP	CAMDEN	NJL600141444	0217190	395552	750130	4.2	BUST
4130	LOCUSTWOOD CEMETERY ASSOCIATION	RTE 70 W	CHERRY HILL TOWNSHIP	CAMDEN	NJL600130645	0203375	395552	750130	4.2	BUST
4131	MCDONNELL DOUGLAS TRUCK SERVICES	2374 MARLTON PK W	CHERRY HILL TOWNSHIP	CAMDEN	NJD070285408	0032591	395545	750331	2.5	BUST
4133	MOBIL SERVICE STATION CHERRY HILL TWP	1498 RTE 561	CHERRY HILL TOWNSHIP	CAMDEN	NJD986568053	0062499	395552	750130	4.2	BUST
4134	MOBIL SERVICE STATION CHERRY HILL TWP	CHURCH & HADDONFIELD RDS	CHERRY HILL TOWNSHIP	CAMDEN	NJD986604056	0163497	395648	750141	4.0	BUST
4135	MOBIL SERVICE STATION CHERRY HILL TWP	HADDONFIELD RD & CHAPEL AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJD986609956	0062525	395604	750150	3.9	BUST
4136	MOBIL SERVICE STATION CHERRY HILL TWP	RTE 38 & CHAPEL AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJD986604189	0062480	395552	750130	4.2	BUST
4137	MOBIL SERVICE STATION CHERRY HILL TWP	RTE 70 & GEORGIA AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJP000887398	0085412	395552	750130	4.2	BUST
4138	NJ DEPT OF MILITARY & VETERANS AFFAIRS	GROVE ST & PARK BLVD	CHERRY HILL TOWNSHIP	CAMDEN	NJD980790794	0006608	395503	750204	3.9	BUST
4140	SERVICE STATION CHERRY HILL TOWNSHIP	2025 RTE 70 & WASHINGTON AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJL600038848	0060257	395552	750130	4.2	BUST
4144	SUNOCO SERVICE STATION CHERRY HILL TWP	RTE 70 & GRAYDON AVE	CHERRY HILL TOWNSHIP	CAMDEN	NJL600102776	0164649	395552	750130	4.2	BUST
4145	SUNOCO SERVICE STATION CHERRY HILL TWP	RTE 70 & MERCER ST	CHERRY HILL TOWNSHIP	CAMDEN	NJD986572212	0145749	395552	750130	4.2	BUST
4146	TEXACO SERVICE STATION CHERRY HILL TWP	798 BERLIN HADDONFIELD RD	CHERRY HILL TOWNSHIP	CAMDEN	NJD986580330	0059286	395552	750130	4.2	BUST
4147	UHR ELECTRIC SUPPLY COMPANY INCORPORATED	1641 E MARLTON PK	CHERRY HILL TOWNSHIP	CAMDEN	NJL600155642	0235244	395552	750130	4.2	BUST
4151	CRESTWOOD MOTORS	RTE 130 & HADDON AVE	COLLINGSWOOD BOROUGH	CAMDEN	NJL600099899	0159104	395456	750343	2.7	BUST
4152	EXXON SERVICE STATION COLLINGSWOOD BORO	HADDON & BRYANT AVES	COLLINGSWOOD BOROUGH	CAMDEN	NJL600050611	0078762	395447	750329	3.0	BUST
4153	FIRST UNITED METHODIST CHURCH	DAYTON & PARK AVES	COLLINGSWOOD BOROUGH	CAMDEN	NJL800080921	0250102	395449	750409	2.5	BUST
4154	SERVICE STATION COLLINGSWOOD BOROUGH	RTE 130 & HARRISON AVE	COLLINGSWOOD BOROUGH	CAMDEN	NJL800072423	0073406	395456	750343	2.7	BUST
4155	WHISTLE CLEAN	RTE 130 & CLAY AVE	COLLINGSWOOD BOROUGH	CAMDEN	NJL600026512	0040565	395456	750343	2.7	BUST
4158	SHELL SERVICE STATION GLOUCESTER CITY	CRESCENT BLVD & NICHOLSON RD	GLOUCESTER CITY	CAMDEN	NJD982279499	0076395	395341	750606	3.0	BUST
4159	WAREHOUSE 1331	1331 RTE 130	GLOUCESTER CITY	CAMDEN	NJL600133029	0206273	395325	750704	3.4	BUST
4170	DISTRIBUTION CENTER	514 ATLANTIC AVE W	HADDON HEIGHTS BOROUGH	CAMDEN	NJL600023063	0035372	395243	750320	4.9	BUST
4171	HADDON HEIGHTS AMBULANCE CORPS	1400 KINGS HWY	HADDON HEIGHTS BOROUGH	CAMDEN	NJL600004972	0007526	395253	750435	4.2	BUST
4173	COTTMAN TRANSMISSION	400 BLACK HORSE PK	HADDON TOWNSHIP	CAMDEN	NJL600164743	0249762	395341	750530	3.1	BUST
4174	DILISIO SONS	HADDON & ALBERTSON AVES	HADDON TOWNSHIP	CAMDEN	NJL600038350	0059484	395442	750311	3.3	BUST
4175	MOBIL SERVICE STATION HADDON TOWNSHIP	2 HADDON AVE & CUTHBERT BLVD	HADDON TOWNSHIP	CAMDEN	NJL600040372	0062471	395446	750325	3.1	BUST
4176	MORGAN BROTHERS	288 HIGHLAND AVE	HADDON TOWNSHIP	CAMDEN	NJL600141865	0217758	395436	750250	3.6	BUST
4177	SHELL SERVICE STATION HADDON TOWNSHIP	309 HADDON AVE	HADDON TOWNSHIP	CAMDEN	NJD986596047	0076403	395507	750436	2.0	BUST
4178	HUTCHINSON PLUMBING	701 HADDON AVE	HADDONFIELD BOROUGH	CAMDEN	NJD002495455	0185619	395416	750229	4.1	BUST
4193	SHELL SERVICE STATION MERCHANTVILLE BORO	MAPLE & CHAPEL AVES	MERCHANTVILLE BOROUGH	CAMDEN	NJD981487481	0076458	395700	750306	2.9	BUST
4194	EXXON SERVICE STATION MOUNT EPHRAIM BORO	BLACK HORSE PK	MOUNT EPHRAIM BOROUGH	CAMDEN	NJD986610814	0078618	395304	750534	3.8	BUST
4195	MERIT OIL CORPORATION	BLACK HORSE PK & KINGS HWY	MOUNT EPHRAIM BOROUGH	CAMDEN	NJD982185332	0091271	395253	750509	4.1	BUST
4196	MOBIL SERVICE STATION MOUNT EPHRAIM BORO	6 BLACK HORSE PK & KINGS HWY	MOUNT EPHRAIM BOROUGH	CAMDEN	NJD986605574	0062444	395253	750509	4.1	BUST
4197	OAKLYN BOROUGH PUBLIC SCHOOL	KENDALL BLVD	OAKLYN BOROUGH	CAMDEN	NJC876008970	0127703	395427	750504	2.4	BUST
4198	TEXACO SERVICE STATION OAKLYN BOROUGH	RTE 30 & COLLINGSWOOD AVE	OAKLYN BOROUGH	CAMDEN	NJL000042390	0159357	395427	750504	2.4	BUST
4199	AMOCO SERVICE STATION PENNSAUKEN TWP	7955 CRESCENT BLVD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986606366	0104159	395541	750500	1.3	BUST
4200	CJ OSBORN COMPANY	820 SHERMAN AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600020622	0031835	395830	750332	3.4	BUST
4201	DELAWARE RIVER PORT AUTHORITY	BEN FRANKLIN BRIDGE PLZA	PENNSAUKEN TOWNSHIP	CAMDEN	NJD981489941	0244596	395660	750712	1.1	BUST
4202	DELAWARE RIVER PORT AUTHORITY	BETSY ROSS BRIDGE PLZA	PENNSAUKEN TOWNSHIP	CAMDEN	NJD981490584	0244613	395841	750256	4.0	BUST
4203	DISMAR CORPORATION	4415 MARLTON PK	PENNSAUKEN TOWNSHIP	CAMDEN	NJD048590087	0005861	395825	750332	3.4	BUST
4204	EXXON SERVICE STATION PENNSAUKEN TWP	7801 MAPLE AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986607729	0078221	395825	750332	3.4	BUST

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4205	FRIEDMANS EXPRESS INCORPORATED	9101 RIVER RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986597680	0180966	395917	750238	4.6	BUST
4206	HERTZ EQUIPMENT RENTAL CORPORATION	2020 HYLTON RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600072433	0115021	395825	750332	3.4	BUST
4207	HESS SERVICE STATION PENNSAUKEN TOWNSHIP	RTE 38 W	PENNSAUKEN TOWNSHIP	CAMDEN	NJP000875708	0084044	395825	750332	3.4	BUST
4208	KOU KAP PARTNERS (QUAKER TOOLS)	7215 MAPLE AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600146419	0223427	395707	750205	3.8	BUST
4209	LIFE SUPPORT AMBULANCE	5050 CENTRAL HWY	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600155782	0235424	395550	750414	1.9	BUST
4210	OVERNITE TRANSPORTATION COMPANY	1215 SHERMAN AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600247571	0025733	395822	750322	3.4	BUST
4211	R MCALLISTER FUELS COMPANY	7116 PARK AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJD011433000	0101206	395723	750221	3.6	BUST
4212	SAFETY BUS SERVICE	7200 PARK AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJP000878157	0023735	395726	750218	3.7	BUST
4213	SHELL SERVICE STATION PENNSAUKEN TWP	4920 RTE 130 & BROWNING RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986594406	0065883	395825	750332	3.4	BUST
4214	SHELL SERVICE STATION PENNSAUKEN TWP	6501 PARK AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJD986594414	0076377	395714	750238	3.3	BUST
4215	STAR ENTERPRISE PENNSAUKEN SALES TERM	401 COVE RD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD069047967	0015329	395826	750428	2.9	BUST
4216	SUPER TIRE SERVICES INCORPORATED	7255 CRESCENT BLVD	PENNSAUKEN TOWNSHIP	CAMDEN	NJD002504215	9403112	395811	750238	3.8	BUST
4217	TEXACO SERVICE STATION PENNSAUKEN TWP	5420 RTE 38 & DREXEL AVE	PENNSAUKEN TOWNSHIP	CAMDEN	NJL600203970	0172983	395825	750332	3.4	BUST
4228	TAVISTOCK COUNTRY CLUB	TAVISTOCK LN	TAVISTOCK BOROUGH	CAMDEN	NJL600202261	0127523	395337	750219	4.6	BUST
4247	MERIT OIL CORPORATION	MT EPHRAIM & FERRY AVES	WOODLYNNE BOROUGH	CAMDEN	NJD982185324	0091280	395505	750605	1.4	BUST
6253	602 PARK AVENUE	602 PARK AVE	COLLINGSWOOD BOROUGH	CAMDEN	NJL800117087	950309095037	395451	750416	2.4	CEHA
6254	MAPLEVIEW APARTMENTS	50 MAPLE AVE	MERCHANTVILLE BOROUGH	CAMDEN	NJL800116212	950302093000	395660	750257	3.0	CEHA
6276	CONSOLIDATED CHEMX CORPORATION	4TH ST & JEFFERSON AVE	CAMDEN CITY	CAMDEN	NJL000071647	9501136	395510	750716	1.6	EPA

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NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
10029W	WEYERHAEUSER PAPER COMPANY	3105360	1	395200	750250	F	5.8	07	03	285	GKMR		125
10063W	GLOUCESTER CITY BD. OF ED.	3104482	1	395300	750645	F	3.9	07	14	118	GKMR		290
10064W	OUR LADY OF LOURDES MED. CENT.	3104620	1	395532	750525	F	1.2	07	08	257	GKMR		250
10221W	HADDON TOWNSHIP BOARD OF ED.	3104986	1	395405	750318	T	3.7	07	16	165	GKMR		100
10250W	BISHOP EUSTACE PREP SCHOOL	3117884	1	395547	750413	T	1.9	07	27	150	GKMR		200
10372W	DY-DEE SERVICE	3105138	1	395444	750309	F	3.3	07	16	451	GKMR		300
10434W	GARDEN STATE RACE TRACK, INC.	5100094	1	395514	750213	U	3.7	07	09	154	GKMR		300
	GARDEN STATE RACE TRACK, INC.	5100095	2	395601	750156	U	3.8	07	09	150	GKMR		400
10465W	KOCH MATERIALS COMPANY	DELAWARE	RIVER	395750	750500	F	2.0	07	27		SDDEL		
10549W	SYCAMORE RIDGE APARTMENTS	3128806	2	395725	750155	T	4.0	07	27	200	GKMR		35
	SYCAMORE RIDGE APARTMENTS	3128807	3	395725	750155	T	4.0	07	27	200	GKMR		35
10677W	CHERRY HILL SCHOOL DISTRICT	3137393	1	395342	750128		5.2	07	09	184	GKR		162
10723W	NJ DEPT. MILITARY & VETRANS	3102680	1	395615	750250	F	3.0	07	09	111	GKMR		150
2038P	GENERAL COLOR CO.	3119275	7	395735	750535		1.5	07	08	194	GKR		180
	GENERAL COLOR CO.	3105064	6	395718	750507		1.5	07	08	184	GKR		0
2148P	MAFCO WORLWIDE CORPORATION	3100290	1	395507	750729	F	1.8	07	08	103	GKMR		300
	MAFCO WORLWIDE CORPORATION	DELAWARE RIVER		395506	750740	U	1.9	07	08		SDDEL		
	MAFCO WORLWIDE CORPORATION	3142789	3R	395508	750740	U	1.9	07	08	149	GKMR		350
2165P	GLOUCESTER TITANIUM CO/VIACOM	3106642	1R	395314	750748	F	3.8	07	14	261	GKR		600
	GLOUCESTER TITANIUM CO/VIACOM	3101210	2	395308	750757	F	4.0	07	14	280	GKR		600
	GLOUCESTER TITANIUM CO/VIACOM	3103401	3	395313	750804	F	3.9	07	14	255	GKR		600
	GLOUCESTER TITANIUM CO/VIACOM	3103402	4	395308	750743	F	3.9	07	14	281	GKR		600
	GLOUCESTER TITANIUM CO/VIACOM	3104454	5	395308	750750	F	3.9	07	14	274	GKR		600
	GLOUCESTER TITANIUM CO/VIACOM	BIG TIMBER CR.		395308	750800	U	4.0	07	14		SDBIG		
2205P	COASTAL EAGLE POINT OIL CO.	3100007	1	395217	750913	1	5.3	15	20	288	GKP		900
	COASTAL EAGLE POINT OIL CO.	3100008	3	395223	750918	1	5.3	15	20	288	GKP		600
	COASTAL EAGLE POINT OIL CO.	3110647	4A	395216	750937	1	5.5	15	20	296	GKP		1000
	COASTAL EAGLE POINT OIL CO.	3100028	5	395221	750854	1	5.1	15	20	283	GKP		0
	COASTAL EAGLE POINT OIL CO.	3106834	7	395200	750948	1	5.9	15	20	306	GKP		1000
	COASTAL EAGLE POINT OIL CO.	3121839	110-1	395214	750935	S	5.5	15	20	14.1	GKM		25
	COASTAL EAGLE POINT OIL CO.	3123044	MW-143-1	395230	750827	S	4.8	15	20	17	GKM		25
	COASTAL EAGLE POINT OIL CO.		LC-1	395223	750913	U	5.2	15	20	21.7	GKM		25
	COASTAL EAGLE POINT OIL CO.		LC-2	395223	750913	U	5.2	15	20	26.8	GKM		25
	COASTAL EAGLE POINT OIL CO.		LC-3	395221	750917	U	5.3	15	20	16.6	GKM		25
	COASTAL EAGLE POINT OIL CO.		LC-4	395221	750917	U	5.3	15	20	16.7	GKM		25
	COASTAL EAGLE POINT OIL CO.		S-1	395216	750913	U	5.3	15	20	12.1	GKM		25
	COASTAL EAGLE POINT OIL CO.		S-3	395212	750911	U	5.4	15	20	16.2	GKM		25
	COASTAL EAGLE POINT OIL CO.		S-4	395213	750990	U	6.0	15	20	16.3	GKM		25
	COASTAL EAGLE POINT OIL CO.		CC-1	395224	750851	U	5.1	15	20	10	GKM		25
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	DOCK(1ARW)	395242	750913	U	4.9	15	20		SDDEL		2500
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	4(45W)	395217	750912	U	5.3	15	20		SDDEL		2000
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	3(35W)	395217	750912	U	5.3	15	20		SDDEL		2000
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	5 (55W)	395217	750912	U	5.3	15	20		SDDEL		2000
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	FIRE1 (1FW	395217	750912	U	5.3	15	20		SDDEL		500
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	FIRE2 (2FW	395217	750912	U	5.3	15	20		SDDEL		1500
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	FIRE 6 6FW	395217	750912	U	5.3	15	20		SDDEL		1500
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	FIRE 7 (7F	395217	750912	U	5.3	15	20		SDDEL		2500
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	COGEN 1	395217	750912	U	5.3	15	20		SDDEL		3200
	COASTAL EAGLE POINT OIL CO.	DELAWARE RIVER	COGEN 2	395217	750912	U	5.3	15	20		SDDEL		3200
2299P	TAVISTOCK COUNTRY CLUB	3105248	1	395230	750110		6.3	07	33	247	GKMR		300
	TAVISTOCK COUNTRY CLUB	POND 1	POND 1	395233	750118	T	6.1	07	33		GKET		1050
2365P	WHEELABRATOR GLOUCESTER CO. LP	DELAWARE RIVER	RM 94.5	395247	750832	T	4.5	20	15		SDDEL		
5004	EVESHAM M.U.A.	3106840	10	395239	750148	G	5.7	05	13	597	GKM		500
5010	GLOUCESTER CITY	3104306	WELL #40	395349	750651	G	2.9	07	14	262	GKP		1000
	GLOUCESTER CITY	3127737	WELL #41	395359	750654	T	2.8	07	14	269	GKP		1000

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
	GLOUCESTER CITY	3105242	WELL #42	395342	750652	G	3.1	07	14	306	GKP		1000
	GLOUCESTER CITY	3118822	WELL #43	395344	750654	G	3.0	07	14	260	GKP		1000
	GLOUCESTER CITY	3104903	REDRILLED	395358	750654	G	2.8				GKMR		
5030	BROOKLAWN BOROUGH WATER DEPT.	3104325	1	395241	750725	G	4.3	07	07	327	GKMR		300
	BROOKLAWN BOROUGH WATER DEPT.	3114471	3	395243	750729	G	4.3	07	07	320	GKMR		350
	BROOKLAWN BOROUGH WATER DEPT.	3119765	4	395247	750738	G	4.3	07	07	293	GKMR		350
5152	HADDONFIELD BOROUGH	3102570	1A	395322	750157	U	5.1	07	17	249	GKMR		1000
	HADDONFIELD BOROUGH	5100062	2	395319	750139	U	5.3	07	17	226	GKMR		
	HADDONFIELD BOROUGH	3102130	5	395318	750141	G	5.3	07	17	577	GKMR		1000
	HADDONFIELD BOROUGH	3109694	7	395321	750137	G	5.3	07	17	600	GKMR		1000
	HADDONFIELD BOROUGH	3105108	6	395317	750142	G	5.3	07	17	372	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105641	BROWNING1A	395622	750409	G	1.8	07	24	152	GKMR		875
	MERCHANTVILLE-PENNSAUKEN WATER	3104642	WOODBINE 1	395649	750313	G	2.7	07	24	288	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3114563	WOODBINE 2	395649	750318	G	2.6	07	24	227	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3101417	DEL GARD 2	395754	750411	G	2.6	07	27	147	GKMR		700
	MERCHANTVILLE-PENNSAUKEN WATER	3102915	MARION 1	395718	750224	G	3.5	07	27	280	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104641	MARION 2	395710	750221	G	3.5	07	27	262	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104836	BROWNING2A	395625	750407	G	1.9	07	27	140	GKMR		900
	MERCHANTVILLE-PENNSAUKEN WATER	3105110	NATL HWY 1	395852	750208	G	4.6	07	27	231	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100010	PARK AVE 1	395801	750114	G	4.8	07	27	274	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	5100064	PARK AVE 2	395801	750121	G	4.7	07	27	260	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3103534	PARK AVE 3	395757	750120	G	4.7	07	27	277	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100011	PARK AVE 5	395758	750128	G	4.6	07	27	290	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	3114564	PARK AVE 6	395753	750128	G	4.5	07	27	270	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3119207	NATL HWY 2	395902	750144	G	5.0	07	27	211	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3143933	BROWNING3A	395629	750411	G	1.8	07	27	196	GKMR		1000
5195	NEW JERSEY-AMERICAN WATER CO.	3104576	13HIGHLAND	395959	750042	G	6.4	05	08	197	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3104864	27HIGHLAND	400000	750043	G	6.4	05	08	176	GKMR		1000
5200	NEW JERSEY-AMERICAN WATER CO.	3101363	LAUREL 13	395440	750103	G	4.9	07	20	456	GKMR		700
5201	NEW JERSEY-AMERICAN WATER CO.	3103456	50	395723	750521	G	1.4	07	08	170	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3104780	51	395721	750509	G	1.5	07	08	192	GKMR		1300
	NEW JERSEY-AMERICAN WATER CO.	3104847	52	395714	750518	G	1.3	07	08	198	GKMR		1050
	NEW JERSEY-AMERICAN WATER CO.	3118947	53	395727	750503	G	1.7	07	08	194	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3118944	54	395730	750459	G	1.7	07	08	195	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3120270	55	395717	750515	G	1.4	07	08	176	GKMR		1050
5202	NEW JERSEY-AMERICAN WATER CO.	3101124	HADDON 14	395240	750324	G	4.9	07	18	598	GKMR		800
	NEW JERSEY-AMERICAN WATER CO.	3102434	HADDON 15	395237	750316	G	5.0	07	18	597	GKMR		800
	NEW JERSEY-AMERICAN WATER CO.	3103375	HADDON 20	395230	750312	G	5.1	07	18	267	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3104798	HADDON 30	395237	750317	G	5.0	07	18	279	GKMR		800
	NEW JERSEY-AMERICAN WATER CO.	3103308	EGBERT 18	395245	750436	G	4.4	07	18	190	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3105054	EGBERT 35	395246	750436	G	4.3	07	18	484	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3140970	HADDON 63	395217	750303	G	5.4	07	03	535	GKMR		1040
5203	NEW JERSEY-AMERICAN WATER CO.	3100684	ELLIS 13	395440	750103	G	4.9	07	09	527	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3103305	ELLIS 16	395439	750104	G	4.9	07	09	220	GKMR		1100
	NEW JERSEY-AMERICAN WATER CO.	3104098	ELLIS 23	395437	750104	G	4.9	07	09	378	GKMR		1200
5209	COLLINGSWOOD BOROUGH	3104053	2	395518	750433	G	1.9	07	12	281	GKMR		700
	COLLINGSWOOD BOROUGH	3104054	3	395521	750432	G	1.9	07	12	290	GKMR		800
	COLLINGSWOOD BOROUGH	5100030	4	395520	750435	G	1.9	07	12	304	GKMR		870
	COLLINGSWOOD BOROUGH	3100079	1	395514	750439	G	1.9	07	12	311	GKMR		650
	COLLINGSWOOD BOROUGH	5100031	5	395526	750428	G	1.9	07	12	281	GKMR		1000
	COLLINGSWOOD BOROUGH	3104799	6	395521	750439	T	1.8	07	12	312	GKMR		1000
	COLLINGSWOOD BOROUGH	3104797	7	395425	750516	G	2.4	07	12	318	GKMR		1000
	COLLINGSWOOD BOROUGH	NEWTON CREEK		395425	750515		2.4	07	12		*SDCQU		1000
5223	BELLMAWR BOROUGH	5100032	1	395221	750637	G	4.6	07	04	164	GKM		500
	BELLMAWR BOROUGH	3102687	3	395221	750637	G	4.6	07	04	359	GKR		800
	BELLMAWR BOROUGH	3119218	6	395219	750640	G	4.6	07	04	386	GKR		1000

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
5235	HADDON TOWNSHIP WATER DEPT.	3105243	1A	395406	750321	G	3.6	07	16	481	GKMR		870
	HADDON TOWNSHIP WATER DEPT.	3104855	4	395405	750334	G	3.5	07	16	448	GKMR		1000
	HADDON TOWNSHIP WATER DEPT.	3129099	2A	395402	750323	G	3.6	07	16	487	GKMR		800
	HADDON TOWNSHIP WATER DEPT.	3128896	3A	395400	750320	G	3.7	07	16	475	GKMR		750
5302	CAMDEN CITY, WATER DIVISION	5100050	MORRIS 1	395938	750220	F	5.1	07	27	107	GKMR		1600
	CAMDEN CITY, WATER DIVISION	3100945	MORRIS 3	395933	750231	F	4.9	07	27	107	GKMR		1800
	CAMDEN CITY, WATER DIVISION	3104252	MORRIS 4	395928	750253	F	4.6	07	27	134	GKMR		1600
	CAMDEN CITY, WATER DIVISION	5100051	MORRIS 6	395900	750320	F	4.0	07	27	138	GKMR		1700
	CAMDEN CITY, WATER DIVISION	5100052	MORRIS 7	395909	750315	F	4.2	07	27	125	GKMR		1680
	CAMDEN CITY, WATER DIVISION	3100944	MORRIS 8	395917	750304	F	4.4	07	27	128	GKMR		1670
	CAMDEN CITY, WATER DIVISION	3104251	MORRIS 10	395919	750302	F	4.4	07	27	118	GKMR		1400
	CAMDEN CITY, WATER DIVISION	5100076	MORRIS 9	395906	750313	F	4.1	07	27	148	GKMR		1670
	CAMDEN CITY, WATER DIVISION	3116814	MORRIS 12	395914	750324	F	4.2	07	27	122	GKMR		2030
	CAMDEN CITY, WATER DIVISION	3115745	MORRIS 11	395900	750325	F	3.9	07	27	149	GKMR		2030
	CAMDEN CITY, WATER DIVISION	3116813	MORRIS 13	395903	750328	F	4.0	07	27	135	GKMR		2060
	CAMDEN CITY, WATER DIVISION	5100053	DELAIR 1	395848	750347	F	3.6	07	27	141	GKMR		1680
	CAMDEN CITY, WATER DIVISION	5100054	DELAIR 2	395850	750348	F	3.6	07	27	146	GKMR		1830
	CAMDEN CITY, WATER DIVISION	5100055	DELAIR 3	395851	750344	F	3.6	07	27	135	GKMR		1830
	CAMDEN CITY, WATER DIVISION	5100056	PUCHACK 1	395844	750318	F	3.8	07	27	141	GKMR		1500
	CAMDEN CITY, WATER DIVISION	5100057	PUCHACK 2	395842	750314	F	3.8	07	27	169	GKMR		1000
	CAMDEN CITY, WATER DIVISION	5100058	PUCHACK 3	395839	750310	F	3.8	07	27	176	GKMR		1280
	CAMDEN CITY, WATER DIVISION	5100059	PUCHACK 5	395836	750307	F	3.8	07	27	186	GKMR		1324
	CAMDEN CITY, WATER DIVISION	3108526A	PUCHACK 7	395835	750304	F	3.8	07	27	180	GKMR		2260
	CAMDEN CITY, WATER DIVISION	5100060	CITY 7	395457	750640	F	1.6	07	08	163	GKMR		1500
	CAMDEN CITY, WATER DIVISION	5100061	CITY 11	395510	750640	F	1.4	07	08	159	GKMR		1010
	CAMDEN CITY, WATER DIVISION	3100904	CITY 13	395553	750538	F	0.7	07	08	230	GKMR		1200
	CAMDEN CITY, WATER DIVISION	3101250	CITY 17	395546	750533	F	0.9	07	08	270	GKMR		1500
	CAMDEN CITY, WATER DIVISION	3109574	CITY 18	395549	750537	F	0.8	07	08	290	GKMR		1200
	CAMDEN CITY, WATER DIVISION	3104649	CITY 5	395457	750640		1.6	07	08	171	GKMR		1100
5319	WESTVILLE BOROUGH	3103418	4	395220	750737	G	4.7	15	21	313	GKMR		750
	WESTVILLE BOROUGH	3105689	5	395215	750740	G	4.8	15	21	274	GKMR		1000
	WESTVILLE BOROUGH	3117923	6	395222	750736	G	4.7	15	21	317	GKMR		1000
CD061R	MONAUGHTON NURSERIES	3147127	WELL 1	395546	750119	F	4.4	07	09	270	GTCH		150

Number of Observations: 144

KEY FOR KNOWN CONTAMINATED SITE LIST CASES

The Contaminated Site List contains the following fields:

SITE #:	Site number assigned by Bureau of Water Allocation for map identification purposes only
NAME:	Name of site
ADDRESS:	Street Address
MUN:	Municipality name
COUNTY:	County Name
CSL #:	Comprehensive Site List number assigned by the Department to each site
CASE #:	Number assigned by the specific Site Remediation Bureau working on the case
LAT:	Latitude of site
LON:	Longitude of site
DISTANCE:	Distance in miles from center of circle
CONTACT:	Department of Environmental Protection lead agency

The data in this listing is from the Department of Environmental Protection's known contaminated case file. The actual transfer date is printed on the left side of the enclosed map. As the identification (and in some instances, creation) of hazardous waste sites is an on-going process, it should be emphasized that this information is not intended to be a complete survey of hazardous waste sites in the area. Locational accuracy varies, sites are located by several different methods including GPS, survey, address matching and zip code centroid. Recognizing the fact that this list may contain errors and omissions, it is advisable to use this resource as a guide and to verify all information.

If you have any questions regarding a specific case site please call or write to the lead contact agency. Agency codes are listed below:

BAC:	Bureau of Applicability and Compliance
BC:	Bureau of Construction
BEECRA:	Bureau of Environmental Evaluation, Clean-up and Responsible Assessment
BER:	Bureau of Emergency Response
BFO:	Bureau of Field Operations
BFCM:	Bureau of Federal Case Management
BSCM:	Bureau of State Case Management
BSM:	Bureau of Site Management
BUST:	Bureau of Underground Storage Tanks
CEHA:	County Environmental Health Act

SITE REMEDIATION PROGRAM QUESTIONS SHOULD BE DIRECTED TO:

GENERAL INFORMATION: (609) 292-9120

DESCRIPTION OF WATER WITHDRAWAL POINTS

The Water Withdrawal Points listing contains the following fields:

CAPACITY:	The pump capacity in gallons per minute
COUNTY:	County the withdrawal point is in
DEPTH:	Depth of the well or pond
DISTANCE:	Distance in miles from center of circle
GEO1:	The ground or surface water source
GEO2:	A secondary source of the water
LAT:	Latitude of the withdrawal point
LLACC:	Accuracy of the latitude and longitude estimates
LOCID:	The local identification of the withdrawal point, or a continuation of the SOURCEID field for surface water
LON:	Longitude of the withdrawal point
MUN:	The municipality the withdrawal point is in
NAME:	Name of the permit, certificate, or registration holder
NUMBER:	Water Allocation Permit, Agricultural Certification, or Registration number
SOURCEID:	The well permit number or other identifier for the water withdrawal

The listing that you have requested includes most wells and surface intakes that are in the Water Allocation Permits, Water Use Registrations, and representative sources from most of the Agricultural Certificates. Recognizing the fact that the list will contain errors and omissions, it is advisable to use this resource as a guide and to verify all data. We try to maintain an accurate database; however, we can not yet guarantee reliability. If you spot any errors we would be very grateful to hear about them. Please call or write to us in reference to the "Radius Program" at:

NJDEP
Water Supply Element
Bureau of Water Allocation
CN-426
Trenton, New Jersey 08625-0426

(609)292-2957

Thank you.

Please see the attached sheets for definitions of the codes used in the Water Withdrawal Points listing.

CODES USED IN THE WATER WITHDRAWAL POINTS LISTING

This packet contains information on the database codes that the Bureau of Water Allocation uses in the Water Withdrawal Points Listing.

COUNTY:	01 - Atlantic	15 - Gloucester	29 - Ocean
	03 - Bergen	17 - Hudson	31 - Passaic
	05 - Burlington	19 - Hunterdon	33 - Salem
	07 - Camden	21 - Mercer	35 - Somerset
	09 - Cape May	23 - Middlesex	37 - Sussex
	11 - Cumberland	25 - Monmouth	39 - Union
	13 - Essex	27 - Morris	41 - Warren

GEO:	RECENT	
	Surficial Deposits	GRS
	PLEISTOCENE	
	Glacial Undifferentiated	GQGU
	Stratified Drift	GQSD
	Terminal Moraine	GQTM
	Bridgeton	GQBS
	Cape May	GQCM
	Holly Beach Mbr.	GQCHB
	Estuarine Sand	GQES
	Pennsauken	GQPS
	TERTIARY	
	Beacon Hill	GTBH
	Cohansey	GTCH
	Cohansey & Kirkwood	GTCK
	Kirkwood	GTKW
	Upper	GTKWU
	Rio Grande	GTKRG
	Lower	GTKWL
	Piney Point Mbr.	GTKPP
	Shark River Marl	GTSR
	Manasquan Marl	GTMQ
	Vincentown Sand	GTVT
	Hornerstown Marl	GTHT
	CRETACEOUS	
	Red Bank	GKRB
	Navesink	GKNS
	Mount Laurel	GKML
	Wenonah	GKWE
	Mount Laurel & Wenonah	GKMW
	Marshalltown	GKMT
	Englishtown	GKET
	Woodbury	GKWB
	Merchantville	GKMV
	Magothy	GKM

Old Bridge	GKROB
Raritan	GKR
Sayreville Sand	GKRSS
Farrington	GKRF
Raritan/Magothy	GKMR
Potomac	GKP
TRIASSIC	
Brunswick Formation	GTRB
Lockatong Formation	GTRL
Stockton Formation	GTRS
Basalt	GTRBS
Diabase	GTRDB
Conglomerate	GTRCG
DEVONIAN	
Undifferentiated	GD
SILURIAN	
Bossardville Limestone	GSBD
Decker Formation	GSDK
Longwood Shale	GSLS
Poxono Island Fm	GSPI
Greenpond Conglomerate	GSGP
High Falls	GSHF
Shawangunk Fm	GSSG
ORDOVICIAN	
Martinsburg Fm	GOMB
Jacksonburg Fm	GOJB
Kittatinny Group	GOK
Outleaunee Fm	GOKO
Harmonyvale Mbr	GOKOH
Beaver Run Mbr	GOKOB
Epler	GOKE
Rickenbach	GOKR
CAMBRO ORDOVICIAN	
Kittatinny Fm	GCOK
CAMBRIAN	
Hardyston Quartzite	GCH
Allentown Fm	GCKA
Upper Mbr	GCKU
Limeport Mbr	GCKLP
Leithsville Fm	GCKL
Walkill Mbr	GCKLW
Hamburg Mbr	GCKLH
Califon Mbr	GCKLC
PRECAMBRIAN	
Granite	GPCGR
Gneiss	GPCGN
Undifferentiated	GPC

Franklin Lms	GPCFL
DELAWARE RIVER BASIN	
Unknown or Non-Specific	SD
Alloways Creek	SDALL
Alexsocken Creek	SDALE
Assiscunk Creek	SDASC
Assunpink Creek	SDASP
Big Timber Creek	SDBIG
Blacks Creek	SDBLA
Cooper's Creek	SDCOO
Crafts Creek	SDCRA
Crosswicks Creek	SDCRO
Delaware River	SDDEL
Flat Brook	SDFLA
Hakihokake Creek	SDHAK
Harihokake Creek	SDHAR
Jacob's Creek	SDJAC
Lockatong Creek	SDLOC
Lopatcong Creek	SDLOP
Mantua Creek	SDMNT
Musconetcong River	SDMUS
Nichisakawick Creek	SDNIC
Old Man's Creek	SDOLD
Paulins Kill	SDPAU
Pennsauken Creek	SDPEN
Pequest River	SDPST
Pohatcong Creek	SDPOH
Raccoon Creek	SDRAC
Rancocas Creek	SDRAN
Salem River	SDSAL
Wickecheoke Creek	SDWIC
RARITAN RIVER BASIN	
Unknown or Non-Specific	SR
Lawrence Brook	SRLAW
Lower Raritan	SRLOW
Millstone River	SRMIL
North Branch Raritan	SRNBR
South Branch Raritan	SRSBR
South River	SRSRV
PASSAIC RIVER BASIN	
Unknown or Non-Specific	SP
Canoe Brook	SPCAN
Lower Mid-Passaic River	SPLMP
Lower Passaic	SPLOW
Passaic River	SPPAS
Peckman River	SPPEC
Pequannock River	SPPNK
Pompton River	SPPOM
Ramapo River	SPRAM
Rockaway River	SPROC
Saddle River	SPSAD

Upper Mid-Passaic River	SPUMP
Upper Passaic River	SPUPP
Wanaque River	SPWAN
Whippany River	SPWHI
ATLANTIC COASTAL BASIN	
Unknown or Non-Specific	SC
Atlantic County Coastal	SCATL
Cape May County Coastal	SCCAP
Cedar Creek	SCCED
Great Egg Harbor River	SCGRE
Manasquan River	SCMSQ
Metedeconk River	SCMET
Monmouth County Coastal	SCMON
Mullica River	SCMUL
Navesink River	SCNAV
Ocean County Coastal	SCOCE
Raritan Bay	SCRAR
Shark River	SCSHA
Shrewsbury River	SCSHR
Toms River	SCTOM
Tuckahoe River	SCTUC
HUDSON RIVER BASIN	
Unknown or Non-Specific	SH
Hudson River	SHHUD
Papakating Creek	SHPAP
Pochuck Creek	SHPOC
Wallkill River	SHWAL
HACKENSACK RIVER BASIN	
Unknown or Non-Specific	SK
Hackensack River	SKHAC
RAHWAY RIVER BASIN	
Unknown or Non-Specific	SY
Rahway River	SYRAH
ELIZABETH RIVER BASIN	
Unknown or Non-Specific	SE
Elizabeth River	SEELI
DELAWARE BAY BASIN	
Unknown or Non-Specific	SB
Cohansey River	SBCOH
Maurice River	SBMAU
Stow Creek	SBSTO

LLACC:

S - accurate to +- 1 second
F - accurate to +- 5 seconds
T - accurate to +- 10 seconds
M - accurate to +- 1 minute
U - accuracy unknown

MUN: ATLANTIC COUNTY (01)

01 - Absecon City
02 - Atlantic City
03 - Brigantine City
04 - Buena Boro
05 - Buena Vista Twp
06 - Corbin City
07 - Egg Harbor City
08 - Egg Harbor Twp
09 - Estell Manor City
10 - Folsom Boro
11 - Galloway Twp
12 - Hamilton Twp
13 - Hammonton Town
14 - Linwood City
15 - Longport Boro
16 - Margate City
17 - Mullica Twp
18 - Northfield City
19 - Pleasantville City
20 - Port Republic City
21 - Somers Point City
22 - Ventnor City
23 - Weymouth Twp

BERGEN COUNTY (03)

01 - Allendale Boro
02 - Alpine Boro
03 - Bergenfield Boro
04 - Bogota Boro
05 - Carlstadt Boro
06 - Cliffside Park Boro
07 - Closter Boro
08 - Cresskill Boro
09 - Demarest Boro
10 - Dumont Boro
12 - East Rutherford Boro
13 - Edgewater Boro
11 - Elmwood Park Boro
14 - Emerson Boro
15 - Englewood City
16 - Englewood Cliffs Boro
17 - Fair Lawn Boro
18 - Fairview Boro
19 - Fort Lee Boro
20 - Franklin Lakes Boro
21 - Garfield Boro
22 - Glen Rock Boro
23 - Hackensack City
24 - Harrington Park Boro
25 - Hasbrouck Heights Boro
26 - Haworth Boro
27 - Hillsdale Boro
28 - Hohokus Boro
29 - Leonia Boro
30 - Little Ferry Boro
31 - Lodi Boro
32 - Lyndhurst Twp
33 - Mahwah Twp
34 - Maywood Boro
35 - Midland Park Boro
36 - Montvale Boro
37 - Moonachie Boro
38 - New Milford Boro
39 - North Arlington Boro
40 - Northvale Boro
41 - Norwood Boro
42 - Oakland Boro
43 - Old Tappan Boro
44 - Oradell Boro
45 - Palisades Park Boro
46 - Paramus Boro
47 - Park Ridge Boro
48 - Ramsey Boro
49 - Ridgefield Boro
50 - Ridgefield Park Village
51 - Ridgewood Village
52 - River Edge Boro
53 - River Vale Twp
54 - Rochelle Park Twp
55 - Rockleigh Boro
56 - Rutherford Boro
57 - Saddle Brook Twp
58 - Saddle River Boro
59 - South Hackensack Twp
60 - Teaneck Twp
61 - Tenafly Boro
62 - Teterboro Boro
63 - Upper Saddle River Boro
64 - Waldwick Boro
65 - Wallington Boro
66 - Washington Twp
67 - Westwood Boro
68 - Wood-Ridge Boro
69 - Woodcliff Lake Boro
70 - Wyckoff Twp

BURLINGTON COUNTY (05)

01 - Bass River Twp
02 - Beverly City
03 - Bordentown City
04 - Bordentown Twp

05 - Burlington City
06 - Burlington Twp
07 - Chesterfield Twp
08 - Cinnaminson Twp
09 - Delanco Twp
10 - Delran Twp
11 - Eastampton Twp
12 - Edgewater Park Twp
13 - Evesham Twp
14 - Fieldsboro Boro
15 - Florence Twp
16 - Hainesport Twp
17 - Lumberton Twp
18 - Mansfield Twp
19 - Maple Shade Twp
20 - Medford Lakes Boro
21 - Medford Twp
22 - Moorestown Twp
23 - Mount Holly Twp
24 - Mount Laurel Twp
25 - New Hanover Twp
26 - North Hanover Twp
27 - Palmyra Boro
28 - Pemberton Boro
29 - Pemberton Twp
30 - Riverside Twp
31 - Riverton Boro
32 - Shamong Twp
33 - Southampton Twp
34 - Springfield Twp
35 - Tabernacle Twp
36 - Washington Twp
37 - Westampton Twp
38 - Willingboro Twp
39 - Woodland Twp
40 - Wrightstown

CAMDEN COUNTY (07)

01 - Audubon Boro
02 - Audubon Park Boro
03 - Barrington Boro
04 - Bellmawr Boro
05 - Berlin Boro
06 - Berlin Twp
07 - Brooklawn Boro
08 - Camden City
09 - Cherry Hill Twp
10 - Chesilhurst Boro
11 - Clementon Boro
12 - Collingswood Boro
13 - Gibbsboro Boro
14 - Gloucester City
15 - Gloucester Twp
18 - Haddon Heights Boro
16 - Haddon Twp
17 - Haddonfield Boro
19 - Hi-Nella Boro
20 - Laurel Springs Boro
21 - Lawnside Boro
22 - Lindenwold Boro
23 - Magnolia Boro
24 - Merchantville Boro
25 - Mount Ephraim Boro
26 - Oaklyn Boro
27 - Pennsauken Twp
28 - Pine Hill Boro
29 - Pine Valley Boro
30 - Runnemede Boro
31 - Somerdale Boro
32 - Stratford Boro
33 - Tavistock Boro
34 - Voorhees Twp
35 - Waterford Twp
36 - Winslow Twp
37 - Woodlynne Boro

CAPE MAY COUNTY (09)

01 - Avalon Boro
02 - Cape May City
03 - Cape May Point Boro
04 - Dennis Twp
05 - Lower Twp
06 - Middle Twp
07 - North Wildwood City
08 - Ocean City
09 - Sea Isle City
10 - Stone Harbor Boro
11 - Upper Twp
12 - West Cape May Boro
13 - West Wildwood Boro
14 - Wildwood City
15 - Wildwood Crest Boro
16 - Woodbine Boro

CUMBERLAND COUNTY (11)

01 - Bridgeton City
02 - Commercial Twp
03 - Deerfield Twp
04 - Downe Twp
05 - Fairfield Twp
06 - Greenwich Twp

13 - Knowlton Twp
14 - Liberty Twp
15 - Lopatcong Twp
16 - Mansfield Twp.
17 - Oxford Twp
18 - Pahaquarry Twp
19 - Phillipsburg Town
20 - Pohatcong Twp
21 - Washington Boro
22 - Washington Twp
23 - White Twp

REFERENCE NO. 10

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Monsanto Company

DATE: 2/19/97

FROM: Swamy S. Ketha

SUBJECT: Public/Municipal drinking water supply systems within 4-mile radius

REFERENCE

Seven Public/Municipal water systems supply potable water from within a 4-mile radius of the Monsanto Company site. The Philadelphia Water Department draws all its drinking water from the Delaware River. The surface water intake is located more than 4-miles upstream of the site. The New Jersey-American Water Company uses both surface water and groundwater as drinking water sources. However surface water and groundwater are not blended together. The remaining five public/municipal water systems use groundwater obtained from the Potmac-Raritan-Magothy (PRM) formation. Refer to the following worksheets for a summary of these systems. A total of 130,866 people are served by these systems which draw water from within 4-mile radius of the site. A total of 705 people are served by private wells (Ref. 18).

The populations served and the distance rings are as follows:

Distance	Population
0-¼ mile	0
>¼ -½ mile	2
>½ - 1 mile	175
>1 - 2 miles	28,443
> 2 - 3 miles	23,524
>3 - 4 miles	79,528

Site Name: Monsanto Company site
Date: 2/19/97

GROUNDWATER POPULATION WORKSHEET NO.1

A Town/City	B Water Co./ Dept. supplying town/city	C No. of wells in system	D Well no.'s and location	E Blended prior to distribution	F Blended with Surface Water. If yes Ratio or % of GW to SW	G Does any well supply more 40%	H Aquifer tapped by each well	I No. of service connections for entire system	J No. of connections per well	K Do private wells exist in Town/City	L Number or Percent of Private well in Town/City	M Identify Areas Within Town/ City Served by Public vs Private Wells	N Aquifer tapped by Private Wells
Merchantville/Pennsauken	Merchantville Pennsauken Water Co.	15	-	Y	N	N	PRM	50,000	3,333	N	-	-	-
Camden	Camden City Water Dept.	7	-	Y	N	N	PRM	54,300	7757	N	-	-	-
Collingswood Boro	Collingswood Boro Water Dept.	7	-	Y	N	N	PRM	21,000	3000	N	-	-	-
Haddon Twp.	Haddon Twp Water Dept.	4	-	Y	N	N	PRM	15,000	3750	N	-	-	-
Gloucester City	Gloucester City Water Dept	4	-	Y	N	N	PRM	14,000	3500	N	-	-	-

Site Name: Monsanto Company
Date: 2/19/97

Groundwater Population Worksheet No. 2

Distance Ring	Water Co./Dept	No. of Public supply Wells in ring	No. of Service Conncetions per well	Population Served by public supply Well in the ring	Population Served by Private Wells in ring	Total Population Served by Wells in Ring
> 0 to 0.25 miles					0	0
>0.25 0.5 miles					1.66	1.66
> 0 .5 to 1 mile					174.72	174.72
>1 to 2 miles	Merchantville/Pennsauken	3	3,333.3	9999.9		
	Collingswood Borough	6	3,000	18000	443.3	28443.2
>2 to 3 miles	Collingswood Borough	1	3,000	3000		
	Merchantville/Pennsauken	3	3,333	9999.9		
	Gloucester City	3	3,500	10500	24.4	23524.3
> 3 to 4 miles	Gloucester City	1	3,500	3500		
	Merchantville/Pennsauken	2	3,333.3	6666.6	61.33	79527.91
	Haddon Township	4	3,750	15000		
	Camden City	7	7757.14	54299.98		

* Unless supplied by well owner, population served by public wells in a particular distance ring were calculated by multiplying the number of wells in the distance ring (see 4-mile map) by the number of service connection per well (see Groundwater Population worksheet No.1) and then multiplying that product by the county average population per household.

** Population served by private wells were calculated by multiplying the number of private wells by the county average population per household.

Site Name: Monsanto Company
Date: 2/19/97

Groundwater Population Worksheet No. 3

Population Supplied by the Aquifer of Concern and Overlying Aquifers Within 4 Miles of the Site

Distance Ring	Population Served by Public Sypply Wells	Population Served by Private Wells	Total Population Supplied
>0 to 0.25 miles	0	0	0
>0.25 to 0.5 miles	0	1 66	1·66
>0.5 to 1.0 mile	0	174·72	174·72
>1 to 2 miles	28,000	443·3	28443·3
>2 to 3 miles	23,500	24·4	23,524·3
>3 to 4 miles	79, 466	61·33	79,528

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: **DATE:** 2/11/95 **TIME:** 1030

DISTRIBUTION:

MONSANTO COMPANY.

BETWEEN: Tom Healey **OF:** Philadelphia Water Manager, Industrial Waste Dept **PHONE:** 215-685-6233

AND

SWAMY KELLIM.

DISCUSSION

START called Mr. Healey to inquire about the drinking water supply sources for the City of Philadelphia. Mr. Healey informed that City of Philadelphia uses (KS) surface water a sources. One of them is on the ~~Schuy~~ (KS) Schuylkill River and the other is on the Delaware River. The Delaware River intake is located between Linden Avenue, PennyPack Street and the Delaware River. It is off the Academy Road Exit on Inter State Highway I-95. The City of Philadelphia does not use any ground water sources for drinking water.

Swamy S. Kellim.

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: **DATE:** 02/11/97 **TIME:** 10:50

DISTRIBUTION:

MONSANTO COMPANY

BETWEEN: RICHARD ZIPIN **OF:** Philadelphia Health Department **PHONE:** 215-823-7343

AND

SWAMY KETHA.

DISCUSSION

I called Mr. Zipin to enquire if there were any drinking water wells in the City of Philadelphia. Mr. Zipin informed that according to their census there were ~~540~~ (15) 530 drinking water wells located on the fringes of the City of Philadelphia towards the North and NorthEast. He informed that these wells are far away from the City of Camden. The distance to the wells from site is more than 4 miles.

He also informed that there was one well located at 240 Spring Garden Street, between 2nd Street and Spring Garden. He informed that the well was for emergency purposes such as a nuclear attack. The well is maintained but has so far not been used for drinking.

Swamy S. Ketha.

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: 96-03-0021 **DATE:** 2/11/97 **TIME:** 1015

DISTRIBUTION:

MONSANTO COMPANY

BETWEEN: Tom Cantwell **OF:** New Jersey American Water Co. **PHONE:** 609-764-3547

AND

SWAMY KETHA.

DISCUSSION

START Ketha called Mr. Cantwell to find out about the wells #'s 50, 51, 52, 53, 54 and 55 listed on the NJDEP well printout. Mr. Cantwell informed that all these wells have been shutdown due to poor water quality and high iron. Water is supplied to some areas of Camden and Pennsauken from surface water intake ~~located in Delran~~ (KS) from the Delaware River. The intake is ~~si~~ located in Delran between Cinnaminson and Taylor's lane.

Swamy S. Ketha

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: **DATE:** Feb 19, 1997 **TIME:** 1100

DISTRIBUTION:

MONSANTO COMPANY SITE

BETWEEN: John Meyers **OF:** Collingswood Borough Water Dept. **PHONE:** 609-854-2332

AND

SWAMY S. KETHA

DISCUSSION

I called Mr. Meyers regarding the drinking water supply for Collingswood Borough. Mr. Meyers informed me that there were 7 wells ~~in the system~~ (ICS) which are used for drinking water supplies. The wells are interconnected and the water is blended. All the wells are about 250 - 300 ft deep and draw water from the Potomac Raritan - Magothy aquifer. Water is supplied to approximately 21,000 people. No single well supplies more than 40% to the system. There are no private drinking water wells.

Swamy S. Ketha.

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: DATE: Feb 12, 1997 TIME: 0930

DISTRIBUTION:

MONSANTO COMPANY

BETWEEN: Leo Holland OF: Merchantville Pennsauken Water Co. PHONE: 609-663-0043

AND

Swamy Ketha.

DISCUSSION

I called Mr. Holland to find the status of the wells Browning 1A, 2A, 3A; Wordline 1, 2; Delgard 2; Marion Land Marion 2 Wells; Mr. Holland informed me that Delgad 2 is not in operation. All other wells are in operation. Water is Blended prior to distribution and no single well contributes more than 40% to the system. The wells are between 150-250 ft deep and tap the PRM aquifer. Mr. Holland said that he could not give the exact population served by the above wells ~~as~~ because the water is combined in the distribution system. He informed that there were a total of 15 wells in their system and serve approximately 50,000 people.

ACTION ITEMS:

Swamy S. Ketha

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO:

DATE: 2/11/97 **TIME:** 1545.

DISTRIBUTION:

MONSANTO COMPANY.

BETWEEN: FRED SCHINDLER **OF:** GLOUCESTER CITY WATER DEPT. **PHONE:** 609-456-0169

AND

SWAMY KETHA.

DISCUSSION

Mr. Schindler informed that the City uses ground water for drinking and there are four wells in the system. The water is blended prior to supply and no single well contributes more 40% of the water to the system. The city supplies water to 14,000 people. The wells are 250-300 ft deep and tap the PRM aquifer.

Swamy S. Ketha.

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: **DATE:** Feb 14, 1997 **TIME:** 1030

DISTRIBUTION:

Monsanto Company

BETWEEN: Al Doenning **OF:** Haddon Township Public Work Dept. **PHONE:** (609) 854-1176.

AND

Swamy Ketha

DISCUSSION

Mr. Doenning informed that there are 4 drinking water supply wells and water is supplied to approximately 15,000 people. Water is blended prior to distribution and no single well contributes more than 40% to the system. The wells are approximately 450 to 500 ft deep and tap the PRM aquifer. Mr. Doenning informed that I could call the treatment plant at (609)854-9413 to get additional details. SZART called the treatment plant but ~~no one~~ nobody was available.

Swamy S. Ketha

ACTION ITEMS:

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: **DATE:** 3/19/97 **TIME:** 1500

DISTRIBUTION:
Monsanto Company

BETWEEN: Robert Pinnotta **OF:** Camden County Health Dept **PHONE:** 609-374-6006

AND
SWAMY KETHA

DISCUSSION

I ~~called~~ (KS) Called Mr. Pinnotta to find out about private wells used for drinking water. Mr. Pinnotta informed that it is not possible for him to give an accurate number ~~of~~ for the wells used for drinking water. There (KS) are very few residences that use private wells for drinking water and there might be approximately 50 wells in Camden City, Gloucester City, Collingswood, Haddon Township, Audubon, Pennsauken, Merchantville, Cherry Hill and Oaklyn. The above cities all have public supply systems. Mr. Pinnotta also informed that START could come down and look at the records to find out the exact locations for the wells.

Swamy S. Ketha

ACTION ITEMS:

WESTON

Jann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Bob Gibson

Company City of Camden, Dept of Utilities

Address

Camden, NJ

Phone (609) 757-7680

Date 02 / 04 / 97

Time 1445 AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 1655

Subject City of Camden potable water supply

Notes: I called Bob Gibson for information concerning the number of wells currently in use by the city of Camden, the population served, availability of well records, etc. Mr. Gibson said that at the Morris "Station", they have a North Field and a South Field. Of the North Field wells, Well No. 1 is currently down for repairs, but it is scheduled to reopen in ~2 weeks. Well No. 2 has been out of service for about 10 years, however, it might be reactivated to replace another well in the system that has gone dry. Well Nos. 3 & 4 in the North Field are operating. Of the South Field Wells, Well No. 5 was sealed in 1991; Well No. 6 is operating but is producing only ~100 gallons per minute (gpm). Well Nos. 7 & 8 are in production, but Well No. 9 is out of service. The city of Camden has requested of the NJ DEP that it be allowed to drill a replacement well for Well No. 9. Well Nos. 10, 11, 12, and 13 are in production, although Well No. 11 is showing some decline. At the Delair Wellfield, Well Nos. 1, 2, and 3 are all in production. At the Pennsauken Wellfield, Well No. 1 is the only well in use. He said that the water is of very poor quality and must be treated before being released into the distribution system. A ~$8.65 million bond had been issued to build a treatment plant to treat the contaminated groundwater from all of the Pennsauken wells, but the design facility turned out to be twice as costly as the available funding; the treatment plant was never built. CDM did the design/engineering.

(continued)

☐ **File**

☐ **Tickle File** / /

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action:

Originator's Initials

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name: Bob Gibson

Company: City of Camden Dept. of Utilities

Address:

Camden, NJ

Phone: (609) 757-7680

Date 02 / 04 / 97

Time 1445 AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 1455

Subject City of Camden potable water supply

Notes: David Geddes of CDM headed up the project. Bob Gibson expects a decision to be made in October of 1998 regarding the results of the study to commence in March 1997 with the installation and sampling of additional monitoring wells by the NJDEP.

The City of Camden's Parkside Treatment Plant wells closed April 30, 1996 due to volatile organics contamination. A program is underway to reopen Well Nos. 17 & 18 in December 1997; Malcolm Pirnie is involved in that effort (Phase I). Well No. 13 in the Parkside system will not be used again because of the high ~~values~~ concentrations of volatile organic contaminants (VOCs) afflicting that well. Phase II of the program calls for replacement of existing filters at the Parkside plant, that will probably occur in 1998. Within the city of Camden, there is a well at South 4th Street & Florence Avenue — Well No. 7 — from which raw water is pumped to a trash to steam facility. The water is used as process water — it is not used for human consumption. There is also a well at 4th & Ferry Streets — Well No. 11, which has not been used since June 27, 1996 because of low pH & high iron values. The city's treatment plant at 4th & Jackson Streets has been closed for several years; no other city wells can be utilized for public water supply. Of the wells in production, pumping rates average 600 to 1,300 gpm, or 0.8 to 1.9 million gallons per day (mgd). The

(continued)

☑ **File** Pulaski Wellfield TDD No. 02-9611-0052

☐ **Tickle File** ____ / ____ / ____

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action:

Originator's Initials JW

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Bob Gibson

Company City of Camden Dept. of Utilities

Address

Camden, NJ

Phone (609) 757-7680

Date 02 / 04 / 97

Time 1445 AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 1655

Subject City of Camden potable water Supply

Notes: said that the City of Camden's allocation permit had been withdrawn by the NJDEP in April 1995; they are currently operating under three different Administrative Consent Orders. He also said that they submitted a new allocation permit to the NJDEP in July 1996, but it was still going through the review process.

I asked Mr. Gibson when it would be most likely for me to reach him if I needed further information. He said he is usually in the office from 8:30 a.m. to 6 p.m., but Tuesday & Thursday mornings he has to attend city council meetings

☑ **File** Puchack Wellfield TDD no. 02-9611-0032

☐ **Tickle File** ____/____/____

☐ **Follow-Up By:**

☐ **Copy/Route To:**

Follow-Up-Action:

Originator's Initials JW

REFERENCE NO. 11

D. Bhamidipati

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300

Hazard Ranking System; Final Rule

TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s)[b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5}	35	25	15	15
Less than 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in

likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3-1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release

REFERENCE NO. 12

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Kimberly Cenno

Company NJDEP, Bureau of Environmental Planning

Address 401 East State Street

Trenton, NJ 08625

Phone (609) 633-1179

Subject Wellhead Protection Areas

Date 10 / 18 / 96

Time 2:20 AM/PM

☐ Originator Placed Call

☑ Originator Received Call

W.O. NO. 1194

Notes: Ms. Cenno returned the calls I had made to Dan Van Abs of the above office regarding the establishment of wellhead protection areas in New Jersey. She said that wellhead protection areas had not yet been officially delineated, as the regulations had not yet been promulgated. The Wellhead Protection Program Plan was approved by the DEP and EPA in December 1991 - this document is the plan of action that is being used to actually develop the delineations. Tom McKee of the Bureau of Environmental Planning is working on writing the rules and regulations in conjunction with Steve Spade of the New Jersey Geological Survey, who is actually drawing up the delineations (the latter can be reached at 609-984-6587. The NJGS will be establishing WHPAs for public supply wells; nonpublic community supply wells may be addressed by the individual municipalities involved. After the rules and regulations have been promulgated, the Wellhead Protection Areas delineated by the NJGS / Bureau of Env. Planning will be subject to a public hearing process for formal adoption. For more details, she suggested we speak with Tom McKee at the phone number above.

☑ **File** National Standard Co. TDD No. 02-9602-0002A

☐ **Tickle File** ____ / ____ / ____

☐ **Follow-Up By:** ____

☐ **Copy/Route To:** Dennis Foerster, Joe Filosa

Follow-Up-Action: ____

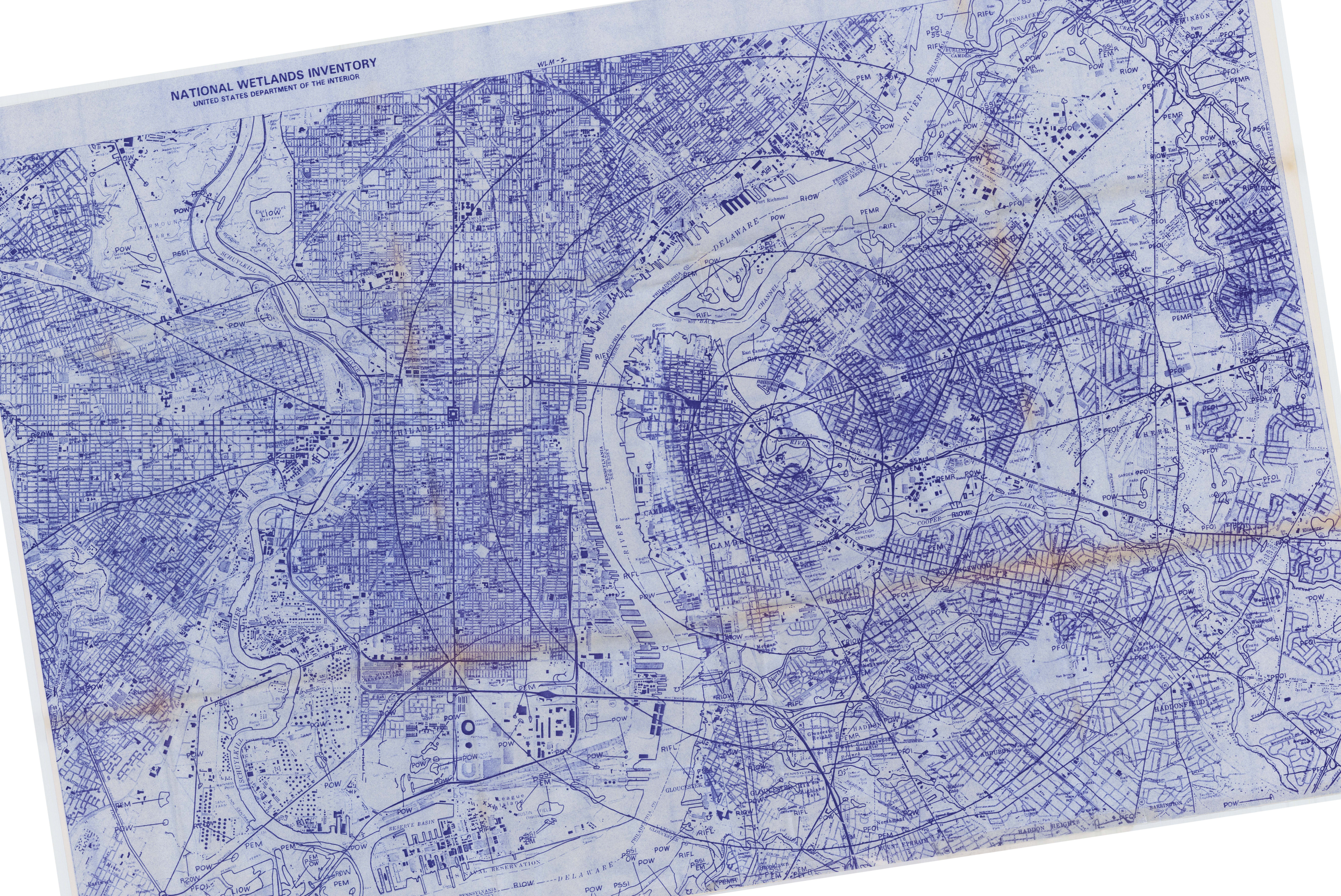
Originator's Initials JW

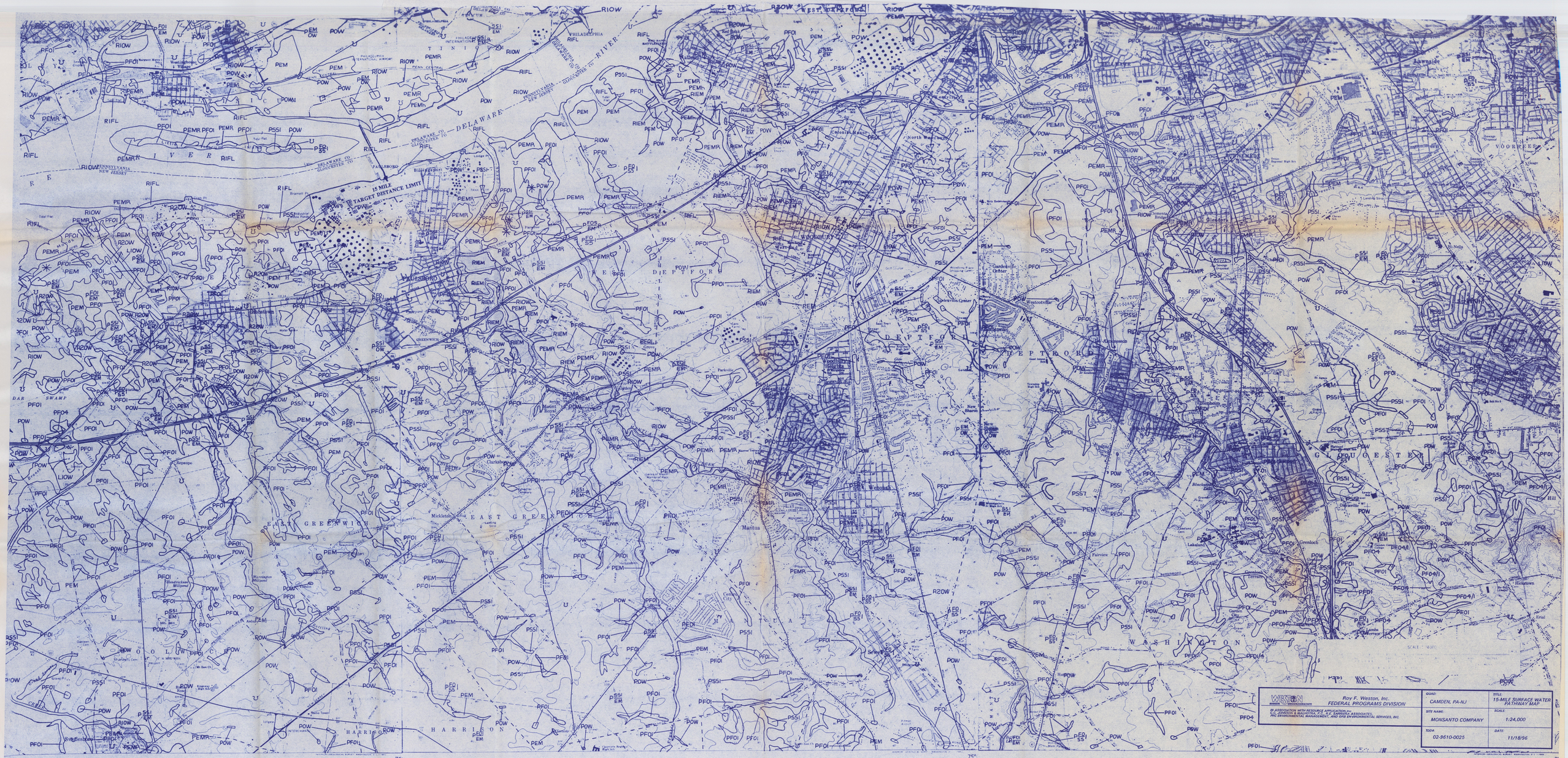
REFERENCE NO. 13

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

WLM-2





Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH RESOURCE APPLICATIONS, INC., JOHNSON & MALHOTRA, P.C., R.F. DANIELS ASSOCIATES, PRC ENVIRONMENTAL MANAGEMENT, AND GHD ENVIRONMENTAL SERVICES, INC.

QUAD: CAMDEN, PA-NJ	TITLE: 15-MILE SURFACE WATER PATHWAY MAP
SITE NAME: MONSANTO COMPANY	SCALE: 1:24,000
TDD#: 02-9610-0025	DATE: 11/18/96

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deep Water Habitats of the United States** (An Operational Draft), Cowardin, et al. 1977. The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest canopy may be omitted on this document. Further information concerning the wetland resources depicted on this document may be available. For information, contact:

SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
E2EM1N
SUBCLASS: WATER REGIME
UPLAND (NON-WETLANDS)

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Dominance type (either vegetative or sedentary animal) can be added to the map by the interested user.
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.

AERIAL PHOTOGRAPHY

SCALE 1:24000

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deep Water Habitats of the United States** (An Operational Draft), Cowardin, et al. 1977. The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and

SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
E2EM1N
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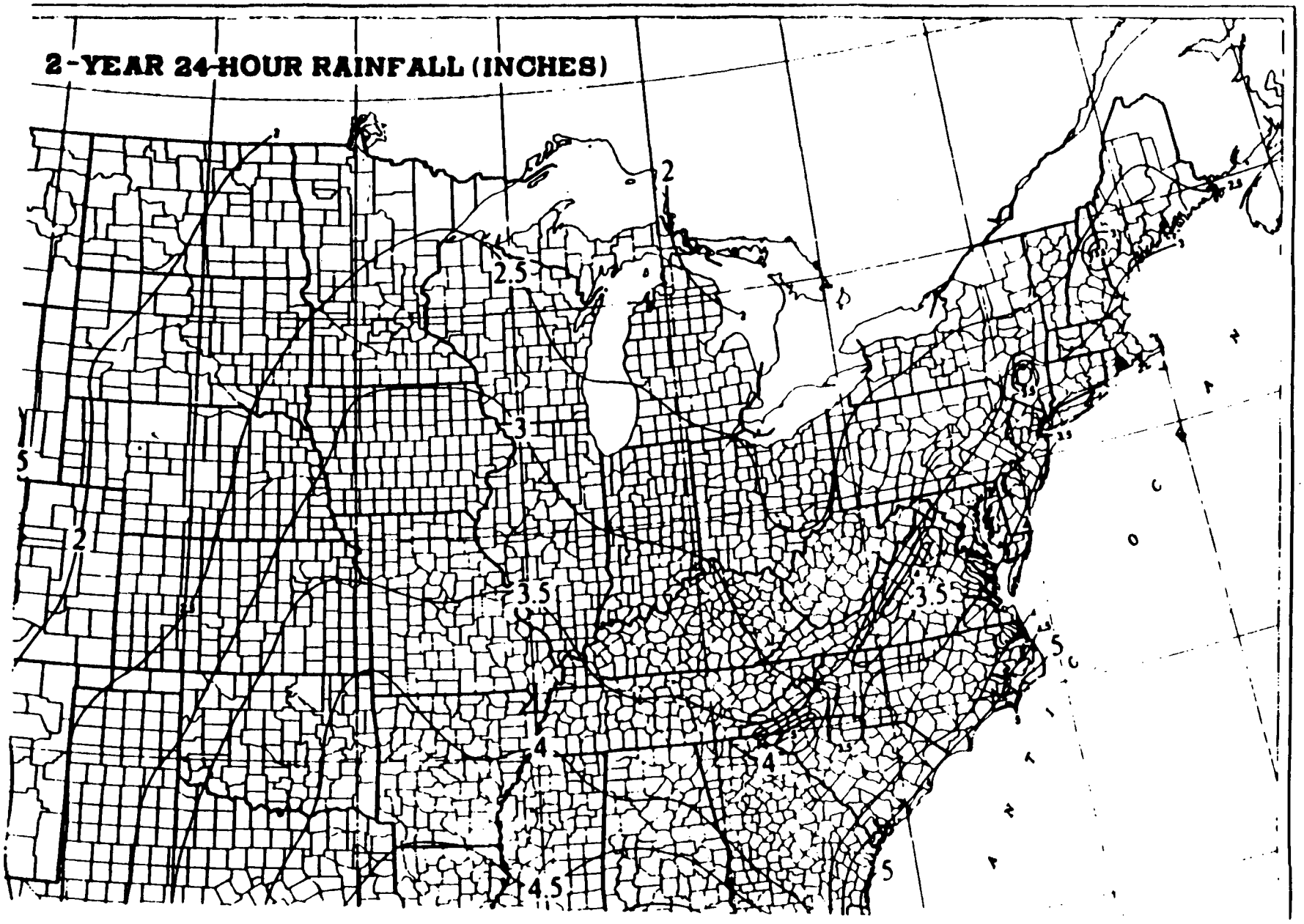
- Dominance type (either vegetative or sedentary animal) can be added to the map by the interested user.
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.

AERIAL PHOTOGRAPHY

REFERENCE NO. 14


2-YEAR 24-HOUR RAINFALL (INCHES)
2
2.5
3
3.5
4
4.5
5

REFERENCE NO. 15

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GEOLOGY AND GROUND-WATER RESOURCES OF CAMDEN COUNTY, NEW JERSEY

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 76–76

Prepared in cooperation with

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER RESOURCES

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Please return within 30 days to:
U.S. Geological Survey, WRD
Mountain View Office Park
810 Bear Tavern Road
Suite 206
West Trenton, New Jersey 08628

GEOLOGY AND GROUND-WATER RESOURCES OF CAMDEN COUNTY, NEW JERSEY

By George M. Farlekas, Bronius Nemickas, and Harold E. Gill

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations 76–76

Prepared in cooperation with
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL
PROTECTION, DIVISION OF WATER RESOURCES

June 1976

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GLOSSARY

Aquifer. A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian aquifer. An aquifer containing water under sufficient pressure to rise above the top of the aquifer when penetrated by a well.

Coefficient of permeability (field). See hydraulic conductivity.

Coefficient of storage. See storage coefficient.

Confining bed. A body of relatively impermeable material stratigraphically adjacent to one or more aquifers. The hydraulic conductivity may range from nearly zero to some value distinctly lower than that of the aquifer.

Drawdown. The lowering of the water table or artesian water level caused by pumping.

Head, static. The height above a standard datum of the surface of a column of water (or other liquid) that can be supported by the static pressure at a given point. Head, when used alone, is understood to mean static head.

Hydraulic conductivity. A measure of the ability of material to transmit water. If the porous medium is isotropic and the fluid is homogeneous, the medium has a hydraulic conductivity of unit length per unit time if it will transmit in unit time a unit volume of water at the prevailing kinematic viscosity through a cross section of unit area, measured at right angles to the direction of flow, under a hydraulic gradient of unit change in head over unit length of flow path. The Geological Survey measures length in feet or meters and time in days. To convert from field coefficient of permeability measured in gallons per day per square foot to hydraulic conductivity measured in feet per day multiply the field coefficient by 0.134. To convert from field coefficient of permeability measured in gallons per day per square foot to hydraulic conductivity measured in meters per day multiply the field coefficient by 0.041.

Permeability. The ability of a rock or earth material to transmit water in response to head differences.

Porosity. The porosity of a rock or soil is its property of containing interstices or voids and may be expressed quantitatively as the ratio of the volume of its interstices to its total volume. It may be expressed as a decimal fraction or as a percentage.

Potentiometric surface. A surface which represents the static head in an aquifer. The potentiometric surface is defined by the levels to which water will rise in tightly cased wells. See head, static.

Recharge. The process by which water is added to an aquifer.

Runoff (average annual, in inches). The depth to which the drainage area would be covered if all the runoff for an average year were uniformly distributed on it.

Specific capacity (of a well). The rate of discharge of water from the well divided by the drawdown in the well. A properly constructed well can be used as a measure of the aquifer's transmissivity; a high specific capacity suggests a high transmissivity while a low specific capacity suggests a low transmissivity. The specific capacity of a well is a function of well construction and development, the aquifer's storage coefficient, and the portion of the aquifer in which the well is screened.

Specific yield. In general terms, the specific yield is the water yielded from a water-bearing material by gravity drainage, as occurs when the water table declines. More exactly the specific yield of a rock or soil is the ratio of 1) the volume of water which, after being saturated, the rock or soil will yield by gravity to 2) the volume of the rock or soil.

Storage coefficient. The volume of water a porous medium releases from or takes into storage per unit surface area of the aquifer per unit change in head.

In a confined water body the water derived from storage with head decline comes from expansion of the water and compression of the aquifer; similarly, water added to storage with a rise in head is accommodated partly by compression of the water and partly by expansion of the aquifer. In an unconfined water

body the amount of water derived from or added to the aquifer generally is negligible compared to that involved in gravity drainage or filling of pores; hence, in an unconfined water body the storage coefficient is virtually equal to the specific yield.

Water table. That surface in an unconfined water body at which the pressure is atmospheric.

CONVERSION FACTORS

Cubic feet		
x 0.02832	=	cubic meters
x 7.48052	=	gallons
x 28.32	=	liters
Cubic feet per second		
x 0.646317	=	million gallons per day
x 448.831	=	gallons per minute
Cubic meters		
x 10^6	=	cubic centimeters
x 35.31	=	cubic feet
x 264.2	=	gallons
x 10^3	=	liters
Feet		
x 30.48	=	centimeters
x 0.3048	=	meters
Gallons		
x 3.785×10^{-3}	=	cubic meters
x 3.785	=	liters
Gallons per minute		
x 2.228×10^{-3}	=	cubic feet per second
x 0.06308	=	liters per second

CONVERSION FACTORS--Continued

Kilometer

x 10^5	=	centimeters
x 3281	=	feet
x 10^3	=	meters
x 0.6214	=	miles

Liters

x 0.0353	=	cubic feet
x 10^3	=	cubic meters
x 0.2642	=	gallons

Liters per second

x 5.886×10^{-4}	=	cubic feet per second
x 4.403×10^{-3}	=	gallons per second

Meters

x 100	=	centimeters
x 3.281	=	feet
x 39.37	=	inches
x 10^{-3}	=	kilometers
x 10^{-3}	=	millimeters

Miles (statute, U.S.)

x 1.609×10^5	=	centimeters
x 5,280	=	feet
x 1.609	=	kilometers

CONVERSION FACTORS--Continued

Milligrams per liter

x 1	=	parts per million

Millimeter

x 0.1	=	centimeter
x 0.03937	=	inches

Square kilometers

x 0.3061	=	square miles

Square meters

x 10.76	=	square feet
x 3.861×10^{-7}	=	square miles

Square miles

x 2.59	=	square kilometers

Relation of Units of Hydraulic Conductivity and Transmissivity

[Equivalent values shown in same horizontal lines. *indicates abandoned term]

A. Hydraulic conductivity

Hydraulic conductivity (K)		*Field coefficient of permeability (P_f)
Feet per day ($ft\ day^{-1}$)	Meters per day ($m\ day^{-1}$)	*Gallons per day per square foot *($gal\ day^{-1}\ ft^{-2}$)
One	0.305	7.48
3.28	One	24.5
.134	.041	One

B. Transmissivity (T)

Square feet per day ($ft^2\ day^{-1}$)	Square meters per day ($m^2\ day^{-1}$)	*Gallons per day per foot *($gal\ day^{-1}\ ft^{-1}$)
One	0.0929	7.48
10.76	One	80.5
.134	.0124	One

A B S T R A C T

Camden County, New Jersey, is located in the Philadelphia-Camden metropolitan area. The western edge of the county is urban and industrial in character. The central part is less industrial and more suburban in character, and the eastern part is sparsely populated and predominantly agricultural, although urbanization is advancing eastward quite rapidly.

Camden County is in the Atlantic Coastal Plain physiographic province. Underlying the county are unconsolidated sediments of Quaternary, Tertiary, and Cretaceous age, consisting of mostly alternating sands, silts, and clays. The sediments dip gently to the southeast and thicken from 40 feet at the Delaware River to 2,900 feet at the Camden-Atlantic County line. Below the unconsolidated sediments is the pre-Cretaceous crystalline bedrock.

The major fresh-water aquifers in Camden County are sands and gravels of Cretaceous and Tertiary age in the Potomac Group and the Raritan and Magothy Formations; the Cohansey Sand; the Wenonah Formation-Mount Laurel Sand; and the Englishtown Formation. Minor aquifers are found in parts of the Merchantville Formation, the undifferentiated Vincentown and Manasquan Formations, and the Kirkwood Formation. Saturated sands and gravels in the surficial deposits of Quaternary age where in direct contact are commonly hydraulically connected to the underlying aquifers.

The rate of ground-water withdrawal for Camden County was 68 mgd (million gallons per day) in 1966. This was the largest average annual county pumpage in the State in 1966. Eighty-five percent (56 mgd) was pumped from the aquifer system in the Potomac Group and the Raritan and Magothy Formations.

The potentiometric surfaces of all the major artesian aquifers in Camden County declined from 1900 to 1970 as a result of pumping. The largest decline occurred in the aquifer system in the Potomac Group and the Raritan and Magothy Formations. At Haddon Heights, in the western part of the county, the potentiometric surface declined about 110 feet from 1900 to 1968. The potentiometric surface of the aquifer in the Wenonah Formation-Mount Laurel Sand declined 43 feet in about 60 years in the vicinity of Berlin Borough.

The chemical quality of ground water in Camden County

is generally satisfactory for most uses. Concentrations of iron greater than the State's potable-water standard of 0.3 milligrams per liter are found in some areas of the Potomac-Raritan-Magothy aquifer system, in scattered locations in the Wenonah Formation-Mount Laurel Sand, and in the Cohansey Sand. In general, higher values of dissolved solids, sulfate, and chloride occur in water in and near the outcrop of the Potomac-Raritan-Magothy aquifer system than downdip in the aquifer. In the southeastern part of the county chloride concentrations in excess of 250 milligrams per liter can be found in the same aquifer system. The high chloride water has remained in the aquifer system from the time of deposition or has re-entered the system from the ocean after changes in sea level since Pleistocene time.

Contamination of water in the Potomac-Raritan-Magothy aquifer system in the Philadelphia area has created a potential water-quality problem for the Camden area near the Delaware River. Contaminated ground water in Philadelphia, with high concentrations of sulfate and dissolved solids, is moving under the Delaware River toward Eagle Point in Gloucester County near the Camden County line. Decrease of pumping in Philadelphia and simultaneous increase of pumping in Camden and Gloucester Counties tends to draw ground water from Philadelphia toward New Jersey.

The greatest potential for additional ground-water development in the county is from the Cohansey Sand which is generally an unconfined aquifer. The Cohansey also has the greatest possibility of ground-water contamination because of the local effect of wastes from suburban and industrial development and the shallow depth of the Cohansey aquifer.

INTRODUCTION

PURPOSE AND SCOPE

This investigation of the ground-water resources and geology of Camden County is part of a statewide program of studies of the water resources of New Jersey. It was conducted by the U. S. Geological Survey in cooperation with the New Jersey State Department of Environmental Protection, Division of Water Resources.

Almost all public, industrial, and irrigation water supplies in Camden County are obtained from ground-water sources. The ground-water environment and its hydrologic and chemical characteristics must be understood in order to facilitate an orderly and safe development of this natural resource. The purpose of this investigation is to collect and interpret the basic hydrologic and geologic data and to appraise and report on the ground-water resources of Camden County. The objectives were to define the thickness and areal extent of the hydrologic units, evaluate the hydraulic characteristics of the aquifers, determine the effect of pumpage on the water levels of the area, define the source of recharge of the aquifers, and to evaluate the chemical quality of the ground water.

LOCATION AND EXTENT

Camden County is in the southwestern part of New Jersey (fig. 1). It is bounded by Burlington County on the northeast, Atlantic County on the southeast, Gloucester County on the southwest, and by the Delaware River on the northwest. The county is part of the Philadelphia standard metropolitan statistical area and occupies an area of 222.2 square miles. The City of Philadelphia, fourth largest city in the United States, is located across the Delaware River from Camden County.

PERSONNEL AND SUPERVISION

The investigation was made by the U. S. Geological Survey in cooperation with the State Department of Environmental Protection, Division of Water Resources. The

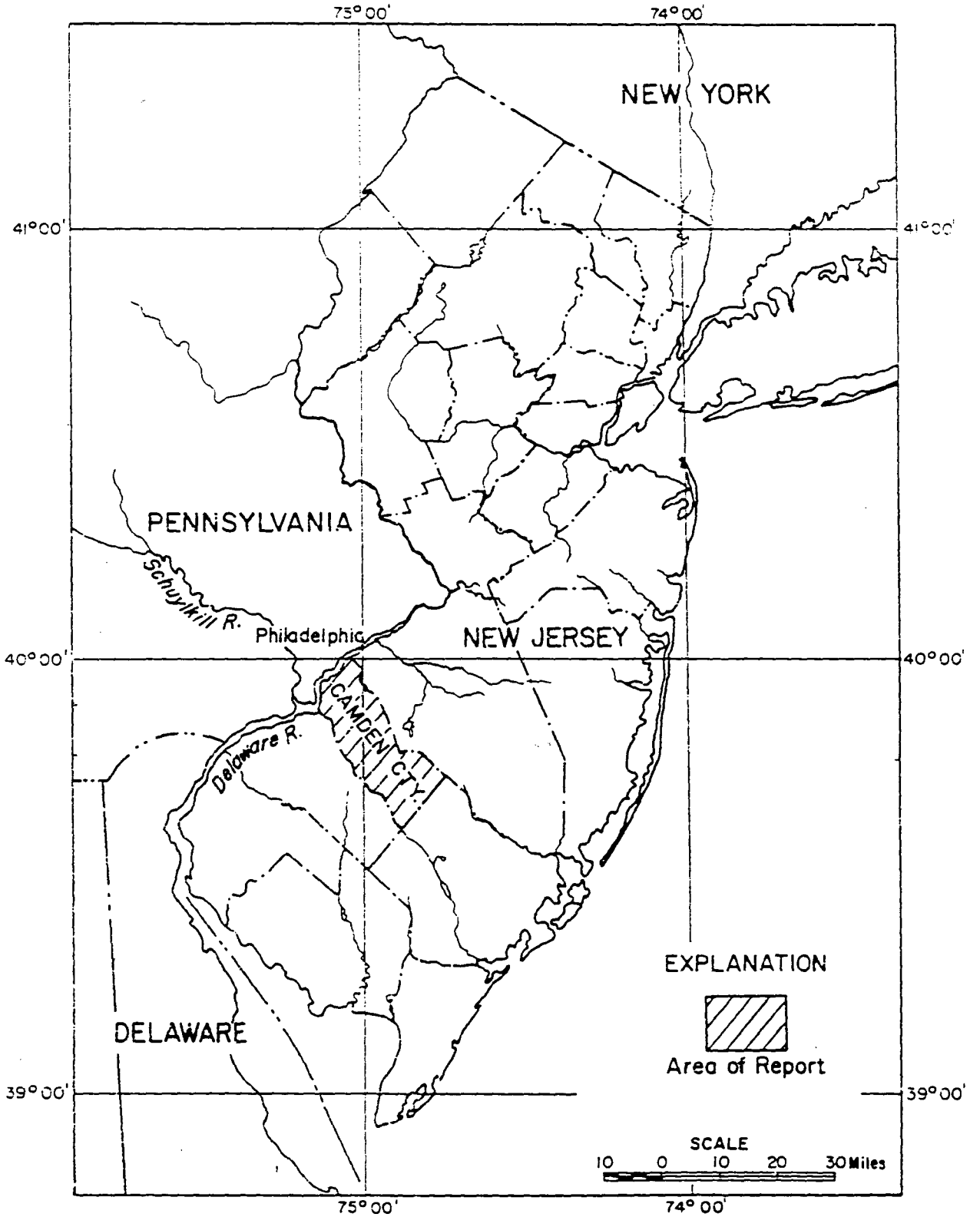


Figure 1. — Map of New Jersey showing location of Camden County.

work was performed under the general supervision of John E. McCall, District Chief, and under direct supervision of William Kam, Supervisory Hydrologist. The authors were assigned to the project in June 1969. Most of the material on the Potomac-Raritan-Magothy aquifer system in this report is from an unpublished study on the aquifer system from Trenton to Salem, New Jersey, by Gill and Farlekas. George M. Farlekas collected, compiled, and interpreted the data for the geologic units younger than the Magothy Formation up to and including the Mount Laurel Sand. Bronius Nemickas was responsible for the work on the geologic units younger than the Mount Laurel Sand. Data for wells tapping units younger than the Magothy were obtained from 1) field work in the summer and fall of 1969, 2) selected data from E. Donsky (1963), and 3) unpublished data from the Great Egg Harbor River basin compiled by P. R. Seaber in 1958. Data collection and analysis for the project was essentially completed in July 1970.

PREVIOUS INVESTIGATIONS

The geology and ground-water resources of the Camden area have been studied intermittently during the past 100 years. Almost all of the early information published in the annual reports of the State Geologist is limited to general descriptions of the water-bearing formations, with lists of wells tapping principal aquifers. Further information on the geology and hydrology of the Camden area was published by Bascom (1904) and Bascom and others (1909). The U. S. Geological Survey began ground-water investigations in New Jersey in 1923 in cooperation with the State. In 1932 a report on the ground-water supplies of the Camden area was published (Thompson, 1932). A progress report on the ground-water resources of the Lower Delaware Valley study was released in 1952 (Barksdale and Graham). The results of this tri-state study, which included Camden County, were reported later by Barksdale and others (1958). A report on the ground-water resources of the nearby Philadelphia Navy Base was prepared by Graham and Kammerer (1954). Greenman and others (1961) prepared a report on the ground-water resources of the Coastal Plain of southeastern Pennsylvania, which included the City of Philadelphia. A basic-data report on wells in Camden County was written by Donsky (1963).

Completed investigations of the geology and ground-water resources of neighboring counties include Burlington County (Rush, 1968), Gloucester County (Hardt and Hilton, 1969), and Atlantic County (Clark and others, 1968).

Iron in water of the aquifer system in the Potomac Group and Raritan and Magothy Formations has been investigated by Langmuir (1969a and 1969b). Regional geology, hydrology, and geochemistry of the aquifer system in the Potomac Group and Raritan and Magothy Formations from Salem County north to Trenton has been investigated by Gill and Farlekas (written commun., 1969).

Detailed geologic field work has been made in a number of 7-1/2 minute quadrangle areas in Burlington County (Minard, Owens, and Nichols, 1964, Owens and Minard, 1962 and 1964a), and one quadrangle in Salem County (Minard, 1965). A geologic map of part of the Coastal Plain at a scale of 1:250,000 was compiled by J. P. Owens in U. S. Geological Survey (1967).

WELL-NUMBERING AND LOCATION SYSTEM

Wells discussed in the report have been located on U. S. Geological Survey 7-1/2 minute quadrangle maps and are shown in figure 2. The municipality and the latitude and longitude in degrees, minutes, and seconds for each well were determined from the 7-1/2 minute quadrangles. Each well (table 1) has a unique number. The first six numbers and the letter N (for North) are the latitude for the well. The fifteenth number is the sequential number, usually "1". If more than one well is located at the same site, the second well will have a sequential number of 2 and the third well a sequential number of 3; with as many sequential numbers as there are wells at that latitude and longitude. The wells (table 1) are listed by municipality and numbered serially in order of decreasing latitude. Decreasing longitude is used to determine the order of the wells if two or more wells have the same latitudes.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of officials and private individuals of the Camden area who furnished information on their wells and permitted access to the wells for the collection of water samples and geophysical and hydrologic data. The staff of the New Jersey Division of Water Resources was helpful in furnishing data from their files. Special thanks are extended to the many well drillers, particularly A. C. Schultes and Sons, Layne-New York Inc., and A. A. and M., for their time and assistance in furnishing well data and geophysical logs.

GEOGRAPHY

TOPOGRAPHY AND DRAINAGE

Camden County lies entirely within the Atlantic Coastal Plain physiographic province, which extends from Massachusetts to Florida. The county is characterized as a low lying, gently rolling plain that ranges in altitude from sea level to about 220 feet. The maximum altitude of about 220 feet is located in the southeastern part of Voorhees Township.

A generalized topographic map of Camden County outlining the major drainage basins is shown in figure 3. In the northeastern part of the county the major streams, the Rancocas, Pennsauken, Newton, and Big Timber Creeks and the Cooper River, flow northeast and north into the Delaware River. In the southeastern part of the county the Mullica and Great Egg Harbor Rivers flow southeast towards the Atlantic Ocean.

Topographic highs in the central part of the county form the drainage divides between the basins. Topographic lows are in the southeastern part of the county and in the northern part of the county along the Delaware River and along streams flowing into the Delaware River.

CLIMATE

The climate of Camden County is continental, generally moderate, with mild winters, warm summers, and generally evenly distributed rainfall. The prevailing direction of air movement is from west to east. During the summer months the prevailing wind direction is from the southwest.

The average annual temperature of the Philadelphia Weather Bureau station for the period 1931-60 was 53.3°F (degrees Fahrenheit). Normal daily maximum and minimum are 40.3°F and 24.3°F for January, and 85.9°F and 65.2°F for July.

Average annual precipitation at the Philadelphia Weather Bureau station for 1931-60 was 42.48 inches. Precipitation is generally distributed evenly throughout the year, with the summer precipitation characterized by localized thundershowers. The winter precipitation is usually more widespread and less intense. Precipitation data for the same

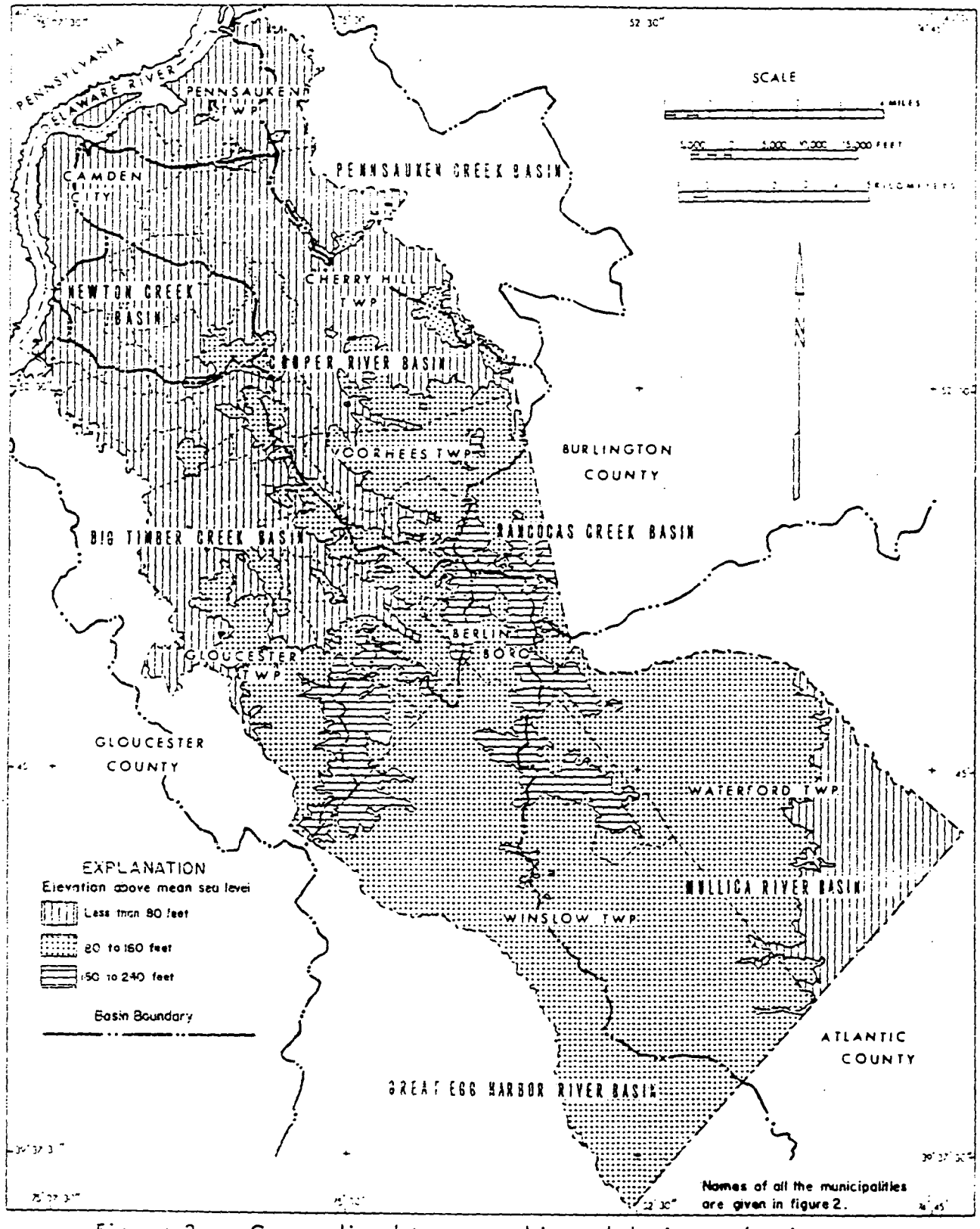


Figure 3. — Generalized topographic and drainage basin map of Camden County.

period indicate that the average of the wettest month of each year is 4.63 inches, while the average of the driest month of each year is 2.78 inches.

POPULATION AND ECONOMY

Camden County had a population of 456,291 in 1970, 392,035 in 1960, and 300,743 in 1950 (U. S. Bureau of Census). The increase from 1960 to 1970 was 16.4 percent and the increase from 1950 to 1960 was more than 30 percent. The most densely populated area is in the northern part of the county. In 1960 the municipalities north of Gloucester Township, Somerdale Borough, and Voorhees Township contained 82 percent of the total population, whereas the land area is only 31 percent. In 1970 the same municipalities contained 77 percent of the county's total population indicating a shift in population toward the southeast.

Camden County is in the Philadelphia metropolitan area and many of the county's residents work in the city or nearby counties. A large work force is employed by manufacturing companies located along the western edge of the county in the area near the Delaware River. The cities of Camden and Gloucester, as well as Pennsauken Township, have much of the manufacturing of the county, although a number of new manufacturing centers are being developed east of the New Jersey Turnpike. Three municipalities, Waterford and Winslow Townships and Chesilhurst Borough, have the largest proportion of land in the county used for agriculture. The percentage of land area used for farms in Camden County has been decreasing in recent years. The U. S. Department of Commerce, Bureau of Census reports indicate that the land area used for farms in Camden County was 8.6 percent in 1969, 10.2 percent in 1964, and 13.7 percent in 1959.

GEOLOGY

STRATIGRAPHY AND STRUCTURE

All exposed geologic units in Camden County are sedimentary and for the most part unconsolidated. They are part of the Atlantic Coastal Plain and range in age from Early Cretaceous to Quaternary. Figure 4 is a geologic map of Camden County delineating the outcrop area of the Cretaceous and Tertiary age sediments. Figures 5 and 6 show two geologic

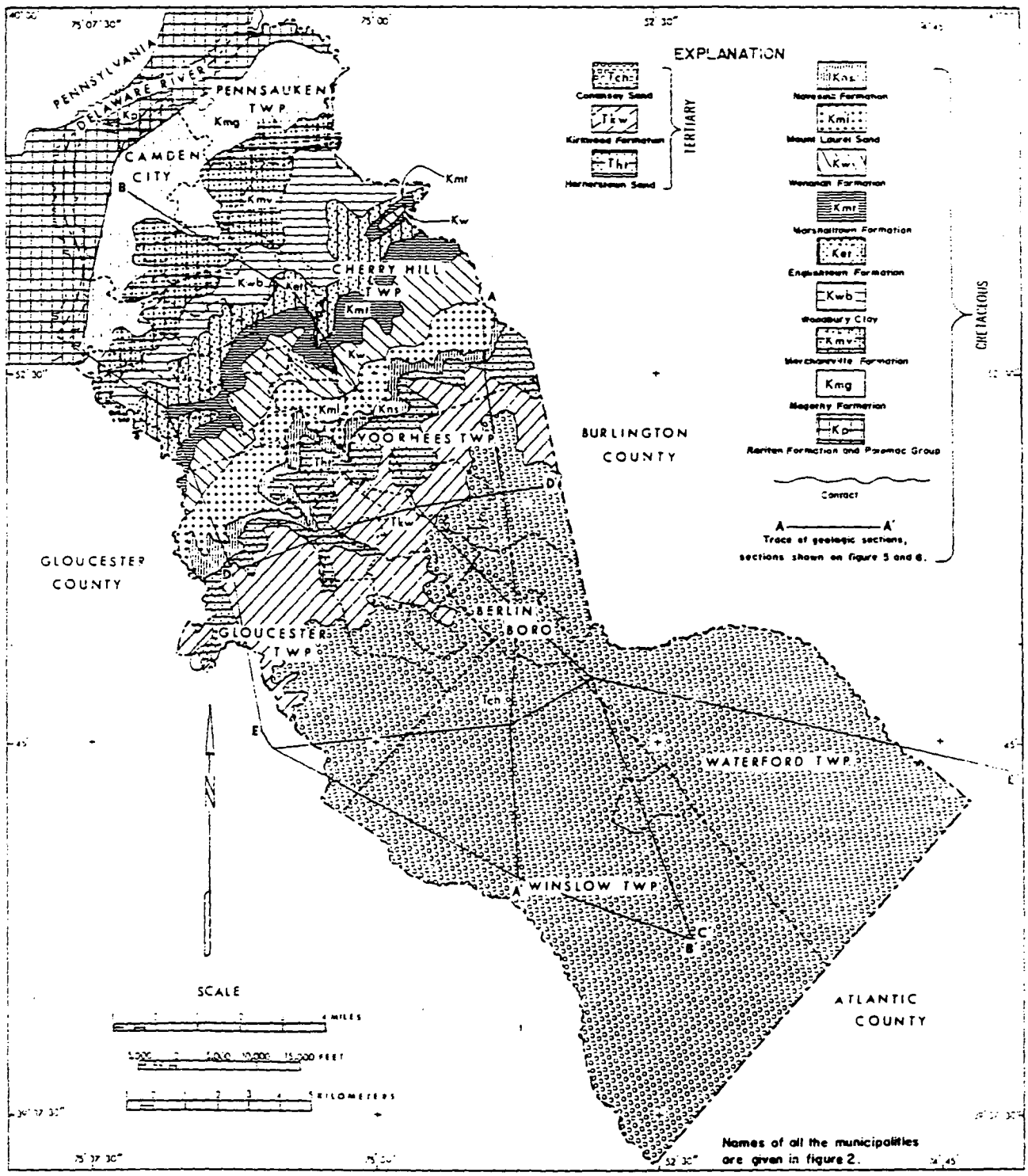


Figure 4. — Pre-Quaternary geologic map of Camden County.

sections of the Coastal Plain sediments in Camden County. The Cretaceous and Tertiary sediments dip gently to the southeast with the oldest sediments cropping out at the Delaware River. In general, the older the sediments are, the greater the dip. The Quaternary formations are essentially flat-lying beds that overlie the Cretaceous and Tertiary sediments.

Underlying the sediments of the Coastal Plain in Camden County are crystalline rocks of pre-Cretaceous age. The surface of the crystalline rocks slopes towards the southeast. The altitude of the crystalline rock surface is about 40 feet below mean sea level at the Delaware River in the vicinity of the Benjamin Franklin Bridge and about 2,800 feet below mean sea level at the Camden-Atlantic County line.

The formations present in Camden County and their water-bearing properties are described in table 2. Also given is the general lithology and range in thickness of the formations.

GEOLOGIC HISTORY

During the Precambrian a great thickness of sediments was deposited in the area. The sediments included sands, silts, clays, and carbonates. The sediments were buried by additional sediments, metamorphosed, and subsequently uplifted during Paleozoic time. Part of the sediments were reconstituted into the metamorphic rocks known as the Wissahickon Formation. In the Camden County area a period of erosion occurred in the Paleozoic Era and continued into the Mesozoic Era, extending through Triassic and Jurassic time. The next sequence of sediments found are the Cretaceous units above the metamorphic rocks. During Cretaceous time sands, clays, and silts were deposited in a deltaic complex somewhat similar to modern deltas. The streams supplying sediment to the deltaic complex flowed from the west-northwest to the east-southeast. They provided the fluvial sediments that make up the Potomac Group and the Raritan and Magothy Formations. In Late Cretaceous time marine seas inundated the area. The marine invasions were cyclic in nature rather than continuous, and periods of complete withdrawal of the sea occurred. During Late Cretaceous time deposits in the Camden area were mainly of deltaic, beach, and marine origin.

The marine environment persisted into Tertiary time, but the marine inundations were not as extensive as those in the Cretaceous. Early Tertiary deposits (Paleocene to Middle Eocene) are marine in origin; whereas, middle and late Tertiary

deposits (Miocene and Pliocene) are either beach or deltaic deposits.

Sands and gravels of fluvial origin were deposited during early Pleistocene time of the Quaternary Period in extensive areas of Camden County. These deposits, known as the Bridgeton and Pennsauken Formations, may be the result of several early glacial or interglacial stages. In middle Pleistocene time sea level rose during interglacial stage. This resulted in a marine invasion of the area along the Delaware River in Camden. Clays and silts were deposited in the low-lying areas while fluvial material such as sands and gravels were deposited in the higher areas.

As the Wisconsin ice sheet advanced into the northern parts of Pennsylvania and New Jersey, sea level declined and the sea withdrew from the Camden area. Glacial meltwaters deposited sands, silts, and clays. In addition, eolian materials were deposited. Sea level rose to its present level with the withdrawal of the Wisconsin glacier. Recent measurements of sea level suggest that it is still rising.

GROUND-WATER QUALITY

Ground water contains dissolved mineral matter as the result of leaching of soluble material, primarily from the soils, sediments, or rocks through which the water moves. Thus, the natural chemical characteristics of ground water are a function of time, pressure, temperature, composition, and solubility of the minerals with which the water is in contact. Consequently, the quality of ground water may very greatly from one place to another and from one aquifer to another. Superimposed on the natural chemical characteristics of ground water is deterioration of the quality of water caused by human activities, such as the utilization of unlined industrial-retention ponds, waste-disposal wells, and improperly located or constructed sanitary landfills and septic tanks.

Pumping also can have an effect on the local quality of ground water. Changes in the potentiometric surface caused by pumping may change the direction of movement of water or greatly accelerate the movement. Thus, ground water of poor quality may move into centers of pumping. Salt water also may move from adjacent aquifers or from tidal streams into the pumped aquifer.

Water-quality standards vary widely depending on the

intended use of the water. A particular industry may have requirements for water within a narrow range of a minor constituent. If the concentration is beyond this range the water may not be suitable for the particular use without treatment. The same water, however, may be acceptable for public-water supply. The Potable Water Standards of the New Jersey Department of Environmental Protection (1970) for some chemical constituents are as follows:

Chemical constituents	Maximum concentrations (mg/l)
Chloride (Cl)	250
Fluoride (F)	1.5
Hardness (as $CaCO_3$)	150
Iron (Fe)	.3
Manganese (Mn)	.05
Nitrate (NO_3-N)	30
Sodium (Na)	50
Sulfate (SO_4)	250
Dissolved solids	500

The source and significance of dissolved-mineral constituents and physical properties of ground water in Camden County are given in table 3.

Regional water-quality studies have been made for several aquifers in Camden County and vicinity. The aquifers are 1) Potomac-Raritan-Magothy aquifer system (Langmuir, 1969a and 1969b, and Gill and Farlekas, written commun., 1969); 2) the Englishtown aquifer (Seaber, 1965); and 3) the Cohansey Sand (Rhodehamel, 1966). Water-quality data for the neighboring counties are given in ground-water reports for Burlington (Rush, 1962 and 1968), Gloucester (Hardt and Hilton, 1969), and Atlantic Counties (Clark and others, 1968). The quality of water data for Camden County are given in table 4. The quality of water data for each aquifer is discussed under the appropriate sections of the individual formations.

GEOLOGIC FORMATIONS AND THEIR HYDROLOGIC CHARACTERISTICS

PRE-CRETACEOUS CRYSTALLINE ROCKS

Geology

Crystalline rocks of pre-Cretaceous age underlie the Coastal Plain sediments in Camden County. The crystalline rocks at or near the surface near Camden are part of the Wissahickon Formation. Much of the data available on the lithology and age of the rocks are from areas where the rocks are at or near the surface. Information about these rocks at depth is from drillers' logs and seismic studies.

The Wissahickon Formation is a medium to coarse-grained foliated crystalline rock that varies in composition and texture from schist to gneiss. The lithology of the formation varies greatly in both vertical and horizontal directions. The formation was probably a sedimentary series of sandstone, siltstone, and shale that have been deformed and re-crystallized by metamorphism.

The outcrop area of the Wissahickon Formation near the project area is in Pennsylvania a few miles west of the Delaware River. The formation is near the surface in the Camden City area near the Delaware River. The depth to the Wissahickon Formation at the Delaware River in the vicinity of the Benjamin Franklin Bridge is about 60 feet. The configuration of the crystalline rocks is shown in figure 7.

Hydrology

Few wells have been drilled for water supply in the crystalline rocks below the Coastal Plain of New Jersey. Two wells were drilled 600 feet into the Wissahickon Formation in Burlington County near the Delaware River. Neither well produced sufficient water to be useful to their owners. The data from these and other wells drilled into the crystalline rocks indicate that development of these rocks as a source of a large ground-water supply is unlikely.

Although the crystalline rocks do not produce a large quantity of water, they are hydrologically important. The basement rocks form a basal confining unit for the overlying unconsolidated aquifers. In addition, the configuration of the bedrock surface is hydrologically important. During Cretaceous and pre-Cretaceous time streams incised major river channels in the bedrock surface. These west to east-trending channels are filled with highly permeable Coastal Plain sediments (Gill and Farlekas, written commun., 1969).

MESOZOIC ERATHEM

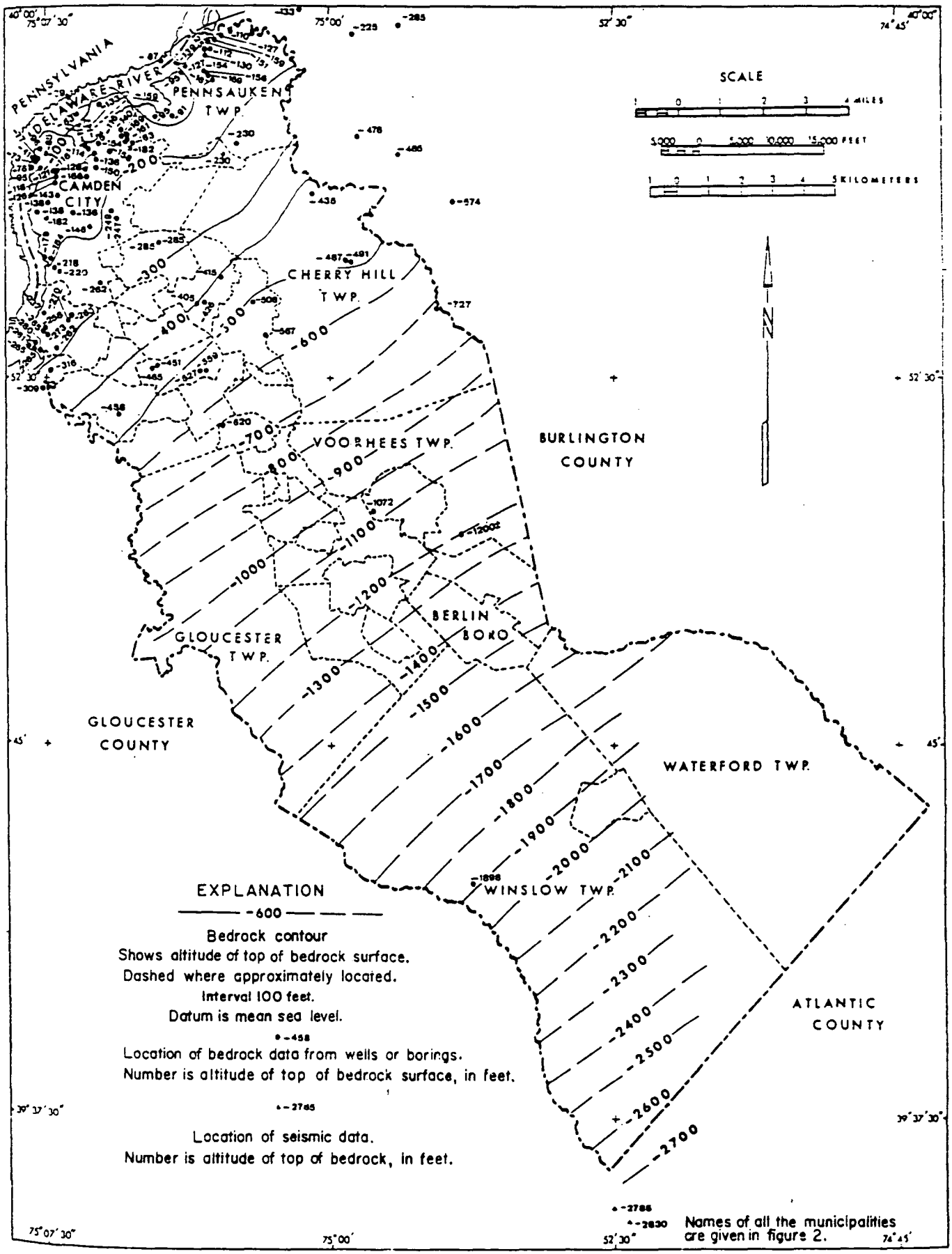


Figure 7. — Configuration of the bedrock surface beneath the Coastal Plain in Camden County.

Cretaceous System

Potomac Group and the Raritan and Magothy Formations

Regional Setting and Stratigraphic Framework

The Potomac Group and the Raritan and Magothy Formations are fluvial-marginal marine sediments of Early to Late Cretaceous age and overlie the pre-Cretaceous crystalline rocks. These sediments make up an extensive part of the Coastal Plain sediments in New Jersey and in the adjacent states. Major structures which contain the greatest thickness of sediments are the Salisbury embayment (Richards, 1945) in Delaware and the Raritan embayment in the vicinity of Raritan Bay and eastern Long Island. The area between these two embayments, which includes Camden County, contains smaller arches and troughs. The outcrop area of the Potomac Group and Raritan and Magothy Formations in Camden County (21 square miles in area) is in the northwestern part of the county near the Delaware River. The units are extensively overlain by permeable Pleistocene deposits in the outcrop area.

The Potomac Group and the Raritan and Magothy Formations form a wedge-shaped body that thickens in a downdip direction and is underlain by the crystalline basement. The configuration of the crystalline rocks is shown in figure 7. The upper limit of the wedge-shaped body is the contact between the Merchantville Formation and the top of the Magothy Formation (fig. 8). The difference between the basement and the top of the Magothy is the total thickness of Potomac Group and the Raritan and Magothy Formations (fig. 9).

In Camden County the thickness of the Potomac Group and Raritan and Magothy Formations ranges from approximately 260 feet at the Collingswood well 7 (CO 7), located near the outcrop area, to approximately 1,210 feet at the New Brooklyn Park test well (WI 27). This is shown on the thickness map in figure 9. The distance between the two wells is 13 miles.

Correlation of part of the Cretaceous stratigraphic section in northern New Jersey and Maryland as determined by Wolfe and Pakiser (1971) is given below.

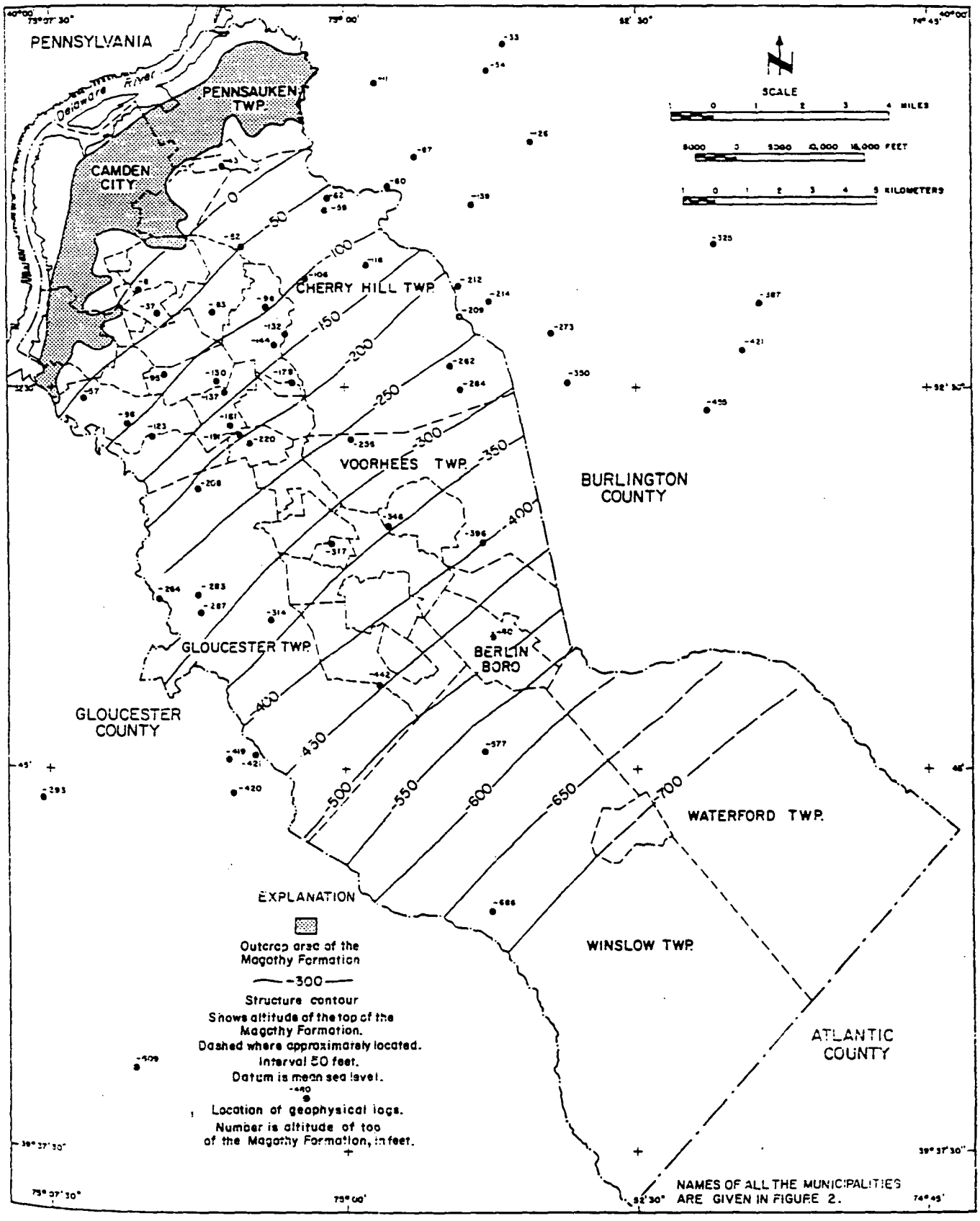


Figure 8. — Structure contour map of the top of the Magothy Formation in Camden County.

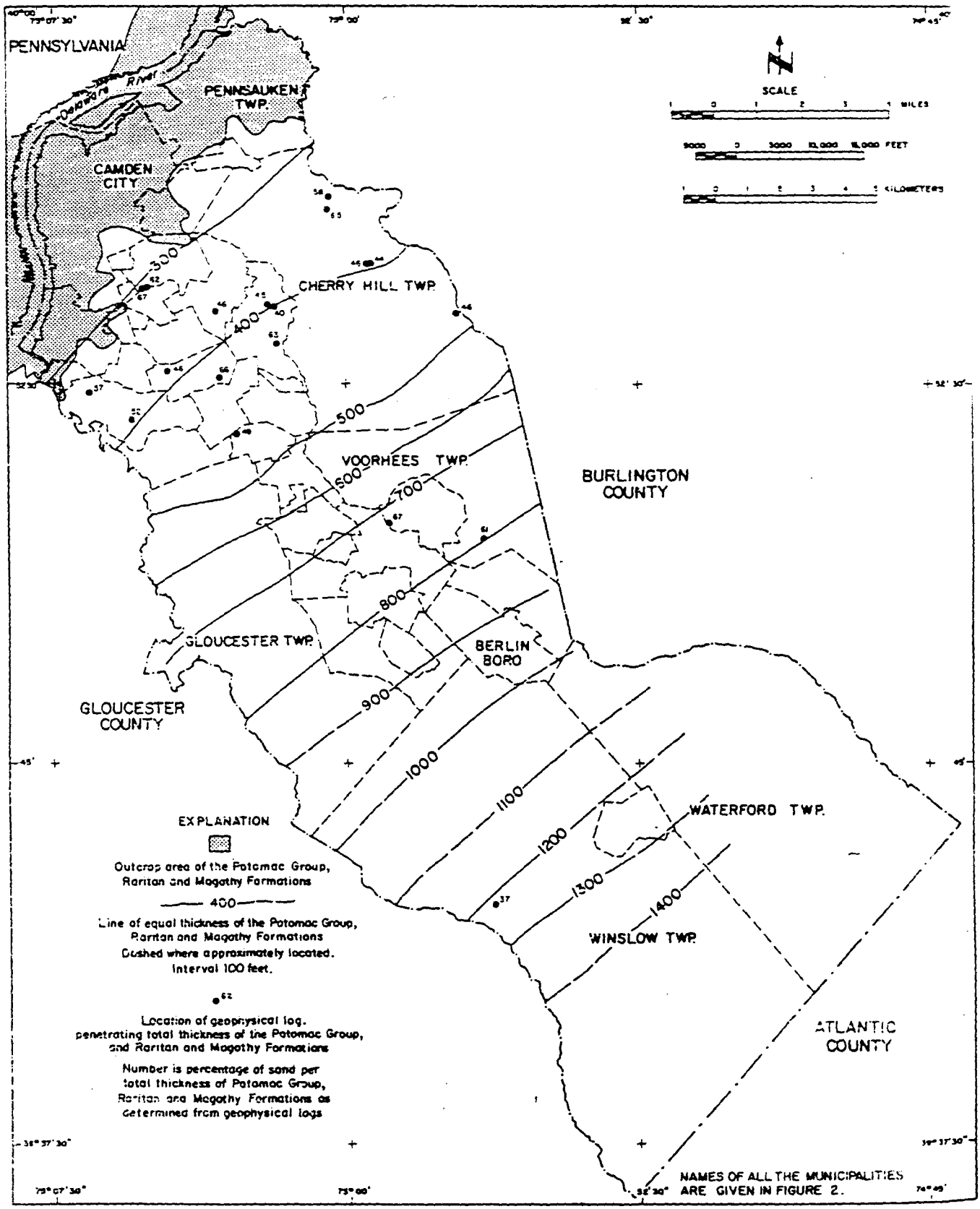
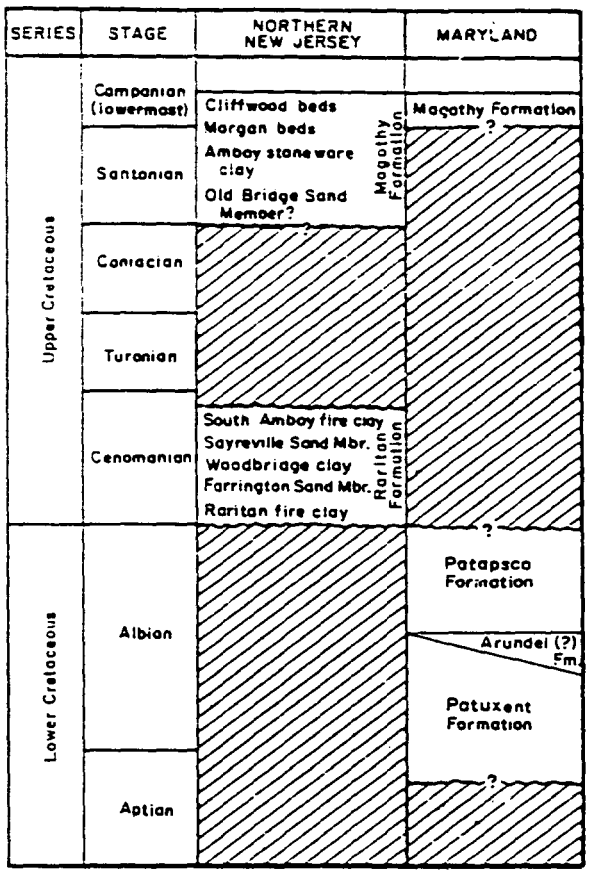


Figure 9. Thickness map of the Potomac Group and the Raritan and Magothy Formations in Camden County.



The lowermost part of the stratigraphic section, the Potomac Group, consists of the Patuxent, Arundel, and Patapsco Formations at the type locality in Maryland. Palynological studies of samples from three sites from the Camden County area by Wolfe and Pakiser (1971) and L. A. Sirkin (written commun., 1971) indicate that only the Upper Patapsco was found at two of the three sites. Berry (1911), from a study of megafossil flora, determined that the sample from a site in the outcrop near Camden is Upper Raritan. However, Wolfe and Pakiser (1971) who examined a sample from the same site indicate an uppermost Patapsco age based on palynologic data. According to Sirkin (written commun., 1971) the uppermost Patapsco can be found at Medford test well (ME 1), but not at the New Brooklyn Park test well (WI 27).

The Raritan Formation at the type locality at Raritan Bay, Middlesex County, was divided into seven units by Ries, Kümmel, and Knapp (1904) and later modified by Berry (1906). Barksdale and others (1943) assigned names to the three sand members. Recent palynological work by Wolfe and Pakiser (1971) and Doyle (1969) indicate that the upper two units, the Amboy stoneware clay and the Old Bridge Sand, are of Magothy age. Wolfe and Pakiser (1971) reassigned the Old Bridge Sand as the basal member of the Magothy Formation. However, the members of the Raritan Formation of the type area in Raritan Bay cannot be traced to the Delaware Valley as distinct lithologic units. Palynologic analysis of core samples from the New Brooklyn test well (WI 27) and the Medford test well (ME 1) indicate the Raritan Formation is present at the two sites (Sirkin, written commun., 1971).

The Magothy Formation in the Raritan Bay area has been re-examined by Owens, Minard, and Sohl (1968). Based on the then unpublished work of Wolfe and Pakiser (1971), Owens, Minard, and Sohl (1968) defined the Magothy as consisting of four units. The total thickness of the Magothy is more than 200 feet in the Raritan Bay area. Members of the Magothy Formation of the Raritan Bay area are not recognizable in the Delaware Valley. Palynological studies by Sirkin (written commun., 1971) indicate that there is about 300 feet of Magothy age sediments at New Brooklyn Park test well (WI 27) and about 100 feet at the Medford test well (ME 1).

Depositional Environment

The Potomac Group and the Raritan and Magothy Formations were deposited in a complex fluvial-deltaic environment (Owens and others, 1968). Figure 10 illustrates the idealized sand-dispersal system showing the various depositional environments for the Eocene deltas of Texas (Fisher and McGowen, 1969). The authors believed that the fluvial-deltaic sediments of the Potomac Group and the Raritan and Magothy Formations have a similar complex depositional history.

In the Camden area the sediments were deposited as part of the ancestral Schuylkill fluvial-deltaic system (Gill and Farlekas, written commun., 1969). Troughs in the bedrock surface represent erosional features that are of Late Cretaceous age or older. These troughs, filled mainly with coarse sands and gravels, have been delineated in Philadelphia by Greenman and others (1961). The sediments were deposited during Cretaceous time in the fluvial part of the system, which

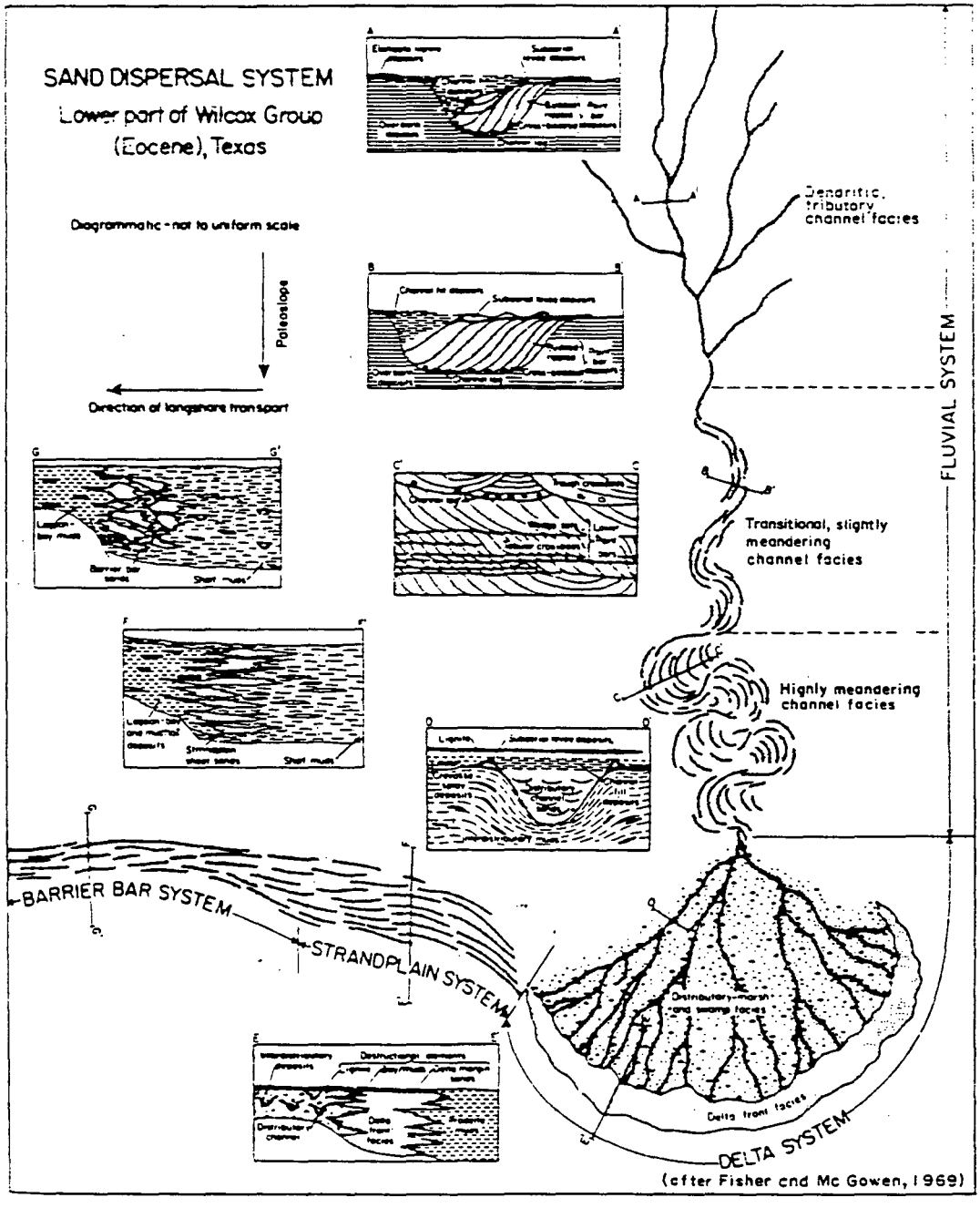


Figure 10. — Idealized sand-dispersal system in various depositional systems, Wilcox Group, Texas.

probably extended from Philadelphia to the area updip from New Brooklyn Park.

A thickness map of the Potomac Group and the Raritan and Magothy Formations is given in figure 9. Also shown is the percentage of sand as estimated from geophysical logs from wells that penetrate the section from the top of the Magothy to the crystalline rocks. The thickness lines show the thickening of the sediments downdip. The percentage of sand indicates greater values in the updip area and lower values in the downdip area. The estimated percentage of sand at the New Brooklyn Park well (WI 27) is 37. Based on the depositional concept developed by Fisher and McGowen (1969) the New Brooklyn Park well is interpreted as being in the distributary channel-marsh and swamp facies. The sediments found in the Haddonfield area are interpreted as including the transitional, slightly meandering channel facies of Fisher and McGowen (1969). The dendritic tributary channel facies is interpreted as occurring in the area from Philadelphia to the northern part of Camden County. The highly meandering channel facies probably occurs in the area downdip from Elm Tree Farms well (VO 12). Lack of data prevents the delineation of the extent of this facies downdip of the Elm Tree Farms area.

Particle-size analysis is available for samples from the New Brooklyn Park test well (WI 27) in Winslow Township (table 5). The particle-size analysis shows the predominant silt and clay values.

Hydrology

The most productive source of ground water in Camden County is the Potomac-Raritan-Magothy aquifer system. The aquifer system is made up of aquifers consisting of sand with some gravel and confining units consisting of silts and clays and is overlain in the outcrop area by highly permeable Pleistocene sand and gravel. The sands are separated into three hydrologic units, an upper, middle, and lower aquifer. The upper unit consists mainly of the sands of the Magothy Formation. The middle and lower units consist mainly of sands of the Raritan Formation and the Potomac Group. The thickness of the three hydrologic units are shown in figures 11, 12, and 13. The lower aquifer in the outcrop area is overlain by and hydraulically connected to the Pleistocene deposits and is a water-table aquifer in Philadelphia. The upper aquifer in the outcrop area is overlain by and hydraulically connected to the Pleistocene deposits in Camden County and is under water-table conditions.

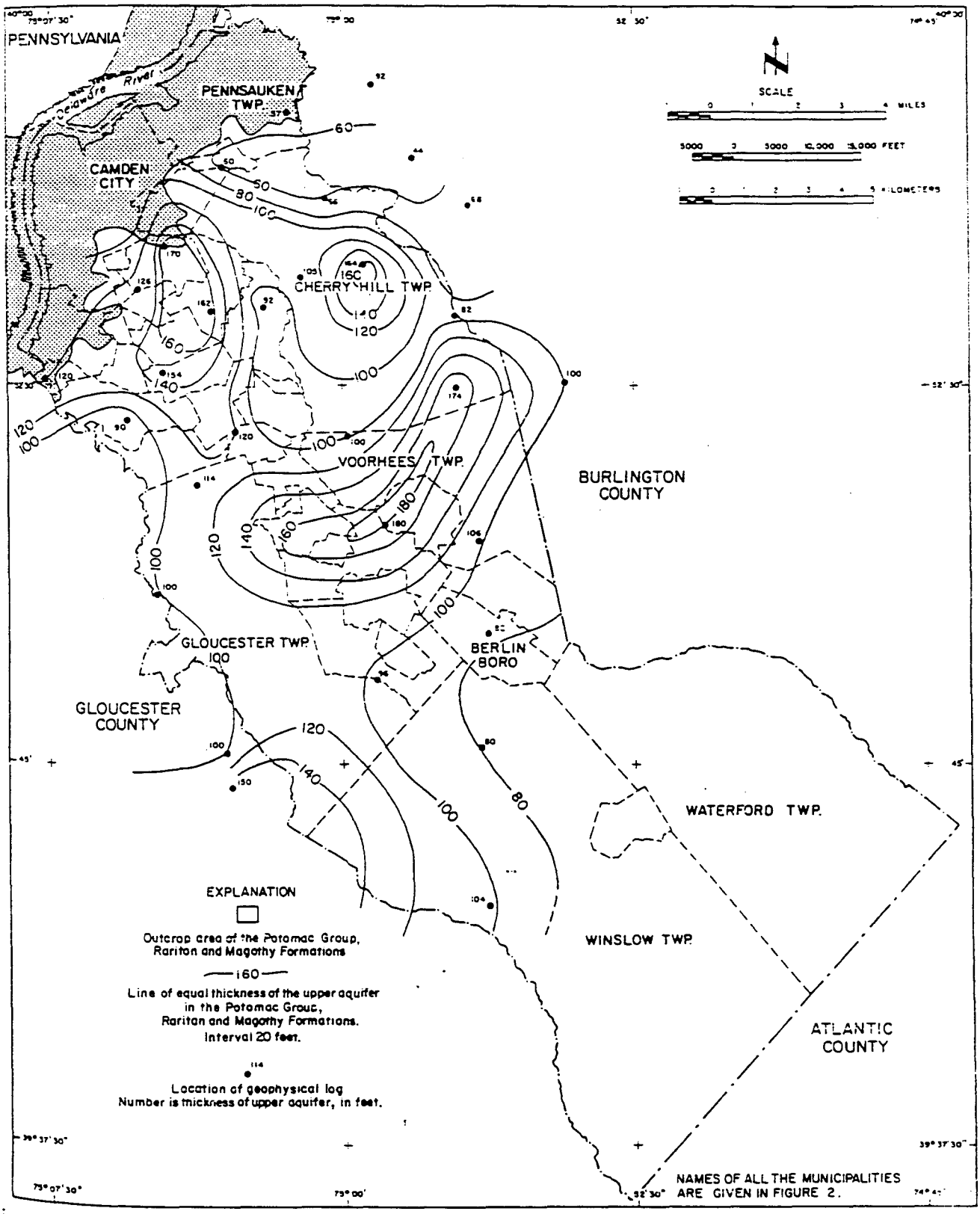


Figure 11. — Thickness map of the upper aquifer in the Potomac-Raritan-Magothy aquifer system in Camden County.

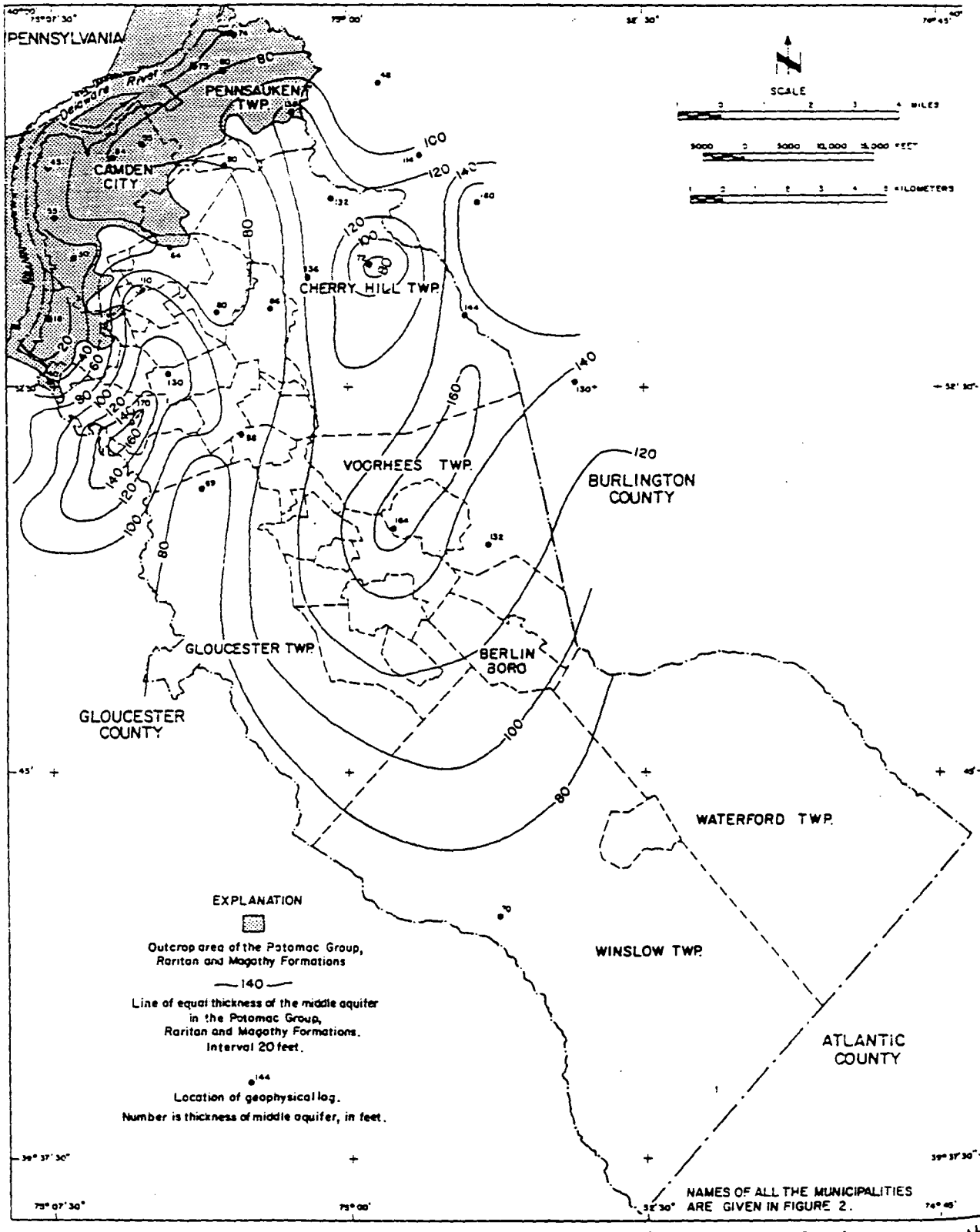


Figure 12. — Thickness map of the middle aquifer in the Potomac-Raritan-Magoth aquifer system in Camden County.

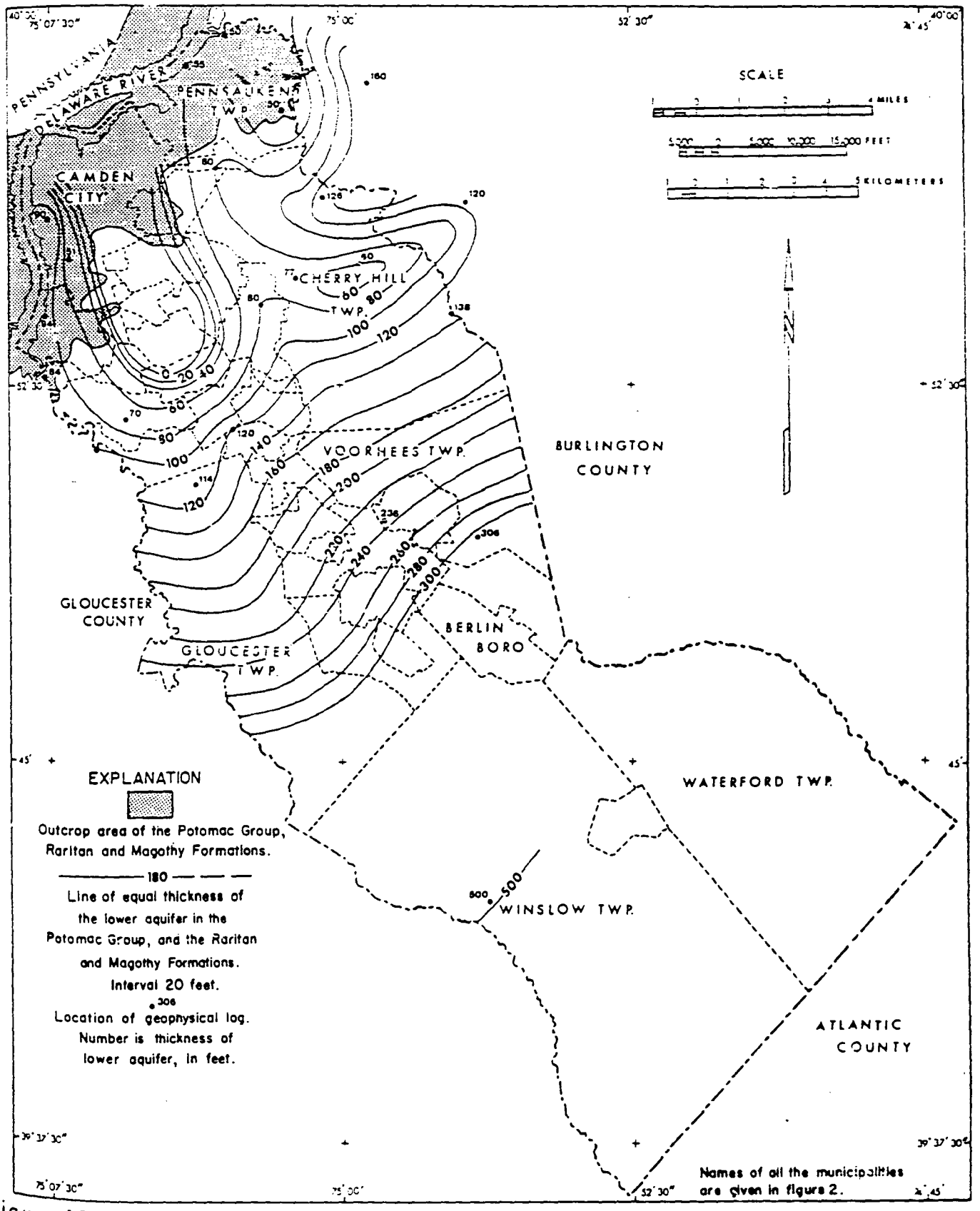


Figure 13. — Thickness map of the lower aquifer in the Potomac-Raritan-Magothy aquifer system in Camden County.

Patterns of Ground-water Movement

Pattern before development.--The natural ground-water flow regimen for the aquifer system prior to development was influenced by topography. The topographically high areas are the natural recharge zones for much of the ground-water system in the Coastal Plain. In areas of topographic highs the prepumping potentiometric surface of each aquifer was greater than that of the aquifer below. This indicates that vertical movement of ground water was downward through the semipervious confining units into the Potomac-Raritan-Magothy aquifer system. The discharge areas were the Delaware River, and to some extent, the topographic lows or stream valleys which cut across the outcrop areas.

The potentiometric map (fig. 14) represents the average natural conditions prior to 1900 for the Potomac-Raritan-Magothy aquifer system in Camden County. Most of the data for the map are from the annual reports of the State Geologist for the period 1888-1909. Water-level data for years after 1900 were used when there was reasonable certainty that the levels were indicative of natural or prepumpage conditions. In Camden County the topographically high recharge area occurs in northern Voorhees Township and southern Cherry Hill Township (fig. 14).

Pattern after development.--The first public-water supply obtained from the Potomac-Raritan-Magothy aquifer system and the hydraulically connected Pleistocene sediments in Camden County was from the Morris well field of the City of Camden in 1898. As the Camden City area's population and industry grew its need for ground water increased. Thompson (1932) describes in detail the ground-water development of the Camden area for 1898-1927. His data for Camden County were used to determine the annual pumpage from the Potomac-Raritan-Magothy aquifer system and the hydraulically connected Pleistocene sediments for 1917-27 shown in figure 15. Withdrawals by industrial wells were estimated by the present authors to be 4 mgd for 1917-27.

The early development of water in the Potomac-Raritan-Magothy aquifer system in Camden County was centered in the vicinity of Camden City, the area containing greatest concentration of population and industry. In later years suburban development had moved southeastward. During the 1950's and 1960's many new public-supply wells were drilled in

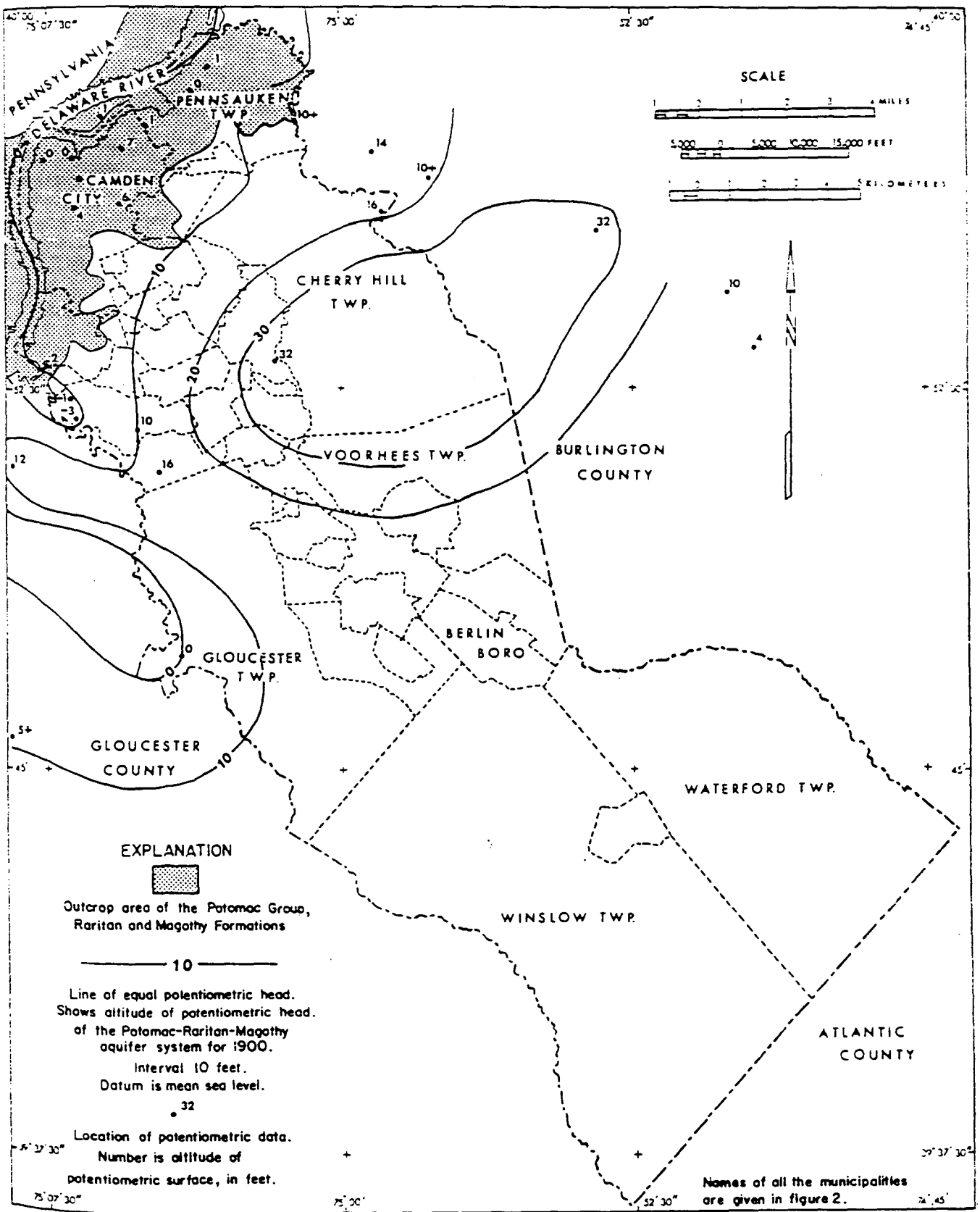


Figure 14. — Potentiometric map for the Potomac-Raritan-Magothy aquifer system in Camden County, 1900.

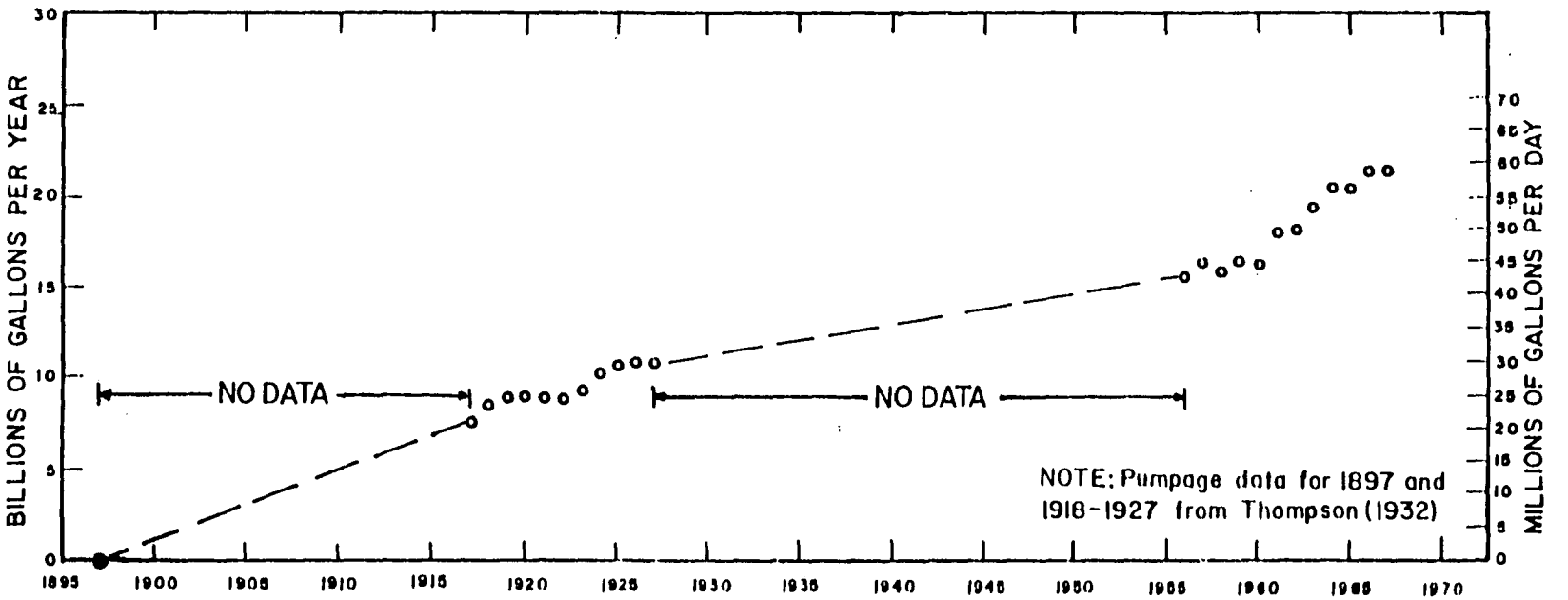


Figure 15. — Pumpage from the Potomac-Raritan-Magothy aquifer system in Camden County, 1897 - 1967.

areas where little or no water had been withdrawn from the Potomac-Raritan-Magothy aquifer system. Figure 16 shows the geographic distribution of the ground-water pumpage in 1966 for Camden County. Data used in figure 16 is tabulated in table 6. The effect of the increasing southeastward movement of demand on the aquifer system can be seen by comparing potentiometric surface maps. Figure 17 shows the 1956 potentiometric surface for the Potomac-Raritan-Magothy aquifer system. The map was developed from data from observation wells and reported data from newly drilled wells from mid-1955 to mid-1957. Figure 18 shows the potentiometric surface for 1968. This map was developed mainly from water-level measurements made over a three-day period from October 17 to October 19, 1968. A significant change in potentiometric surface occurred in the southeastern part of Camden County between 1956 and 1968. Prior to 1956 there was little ground-water diversion in the southeastern part of Camden County. New pumpage in this area after 1956, primarily from the upper and middle aquifer, is the probable cause for the change in potentiometric surface in the southeastern part of Camden County. Consequently, by 1968 a significant head difference existed between the upper and lower aquifer in southeastern Camden County and adjacent Gloucester County. The potentiometric heads for the upper and lower aquifers in the southeastern part of Camden County is shown in figure 18.

Three potentiometric decline maps were constructed from the potentiometric surface maps of the Potomac-Raritan-Magothy aquifer system. They are for 1) 1900 to 1956 (fig. 19), 2) 1956 to 1968 (fig. 20), and 3) 1900 to 1968 (fig. 21). Almost all of the decline from 1900 to 1956 occurred in the northern part of the county. The decline in the potentiometric surface during 1956 to 1968 (fig. 20) occurred throughout the county with the greatest declines in the Cherry Hill Township-Voorhees Township area and Berlin Borough area. From 1900 to 1968 the greatest potentiometric declines (more than 100 feet) occurred in the northcentral part of the county (fig. 21). Withdrawals from the Potomac-Raritan-Magothy aquifer system responsible for the decline in head are shown in figure 15. Pumpage was estimated for periods for which data were not available. Total pumpage from the Potomac-Raritan-Magothy aquifer system in Camden County from 1898 to 1968 based on figure 15 is 800 billion gallons. One-third of that pumpage was withdrawn in 13 years (1956 to 1968), which is 19 percent of the total period of pumpage.

Withdrawals in Philadelphia from the lower aquifer in the Potomac-Raritan-Magothy aquifer system has a direct effect on the potentiometric surface and ground-water flow in the Camden area. Greenman and others (1961) describe the history

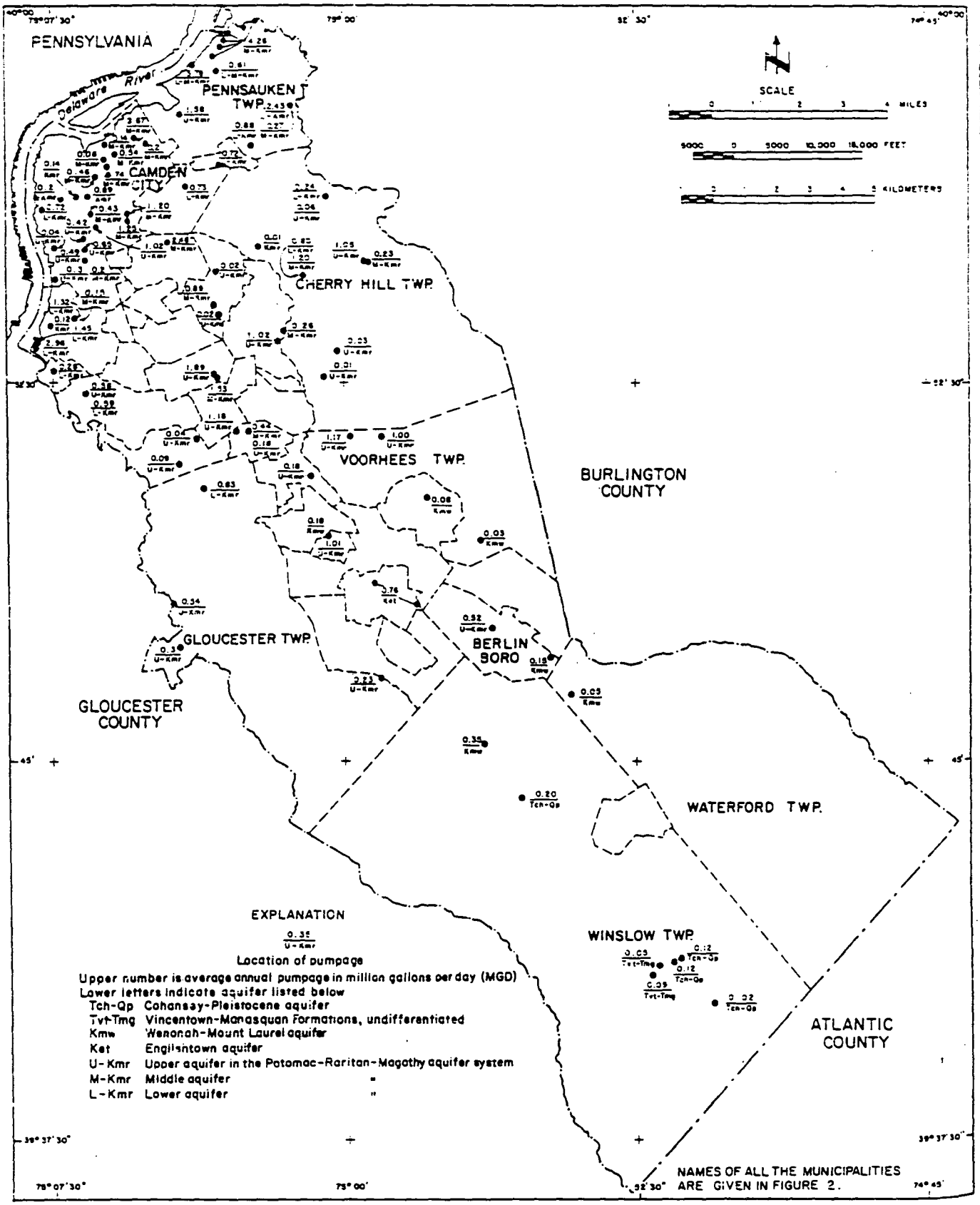


Figure 16. — Map showing the distribution of public and industrial pumpage in Camden County, 1966.

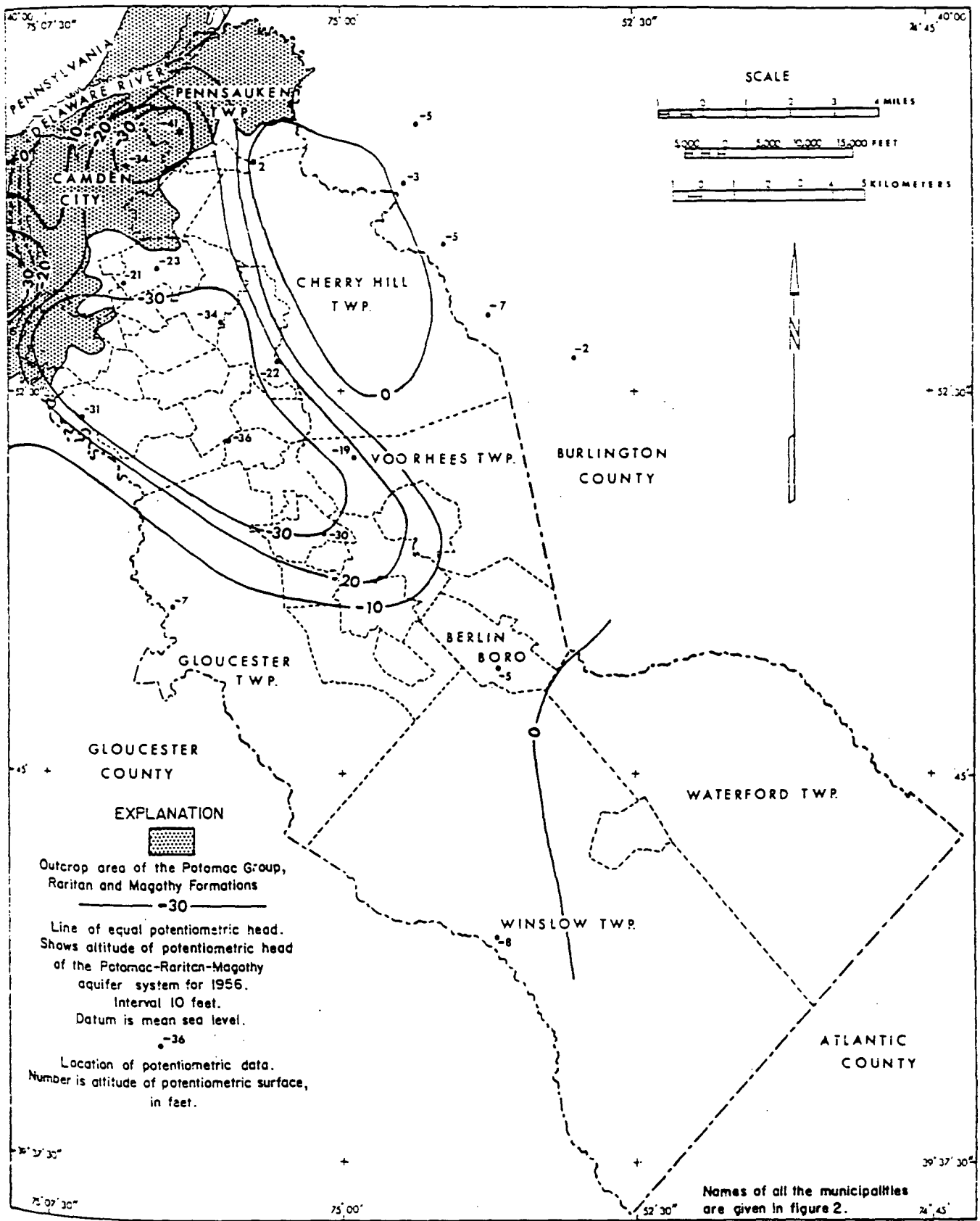


Figure 17. — Potentiometric map for the Potomac-Raritan-Magothy aquifer system in Camden County, 1956.

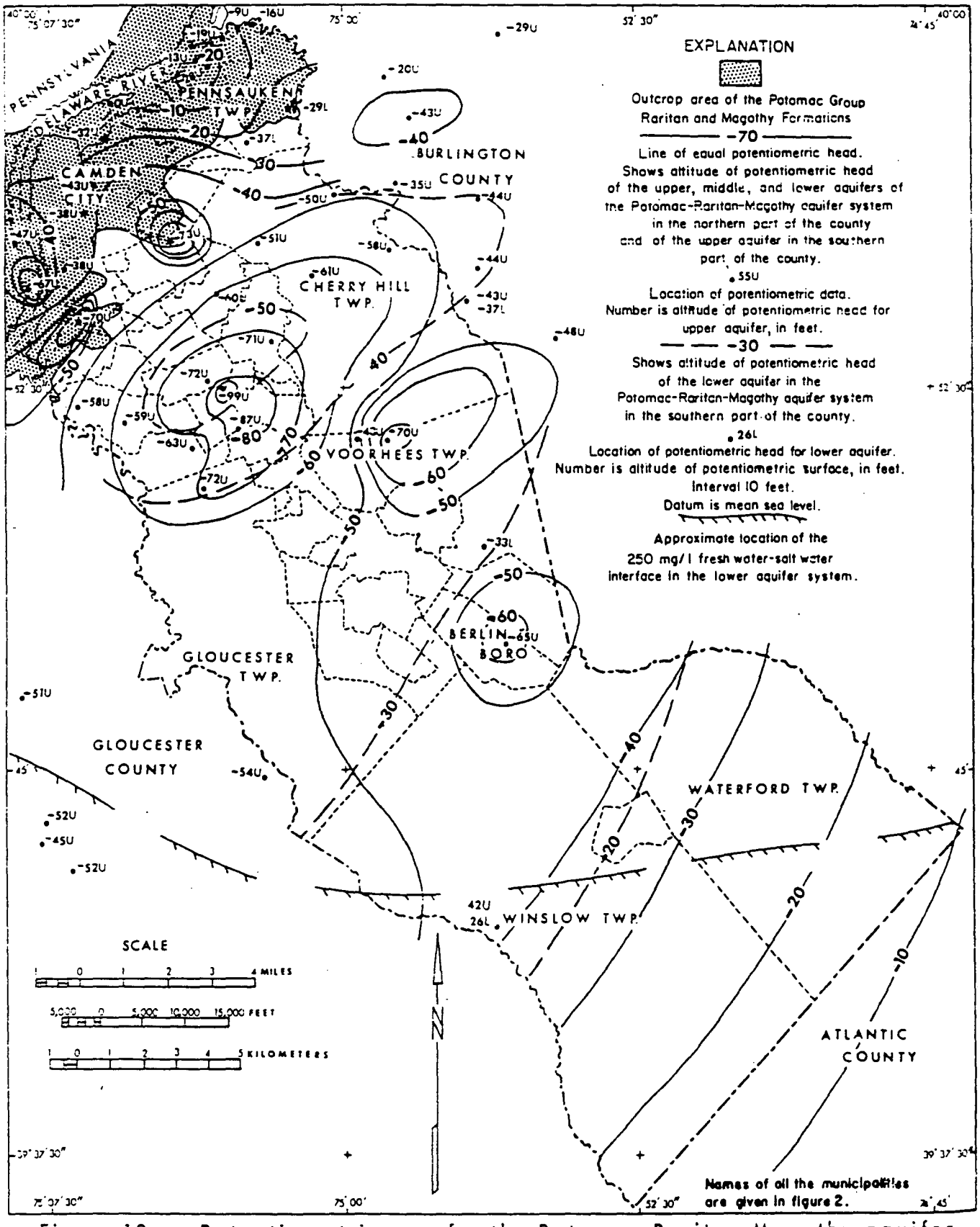


Figure 18. — Potentiometric map for the Potomac-Raritan-Magothy aquifer system in Camden County, October 17-19, 1968.

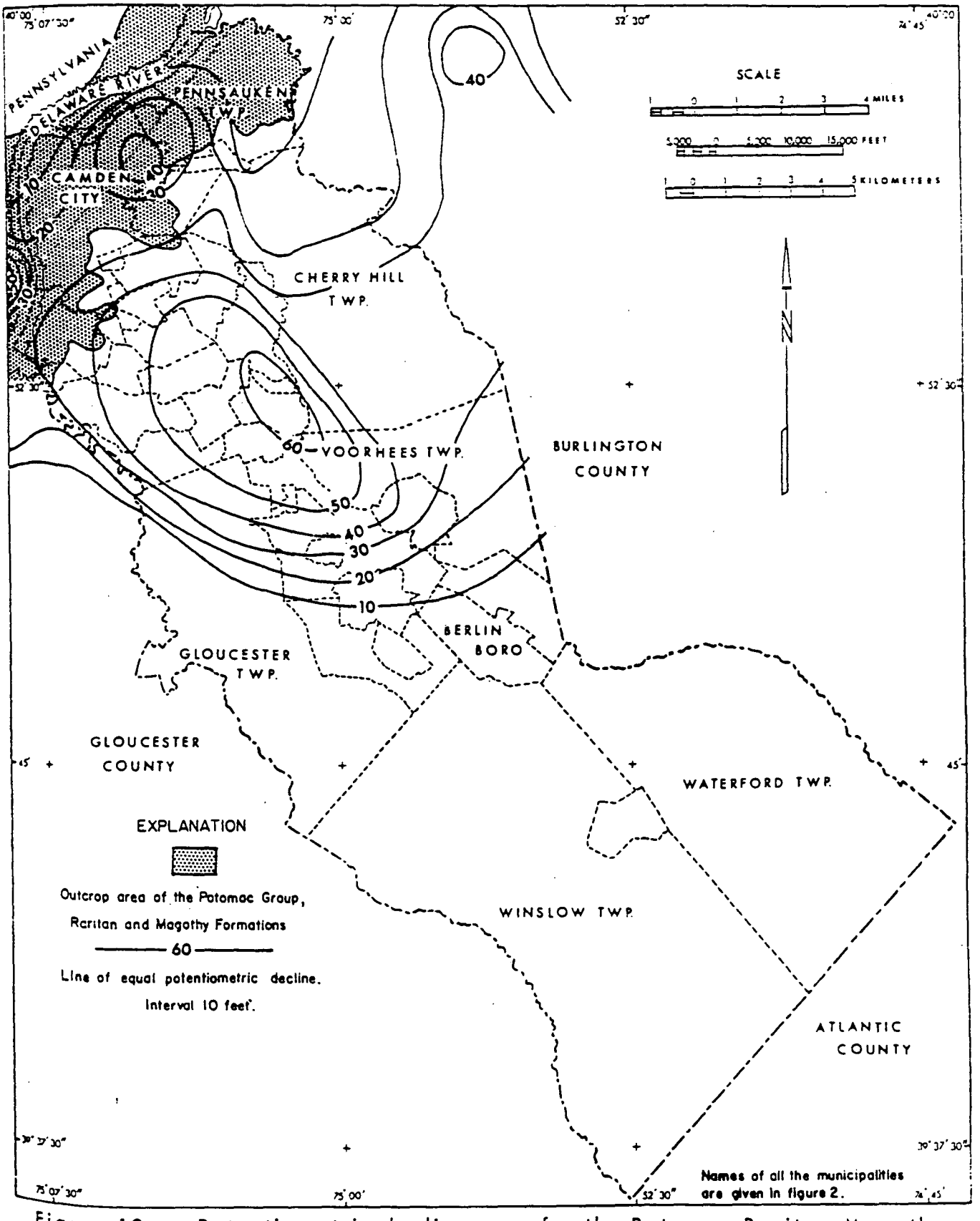


Figure 19. — Potentiometric decline map for the Potomac-Raritan-Magothy aquifer system in Camden County, 1900-56.

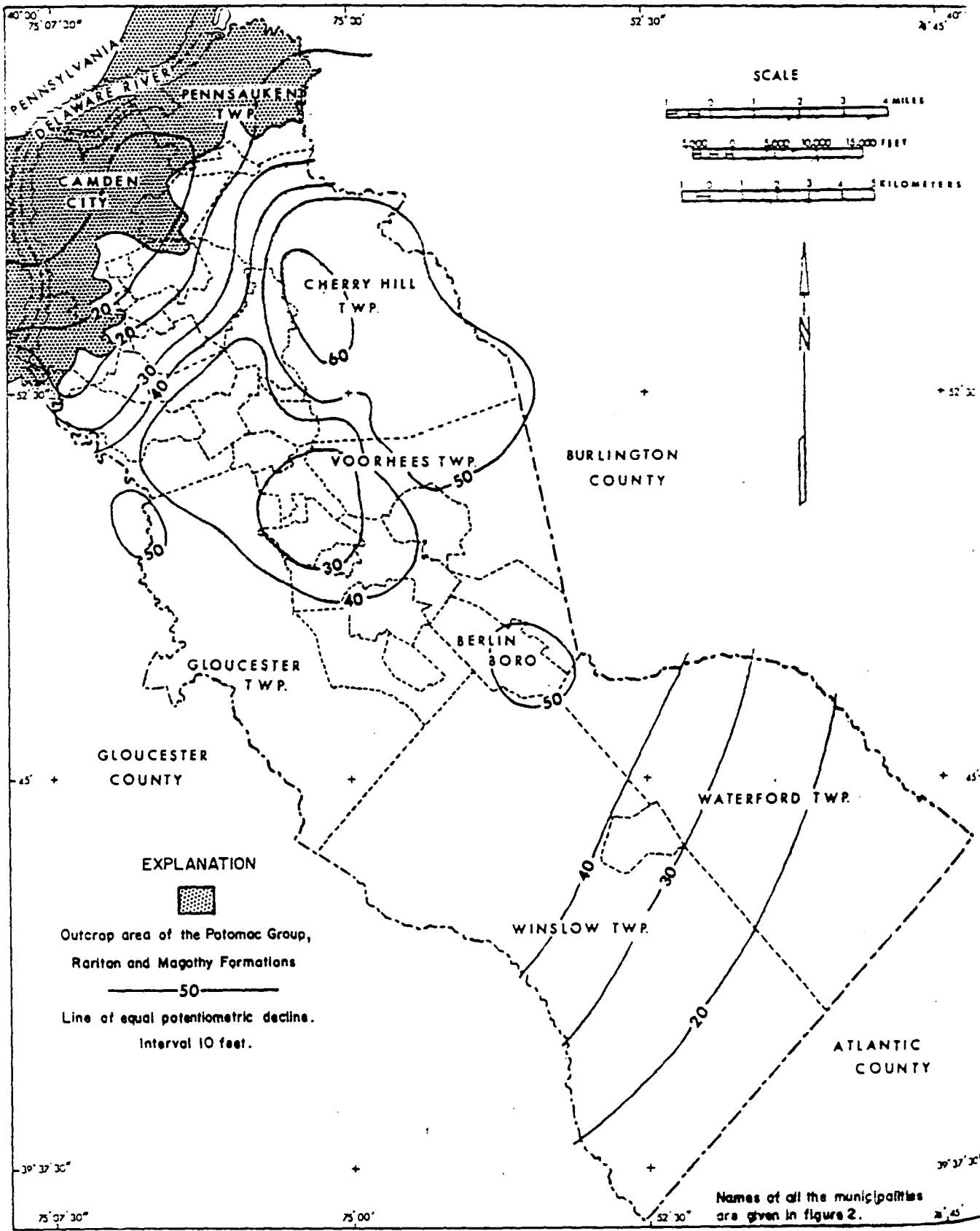


Figure 20. — Potentiometric decline map for the Potomac-Raritan-Magothy aquifer system in Camden County, 1956-68.

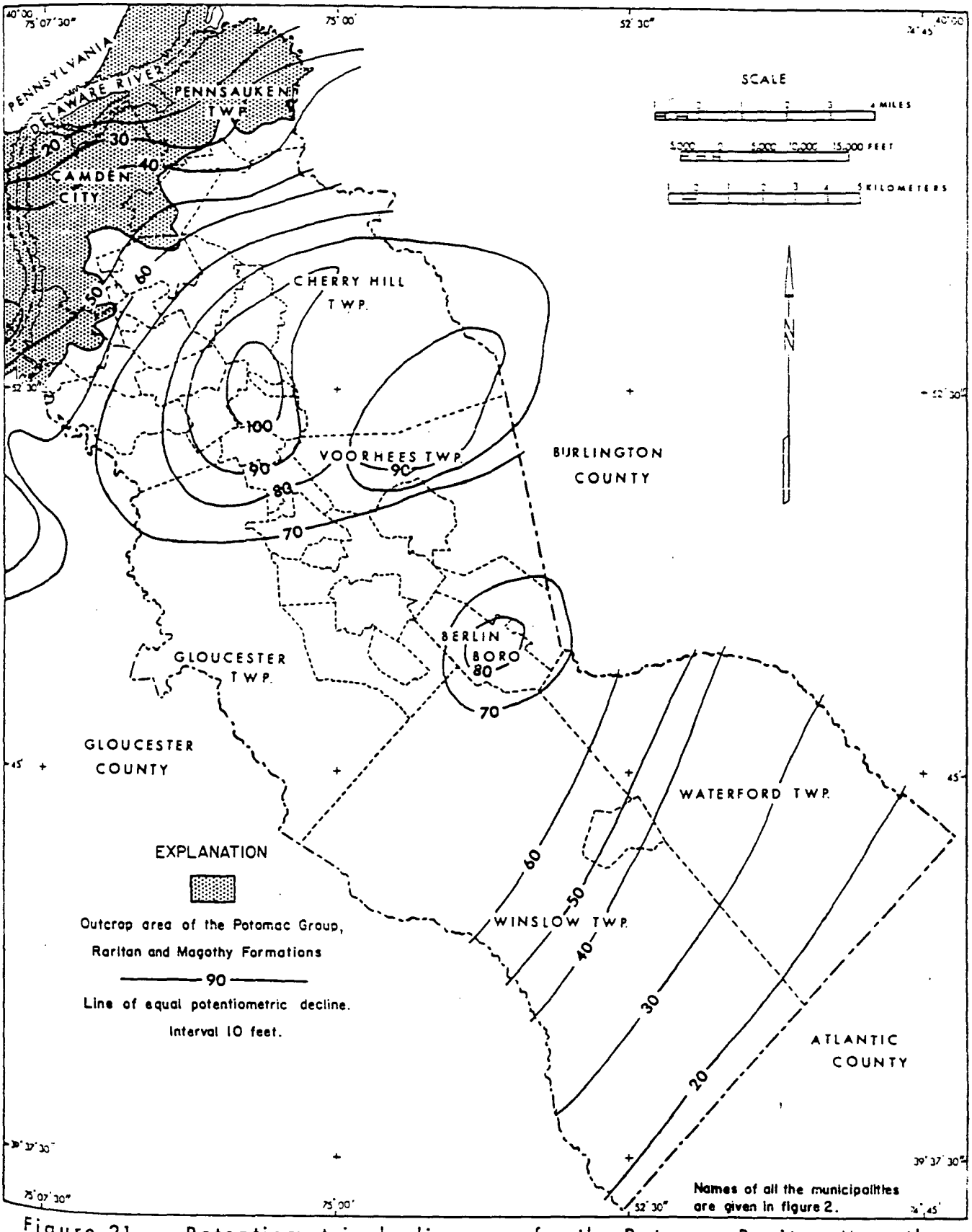


Figure 21. — Potentiometric decline map for the Potomac-Raritan-Magothy aquifer system in Camden County, 1900-68.

of development from the lower aquifer in Philadelphia and present maps of the potentiometric surface for the early 1920's, 1940, 1945, and 1954. The pumpage was approximately 5 mgd in 1920, 15 mgd in 1940, and 23 mgd in 1945. Withdrawals from the lower aquifer in Philadelphia decreased in 1946 and 1947, but again increased to 23 mgd in 1951. The rate of withdrawals declined after 1953 and pumpage in South Philadelphia in 1956 was 18 mgd. No recent complete inventory of withdrawal from the lower aquifer in Philadelphia has been made. However, spot inventories at the U. S. Navy Base and head measurements in 1968 in a few wells in Philadelphia indicate a much lower pumpage. Many wells pumped in 1956 were no longer in use in 1968.

Recharge and Movement of Ground Water

As presented in the section on patterns of ground-water movement the movement of water in the Potomac-Raritan-Magothy aquifer system prior to pumpage was influenced by recharge in topographically high areas while the discharge areas were the Delaware River, and to some extent, the topographic lows or stream valleys which cut across the outcrop areas.

Recharge and movement of water in the Potomac-Raritan-Magothy aquifer system was altered by the large amount of withdrawals, especially in the area near the Delaware River. As pumping increased the gradients were reversed in the water table and artesian aquifers near and under the Delaware River. Greenman and others (1961) suggest that induced recharge occurs from the Delaware River into the aquifers in Philadelphia. They compared the specific conductance of the water from a well located near the Delaware River and the specific conductance of the Delaware River. Fluctuations in specific conductance were similar except that there was a five-month time lag. Barksdale and others (1958) give substantial evidence to show that induced recharge from the Delaware River occurs in the heavily pumped parts of the aquifer near the river. They cite three types of evidence; aquifer test results, temperature fluctuations, and changes in chemical quality. An aquifer test at the Morro Phillips tract in Camden City near the Delaware River indicated a recharge boundary under the river and suggested that after two years of operation a well near the river would obtain 90 percent of its water from the river. Temperatures of water in a well near the river (at Beverly, Burlington County) change seasonally as does the temperature of water in the Delaware River. On the other hand the temperature of the water in a well several miles away from the river (at

Haddon Heights) remains essentially constant (Barksdale and others, 1958, p. 106-108). Changes in chemical quality of water from wells near the river were cited by Barksdale and others (1958) as evidence of induced recharge. Table 7 gives the chemical quality data of two wells, located in Pennsauken Township, used by Barksdale and others (1958, p. 121-123) and also includes more recent data. The water-quality analyses dated 1924 (table 7) were for samples collected just after completion of the wells. As pointed out by Barksdale and others (1958) the dissolved-solids content of the water from well 1 (PE 18), located near the river, more than doubled between 1924 and 1953 while the quality of water from well 4 (PE 21), located one mile from the river, remained the same. Much of the water obtained from well 1 is induced river water; whereas, well 4 receives a much greater part of its water from the aquifer and a lesser amount of water from the Delaware River. Data from samples taken after 1953 from well 1 indicate improved quality for a period of approximately 13 years. This was followed by a decline in quality as evidenced by increasing chlorides, sulfates, and specific conductance. Chlorides were 27 mg/l (milligrams per liter) in 1969, an increase from 8.0 mg/l in 1963. Changes in the quality of the river water probably caused the variation in quality of water in the wells.

Recharge of the aquifer system downdip from the outcrop area is mainly from vertical leakage through the overlying confining unit. In the area downdip of the outcrop there have been significant declines in the potentiometric surface--declines in excess of 100 feet at some locations. The difference in heads between those in the Potomac-Raritan-Magothy aquifer system and the overlying aquifers provides the driving mechanism for downward vertical leakage. The rate of vertical leakage is, with all other factors being equal, probably greater in the downdip area where large head differences occur. In the area near the outcrop the head difference is not as large, and thus the rate of vertical leakage is probably smaller. This area is also closer to the Delaware River, which is a recharge boundary. In addition to recharge of water through the confining units, significant amounts of water are released to the aquifer system from storage within the confining silts and clays in the Potomac Group and the Raritan and Magothy Formations and the overlying confining units.

An additional source of water lies outside of the political boundaries of Camden County. Water moves toward Camden from the adjacent areas outside the county line as the pumping cone of depression expands. Description of the regional pattern of ground-water flow for this aquifer system for the hydrologic unit in southern New Jersey has been studied

in detail by Gill and Farlekas (written commun., 1969).

The source of water in the Potomac-Raritan-Magothy aquifer system in Camden County is therefore 1) precipitation on the outcrop area and induced recharge from streams located in the outcrop area, for example, the Delaware River, 2) recharge through the confining units, 3) water released from storage from the silts and clays of the Potomac Group and Raritan and Magothy Formations and overlying units, and 4) water from the adjacent areas as the cone of depression expands.

Aquifer Characteristics

A number of aquifer tests in the Camden County area for wells tapping the Potomac-Raritan-Magothy aquifer system have been evaluated in the past using the Theis nonequilibrium method (Ferris and others, 1962, p. 92), which assumes that the confining layers are impermeable. Results were reported in Barksdale and others (1958, p. 96-98) and Rush (1968, p. 32-33). Four of these aquifer tests have been re-evaluated (Harold Meisler, written commun., 1973) to include leaky artesian aquifer conditions proposed by Hantush (1960). Two of the four re-evaluated aquifer tests are for wells located in Camden County near the Delaware River and tap the middle aquifer of the Potomac-Raritan-Magothy aquifer system. The results of the test at the site of the Camden Water Department well 14 (CA 18) indicate that the transmissivity ranges from 2,300 to 6,700 ft^2/day (17,000-50,000 gpd/ft) with an average of 4,300 ft^2/day (32,000 gpd/ft^2). The storage coefficient ranges from 1.0×10^{-4} to 3.5×10^{-4} with an average of 1.8×10^{-4}. The re-evaluated results of the aquifer test at the Stockton pumping station (Camden Division) of the New Jersey Water Company indicate that the transmissivity ranges from 3,200 to 3,700 ft^2/day (24,000-28,000 gpd/ft) and the storage coefficient ranges from 3.3×10^{-5} to 1.5×10^{-3}.

Many large diameter high-yielding wells tap the Potomac-Raritan-Magothy aquifer system. The yields of 106 wells in Camden County (diameter 12 inches or greater) range from 455 to 1,900 gpm (gallons per minute) (table 1). The average yield for 106 wells is 1,085 gpm. The specific capacities of these wells are high, indicating a high aquifer transmissivity. The range of specific capacity of 96 wells (diameter 12 inches or greater) tapping the Potomac-Raritan-Magothy aquifer system in Camden County is 6.1 to 80 gpm/ft (gallons per minute per foot of drawdown) (table 1). The average specific capacity of these wells is 29.3

gpm/ft. Two-thirds of the specific capacities range between 15 to 35 gpm/ft. Figure 22A shows the distribution of the specific capacities of the 96 large diameter wells.

Another method for determining the hydraulic properties of aquifers is the specific capacity of a well divided by the length of well screen. The specific capacity of the well per foot of well screen may be more meaningful than specific capacity where the length of well screens differ considerably. The distribution of values of specific capacity per foot of well screen for 95 wells (diameter 12 inches or greater) tapping the Potomac-Raritan-Magothy aquifer system in Camden County is shown in figure 22B. These values range from 0.12 to 2.29 gpm per foot of screen. About 56 percent of the values range between 0.6 and 1.0 gpm per foot of screen. The average specific capacity per foot of well screen is 0.83 gpm per foot of screen. Values of specific capacity per foot of well screen for wells tapping the Potomac-Raritan-Magothy aquifer system located in the outcrop area are generally higher than those located downdip from the outcrop. The average specific capacity per foot of well screen for 60 wells located in the outcrop area is 0.95 gpm per foot of screen and the range is from 0.35 to 2.29 gpm per foot of screen. The average specific capacity per foot of well screen for 35 wells located downdip from the outcrop is 0.52 gpm per foot of screen and the range is from 0.22 to 1.7 gpm per foot of screen. The higher values for wells located in the outcrop area are attributed to better hydraulic properties of the aquifer and proximity to source of recharge, primarily from the Delaware River. This is in agreement with the evidence cited by Barksdale and others (1958) and Greenman and others (1961) indicating recharge from the Delaware River.

Quality of Water

Detailed analysis of water-quality data for the Potomac-Raritan-Magothy aquifer system has been presented in recent publications by Langmuir (1969a and 1969b) and Gill and Farlekas (written commun., 1969). Camden County was one of the counties included in these recent studies. Some of the data used in the recent studies are given in table 4.

Water from the Potomac-Raritan-Magothy aquifer system in a large part of Camden County, with the exception of iron content, meets the State's standards for potable water (New Jersey State Department of Environmental Protection, 1970) with little or no treatment and is suitable for most industrial and agricultural needs. Recent analyses of water from two wells in Camden City suggest that chromium values are equal to or above

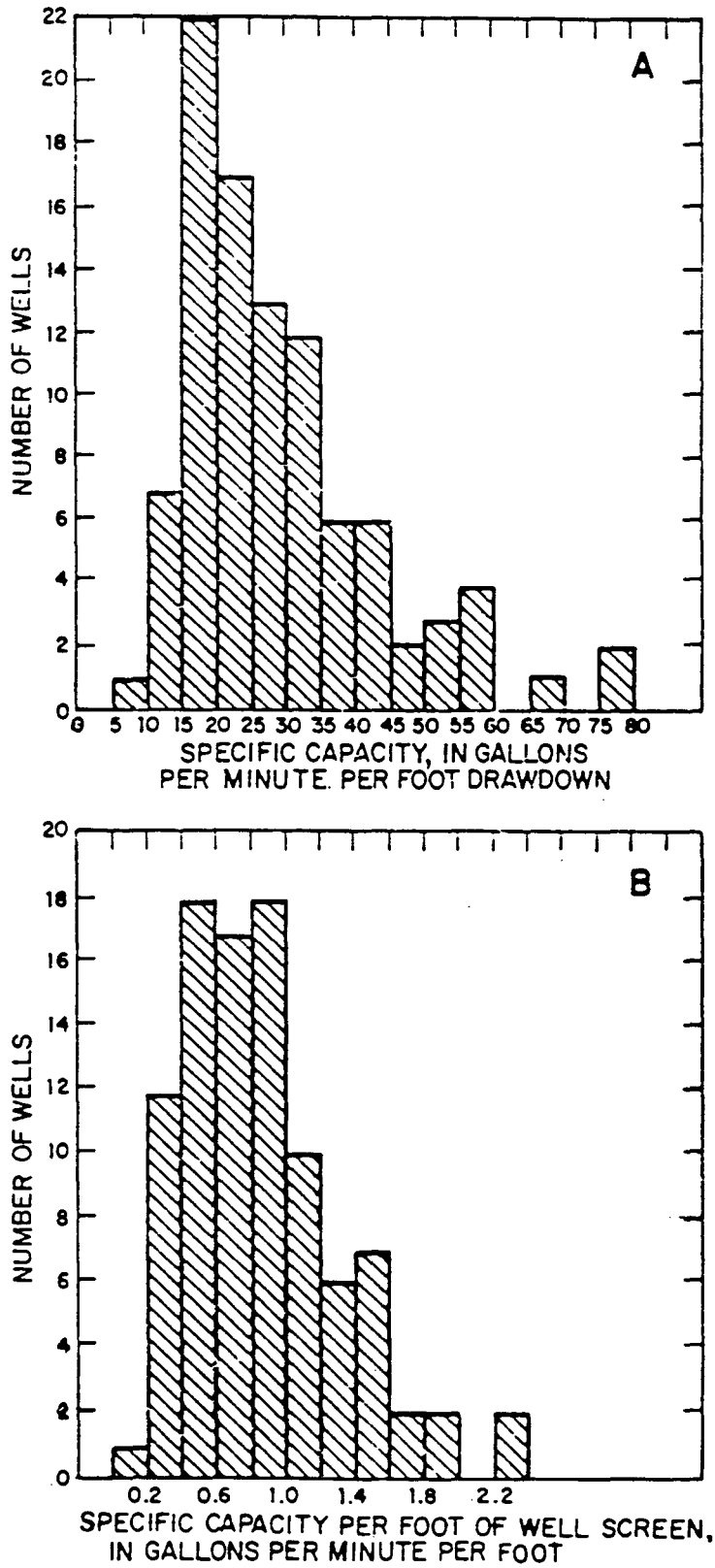


Figure 22. — Distribution of specific capacities of large diameter wells (12 inches or greater) tapping the Potomac-Raritan-Magothy aquifer system in Camden County.

the State's standards. This and additional water-quality problems are described below.

A summary of chemical analyses of water from wells tapping the Potomac-Raritan-Magothy aquifer system in Camden County is shown in table 8. This table gives maximum, average, and minimum parameters for samples from wells located in the outcrop area of the Potomac-Raritan-Magothy aquifer system and from samples from wells located downdip from the same outcrop area. Only the most recent analyses (table 4) were used to determine values shown in table 8.

The quality of water from wells located in the outcrop area of the Potomac-Raritan-Magothy aquifer system in Camden County varies from well to well. The variation is partly dependent on the depth of the well, the nature of the overlying sediments, and on the distance from the Delaware River. Chemical analyses (table 8) indicate that dissolved solids range from 39-445 mg/l; sulfates, 0.8-178 mg/l; and chlorides, 5.5-59 mg/l for samples from wells located in the outcrop area. Hardness ranges from soft to very hard (14-274 mg/l).

The quality of water of the Potomac-Raritan-Magothy aquifer system is, with the exception of iron content, within the State's standards for potable water in the area from the southeast limit of the outcrop area downdip to the vicinity of the New Brooklyn Park observation wells in Winslow Township. Water obtained from wells tapping the aquifer in the area that is overlain by the Merchantville-Woodbury confining unit, excluding the New Brooklyn Park area, is low in dissolved solids (48-150 mg/l), sulfates (2.6-34 mg/l), and chlorides (1.4-18 mg/l). Hardness ranges from soft to moderately hard (14-114 mg/l).

Samples collected in 1961 from the New Brooklyn Park well (WI 27) tapping the upper aquifer indicate chloride concentrations of approximately 4.0 mg/l; whereas, water from well (WI 28) tapping the lower aquifer in 1960 had a chloride concentration of approximately 300 mg/l (Donsky, 1963). Analyses of samples collected in 1972 for these two wells have similar values (table 4). The difference in chloride data from the New Brooklyn Park wells and other wells tapping the Potomac-Raritan-Magothy aquifer system in Ocean and Gloucester Counties (Gill and Farlekas, written commun., 1969) suggests lateral as well as vertical differences in chloride content in the aquifer system. This difference in chloride content as well as other water-quality parameters suggest that an interface exists between the salt water to the southeast and fresh water to the northwest and is represented by a broad zone of diffusion in the aquifer system. The 250 mg/l chloride line

for the upper aquifer is located several miles southeastward of the 250 mg/l chloride line for the lower aquifer (fig. 19). The 250 mg/l chloride line may be considered the limit of sea-water encroachment, inasmuch as the interface of salt and fresh water probably is not far seaward from this line (Parker, 1964). The high-chloride water in the southeastern part of the Potomac-Raritan-Magothy aquifer system is probably due to brackish-marine water entering the aquifer system during deposition of the sediments or the re-entering of ocean water after changes in sea level.

Water-quality analyses for wells tapping the Potomac-Raritan-Magothy aquifer system in Camden County indicate change in quality of water in the aquifers with time. In some cases the analyses show decreases in chloride and nitrate concentrations over a period of time; whereas, in other cases analyses show increases in chloride, sulfate, and dissolved solids. A summary of chemical analyses for selected wells tapping the Potomac-Raritan-Magothy aquifer system in Camden City for 1923-70 is shown in table 9. Data used in table 9 is from Thompson (1932), Donsky (1963), and table 4.

Chlorides, as reported (Thompson, 1932) for wells at two different sites tapping the upper aquifer in Camden City, were higher than those reported for the same or comparable well samples in 1966-67. The chloride content at one of the sites (Camden City Water Department wells 3-3A) decreased from 51 mg/l in 1928 (Thompson, 1932) to 28 mg/l in 1949 (Donsky, 1963). The chloride content for the same site was 41 mg/l in 1969 (table 4). At the second site (Camden City Water Department wells 6-6N) the chloride content decreased from 72 mg/l in 1932 (Donsky, 1963) to 32 mg/l in 1969 (table 4).

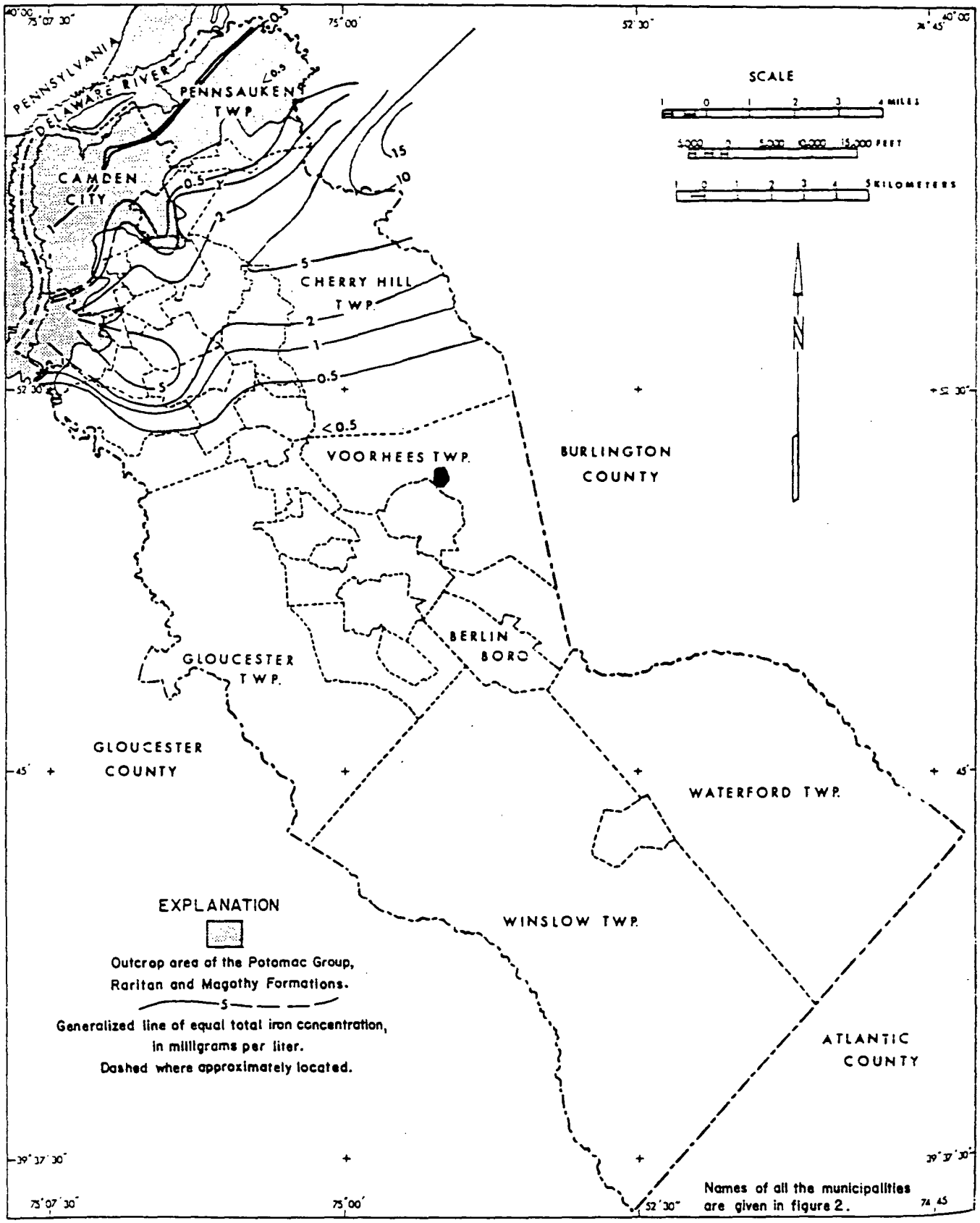
Wells tapping the middle or lower aquifer near the Delaware River generally have shown a deterioration in water quality over a period of time, as indicated by an increase in chloride and sulfate concentrations. Camden City Water Department wells at four sites (1A, 5-5N, 7, and 11) indicate a rise in chloride concentration over a period of years (table 4). There is also a corresponding rise in sulfate concentration in Camden City Water Department wells 1, 3, 4, 5, 6, and 10 (table 4). Water-quality analyses from Camden City wells 13 and 17, which tap the middle or lower aquifer, indicate that there has not been a change in quality at the two sites during the period samples. These two wells are located farther east than the other Camden City wells cited above, suggesting no change in water quality of the middle and lower aquifer in this area.

It can be assumed that water from wells in the Camden City area prior to 1920 probably was of slightly better quality than that reported by Thompson (1932). The change in the quality of water in the shallow and deeper aquifer between 1900 and 1967 as noted above may have been due to contamination from disposal ponds, waste-injection wells, and improperly sealed abandoned wells. The contamination may be similar to that documented by Greenman and others (1961) in adjacent areas of Philadelphia, but on a smaller scale.

Iron in the water of the Potomac-Raritan-Magothy aquifer system is the most troublesome water-quality parameter for many users. New Jersey's Potable Water Standards (1970) recommends a maximum iron concentration of less than 0.3 mg/l for potable supplies; however, most of the water analyses for the aquifer system indicate concentrations greater than 0.3 mg/l. Thus, treatment for iron removal is required for most users. The iron is present in the water as dissolved Fe^{+2} and $FeOH^{+1}$, and as suspended ferric oxyhydroxides, probably caused by the oxidation of ferrous species already in solution (Langmuir, 1969b). Langmuir (1969b) suggests that the oxyhydroxides are mixtures of goethite and amorphous materials with small amounts of hematite.

Samples from wells in the Camden County area were collected and analyzed separately for total iron and ferrous iron, with the difference assumed to be the concentration of particulate ferric hydroxide (Langmuir, 1969a, p. 19). Total iron, therefore, represents the sum of dissolved ferrous iron and colloidal ferric hydroxide. The distribution of total iron and ferrous iron concentrations in water of the Potomac-Raritan-Magothy aquifer system in the vicinity of Camden County as determined by Langmuir (1969b) is shown in figures 23 and 24. In the outcrop area dissolved ferrous or suspended ferric species are generally less than 0.5 mg/l in unpolluted waters. High concentrations in the outcrop area are interpreted by Langmuir (1969b) as the result of local ground-water contamination.

Immediately downdip of the outcrop area the ferrous and ferric iron species increase abruptly to about 7.0 mg/l. The high build-up of ferrous iron species in this area is due to the reaction with the ferrous iron minerals, such as pyrite and siderite, in the Merchantville-Woodbury confining bed. Langmuir (1969b) concluded that the parallel increase in ferric species to 6.0-11 mg/l may be caused by partial oxidation of Fe^{+2} and $FeOH^{+1}$. Total iron concentrations in the water of the Potomac-Raritan-Magothy aquifer system are highest in areas adjacent to the outcrop area. Seaber (1965) in his geochemical analysis of the Englishtown Formation also noted that the



After Langmuir 1969a.

Figure 23. — Map showing generalized total iron concentrations in water of the Potomac-Raritan-Magothy aquifer system in Camden County, 1965.

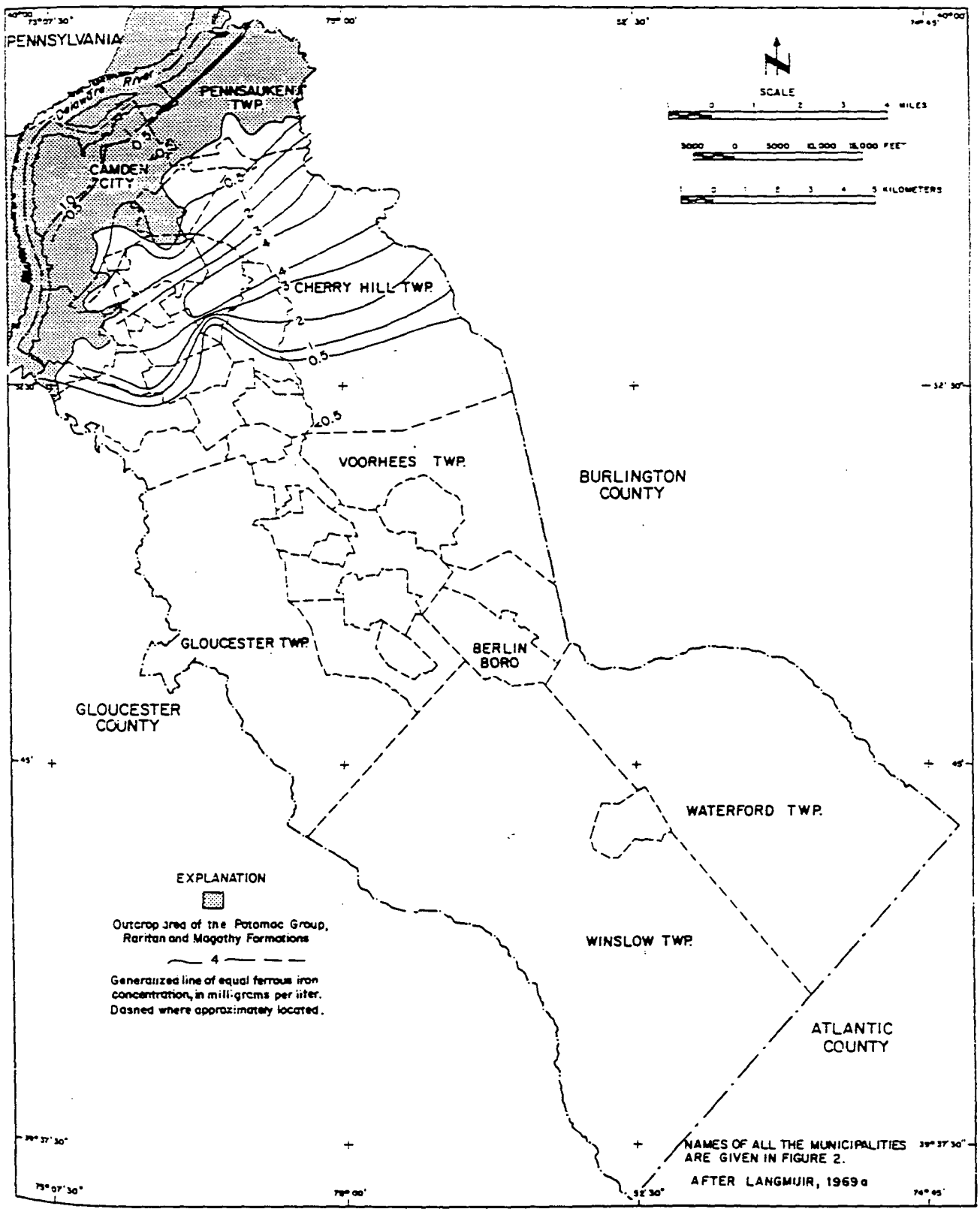


Figure 24. — Map showing generalized ferrous iron concentrations in water of the Potomac-Raritan-Magothy aquifer system in Camden County, 1965.

highest total iron concentrations occurred adjacent to the outcrop area.

Farther downdip both the dissolved ferrous and suspended ferric iron species decrease gradually to less than 0.5 mg/l. Langmuir (1969b) attributed the gradual decline in ferrous species to an increase in the stability of the suspended amorphous material due to aging, coupled with adsorption of ferrous iron by the oxyhydroxides and partial conversion of the amorphous phase to goethite. The decrease in suspended ferric species is interpreted by Langmuir as being caused by cation adsorption, aging, coagulation, and settling.

Ground-Water Contamination

Contamination of the water in the Potomac-Raritan-Magothy aquifer system is presently limited to the area at or near the outcrop. Contamination of the water-table and the artesian aquifer underlying Philadelphia has been thoroughly documented for the period prior to 1956 by Greenman and others (1961). They cite many instances of contamination, with the largest known area of contamination from industrial wastes located in the League Island Trough.

The League Island Trough is shown on the bedrock surface map of the Philadelphia area (fig. 25). The trough, filled with highly permeable sediments, has a northwest trend. A geologic section showing the distribution of the water-bearing sands and gravels from the Schuylkill River in Philadelphia through the Philadelphia Navy Base to the Texas Company's Eagle Point works near Westville, New Jersey, just south of the Camden County line, is shown in figure 26. The lower artesian aquifer (Farrington Sand of Greenman and others, 1961), consisting of sands and gravel immediately above the bedrock, has a direct hydraulic connection with the lower aquifer being tapped by the Texas Company wells in West Deptford Township, Gloucester County.

Barksdale and others (1958, p. 121) stated that, "Originally, the wells at the Navy Base yielded waters that were similar in chemical characteristics to that from the wells of The Texas Co." Greenman and others (1961, plates 21 and 22) indicate high concentrations of sulfates and dissolved solids in the water of the lower artesian aquifer in the League Island Trough in 1956. A sample from one well had more than 1,300 mg/l of sulfate. The movement of ground water with high

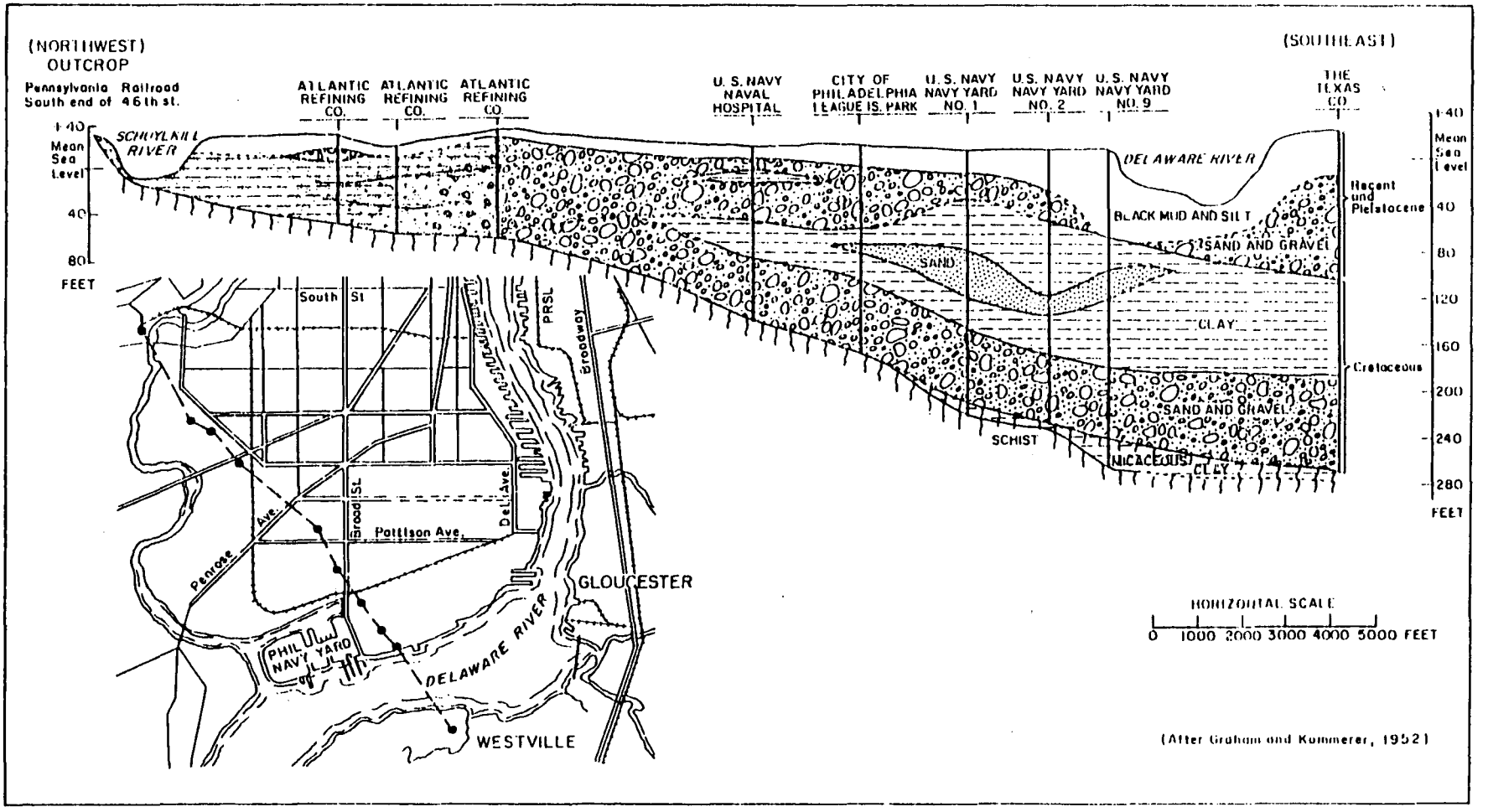


Figure 26. — Geologic cross section, Philadelphia, Pa. - Westville, N. J.

concentration of sulfates and dissolved solids was documented (Greenman and others, 1961) as moving downdip along the trough. The location of the 200 mg/l sulfate line in 1956 (Greenman and others, 1961) is shown in figure 27.

Withdrawal of water at the Philadelphia Navy Base from the lower aquifer had a regional effect on the potentiometric surface. As documented by Greenman and others (1961), heavy pumping at the Philadelphia Navy Base provided the hydraulic gradient that caused the movement of poor quality water from the head of League Island Trough downdip toward the Navy Base. Barksdale and others (1958, p. 121) stated that if pumping were greatly curtailed at the Navy Base the contaminated water would move beneath the river into New Jersey. In 1966 withdrawals at the Navy Base were substantially curtailed, while other wells in the area had been shut down. The Navy Base wells no longer act as a shield for the New Jersey wells and pumping at the Texas Company wells and other wells in New Jersey provided a new hydraulic gradient. A map of the potentiometric surface for the artesian aquifer in the Philadelphia area in October 1968 is shown on figure 28. The area with the lowest potentiometric surface is the area of the Texas Company well field. The nearest pumping to Navy Base wells is the Texas well field. Pumpage for 1968 for this well field was an average of 5.5 mgd. This was the largest total daily pumpage from the lower aquifer in the vicinity. In 1968 water samples of wells tapping the lower aquifer in Philadelphia, Camden area, and the Texas Company well field were collected and analyzed. Figure 27 shows the change in the 200 mg/l sulfate line from 1956 to 1968. The high sulfate, high dissolved-solids water will probably continue to move towards the Texas Company well field if present or increased pumpage rates are maintained.

Additional water samples were collected in 1971 from wells tapping the lower artesian aquifer for chemical (table 4) and trace-element analyses (table 10). The sulfate concentrations are shown in figure 27. Results indicate a decrease in concentrations of sulfate and dissolved solids from 1968 to 1971 in Navy Base wells 4 (PH 11) and 11 (PH 16), but an increase in Navy Base well 9 (PH 13). Navy Base wells 4 and 11 are located downdip from an area that had lower concentrations of sulfate in 1956 (Greenman and others, 1961, plate 22). If movement of ground water did occur downdip, there would be first an increase and then a decrease of sulfate content. Analyses for 1968 and 1971 indicate the decrease in sulfate concentration suggesting movement of ground water downdip. The sulfate concentration updip from Navy Base well 9 in 1956, as given in Greenman and others (1961, plate 22). indicates progressively higher sulfate concentrations.

Analysis of samples taken from Navy Base well 9 in 1967 and 1971 indicates progressively higher sulfate also suggesting movement of ground water downdip toward the Texas Oil Company well field.

The concentration of 24 trace elements in the water samples were obtained from wells tapping the lower aquifer. Results of the analysis (table 10) indicate that only iron and manganese exceed the limits suggested by the U. S. Public Health Service for drinking water. High concentrations of both these elements are not uncommon in the Potomac-Raritan-Magothy aquifer system and have been found in areas of no known contamination resulting from man's activities.

Another area of ground-water contamination, documented by Greenman and others (1961), is the artesian aquifer in the area north of the Philadelphia Navy Base, northwest of the Walt Whitman Bridge. Water from the well (PH 6) at the center of this area had a sulfate concentration of 231 mg/l in 1956 (Greenman and others, 1961, plate 22). Recent analyses of water from wells in this same area (table 4) show a lower sulfate concentration at the center of the area. Water from the same well (PH 6) at the center of the area had a sulfate concentration of 162 mg/l in July 1967 (table 4), a decrease in sulfate concentration of over 30 percent. However, sulfate and dissolved solids in water from PH 7, a well downdip from well PH 6, increased substantially. Sulfate concentration of water from well PH 7 in February 1956 was 18 mg/l (Greenman and others, 1961). In July 1967 the sulfate concentration was 22 mg/l and in May 1971, 131 mg/l (table 4), a 600 percent increase. The increase in sulfate concentration may be due to movement of water from well PH 6 toward well PH 7. Figure 28 shows the area at well PH 7 to be a center of a regional cone of depression. There is a possibility that the contaminated water in the Navy Base area may also move northward due to the much greater gradient in that direction since 1966. Continued surveillance of the quality of ground water would be a method that could be used to determine the change in quality and its possible effect on the ground-water supplies of New Jersey.

Another area of possible water-quality problems in the Potomac-Raritan-Magothy aquifer system in Camden County is located approximately one mile south of the Benjamin Franklin Bridge. Water samples from wells in Philadelphia (one mile south of the Benjamin Franklin Bridge) indicate that water in the lower aquifer contained high sulfates (as much as 284 mg/l) and dissolved solids (as much as 646 mg/l) in 1956 (Greenman and others, 1961, plates 21 and 33). Recent potentiometric measurements in the area show a gradient to the east and to the south; thus, it is possible for this poor quality water to move

to New Jersey. No water samples have been collected from wells in immediately adjacent areas of Camden County. Analyses of water from wells inland show that the quality in the lower aquifer has improved since 1927 (Thompson, 1932) to 1967 (table 4).

Chromium equal to or in excess of the State's standards for potable water has been found in water from two wells in Camden City. Routine sampling of the Camden City Water Department's distribution system by the State in December 1972 showed a high chromium content in the water delivered to a residence. Analyses for chromium from samples obtained from Camden City Water Department public-supply wells in the same area indicated that well 4 (CA 42) had chromium values in excess of the State's standards. Sampling of additional wells located nearby showed even higher chromium values for the West Jersey Hospital well (CA 47). Re-sampling of water from five wells in November 1973 confirmed the high chromium values for two of the five wells. The results of the analysis are given in table 10. The chromium values are 200 µg/l (micrograms per liter) for the West Jersey Hospital well and 50 µg/l for Camden City Water Department well 4. The State's standard for potable water is 50 µg/l for hexavalent chromium. It can be assumed that most of the chromium reported in table 10 is hexavalent chromium. Both wells tap the same sand unit in the aquifer system. The well yielding water with the lower chromium values is located 600 feet east of the West Jersey Hospital well. The potentiometric head measurements made in November and December 1973 show water levels were lower east of the two wells, indicating an easterly hydraulic gradient with ground-water movement in that direction. Water-level measurements made in October 1968 indicated the same gradient direction. This would suggest the chromium content in the ground water in this sand unit would be higher in the area west of the West Jersey Hospital well.

The source of the chromium is not known. However, at least three metal plating companies are located within a radius of 1,600 feet. Analyses of waste water to sewer lines from three metal plating companies for samples collected in February and March 1973 show high chromium values in excess of 9 mg/l (written commun., New Jersey Department of Environmental Protection, 1973).

Barksdale and others (1953) and Greenman and others (1961) have shown that induced recharge from the Delaware River does occur. Deterioration of the quality of the river by man's activities may, in turn, cause water-quality problems in that part of the aquifer being recharged by the river. A "polluted" Delaware River is a possible source of water contamination in

the Potomac-Raritan-Magothy aquifer system in the northeastern part of Camden County.

Salt-Water Encroachment

There are two areas of potential salt-water encroachment in the Potomac-Raritan-Magothy aquifer system in Camden County. One area is along the Delaware River and the second is near the fresh water-salt water interface in Winslow Township.

The Delaware River in the vicinity of Camden County is tidal. Normally salt water from the ocean does not reach the vicinity of Camden. In extended drought, such as that between 1961 and 1966, a decrease in fresh-water inflow to the estuary permits salt water to move farther upstream. For example, in 1965 and 1966 the salt front advanced farther upstream in the Delaware estuary than had been previously recorded. On September 1966 the 250 mg/l chloride line reached the vicinity of the Benjamin Franklin Bridge (Keighton, 1969). At the same time the chloride concentration of the Delaware River at Delaware Memorial Bridge was 4,340 mg/l. Aquifer test and water-quality data given in another section of this report have indicated hydraulic connection between the river water and nearby wells. If the river's chloride content in the Philadelphia-Camden area were to remain at relatively high levels for a long period of time, there could be movement of this water from the river into the aquifer system, especially the middle and upper aquifers.

The second area of potential salt-water encroachment in the aquifer system is in the vicinity of the salt water-fresh water interface. The interface in the aquifer system is actually a broad zone. An approximate location in Camden County based primarily on the chloride concentration of the water from the New Brooklyn Park well 1 (WI 27) is shown on figure 18. The chloride concentration of water from this well in 1960 (Donsky, 1961) was 310 mg/l. In 1967 and in 1972 the chloride concentration (table 4) was approximately the same suggesting no change in the lower aquifer for the 12-year period. The chloride concentration of a water sample from the upper aquifer (New Brooklyn Park 2, WI 28) was 4.2 mg/l in 1961 (Donsky, 1961) and 2.5 mg/l in 1972 (table 4).

The ground-water system is a dynamic one. Changes in the hydraulic gradients due to pumping may cause the movement of higher chloride water towards centers of pumpage. Withdrawals from the Potomac-Raritan-Magothy aquifer system in the central part of the county is almost all from the upper

aquifer (fig. 16). In addition pumping withdrawals from the upper aquifer at Bell's Lake, Pitman, Glassboro, and Clayton in Gloucester County to the south has further enlarged the cone of depression over a sizable area (fig. 18). Increased pumping in this area of Gloucester County and additional pumping downdip of areas of existing pumping in Camden County may move water of high chloride content toward the centers of pumping. Water-level measurements made in October 1968 indicate that the potentiometric surface in the upper aquifer is lower in the area of pumping than in the downdip area (fig. 18). The direction of the hydraulic gradient is from the interface toward the center of pumping. It is, therefore, possible for the high-chloride water to migrate toward the centers of pumping.

An extensive aquifer test at Courses Landing in Salem County has shown that the most immediate danger of salt-water contamination of middle and upper aquifers is probably by vertical coning of the salt water from the lower aquifer (Gill and Farlekas, written commun., 1969). For example, heads in the upper aquifer at Courses Landing were lowered by withdrawals causing a head difference to develop between the upper and lower aquifer. This change in the hydraulic gradient caused the higher chloride water to move upward from the lower aquifer. A similar situation may exist in southeastern Camden County and adjacent Gloucester County. Head measurements made in October 1968 at the New Brooklyn Park observation wells (WI 27 and WI 28) indicate that a 16-foot head differential exists between the upper aquifer and the lower aquifer. The well tapping the upper aquifer had the lower head. The head in the upper aquifer was at an altitude of 42 feet below mean sea level. The nearest withdrawal point from the Potomac-Raritan-Magothy aquifer system is 6 miles from the New Brooklyn Park wells. In Glassboro, Gloucester County head measurements of approximately 50 feet below mean sea level were observed in October 1968 during non-pumping conditions in three wells tapping the upper aquifer. Under pumping conditions the water levels would be at least 20 feet lower near the pumping wells. The potentiometric surface for the lower aquifer is not known for the Glassboro area, but in all probability it is higher than the potentiometric surface in the upper aquifer. If the head in the lower aquifer is significantly higher than the head in the upper aquifer, the head differential would cause water to move upward into the upper aquifer. High-chloride water (chloride content greater than 250 mg/l) underlies the water in the upper aquifer in the southeastern part of Camden and adjacent Gloucester County (fig. 18). Hence, vertical coning of high-chloride water is a possibility in this area.

Merchantville Formation and Woodbury Clay

Geology

The Merchantville Formation and Woodbury Clay crop out in an irregular-shaped belt in the northwestern part of Camden County (fig. 4). Together they have an outcrop area of 18.7 square miles.

The Merchantville Formation is the oldest major marine glauconitic unit in the New Jersey Coastal Plain. The contact between the Merchantville Formation and the underlying Magothy Formation is always sharp and disconformable (Owens and Sohl, 1969). The thickness of the Merchantville Formation is consistently 50 feet in outcrop but the lithology varies along strike. The formation is essentially a dark gray to grayish-black micaceous clay to clayey silt with beds and lenses of glauconite sand, especially near the top of the formation. A sand unit which ranges from 0-30 feet thick in Camden County has been mapped from geophysical logs. The thickness is shown on figure 29. The structure contour map of the top of the sand unit is given in figure 30. Three cross sections (fig. 31) based on geophysical logs suggest that this unit is near the top of the Merchantville Formation.

The Woodbury Clay which overlies the Merchantville Formation is a grayish-black massive micaceous clayey silt. The thickness of the Woodbury in the outcrop area is reported to be 50 feet (Owens and Sohl, 1969). Calcareous fossils found at Haddonfield indicate a marine origin for the unit (Owens and Sohl, 1969). The top of the Woodbury Clay is delineated in figure 32. The thickness of the Merchantville Formation and Woodbury Clay ranges from 106 to 165 feet in Camden County and thickens downdip as shown on figure 33.

Particle-size analyses of samples of the Merchantville Formation and Woodbury Clay from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5. The analyses of the Woodbury Clay indicate a range of 70 to 98 percent clay and silt. The analyses of the Merchantville Formation indicate a range of 42 to 56 percent of clay and silt.

Hydrology

The Merchantville Formation and Woodbury Clay function

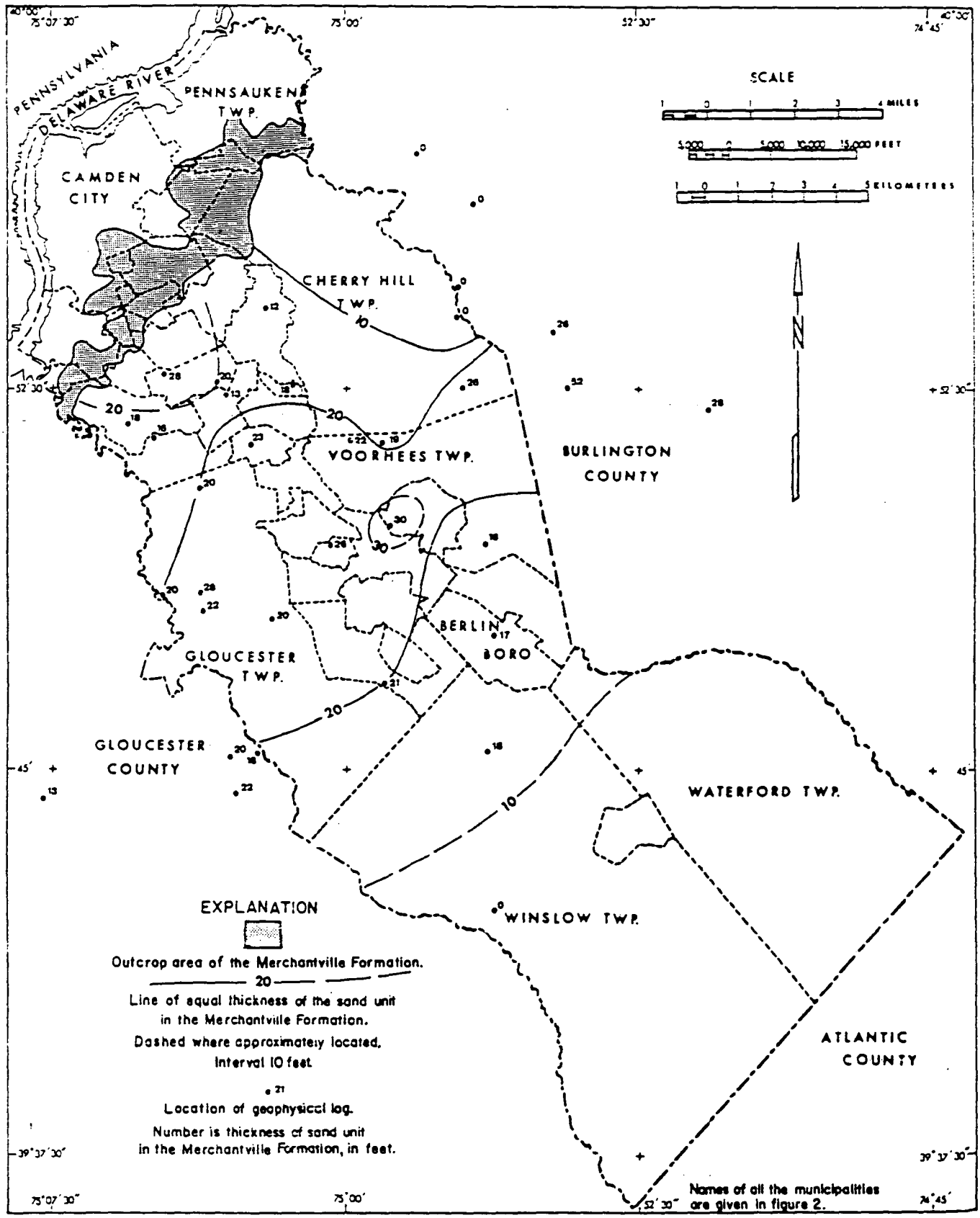


Figure 29. — Thickness map of the sand unit in the Merchantville Formation in Camden County.

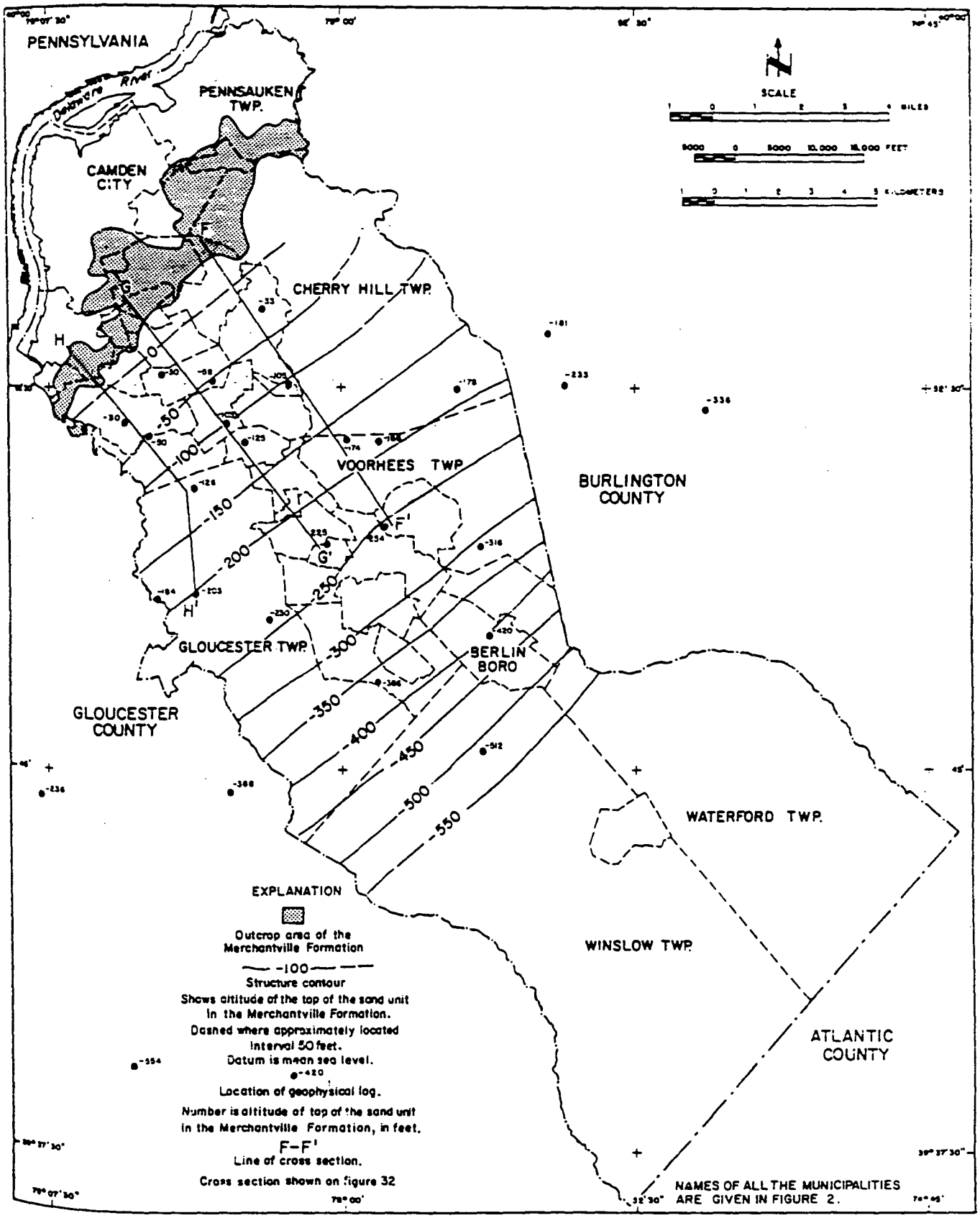


Figure 30. — Structure contour map of the top of the sand unit in the Merchantville Formation in Camden County.

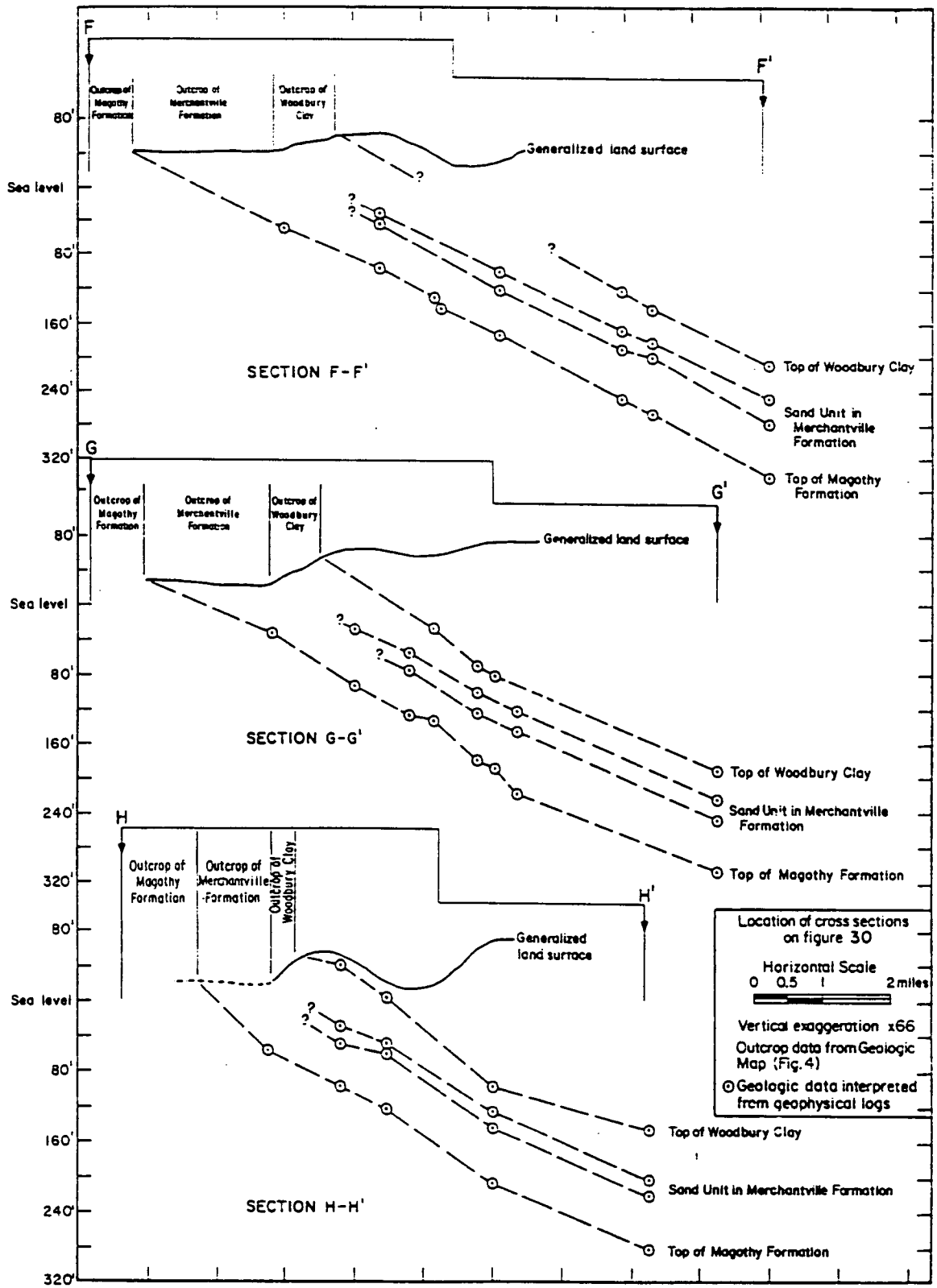


Figure 31. — Geologic sections of the Coastal Plain in the northeastern part of Camden County.

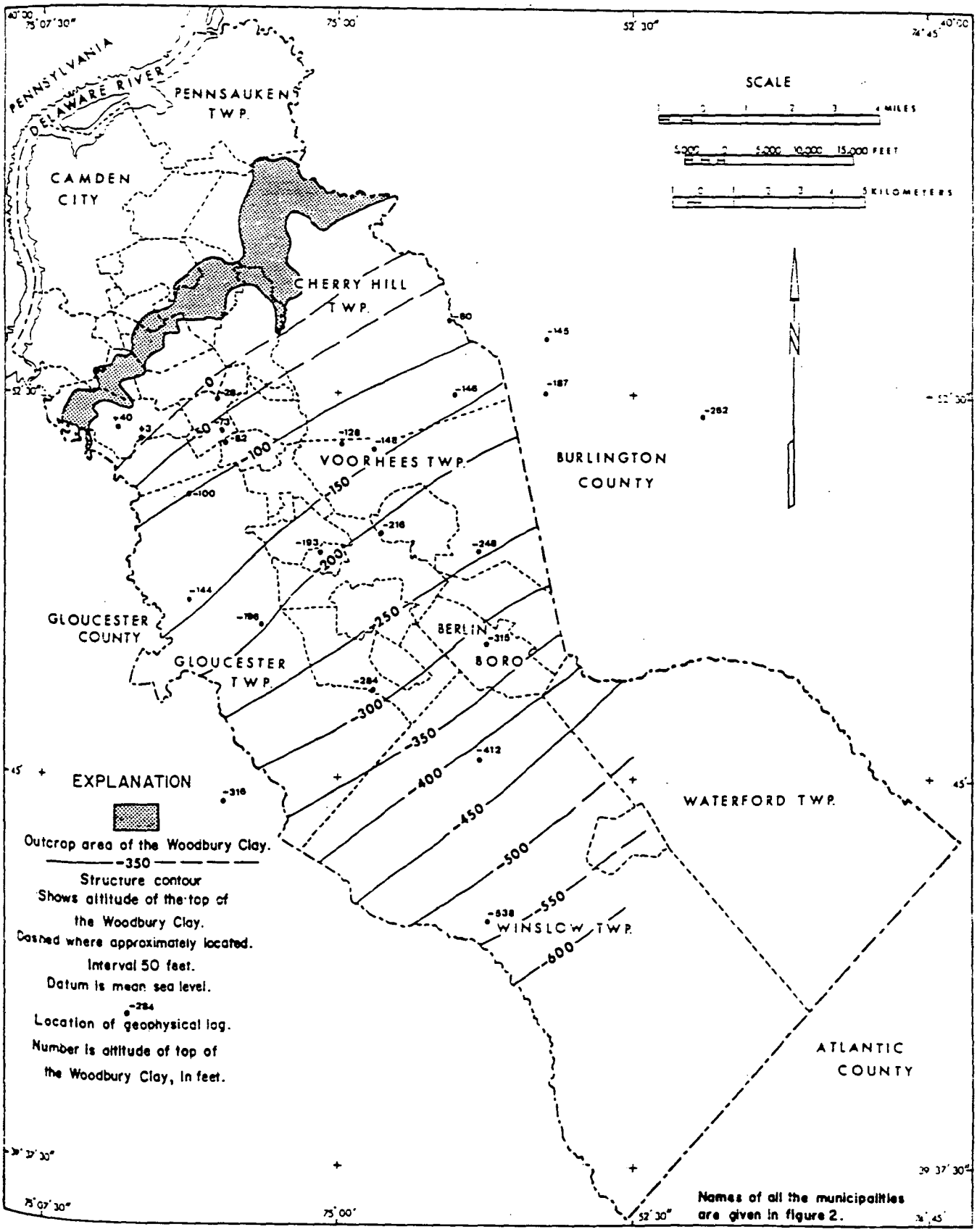


Figure 32. — Structure contour map of the top of the Woodbury Clay in Camden County.

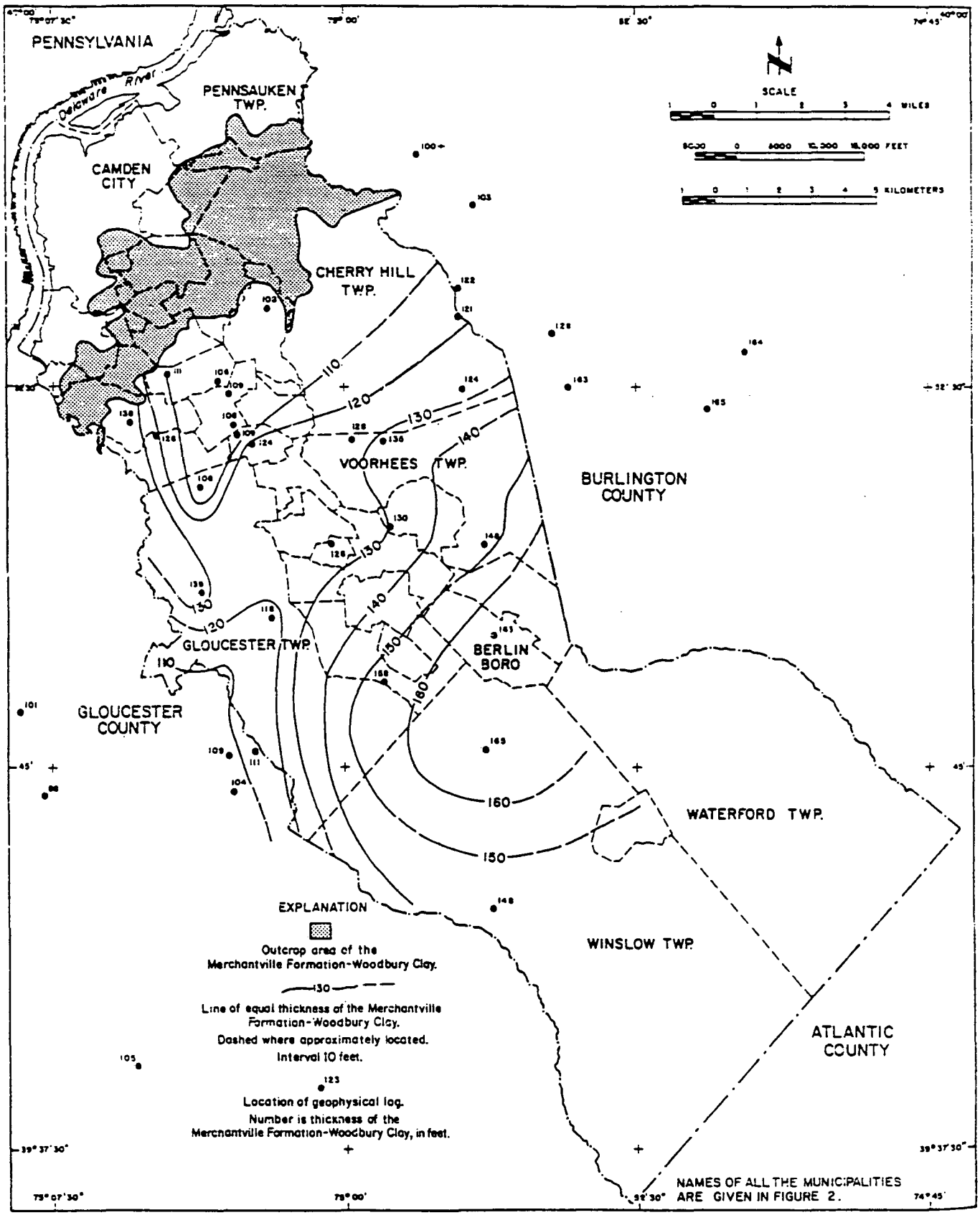


Figure 33. — Thickness map of the Merchantville Formation-Woodbury Clay in Camden County.

as semipervious confining units. However, the lensing sand unit near the top of the Merchantville Formation is tapped for domestic water supplies. Yields range from 15 to 50 gpm for the wells given in table 1. Wells that tap this sand unit are located near the outcrop area. The prepumpage potentiometric surface in this unit in Camden County was at a higher level than the prepumpage potentiometric surface of the Potomac-Raritan-Magothy aquifer system and at a lower level than the prepumpage potentiometric surface in the overlying Englishtown Formation, for the same area. Sparse water-level data from drillers' records of wells drilled in the early to mid-1950's suggest a decline in potentiometric surface from 1900 to the 1950's.

Quality of Water

Only one sample (GT 4) was obtained from a well tapping the sand unit in the Merchantville Formation. The sample (table 4) had a high pH (8.3), low chloride content (0.8 mg/l), low sulfate content (3.9 mg/l), and low dissolved solids (107 mg/l).

Englishtown Formation

Geology

The Englishtown Formation crops out in the northwestern part of the county in an area of approximately 7.7 square miles (fig. 4). It lies conformably above the Woodbury Clay. The transition from the Woodbury Clay to the Englishtown Formation is marked by a gradual increase of quartz sand and a decrease in silt and clay.

The lithology of the Englishtown Formation in New Jersey varies along strike and downdip. Several lithofacies have been recognized. In the southern part of the coastal plain the Englishtown is a massive dark-colored silty sand that resembles the non-glauconitic beds of the Merchantville Formation (Owens and Sohl, 1969). It is 40 feet thick in outcrop. Rush (1968, fig. 22) has shown that the aggregate thickness of sand in the Englishtown decreases downdip toward the south in Burlington County.

The structure contours (fig. 34) on the top of the Englishtown Formation in Camden County indicate that the

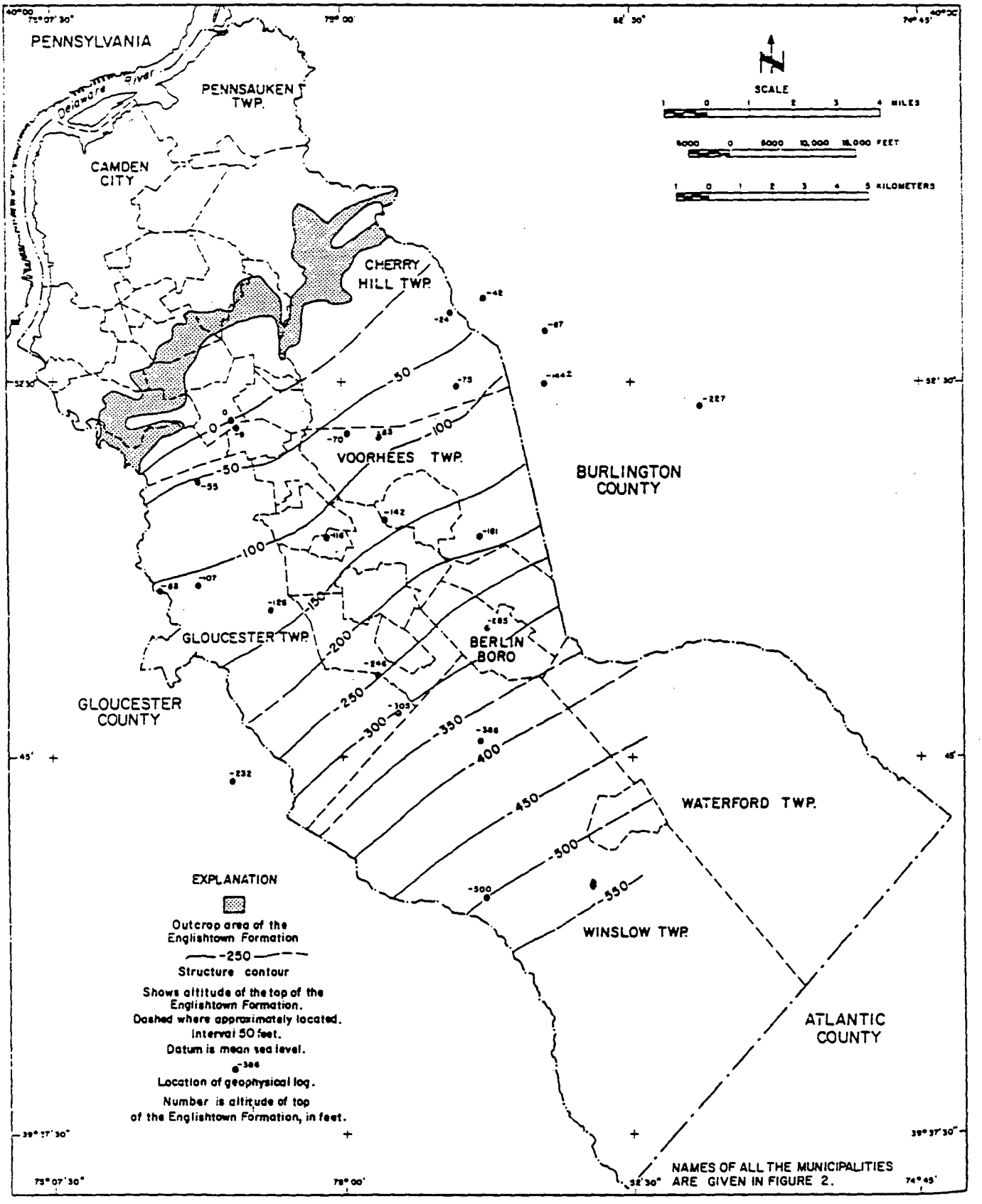


Figure 34. — Structure contour map of the top of the Englishtown Formation in Camden County.

Englishtown strikes in a northeasterly direction and has a dip of approximately 40 feet per mile toward the southeast.

Figure 35 is a lithologic map of the sand facies of the Englishtown Formation in Camden County. The aggregate thickness of the sand ranges from 5 to 30 feet with the greatest thickness of the sand in the central part of the county. The farthest downdip data available for the Englishtown in Camden County is from the New Brooklyn Park well 1 (WI 27). Particle-size analyses of samples from this test well (table 5) indicate a range of 67 to 87 percent of clay and silt.

Hydrology

Few wells tap the Englishtown Formation in Camden County (table 1). Domestic wells tapping the unit are located near the outcrop area. The only known public-supply or industrial wells tapping the formation in Camden County belong to the Clementon Water Department. All but one of their wells tap the Englishtown aquifer. The Clementon Water Department wells are located in the central part of the county, the area of greatest sand thickness. Yields of three wells in the Englishtown (Clementon Water Department wells 6, 8 and 9) are 250, 510, and 503 gpm, respectively. The specific capacities for wells 8 and 9 are 9.8 and 5.3 gpm, respectively.

Analysis of data from an aquifer test conducted in 1959 in Lakewood, Ocean County, (Seaber, 1965, p. B16) indicated a transmissivity of 1,340 ft^2/day (10,000 gpd/ft) and a coefficient of storage of 2.7×10^{-4} for the pumping phase of the test. For the recovery phase of this test the transmissivity is 2,144 ft^2/day (16,000 gpd/ft) and storage coefficient is 2.0×10^{-4}. The computed average hydraulic conductivity is about 40 ft/day (300 gpd/ft^2).

The transmissivity of the aquifer near the Clementon Water Department wells 8 and 9 was calculated using the method devised by Hurr (1966) which is based on the analysis of a single observation of drawdown at one well. This method is useful although it provides only an estimate. The computed transmissivity of the aquifer using data from the Clementon Water Department well 8 (CL 3) is 2,150 ft^2/day (16,050 gpd/ft); whereas, well 9 (CL 5) is 1,290 ft^2/day (9,630 gpd/ft). An assumed coefficient of storage of 2.7×10^{-4} was used in the calculations.

Porosity and hydraulic conductivity values obtained

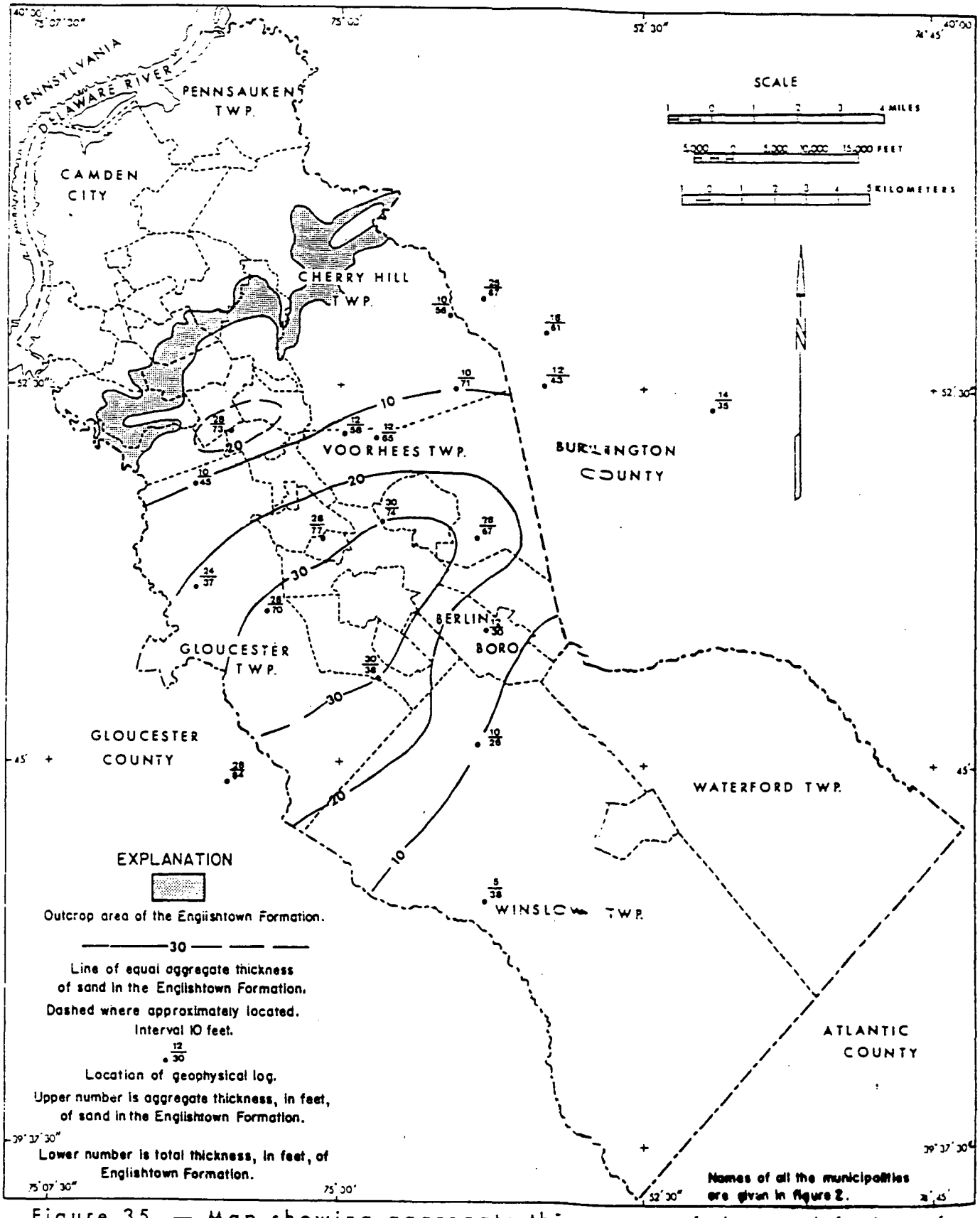


Figure 35. — Map showing aggregate thickness of the sand facies of the Englishtown Formation in Camden County.

from laboratory analyses of samples from the New Brooklyn Park well (WI 27) in Winslow Township are listed in table 5. The hydraulic conductivity values are very low indicating that the Englishtown Formation in the New Brooklyn Park area is not suitable for development as a source of water.

Seaber (1965, p. 16) indicates that the Englishtown Formation does not receive its major recharge from the outcrop area but rather from vertical leakage. The recharge is obtained from the overlying Wenonah-Mount Laurel aquifer through the Marshalltown Formation in areas of topographic highs. Figure 36 shows the potentiometric surface for the Englishtown Formation based on limited available data. The data suggest that a potentiometric high occurs in the Marlton area of Burlington County just east of Cherry Hill Township.

Pumpage from the Englishtown Formation in Camden County during 1966 amounted to 0.76 mgd. Peak use occurred in July with an average of 1.02 mgd. Additional amounts of water can be derived from the Englishtown Formation, especially in the central part of the county where the sand is thickest. However, greatly increased withdrawals from the aquifer in the county may accelerate the rate of water-level decline.

Quality of Water

Only one analysis of a well sample from the Englishtown Formation in Camden County is given in table 4. Seaber (1965, p. 6) in his study on the variations in chemical character of water from the Englishtown Formation lists additional water analyses of six wells in Camden County. The quality of the water from the Englishtown Formation in Camden County, as reported by Seaber (1965), is within the State's standards for potable water. Chloride concentration of water from the six wells ranges from 1.9-10 mg/l; sulfate from 6.9-25 mg/l; dissolved solids from 35-105 mg/l; and iron from 0.26-7.8 mg/l.

An analysis in September 1969 of a sample from the Clementon Water Department well 8 (CL 3) (table 4) is similar to a 1957 analysis of the Water Department's well 9 (CL 5). This suggests that very little change has occurred in the quality of water of the Englishtown Formation in the area.

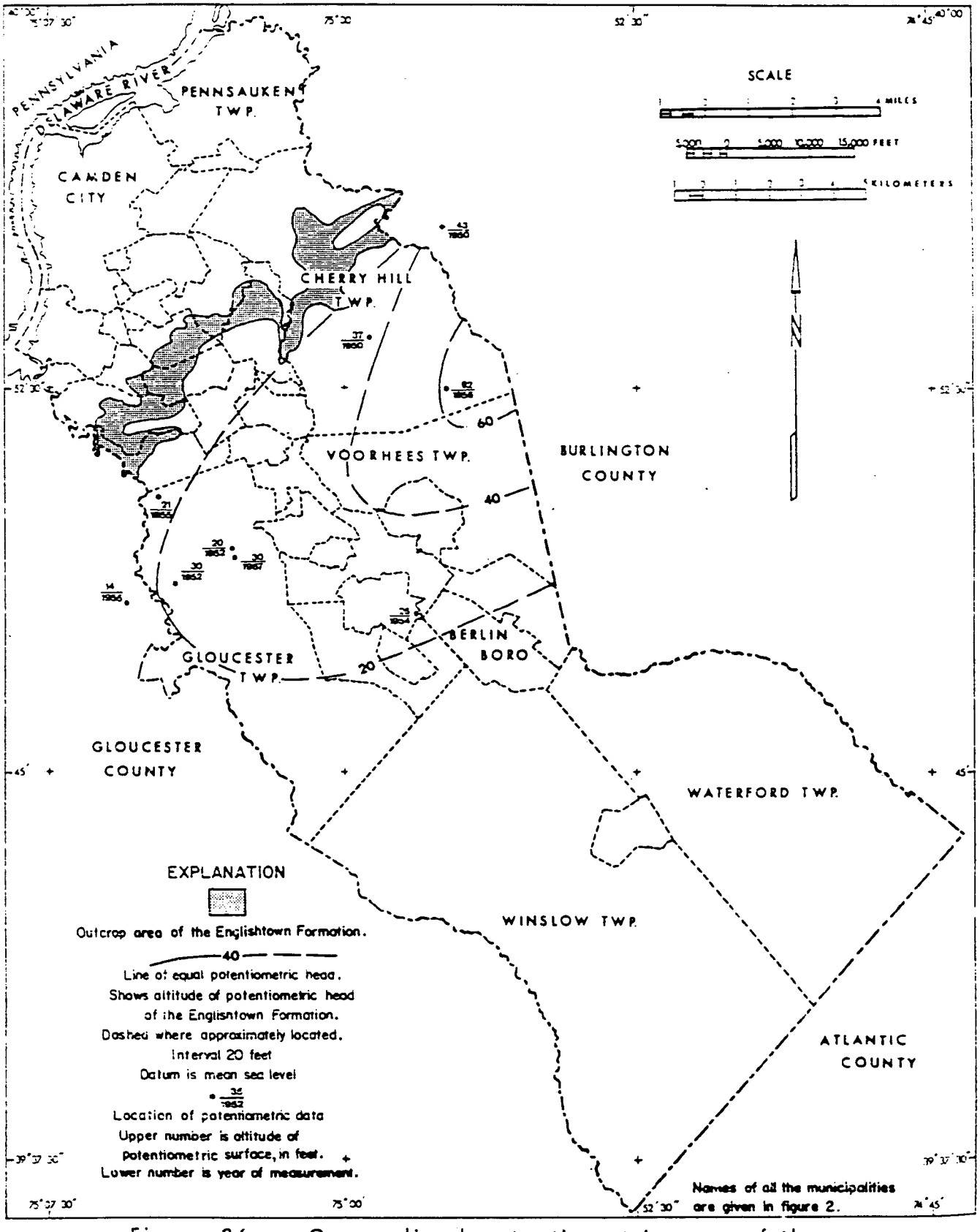


Figure 36. — Generalized potentiometric map of the Englishtown Formation in Camden County.

Marshalltown Formation

Geology

The Marshalltown Formation crops out in a northeasterly direction in northwestern Camden County in the vicinity of the New Jersey Turnpike (fig. 4) and has an outcrop area of approximately 6.3 square miles. The Marshalltown is characteristically a dark gray, micaceous, silty, glauconite sand overlying the Englishtown Formation. The abrupt change in lithology between the Marshalltown Formation and Englishtown Formation suggests a disconformable contact (Owens and Sohl, 1969). Glauconite and fossils in the Marshalltown indicate that it is of marine origin. Particle-size analysis of a sample from the New Brooklyn Park well (WI 27) in Winslow Township indicates a silty sand composition (table 5).

In the outcrop area the thickness of the Marshalltown Formation is about 20 feet. Its thickness downdip is about 20-25 feet. Hence, the altitude of the top of the Marshalltown Formation may be approximated by adding 20-25 feet to the top of the Englishtown Formation shown in figure 34.

Hydrology

The Marshalltown Formation functions as a confining layer between the Englishtown Formation and the overlying Wenonah Formation and Mount Laurel Sand. Clayey and silty beds of the lower part of the Wenonah Formation and the Marshalltown Formation form a confining layer 40 to 50 feet thick in Camden County. Vertical leakage from the Wenonah-Mount Laurel aquifer through the Marshalltown Formation recharges the Englishtown Formation. Porosity and hydraulic conductivity values from a laboratory analysis of a sample from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5. The value of hydraulic conductivity supports the contention that vertical leakage occurs through the Marshalltown Formation.

Wenonah Formation and Mount Laurel Sand

Geology

The Wenonah Formation and the Mount Laurel Sand in Camden County crops out in a northeasterly direction and has an

outcrop area of about 16.6 square miles (fig. 4). The Wenonah Formation is a dark gray, poorly sorted, very micaceous, silty, fine quartz sand. Glauconite is abundant in the lower part but rapidly diminishes in the upper part (Owens and Sohl, 1969). The contact of the Wenonah Formation with the underlying Marshalltown Formation is gradational as is the contact with the overlying Mount Laurel Sand. The change from the Wenonah Formation to the Mount Laurel Sand is generally marked by an increase in average grain size, a decrease in mica, and a change in color from dark gray to lighter gray (Owens and Sohl, 1969). In general, the Mount Laurel Sand is a coarser sand unit than the Wenonah Formation and is the major component of the aquifer. The Wenonah Formation and the Mount Laurel Sand are distinct lithologic units but are hydraulically connected. Particle-size analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5.

The top of the Mount Laurel Sand in Camden County (fig. 37) strikes in a northeasterly direction and has a dip toward the southeast of approximately 30-35 feet per mile near the outcrop and 27 feet per mile downdip.

The combined thickness of the Wenonah Formation and Mount Laurel Sand in outcrop is about 100 feet in the Mount Holly 7-1/2 minute quadrangle, Burlington County (Minard, Owens, and Nichols, 1964). The Wenonah Formation-Mount Laurel Sand is about the same thickness in the outcrop area in Camden County. In the subsurface the Wenonah Formation and Mount Laurel Sand range in thickness from 80-90 feet near the outcrop to almost 130 feet at the New Brooklyn Park well (WI 27) in Winslow Township. The thickness map of the Wenonah Formation-Mount Laurel Sand (fig. 38) shows that the unit thickens downdip. Interpretation of geophysical logs suggest that the Wenonah Formation-Mount Laurel Sand is mainly a sand unit although the lower 20 percent of the unit consists of silt. A lithologic map of the sand facies is shown in figure 39. The greatest thickness of the sand facies is in the southcentral part of the county.

Hydrology

The Wenonah-Mount Laurel aquifer is an important water-bearing unit in Camden County. Industrial and public-supply wells are screened in this aquifer. In addition many domestic wells southeast of the outcrop area tap this unit. Almost all the wells in Camden County tapping the Wenonah-Mount Laurel aquifer are located in a northeast-trending area less than ten miles from the outcrop.

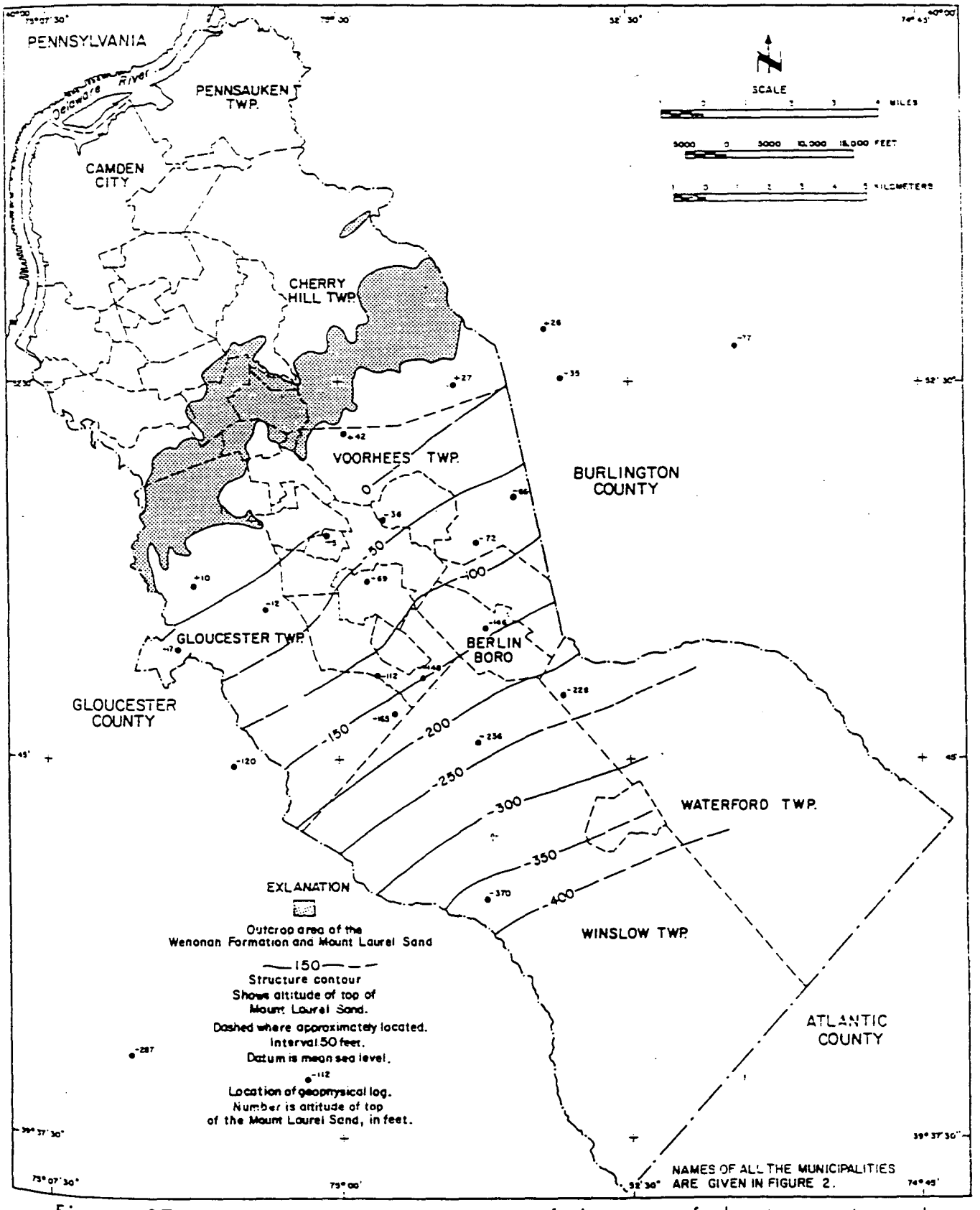


Figure 37. — Structure contour map of the top of the Mount Laurel Sand in Camden County.

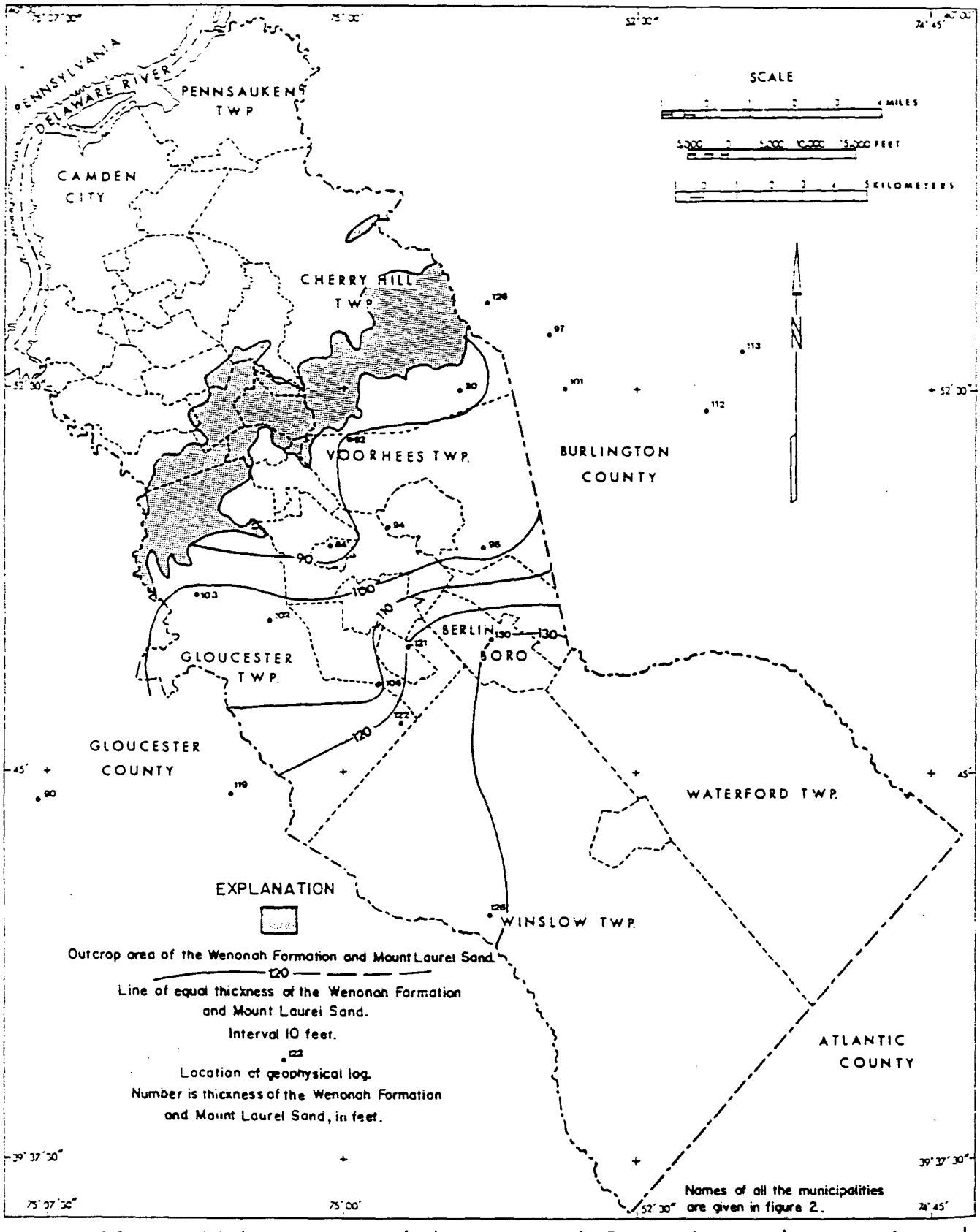


Figure 38. — Thickness map of the Wenonah Formation and Mount Laurel Sand in Camden County.

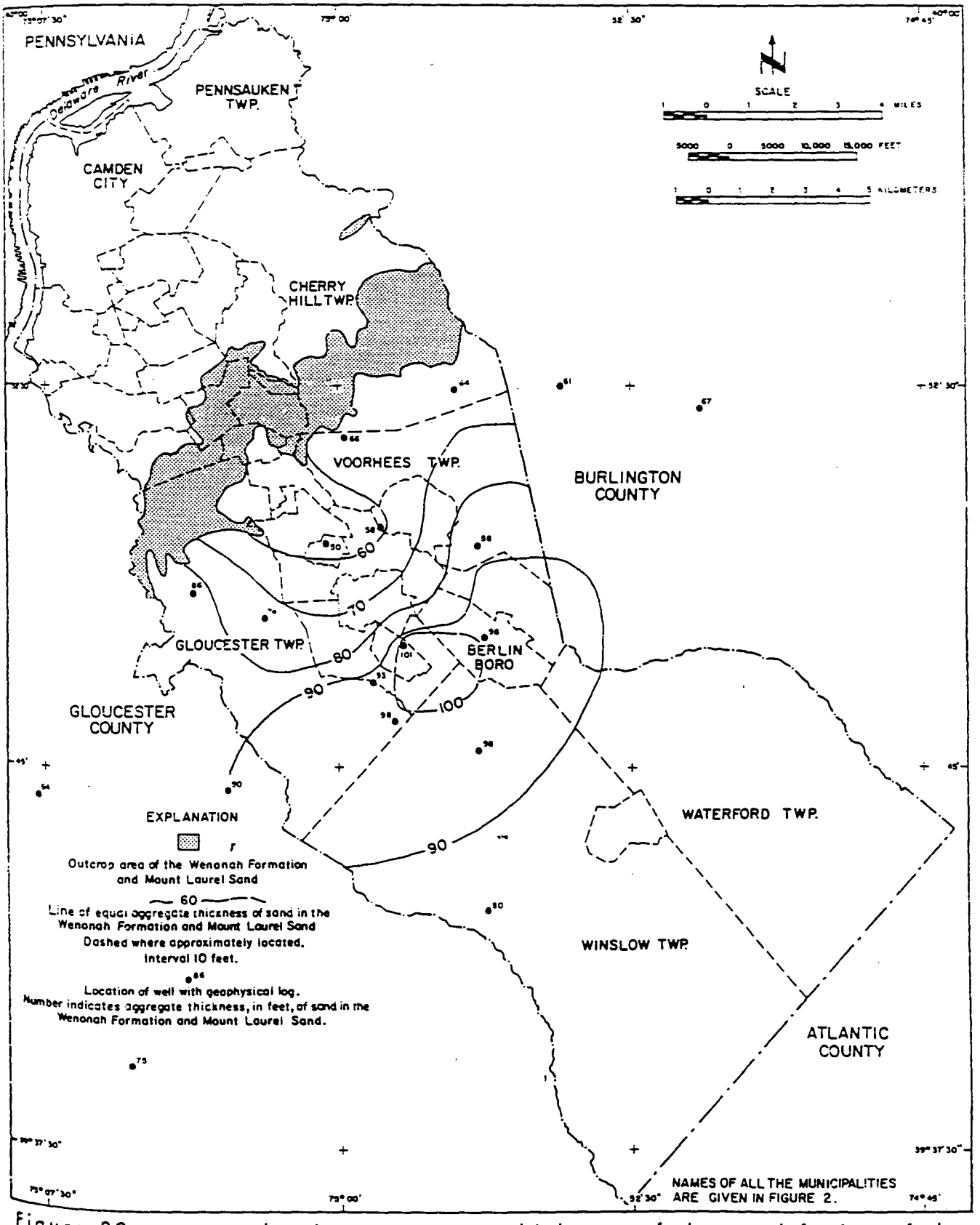


Figure 39. — Map showing aggregate thickness of the sand facies of the Wenonah Formation and Mount Laurel Sand in Camden County.

Data from three aquifer tests of the Wenonah-Mount Laurel aquifer are available. The analysis of aquifer tests conducted in 1954 at Bradley Beach in Monmouth County (Jablonski, 1968, p. 62) indicated an average transmissivity of 670 ft^2/day (5,000 gpd/ft) with a range of 360 to 1,420 ft^2/day (2,700 to 10,700 gpd/ft). The average coefficient of storage is about 1.2×10^{-4} with a range from 7.0×10^{-5} to 2.1×10^{-4}. The average hydraulic conductivity is about 17 ft/day (130 gpd/ft^2). In 1965 an aquifer test was run at Salem City, Salem County. The average transmissivity of the Wenonah-Mount Laurel aquifer was determined to be 1,200 ft^2/day (9,000 gpd/ft). The storage coefficient is 3.5×10^{-4} and the hydraulic conductivity is about 13 ft/day (100 gpd/ft^2) (Rosenau and others, 1969, p. 40). An aquifer test was run at Artificial Island in Salem County in 1968 by Dames and Moore, consulting engineers for Public Service Electric and Gas Company (Dames and Moore, 1968). The transmissivity was about 940 ft^2/day (7,000 gpd/ft), and the hydraulic conductivity was about 19 ft/day (140 gpd/ft^2).

Ten industrial and public-supply wells tapping the Wenonah-Mount Laurel aquifer in Camden County furnish sufficient specific capacity data for estimating the transmissivity by the Hurr (1966) method (table 11). Transmissivity computed for the 10 wells ranges from 430 to 1,780 ft^2/day (3,200 to 13,300 gpd/ft). The median transmissivity for the 10 wells is 780 ft^2/day (5,820 gpd/ft). The specific capacities for the 10 wells range from 1.8 to 6.4 gpm/ft. The median specific capacity for the 10 wells is 3.2 gpm/ft. A coefficient of storage of 2.4×10^{-4} was used in calculations to estimate transmissivity. Porosity and hydraulic conductivity values obtained from laboratory analyses of samples from the New Brooklyn Park well in Winslow Township are given in table 5.

A generalized potentiometric surface map of the Wenonah-Mount Laurel aquifer based on the earliest record for each well is given in figure 40. Almost all of these wells are within 10 miles of the outcrop area. The map indicates a high potentiometric surface in northeastern Voorhees Township and in southern Gloucester Township. These areas are the main recharge areas for the Wenonah-Mount Laurel aquifer in Camden County and they coincide with areas of topographic highs as shown in figure 3. Recharge is mainly from downward vertical leakage. Potentiometric highs coinciding with topographic highs have been shown to exist for the Wenonah-Mount Laurel aquifer in Burlington County (Rush, 1968, p. 49) and Gloucester County (Hardt and Hilton, 1969, p. 23).

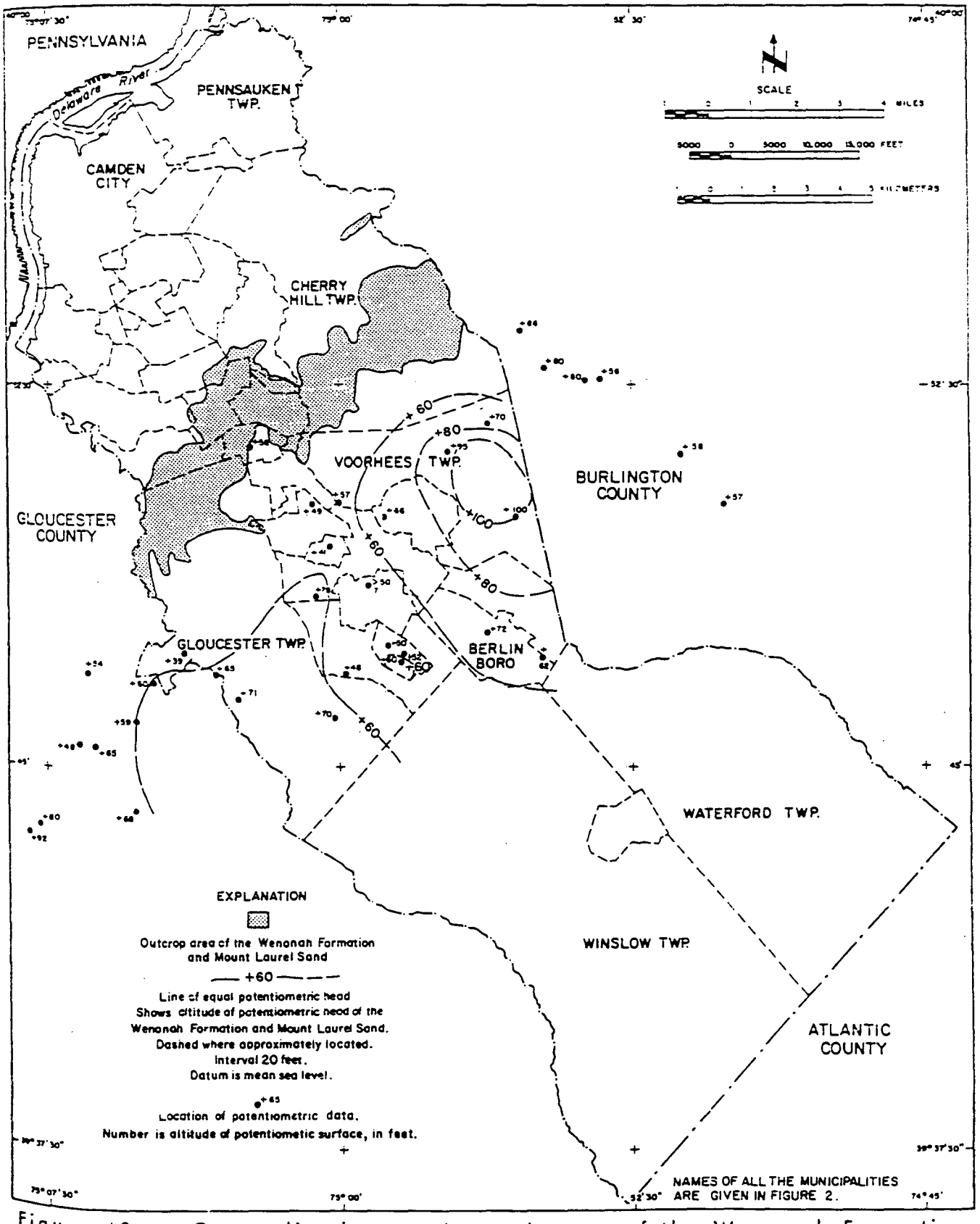


Figure 40. — Generalized potentiometric map of the Wenonah Formation and Mount Laurel Sand, based upon earliest record for each control point.

Natural discharge areas for the aquifer occur along topographic lows in the outcrop area. One of the discharge areas for the Wenonah-Mount Laurel aquifer prior to pumpage was along Cooper River in northern Somerdale Borough.

The potentiometric map of the Wenonah-Mount Laurel aquifer based on data for the period November 1968 to May 1970 is shown in figure 41. The potentiometric surface has been lowered in several areas mainly during the past 20 years. The greatest decline in head (43 feet) known in Camden County for the Wenonah-Mount Laurel aquifer is in the vicinity of Berlin Borough, an area where most of the industrial and public-supply pumpage occurs.

An observation well in the Wenonah-Mount Laurel aquifer was drilled at New Brooklyn Park (WI 29) in 1961. Head data from 1963 to 1970 are given in figure 42. From May 1962 to September 1964 the head declined about 9 feet. The decline is interpreted as being mainly due to additional pumping in the area of Berlin and northern Winslow Township including withdrawals from the Johns-Manville well (WI 3), located 3.5 miles north of the New Brooklyn Park observation well. Pumpage at Johns-Manville began in late 1963.

Quality of Water

The quality of water from the Wenonah-Mount Laurel aquifer is generally within the State's standards for potable water with the exception of high iron concentrations in local areas. A summary of chemical analyses of ground water from wells tapping the Wenonah-Mount Laurel aquifer in Camden County is shown in table 12. The water is generally low in dissolved solids (97-178 mg/l), sulfates (0-28 mg/l), and chloride (0.3-9.7 mg/l). Laboratory analyses of water samples (table 4) indicate 6 of 13 analyses have iron concentrations exceeding the State's potable-water standard of 0.3 mg/l. The range in iron concentration is 0-3.6 mg/l. There is no apparent regional distribution of the high iron concentration in the aquifer in Camden County. Hardness ranges from soft to moderately hard (17-126 mg/l).

Sulfate concentration of 28 mg/l was determined for a sample obtained in January 1970 from the New Jersey Water Company's well 4 (LS 6) at Laurel Springs. Chemical analyses (Donsky, 1963) indicate sulfate concentrations of 13 mg/l in May 1951 and 17 mg/l in August 1960 for well 8 (LS 4) which is screened at the same interval and is located near well 4. In

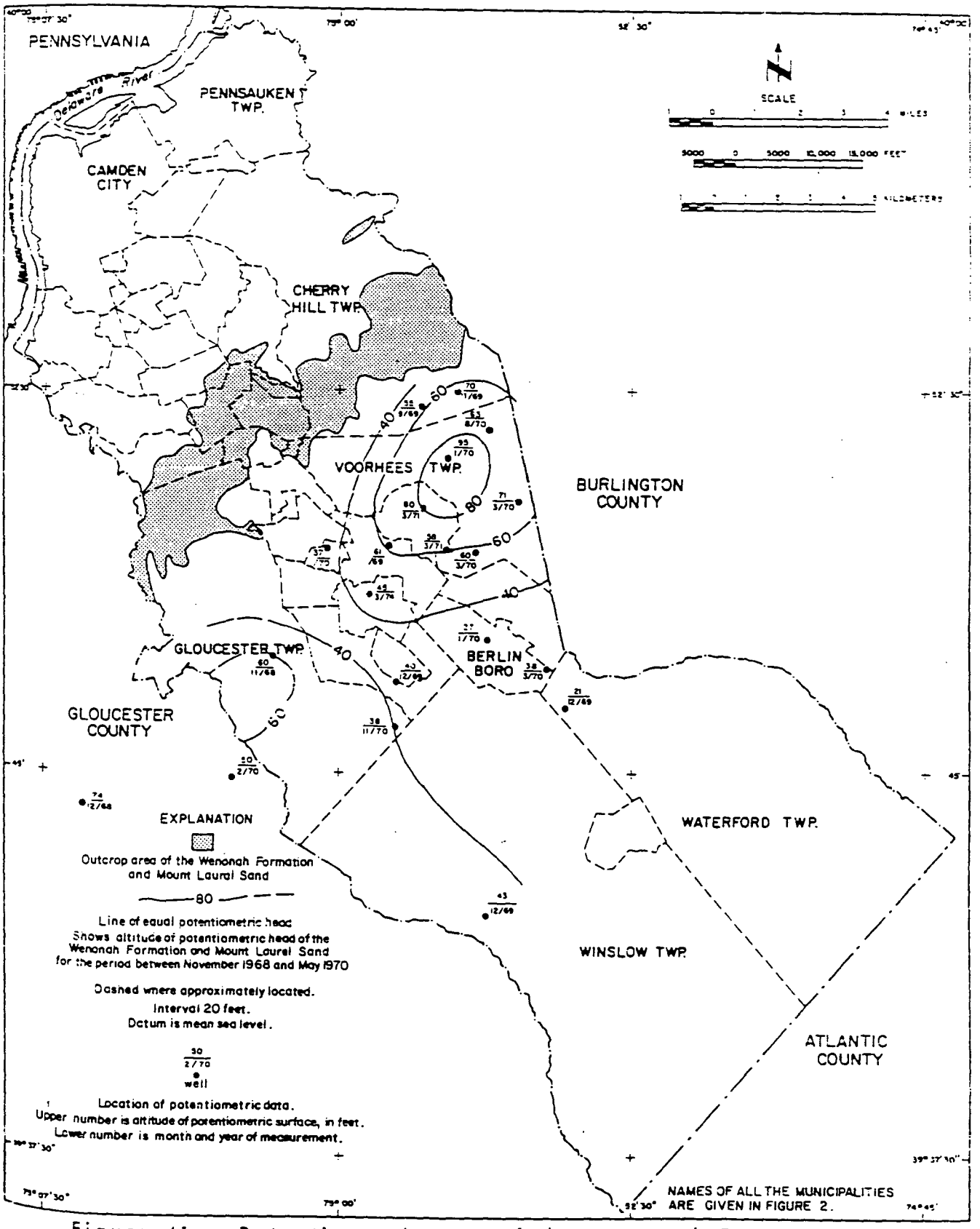


Figure 41.— Potentiometric map of the Wenonah Formation and Mount Laurel Sand, November 1968 - May 1970.

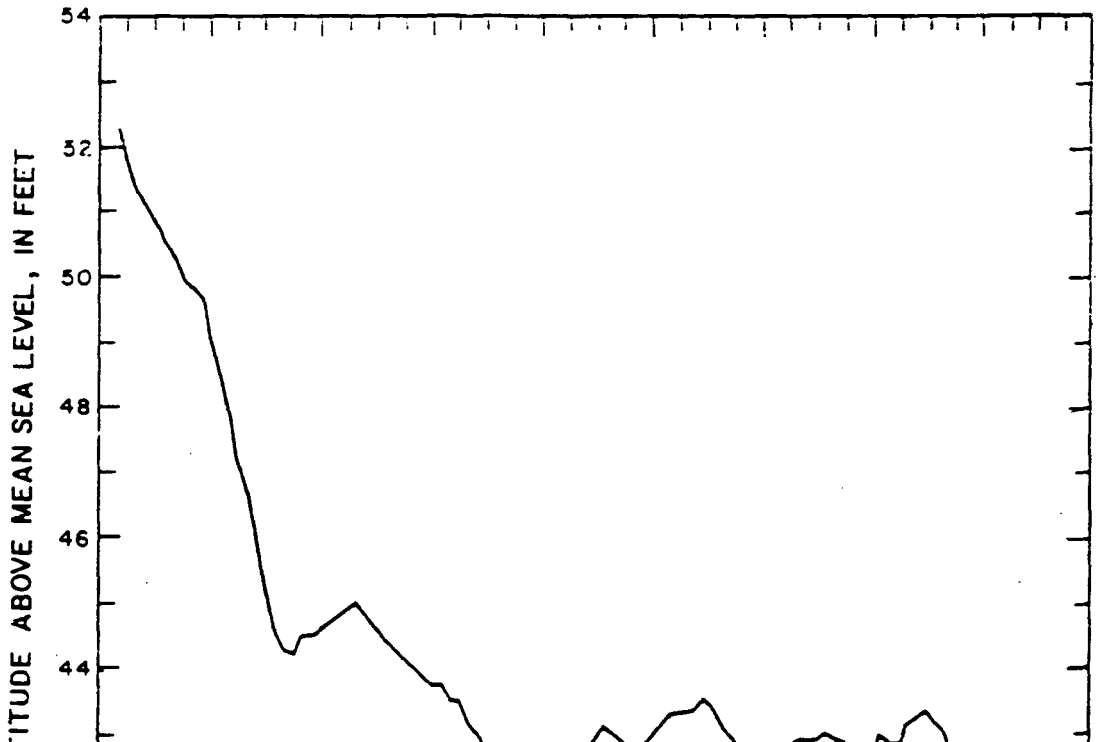


Figure 42. — Hydrograph of the lowest monthly water level in the observation well tapping the Wenonah-Mount Laurel aquifer at New Brooklyn Park, Winslow Township, January 1963 - December 1970.

addition to the increase in sulfate, there was an increase in dissolved solids. Although sulfate and dissolved solids are well within the State's Potable Water Standards, the increase may indicate a rising trend. Withdrawals from the Wenonah-Mount Laurel aquifer at Laurel Springs may have reversed the hydraulic gradient, thereby causing the water to move from the outcrop area to the well field.

A water sample obtained in February 1970 from a domestic well (GT 10) located very close to the outcrop area of the Wenonah Formation and Mount Laurel Sand had a nitrate concentration of 15 mg/l. Nitrate in the Wenonah-Mount Laurel aquifer is generally much lower (0 to 1.4 mg/l). The high nitrate suggests local ground-water contamination, possibly from fertilizers in the outcrop area or through the overlying sediments.

Navesink Formation

Geology

The Navesink Formation crops out in an irregular belt southeast of the Mount Laurel Sand in Camden County and is approximately 3.9 square miles in area (fig. 4).

The Navesink Formation in Camden County is the uppermost unit of the Cretaceous System. It is unconformably overlain by the Hornerstown Sand of Tertiary age and underlain conformably by the Mount Laurel Sand. Fossils and glauconite found in the Navesink indicate that it is of marine origin.

The Navesink Formation consists of a dark green to black glauconitic sand and clay mixed with varying amounts of quartz sand. A prominent shell zone occurs at the base of this formation and is one of the best marker horizons in Camden County. The bulk of the fossils are the thick-shelled Exogyra, Gryphaea, and Belemnites (Owens and Minard, 1960, p. 23). The formation dips about 30 feet per mile to the southeast and ranges in thickness from 15 feet in Laurel Springs Borough near the outcrop area to 34 feet in Winslow Township. Particle-size analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township are listed in table 5.

Hydrology

The Navesink Formation functions as a confining layer in Camden County. Recharge to the underlying Wenonah Formation and Mount Laurel Sand takes place as a result of vertical leakage through the Navesink Formation. Porosity and hydraulic conductivity values for samples of the formation from the New Brooklyn Park well (WI 27) in Winslow Township are listed in table 5.

In this report the Navesink Formation and the Hornerstown Sand are treated as a hydrologic unit. The total thickness of the Navesink Formation and Hornerstown Sand is shown in figure 43.

CENOZOIC ERATHEM

Tertiary System, Paleocene-Eocene Series

Hornerstown Sand

Geology

The Hornerstown Sand of Paleocene age crops out in an irregular belt southeast of the Navesink Formation (fig. 4). The outcrop area in Camden County is approximately 9.4 square miles.

The Hornerstown Sand in Camden County is the lowest unit of the Tertiary System. It unconformably overlies the Navesink Formation. Fossils and the high glauconite content of the Hornerstown Sand indicate that it is of marine origin. Dorf and Fox (1957, p. 5) suggest that the Hornerstown represents a transgressive marine phase.

The Hornerstown Sand is composed of sand and clay and contains as much as 90 percent glauconite. This mineral gives the Hornerstown Sand its dark-green color. The formation dips about 30 feet per mile to the southeast and ranges in thickness from 36 feet in Voorhees Township near the outcrop area to 18 feet in Waterford Township. Particle-size analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5.

Gamma-ray logs of wells in Camden County indicate that two relatively high radioactive layers occur 25 to 40 feet apart in the Navesink-Hornerstown confining layer. The layers

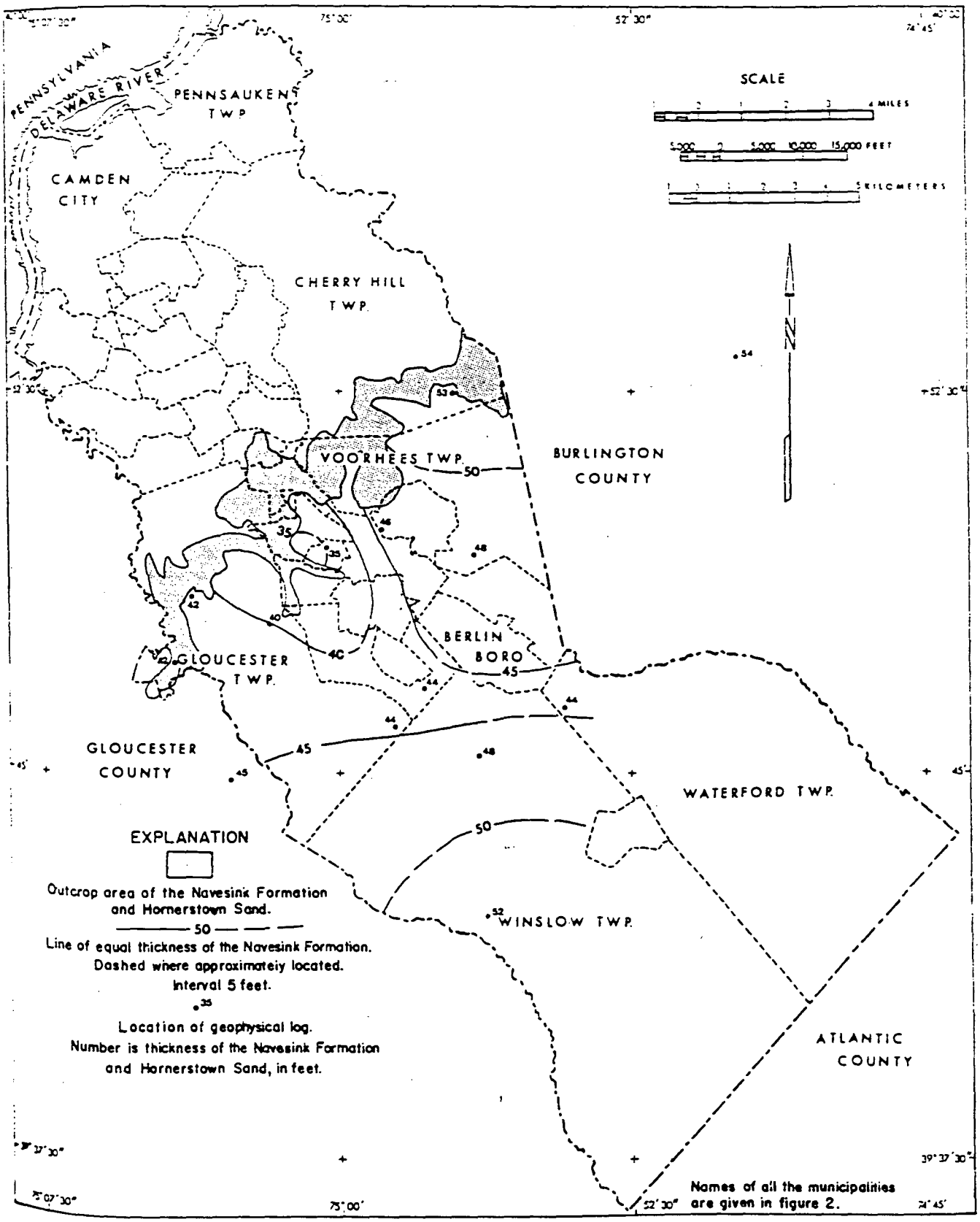


Figure 43. — Thickness map of the Navesink Formation and Hornerstown Sand in Camden County.

appear to coincide in position with high concentrations of glauconitic sand or with reported shell layers near the top of the Hornerstown Sand and the bottom of the Navesink Formation. Thus, one can establish the Tertiary-Cretaceous (Hornerstown Sand-Navesink Formation) contact zone in Camden County. These two layers were used as markers in correlating well logs shown in figure 6.

Hydrology

The Hornerstown Sand in conjunction with the underlying Navesink Formation is a leaky confining unit. Recharge to the Mount Laurel Sand takes place as a result of vertical leakage through these overlying formations. One domestic well is known to tap the Hornerstown Sand and three wells are known to tap the undifferentiated Hornerstown Sand and overlying Vincentown Formation in Camden County. Porosity and hydraulic conductivity values for samples from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5.

Vincentown and Manasquan Formations

Vincentown Formation

Geology

The Vincentown Formation of Paleocene age does not crop out in Camden County. In the subsurface the formation thickens to the southeast. The authors were unable to differentiate the Vincentown Formation from the overlying Manasquan Formation on geophysical logs. The total thickness of the Vincentown and Manasquan Formations in Camden County ranges from 0 to 210 feet (fig. 44). The Vincentown Formation is estimated to range in thickness in Camden County from 0 to 80 feet. The contact with the underlying Hornerstown Sand is unconformable.

The Vincentown Formation in Camden County consists chiefly of a light brown to light gray, very fine, calcareous, micaceous sand. The formation has two recognizable facies; (1) a quartzose sand with glauconite, and (2) a limey sandstone which contains fossil shells. Neither facies is traceable for any great distance because of the lensing nature of the limey

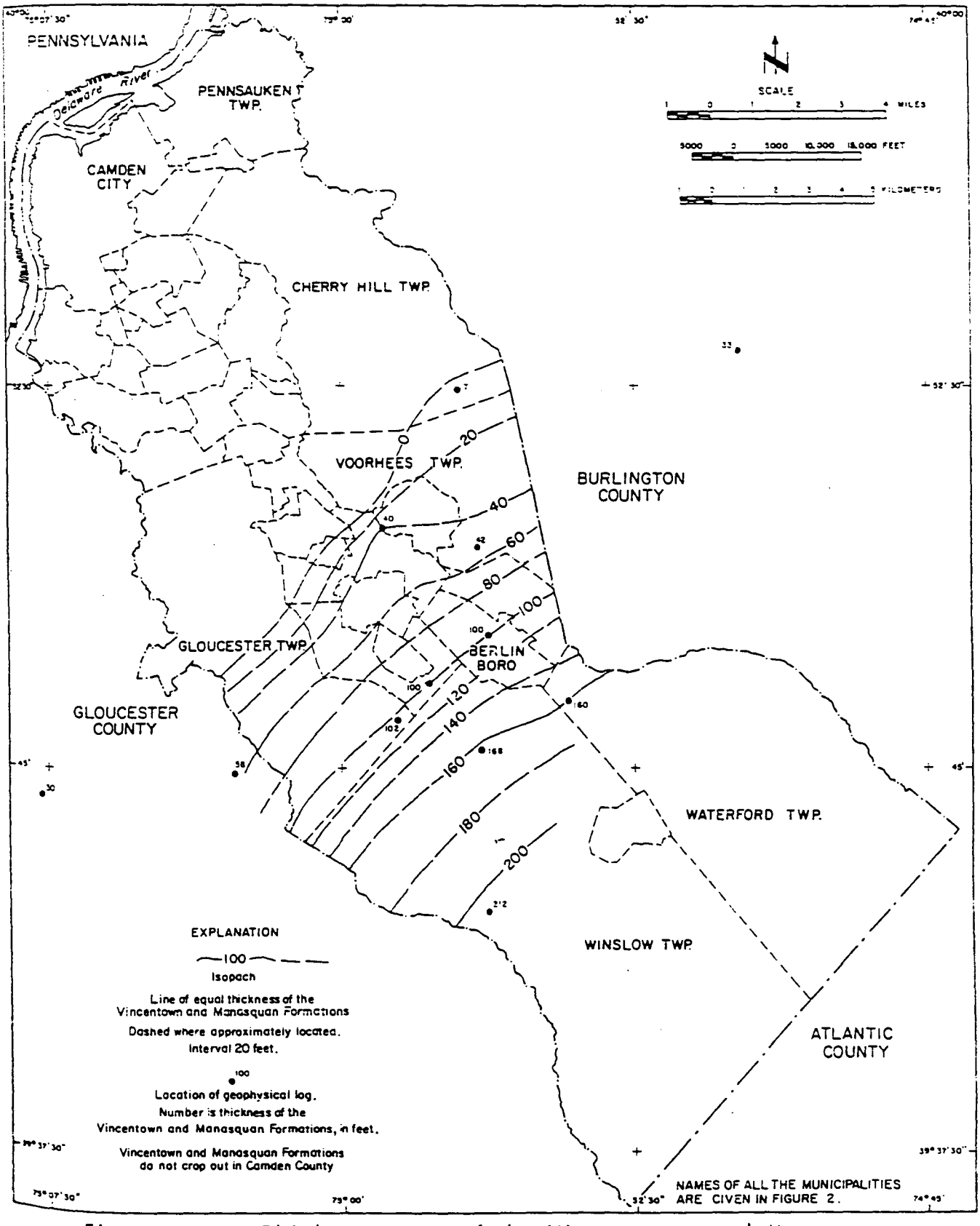


Figure 44. — Thickness map of the Vincentown and Manasquan Formations in Camden County.

sandstone. The sand fraction in the limey sandstone facies consists primarily of calcareous fragments of bryozoans, foraminifera, and corals. The clay-size fraction is primarily calcite with small amounts of montmorillonite (Owens and Minard, 1960, p. 25). The limey sandstone facies is predominant in Camden County. Particle-size analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township are given in table 5.

Manasquan Formation

Geology

The Manasquan Formation of Eocene age does not crop out in Camden County. In the subsurface the formation thickens to the southeast. The total thickness of the Manasquan and Vincentown Formations in Camden County ranges from 0 to about 210 feet (fig. 44). The Manasquan Formation is estimated to range in thickness in Camden County from 0 to about 140 feet.

The Manasquan Formation overlies the Vincentown Formation. The contact between the Manasquan Formation and the overlying Kirkwood Formation is unconformable. Fossils and glauconite found in the Manasquan Formation indicate that it is of marine origin. Dorf and Fox (1957, p. 12) considered the Manasquan Formation to represent a second transgressive phase of the lower Tertiary. Perfectly preserved specimens of Maringulina vacavillensis (Hanna) and associated small foraminifera found in the New Brooklyn Park test well (WI 27) suggest marine conditions during middle Eocene time similar to that of the present day Gulf Coast (Herrick, 1962).

The Manasquan Formation is described by Owens and Minard (1960, p. 25-26) as a clayey, quartz, glauconite sand similar to the Hornerstown Sand, except that the Manasquan has more clay and quartz sand. Samples taken from two test wells of the Manasquan Formation in Burlington County were olive gray, glauconitic, clayey sand having small amounts of mica and shell fragments. Mechanical analyses were made on six samples and a typical sample gave the following particle-size distribution: gravel, 1 percent; very coarse-grained sand, 3 percent; coarse-grained sand, 3 percent; medium-grained sand, 12 percent; fine-grained sand, 36 percent; very fine-grained sand, 20 percent; silt, 8 percent; and clay, 17 percent (Rush, 1968, p. 54). Particle-size analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township, Camden County, are given in table 5. The samples in general have more than 30

percent clay and as much as 82 percent clay.

Vincentown and Manasquan Formations Undifferentiated

Hydrology

The Vincentown and Manasquan Formations, along with the Hornerstown Sand and Navesink Formation, function as confining layers between the underlying Wenonah-Mount Laurel aquifer and overlying aquifers of the Kirkwood Formation and Cohansey Sand.

Laboratory analysis of an outcrop sample of the Vincentown Formation taken between Jacobstown and New Egypt in Burlington County indicates a hydraulic conductivity of 21 ft/day (160 gpd/ft^2). Laboratory analyses of six samples of the Manasquan Formation in Burlington County give a range for hydraulic conductivity from 0.04 to 16 ft/day (0.3 to 120 gpd/ft^2) with most hydraulic conductivity values grouped between 0.5 and 0.8 ft/day (4 and 6 gpd/ft^2) (Rush, 1968, p. 55). Hydraulic conductivity values of samples from the New Brooklyn Park well (WI 27) in Winslow Township range from 8 x 10^{-5} to 4 x 10^{-2} ft/day (0.0006 to 0.3 gpd/ft^2) (table 5).

Ancora State Hospital in Winslow Township has three wells that tap the undifferentiated Vincentown and Manasquan Formations (reported by Rush, 1968, as wells tapping the Kirkwood Formation). Wells 1 (WI 40) and 2 (WI 38) yield 185 gpm and 360 gpm, respectively. Specific capacities for wells 1 and 2 are 1.9 and 1.3 gpm/ft drawdown, respectively.

Continuous water-level data have been collected at observation well 3 (WI 37), Ancora State Hospital, since 1953. A hydrograph of monthly low water levels is shown on figure 45. A close relationship is found between monthly head fluctuations and variation in the monthly pumpage for wells 1 (WI 40) and 2 (WI 38) (fig. 45). The increased rate of head decline in 1955-56, 1958-59, and 1966-67 is the result of increased withdrawals from wells 1 and 2 as shown in figure 45.

Piney Point(?) Formation

The Piney Point(?) Formation of Eocene age does not crop out in New Jersey. The Eocene age marine sediments which are correlated with the Jackson Formation of the Gulf Coast are

recognized in well logs from Delaware (Marine and Rasmussen, 1955) and southern New Jersey (Richards, 1956, p. 84). The glauconitic sands and shell beds in southern Maryland were named the Piney Point Formation (Otton, 1955, p. 85) from a well located at Piney Point, St. Mary's County, Maryland. The name was extended (Rasmussen and others, 1957, p. 61-67) to include a similar unit on the eastern shore of Maryland. The sediments penetrated by a deep well at Atlantic City, New Jersey, were tentatively assigned the name Piney Point Formation by Parker and others (1964, p. 60). The total thickness of the Piney Point Formation at Atlantic City is 290 feet (Parker and others, 1964).

Interpretation of geophysical and geologic logs suggests that the Ancora State Hospital well 3 (WI 37) may penetrate about 35 feet of sand which may be part of the Piney Point(?) Formation. This interpretation is based on stratigraphic correlation study conducted primarily in Cumberland County on the Piney Point aquifer by Nemickas and Carswell (written commun., 1974). The Piney Point aquifer in their study was extended from the Cumberland County area to the New Brooklyn Park wells. Data from the New Brooklyn Park well (WI 27) in Winslow Township in the southern part of Camden County suggests the presence of about 35 feet of sand that may be the extension of the Piney Point aquifer. In the central part of Camden County the Piney Point sand probably pinches out or is truncated by the overlying Kirkwood Formation. Figure 5 shows stratigraphic section (C-C') from Ancora State Hospital well 3 (WI 37) to the Gino's Restaurant well 1 (WA 12) showing the pinching out of the Piney Point sand. Geophysical data indicate that the Piney Point sand is present in Winslow Township in Camden County but would probably be less than 40 feet thick.

Tertiary System, Miocene Series

Kirkwood Formation

Geology

The Kirkwood Formation of Miocene age crops out in an irregular northeasterly-trending belt southeast of the outcrop area of the Hornerstown Sand (fig. 4). The outcrop area of the Kirkwood Formation in Camden County is approximately 18.9 square miles. The formation dips 15 to 25 feet per mile to the southeast and ranges in thickness from 57 feet in Voorhees Township to 96 feet in Gloucester Township. The thickness map of the Kirkwood Formation in Camden County is shown in figure 46. The Kirkwood Formation in Camden County rests

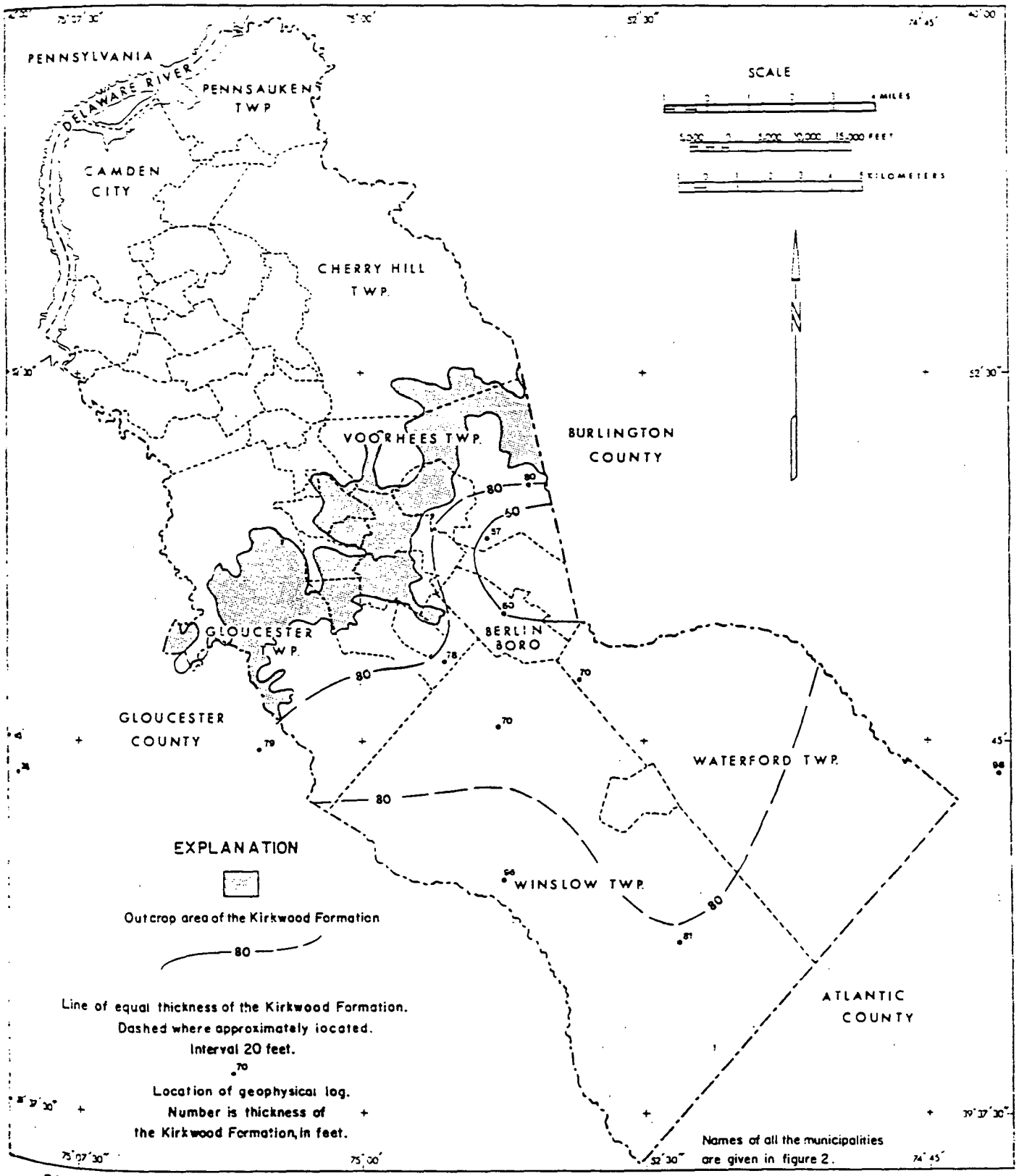


Figure 46. — Thickness map of the Kirkwood Formation in Camden County.

unconformably on the Hornerstown Sand in the outcrop area and on the Manasquan Formation in the subsurface. The structure contour maps of the base and the top of the Kirkwood Formation in Camden County (figs. 47 and 48) are based on the interpretation of geophysical and geologic logs. The Cohansey Sand unconformably overlaps the Kirkwood Formation in Camden County.

The Kirkwood Formation consists chiefly of sand, silt, and clay; dark gray where unaltered; light gray, yellowish- and grayish-orange to grayish-yellow, light red to moderate reddish-brown, and moderate to dusky yellow and yellowish-gray where weathered (Minard, 1965). The lower part of the formation is mostly thick bedded, very fine to fine-grained sand, and is typically micaceous. The basal 2 to 4 feet consists of poor to moderately sorted pebbly coarse sand with abundant glauconite. The upper part of the formation is interbedded poorly sorted silt and clay. Quartz is the dominant sand-size constituent throughout the formation; feldspar and mica (mostly muscovite) are less common (Minard, 1965). Carbonaceous matter is abundant in the basal dark-gray beds. The Kirkwood Formation unconformably overlies the Hornerstown Sand on the surface in Camden County and the Manasquan Formation in the subsurface. Particle-size analyses of samples from the New Brooklyn Park well (WI 27) in Winslow Township Atsion well 1 (SH 1) in Burlington County are listed in tables 5 and 13.

Hydrology

The Kirkwood Formation is not being utilized for water supply in Camden County. The overlying Cohansey Sand is preferred for water supply because of its shallower depth. Recharge to the Kirkwood takes place principally in upland areas by percolation into the formation from the overlying Cohansey Sand. Ground-water movement is probably toward the lowland areas where the water is discharged mostly to streams.

The Kirkwood Formation is of hydrologic importance in Camden County because its large surface area absorbs precipitation that is partly transmitted to deeper aquifers. Porosity and hydraulic conductivity values of samples from the New Brooklyn Park well (WI 27) in Winslow Township and Atsion well 1 (SH 1) in Burlington County are listed in tables 5 and 13.

The Kirkwood Formation can be developed as a source of water in the southern part of Camden County. Just southeast of

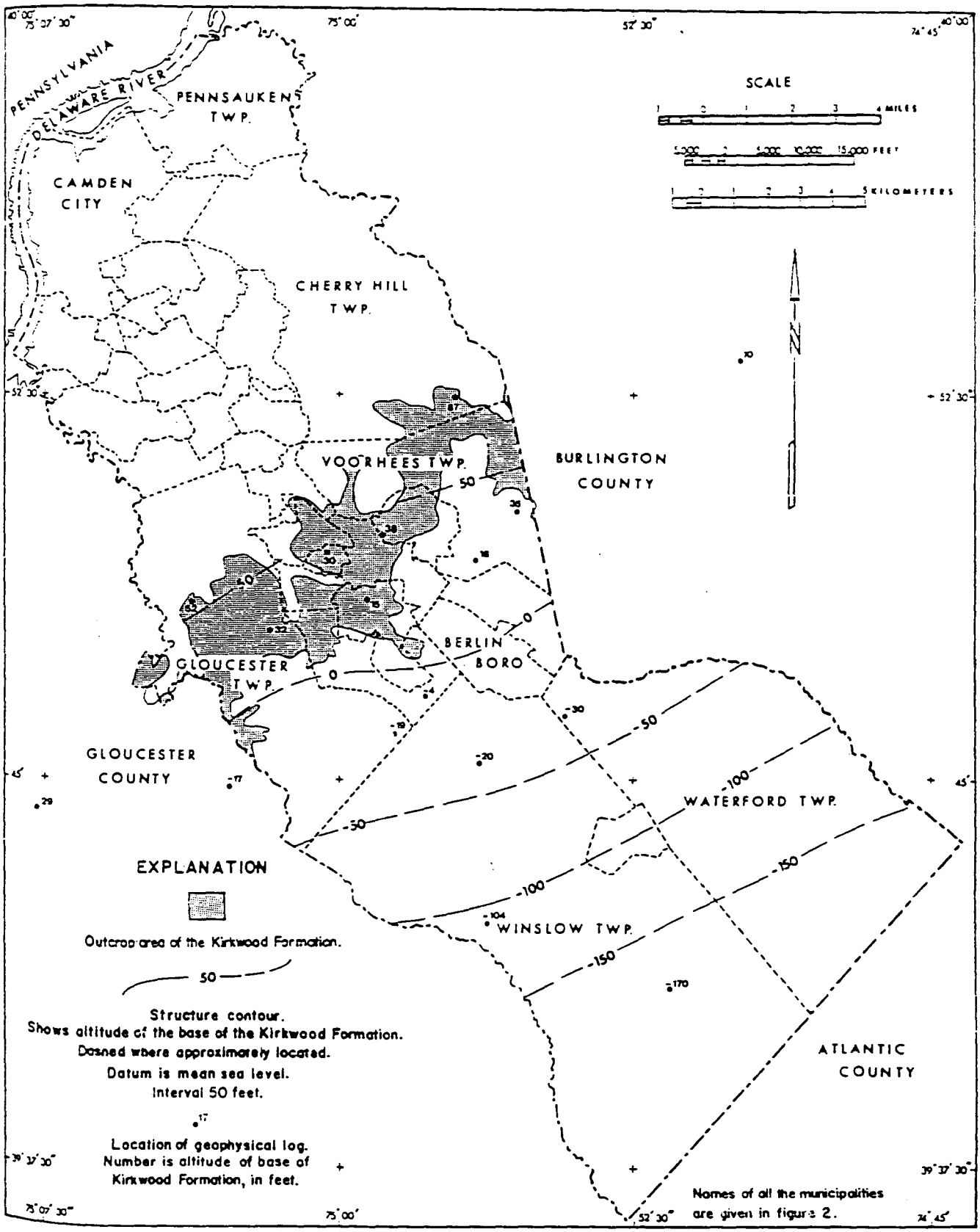


Figure 47. — Structure contour map of the base of the Kirkwood Formation in Camden County.

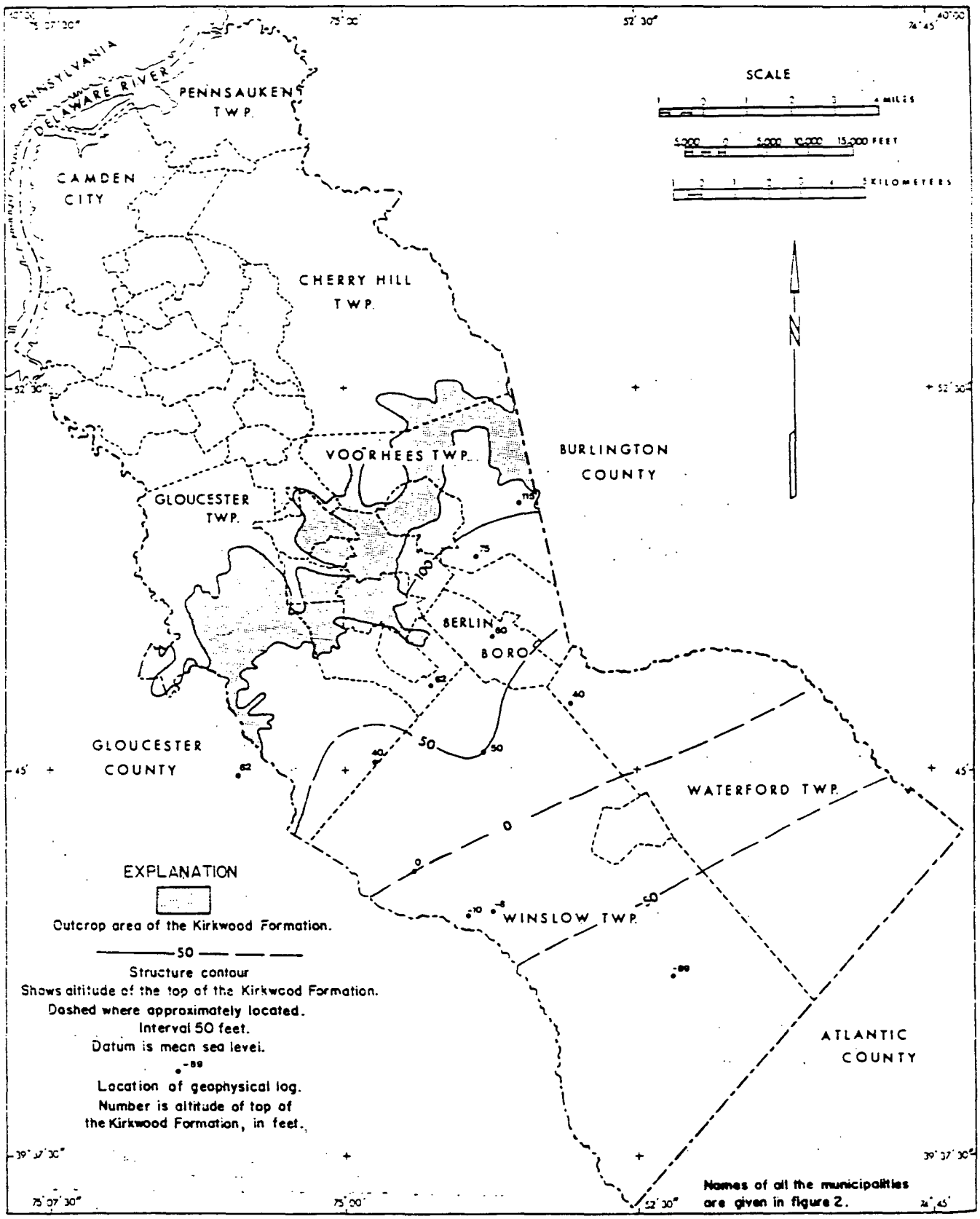


Figure 48. — Structure contour map of the top of the Kirkwood Formation in Camden County.

the Camden County line in Atlantic County yields from wells in the Kirkwood are as high as 700 gpm (Clark and others, 1968). In the outcrop area of the Kirkwood in central Camden County it has been found desirable to drill to the Wenonah Formation and Mount Laurel Sand because the Kirkwood has poor water-transmitting characteristics.

Quality of Water

One chemical analysis of water is available from the Kirkwood Formation in Camden County. The analysis, from the New Brooklyn Park well 4 (WI 30), indicates an iron concentration of 6.0 mg/l and dissolved solids of 136 mg/l. In adjacent Burlington County, analyses from eight wells indicate generally good chemical quality; however, some analyses showed high iron concentrations, ranging from 0.02 to 2.9 mg/l. The water is generally very soft (2 to 94 mg/l) and the dissolved solids are low, ranging from 13 to 125 mg/l.

In Atlantic County (Clark and others, 1968) analyses of water samples from seven wells located 1 to 8 miles from the Camden County line indicate some objectionable chemical characteristics. Iron concentrations range from 0.13 to 4.6 mg/l. Six of the seven samples are above the limit set in the State's Potable Water Standards. Dissolved solids range from 51 to 98 mg/l. Hardness of the seven samples ranges from 9 to 28 mg/l and pH from 5.0 to 7.4.

Tertiary System, Miocene(?) and Pliocene(?) Series

Cohansey Sand and Younger Sediments

Geology

The Cohansey Sand was named and defined by Ries, Kümmel, and Knapp (1904, p. 139). It crops out in all of the southeastern half of Camden County (fig. 4). The outcrop area in Camden County is approximately 124 square miles or about 55 percent of the total county area. The Cohansey Sand rests unconformably on the Kirkwood Formation and is unconformably overlain by the Bridgeton Formation of Pleistocene age.

The structure contour map of the top of the Kirkwood Formation in Camden County, shown in figure 48, also delineates

the base of the Cohansey Sand. The Cohansey Sand strikes in a northeasterly direction and dips from 10 to 20 feet per mile to the southeast. The steeper dips, in general, are encountered to the southeast. The estimated thickness of the Cohansey Sand ranges from 0 to 140 feet. The saturated thickness of the Cohansey Sand and the overlying younger sediments ranges from 0 to 190 feet as shown on figure 49 which is based on interpretation of geophysical and geologic logs and water-level measurements (1951 to 1969).

The Cohansey Sand in Camden County consists chiefly of yellowish-orange, fine- to coarse-grained quartzose sand and fine gravel. The sand also contains lenses of silt and clay which are as much as 30 feet thick. The average grain size of the materials decreases southeastward; beds of silt and clay become thicker, more numerous, and more extensive to the southeast. Mechanical analysis of samples from the New Brooklyn Park well (WI 27) in Winslow Township, Camden County, and Atsion well (SH 1) in Burlington County are given in tables 5 and 13.

The Cohansey Sand was derived in part from older sedimentary rocks and from deeply weathered crystalline rocks of the New Jersey Highlands. Sedimentary rocks of Paleozoic age, as indicated by fossiliferous chert pebbles, were incorporated into the Cohansey Sand. The almost complete absence of glauconite in the Cohansey Sand indicates that the older marine Coastal Plain sediments (pre-Kirkwood) were not a major contributing source of sediments. These older glauconitic sediments were either covered by the Kirkwood Formation or the sediments were being transported by longshore currents from the north. The clearness and angularity of most of the quartz grains and the absence of amphiboles, pyroxene, and feldspars indicate a deeply weathered crystalline source. The absence of fossils and the lack of glauconite in the Cohansey Sand indicate a non-marine environment. "Cross-bedding, local cut and fill structures, and heterogenity of grain size suggest an active stream environment on an extensive alluvial plain in the inland deposits" (Markewicz, 1969, p. 368-369). Its coarse texture, poor sorting, and cross-bedding fit this interpretation. However, Owens and Minard (1960, p. 27) discount this hypothesis on the grounds that the formation is too widespread. They favor a hypothesis of beach deposition. Rhodehamel (oral communication, 1970) interprets the Cohansey Sand as a deltaic deposit.

Hydrology

The Cohansey Sand is one of the important aquifers in

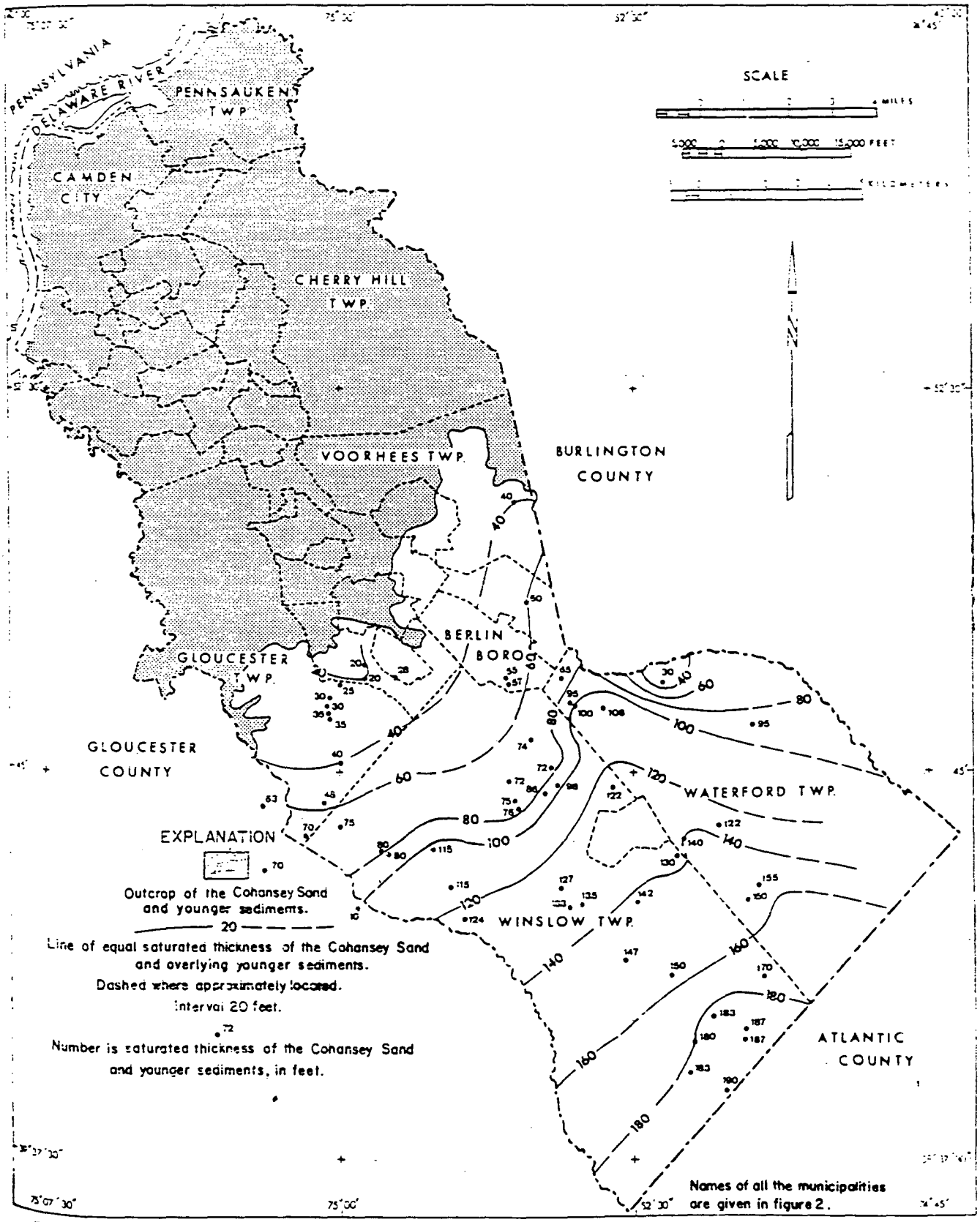


Figure 49. — Saturated thickness of the Cohansey Sand and overlying younger sediments in Camden County.

Camden County. The Cohansey Sand and the overlying younger material consist of as much as 190 feet of saturated sediments of high porosity and permeability. It is virtually untapped by wells and has an excellent potential for water development in the southeastern part of the county. The Cohansey Sand in many areas is hydraulically connected with the underlying Kirkwood Formation. There are no extensive confining beds overlying it, but clay lenses commonly cause local perched water-table conditions. However, most of the formation in Camden County is under water-table conditions.

Water enters the aquifer directly from precipitation and moves toward low-level areas where it is ultimately discharged into streams. The generalized water-table map of the Cohansey Sand and overlying sediments (fig. 50) is a subdued replica of the topography (fig. 3).

In Camden County the Cohansey Sand is tapped mostly by domestic and irrigation wells. Relatively few industrial and public-supply wells draw water from the Cohansey Sand as yet because of the rural nature of the area. Berlin Water Department well 5 (BB 4) yields 365 gpm. The other large diameter wells that draw water from the Cohansey Sand are located in Winslow Township. Water-yield data are given below.

Map Number	Owner	Well Number	Yield (gpm)	Specific Capacity (gpm/ft of drawdown)
WI 36	Ancora State Hospital	4	708	9.1
WI 35	Do.	5	502	8.4
WI 12	Certain-teed Saint Gobin	1	524	12.1
WI 11	Do.	2	510	19.6
WI 42	M. and R. Refractory Metals	-	377	10
WI 19	Winslow Water Company	Prod. 1	1,000	35
WI 14	Do.	Prod. 2	1,000	25.6

Aquifer tests on wells in the Cohansey have been conducted in Camden, Atlantic, Cape May, and Cumberland Counties. In these tests the aquifer was not completely penetrated and was partially confined beneath clay layers. The storage coefficient ranged from 2.7×10^{-3} to 4×10^{-5}. Computed transmissivity, which did not represent the total thickness of the Cohansey Sand, ranged from 2,410 to 20,100 ft^2/day (18,000 to 150,000 gpd/ft). Computed hydraulic

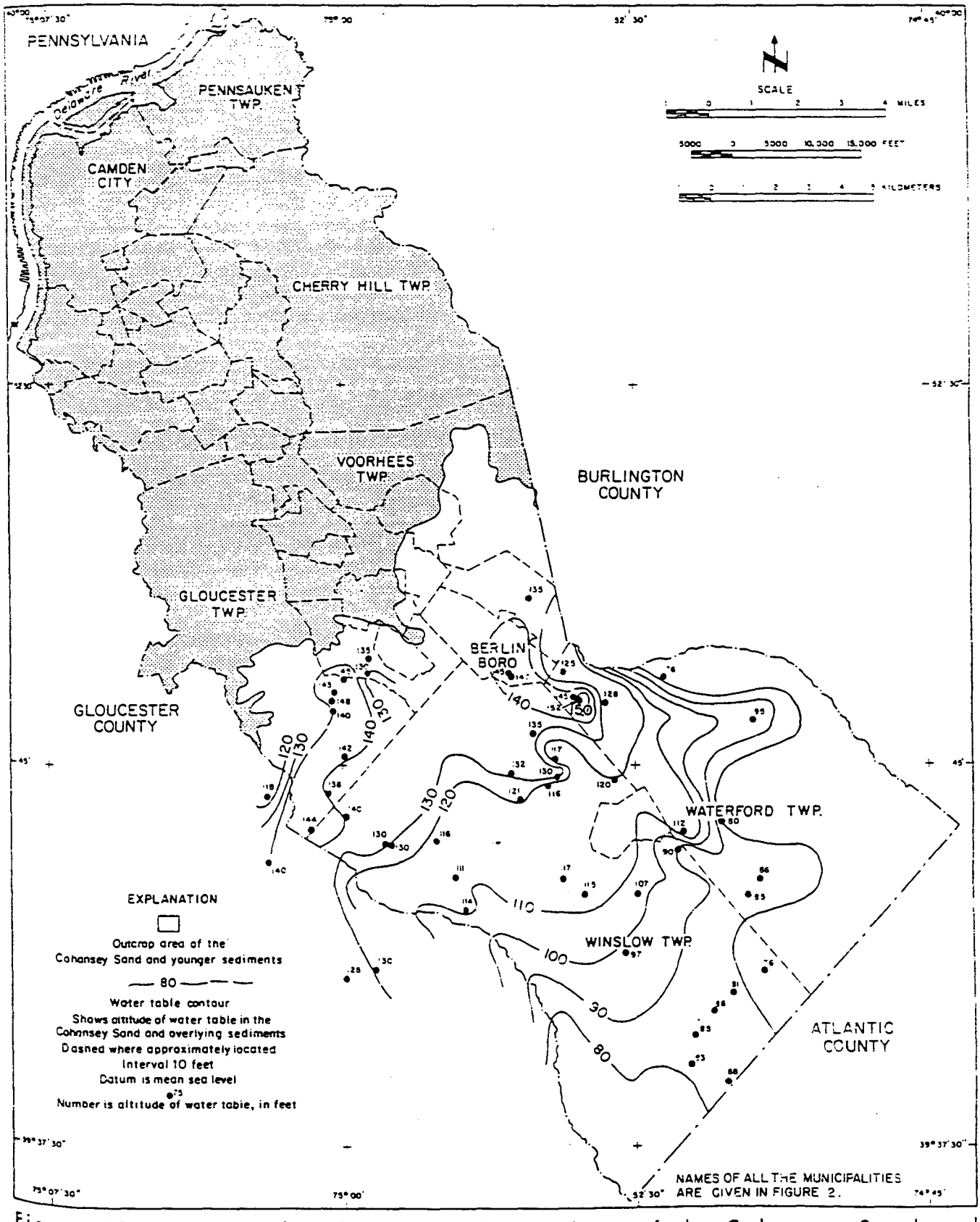


Figure 50. — Generalized water-table surface of the Cohansey Sand and overlying younger sediments in Camden County.

conductivities range from 64 to 442 ft/day (480 to 3,300 gpd/ft^2), but typically range from 100 to 134 ft/day (750 to 1,000 gpd/ft^2) (Rhodehamel, 1972). Porosity and hydraulic conductivity values of samples from the New Brooklyn Park well (WI 27) and of samples from Atsion well (SH 1) in Burlington County are given in tables 5 and 13.

The Cohansey Sand has an estimated average specific yield of about 21 percent (Rhodehamel, 1970). Thus, where sufficiently thick, the Cohansey Sand can store and release substantial quantities of water.

Rhodehamel (1970) evaluated the hydrologic budget for the Pine Barrens region which includes the entire outcrop area of the Cohansey Sand in Camden County. The average annual stream runoff, measured as inches depth over the Pine Barrens region, was 22.5 inches (1.07 mgd per square mile). If the same value is used for the outcrop area of the Cohansey Sand in Camden County, the 22.5 inches of runoff over the area of 124 square miles is equivalent to about 130 mgd average runoff from the Cohansey Sand in Camden County.

The Cohansey Sand is capable of extensive development as a source of water in Camden County. At present the amount of water withdrawn is small compared to the quantity potentially available. Locally, there may be more than one water-bearing zone present; however, the formation is generally regarded as a hydrologic unit. Large diameter wells (12 or more inches in diameter) can continuously yield 500 to 1,000 gpm of water. A well pumping at a rate of about 700 gpm will produce 1 mgd--enough water for many moderate-sized industries (Rhodehamel, 1966). Development of the water resources could be achieved by a number of ways. One way mentioned by Rhodehamel (1970) is to locate high-yielding wells adjacent to the downstream reaches of major streams thus inducing recharge. Additional wells could be located farther from the stream for use during prolonged low-flow periods.

Reported industrial and institutional withdrawals from the Cohansey Sand in Camden County for 1966 amounted to 0.45 mgd. No public-supply pumpage was reported from the Cohansey Sand in 1966. Annual average use of water for irrigation in Camden County was estimated to be 10 mgd shown below (Asghar Hasan, 1970, New Jersey Division of Water Resources, written commun.).

IRRIGATIONAL DEMAND FOR THE GROWING SEASON
(JUNE-AUG.) FOR CAMDEN COUNTY
(Based on 1966 Controlling Year)
(Hasan, 1970, written communication)

FARMS				GOLF COURSES AND RECREATIONAL, ETC.				TOTAL			
Irrigated (acres)	Rate of Delivery (in/wk)	Water Delivered (mg)	Seasonal Average (mgd)	Irrigated (acres)	Rate of Delivery (in/wk)	Water Delivered (mg)	Seasonal Average (mgd)	Irrigated (acres)	Water Delivered (mg)	Seasonal Average (mgd)	Annual Average (mgd)
3,000	1.3	2,294	25	3,048	1.37	1,475	16	6,048	3,769	41	10

Quality of Water

Chemical analyses of eight samples from wells in the Cohansey Sand and Pleistocene sediments are listed in table 4; the well locations are shown in figure 2. The summary of the analyses (table 14) indicate that water in the Cohansey Sand in Camden County has some objectionable chemical and physical characteristics, such as low pH, high iron concentration, and undesirable color; but, in general, it is suitable for man's use after treatment. The water in the Cohansey is low in dissolved-solids content, ranging from 13 to 125 mg/l in Camden County. Hardness of the water is generally less than 25 mg/l. The pH ranges from 5.3 to 8.4. In areas of low pH the water is corrosive and readily dissolves iron from the minerals in the soil and underlying sediments. Concentrations of iron range from less than 0.1 mg/l to 3.8 mg/l.

Quaternary System, Pleistocene Series

The Pleistocene Series consists of the Bridgeton, Pensauken, and Cape May Formations. These formations have similar geohydrologic characteristics and cap the older sediments in Camden County. They are normally thin, usually less than 40 feet thick.

The mode of deposition of the Pleistocene formations differs markedly from most of the older Coastal Plain formations. Most of the evidence suggests that the Pleistocene sediments are primarily stream deposits (Owens and Minard, 1960, p. 28). Where these formations overlie aquifers the recharge they receive from precipitation is transmitted downward to the underlying aquifers.

Bridgeton Formation

The Bridgeton Formation occurs as isolated patches on topographic highs. It unconformably overlies the Cohansey Sand and the Kirkwood Formation and is connected hydraulically with them. The thickness of the formation ranges from a few feet to about 30 feet in Camden County.

The Bridgeton Formation consists of fine to very coarse quartzose sand and gravel. Mechanical analysis of a sample collected 2 miles northeast of Mullica Hill in Gloucester County contains more than 95 percent medium- to very coarse-grained sand. The sand is white to brown in color and usually is fairly well sorted and subangular (Hart and Hilton, 1969, p. 30-31).

Pensauken Formation

The Pensauken Formation crops out in isolated and irregular patches in the northcentral part of Camden County and near the Delaware River. The geohydrologic characteristics of the Pensauken Formation are similar to those of the Bridgeton Formation. The Pensauken Formation ranges in thickness from a few feet to 30 feet in Camden County.

The formation consists of medium- to coarse-grained quartzose sand, gravel, and clay. The sand is generally poorly sorted, subangular, and with color ranging from yellow to brown. Because the lithologies of the Pensauken Formation and the older Bridgeton Formation are similar it is difficult to differentiate the two formations.

Cape May Formation

The Cape May Formation occurs adjacent to the Delaware River and tributary streams. The outcrop area is fairly flat and precipitation infiltrates easily through the formation into the underlying Raritan and Magothy Formations. The Cape May Formation ranges in thickness from a few feet to 40 feet in Camden County. The hydrology of the Cape May Formation is discussed with the Potomac-Raritan-Magothy aquifer system, because where both are present they are hydraulically connected.

The Cape May Formation consists of medium- to coarse-grained quartzose sand, gravel, and clay. The sand and gravel is usually yellow to brown to gray in color. The clays are yellow, brown, gray, and black. The Cape May is commonly poorly sorted, and the sand grains are subangular. In some areas it is difficult to distinguish the Cape May Formation from the Pensauken Formation because of similar lithologies.

Quaternary System, Holocene Series

Eolian Deposits

Windblown deposits occur locally and are generally thin in Camden County. They are light gray, well sorted quartz sands that have been rounded by wind action. Due to the high permeability of the eolian deposits water percolates through the sands into the underlying aquifers.

Alluvium

The alluvium is a mixture of clay, silt, organic material, sand, and gravel deposited in tidal flats and low-gradient stream channels. Most of the alluvial material consists of fine silt and clay of relatively low permeability. The alluvial deposits retard brackish water from the Delaware River from entering the water-bearing sands of the Potomac-Raritan-Magothy aquifer system where the water levels in this aquifer are below the river level.

SUMMARY AND CONCLUSIONS

Nearly all of the water supplies of Camden County are derived from ground-water sources. The average annual ground-water use of approximately 68 mgd in Camden County during 1966 was the largest county use in the State.

The major fresh-water aquifers are in the unconsolidated sediments of Cretaceous and Tertiary age. The largest producer is the Potomac-Raritan-Magothy aquifer system. In 1966 almost 56 mgd was withdrawn from this aquifer system which was approximately 85 percent of the total pumpage in the county. Other aquifers yielding large amounts of water were

the aquifers in the Cohansey Sand, the Wenonah Formation and Mount Laurel Sand, and the Englishtown Formation. The Cohansey Sand is the only water-table aquifer producing significant amounts of water.

The artesian aquifers have had declines in the potentiometric surface due to pumping. The largest decline occurred in the Potomac-Raritan-Magothy aquifer system. The head decline at Haddon Heights from 1900 to 1968 has been over 110 feet. The decline in the potentiometric surface in the aquifer in the Wenonah Formation and Mount Laurel Sand has been about 43 feet at Berlin.

The quality of ground water is generally good; however, there are some exceptions. High iron concentrations (in excess of 0.3 mg/l) are found in some areas of the Potomac-Raritan-Magothy aquifer system, at scattered locations in the Wenonah Formation and Mount Laurel Sand aquifer, and in the Cohansey Sand. In the southeastern part of the county a fresh water-salt water interface exists in the Potomac-Raritan-Magothy aquifer system. Overdevelopment in this area may cause the water to move updip or move upward by vertical coning. There also exists a potential salt-water encroachment of the Potomac-Raritan-Magothy aquifer system in the vicinity of the Delaware River. Previous investigations have shown a hydraulic connection of the upper sands and gravels with the Delaware River. If the Delaware River in the vicinity of Camden sustains high chloride levels for an extended period of time, heavy withdrawals from along the river may induce the high-chloride water into the aquifer system.

Contamination of ground water in Philadelphia has created a potential water-quality problem for the Camden area near the Delaware River. High concentrations of sulfate (in excess of 250 mg/l) and dissolved solids (in excess of 500 mg/l) in water in the Potomac-Raritan-Magothy aquifer system underlying Philadelphia are moving under the Delaware River toward the Texas Company's Eagle Point Plant in Gloucester County near the Camden County line.

Camden County has an abundant supply of ground water. The Potomac-Raritan-Magothy aquifer system will probably remain the largest source for many years. The Cohansey Sand is capable of extensive development in Camden County. Additional supplies of water can be obtained from the aquifers in the Wenonah Formation-Mount Laurel Sand and the Englishtown Formation in parts of Camden County. The Kirkwood Formation, presently untapped in Camden County, can yield an additional supply of water under artesian conditions mainly in the area near the Atlantic County line.

TABLES

Table 1.--Records of selected wells in Camden County and vicinity

MAP NUMBER	MUNICIPALITY	LATITUDE-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			ATLANTIC COUNTY					
AA-1	HAMMONTON TOWN	393653N074[illegible]3.1	ATLANTIC C EXPR	HAMMONTON 1	196[illegible]	77	220	220
			BURLINGTON COUNTY					
EV-1	EVESHAM TWP	395[illegible]N074[illegible].1	EVESHAM M U A	EMUA 3	1967	50	288	334
EV-2	EVESHAM TWP	395[illegible]N074[illegible].1	BYRON T ROBERTS	ROBERTS 2	1957	93	322	375
EV-3	EVESHAM TWP	3[illegible]N074[illegible].1	EVESHAM M U A	EMUA 2	1963	115	405	435
EV-4	EVESHAM TWP	3[illegible]N074[illegible].1	EVESHAM M U A	EMUA 1	1956	89	369	389
EV-5	EVESHAM TWP	3[illegible]N074[illegible].1	EVESHAM TWP W D	ETWD 1	1957	115	--	212
EV-6	EVESHAM TWP	[illegible]	EVESHAM M U A	TEST WELL 11	1964	110	589	599
EV-7	EVESHAM TWP	3[illegible]N074[illegible].2	EVESHAM M U A	EMUA [illegible]	1970	110	494	500
EV-8	EVESHAM TWP	[illegible]	US ARMY	CONTROL AREA	195[illegible]	84	138	154
MS-1	MAPLE SHADE TWP	3[illegible]N074[illegible].1	MAPLE SHADE W D	MSWD 4	1955	10	211	272
MS-2	MAPLE SHADE TWP	3[illegible]N074[illegible].1	MAPLE SHADE W D	MSWD 5	1961	20	410	494
MS-3	MAPLE SHADE TWP	3[illegible]N074[illegible].1	MAPLE SHADE W D	MSWD 1	--	35	413	493
MS-4	MAPLE SHADE TWP	3[illegible]N074[illegible].2	MAPLE SHADE W D	MSWD 6	1965	40	173	204
MS-5	MAPLE SHADE TWP	3[illegible]N074[illegible].3	MAPLE SHADE W D	MSWD 7	1966	29	140	175
ML-1	MEDFORD LAKES BOR	3[illegible]N074[illegible].1	LINGO	--	1966	75	--	260
ML-2	MEDFORD LAKES BOR	3[illegible]N074[illegible].1	L A CAMPANELLI	--	1966	100	--	310
ML-3	MEDFORD LAKES BOR	3[illegible]N074[illegible].1	THOMAS DICKINSON	1	1954	120	--	320
ME-1	MEDFORD TWP	3[illegible]N074[illegible].1	US GEOL SURVEY	MEDFORD 4	1967	72	1125	1145
ME-2	MEDFORD TWP	3[illegible]N074[illegible].1	US GEOL SURVEY	MEDFORD 5	1967	70	740	750
ME-3	MEDFORD TWP	3[illegible]N074[illegible].1	US GEOL SURVEY	MEDFORD 1	1963	70	400	410
ME-4	MEDFORD TWP	395413N074[illegible]2.1	MEDFORD W C	MWC 3	1957	48	506	536
ME-5	MEDFORD TWP	395316N074[illegible].1	MEDFORD W C	MWC 2	1968	45	506	535
ME-6	MEDFORD TWP	395250N074[illegible].1	PARSAMONTI	1	1966	50	--	130
ME-7	MEDFORD TWP	395209N074[illegible].1	LAKES WATER CO	LWC 3	1968	55	523	544
ME-8	MEDFORD TWP	395155N074[illegible].1	MEDFORD LAUND	LAUNDROMAT 1	1967	50	193	209
ME-9	MEDFORD TWP	395140N074[illegible]2.1	LAKES W C	2	1950	52	180	200
ME-10	MEDFORD TWP	395112N074[illegible]3.1	TAUNTON LAKE WC	1	1950	57	230	252
ME-11	MEDFORD TWP	395100N074[illegible].1	ROBERT DICKSON	--	1951	66	222	242
ME-12	MEDFORD TWP	395[illegible]N074[illegible].1	GEORGE AARON	--	1952	116	320	340
ME-13	MEDFORD TWP	395[illegible]N074[illegible].1	W G FREEMAN	--	1955	65	260	275
MO-1	MOORESTOWN TWP	395915N074[illegible].1	MOORESTOWN T WD	TEST HOLE 1-66	1966	68	320	340
MO-2	MOORESTOWN TWP	395[illegible]N074[illegible].1	CAMPBELL SOUP	CAMPBELL 1	1956	40	242	258
MO-3	MOORESTOWN TWP	395[illegible]N074[illegible].1	MOORESTOWN T WD	TEST HOLE 1-68	1968	35	315	375
MO-4	MOORESTOWN TWP	3[illegible]N074[illegible].1	LAYNE NY CO	LAYNE 1	1960	70	--	258
MO-5	MOORESTOWN TWP	395700N074[illegible].1	MOORESTOWN T WD	MTWD 5	1963	35	248	298
MO-6	MOORESTOWN TWP	395732N074[illegible].2	MOORESTOWN T WD	MTWD 6	1963	47	248	288
MT-1	MOUNT LAUREL TWP	395[illegible]N074[illegible].1	MT LAUREL W CO	MLWC 1	1961	20	558	589
MT-2	MOUNT LAUREL TWP	395555N074[illegible].1	EVA DIAMOND	--	1951	73	190	202
MT-3	MOUNT LAUREL TWP	395[illegible]N074[illegible].1	RALPH VASTURO	--	1950	68	100	119
MT-4	MOUNT LAUREL TWP	395552N074[illegible].1	NJ TRNPKE AUTH	INTERCHANGE 4	1961	35	137	147
SH-1	SHAMONG TWP	394422N074[illegible].1	US GEOL SURVEY	ATSION 1	1963	46	240	260
SH-2	SHAMONG TWP	394422N074[illegible].2	US GEOL SURVEY	ATSION 2	1963	49	63	65
SH-3	SHAMONG TWP	394422N074[illegible].3	US GEOL SURVEY	ATSION 3	1963	47	14	17
			CAMDEN COUNTY					
AU-1	AUDUBON BORO	395327N075[illegible].1	PUBLIC SERV E-G	PSEGC 1	1953	25	120	130
AU-2	AUDUBON BORO	395326N075[illegible]	D CORVELLI	--	1949	65	183	191
BA-1	BARRINGTON BORO	395224N075[illegible]	NJ WATER CO	TEST WELL T 1	1966	70	482	492
BA-2	BARRINGTON BORO	395224N075[illegible]	NJ WATER CO	TEST WELL T 2	1968	70	350	360
BA-3	BARRINGTON BORO	395146N075[illegible]	OWENS CORNING	CORNING 1	1956	60	285	318
BL-1	BELLMAWR BORO	395222N075[illegible]	BELLMAWR B W D	BBWD 1	1942	31	111	160
BL-2	BELLMAWR BORO	395221N075[illegible]	BELLMAWR B W D	BBWD 3	1956	31	331	356
BL-3	BELLMAWR BORO	395219N075[illegible]	BELLMAWR B W D	BBWD 2	1942	31	111	159
BL-4	BELLMAWR BORO	395151N075[illegible]	BELLMAWR B W D	BBWD 4	1965	82	320	557
BR-1	BERLIN BORO	394738N074[illegible]	BERLIN WATER D	BWD 9	1955	150	650	713
BR-2	BERLIN BORO	394738N074[illegible].2	BERLIN WATER D	BWD 10	1967	145	645	713
BR-3	BERLIN BORO	394738N074[illegible].3	BERLIN WATER D	BWD 1	1923	145	259	339
BR-4	BERLIN BORO	394738N074[illegible].4	BERLIN WATER D	BWD 5	1950	150	67	82
BR-5	BERLIN BORO	394738N074[illegible].5	BERLIN WATER D	BWD 8	1952	150	310	350
BR-6	BERLIN BORO	394705N074[illegible].1	OWENS CORNING	1	1951	160	410	440
BR-7	BERLIN BORO	394653N074[illegible].1	D CHILLEMNI	--	1951	160	68	78
BR-8	BERLIN BORO	394[illegible]N074[illegible].1	GREGORY PONRAL	--	1954	155	40	60
BT-1	BERLIN TWP	394816N074[illegible].1	ARTHUR TILLEN	--	1952	175	34	40
BR-1	BROOKLAWN BORO	395[illegible]N075[illegible].1	BROOKLAWN B W D	BBWD 2	1956	13	133	167
BR-2	BROOKLAWN BORO	395[illegible]N075[illegible].2	BROOKLAWN B W D	BBWD 3	1961	13	307	328
BR-3	BROOKLAWN BORO	395243N075[illegible].1	BROOKLAWN B W D	BBWD NEW WELL	1967	13	288	321
BR-4	BROOKLAWN BORO	395242N075[illegible].1	BROOKLAWN B W D	LEGION	1942	13	120	161
CA-1	CAMDEN CITY	395732N075[illegible].1	NJ WATER CO	CAMDEN DIV 27	1924	10	102	135
CA-2	CAMDEN CITY	395729N075[illegible].1	NJ WATER CO	CAMDEN DIV 48	1954	10	122	164
CA-3	CAMDEN CITY	395726N075[illegible].1	NJ WATER CO	CAMDEN DIV 50	1958	10	139	170
CA-4	CAMDEN CITY	395725N075[illegible].1	NJ WATER CO	CAMDEN DIV 49	1955	9	137	169
CA-5	CAMDEN CITY	395722N075[illegible].1	NJ WATER CO	CAMDEN DIV 46	1950	9	148	178
CA-6	CAMDEN CITY	395722N075[illegible].1	NJ WATER CO	CAMDEN DIV 10	1932	11	--	150
CA-7	CAMDEN CITY	395720N075[illegible].1	NJ WATER CO	CAMDEN DIV 51	1965	10	140	192
CA-8	CAMDEN CITY	395719N075[illegible].1	NJ WATER CO	CAMDEN DIV 45	1950	10	142	173
CA-9	CAMDEN CITY	395718N075[illegible].1	NJ WATER CO	CAMDEN DIV 47	1953	20	159	174
CA-10	CAMDEN CITY	395718N075[illegible].1	M KOHNSTAMM CO	6	1967	30	163	193
CA-11	CAMDEN CITY	395716N075[illegible].1	CAMDEN CITY W D	CITY 15	1954	8	116	136
CA-12	CAMDEN CITY	395716N075[illegible].1	M KOHNSTAMM CO	3	1954	30	116	136
CA-13	CAMDEN CITY	395716N075[illegible].2	M KOHNSTAMM CO	4	1959	30	133	153
CA-14	CAMDEN CITY	395716N075[illegible].3	M KOHNSTAMM CO	5	1950	30	112	138
CA-15	CAMDEN CITY	395715N075[illegible].1	NJ WATER CO	CAMDEN DIV 52	1965	18	--	200
CA-16	CAMDEN CITY	395715N075[illegible].1	NJ WATER CO	CAMDEN DIV 44	1950	20	147	198
CA-17	CAMDEN CITY	395711N075[illegible].1	NJ WATER CO	36 OBS 27TH ST	1932	50	185	202
CA-18	CAMDEN CITY	395707N075[illegible].1	CAMDEN CITY W D	CITY 14	1953	8	105	145

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLI-DATED ROCK (FT)	CASING DIAME-TER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW-DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
					ATLANTIC COUNTY						
HA-1	10	--	6	9	5-64	51	72	0.8	12	H	TM KW
					BURLINGTON COUNTY						
EV-1	49	--	10	104	5-67	408	54	9.5	5	P	KJ MR
EV-2	53	--	8	100	11-57	750	80	9.4	--	I	KJ MR
EV-3	30	--	10	135	10-63	800	45	9.4	8	P	KJ MR
EV-4	20	--	4	91	6-56	517	168	3.1	--	P	KJ MR
EV-5	--	--	6	42	--	100	--	--	--	P	KJ ET
EV-6	10	--	6	159	12-57	109	12	9.1	--	U	KJ MR
EV-7	36	--	12	172	5-70	1112	41	24.7	8	P	KJ MR
EV-8	20	--	6	41	6-54	200	43	4.7	--	--	KJ MW
MS-1	21	--	12	19	12-55	1020	42	24.3	48	P	KJ MR
MS-2	55	494	8	45	9-51	1001	64	15.6	8	P	KJ MR
MS-3	60	--	--	53	--	131	--	--	--	P	KJ MR
MS-4	25	--	12	57	12-63	1034	67	15.0	8	P	KJ MW
MS-5	55	--	8	50	7-56	600	60	10.0	5	P	KJ MR
ML-1	--	--	4	45	6-66	70	--	--	1	H	KJ MW
ML-2	--	--	4	75	10-66	100	--	--	1	H	KJ MW
ML-3	--	--	4	70	7-67	100	--	--	1	H	KJ MW
ME-1	--	--	6	45	1-56	--	--	--	--	U	KJ MR
ME-2	10	--	6	92	1-56	--	--	--	--	U	KJ MR
ME-3	10	--	6	45	10-63	--	--	--	--	U	KJ MR
ME-4	30	--	6	48	--	517	66	6.0	--	P	KJ MR
ME-5	30	--	6	54	10-66	524	35	15.0	8	P	KJ MR
ME-6	--	--	4	10	10-66	100	--	--	1	H	KJ MW
ME-7	21	--	6	43	10-66	307	76	3.9	6	P	KJ MR
ME-8	16	--	4	--	--	--	--	--	--	H	KJ MW
ME-9	20	--	6	20	1-50	100	--	--	6	H	KJ MW
ME-10	--	--	6	25	11-50	300	--	--	--	P	KJ MW
ME-11	20	--	4	20	1-51	100	--	--	--	H	KJ MW
ME-12	20	--	4	50	6-52	50	--	--	--	H	KJ MW
ME-13	15	--	4	20	1-55	40	--	--	--	H	KJ MW
MO-1	20	--	8	90	11-66	530	--	--	--	U	KJ MR
MO-2	21	--	10	41	10-56	560	54	10.4	8	A	KJ MR
MO-3	40	--	4	55	3-66	350	--	--	--	U	KJ MR
MO-4	--	--	--	--	--	--	--	--	--	N	KJ MR
MO-5	40	--	12	67	11-53	805	36	22.4	8	P	KJ MR
MO-6	40	--	12	55	10-63	1000	55	18.2	8	P	KJ MR
MT-1	31	594	8	35	3-51	548	78	7.0	8	P	KJ MR
MT-2	10	--	4	48	9-51	10	6	1.7	--	H	KJ ET
MT-3	19	--	6	25	--	10	--	--	--	H	KJ ET
MT-4	10	--	6	39	6-61	25	40	0.6	16	H	KJ MR
SH-1	20	--	6	45	9-63	--	--	--	--	U	TE MA
SH-2	5	--	1	6	10-63	--	--	--	--	U	AA CP
SH-3	3	--	1	7	12-63	--	--	--	--	U	AA CP
					CAMDEN COUNTY						
AU-1	10	--	4	40	1-53	50	--	--	6	N	KJ MR
AU-2	4	--	4	62	9-49	30	18	1.7	--	H	KJ MR
BA-1	10	510	6	111	3-56	130	21	6.2	24	U	KJ MR
BA-2	10	510	4	116	3-66	40	6	6.7	60	U	KJ MR
BA-3	30	--	12	95	2-56	1045	43	24.3	8	N	KJ MR
BL-1	49	--	12	42	7-42	1000	18	55.6	36	P	KJ MR
BL-2	25	--	8	62	8-56	1001	71	14.1	8	P	KJ MR
BL-3	48	--	12	45	10-42	500	12	41.7	24	P	KJ MR
BL-4	59	570	12	127	6-66	1016	25	40.6	24	P	KJ MR
BR-1	63	--	8	155	7-55	1000	99	10.1	8	P	KJ MW
BR-2	42	--	8	--	--	1012	69	14.7	8	P	KJ MR
BR-3	40	--	6	73	12-23	155	--	--	--	P	KJ MW
BR-4	15	--	8	--	--	365	--	--	--	P	AA CP
BR-5	53	--	8	94	6-52	450	136	3.3	8	P	KJ MW
BR-6	30	--	6	95	6-51	115	63	1.8	8	N	KJ MW
BR-7	10	--	3	15	10-51	30	1	30.0	3	H	AA CP
BR-8	20	--	4	8	3-54	50	--	--	5	N	AA CP
BT-1	6	--	4	21	4-52	--	--	--	--	H	AA CP
BR-1	34	--	10	16	2-56	455	18	25.3	--	P	KJ MR
BR-2	21	325	5	11	6-61	500	33	15.2	--	P	KJ MR
BR-3	33	--	10	70	--	--	--	--	--	P	KJ MR
BR-4	25	--	12	22	6-62	455	18	25.3	8	P	KJ MR
CA-1	33	--	14	21	5-24	1050	22	47.7	--	P	KJ MR
CA-2	32	164	12	45	4-54	1412	54	26.1	2	--	KJ MR
CA-3	31	--	12	44	5-56	1000	52	19.2	8	P	KJ MR
CA-4	32	169	12	44	5-55	--	--	--	--	P	KJ MR
CA-5	30	--	12	35	11-50	1400	55	25.5	8	P	KJ MR
CA-6	--	--	8	10	3-33	--	--	--	--	U	KJ MR
CA-7	51	193	16	56	1-65	1471	74	19.9	5	P	KJ MR
CA-8	31	--	12	35	6-50	700	65	10.8	--	P	KJ MR
CA-9	25	--	12	34	4-53	1012	45	22.5	4	P	KJ MR
CA-10	20	--	8	40	2-67	200	--	--	48	N	KJ MR
CA-11	20	148	18	37	3-54	1000	70	14.3	8	P	KJ MR
CA-12	20	--	6	50	12-54	150	--	--	6	N	KJ MR
CA-13	25	--	6	40	3-57	250	20	12.5	6	N	KJ MR
CA-14	26	--	6	40	4-50	200	20	10.0	4	N	KJ MR
CA-15	--	200	16	60	7-65	1404	--	--	5	P	KJ MR
CA-16	51	--	12	61	5-50	1400	26	53.8	3	P	KJ MR
CA-17	10	--	6	57	6-52	--	--	--	--	U	KJ MR
CA-18	40	164	18	35	2-53	1000	52	19.2	8	P	KJ MR

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			CAMDEN COUNTY					
CA-19	CAMDEN CITY	395706N0750553.1	CAMDEN CITY W D	CITY 16	1954	23	149	179
CA-20	CAMDEN CITY	395659N0750610.1	CAMDEN CITY W D	CITY 9	1957	9	116	146
CA-21	CAMDEN CITY	395659N0750610.2	CAMDEN CITY W D	TEST WELL 1950	1950	5	129	150
CA-22	CAMDEN CITY	395659N0750610.3	CAMDEN CITY W D	CITY 9-1924	1924	9	106	146
CA-23	CAMDEN CITY	395652N0750607.1	CAMDEN CITY W D	CITY 10	1935	10	126	158
CA-24	CAMDEN CITY	395649N0750743.1	ESTERBROOK PEN	ESTERBROOK OBS	--	8	--	300
CA-25	CAMDEN CITY	395640N0750622.1	CAMDEN CITY W D	CITY 1-1940	1940	5	135	168
CA-26	CAMDEN CITY	395638N0750622.1	CAMDEN CITY W D	CITY 1A	1953	10	135	170
CA-27	CAMDEN CITY	395638N0750622.2	CAMDEN CITY W D	CITY 1-1922	1922	5	146	174
CA-28	CAMDEN CITY	395617N0750710.1	CAMDEN CITY W D	CITY 12	1945	23	136	166
CA-29	CAMDEN CITY	395615N0750633.1	CAMDEN CITY W D	CITY 5N	1963	22	134	169
CA-30	CAMDEN CITY	395614N0750633.2	CAMDEN CITY W D	CITY 5-1937	1937	22	142	172
CA-31	CAMDEN CITY	395614N0750633.1	CAMDEN CITY W D	CITY 5-1928	1928	22	152	171
CA-32	CAMDEN CITY	395604N0750735.1	PUBLIC SERV E G	6 REPLACEMENT	1954	5	118	145
CA-33	CAMDEN CITY	395603N0750736.1	PUBLIC SERV E-G	PSEGC 8	1955	4	119	145
CA-34	CAMDEN CITY	395602N0750744.1	PUBLIC SERV E-G	PSEGC 7	1947	4	116	145
CA-35	CAMDEN CITY	395557N0750629.1	CAMDEN CITY W D	CITY 3A	1953	15	91	115
CA-36	CAMDEN CITY	395557N0750629.2	CAMDEN CITY W D	CITY 3-1934	1934	15	91	113
CA-37	CAMDEN CITY	395557N0750629.3	CAMDEN CITY W D	CITY 3-1922	1922	15	85	110
CA-38	CAMDEN CITY	395552N0750535.1	CAMDEN CITY W D	CITY 13	1953	30	185	225
CA-39	CAMDEN CITY	395551N0750725.1	PUBLIC SERV E-G	PSEGC 14	1950	5	120	146
CA-40	CAMDEN CITY	395550N0750729.1	CAMDEN CITY W D	CITY 29	1953	8	111	136
CA-41	CAMDEN CITY	395546N0750533.1	CAMDEN CITY W D	CITY 17	1954	34	230	265
CA-42	CAMDEN CITY	395541N0750622.1	CAMDEN CITY W D	CITY 4	1950	41	131	156
CA-43	CAMDEN CITY	395541N0750622.2	CAMDEN CITY W D	CITY 4-1935	1935	40	121	156
CA-44	CAMDEN CITY	395541N0750622.3	CAMDEN CITY W D	CITY 4-1922	1922	40	--	--
CA-45	CAMDEN CITY	395540N0750742.1	CAMDEN CITY W D	CITY 8	1928	6	150	175
CA-46	CAMDEN CITY	395540N0750742.2	CAMDEN CITY W D	CITY 8A	1953	6	89	124
CA-47	CAMDEN CITY	395539N0750630.1	W JERSEY HOSP	W JERSEY HOSP1	1958	30	119	140
CA-48	CAMDEN CITY	395539N0750541.1	OLDL HOSPITAL	STAND BY WELL	1963	30	241	258
CA-49	CAMDEN CITY	395534N0750724.1	GALLAGHERS WHSE	EVRSN LVRNG 1	1929	10	--	170
CA-50	CAMDEN CITY	395532N0750720.1	GALLAGHERS WHSE	EVRSN LVRNG 2	1933	10	145	171
CA-51	CAMDEN CITY	395530N0750719.1	GALLAGHERS WHSE	EVRSN LVRNG 5	1929	10	--	203
CA-52	CAMDEN CITY	395528N0750538.1	A N STOLLWRECK	2	1950	28	111	131
CA-53	CAMDEN CITY	395527N0750646.1	CAMDEN CITY W D	CITY 6N	1948	14	111	136
CA-54	CAMDEN CITY	395527N0750646.2	CAMDEN CITY W D	CITY 6-1928	1928	14	111	135
CA-55	CAMDEN CITY	395523N0750729.1	CAMDEN CITY	SEWAGE PLANT 1	1954	9	163	193
CA-56	CAMDEN CITY	395512N0750640.1	CAMDEN CITY W D	CITY 11	1942	13	124	154
CA-57	CAMDEN CITY	395502N0750655.1	CAMDEN BREWERY	--	--	18	160	180
CA-58	CAMDEN CITY	395457N0750641.1	CAMDEN CITY W D	CITY 7	1945	21	126	160
CA-59	CAMDEN CITY	395457N0750641.2	CAMDEN CITY W D	CITY 7-1928	1928	21	126	164
CA-60	CAMDEN CITY	395457N0750640.1	CAMDEN CITY W D	CITY 7N	1966	21	123	163
CA-61	CAMDEN CITY	395455N0750716.1	SO JRSY PORT CM	NY SHIP 7	1942	12	187	229
CA-62	CAMDEN CITY	395449N0750716.1	SO JRSY PORT CM	NY SHIP 6	1941	12	119	225
CA-63	CAMDEN CITY	395447N0750711.1	SO JRSY PORT CM	NY SHIP 5A	1940	12	87	104
CA-64	CAMDEN CITY	395435N0750720.1	SO JRSY PORT CM	NY SHIP PW 1	1956	12	50	124
CA-65	CAMDEN CITY	395427N0750606.1	CAMDEN CITY W D	WATER WORKS T1	1942	15	247	300
CH-1	CHERRY HILL TWP	395621N0745840.1	ANTHONY MALADRA	--	1955	60	--	115
CH-2	CHERRY HILL TWP	395616N0750027.1	NJ WATER CO	COLUMBIA 22	1960	39	371	453
CH-3	CHERRY HILL TWP	395615N0750027.1	NJ WATER CO	COLUMBIA 24	1961	34	153	167
CH-4	CHERRY HILL TWP	395613N0750052.1	JERRY SCHAEFER	1	1965	45	100	105
CH-5	CHERRY HILL TWP	395612N0750142.1	RADIO CORP AMER	RCA 1	1955	128	220	--
CH-6	CHERRY HILL TWP	395606N0750148.1	GS RACING ASSCT	CHRY HLL INN 1	1954	80	--	179
CH-7	CHERRY HILL TWP	395606N0750148.2	GS RACING ASSCT	CHRY HLL INN 2	1967	60	148	172
CH-8	CHERRY HILL TWP	395603N0750031.1	NJ WATER CO	COLUMBIA 31	1967	45	376	427
CH-9	CHERRY HILL TWP	395556N0745924.1	M HOLZER	--	1953	75	178	183
CH-10	CHERRY HILL TWP	395530N0750301.1	E H ELLIS SON	1	1949	23	158	168
CH-11	CHERRY HILL TWP	395514N0750213.1	GARDEN STATE PK	RACE TRACK	--	25	128	158
CH-12	CHERRY HILL TWP	395511N0750202.1	WIDELL AND SONS	--	1953	27	125	135
CH-13	CHERRY HILL TWP	395502N0750221.1	N J NATIONAL GO	1	1956	10	97	111
CH-14	CHERRY HILL TWP	395455N0745929.1	NJ WATER CO	KINGSTON 25	1961	44	309	367
CH-15	CHERRY HILL TWP	395455N0745929.2	NJ WATER CO	KINGSTON 28	1964	44	175	207
CH-16	CHERRY HILL TWP	395455N0745924.1	NJ WATER CO	KINGSTON 27	1963	40	365	417
CH-17	CHERRY HILL TWP	395452N0750035.1	W J OSTERTAG	1	1953	55	87	115
CH-18	CHERRY HILL TWP	395442N0750103.1	NJ WATER CO	ELLISBURG 13	1960	39	491	527
CH-19	CHERRY HILL TWP	395441N0750104.1	NJ WATER CO	ELLISBURG 16	1957	39	187	220
CH-20	CHERRY HILL TWP	395438N0750107.1	NJ WATER CO	ELLISBURG 23	1960	32	318	375
CH-21	CHERRY HILL TWP	395422N0745641.1	DEER PARK FIRE	CO 1	1954	70	252	258
CH-22	CHERRY HILL TWP	395419N0745721.1	FRANK POWERS	--	1949	72	310	320
CH-23	CHERRY HILL TWP	395409N0750048.1	P A VATTER	--	1953	64	224	234
CH-24	CHERRY HILL TWP	395409N0745957.1	ROBERT COLEMAN	--	195-	17	98	108
CH-25	CHERRY HILL TWP	395406N0745841.1	ARNOLD PALMER	DRIVING RANGE	1964	60	275	285
CH-26	CHERRY HILL TWP	395356N0745708.1	NJ WATER CO	OLD ORCHARD A	1967	71	743	748
CH-27	CHERRY HILL TWP	395356N0745708.2	NJ WATER CO	OLD ORCHARD B	1967	71	328	342
CH-28	CHERRY HILL TWP	395356N0745708.3	NJ WATER CO	OLD ORCHARD C	1967	71	487	500
CH-29	CHERRY HILL TWP	395356N0745708.4	NJ WATER CO	OLD ORCHARD 36	1968	8	299	349
CH-30	CHERRY HILL TWP	395356N0745706.5	NJ WATER CO	OLD ORCHARD 37	1968	6	454	488
CH-31	CHERRY HILL TWP	395356N0745708.6	NJ WATER CO	OLD ORCHARD 38	1968	72	443	493
CH-32	CHERRY HILL TWP	395331N0745920.1	A R ROSS	1	1950	100	125	135
CH-33	CHERRY HILL TWP	395321N0745617.1	EUGENE MILLER	1	1954	92	360	370

Table 1.--Records of selected wells in Camden County and vicinity--Continued

WELL DEPTH (FT)	MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLI-DATED ROCK (FT)	CASING DIAM-ETER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
						CAMDEN COUNTY						
179	CA-19	30	--	18	50	12-54	1130	53	21.3	8	P	K3 MR
146	CA-20	30	146	18	48	11-57	1020	53	19.2	--	P	K3 MR
150	CA-21	21	166	5	23	7-50	300	57	5.3	--	U	K3 MR
146	CA-22	40	146	26	15	3-24	1420	72	19.7	--	P	K3 MR
158	CA-23	30	158	18	57	11-57	1020	32	31.9	--	P	K3 MR
300												
168	CA-24	--	--	6	--	--	--	--	--	--	U	MG
170	CA-25	32	--	18	--	--	--	--	--	--	P	K3 MR
174	CA-26	35	--	18	42	12-53	1000	54	18.5	8	P	K3 MR
166	CA-27	39	--	26	12	10-22	1050	67	15.7	--	P	K3 MR
	CA-28	30	--	16	32	4-45	857	74	11.6	--	P	K3 MR
169												
172	CA-29	35	--	18	58	10-63	1000	32	31.2	--	P	K3 MR
171	CA-30	30	--	18	--	--	--	--	--	--	P	K3 MR
145	CA-31	19	--	26	31	5-28	1100	37	29.7	--	P	K3 MR
145	CA-32	32	--	8	35	12-54	350	25	14.0	24	N	K3 MR
	CA-33	26	--	--	--	--	--	--	--	--	N	K3 MR
145												
115	CA-34	29	--	--	--	--	--	--	--	--	N	K3 MR
113	CA-35	25	--	18	37	12-55	1000	46	21.7	8	P	K3 MR
110	CA-36	22	--	18	--	--	--	--	--	--	P	K3 MR
225	CA-37	24	--	26	15	6-22	1160	55	21.1	--	P	K3 MR
	CA-38	40	--	18	46	6-53	1000	24	41.7	--	P	K3 MR
146												
136	CA-39	26	--	10	31	5-50	506	34	14.9	12	N	K3 MR
265	CA-40	25	190	18	41	12-54	1000	46	21.7	8	P	K3 MR
156	CA-41	35	--	18	64	7-58	1250	32	39.1	8	P	K3 MR
156	CA-42	25	--	18	77	11-57	1000	27	37.0	--	P	K3 MR
	CA-43	35	--	18	56	6-35	1200	34	35.3	--	P	K3 MR
--												
175	CA-44	--	--	--	--	--	--	--	--	--	P	K3 MR
124	CA-45	25	--	18	21	9-26	1085	52	20.9	--	P	K3 MR
140	CA-46	35	--	18	12	7-53	1000	30	33.3	8	P	K3 MR
258	CA-47	21	--	8	52	12-58	205	58	3.5	8	T	K3 MR
	CA-48	21	--	8	68	9-63	275	11	25.0	4	T	K3 MR
170												
171	CA-49	--	--	4	--	--	150	--	--	--	N	K3 MR
203	CA-50	26	--	8	--	--	300	--	--	--	N	K3 MR
131	CA-51	--	--	12	--	--	--	--	--	--	N	K3 MR
136	CA-52	20	--	8	52	2-50	210	8	26.2	3	N	K3 MR
	CA-53	25	--	18	39	2-48	1012	31	32.6	8	P	K3 MR
35												
193	CA-54	25	--	26	18	9-28	1180	47	25.1	--	P	K3 MR
154	CA-55	--	201	10	36	1-54	907	--	--	--	U	K3 MR
180	CA-56	30	--	16	32	9-42	1005	30	33.5	8	P	K3 MR
160	CA-57	20	--	--	--	--	--	--	--	--	N	K3 MR
	CA-58	40	--	18	49	7-45	775	47	16.5	--	P	K3 MR
164												
163	CA-59	38	--	26	29	9-28	1000	38	26.3	--	P	K3 MR
229	CA-60	40	--	14	60	6-66	1023	21	48.7	8	P	K3 MR
225	CA-61	42	--	12	35	5-43	1005	57	17.6	--	U	K3 MR
104	CA-62	26	--	10	28	3-41	830	81	10.2	--	N	K3 MR
	CA-63	17	--	8	28	4-41	533	37	14.4	--	U	K3 MR
124												
300	CA-64	62	--	16	17	1-56	--	56	--	40	N	K3 MR
115	CA-65	--	--	6	27	5-42	--	--	--	--	U	K3 MR
453	CH-1	--	--	--	55	1-55	15	--	--	2	H	K3 MV
167	CH-2	82	--	12	57	3-60	1067	49	21.8	8	P	K3 MR
	CH-3	14	--	12	26	--	1051	44	23.9	8	P	K3 MR
105												
--	CH-4	5	--	4	50	1-65	20	10	2.0	5	H	K3 MR
179	CH-5	--	--	6	48	--	50	--	--	4	N	K3 MR
172	CH-6	25	--	8	92	9-54	400	43	9.3	10	U	K3 MR
427	CH-7	24	--	12	--	--	--	--	--	--	I	K3 MR
	CH-8	47	--	12	85	1-67	1030	57	18.1	24	--	K3 MR
183												
158	CH-9	5	--	4	45	3-53	15	10	1.5	2	H	K3 MR
158	CH-10	10	--	5	25	4-49	15	20	0.7	4	N	K3 MR
135	CH-11	30	--	--	--	--	--	--	--	--	I	K3 MR
111	CH-12	10	--	6	25	3-53	60	--	--	6	H	K3 MR
	CH-13	5	--	6	36	5-56	150	14	10.7	8	T	K3 MR
367												
207	CH-14	58	528	12	69	9-61	1000	--	--	8	P	K3 MR
417	CH-15	25	--	12	82	10-64	857	70	12.2	8	P	K3 MR
115	CH-16	52	531	12	73	12-63	812	70	11.6	8	P	K3 MR
527	CH-17	--	--	8	74	10-53	25	--	--	2	H	K3 MV
	CH-18	36	--	10	54	4-53	1200	50	24.0	8	P	K3 MR
220												
375	CH-19	33	--	12	59	11-57	1000	62	16.1	5	P	K3 MR
258	CH-20	57	--	12	62	5-60	1001	34	29.4	8	P	K3 MR
320	CH-21	6	--	4	35	11-54	20	15	1.3	2	H	K3 MR
254	CH-22	10	--	5	60	12-49	100	20	5.0	4	H	K3 MR
	CH-23	10	--	3	60	2-53	40	--	--	4	H	K3 MR
108												
285	CH-24	10	--	4	43	5-53	40	17	2.4	--	H	K3 MV
248	CH-25	10	--	4	90	5-64	50	10	5.0	--	I	K3 MR
[illegible]	CH-26	5	807	2	107	3-67	--	--	--	--	U	K3 MR
	CH-27	5	--	3	110	3-67	--	--	--	--	U	K3 MR
	CH-28	5	--	3	109	--	--	--	--	--	U	K3 MR
349												
488	CH-29	50	--	12	123	4-68	703	116	6.1	24	P	K3 MR
493	CH-30	34	--	12	109	4-68	1209	47	25.7	24	P	K3 MR
135	CH-31	50	--	12	113	5-68	1455	49	29.7	24	P	K3 MR
370	CH-32	--	--	6	63	9-50	250	--	--	--	H	K3 ET
	CH-33	10	--	6	92	7-54	200	18	11.1	6	H	K3 MR

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			CAMDEN COUNTY					
CH-34	CHERRY HILL TWP	395308N0750015..	NJ TURNPIKE AU	SERVICE 3S-2	1951	65	231	261
CH-35	CHERRY HILL TWP	395259N0745720.1	IMMAC CONCEPTN	NOVITIATE 2	1952	65	329	339
CH-36	CHERRY HILL TWP	395254N0745822.1	F MYERS	1	1967	60	321	331
CH-37	CHERRY HILL TWP	395236N0750030..	MUSSMAN REFRIDG	MUSSMAN	1957	67	276	306
CH-38	CHERRY HILL TWP	395224N0745722.1	HAROLD SNYDER	1	1956	127	210	215
CH-39	CHERRY HILL TWP	395224N0745712.1	NJ WATER CO	HUTTON HILL 1	1965	156	552	562
CH-40	CHERRY HILL TWP	395229N0745712.2	NJ WATER CO	HUTTON HILL 2	1965	156	137	147
CH-41	CHERRY HILL TWP	395212N0745757..	DR E BROWN	--	1969	100	105	115
CH-42	CHERRY HILL TWP	395150N0745916.1	WOODCREST CT CL	CLUB 1	1949	92	400	420
CH-43	CHERRY HILL TWP	395153N0745913..	WOODCREST CT CL	CLUB 2	1955	100	354	385
CL-1	CLEMENTON BORO	394832N0745915.1	CLEMENTON W D	CWD 6	1924	59	--	240
CL-2	CLEMENTON BORO	394832N0745915.2	CLEMENTON W D	CWD 7	1943	59	543	633
CL-3	CLEMENTON BORO	394832N0745915.3	CLEMENTON W D	CWD 8	1950	60	251	276
CL-4	CLEMENTON BORO	394832N0745915.4	CLEMENTON W D	ABANDON WELL	--	55	126	168
CL-5	CLEMENTON BORO	394807N0745606.1	CLEMENTON W D	CWD 9	195-	150	367	457
CO-1	COLLINGSWOOD BORO	395526N0750424.1	COLLINGSWOOD WD	CWD 5	1956	20	248	278
CO-2	COLLINGSWOOD BORO	395522N0750432.1	COLLINGSWOOD WD	CWD 3	1960	10	257	287
CO-3	COLLINGSWOOD BORO	395521N0750435.1	COLLINGSWOOD WD	CWD 4	1942	9	275	304
CO-4	COLLINGSWOOD BORO	395519N0750432.1	COLLINGSWOOD WD	CWD 2R	1960	12	248	278
CO-5	COLLINGSWOOD BORO	395515N0750436.1	COLLINGSWOOD WD	CWD 1R	1950	16	266	306
CO-6	COLLINGSWOOD BORO	395506N0750507.1	FRIENDSHIP DAIR	DAIRY 1	1955	21	143	164
CO-7	COLLINGSWOOD BORO	395426N0750514.1	COLLINGSWOOD WD	CWD 7	1965	10	224	313
CO-8	COLLINGSWOOD BORO	395426N0750514.2	COLLINGSWOOD WD	CWD 6	1965	10	218	312
GI-1	GIBBSBORO BORO	395015N0745752.1	LUCAS PAINT CO	MAIN	--	93	--	165
GI-2	GIBBSBORO BORO	395015N0745752.2	LUCAS PAINT CO	STEAM PUMP	--	93	--	160
GI-3	GIBBSBORO BORO	394955N0745852.1	KARL W FUCHS	1	1951	70	108	108
GI-4	GIBBSBORO BORO	394946N0745855.1	NJ WATER CO	GIBBSBORO OB 1	1969	70	1081	1091
GI-5	GIBBSBORO BORO	394946N0745855.2	NJ WATER CO	GIBBSBORO OB 2	1969	70	940	950
GI-6	GIBBSBORO BORO	394946N0745855.3	NJ WATER CO	GIBBSBORO OB 3	1969	70	670	680
GI-7	GIBBSBORO BORO	394944N0745717.1	JAMES E HALE	--	1952	135	138	150
GI-8	GIBBSBORO BORO	394927N0745715.1	US AIR FORCE	RADAR 1	1959	191	260	290
GI-9	GIBBSBORO BORO	394923N0745714.1	US AIR FORCE	RADAR 2	1960	193	280	310
GC-1	GLOUCESTER CITY	395354N0750654.1	GLOUCESTER C WD	GCWD 41	1965	10	226	266
GC-2	GLOUCESTER CITY	395355N0750738.1	US GEOL SURVEY	COAST GUARD 1	1966	10	162	170
GC-3	GLOUCESTER CITY	395349N0750651.1	GLOUCESTER C WD	GCWD 40	1961	10	221	262
GC-4	GLOUCESTER CITY	395348N0750654.1	GLOUCESTER C WD	GCWD 37	1947	5	84	125
GC-5	GLOUCESTER CITY	395348N0750654.2	GLOUCESTER C WD	GCWD 30	1936	13	152	175
GC-6	GLOUCESTER CITY	395348N0750654.3	GLOUCESTER C WD	GCWD 34	1942	10	--	175
GC-7	GLOUCESTER CITY	395348N0750654.4	GLOUCESTER C WD	GCWD 35	1944	5	88	122
GC-8	GLOUCESTER CITY	395348N0750654.5	GLOUCESTER C WD	GCWD 36	1946	5	85	126
GC-9	GLOUCESTER CITY	395347N0750652.1	GLOUCESTER C WD	GCWD 33	1938	14	220	240
GC-10	GLOUCESTER CITY	395347N0750651.1	GLOUCESTER C WD	GCWD 38	1949	10	279	300
GC-11	GLOUCESTER CITY	395346N0750651.1	GLOUCESTER C WD	GCWD 32	1938	11	--	175
GC-12	GLOUCESTER CITY	395345N0750653.1	GLOUCESTER C WD	GCWD 2	1929	11	140	171
GC-13	GLOUCESTER CITY	395343N0750652.1	GLOUCESTER C WD	GCWD 42	1968	15	--	306
GC-14	GLOUCESTER CITY	395332N0750734.1	HINDE AND DAUCH	JERSEY AVE 1	1945	9	241	261
GC-15	GLOUCESTER CITY	395329N0750732.1	HINDE AND DAUCH	2	1945	9	241	261
GC-16	GLOUCESTER CITY	395324N0750736.1	HINDE AND DAUCH	3	1945	7	240	260
GC-17	GLOUCESTER CITY	395322N0750757.1	HARSHAW CHEM CO	HARSHAW 4	1953	5	235	260
GC-18	GLOUCESTER CITY	395322N0750751.1	HARSHAW CHEM CO	HARSHAW 2	1951	6	221	251
GC-19	GLOUCESTER CITY	395321N0750747.1	HARSHAW CHEM CO	HARSHAW 3	1952	8	245	265
GC-20	GLOUCESTER CITY	395316N0750755.1	HARSHAW CHEM CO	HARSHAW 1	1948	5	246	266
GC-21	GLOUCESTER CITY	395315N0750617.1	H W WILSON JR	1	1954	25	102	112
GC-22	GLOUCESTER CITY	395314N0750749.1	NJ ZINC CO	1-DEEP	1945	5	230	250
GC-23	GLOUCESTER CITY	395313N0750804.1	NJ ZINC CO	3-DEEP	1958	5	223	255
GC-24	GLOUCESTER CITY	395308N0750757.1	NJ ZINC CO	2-DEEP	1954	5	245	275
GC-25	GLOUCESTER CITY	395308N0750749.1	NJ ZINC CO	5-DEEP	--	5	--	175
GC-26	GLOUCESTER CITY	395308N0750744.1	NJ ZINC CO	4-DEEP	--	5	249	279
GC-27	GLOUCESTER CITY	395252N0750623.1	GLOUCESTER C WD	GCWD 39	1958	24	161	165
GT-1	GLOUCESTER TWP	395030N0750347.1	NJ WATER CO	OTTERBROOK 29	1965	58	612	712
GT-2	GLOUCESTER TWP	395030N0750347.2	NJ WATER CO	OTTERBROOK 39	1968	60	259	349
GT-3	GLOUCESTER TWP	395029N0750344.1	NJ WATER CO	OTTERBROOK 34	1967	60	288	377
GT-4	GLOUCESTER TWP	395026N0750502.1	EDWARD MARSH	--	1952	15	--	150
GT-5	GLOUCESTER TWP	395025N0750443.1	EDWARD BROWN	--	1955	44	65	75
GT-6	GLOUCESTER TWP	395017N0750454.1	W L DOUGHERTY	--	1949	31	132	142
GT-7	GLOUCESTER TWP	395007N0750425.1	J STEZZI	--	1955	30	274	287
GT-8	GLOUCESTER TWP	394932N0750301.1	JOHN WARGO	--	1949	71	359	377
GT-9	GLOUCESTER TWP	394914N0750244.1	JOHN BISHOP	1	1967	70	160	170
GT-10	GLOUCESTER TWP	394855N0750442.1	T-EISS	1	1968	65	56	71
GT-11	GLOUCESTER TWP	394841N0750354.1	EILLEN GESSWIN	--	1952	70	170	180
GT-12	GLOUCESTER TWP	394840N0750314.1	ROBERT MANNING	--	1953	104	121	131
GT-13	GLOUCESTER TWP	394839N0750410.1	MARY BENNIE	1	1950	72	166	176
GT-14	GLOUCESTER TWP	394836N0750150.1	WARNER LOMBARDI	--	1955	81	275	290
GT-15	GLOUCESTER TWP	394833N0750355.1	ARTHUR JONES	--	--	70	179	185
GT-16	GLOUCESTER TWP	394830N0750426.1	WM D CATHCART	1	1967	68	175	185
GT-17	GLOUCESTER TWP	394829N0750347.1	SUN TEMP INDUST	--	1966	80	--	388
GT-18	GLOUCESTER TWP	394824N0750445.1	GLOUC M U AUTH	TREAT PLANT	1971	20	--	358
GT-19	GLOUCESTER TWP	394815N0750356.1	AMANDUS CARLSON	--	1953	25	188	198
GT-20	GLOUCESTER TWP	394806N0750426.1	GAR ST WC-BLKWD	BLACKWOOD DIV 1	1948	20	335	386
GT-21	GLOUCESTER TWP	394806N0750426.2	GAR ST WC-BLKWD	BLACKWOOD DIV 5	1930	60	49	79

Table 1.--Records of selected wells in Camden County and vicinity--Continued

WELL DEPTH (FT)	MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLIDATED ROCK (FT)	CASING DIAMETER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
						CAMDEN COUNTY						
261	CH-34	20	--	8	81	8-51	13	24	0.5	48	H	K3 MR
339	CH-35	10	--	6	41	-52	--	--	--	--	H	K3 MR
331	CH-36	10	--	-	--	4-67	100	--	--	--	H	K3 MR
306	CH-37	30	--	8	87	7-59	317	19	16.7	4	N	K3 MR
215	CH-38	5	--	-	65	2-56	100	--	--	5	H	K3 ET
562	CH-39	10	--	6	200	10-65	--	--	--	--	U	K3 MR
147	CH-40	10	--	6	88	10-65	--	--	--	--	U	K3 MW
115	CH-41	10	--	4	45	9-69	20	10	3.0	1	H	K3 MW
120	CH-42	20	--	6	100	5-49	150	9	16.7	5	H	K3 MR
385	CH-43	31	--	10	90	7-55	300	15	20.0	8	H	K3 MR
240	CL-1	--	--	8	--	--	250	--	--	--	P	K3 ET
633	CL-2	90	--	6	53	4-50	500	135	3.7	--	P	K3 MR
275	CL-3	25	--	10	46	7-50	510	--	--	15	P	K3 ET
168	CL-4	42	--	8	10	3-70	--	--	--	--	U	K3 MW
457	CL-5	46	--	6	124	7-54	503	96	5.2	4	P	K3 ET
378	CO-1	30	--	12	43	2-56	1000	71	14.1	8	P	K3 MR
287	CO-2	30	--	12	57	-53	1000	63	15.9	8	P	K3 MR
304	CO-3	30	--	10	32	7-42	760	37	20.5	8	P	K3 MR
278	CO-4	30	300	12	57	6-60	1000	51	19.6	8	P	K3 MR
306	CO-5	40	--	12	54	10-49	1023	44	23.2	8	P	K3 MR
164	CO-6	21	--	6	41	1-55	100	38	2.6	68	N	K3 MR
313	CO-7	49	--	12	49	3-65	1034	18	57.4	8	P	K3 MR
312	CO-8	53	--	12	46	5-65	1034	13	79.5	8	P	K3 MR
165	GI-1	--	--	4	--	--	150	--	--	--	N	K3 MW
160	GI-2	--	--	--	--	--	--	--	--	--	I	K3 MW
108	GI-3	--	--	3	4	7-51	50	--	--	6	H	K3 MW
1091	GI-4	10	1142	3	115	3-69	43	30	1.4	2	U	K3 MR
950	GI-5	10	1142	3	125	1-69	--	--	--	--	U	K3 MR
680	GI-6	10	1142	3	119	2-69	35	9	3.9	--	U	K3 MR
150	GI-7	--	--	4	42	11-52	50	--	--	--	H	TL --
290	GI-8	--	--	8	118	4-59	55	--	--	--	H	K3 MW
310	GI-9	--	--	8	130	8-60	102	--	--	24	H	K3 MW
266	GC-1	40	--	12	58	10-65	1034	42	24.6	8	P	K3 MR
170	GC-2	8	252	6	--	--	--	--	--	--	U	K3 MR
262	GC-3	40	--	12	58	6-61	1000	41	24.4	4	P	K3 MR
[illegible]	GC-4	41	--	6	--	4-61	70	--	--	--	U	K3 MR
[illegible]	GC-5	23	--	8	--	--	--	--	--	--	U	K3 MR
175	GC-6	--	--	8	--	--	--	--	--	--	U	K3 MR
122	GC-7	22	--	10	17	6-44	600	28	21.4	2	U	K3 MR
126	GC-8	24	--	8	29	1-46	400	13	30.8	2	U	K3 MR
240	GC-9	20	--	12	21	3-38	975	52	16.8	--	U	K3 MR
300	GC-10	21	--	8	36	--	300	--	--	24	U	K3 MR
175	GC-11	--	--	8	--	--	--	--	--	--	U	K3 MR
171	GC-12	30	--	8	33	4-53	200	32	6.2	--	U	K3 MR
306	GC-13	--	--	10	--	--	--	--	--	--	P	K3 MR
261	GC-14	20	--	10	--	--	--	--	--	--	N	K3 MR
261	GC-15	20	--	10	--	--	--	--	--	--	N	K3 MR
260	GC-16	20	--	10	--	--	--	--	--	--	N	K3 MR
250	GC-17	25	--	10	55	3-53	566	22	25.7	--	N	K3 MR
251	GC-18	30	--	10	77	3-51	578	24	24.1	8	N	K3 MR
265	GC-19	20	--	10	57	9-52	530	26	20.4	8	U	K3 MR
266	GC-20	20	--	10	38	9-48	560	45	12.4	8	N	K3 MR
112	GC-21	10	--	3	33	4-53	25	--	--	8	H	K3 MR
250	GC-22	20	--	--	34	-45	600	25	24.0	--	N	K3 MR
255	GC-23	30	260	10	64	12-57	600	24	25.0	8	N	K3 MR
275	GC-24	30	--	10	49	7-54	600	29	20.7	8	N	K3 MR
175	GC-25	--	--	--	--	--	--	--	--	--	N	K3 MR
279	GC-26	30	285	10	57	--	600	35	17.1	8	N	K3 MR
185	GC-27	24	--	10	49	3-60	500	46	10.9	48	U	K3 MR
712	GT-1	89	--	10	111	1-65	1010	32	31.6	5	P	K3 MR
349	GT-2	80	--	12	112	4-68	1529	54	28.3	24	P	K3 MR
377	GT-3	62	--	12	108	1-67	1000	35	28.6	8	P	K3 MR
150	GT-4	--	--	4	5	10-52	25	--	--	--	H	K3 MV
75	GT-5	6	--	4	12	1-55	60	4	15.0	--	H	K3 ET
142	GT-6	10	--	3	20	4-49	25	10	2.5	4	H	K3 MR
287	GT-7	10	--	3	47	1-55	20	7	2.9	8	H	K3 MR
177	GT-8	18	--	4	86	5-49	250	6	41.7	12	H	K3 MR
70	GT-9	10	--	4	40	10-67	50	10	5.0	1	H	K3 ET
71	GT-10	10	--	4	35	12-68	8	20	0.4	1	H	K3 MW
180	GT-11	10	--	3	40	1-52	20	--	--	2	H	K3 ET
31	GT-12	10	--	3	50	6-53	40	--	--	4	H	K3 MR
76	GT-13	10	--	4	45	3-50	--	--	--	2	H	K3 ET
90	GT-14	--	--	4	71	8-55	25	--	--	12	H	K3 MR
185	GT-15	6	--	4	--	--	--	10	--	4	H	K3 ET
[illegible]	GT-16	--	--	4	--	--	50	--	--	--	H	K3 ET
[illegible]	GT-17	--	--	6	123	9-66	--	--	--	--	N	K3 MR
98	GT-18	--	--	--	--	--	--	--	--	--	--	--
386	GT-19	10	--	3	43	2-53	--	--	--	--	H	K3 ET
79	GT-20	38	--	8	24	8-48	600	40	15.0	8	P	K3 MR
	GT-21	30	--	6	4	1-30	100	--	--	10	P	K3 MW

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			CAMDEN COUNTY					
GT-22	GLOUCESTER TWP	394759N0750158.1	GARDEN STATE WC	TEST 1	1970	78	458	466
GT-23	GLOUCESTER TWP	394754N0750343.1	GAR ST WC-BLKWD	BLACKWOD DIV 3	1956	81	426	447
GT-24	GLOUCESTER TWP	394739N0750227.1	GLOU TWP BD ED	LEWIS SCHOOL	1964	117	435	475
GT-25	GLOUCESTER TWP	394719N0750146.1	ROBERT BENNETT	MONARCH BOILER	1968	110	--	200
GT-26	GLOUCESTER TWP	394718N0750341.1	GARDEN STATE WC	PEOPLES 1	1953	65	419	449
GT-27	GLOUCESTER TWP	394716N0750420.1	CAMDEN COUNTY	LAKELAND 1	--	55	--	420
GT-28	GLOUCESTER TWP	394714N0750410.1	CAMDEN COUNTY	LAKELAND 3	--	25	--	93
GT-29	GLOUCESTER TWP	394712N0750413.1	CAMDEN COUNTY	LAKELAND 2	--	25	--	386
GT-30	GLOUCESTER TWP	394712N0750220.1	SOCIETY DIVINE	SAVIOR	1951	117	442	512
GT-31	GLOUCESTER TWP	394711N0750415.1	CAMDEN COUNTY	LAKELAND FOUNT	--	25	--	--
GT-32	GLOUCESTER TWP	394702N0750321.1	MYRA LORING	--	1957	73	109	130
GT-33	GLOUCESTER TWP	394658N0750305.1	P HENDRICKS	--	1956	81	100	135
GT-34	GLOUCESTER TWP	394641N0745959.1	P BARATTA	--	1951	180	56	66
GT-35	GLOUCESTER TWP	394626N0750015.1	A MINARDI	1	1954	175	52	62
GT-36	GLOUCESTER TWP	394620N0750032.1	ROBERT BENNETT	HOME WELL	--	172	--	72
GT-37	GLOUCESTER TWP	394618N0750235.1	H A SANDBERG	--	1952	130	218	250
GT-38	GLOUCESTER TWP	394617N0750237.1	J BECICA	--	1949	111	200	220
GT-39	GLOUCESTER TWP	394614N0750017.1	POWELL	--	1951	178	49	54
GT-40	GLOUCESTER TWP	394607N0750031.1	GLOUCESTER TWP	BD OF EDUCATN	1960	178	293	315
GT-41	GLOUCESTER TWP	394606N0750016.1	F MORRISEY	--	1955	178	55	65
GT-42	GLOUCESTER TWP	394605N0750016.1	HOWARD MORRISEY	--	1956	178	55	60
GT-43	GLOUCESTER TWP	394558N0750210.1	E G HOTHO	--	1955	98	122	135
GT-44	GLOUCESTER TWP	394556N0745835.1	CAMDEN CO BD ED	VOC&TECH H S 1	1967	145	322	401
GT-45	GLOUCESTER TWP	394512N0750145.1	WALTER JOHNSON	--	1954	110	220	240
GT-46	GLOUCESTER TWP	394509N0745958.1	US ARMY	--	1954	173	82	102
GT-47	GLOUCESTER TWP	394430N0745958.1	US ARMY	--	1954	170	62	82
GT-48	GLOUCESTER TWP	394421N0750025.1	JOSEPH A MELZI	--	1952	162	58	64
GT-49	GLOUCESTER TWP	394343N0750049.1	B W BAUER	--	1951	164	40	45
MA-1	MADDON TWP	395444N0750316.1	MILGRAM THEATER	WESTMONT	--	50	135	150
MA-2	MADDON TWP	395436N0750252.1	MORGAN BROTHERS	REPLACEMENT	1967	50	431	451
MA-3	MADDON TWP	395416N0750336.1	MADDON TWP BD E	MADDON TWP HS1	1966	10	141	165
MA-4	MADDON TWP	395412N0750338.1	MADDON TWP W D	MTWD 4	1965	82	417	448
MA-5	MADDON TWP	395406N0750317.1	MADDON TWP W D	MTWD 1	1952	56	436	468
MA-6	MADDON TWP	395406N0750317.2	MADDON TWP W D	MTWD 1-R	1968	56	--	480
MA-7	MADDON TWP	395403N0750322.1	MADDON TWP W D	MTWD 2	1952	50	439	470
MA-8	MADDON TWP	395359N0750322.1	MADDON TWP W D	MTWD 3	1956	61	432	469
MA-9	MADDON TWP	395351N0750313.1	GREEN VALLEY FM	FARM 2	1965	77	194	215
MF-1	MADDONFIELD BORO	395404N0750202.1	MADDONFIELD W D	TEST WELL 1965	1965	45	490	510
MF-2	MADDONFIELD BORO	395404N0750202.2	MADDONFIELD W D	LAKE ST WELL	1967	50	307	372
MF-3	MADDONFIELD BORO	395333N0750132.1	MADDONFIELD W D	RULON	1956	20	523	572
MF-4	MADDONFIELD BORO	395324N0750138.1	MADDONFIELD W D	CREEK 3	1938	18	211	245
MF-5	MADDONFIELD BORO	395322N0750154.1	MADDONFIELD W D	LAYNE 2	1956	30	206	246
MF-6	MADDONFIELD BORO	395322N0750147.1	MADDONFIELD W D	MWD 2	1956	38	152	192
MF-7	MADDONFIELD BORO	395317N0750141.1	MADDONFIELD W D	MWD 4	1943	18	186	240
MH-1	MADDON HGTS BORO	395248N0750433.1	NJ WATER CO	EGGBERT 18	1958	22	144	191
MH-2	MADDON HGTS BORO	395248N0750433.2	NJ WATER CO	EGGBERT 6	1926	23	154	202
MH-3	MADDON HGTS BORO	395247N0750432.1	NJ WATER CO	EGGBERT 35	1967	22	425	484
MH-4	MADDON HGTS BORO	395246N0750433.1	NJ WATER CO	EGBERT	1962	24	445	455
MH-5	MADDON HGTS BORO	395242N0750320.1	NJ WATER CO	MADDON 11	1945	84	212	272
MH-6	MADDON HGTS BORO	395240N0750324.1	NJ WATER CO	MADDON 14	1954	76	506	598
MH-7	MADDON HGTS BORO	395240N0750318.1	NJ WATER CO	MADDON 12	1947	66	227	267
MH-8	MADDON HGTS BORO	395238N0750317.1	NJ WATER CO	MADDON 30	1965	65	224	279
MH-9	MADDON HGTS BORO	395238N0750316.1	NJ WATER CO	MADDON 15	1956	65	452	631
MH-10	MADDON HGTS BORO	395231N0750314.1	NJ WATER CO	MADDON 20	1958	60	241	275
LS-1	LAUREL SPRGS BORO	394928N0750027.1	NJ WATER CO	LAUREL 15	1964	75	395	473
LS-2	LAUREL SPRGS BORO	394928N0750024.1	NJ WATER CO	LAUREL 13	1954	77	395	456
LS-3	LAUREL SPRGS BORO	394928N0750023.1	NJ WATER CO	LAUREL 6	1918	77	--	120
LS-4	LAUREL SPRGS BORO	394928N0750021.1	NJ WATER CO	LAUREL 8	1920	77	105	125
LS-5	LAUREL SPRGS BORO	394925N0750021.2	NJ WATER CO	LAUREL 10	1923	77	99	126
LS-6	LAUREL SPRGS BORO	394927N0750025.1	NJ WATER CO	LAUREL 4	1918	77	--	128
LS-7	LAUREL SPRGS BORO	394927N0750024.1	NJ WATER CO	LAUREL 1	1918	77	100	120
LI-1	LINDENWOLD BORO	394932N0745854.1	MUN UTIL AUTH	SEWAGE PLANT 1	1964	78	141	152
LI-2	LINDENWOLD BORO	394929N0745208.1	J A PIPPET	--	1954	93	92	100
LI-3	LINDENWOLD BORO	394805N0745732.1	LINDENWOLD ANM	ANIMAL SMELT 1	1967	160	--	285
MA-1	MAGNOLIA BORO	395135N0750246.1	OWENS CORNING	CORNING 2	1956	67	290	320
MA-2	MAGNOLIA BORO	395134N0750251.1	OWENS CORNING	TEST 2	1964	65	565	680
MA-3	MAGNOLIA BORO	395134N0750230.1	NJ WATER CO	MAGNOLIA 33	1967	60	271	348
MA-4	MAGNOLIA BORO	395134N0750229.1	NJ WATER CO	MAGNOLIA 16	1964	70	428	510
ME-1	MRCHNTVILLE BORO	395652N0750307.1	MERCH-PENNS W C	WOODBINE 1	1963	90	245	285
OA-1	OAKLYN BORO	395358N0750447.1	NJ WATER CO	OAKLYN TEST	1961	33	104	113
PE-1	PENNSAUKEN TWP	395943N0750212.1	CAMDEN CITY W D	MORRIS 1	--	9	77	107
PE-2	PENNSAUKEN TWP	395940N0750230.1	CAMDEN CITY W D	MORRIS 5NA	1960	5	79	114
PE-3	PENNSAUKEN TWP	395939N0750229.1	CAMDEN CITY W D	MORRIS 5	1932	5	80	115
PE-4	PENNSAUKEN TWP	395934N0750229.1	CAMDEN CITY W D	MORRIS 3A	1953	17	73	107
PE-5	PENNSAUKEN TWP	395929N0750253.1	CAMDEN CITY W D	MORRIS 4A	1960	8	95	134
PE-6	PENNSAUKEN TWP	395929N0750253.2	CAMDEN CITY W D	MORRIS 4	--	8	95	130
PE-7	PENNSAUKEN TWP	395925N0750230.1	KINGSTON TRAP	TRAP RK IND 2	1966	35	115	133
PE-8	PENNSAUKEN TWP	395923N0750300.1	CAMDEN CITY W D	MORRIS 10	1960	16	75	115
PE-9	PENNSAUKEN TWP	395916N0750303.1	CAMDEN CITY W D	MORRIS 7	1932	10	85	120
PE-10	PENNSAUKEN TWP	395910N0750307.1	CAMDEN CITY W D	MORRIS 8	--	10	89	124

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLIDATED ROCK (FT)	CASING DIAMETER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAWDOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
					CAMDEN COUNTY						
GT-22	10	--	5	125	11-70	75	33	2.3	5	U	K3 MR
GT-23	21	--	12	58	7-56	708	43	16.5	8	P	K3 MR
GT-24	20	--	5	129	8-64	220	56	3.9	8	T	K3 MR
GT-25	--	--	4	50	11-66	100	--	--	1	N	K3 MR
GT-26	30	--	5	70	--	--	--	--	--	P	K3 MR
GT-27	--	--	--	--	--	--	--	--	--	T	K3 MR
GT-28	--	--	--	F	8-70	--	--	--	--	T	K3 MR
GT-29	--	--	--	--	--	--	--	--	--	T	K3 MR
GT-30	20	--	10	103	7-51	510	100	5.1	72	H	K3 MR
GT-31	--	--	--	134	8-70	--	--	--	--	T	K3 MR
GT-32	21	--	3	25	11-57	100	--	--	3	H	K3 MR
GT-33	--	--	4	6	10-56	150	--	--	4	H	K3 MR
GT-34	10	--	3	35	10-51	25	5	5.0	--	H	AA CP
GT-35	10	--	3	32	7-54	8	3	2.7	6	H	AA CP
GT-36	--	--	--	--	--	--	--	--	--	--	AA CP
GT-37	32	--	4	48	6-52	170	--	--	--	H	K3 MR
GT-38	20	--	4	40	11-49	50	--	--	2	H	K3 MR
GT-39	5	--	3	30	11-51	5	6	0.8	--	H	AA CP
GT-40	--	--	6	125	4-60	80	--	--	8	H	K3 MR
GT-41	10	--	4	40	9-55	30	5	6.0	3	H	AA CP
GT-42	5	--	4	38	10-55	25	4	6.2	2	H	AA CP
GT-43	13	--	4	154	1-55	100	--	--	5	H	TL VM
GT-44	79	--	8	113	9-57	320	123	2.6	8	P	K3 MR
GT-45	20	--	4	40	11-54	80	15	5.3	5	H	TL MT
GT-46	20	--	8	36	5-54	240	48	5.0	24	P	AA CP
GT-47	20	--	8	30	6-54	240	40	6.0	24	P	AA CP
GT-48	6	--	4	24	9-52	25	--	--	5	H	AA CP
GT-49	5	--	3	20	10-51	5	5	1.0	--	H	AA CP
HA-1	15	--	8	--	--	150	--	--	--	--	K3 MR
HA-2	--	465	10	104	--	302	--	--	8	N	K3 MR
HA-3	20	--	5	60	11-66	200	23	8.7	--	I	K3 MR
HA-4	27	455	12	100	8-65	726	42	17.3	8	P	K3 MR
HA-5	32	475	10	80	2-52	800	40	20.0	8	P	K3 MR
HA-6	--	--	12	125	11-66	870	--	--	8	P	K3 MR
HA-7	31	--	10	74	4-52	1000	41	24.4	8	P	K3 MR
HA-8	37	--	10	95	6-56	800	35	22.9	--	P	K3 MR
HA-9	21	--	6	121	1-55	151	12	12.6	6	I	K3 MR
HF-1	20	553	6	90	1-65	350	35	10.0	8	U	K3 MR
HF-2	50	--	12	107	5-67	1330	43	21.5	8	P	K3 MR
HF-3	49	--	12	42	6-56	1100	38	28.9	48	P	K3 MR
HF-4	33	--	8	56	7-59	450	54	8.3	--	--	K3 MR
HF-5	40	--	12	105	5-56	1001	46	21.8	8	P	K3 MR
HF-6	40	--	8	55	7-59	600	31	19.4	--	P	K3 MR
HF-7	54	--	6	56	3-56	600	26	23.1	8	P	K3 MR
HH-1	47	--	12	69	7-58	708	45	15.7	8	P	K3 MR
HH-2	48	--	8	23	-26	535	25	21.4	3	P	K3 MR
HH-3	44	477	12	83	3-67	850	60	14.2	8	P	K3 MR
HH-4	10	479	6	61	1-62	30	30	1.0	8	U	K3 MR
HH-5	60	--	12	123	--	450	--	--	--	P	K3 MR
HH-6	53	603	8	101	8-54	1018	88	11.6	6	P	K3 MR
HH-7	40	--	10	93	--	--	--	--	--	P	K3 MR
HH-8	51	--	--	129	3-65	811	38	21.3	--	P	K3 MR
HH-9	74	--	8	72	2-56	1100	35	31.4	6	P	K3 MR
HH-10	21	--	12	36	6-58	950	52	18.3	8	P	K3 MR
LS-1	64	--	8	130	--	650	98	6.6	24	P	K3 MR
LS-2	61	--	8	84	6-54	759	80	9.5	--	P	K3 MR
LS-3	--	--	8	--	--	--	--	--	--	U	K3 MR
LS-4	20	--	4	44	9-52	175	--	--	--	P	K3 MR
LS-5	--	--	8	--	--	200	--	--	--	P	K3 MR
LS-6	--	--	8	--	--	330	--	--	--	P	K3 MR
LS-7	--	--	8	--	--	300	--	--	--	P	K3 MR
LI-1	11	--	6	16	11-64	50	--	--	--	--	K3 MR
LI-2	--	--	3	18	7-54	14	--	--	7	H	TL VM
LI-3	--	--	4	--	--	--	--	--	--	H	K3 MR
MA-1	30	--	12	96	3-56	1000	41	24.4	8	N	K3 MR
MA-2	60	--	6	128	6-64	668	48	13.9	22	N	K3 MR
MA-3	77	--	12	141	3-67	1090	46	23.7	24	P	K3 MR
MA-4	--	--	--	--	--	--	--	--	--	P	K3 MR
ME-1	--	--	12	85	9-63	1040	--	--	--	P	K3 MR
OA-1	8	--	6	56	10-61	50	16	3.1	16	U	K3 MR
PE-1	30	--	18	--	--	1180	--	--	--	P	K3 MR
PE-2	35	--	18	12	11-60	1450	46	31.5	--	P	K3 MR
PE-3	35	--	26	15	8-32	1630	37	44.1	8	P	K3 MR
PE-4	30	136	30	12	7-53	1000	34	29.4	8	P	K3 MR
PE-5	35	--	18	13	10-60	1585	28	56.6	8	P	K3 MR
PE-6	35	--	26	--	--	--	--	--	--	P	K3 MR
PE-7	8	--	8	26	8-66	200	34	5.9	2	N	K3 MR
PE-8	40	--	18	11	11-61	1450	35	41.4	8	P	K3 MR
PE-9	35	--	26	13	--	1680	32	52.5	8	P	K3 MR
PE-10	35	--	26	--	--	1412	--	--	--	P	K3 MR

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			CAMDEN COUNTY					
PE-11	PENNSAUKEN TWP	395906N0750313.1	CAMDEN CITY W D	MORRIS 9	1932	10	118	143
PE-12	PENNSAUKEN TWP	395902N0750318.1	CAMDEN CITY W D	MORRIS 6	1932	8	98	133
PE-13	PENNSAUKEN TWP	395902N0750153.1	MERCH-PENNS W C	NATIONAL HWY 1	1967	40	195	231
PE-14	PENNSAUKEN TWP	395853N0750348.1	CAMDEN CITY W D	DELAIR 3	1930	8	86	126
PE-15	PENNSAUKEN TWP	395851N0750355.1	CAMDEN CITY W D	DELAIR 2	1930	10	111	141
PE-16	PENNSAUKEN TWP	395848N0750347.1	CAMDEN CITY W D	DELAIR 1	1960	10	103	138
PE-17	PENNSAUKEN TWP	395845N0750317.1	CAMDEN CITY W D	PUCHACK 3	1924	10	127	175
PE-18	PENNSAUKEN TWP	395845N0750312.1	CAMDEN CITY W D	PUCHACK 1	1924	10	108	140
PE-19	PENNSAUKEN TWP	395844N0750352.1	PENNSYLVANIA RR	PRR TEST 1	1951	30	102	122
PE-20	PENNSAUKEN TWP	395842N0750312.1	CAMDEN CITY W D	PUCHACK 2	1924	14	126	159
PE-21	PENNSAUKEN TWP	395839N0750306.1	CAMDEN CITY W D	PUCHACK 4	1924	10	136	184
PE-22	PENNSAUKEN TWP	395837N0750151.1	CHRISTIAN BR SW	1	1950	73	125	136
PE-23	PENNSAUKEN TWP	395835N0750308.1	CAMDEN CITY W D	PUCHACK 5	1924	19	136	186
PE-24	PENNSAUKEN TWP	395827N0750246.1	H W LAYER	--	1951	40	127	137
PE-25	PENNSAUKEN TWP	395815N0750359.1	PARAGON OIL CO	1	1961	25	51	61
PE-26	PENNSAUKEN TWP	395811N0750549.1	CITIES SERVICE	PETTY IS OBS	--	11	--	143
PE-27	PENNSAUKEN TWP	395802N0750118.1	MERCH-PENNS W C	PARK AVE 2	1943	12	232	257
PE-28	PENNSAUKEN TWP	395802N0750117.1	MERCH PENNS W C	PARK AVE 1	1947	19	240	270
PE-29	PENNSAUKEN TWP	395801N0750119.1	MERCH PENNS W C	PARK AVE 3	1958	19	240	275
PE-30	PENNSAUKEN TWP	395800N0750125.1	MERCH PENNS W C	PARK AVE 4	1933	20	146	181
PE-31	PENNSAUKEN TWP	395800N0750115.1	MERCH-PENNS W C	PARK AVE REP 6	1940	15	212	260
PE-32	PENNSAUKEN TWP	395758N0750120.1	MERCH-PENNS W C	PARK AVE 5	1948	20	248	298
PE-33	PENNSAUKEN TWP	395757N0750640.1	U S GEOL SURVEY	PETTY I WEST 1	1966	5	77	84
PE-34	PENNSAUKEN TWP	395752N0750411.1	MERCH-PENNS W C	DELA GARDEN 1	1945	50	97	123
PE-35	PENNSAUKEN TWP	395752N0750411.2	MERCH-PENNS W C	DELA GARDEN 2	1955	39	115	145
PE-36	PENNSAUKEN TWP	395752N0750411.3	MERCH-PENNS W C	DELA GARDEN 1A	1968	50	109	139
PE-37	PENNSAUKEN TWP	395737N0750626.1	U S GEOL SURVEY	PETTY ISLAND 2	1966	5	--	129
PE-38	PENNSAUKEN TWP	395737N0750626.2	U S GEOL SURVEY	PETTY I EAST 3	1966	5	44	55
PE-39	PENNSAUKEN TWP	395720N0750225.1	MERCH-PENNS W C	MARION 1	1957	61	243	278
PE-40	PENNSAUKEN TWP	395713N0750405.1	MERCH-PENNS W C	AMON HGTS 2	1923	69	157	176
PE-41	PENNSAUKEN TWP	395711N0750220.1	MERCH-PENNS W C	MARION 2	1963	60	223	258
PE-42	PENNSAUKEN TWP	395628N0750409.1	MERCH PENNS W C	FROSTHOFFER T2	1963	25	204	224
PE-43	PENNSAUKEN TWP	395628N0750406.2	MERCH-PENNS W C	BROWNING 2A	1955	30	110	140
PE-44	PENNSAUKEN TWP	395627N0750404.1	MERCH-PENNS W C	BROWNING 1	1960	25	107	137
PE-45	PENNSAUKEN TWP	395627N0750404.2	MERCH PENNS W C	FROSTHOFFER T1	1963	25	118	138
PH-1	PINE HILL BORO	394707N0745921.1	HARRY WEBER	--	1955	165	56	60
PH-2	PINE HILL BORO	394650N0745922.1	J MC GILLEN	--	1954	160	40	50
PH-3	PINE HILL BORO	394649N0745833.1	PINE HILL M U A	PHMUA 2	1957	160	296	355
PH-4	PINE HILL BORO	394649N0745833.2	PINE HILL M U A	PHMUA 3	1960	160	31	86
PH-5	PINE HILL BORO	394642N0745953.1	LEROY KINGETT	--	1949	180	337	347
PH-6	PINE HILL BORO	394641N0745909.1	PINE HILL M U A	PHMUA 1	1962	150	600	687
PH-7	PINE HILL BORO	394639N0745750.1	OVERBROOK REG H	--	1971	160	310	330
PV-1	PINE VALLEY BORO	394728N0745837.1	JOHN GALBRAITH	--	1952	170	300	355
PV-2	PINE VALLEY BORO	394722N0745810.1	PINE VALLEY G C	GOLF CLUB	1955	85	--	267
PV-3	PINE VALLEY BORO	394712N0745841.1	J R FERGUSON	--	1950	172	330	360
PV-4	PINE VALLEY BORO	394702N0745824.1	PINE VALLEY G C	GOLF CLUB 1-49	1949	170	310	370
RU-1	RUNNEMEDE BORO	395134N0750454.1	TRAP ROCK CO	2	1963	40	196	222
RU-2	RUNNEMEDE BORO	395133N0750455.1	TRAP ROCK IND	3	1968	40	195	215
RU-3	RUNNEMEDE BORO	395128N0750350.1	EASTERN RECORD	EASTERN 1	1963	40	250	260
RU-4	RUNNEMEDE BORO	395115N0750325.1	RED COACH INC	HIRST	1964	79	302	312
RU-5	RUNNEMEDE BORO	395056N0750417.1	NJ WATER CO	RUNNEMEDE 19	1958	67	301	338
RU-6	RUNNEMEDE BORO	395055N0750418.1	NJ WATER CO	RUNNEMEDE 7	1926	67	265	318
SO-1	SOMERDALE BORO	395041N0750053.1	NJ WATER CO	SOMERDALE 14	1956	105	389	441
TA-1	TAVISTOCK BORO	395237N0750122.1	TAVISTOCK CLUB	COUNTRY CLUB 1	1968	30	217	246
VO-1	VOORHEES TWP	395148N0745615.1	THOMAS DECAU	1	1957	115	127	147
VO-2	VOORHEES TWP	395129N0745906.1	NJ WATER CO	VOORHEES 21	1959	129	422	432
VO-3	VOORHEES TWP	395128N0745954.1	NJ WATER CO	ASHLAND TER 32	1966	70	--	459
VO-4	VOORHEES TWP	395128N0745954.2	NJ WATER CO	ASHLAND TER 9	1926	74	355	407
VO-5	VOORHEES TWP	395128N0745954.3	NJ WATER CO	ASHLAND TER 9R	1966	74	364	437
VO-6	VOORHEES TWP	395124N0745952.1	NJ WATER CO	ASHLAND 17	1958	100	379	421
VO-7	VOORHEES TWP	395109N0745715.1	RADIO CORP AMER	RCA	1955	175	220	234
VO-8	VOORHEES TWP	395107N0745854.1	R H DOBBS	--	1949	121	140	161
VO-9	VOORHEES TWP	395044N0745749.1	HAINES BLOCK CO	--	1955	118	--	160
VO-10	VOORHEES TWP	395015N0745528.1	CAMDEN LIME CO	3	--	155	--	255
VO-11	VOORHEES TWP	394954N0745530.1	CAMDEN LIME CO	1	1955	175	260	280
VO-12	VOORHEES TWP	394922N0745633.1	NJ WATER CO	ELM TREE 2	1963	148	1217	1227
VO-13	VOORHEES TWP	394922N0745633.2	NJ WATER CO	ELM TREE 3	1963	147	706	717
VO-14	VOORHEES TWP	394922N0745633.3	NJ WATER CO	ELM TREE 26	1960	150	237	275
WA-1	WATERFORD TWP	394651N0745421.1	ATCO DRIVE-IN	--	1955	170	65	76
WA-2	WATERFORD TWP	394645N0745146.1	CENTRAL SUPPLY	--	1955	121	78	83
WA-3	WATERFORD TWP	394620N0745403.1	GREEN ACRES MTL	MOTEL 1	1968	165	71	81
WA-4	WATERFORD TWP	394618N0745413.1	IVYSTONE W W	WATER WKS 2-62	1962	159	420	460
WA-5	WATERFORD TWP	394618N0745413.2	IVYSTONE W W	WATER WKS 3-65	1965	159	420	460
WA-6	WATERFORD TWP	394615N0745358.1	WILLIAM JULANO	--	1955	170	79	83
WA-7	WATERFORD TWP	394614N0745316.1	H W GSELL	--	1947	159	93	103
WA-8	WATERFORD TWP	394613N0745353.1	AL GIORDANO	1	1955	170	98	113
WA-9	WATERFORD TWP	394552N0744930.1	JOSEPH LANNI	--	1951	101	65	75
WA-10	WATERFORD TWP	394357N0745022.1	ALBERT PAGIA	--	1952	102	72	82
WA-11	WATERFORD TWP	394341N0745117.1	BRIDGE VIEW FAR	1	1946	120	110	130
WA-12	WATERFORD TWP	394243N0744932.1	EUGENE BRITTIN	--	1955	88	100	105

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLI-DATED ROCK (FT)	CASING DIAME-TER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
					CAMDEN COUNTY						
PE-11	35	--	26	12	7-32	1900	28	67.9	8	P	K3 MR
PE-12	35	--	26	14	7-32	1700	46	37.0	8	P	K3 MR
PE-13	25	--	12	80	7-67	1000	29	34.5	8	P	K3 MR
PE-14	30	135	26	11	11-50	1850	49	37.8	8	P	K3 MR
PE-15	30	--	26	13	10-30	1330	75	17.7	8	P	K3 MR
PE-16	35	--	18	20	10-30	1660	21	80.0	--	P	K3 MR
PE-17	48	--	26	14	5-24	1175	67	17.5	--	P	K3 MR
PE-18	32	--	26	31	10-24	1400	44	31.8	--	P	K3 MR
PE-19	20	--	3	35	12-51	--	--	--	--	N	K3 MR
PE-20	43	174	26	20	--24	1440	49	29.4	5	P	K3 MR
PE-21	48	--	26	18	5-24	1680	40	42.0	--	P	K3 MR
PE-22	11	--	6	--	11-50	75	--	--	--	H	K3 MR
PE-23	--	--	26	38	5-24	1000	--	--	--	P	K3 MR
PE-24	10	--	4	95	4-51	25	--	--	2	H	K3 MR
PE-25	10	--	4	14	3-51	130	5	20.0	5	N	K3 MR
PE-26	--	--	6	6	12-50	--	--	--	--	U	K3 MR
PE-27	25	--	12	17	10-43	1000	27	37.0	8	P	K3 MR
PE-28	33	--	12	15	11-47	1005	23	43.7	8	P	K3 MR
PE-29	35	--	12	39	8-56	1034	37	27.9	8	P	K3 MR
PE-30	35	--	10	34	7-33	600	36	16.7	12	P	K3 MR
PE-31	50	--	12	6	1-40	720	20	36.0	24	P	K3 MR
PE-32	40	--	12	22	4-46	1005	53	19.0	8	P	K3 MR
PE-33	--	71	10	--	--	--	--	--	--	U	K3 MR
PE-34	26	--	18	64	4-55	900	8	112.5	--	P	K3 MR
PE-35	30	--	12	50	7-55	723	23	31.7	8	P	K3 MR
PE-36	30	--	12	53	4-66	862	15	58.8	8	P	K3 MR
PE-37	--	116	10	--	--	--	--	--	--	U	K3 MR
PE-38	9	--	--	--	--	--	--	--	--	U	K3 MR
PE-39	35	--	12	59	7-57	1020	39	26.2	8	P	K3 MR
PE-40	20	--	10	67	--	130	--	--	--	U	K3 MR
PE-41	35	--	12	90	10-62	1000	43	23.3	8	P	K3 MR
PE-42	20	--	6	46	-63	250	16	15.6	--	U	K3 MR
PE-43	30	--	12	43	5-65	900	25	36.0	8	P	K3 MR
PE-44	30	--	12	47	12-59	875	26	33.7	8	P	K3 MR
PE-45	20	--	6	40	9-63	400	23	17.4	8	U	K3 MR
PH-1	10	--	3	30	9-55	25	10	2.5	3	H	AA CP
PH-2	10	--	4	30	8-54	15	5	3.0	4	H	AA CP
PH-3	36	--	4	120	8-57	197	61	3.2	4	P	K3 MW
PH-4	55	--	8	22	3-60	100	54	1.7	10	P	AA CP
PH-5	10	--	4	132	11-49	40	18	2.2	8	H	K3 MW
PH-6	61	--	8	180	10-62	759	35	21.7	8	P	K3 MR
PH-7	20	--	--	126	5-71	--	--	--	--	T	K3 MW
PV-1	55	--	6	124	2-52	100	--	--	10	H	K3 MW
PV-2	--	--	10	40	10-55	200	--	--	8	P	K3 MW
PV-3	--	--	6	120	6-50	50	--	--	8	H	K3 MW
PV-4	50	--	8	110	9-49	125	20	6.2	8	H	K3 MW
RU-1	25	--	8	62	8-63	250	18	13.9	2	N	K3 MR
RU-2	10	--	4	80	12-66	100	20	5.0	1	H	K3 MR
RU-3	10	--	6	90	8-63	150	9	16.7	--	I	K3 MR
RU-4	10	--	3	120	3-64	70	5	14.0	--	H	K3 MR
RU-5	42	--	12	98	4-58	1900	61	31.1	8	P	K3 MR
RU-6	53	--	6	90	9-26	527	25	21.1	--	P	K3 MR
SO-1	52	--	10	115	5-56	709	76	9.3	8	P	K3 MR
TA-1	23	--	6	101	7-68	285	25	11.4	4	I	K3 MR
VO-1	20	--	8	45	9-57	300	45	6.7	6	I	K3 MW
VO-2	60	--	12	161	5-59	1012	30	33.7	8	P	K3 MR
VO-3	--	--	12	--	--	--	--	--	--	P	K3 MR
VO-4	50	--	12	94	--	1000	57	17.5	--	P	K3 MR
VO-5	40	--	6	136	6-66	709	22	32.2	8	P	K3 MR
VO-6	42	--	12	93	12-57	1016	38	26.7	8	P	K3 MR
VO-7	14	--	6	80	4-55	50	--	--	4	H	K3 MW
VO-8	21	--	6	38	12-49	100	--	--	10	H	K3 MW
VO-9	--	--	4	11	2-55	50	--	--	--	N	K3 MW
VO-10	--	--	4	81	3-70	--	--	--	--	U	K3 MW
VO-11	20	--	4	50	11-55	50	10	5.0	4	N	K3 MW
VO-12	10	1259	6	183	2-63	10	258'	0.0	--	U	K3 MR
VO-13	11	--	5	190	2-63	15	--	--	--	U	K3 MR
VO-14	42	--	8	81	6-60	--	--	--	--	P	K3 MW
WA-1	11	--	6	45	6-55	60	8	7.5	5	N	AA CP
WA-2	5	--	4	45	3-55	45	5	9.0	1	H	AA CP
WA-3	10	--	4	20	10-66	70	10	7.0	1	H	AA CP
WA-4	40	--	10	135	5-62	535	155	3.5	48	P	K3 MW
WA-5	40	--	6	140	2-65	500	108	4.6	8	P	K3 MW
WA-6	5	--	4	18	5-55	30	7	4.3	4	H	AA CP
WA-7	10	--	--	31	12-47	8	--	--	--	H	AA CP
WA-8	--	--	4	--	--	--	--	--	--	I	AA CP
WA-9	10	--	6	6	8-51	50	--	--	6	H	AA CP
WA-10	10	--	3	22	11-52	40	6	6.7	4	H	AA CP
WA-11	20	--	4	8	4-66	60	1	60.0	2	I	AA CP
WA-12	5	--	6	42	8-55	50	12	4.2	6	H	AA CP

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			CAMDEN COUNTY					
WA-13	WATERFORD TWP	394243N0744918.1	E A CAPOFERRI	1	1966	92	10	130
WA-14	WATERFORD TWP	394229N0744941.1	E A CAPOFERRI	2	1966	89	30	129
WI-1	WINSLOW TWP	394623N0745544.1	HERBERT WILSON	1	1966	163	53	58
WI-2	WINSLOW TWP	394538N0745506.1	ROY W KRESGE	--	1956	160	61	67
WI-3	WINSLOW TWP	394522N0745625.1	JOHNS-MANVILLE	1	1963	160	410	450
WI-4	WINSLOW TWP	394522N0745625.2	JOHNS-MANVILLE	2	1963	160	410	450
WI-5	WINSLOW TWP	394522N0745625.3	JOHNS-MANVILLE	TEST HOLE 1	1963	160	--	890
WI-6	WINSLOW TWP	394507N0745438.1	PETER SEN	--	1952	143	90	97
WI-7	WINSLOW TWP	394449N0745540.1	FORMEGLI CORP	--	1957	150	86	106
WI-8	WINSLOW TWP	394443N0745434.1	CAMDEN CO F H S	REGIONAL H S 1	1957	175	102	110
WI-9	WINSLOW TWP	394443N0745304.1	DOMENIC CASARIO	--	1951	150	53	60
WI-10	WINSLOW TWP	394433N0745445.1	AMERICAN TELEPH	TELEGRAPH 1	1966	172	120	130
WI-11	WINSLOW TWP	394423N0745540.1	CERTAIN TEED ST	2	1969	160	113	138
WI-12	WINSLOW TWP	394417N0745538.1	CERTAIN TEED ST	1	1965	160	113	138
WI-13	WINSLOW TWP	394400N0745959.1	N TOMASELLA	1	1964	165	82	101
WI-14	WINSLOW TWP	394332N0745740.1	WINSLOW W C	PROD 2	1971	120	64	90
WI-15	WINSLOW TWP	394326N0745856.1	JOSEPH VOLPA	--	--	159	112	127
WI-16	WINSLOW TWP	394326N0745849.1	J LA GRATTO	--	1951	160	68	75
WI-17	WINSLOW TWP	394322N0745125.1	JAMES SARAPPA	--	1955	125	113	133
WI-18	WINSLOW TWP	394302N0745817.1	WINSLOW W C	TEST 5	1970	145	--	167
WI-19	WINSLOW TWP	394248N0745710.1	WINSLOW W C	PROD 1	1971	115	72	103
WI-20	WINSLOW TWP	394248N0745423.1	NICK ETTORE	--	1952	135	64	90
WI-21	WINSLOW TWP	394246N0745708.1	WINSLOW W C	OBS 1	1970	115	25	30
WI-22	WINSLOW TWP	394246N0745708.2	WINSLOW W C	OBS 2	1970	115	77	103
WI-23	WINSLOW TWP	394244N0745707.1	WINSLOW W C	OBS 3	1970	115	77	103
WI-24	WINSLOW TWP	394230N0745229.1	WINSLOW BD ED	1	1948	120	118	139
WI-25	WINSLOW TWP	394228N0745341.1	HOWARD BUSER	--	1955	130	87	94
WI-26	WINSLOW TWP	394221N0745412.1	A K BROWN JR	1	1967	140	40	100
WI-27	WINSLOW TWP	394215N0745617.1	US GEOL SURVEY	NEW BROOKLYN 1	1960	112	1485	1495
WI-28	WINSLOW TWP	394215N0745617.2	US GEOL SURVEY	NEW BROOKLYN 2	1961	112	829	839
WI-29	WINSLOW TWP	394215N0745617.3	US GEOL SURVEY	NEW BROOKLYN 3	1961	111	520	530
WI-30	WINSLOW TWP	394215N0745617.4	US GEOL SURVEY	NEW BROOKLYN 4	1961	112	200	210
WI-31	WINSLOW TWP	394210N0745654.1	WINSLOW W C	TEST 1	1970	115	94	114
WI-32	WINSLOW TWP	394139N0745424.1	RUDOLPH KRUGER	--	1953	134	49	55
WI-33	WINSLOW TWP	394129N0745055.1	ANCORA FARM	POOR FARM	1942	105	--	325
WI-34	WINSLOW TWP	394121N0745247.1	WINSLOW BD ED	--	1952	130	64	70
WI-35	WINSLOW TWP	394107N0745123.1	ANCORA STA HOSP	5	1953	105	117	138
WI-36	WINSLOW TWP	394105N0745134.1	ANCORA STA HOSP	4	1953	108	141	167
WI-37	WINSLOW TWP	394104N0745134.1	ANCORA STA HOSP	ASH 3	1952	109	326	356
WI-38	WINSLOW TWP	394100N0745157.1	ANCORA STA HOSP	2	1952	114	306	331
WI-39	WINSLOW TWP	394100N0744912.1	CARMEN GRASSE	--	1954	91	65	71
WI-40	WINSLOW TWP	394046N0745208.1	ANCORA STA HOSP	1	1952	135	344	372
WI-41	WINSLOW TWP	394038N0744958.1	WINSLOW BD ED	--	1951	93	144	151
WI-42	WINSLOW TWP	394015N0745030.1	M&R REFRACTORY	1	1965	110	70	104
WI-43	WINSLOW TWP	393957N0744940.1	JOSEPH DEMEGLIO	1	1966	105	20	200
WI-44	WINSLOW TWP	393946N0745102.1	SJ TRANSIT MIX	1	1965	100	33	53
WI-45	WINSLOW TWP	393946N0744940.1	JOSEPH PAGANO	1	1966	100	40	180
WI-46	WINSLOW TWP	393945N0745102.1	LORENZO ROMANO	--	1953	95	97	103
WI-47	WINSLOW TWP	393909N0745104.1	THOMAS FEBO	1	1969	98	57	67
WI-48	WINSLOW TWP	393845N0745009.1	A SCARDO JR	1	1968	102	122	122
			GLOUCESTER COUNTY					
GL-1	CLAYTON BORO	393912N0750522.1	CLAYTON W D	CWD 3	1956	133	746	800
DE-1	DEPTFORD TWP	395003N0750722.1	WALTER POTTS	--	1949	60	120	130
DE-2	DEPTFORD TWP	394950N0750626.1	LEROY LLOYD	--	1952	55	47	55
DE-3	DEPTFORD TWP	394947N0750731.1	WM PINTOZZI	--	1968	45	110	120
DE-4	DEPTFORD TWP	394827N0750758.1	MARION THOMPSON	--	1953	102	83	107
DE-5	DEPTFORD TWP	394821N0750530.1	ROBERT A GREER	--	1955	44	120	132
DE-6	DEPTFORD TWP	394816N0750730.1	NEW SHARON F C	--	1953	82	30	35
DE-7	DEPTFORD TWP	394805N0750913.1	DEPTFORD T W A	DTWA 2	1958	40	255	281
DE-8	DEPTFORD TWP	394628N0750813.2	WOODBURY W D	SEWELL 1A	1967	20	243	311
GL-1	GLASSBORO BORO	394142N0750608.1	E FOULKES	1	1966	138	306	311
MA-1	MANTUA TWP	394712N0751008.1	MANTUA WATER CO	MWC 2	1954	65	295	317
MA-2	MANTUA TWP	394636N0751115.1	EDENWOOD W C	EWC 1	1957	88	315	337
MA-3	MANTUA TWP	394629N0750859.1	SEWELL W C	SWC 2	1965	60	336	368
MA-4	MANTUA TWP	394617N0750833.1	PRICKETTS NURS	NURSERY 1	1969	80	377	397
MA-5	MANTUA TWP	394430N0750911.1	PITMAN CNTY CLB	COUNTRY CLUB 1	1967	85	378	408
MO-1	MONROE TWP	394059N0745913.1	THOMAS BRYNELL	--	1968	140	75	85
MO-2	MONROE TWP	394050N0745958.1	VIOLET PACKING	2	1967	155	115	150
NP-1	NATIONAL PK BORO	395156N0751053.1	NATIONAL PK W D	NPWD 2	1956	30	241	282
PI-1	PITMAN BORO	394427N0750743.1	PITMAN W D	PWD P3	1960	99	447	487
WA-1	WASHINGTON TWP	394649N0750624.1	RUSSEL GRASMICK	--	1954	100	106	125
WA-2	WASHINGTON TWP	394649N0750624.2	RUSSEL GRASMICK	1	1968	105	--	124
WA-3	WASHINGTON TWP	394641N0750449.1	WILLIAM MICHAEL	--	1952	80	122	140
WA-4	WASHINGTON TWP	394623N0750328.1	RUTH SAGERS	--	1953	89	75	105
WA-5	WASHINGTON TWP	394610N0750303.1	PRIMROSE MOTEL	--	1955	83	164	190
WA-6	WASHINGTON TWP	394533N0750323.1	WASHINGTON TMUA	WTMUA 2	1965	90	543	577
WA-7	WASHINGTON TWP	394531N0750653.1	R KRAEMER	1	1968	60	72	104
WA-8	WASHINGTON TWP	394525N0750640.1	C BRETT	--	1960	70	--	90
WA-9	WASHINGTON TWP	394522N0750617.1	CARLTON GANT	--	1953	81	107	125
WA-10	WASHINGTON TWP	394520N0750218.1	WASHINGTON TMUA	WTMUA 1	1959	100	581	612
WA-11	WASHINGTON TWP	394517N0750300.2	BELLS LAKE W C	2	1968	130	547	620

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLIDATED ROCK (FT)	CASING DIAMETER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
					CAMDEN COUNTY						
WA-13	120	--	6	5	4-66	60	1	60.0	3	I	AA CP
WA-14	99	--	6	4	4-66	60	1	60.0	2	I	AA CP
WI-1	5	--	3	--	--	--	--	--	--	H	AA CP
WI-2	6	--	3	25	1-56	7	10	0.7	0	H	AA CP
WI-3	40	--	10	126	10-63	300	124	2.4	24	N	K3 MW
WI-4	40	--	8	126	4-63	200	98	2.0	48	N	K3 MW
WI-5	--	--	--	--	--	--	--	--	--	U	--
WI-6	7	--	3	26	2-52	15	2	7.5	5	H	AA CP
WI-7	20	--	6	18	2-57	100	--	--	-	N	AA CP
WI-8	8	--	6	48	9-57	240	12	20.0	8	I	AA CP
WI-9	7	--	3	30	8-51	10	--	--	5	H	AA CP
WI-10	--	--	6	59	1-66	150	--	--	4	C	AA CP
WI-11	--	--	--	35	7-69	510	--	--	--	N	AA CP
WI-12	--	--	8	39	7-65	524	--	--	--	N	AA CP
WI-13	21	--	12	32	1-54	596	42	14.2	8	I	AA CP
WI-14	26	--	24	4	1-71	1000	39	25.6	48	P	AA CP
WI-15	15	--	8	29	--	--	--	--	--	I	AA CP
WI-16	7	--	3	30	8-51	10	--	--	8	H	AA CP
WI-17	20	--	4	35	4-55	50	--	--	4	H	AA CP
WI-18	--	--	--	--	--	--	--	--	--	U	--
WI-19	31	--	24	5	12-70	1000	28	35.7	48	P	AA CP
WI-20	6	--	2	18	2-52	20	10	2.0	2	H	AA CP
WI-21	5	--	2	3	12-70	--	--	--	--	U	AA CP
WI-22	26	--	2	3	12-70	--	--	--	--	U	AA CP
WI-23	26	--	2	3	12-70	--	--	--	--	U	AA CP
WI-24	20	--	8	14	5-68	225	9	25.0	8	H	AA CP
WI-25	7	--	3	15	2-55	50	1	50.0	4	H	AA CP
WI-26	60	--	6	27	4-67	300	53	5.7	2	I	AA CP
WI-27	10	2010	4	120	8-60	30	4	7.5	8	U	K3 MR
WI-28	10	--	6	131	4-61	14	6	2.3	58	U	K3 MR
WI-29	10	--	5	56	5-61	6	49	0.1	8	U	K3 MW
WI-30	10	--	5	4	4-61	3	--	--	57	U	TM KW
WI-31	20	--	6	1	12-70	--	--	--	--	U	AA CP
WI-32	6	--	3	--	--	--	--	--	--	H	AA CP
WI-33	--	--	--	--	--	--	--	--	--	T	TS MV
WI-34	10	--	3	33	7-52	7	2	3.5	--	H	AA CP
WI-35	21	--	8	16	10-54	502	60	8.4	5	T	AA CP
WI-36	26	--	8	22	7-53	708	78	9.1	8	T	AA CP
WI-37	30	--	8	41	1-63	--	--	--	--	T	TS MV
WI-38	25	--	8	46	9-52	360	206	1.7	24	T	TS MV
WI-39	6	--	3	15	2-54	6	6	1.0	1	H	AA CP
WI-40	28	--	8	72	10-54	185	98	1.9	4	T	TS MV
WI-41	7	--	3	12	6-51	30	--	--	--	P	AA CP
WI-42	34	--	8	22	11-65	377	38	9.9	1	N	AA CP
WI-43	180	--	6	18	5-66	60	1	60.0	3	I	AA CP
WI-44	20	--	4	16	9-65	72	21	3.4	5	N	AA CP
WI-45	140	--	6	13	5-66	60	1	60.0	3	I	AA CP
WI-46	6	--	4	10	9-53	30	12	2.5	1	H	AA CP
WI-47	10	--	3	15	11-69	40	10	4.0	1	H	AA CP
WI-48	92	--	6	12	5-68	75	2	37.5	1	I	AA CP
					GLOUCESTER COUNTY						
GL-1	30	--	8	151	11-56	708	90	7.9	8	P	K3 MR
DE-1	20	--	4	50	4-49	50	10	5.0	4	H	K3 MV
DE-2	10	--	3	4	10-52	25	--	--	6	H	K3 MW
DE-3	10	--	4	50	8-56	20	20	1.0	1	H	K3 MW
DE-4	24	--	4	23	4-53	25	--	--	8	H	K3 MW
DE-5	12	--	4	30	10-55	30	10	3.0	4	H	K3 ET
DE-6	5	--	4	10	12-53	25	--	--	2	H	K3 MW
DE-7	26	--	12	70	1-58	1018	59	17.3	8	P	K3 MR
DE-8	42	--	12	60	11-67	1150	25	46.0	8	P	K3 MR
GL-1	5	--	4	80	5-66	5	5	1.0	--	U	K3 MW
MA-1	21	700	8	90	12-53	287	40	7.2	4	P	K3 MR
MA-2	22	--	12	93	2-57	533	13	41.0	8	P	K3 MR
MA-3	32	--	10	102	4-65	525	13	40.4	4	P	K3 MR
MA-4	20	--	6	120	3-69	150	12	12.5	2	H	K3 MR
MA-5	30	--	10	122	3-67	411	34	12.1	8	I	K3 MR
MO-1	10	--	4	10	4-68	60	5	12.0	1	H	AA CP
MO-2	35	--	8	27	11-69	300	20	15.0	3	N	AA CP
NP-1	41	288	8	52	4-56	636	31	20.5	8	P	K3 MR
PI-1	40	--	10	122	12-60	1000	27	37.0	8	P	K3 MR
WA-1	19	--	4	44	2-54	90	--	--	--	H	K3 MW
WA-2	--	--	--	--	--	--	--	--	--	H	K3 MW
WA-3	18	--	4	20	5-52	100	--	--	8	H	K3 MW
WA-4	30	--	3	23	9-53	50	--	--	2	H	TL --
WA-5	20	--	4	30	7-55	150	--	--	3	H	K3 MW
WA-6	30	--	8	119	7-65	503	33	15.2	8	P	K3 MR
WA-7	32	--	4	7	2-68	50	10	5.0	1	H	K3 MW
WA-8	--	--	3	--	--	--	--	--	--	H	TF CS
WA-9	18	--	4	16	5-53	90	--	--	4	H	K3 MW
WA-10	31	--	8	131	9-59	626	28	22.4	8	P	K3 MR
WA-11	50	--	8	174	3-68	735	33	22.3	8	P	K3 MR

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	MUNICIPALITY	LAT-LONG	OWNER	LOCAL WELL NUMBER	DATE DRILLED (YEAR)	ALTITUDE OF LSD (FT)	CASING DEPTH (FT)	WELL DEPTH (FT)
			GLOUCESTER COUNTY					
WA-12	WASHINGTON TWP	394452N0750243.1	GINO'S REST	1	1970	150	278	310
WA-13	WASHINGTON TWP	394442N0750504.1	WALTER F EMOND	1	1958	150	220	244
WA-14	WASHINGTON TWP	394433N0750250.1	FRIES MILLS W C FMWC	1	1954	152	584	652
WA-15	WASHINGTON TWP	394423N0750157.1	C W GREENE	--	1954	150	57	67
WA-16	WASHINGTON TWP	394420N0750630.1	HARRY J DE SOI	1	1968	90	141	165
WA-17	WASHINGTON TWP	394309N0750155.1	JOSEPH BRYAN	--	1954	155	42	47
WE-1	WENONAH BORO	394751N0750912.1	WENONAH WATER D	WWD 2	1951	30	270	310
WE-2	WENONAH BORO	394743N0750902.1	WENONAH WATER D	WWD 1	1944	80	230	320
WD-1	WEST DEPTFORD TWP	395236N0750821.1	TEXAS OIL CO	EAGLE PT OBS 4	1948	10	214	224
WD-2	WEST DEPTFORD TWP	395232N0750942.1	TEXAS OIL CO	EAGLE PT OBS 3	1948	21	255	276
WD-3	WEST DEPTFORD TWP	395222N0750918.1	TEXAS OIL CO	EAGLE POINT 3	1947	20	258	288
WD-4	WEST DEPTFORD TWP	395221N0750856.1	TEXAS OIL CO	EAGLE POINT 5	1948	10	237	277
WD-5	WEST DEPTFORD TWP	395216N0750915.1	TEXAS OIL CO	EAGLE POINT 1	1947	32	248	288
WD-6	WEST DEPTFORD TWP	395213N0750936.1	TEXAS OIL CO	EAGLE POINT 4	1948	14	259	289
WD-7	WEST DEPTFORD TWP	395207N0750930.1	TEXAS OIL CO	EAGLE POINT 2	1948	17	263	289
WD-8	WEST DEPTFORD TWP	395159N0750907.1	TEXAS OIL CO	EAGLE PT OBS 1	1948	32	288	298
WD-9	WEST DEPTFORD TWP	395158N0750950.1	TEXAS OIL CO	EAGLE PT OBS 2	1948	10	285	295
WD-10	WEST DEPTFORD TWP	395153N0750946.1	TEXAS OIL CO	EAGLE POINT 6	1949	15	279	318
WD-11	WEST DEPTFORD TWP	394919N0751256.2	SHELL CHEM CO	SHELL 3	1962	30	358	384
WD-12	WEST DEPTFORD TWP	394917N0751307.1	SHELL CHEM CO	SHELL 1	1962	12	328	360
WS-1	WESTVILLE BORO	395221N0750737.1	WESTVILLE W D	WWD 4	1957	16	286	313
WS-2	WESTVILLE BORO	395221N0750737.2	WESTVILLE W D	WWD 3	1945	16	115	140
WB-1	WOODBURY CITY	394950N0750909.1	WOODBURY W D	RAILROAD 5	1960	35	405	457
			PHILADELPHIA COUNTY					
PH-1	PHILADELPHIA CITY	395536N0750843.1	CROWN PAPER BRD	1	1925	13	--	108
PH-2	PHILADELPHIA CITY	395536N0750905.1	S P DRESS BEEF	S PHILA BEEF 4	--	15	--	60
PH-3	PHILADELPHIA CITY	395534N0751106.1	GILBERT ADDED	PRES THEATER	1936	30	65	86
PH-4	PHILADELPHIA CITY	395524N0750822.1	CONTINENTL DIST	CONT DIST R-7	1948	10	118	128
PH-5	PHILADELPHIA CITY	395511N0750833.1	WILSON-MARTIN	WILSON 1	1953	13	150	175
PH-6	PHILADELPHIA CITY	395448N0750856.1	TWIN PACKING CO	1	--	10	140	180
PH-7	PHILADELPHIA CITY	395428N0750804.1	PUBLICKER IND	P INDUSTRIES17	1937	8	159	169
PH-8	PHILADELPHIA CITY	395412N0751211.1	GULF OIL CORP	WEST WELL	1946	17	72	182
PH-9	PHILADELPHIA CITY	395342N0751021.1	U S NAVAL BASE	OBS WELL PH-12	1944	10	94	104
PH-10	PHILADELPHIA CITY	395329N0751012.1	U S NAVAL BASE	2	1940	10	207	232
PH-11	PHILADELPHIA CITY	395328N0751034.1	U S NAVAL BASE	4	1941	11	237	267
PH-12	PHILADELPHIA CITY	395328N0751028.1	U S NAVAL BASE	3	1941	12	238	268
PH-13	PHILADELPHIA CITY	395318N0750938.1	U S NAVAL BASE	9	1943	12	189	228
PH-14	PHILADELPHIA CITY	395316N0751049.1	U S NAVAL BASE	OBS WELL PH-20	1946	13	228	243
PH-15	PHILADELPHIA CITY	395316N0751031.1	U S NAVAL BASE	8	1944	12	200	230
PH-16	PHILADELPHIA CITY	395315N0751007.1	U S NAVAL BASE	11	1952	11	214	245

EXPLANATION

1. AQUIFER
   - WG WISSAHICKON FORMATION
   - K3RA RARITAN FORMATION
   - K3MR MAGOTHY-RARITAN FORMATIONS
   - K3MV MERCHANTVILLE FORMATION
   - K3ET ENGLISHTOWN FORMATION
   - K3MW MOUNT LAUREL SAND-WENONAH FORMATION
   - K3NA NAVESINK FORMATION
   - TLHT HORNERSTOWN SAND
   - TLVH VINCENTOWN FORMATION-HORNERSTOWN SAND
   - TSMV MANASQUAN-VINCENTOWN FORMATION
   - TEMA MANASQUAN FORMATION
   - TMKW KIRKWOOD FORMATION
   - TFCS COHANSEY SAND
   - AACP PLEISTOCENE-COHANSEY SAND
   - TL TERTIARY-PALEOCENE
   - QRCM CAPE MAY FORMATION

2. WATER LEVEL BELOW LAND SURFACE
   - F FLOWS

3. WATER USE
   - A AIR CONDITION
   - C COMMERCIAL
   - H DOMESTIC
   - I IRRIGATION
   - N INDUSTRIAL
   - P PUBLIC SUPPLY
   - T INSTITUTIONAL
   - U UNUSED
   - Z OTHER

Table 1.--Records of selected wells in Camden County and vicinity--Continued

MAP NUMBER	LENGTH OF WELL OPEN TO AQUIFER (FEET)	DEPTH TO CONSOLIDATED ROCK (FT)	CASING DIAMETER (IN)	WATER LEVEL (FT)	DATE WATER LEVEL MEASURED	YIELD (GPM)	DRAW DOWN (FT)	SPECIFIC CAPACITY	PUMPING PERIOD (HOURS)	USE OF WATER	MAJOR AQUIFER
					GLOUCESTER COUNTY						
WA-12	32	--	6	100	2-70	--	--	--	--	C	K3 MW
WA-13	24	--	4	74	2-68	60	15	4.0	1	H	K3 MW
WA-14	68	--	8	188	9-64	858	50	17.2	--	P	K3 MR
WA-15	10	--	4	32	10-54	15	6	2.5	--	H	AA CP
WA-16	24	--	4	15	12-68	60	12	5.0	2	H	K3 MW
WA-17	5	--	3	15	5-54	9	7	1.3	H	H	AA CP
WE-1	46	--	12	67	2-51	1200	40	30.0	8	P	K3 MR
WE-2	40	700	12	40	5-66	500	30	16.7	24	P	K3 MR
WD-1	10	--	3	31	7-68	--	--	--	--	U	K3 MR
WD-2	20	298	6	42	11-52	--	--	--	--	U	K3 MR
WD-3	30	288	12	39	12-47	1012	43	23.5	24	N	K3 MR
WD-4	40	287	12	46	10-48	1029	44	23.4	8	N	K3 MR
WD-5	40	--	12	39	11-47	1110	34	32.6	8	N	K3 MR
WD-6	31	--	14	38	3-48	1100	52	21.2	90	N	K3 MR
WD-7	31	--	16	38	1-46	1100	59	18.6	24	N	K3 MR
WD-8	10	--	4	--	10-47	--	--	--	--	U	K3 MR
WD-9	10	--	3	18	7-48	250	--	--	--	U	K3 MR
WD-10	39	--	16	35	1-49	1200	76	15.8	48	N	K3 MR
WD-11	25	--	12	35	12-61	1000	105	9.5	8	N	K3 MR
WD-12	30	--	12	30	10-61	1000	36	27.8	8	N	K3 MR
WS-1	27	325	10	51	--	1205	95	12.7	8	P	K3 MR
WS-2	28	--	10	24	6-45	500	28	17.9	2	P	K3 MR
WR-1	52	--	12	62	4-60	1016	24	42.3	10	P	K3 MR
					PHILADELPHIA COUNTY						
PH-1	--	--	8	18	--	100	--	--	--	N	K3 MR
PH-2	--	--	--	--	--	--	--	--	--	Z	K3 MR
PH-3	21	--	8	39	6-36	90	30	3.0	--	A	GG CM
PH-4	17	--	10	41	10-48	--	--	--	--	N	K3 RA
PH-5	25	--	10	--	--	250	--	--	--	Z	K3 MR
PH-6	15	172	--	72	12-43	726	--	--	--	N	K3 RA
PH-7	30	--	18	48	--	1030	--	--	--	I	K3 RA
PH-8	10	--	6	14	3-46	420	--	--	--	N	K3 RA
PH-9	10	--	8	27	11-44	--	--	--	--	U	K3 MR
PH-10	35	--	12	18	7-40	730	75	9.7	--	N	K3 RA
PH-11	30	--	12	25	--	800	--	--	--	N	K3 RA
PH-12	--	--	12	30	--	860	--	--	--	N	K3 RA
PH-13	--	--	12	32	--	710	--	--	--	N	K3 RA
PH-14	5	--	8	23	5-46	--	--	--	--	U	K3 MR
PH-15	30	--	8	51	12-44	740	--	--	--	N	K3 RA
PH-16	31	--	12	47	--	640	--	--	--	N	K3 RA

Table 2.--Geologic formations and their water-bearing properties in Camden County

Erathem	System	Series	Stage*	Subdivision	Lithology	Thickness	Geohydrologic properties
Cenozoic	Quaternary	Holocene		Alluvial deposits	Gray mixture of clay, silt, organic material, sand, and gravel.	3-10	Too thin to be tapped for water.
				Eolian deposits	Light gray, well sorted quartz sands.	3-10	Too thin to be tapped for water.
		Pleistocene	Cohansey Sand	Cape May Formation	Yellow to brown to gray, medium to coarse-grained quartzose sand.	3-40	Usually hydraulically connected with underlying aquifers.
				Pensauken Formation	Yellow to brown, medium to coarse-grained quartzose sand.	3-30	
				Bridgeton Formation	White to brown, fine to very coarse quartzose sand and gravel, fairly well sorted and subangular.	3-30	
	Tertiary	Pliocene(?) and Miocene(?)		Cohansey Sand	Yellowish orange, fine to coarse quartzose sand and fine gravel, somewhat micaceous, contains lenses of silt and clay.	35-140(?)	A major aquifer. Ground water occurs generally under water-table conditions. Water is of satisfactory quality; generally soft but occasionally high in iron. Wells yield up to 1,300 gpm.
		Miocene		Kirkwood Formation	Light olive gray, glauconitic, slightly micaceous, very fine to fine quartzose sand.	50-100	A minor aquifer. Excellent to poor capability to yield water.
		Eocene	Yoredian*	Piney Point(?) Formation	Glauconitic sands, shell beds.	0-40	Does not crop out in Camden County. Presence questionable in subsurface. Too thin to be tapped for water.
				Manasquan Formation	Olive gray, clayey, quartz, glauconitic, silty sand.	0-140	Does not crop out in Camden County. Present only in subsurface. Moderately permeable confining bed. Locally water-bearing sand unit in southeastern part of Camden County.
		Paleocene	Thanetian	Vincentown Formation	Light brown to gray, very fine, calcareous, micaceous, sand and silt.	0-80	Does not outcrop in Camden County. Present only in subsurface. In most of the county it is a leaky confining unit.
			Danian	Hornerstown Sand	Dark green glauconitic sand and clay.	15-36	A leaky confining unit containing shell beds. Yields small quantities of water.
Mesozoic	Cretaceous	Upper Cretaceous	Maestrichtian	Navesink Formation	Dark green to black glauconitic sand and clay.	15-34	
			Upper Campanian	Mount Laurel Sand	Light gray, fine to coarse-grained quartz sand.	80-132	A major aquifer. Wells yield up to 535 gpm. Good capability to yield water. Quality of water good, locally high in iron.
				Wenonah Formation	Dark gray, poorly sorted, very micaceous, silty, fine quartz sand.		
				Marshalltown Formation	Dark gray, micaceous, silty glauconite sand.	20-25	Confining bed.
			Lower Campanian	Englishtown Formation	Massive dark-colored silty sand.	26-77	Not used extensively. Greatest thickness of sand in central portion of county. Yields up to 510 gpm. Good to poor capability to yield water.
				Woodbury Clay	Grayish-black massive micaceous clayey silt.	106-165	Confining bed.
				Merchantville Formation	Dark gray to grayish-black micaceous clay to clayey silt with beds and lenses of glauconite sand.		Leaky confining bed and minor aquifer. Sand unit near top of formation used for domestic wells.
			?—Santonian	Magothy Formation	Alternating clays, silts, sands, and gravel.	25-1700	Major aquifer system in Camden County. Series of confining beds and aquifers. Wells yield up to 1,350 gpm. Excellent capability to yield water. Water high in iron in portion of county. Chloride content increasing downdip of New Brooklyn Park area in Winslow Township. Contamination of aquifer may occur near Delaware River.
				Raritan Formation			
				Potomac Group			
		Lower Cretaceous					
	Pre-Cretaceous	Pre-Cretaceous consolidated rocks and Wissenickon Formation (Precambrian to Lower Ordovician).			Schist and gneiss.	Unknown	No water producing wells known to tap consolidated rocks in Camden County.

*Owens and Sohl, 1969; supplement to field trip No. 2, Guidebook.

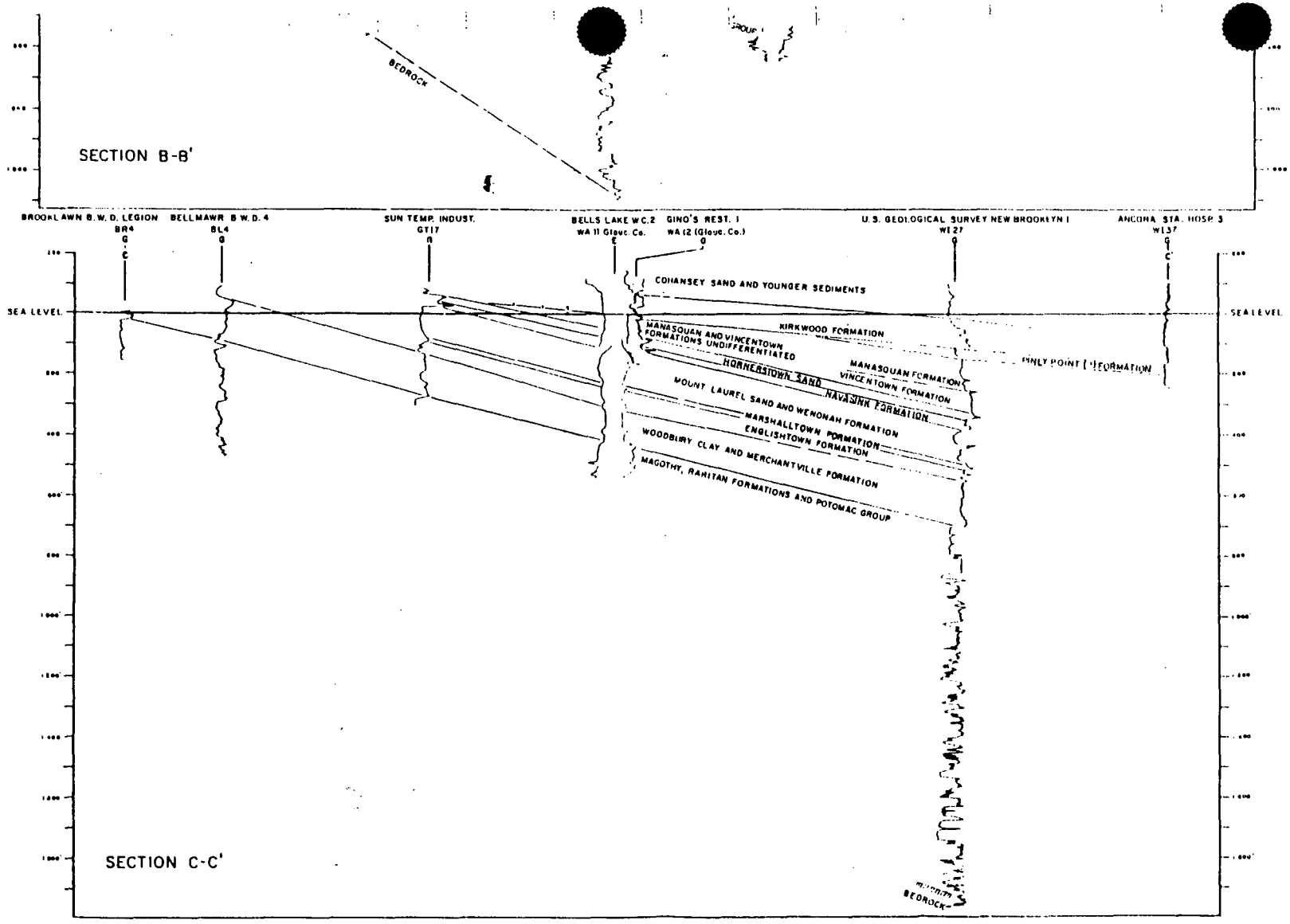
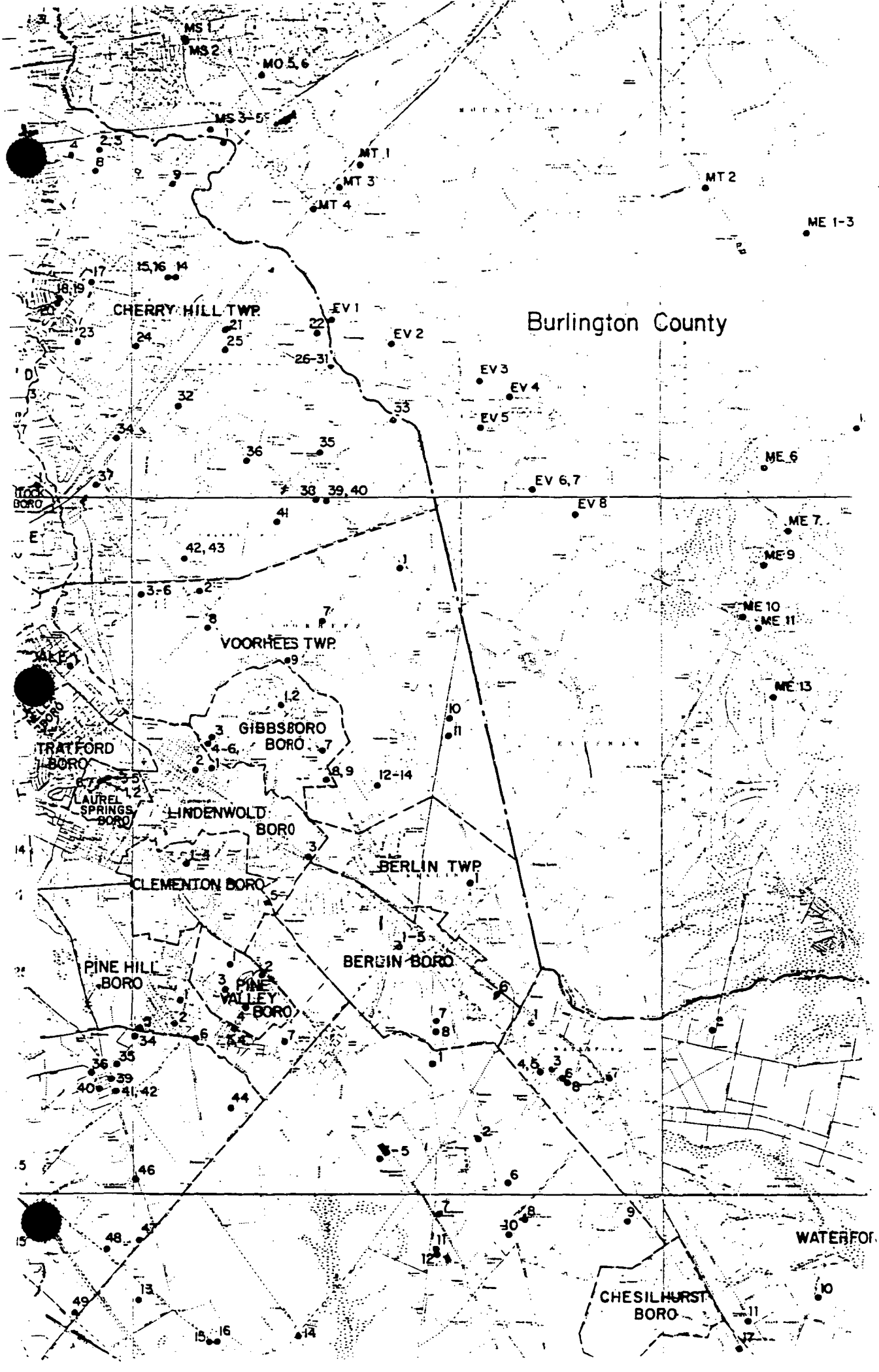


Figure 5.— Geologic sections A-A', B-B', and C-C' of the Coastal Plain in Camden County.


Burlington County
CHERRY HILL TWP.
VOORHEES TWP.
GIBBSBORO BORO
TRATFORD BORO
LAUREL SPRINGS BORO
LINDENWOLD BORO
CLEMENTON BORO
BERLIN TWP.
BERLIN BORO
PINE HILL BORO
PINE VALLEY BORO
CHESILHURST BORO
WATERFOR
MS 1
MS 2
MO 5,6
MS 3-5
MT 1
MT 2
MT 3
MT 4
ME 1-3
EV 1
EV 2
EV 3
EV 4
EV 5
EV 6,7
EV 8
ME 6
ME 7
ME 9
ME 10
ME 11
ME 13

REFERENCE NO. 16

New Jersey Geological Survey
Geological Survey Report GSR 38

GROUND-WATER FLOW AND FUTURE CONDITIONS IN THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM, CAMDEN AREA, NEW JERSEY

by
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New Jersey Department of Environmental Protection
Division of Science and Research
Geological Survey
CN 427
Trenton, NJ 08625
1995
Printed on recycled paper

Characteristics of Hydrogeologic Units

The Potomac-Raritan-Magothy aquifer system contains upper, middle, and lower aquifers separated by intervening confining units. It is bounded above by the Merchantville-Woodbury confining unit and below by the bedrock surface. The relations among the geologic and hydrogeologic units of the New Jersey Coastal Plain are shown in table 1. The upper aquifer generally corresponds to the sands of the Magothy Formation, and the middle and lower aquifers generally correspond to the sand deposits within the undifferentiated Potomac Group and Raritan Formation. Further discussion of the aquifer system and other hydrogeologic units of the New Jersey Coastal Plain is given in Zapecza (1989).

The aquifer system is confined by the Merchantville-Woodbury confining unit. The approximate thickness of the Merchantville-Woodbury confining unit, which ranges from 0 to more than 200 ft in the study area is shown in figure 2. The unit thickens downdip at a rate of about 4 ft/mi.

The altitude of the top of the upper aquifer and its outcrop area are shown in figure 3. This unit is present across the study area, in nearly uniform thickness, as shown in figure 4. The upper aquifer, unlike the middle or lower aquifer, can be distinguished in the downdip part of the study area, however, differentiation of the upper and middle aquifers is difficult locally, where the intervening confining unit thins as a result of the complex depositional nature of deltaic deposits.

The altitude of the top of the middle aquifer and its outcrop area is shown in figure 5. The thickness of this unit is illustrated in figure 6. The unit has not been differentiated from the lower aquifer in downdip areas. In the Philadelphia area, the outcrop of the middle aquifer is overlain by a thin veneer of upper Cenozoic clay deposits (Owens and Minard, 1979).

The altitude of the top of the lower aquifer and its outcrop area are shown in figure 7. The thickness of the lower aquifer is shown in figure 8. The unit thickens downdip at a rate of about 20 ft/mi. Beginning about 10 to 12 miles downdip from the outcrop area, the middle aquifer is indistinguishable from the lower aquifer as a result of an increase in the thickness and number of interfingering clay and silt beds (Zapecza, 1989). In the northeastern corner of the study area, in the vicinity of Mount Holly, the lower aquifer pinches out in the subsurface as a result of the presence of a local bedrock high (Zapecza, 1989).

Locally, in the updip part of the study area, the confining unit between the upper and middle aquifers is lenticular and discontinuous. This is particularly evident in the northwestern corner of Gloucester County where the upper and middle aquifers are not easily differentiable as a result of the lenticular habit of the intervening confining unit (Lewis and others, 1991; Barton and Kozinski, 1991). The thickness of the confining unit between the middle and lower aquifers varies, particularly in the updip part of the study area, as a result of the lenticular nature of the unit.

The crystalline bedrock underlying the Coastal Plain sediments, a mica schist, is largely impermeable. A weathered zone of clay and loose mica overlies the hard bedrock and varies in thickness, with a maximum of 15 ft. This zone can function as an aquifer or aquitard depending on the degree of weathering. Available information is insufficient to delineate the weathered zone from unweathered bedrock on a regional basis. The top of bedrock surface is shown in figure 9. The surface is irregular in the updip part of the study area as a result of the presence of erosional troughs, which were mapped by Greenman and others (1961). These troughs are situated transverse to the present Delaware River channel and may represent incised channels of a pre-Cretaceous drainage system. Although the bedrock surface appears more uniform downdip, this results from a decrease in data-point density.

Table 1. --Geologic and hydrogeologic units in the Coastal Plain of New Jersey

[Modified from Zapecza, 1989, table 2.]

SYSTEM	SERIES	GEOLOGIC UNIT	LITHOLOGY	HYDROGEOLOGIC UNIT		HYDROLOGIC CHARACTERISTICS
Quaternary	Holocene	Alluvial deposits	Sand, silt and black mud.	undifferentiated		Surficial material, commonly hydraulically connected to underlying aquifers. Locally some units may act as confining units. Thicker sands are capable of yielding large quantities of water.
		Beach sand and gravel	Sand, quartz, light-colored, medium- to coarse-grained pebbly.			
	Pleistocene	Cape May Formation	Sand, quartz, light-colored, heterogeneous, clayey, pebbly.			
Tertiary	Miocene	Pennsauken Formation		Kirkwood-Cohansey aquifer system		A major aquifer system. Ground water occurs generally under water-table conditions. In Cape May County, the Cohansey Sand is under artesian conditions.
		Bridgeton Formation				
		Beacon Hill Gravel	Gravel, quartz, light-colored, sandy.			
		Cohansey Sand	Sand, quartz, light-colored, medium- to coarse-grained, pebbly, local clay beds.			
		Kirkwood Formation	Sand, quartz, gray and tan, very fine to medium-grained, micaceous, and dark-colored diatomaceous clay.	Confining unit		Thick diatomaceous clay bed occurs along coast and for a short distance inland. A thin water-bearing sand is present in the middle of this unit.
				Rio Grande water-bearing zone		
				Confining unit		
				Atlantic City 800-foot sand		A major aquifer along the coast.
				Composite confining unit		Poorly permeable sediments.
	Oligocene	Piney Point Formation / Shark River Formation	Sand, quartz and glauconite, fine- to coarse-grained.		Piney Point aquifer	Yields moderate quantities of water.
	Eocene					
		Manasquan Formation	Clay, silty and sandy, glauconitic, green gray, and brown, contains fine-grained quartz.			Poorly permeable sediments.
	Paleocene	Vincentown Formation	Sand, quartz, gray and green, fine- to coarse-grained, glauconitic, and brown clayey, very fossiliferous, glauconite and quartz calcarenite.		Vincentown aquifer	Yields small to moderate quantities of water in and near its outcrop area.
		Hornerstown Sand	Sand, clayey, glauconitic, dark-green, fine- to coarse-grained.			Poorly permeable sediments.
Cretaceous	Upper Cretaceous	Tinton Sand	Sand, quartz, glauconitic, brown and gray, fine- to coarse-grained, clayey, micaceous.			
		Red Bank Sand			Red Bank Sand	Yields small quantities of water in and near its outcrop area.
		Navesink Formation	Sand, clayey, silty, glauconitic, green and black, medium- to coarse-grained.			Poorly permeable sediments.
		Mount Laurel Sand	Sand, quartz, brown and gray, fine- to coarse-grained, slightly glauconitic.	Wenonah-Mount Laurel aquifer		A major aquifer.
		Wenonah Formation	Sand, very fine- to fine-grained, gray and brown, silty, slightly glauconitic.			
		Marshalltown Formation	Clay, silty, dark-greenish-gray; contains glauconitic quartz sand.	Marshalltown-Wenonah confining unit		A leaky confining unit.
		Englishtown Formation	Sand, quartz, tan and gray, fine- to medium-grained; local clay beds.	Englishtown aquifer system		A major aquifer. Two sand units in Monmouth and ocean Counties.
		Woodbury Clay	Clay, gray and black, and micaceous silt.	Merchantville-Woodbury confining unit		A major confining unit. Locally the Merchantville Formation may contain a thin water-bearing sand.
		Merchantville Formation	Clay, glauconitic, micaceous, gray and black; locally very fine grained quartz and glauconitic sand are present.			
		Magothy Formation	Sand, quartz, light-gray, fine- to coarse grained. Local beds of dark gray lignitic clay. Includes Old Bridge Sand Member.	Potomac-Raritan-Magothy aquifer system	Upper aquifer	A major aquifer system. In the northern Coastal Plain, the upper aquifer is equivalent to the Old Bridge aquifer and the middle aquifer is equivalent to the Farrington aquifer. In the Delaware River Valley, three aquifers are recognized. In the deeper subsurface, units below the upper aquifer are undifferentiated.
		Raritan Formation	Sand, quartz, light-gray, fine- to coarse-grained, poorly arkosic; contains red, white, and variegated clay. Includes Farrington Sand Member.		Confining unit	
					Middle aquifer	
					Confining unit	
	Lower Cretaceous	Potomac Group	Alternating clay, silt, sand, and gravel.		Lower aquifer	
Pre-Cretaceous		Bedrock	Precambrian and lower Paleozoic crystalline rocks, schist and gneiss; locally Triassic sandstone and shale, and Jurassic diabase are present.	Bedrock confining unit		No wells obtain water from these consolidated rocks, except along Fall line.

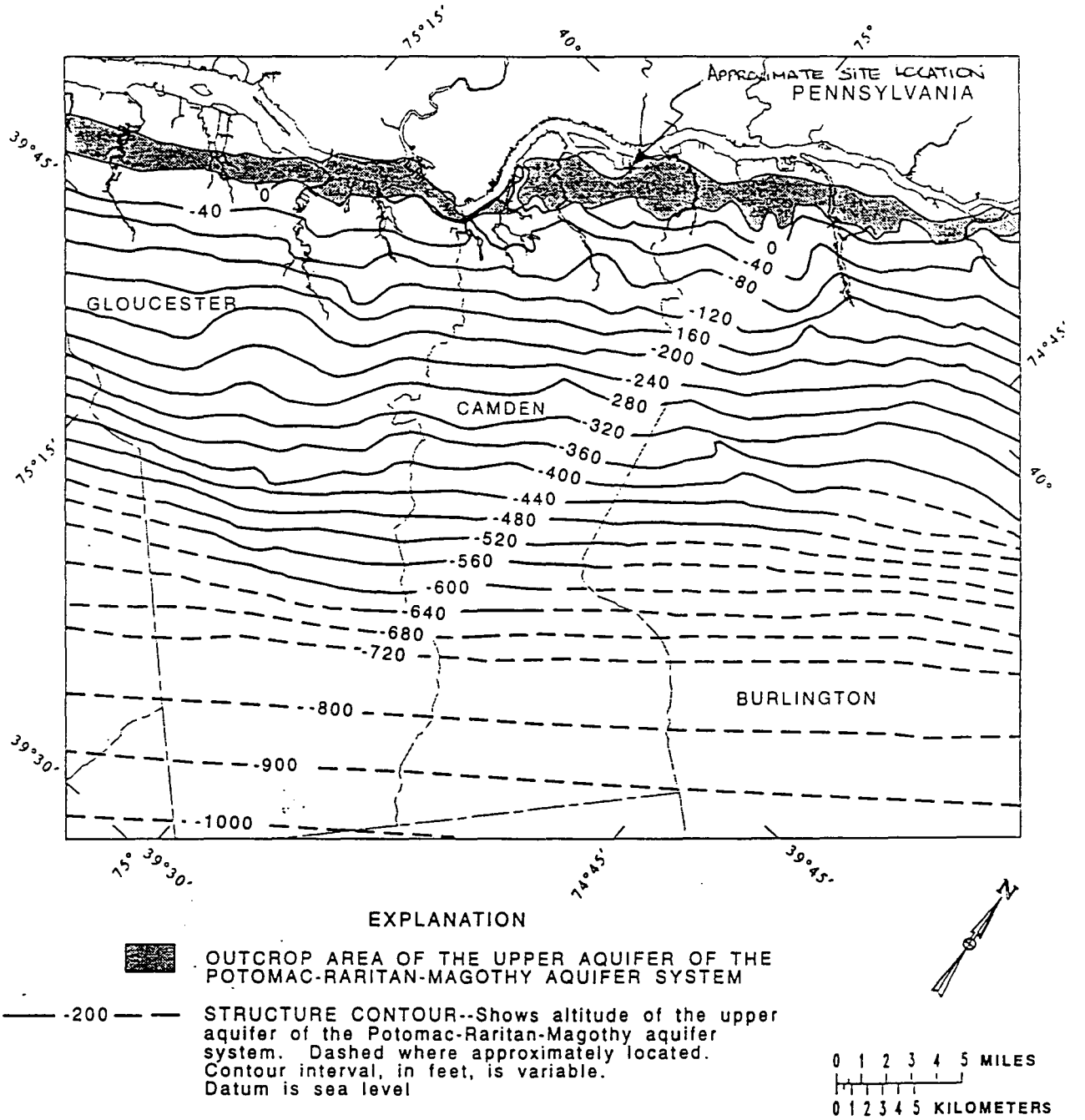


Figure 3. Altitude of the top of the upper aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

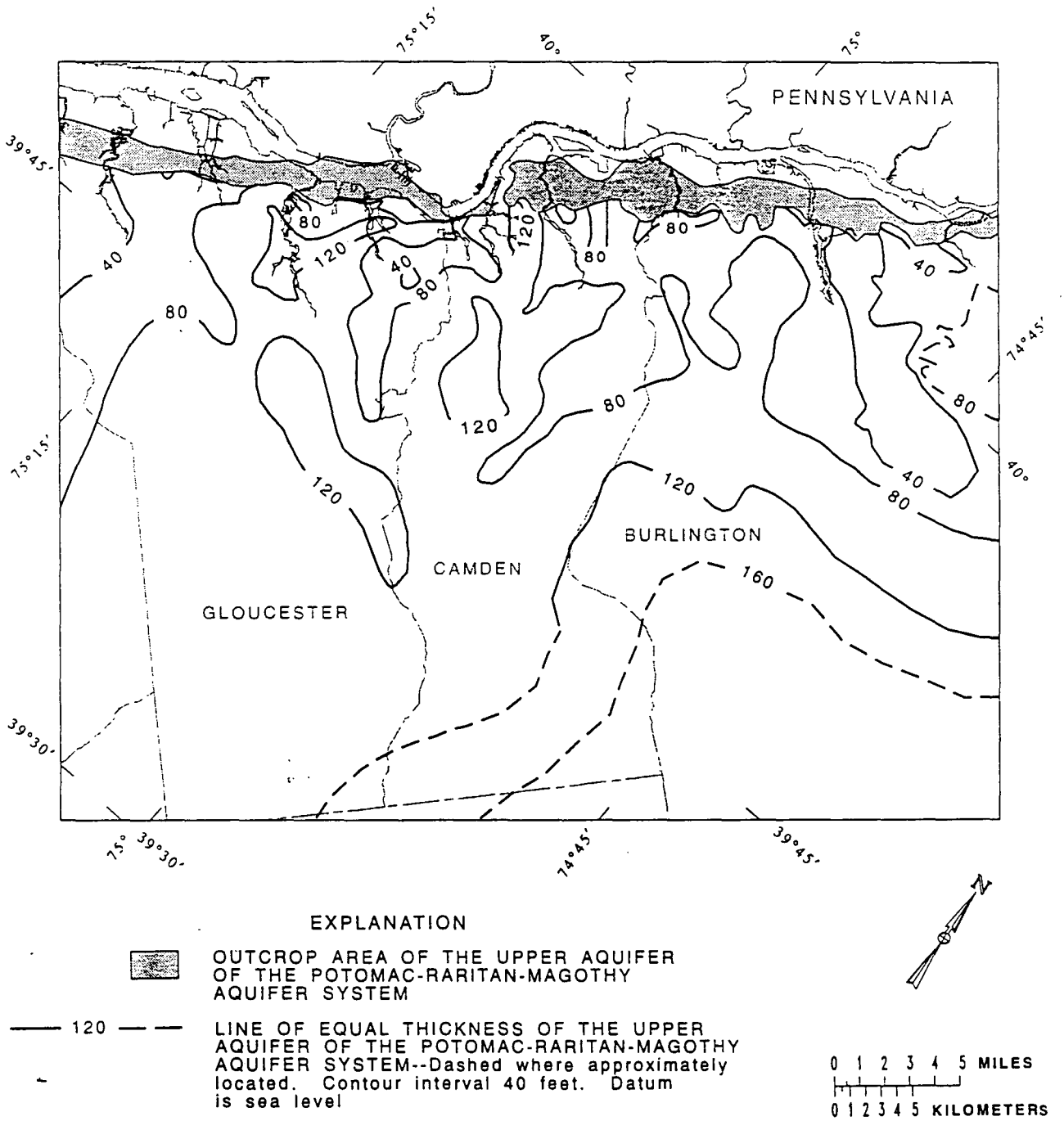


Figure 4. Thickness of the upper aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

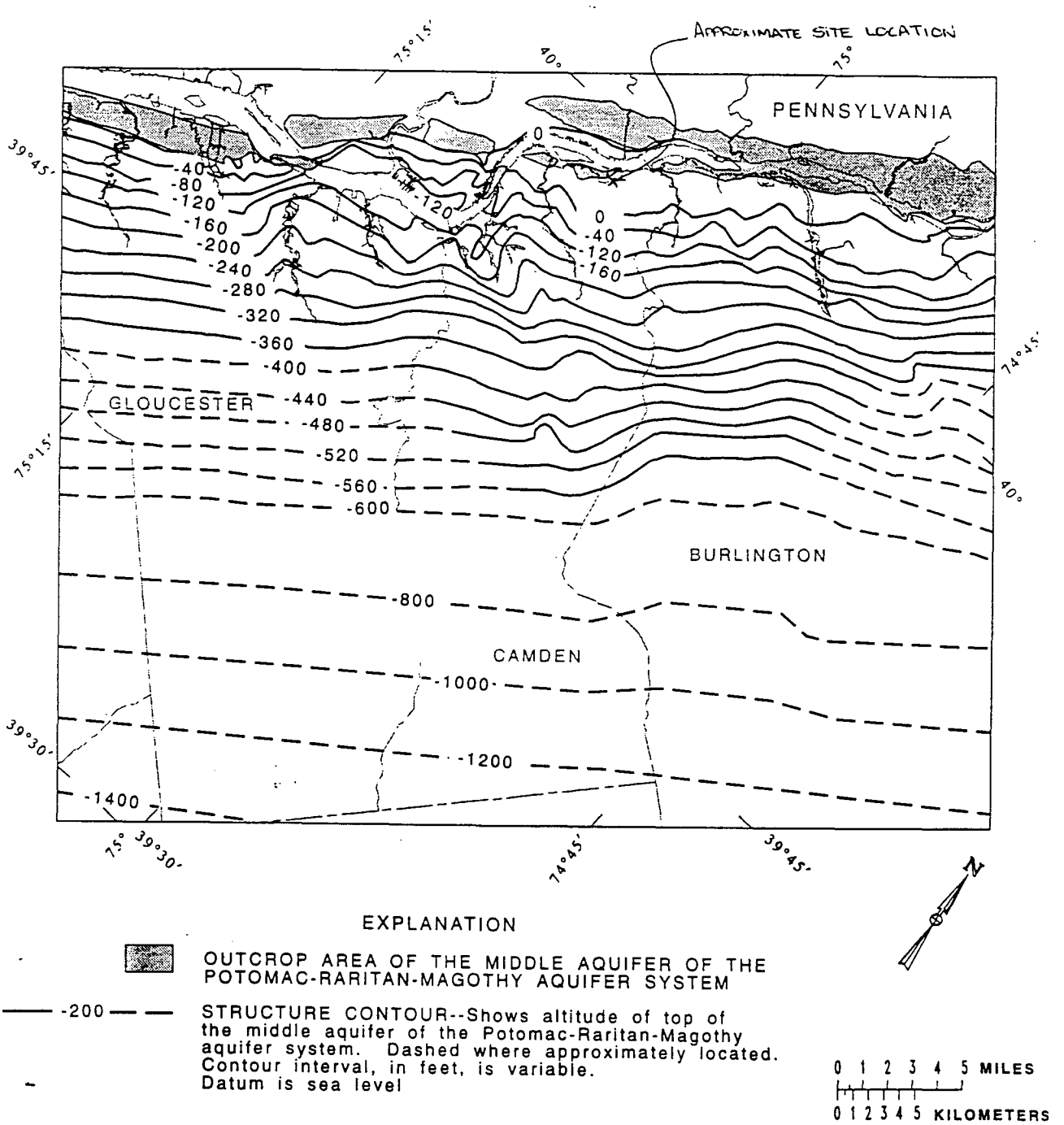


Figure 5. Altitude of the top of the middle aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

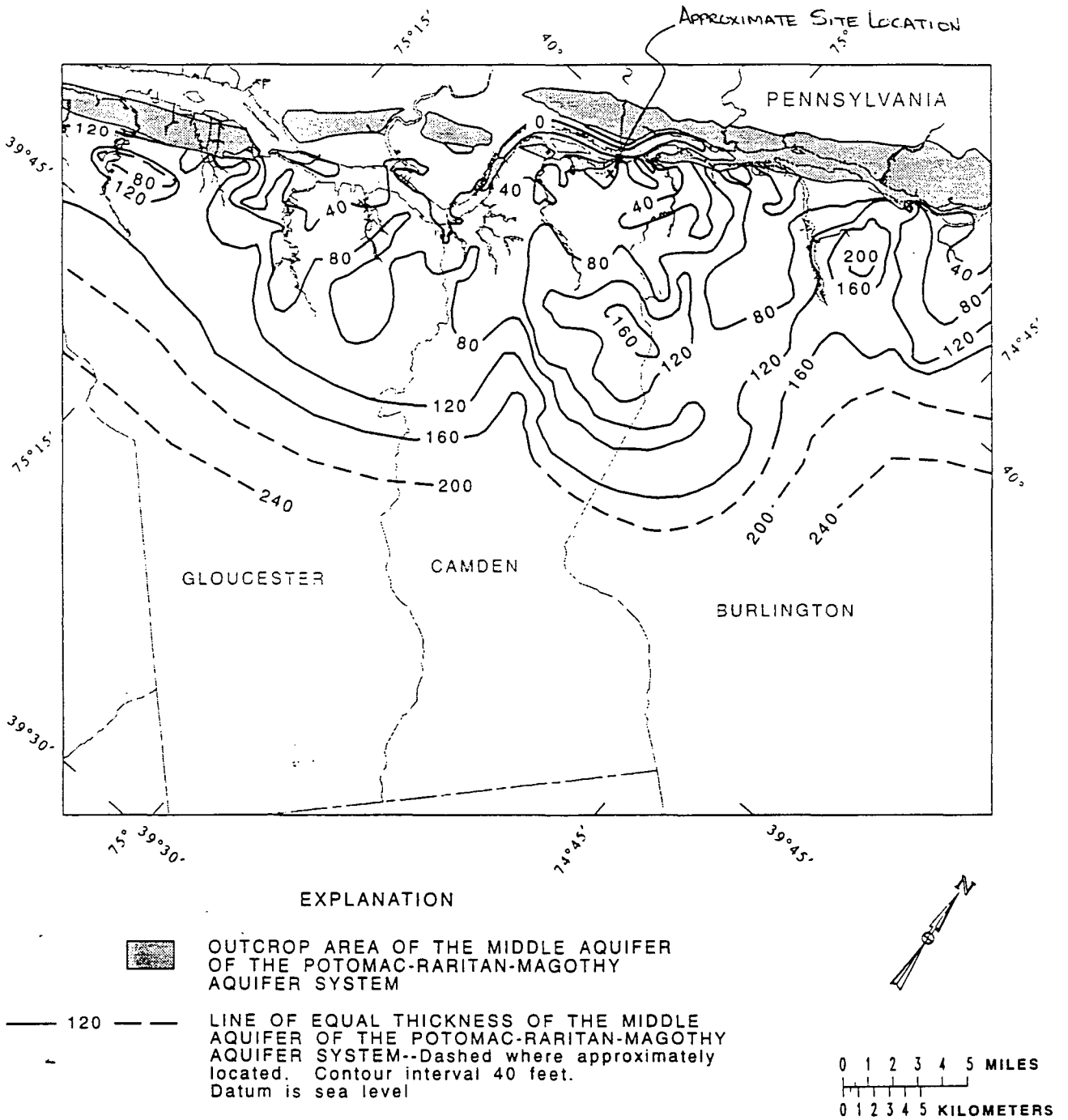


Figure 6. Thickness of the middle aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

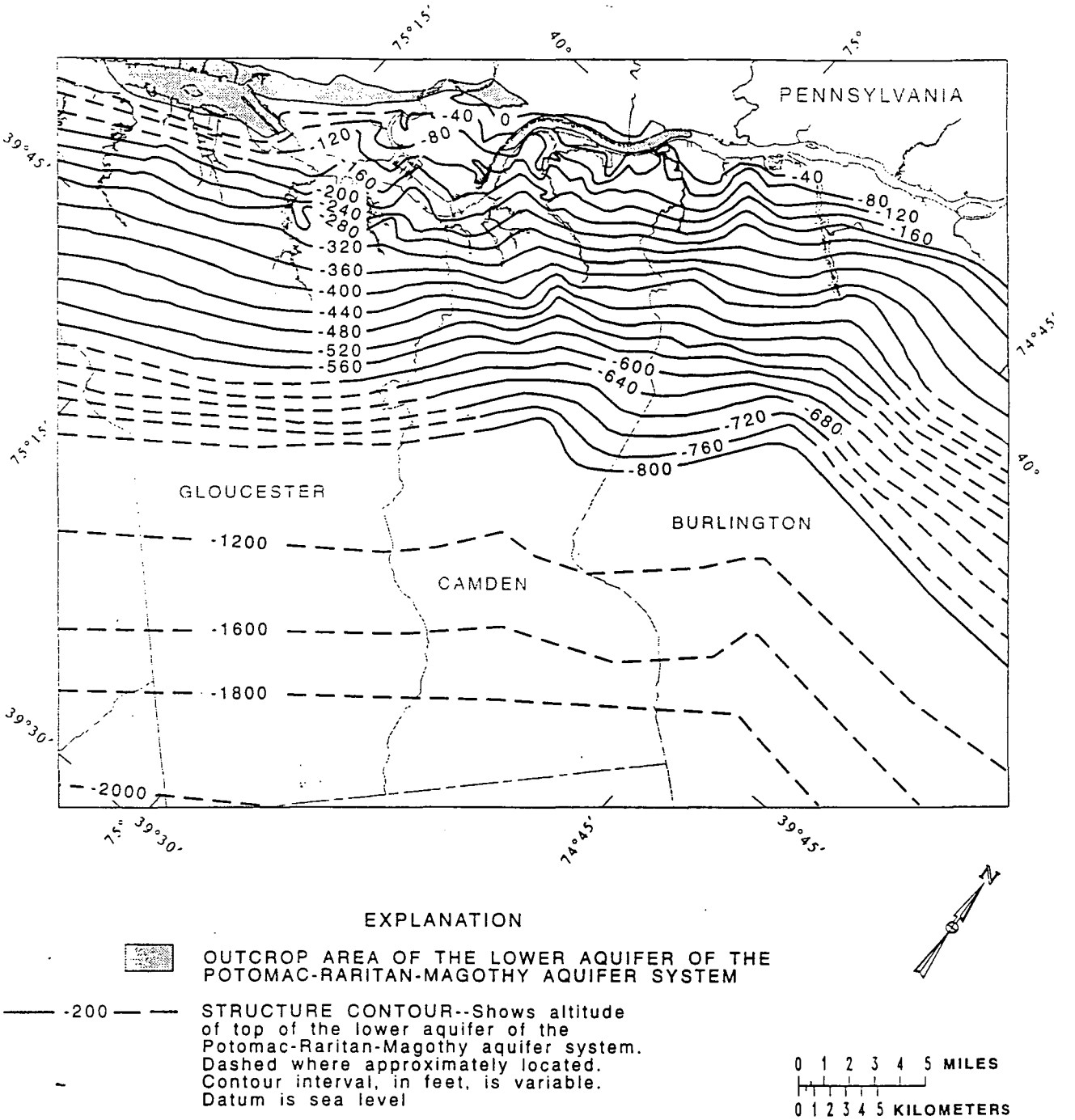


Figure 7. Altitude of the top of the lower aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

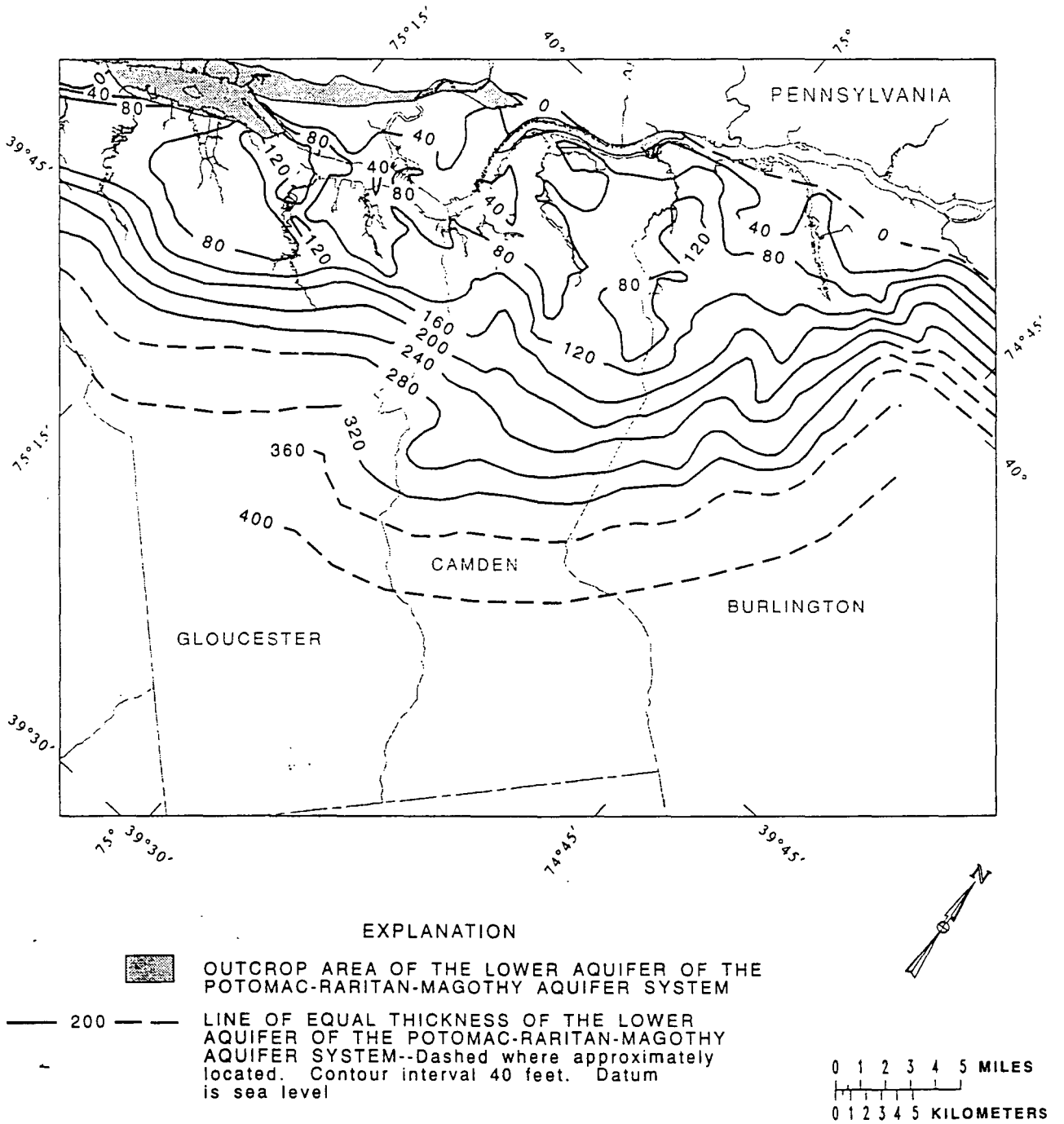


Figure 8. Thickness of the lower aquifer of the Potomac-Raritan-Magothy aquifer system, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

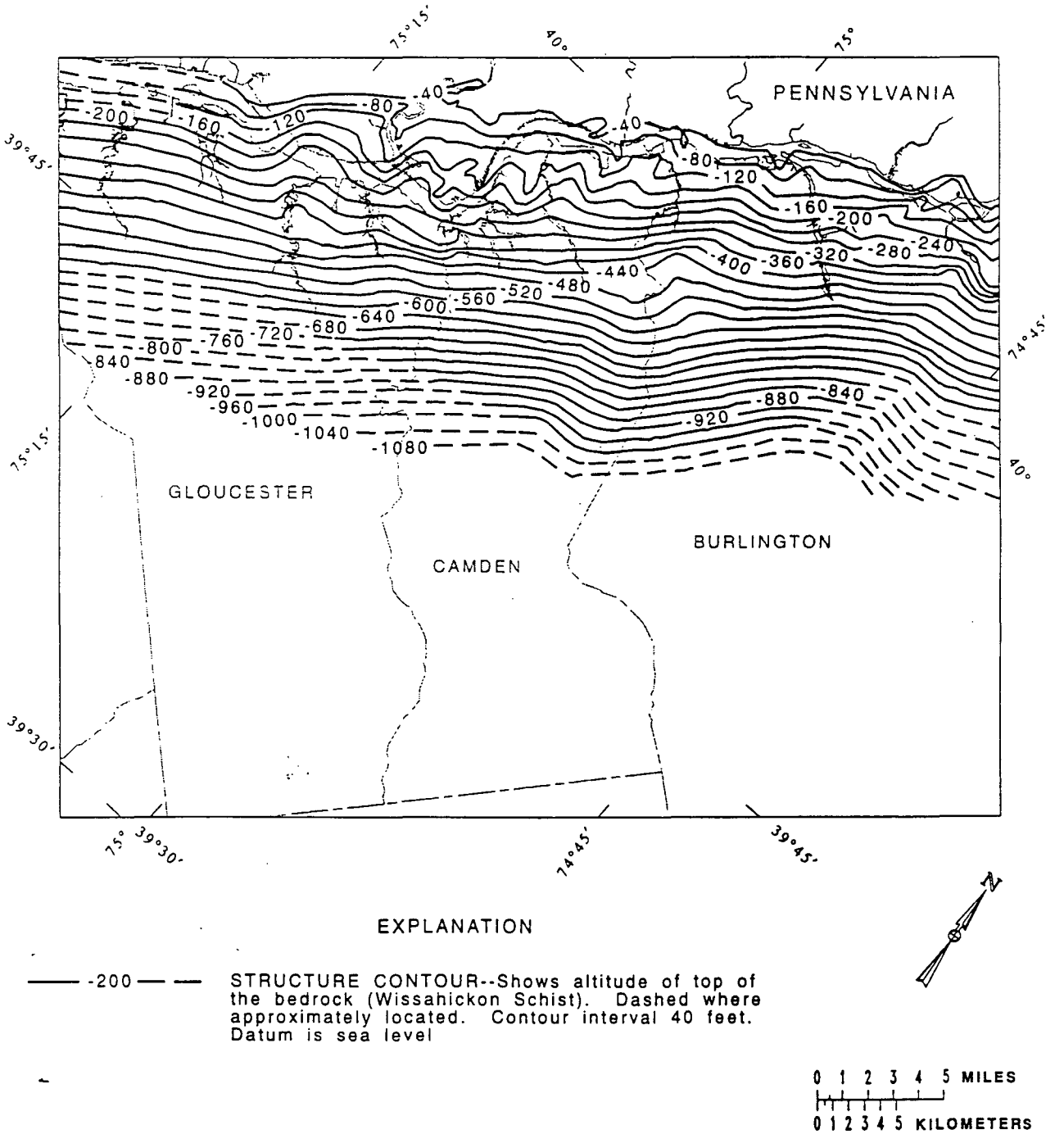


Figure 9. Altitude of the top of bedrock surface, Camden area, New Jersey (modified from E.C. Regan, U.S. Geological Survey, written commun., 1986).

Aquifer and Confining-Unit Hydraulic Properties

The aquifers of the Potomac-Raritan-Magothy aquifer system are among the most permeable of the New Jersey Coastal Plain. Selected data on transmissivity, hydraulic conductivity, storage coefficients, and vertical hydraulic conductivity for the aquifer system and related units in the Camden area are summarized in table 2. The data in table 2 are not internally consistent because they originate from different sources and types of analyses and may not represent actual hydraulic characteristics as a result of the method of collection or analysis (Martin, 1990, p. 9). The data from Martin (1990) are the calibrated hydraulic properties from the RASA model in the Camden area. These data probably are the best estimates of hydraulic properties available at a regional scale.

Precipitation and Recharge

Precipitation in the Coastal Plain of New Jersey is about 45 in/yr. Rhodehamel (1970, p. 6-7) estimated evapotranspiration to be about 22.5 in/yr, surface-water runoff to be about 2.5 in/yr, and recharge to the ground-water system to be about 20 in/yr. Of the 20 in/yr that recharges the ground-water system, about 17 in/yr is discharged as base flow to streams; the remainder flows into deeper aquifers. Rhodehamel's estimates are based on the flow system of the entire Coastal Plain. In the Camden area, the amount of recharge to the ground-water system may be less than 20 in/yr as a result of urbanization. Much of the water that has entered the ground may be intercepted by public-supply wells in the Camden area, reducing the ground-water contribution to base flow. The direct measurement of recharge in the urbanized Camden area was not attempted. Measurement of stream base flow as a method of approximating recharge was not possible either, as a result of tidal effects. Therefore, the only feasible quantitative approach to the estimation of recharge is to check or modify values derived from similar areas elsewhere in the Coastal Plain during calibration of water levels obtained by using a ground-water-flow model.

Ground-Water Withdrawals

Ground water is the major source of potable water in the Camden area. In 1980, 95 percent of ground-water withdrawals in Burlington, Camden, and Gloucester Counties were from either the upper, middle, or lower aquifer (Vowinkel, 1984, p. 19). Although early withdrawals from the aquifer system were concentrated in the City of Camden, development in the suburbs has led to increased use over much of the study area.

Annual withdrawals

Significant development of the aquifer system began in 1898, when the first withdrawals from wells in the City of Camden's Morris well field were made (Farlekas and others, 1976, p. 26). Annual withdrawals from each of the upper, middle, and lower aquifers and the combined total are shown in figure 10. The increase in withdrawals from the 1930's to the 1970's is readily apparent. Use of the lower aquifer has been, and continues to be, the highest among the three aquifers. Use of the upper and middle aquifers currently (1987) is similar. Current (1987) withdrawals from the aquifer system in the Camden area are about 125 Mgal/d. Positive correlation between population and withdrawals was strong from the turn of the century until the 1970's. Population increased more slowly in the 1970's (Camp Dresser and McKee, Inc., 1984a, p. 3-9), while withdrawals slightly decreased. Economic conditions also affect withdrawals directly by increasing or decreasing industrial withdrawals and indirectly by affecting population. The decrease in withdrawals from 1980 to 1981, shown in figure 10, may have been caused, in part, by the statewide restriction on water use imposed in 1981 as a result of drought conditions that year (Camp Dresser and McKee, Inc., 1984a, p. 3-22).

Table 2.--Selected data on hydraulic characteristics of the Potomac-Raritan-Magothy aquifer system and related units in the vicinity of the Camden area, New Jersey

[Modified from Martin, 1990; ft/d, feet per day; ft^2/d, feet squared per day; Co., County; Twp., Township; --, no information]

Transmissivity (ft^2/d)	Hydraulic conductivity (ft/d)	Storage coefficient (dimensionless)	Source of data	Location	Reference
		ENGLISHTOWN AQUIFER SYSTEM			
2,100	--	$2.7x10^{-4}$	Aquifer test	Clementon, Camden Co.	Farlekas and others (1976, p. 61)
500	--	$1.0x10^{-4}$	Simulation results	Camden area	Martin (1990, p. 104)
		UPPER AQUIFER OF THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM			
500-3,000	--	$1.0x10^{-4}$	Aquifer test	Delmarva Peninsula	Cushing and others (1973, p. 41)
16,600	240	$1.0x10^{-3}$	Aquifer test	Haddon Heights, Camden Co.	Barksdale and others (1958, p. 97)
2,300-9,000		$5.8x10^{-4}$-$2.4x10^{-3}$	Aquifer test	Old Bridge, Middlesex Co.	Barksdale and others (1958, p. 47)
6,000-35,000	--	$8.0x10^{-5}$-$8.0x10^{-3}$	Simulation results	N.J. Coastal Plain	Luzier (1980, p. 44)
2,000-10,000	--	$1.0x10^{-4}$	Simulation results	Camden area	Martin (1990, p. 103)
		MIDDLE AQUIFER OF THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM			
6,200-12,000	130-270	$2.1x10^{-4}$	Aquifer test	Burlington Twp., Burlington Co.	Rush (1968, p. 33)
22,000	200	$6.0x10^{-2}$	Aquifer test	Burlington Twp., Burlington Co.	Rush (1968, p. 33)
28,200-68,600	--	$1.1x10^{-4}$-$5.8x10^{-4}$	Aquifer test	Palmyra, Burlington Co.	Rush (1968, p. 33)
13,100-17,400	217-290	$1.0x10^{-4}$-$2.4x10^{-4}$	Aquifer test	Beverly, Burlington Co.	Rush (1968, p. 33)
20,000	200	$1.5x10^{-4}$	Aquifer test	Riverton, Gloucester Co.	Barksdale and others (1958, p. 97)
6,300	200	$1.5x10^{-4}$	Aquifer test	Gibbstown, Gloucester Co.	Barksdale and others (1958, p. 97)
8,300	350	$1.2x10^{-3}$	Aquifer test	Camden, Camden Co.	Barksdale and others (1958, p. 97)
6,000-35,000	--	$8.0x10^{-5}$-$8.0x10^{-3}$	Simulation results	N.J. Coastal Plain	Luzier (1980, p. 44)
4,000-10,000	--	$1.0x10^{-4}$	Simulation results	Camden area	Martin (1990, p. 102)
		LOWER AQUIFER OF THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM			
2,300-6,700	--	$1.0x10^{-4}$-$3.5x10^{-4}$	Aquifer test	Camden, Camden Co.	Farlekas and others (1976, p. 38)
3,200-3,700	--	$3.3x10^{-5}$-$1.5x10^{-3}$	Aquifer test	Camden, Camden Co.	Farlekas and others (1976, p. 38)
8,300	350	$1.2x10^{-3}$	Aquifer test	Camden, Camden Co.	Barksdale and others (1958, p. 97)
16,600	240	$1.0x10^{-3}$	Aquifer test	Haddon Heights, Camden Co.	Barksdale and others (1958, p. 97)
6,800-9,100	140-190	$9.0x10^{-5}$-$1.7x10^{-4}$	Aquifer test	Westville, Gloucester Co.	Barksdale and others (1958, p. 97)
6,000-35,000	--	$8.0x10^{-5}$-$8.0x10^{-3}$	Simulation results	N.J. Coastal Plain	Luzier (1980, p. 44)
4,000-10,000	--	$1.0x10^{-4}$	Simulation results	Camden area	Martin (1990, p. 101)

Geologic unit	Vertical hydraulic conductivity (ft/d)	Source of data	Location	Reference
Englishtown Formation (clayey-silt lithofacies)	$1.9x10^{-6}$	Laboratory test	Lakewood, Ocean Co.	Nichols (1977a, p. 58)
Merchantville Formation	$1.0x10^{-4}$-$4.0x10^{-4}$	Laboratory test	Winslow Township, Camden Co.	Farlekas and others (1976, p. 133-134)
Merchantville Formation and Woodbury Clay	$3.7x10^{-6}$-$6.0x10^{-5}$	Laboratory test	Fort Dix, Burlington Co.	Nichols (1977b, p. 58)
Merchantville Formation and Woodbury Clay	$3.6x10^{-6}$-$1.4x10^{-5}$	Laboratory test	Lakewood, Ocean Co.	Nichols (1977b, p. 58)
Merchantville Formation and Woodbury Clay	$4.3x10^{-6}$	Simulation results	Northern N.J. Coastal Plain	Nichols (1977a, p. 76)
Merchantville Formation and Woodbury Clay	$8.6x10^{-7}$-$1.7x10^{-3}$	Simulation results	N.J. Coastal Plain	Luzier (1980, p. 29)
Woodbury Clay	$1.0x10^{-4}$-$3.0x10^{-2}$	Laboratory test	Winslow Township, Camden Co.	Farlekas and others (1976, p. 133-134)

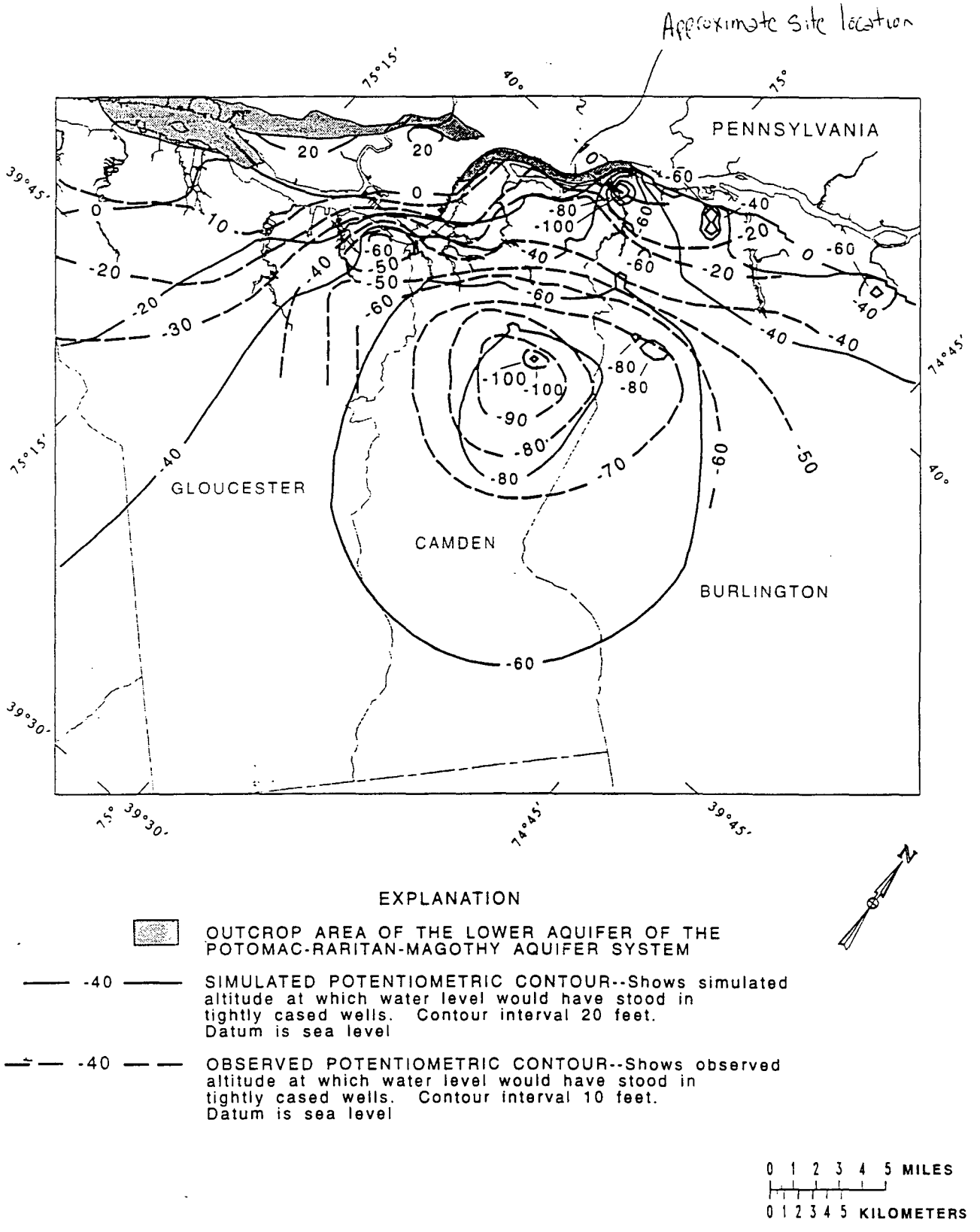
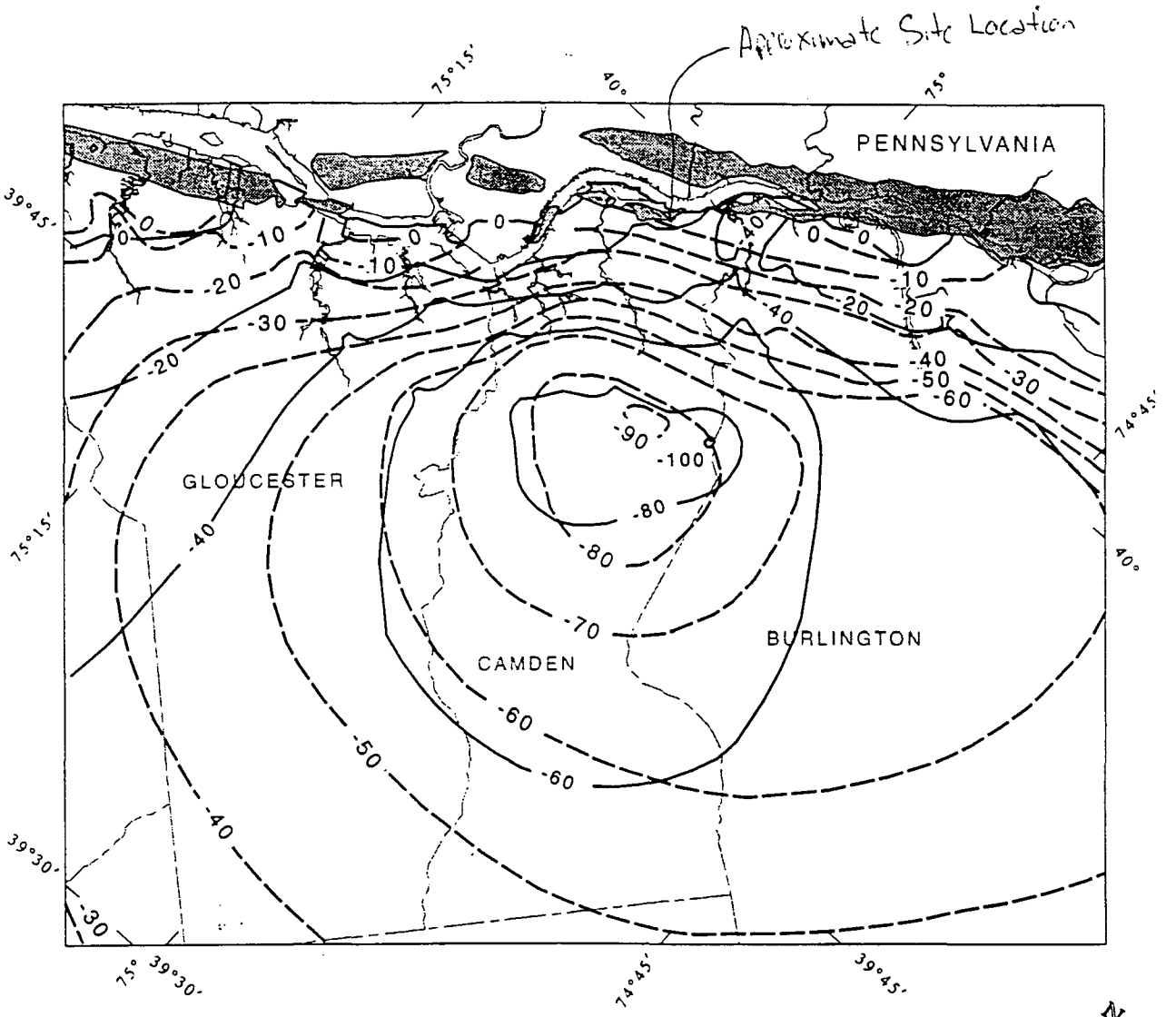


Figure 38. Simulated and measured fall 1988 potentiometric surfaces for the lower aquifer of the Potomac-Raritan-Magothy aquifer system.

013a



EXPLANATION

OUTCROP AREA OF THE MIDDLE AQUIFER OF THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM

—— -40 —— SIMULATED POTENTIOMETRIC CONTOUR--Shows simulated altitude at which water level would have stood in tightly cased wells. Contour interval 20 feet. Datum is sea level

— — -40 — — OBSERVED POTENTIOMETRIC CONTOUR--Shows observed altitude at which water level would have stood in tightly cased wells. Contour interval 10 feet. Datum is sea level

0 1 2 3 4 5 MILES

0 1 2 3 4 5 KILOMETERS

Figure 37. Simulated and measured fall 1988 potentiometric surfaces for the middle aquifer of the Potomac-Raritan-Magothy aquifer system.

0136

Table 5.--Well-location and -construction data

[WSCH, Wissahickon Schist; MRPA, Potomac-Raritan-Magothy aquifer system (undifferentiated); MRPAL, lower aquifer of the Potomac-Raritan-Magothy aquifer system; MRPAM, middle aquifer of the Potomac-Raritan-Magothy aquifer system; MRPAU, upper aquifer of the Potomac-Raritan-Magothy aquifer system; EGLS, Englishtown aquifer system; PNPN, Piney Point aquifer; QRNR, Quaternary sands; n/a, not applicable; --, missing information; DMS, degrees, minutes, seconds; TWP, Township; BORO, Borough; MUA, Municipal Utilities Authority; WD, Water Department; WC, Water Company; WCM, Water Commission; CC, Country Club; GC, Golf Club; TSA, Township Sewer Authority; (G), information from Greenman and others (1961); (P), information from Paulachok and others (1984)]

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
Ex. 9	Ex. 9	Ex. 9	BEVERLY CITY	Ex. 9			MRPAM	Ex. 9			
			BEVERLY CITY				MRPAM				
			BURLINGTON CITY				MRPAM				
			BURLINGTON CITY				MRPAU				
			BURLINGTON CITY				MRPAU				
			BURLINGTON CITY				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAU				
			BURLINGTON TWP				MRPAU				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
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			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				
			BURLINGTON TWP				MRPAM				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	[redacted]	[redacted]	BURLINGTON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
			BURLINGTON TWP				MRPAM				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPA				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP				MRPAL				
			CINNAMINSON TWP			5	MRPAM				
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPAM				
			DELANCO TWP				MRPAM				
			DELRAN TWP				MRPAL				
			DELRAN TWP				MRPAM				
			DELRAN TWP				MRPAM				
			DELRAN TWP				MRPAL				
			DELRAN TWP				MRPAM				
			DELRAN TWP				MRPAM				
			EDGEWATER PARK TWP				MRPA				
			EDGEWATER PARK TWP				MRPAL				
			EDGEWATER PARK TWP				MRPAM				
			EDGEWATER PARK TWP				MRPAM				
			EDGEWATER PARK TWP				MRPAM				
			EVESHAM TWP				MRPAU				
			EVESHAM TWP				MRPAU				
			EVESHAM TWP				MRPAU				
			FLORENCE TWP				MRPAM				
			FLORENCE TWP				MRPAM				
			FLORENCE TWP				MRPAM				
			FLORENCE TWP				MRPAM				
			MANSFIELD TWP				MRPAU				
			MANSFIELD TWP				MRPAM				
			MAPLE SHADE TWP				MRPAL				
			MAPLE SHADE TWP				MRPAU				

Ex. 9 Ex. 9 Ex. 9

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
Ex. 9			MAPLE SHADE TWP	Ex. 9			MRPAM	Ex. 9			
			MEDFORD TWP				MRPAU				
			MEDFORD TWP				MRPAU				
			MEDFORD TWP				MRPAU				
			MEDFORD TWP				MRPAU				
			MEDFORD TWP				MRPAU				
			MEDFORD TWP				EGLS				
			MEDFORD TWP				MRPAM				
			MEDFORD TWP				MRPAL				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAL				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN				MRPAL				
			MOORESTOWN TWP				MRPA				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAL				
			MOORESTOWN TWP				MRPAM				
			MOORESTOWN TWP				MRPAM				
			MOUNT HOLLY TWP				MRPAU				
			MOUNT HOLLY TWP				MRPAU				
			MOUNT HOLLY TWP				MRPAM				
			WESTAMPTON TWP				MRPAM				
			MOUNT LAUREL TWP				MRPAM				
			MOUNT LAUREL TWP				MRPAL				
			MOUNT LAUREL TWP				MRPAM				
			MOUNT LAUREL TWP				MRPAU				
			MOUNT LAUREL TWP				MRPAU				
			MOUNT LAUREL TWP				MRPAU				
			MOUNT LAUREL TWP				MRPAU				
			MOUNT LAUREL TWP				MRPAU				
			PALMYRA BORO				MRPAL				
			PEMBERTON TWP				MRPAM				
			PEMBERTON TWP				MRPAU				
			PEMBERTON TWP				MRPAM				
			RIVERSIDE TWP				MRPAM				
			RIVERSIDE TWP				MRPAM				
			RIVERSIDE TWP				MRPAL				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	SPRINGFIELD TWP	[redacted]	Ex. 9	[redacted]	MRPAU	[redacted]	Ex. 9	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	SPRINGFIELD TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	SPRINGFIELD TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	SPRINGFIELD TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WESTAMPTON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WESTAMPTON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	BURLINGTON CITY	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	EVESHAM TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WILLINGBORO TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	BURLINGTON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	WESTAMPTON TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MOUNT LAUREL TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	MOUNT LAUREL TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	EVESHAM TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	RIVERSIDE TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	BURLINGTON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	EVESHAM TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]			CINNAMINSON TWP	[redacted]			MRPAM	[redacted]			
			CINNAMINSON TWP				MRPAM				
			CINNAMINSON TWP				MRPAM				
			MOUNT LAUREL TWP				MRPAL				
			EVESHAM TWP				MRPAU				
			WESTAMPTON TWP				MRPAU				
			MOUNT LAUREL TWP				MRPAL				
			MOUNT LAUREL TWP				MRPAL				
			EVESHAM TWP				MRPAU				
			MOORESTOWN TWP				MRPAL				
			WILLINGBORO TWP				MRPAM				
			BARRINGTON BORO				MRPAU				
			BARRINGTON BORO				MRPAU				
			BELLMAWR BORO				MRPAL				
			BELLMAWR BORO				MRPAL				
			BELLMAWR BORO				MRPAU				
			BERLIN BORO				MRPAU				
			BERLIN BORO				MRPAU				
			BERLIN BORO				MRPAU				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAU				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAM				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPA				

Table 5.–Well-location and -construction data – continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	CAMDEN CITY	[redacted]	Ex. 9	[redacted]	MRPAL	[redacted]	Ex. 9	[redacted]	[redacted]
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAM				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAL				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAU				
			CHERRY HILL TWP				MRPAL				
			COLLINGSWOOD BORO				MRPAL				
			COLLINGSWOOD BORO				MRPAL				
			COLLINGSWOOD BORO				MRPAL				
			COLLINGSWOOD BORO				MRPAL				
			COLLINGSWOOD BORO				MRPAL				
			COLLINGSWOOD BORO				MRPAL				

Table 5.–Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	COLLINGSWOOD BORO	[redacted]	Ex. 9	[redacted]	MRPAL	[redacted]	Ex. 9	[redacted]	[redacted]
			GIBBSBORO BORO				MRPAL				
			GIBBSBORO BORO				MRPAL				
			GIBBSBORO BORO				MRPAL				
			GIBBSBORO BORO				MRPAM				
			GIBBSBORO BORO				MRPAL				
			GIBBSBORO BORO				MRPAL				
			GLOUCESTER CITY				MRPAU				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAM				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER CITY				MRPAL				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPA				
			GLOUCESTER TWP				MRPAU				
			GLOUCESTER TWP				MRPAL				
			GLOUCESTER TWP				MRPAU				
			BARRINGTON BORO				MRPAU				
			HADDON HEIGHTS BORO				MRPAL				
			HADDON HEIGHTS BORO				MRPAU				
			HADDON HEIGHTS BORO				MRPA				
			HADDON HEIGHTS BORO				MRPAL				
			HADDON HEIGHTS BORO				MRPAU				
			HADDON HEIGHTS BORO				MRPAL				

Table 5.–Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	HADDON HEIGHTS BORO	[redacted]	Ex. 9	[redacted]	MRPA	[redacted]	Ex. 9	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON HEIGHTS BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPA	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDON TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDONFIELD BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDONFIELD BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDONFIELD BORO	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	HADDONFIELD BORO	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	LAUREL SPRINGS BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	LAUREL SPRINGS BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MAGNOLIA BORO	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MAGNOLIA BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MAGNOLIA BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	MERCHANTVILLE BORO	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	OAKLYN BORO	[redacted]	[redacted]	[redacted]	MRPAU	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAM	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PENNSAUKEN TWP	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	PENNSAUKEN TWP	[redacted]	Ex. 9	[redacted]	MRPAL	[redacted]	Ex. 9	[redacted]	[redacted]
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PINE HILL BORO				MRPAU				
			PINE HILL BORO				MRPAU				
			RUNNEMEDE BORO				MRPAU				
			RUNNEMEDE BORO				MRPAU				
			SOMERDALE BORO				MRPAU				
			TAVISTOCK BORO				MRPAU				
			VOORHEES TWP				MRPAL				
			VOORHEES TWP				MRPAM				
			VOORHEES TWP				MRPAU				
			VOORHEES TWP				MRPAM				
			VOORHEES TWP				MRPAU				
			WINSLOW TWP				MRPA				
			WINSLOW TWP				MRPAU				
			BROOKLAWN BORO				MRPAL				
			CLEMENTON BORO				MRPAU				
			BELLMAWR BORO				MRPAL				
			HADDONFIELD BORO				MRPAL				
			CAMDEN CITY				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			MERCHANTVILLE BORO				MRPAL				
			CAMDEN CITY				MRPAL				
			CAMDEN CITY				MRPAM				
			GLOUCESTER CITY				MRPAU				
			BROOKLAWN BORO				MRPAL				
			CAMDEN CITY				MRPAL				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
Ex. 9			GLOUCESTER TWP	Ex. 9			MRPAU	Ex. 9			
			BELLMAWR BORO				MRPAL				
			HADDON TWP				MRPAL				
			PENNSAUKEN TWP				MRPAL				
			GLOUCESTER CITY				MRPA				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				MRPAM				
			CLAYTON BORO				MRPAU				
			CLAYTON BORO				MRPAU				
			DEPTFORD TWP				MRPAU				
			DEPTFORD TWP				MRPAU				
			DEPTFORD TWP				MRPAU				
			DEPTFORD TWP				MRPAU				
			DEPTFORD TWP				MRPAU				
			DEPTFORD TWP				MRPAM				
			EAST GREENWICH TWP				MRPAU				
			GLASSBORO BORO				MRPAU				
			GLASSBORO BORO				MRPAU				
			GLASSBORO BORO				MRPAU				
			GLASSBORO BORO				MRPAU				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAL				
			GREENWICH TWP				MRPAL				
			HARRISON TWP				MRPAU				
			HARRISON TWP				MRPAU				
			HARRISON TWP				MRPAU				
			HARRISON TWP				MRPAU				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	LOGAN TWP	[redacted]	Ex. 9	[redacted]	MRPAM	[redacted]	Ex. 9	[redacted]	[redacted]
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAL				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPA				
			LOGAN TWP				MRPA				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAL				
			MANTUA TWP				MRPAU				
			MANTUA TWP				MRPAU				
			MANTUA TWP				MRPAU				
			MANTUA TWP				MRPAU				
			NATIONAL PARK BORO				MRPAL				
			PAULSBORO BORO				MRPAM				
			PAULSBORO BORO				MRPAM				
			PAULSBORO BORO				MRPAM				
			PAULSBORO BORO				MRPAL				
			PAULSBORO BORO				MRPAL				
			PITMAN BORO				MRPAU				
			PITMAN BORO				MRPAU				
			SWEDESBORO BORO				MRPAM				
			SWEDESBORO BORO				MRPAM				
			SWEDESBORO BORO				MRPA				
			SWEDESBORO BORO				MRPAU				
			SWEDESBORO BORO				MRPAM				
			WASHINGTON TWP				MRPAU				
			WASHINGTON TWP				MRPAU				
			WASHINGTON TWP				MRPAU				
			WASHINGTON TWP				MRPAU				
			WASHINGTON TWP				MRPAU				
			WENONAH BORO				MRPAU				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
Ex. 9			WENONAH BORO	Ex. 9			MRPAU	Ex. 9			
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAM				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAL				
			WESTVILLE BORO				MRPAL				
			WESTVILLE BORO				MRPAL				
			WOODBURY HGTS BORO				MRPAU				
			WOODBURY CITY				MRPAL				
			WOODBURY CITY				MRPAU				
			WOODBURY CITY				MRPAU				
			WOOLWICH TWP				MRPAU				
			WOOLWICH TWP				MRPAU				
			WOOLWICH TWP				MRPAU				
			HARRISON TWP				MRPAU				

Table 5.--Well-location and -construction data – continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
Ex. 9			GREENWICH TWP	Ex. 9			MRPAM	Ex. 9			
			GREENWICH TWP				MRPAM				
			LOGAN TWP				MRPAL				
			LOGAN TWP				MRPAL				
			LOGAN TWP				MRPAM				
			EAST GREENWICH TWP				MRPAU				
			GREENWICH TWP				MRPAM				
			GLASSBORO BORO				MRPAU				
			SOUTH HARRISON TWP				MLRW				
			WEST DEPTFORD TWP				MRPAL				
			DEPTFORD TWP				MRPAM				
			MANTUA TWP				MRPAU				
			LOGAN TWP				MRPAM				
			WOOLWICH TWP				MRPAU				
			WOOLWICH TWP				MRPAU				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAL				
			GREENWICH TWP				MRPAL				
			GREENWICH TWP				MRPAL				
			WEST DEPTFORD TWP				MRPAM				
			WEST DEPTFORD TWP				MRPAL				
			WOODBURY CITY				MRPAM				
			WASHINGTON TWP				MRPAU				
			WESTVILLE BORO				MRPAL				
			WEST DEPTFORD TWP				MRPAM				
			WOODBURY CITY				MRPAU				
			WEST DEPTFORD TWP				MRPAL				
			PAULSBORO BORO				MRPAL				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			E GREENWICH TWP				MRPAU				
			GREENWICH TWP				MRPAU				
			GREENWICH TWP				MRPAU				
			NATIONAL PARK BORO				MRPAL				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPA				
			LOGAN TWP				MRPAM				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	LOGAN TWP	[redacted]	Ex. 9	[redacted]	MRPAU	[redacted]	Ex. 9	[redacted]	[redacted]
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			LOGAN TWP				MRPAM				
			LOGAN TWP				MRPAU				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAL				
			PAULSBORO BORO				QRNR				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			PAULSBORO BORO				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			LOGAN TWP				MRPAM				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			LOGAN TWP				MRPAU				
			PAULSBORO BORO				QRNR				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]			PAULSBORO BORO	[redacted]			QRNR	[redacted]			
			GREENWICH TWP				MRPAL				
			GREENWICH TWP				MRPAL				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAU				
			GREENWICH TWP				MRPAL				
			MANTUA TWP				MRPAU				
			MANTUA TWP				MRPAL				
			NATIONAL PARK BORO				MRPAL				
			NATIONAL PARK BORO				MRPAM				
			NATIONAL PARK BORO				MRPAL				
			NATIONAL PARK BORO				MRPAU				
			NATIONAL PARK BORO				MRPAM				
			NATIONAL PARK BORO				MRPAM				
			NATIONAL PARK BORO				MRPAU				
			NATIONAL PARK BORO				MRPAU				
			NATIONAL PARK BORO				MRPAM				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
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			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				QRNR				
			GREENWICH TWP				MRPAM				
			GREENWICH TWP				MRPAM				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	PAULSBORO BORO	[redacted]	Ex. 9	[redacted]	QRNR	[redacted]	Ex. 9	[redacted]	[redacted]
			PAULSBORO BORO				MRPAU				
			CLAYTON BORO				MRPAM				
			CLAYTON BORO				MRPAL				
			DEPTFORD TWP				MRPAU				
			WASHINGTON TWP				MRPAL				
			MANTUA TWP				MRPAU				
			WASHINGTON TWP				MRPAU				
			WOOLWICH TWP				MRPAU				
			PAULSBORO BORO				MRPAM				
			GREENWICH TWP				MRPAL				
			OLDMANS TWP				MRPAU				
			OLDMANS TWP				MRPAM				
			OLDMANS TWP				MRPAL				
			PILESGROVE TWP				MRPAL				
			TINICUM				--				
			BRISTOL				--				
			PHILADELPHIA				WSCK				
			PHILADELPHIA				--				
			PHILADELPHIA				--				
			PHILADELPHIA				--				
			BENSALEM				--				
			BENSALEM				--				
			BENSALEM				--				
			BRISTOL				--				
			BRISTOL				--				
			BURLINGTON CITY				--				
			BURLINGTON TWP				--				
			PHILADELPHIA				WSCK				
			BRISTOL				--				
			BRISTOL				--				
			TINICUM				--				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				MRPAM				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				MRPAL				
			PHILADELPHIA				--				
			PHILADELPHIA				--				

Table 5.--Well-location and -construction data -- continued.

Well Number	Owner	Local Identifier	Municipality	Latitude (DMS)	Longitude (DMS)	Land-Surface Elevation (ft)	Aquifer	Depth of Well (ft)	Depth to Well Opening (ft)	Bottom of Well Opening (ft)	N.J. Well Permit Number
[redacted]	Ex. 9	[redacted]	PHILADELPHIA	[redacted]	Ex. 9	[redacted]	MRPAL	[redacted]	Ex. 9	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	WSCK	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	MRPAL	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	PHILADELPHIA	[redacted]	[redacted]	[redacted]	--	[redacted]	[redacted]	[redacted]	[redacted]

REFERENCE NO. 17

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
CAMDEN,
NEW JERSEY
CAMDEN COUNTY

PANEL 3 OF 5
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
340128 0003 B

EFFECTIVE DATE:
DECEMBER 1, 1981

federal emergency management agency
federal insurance administration

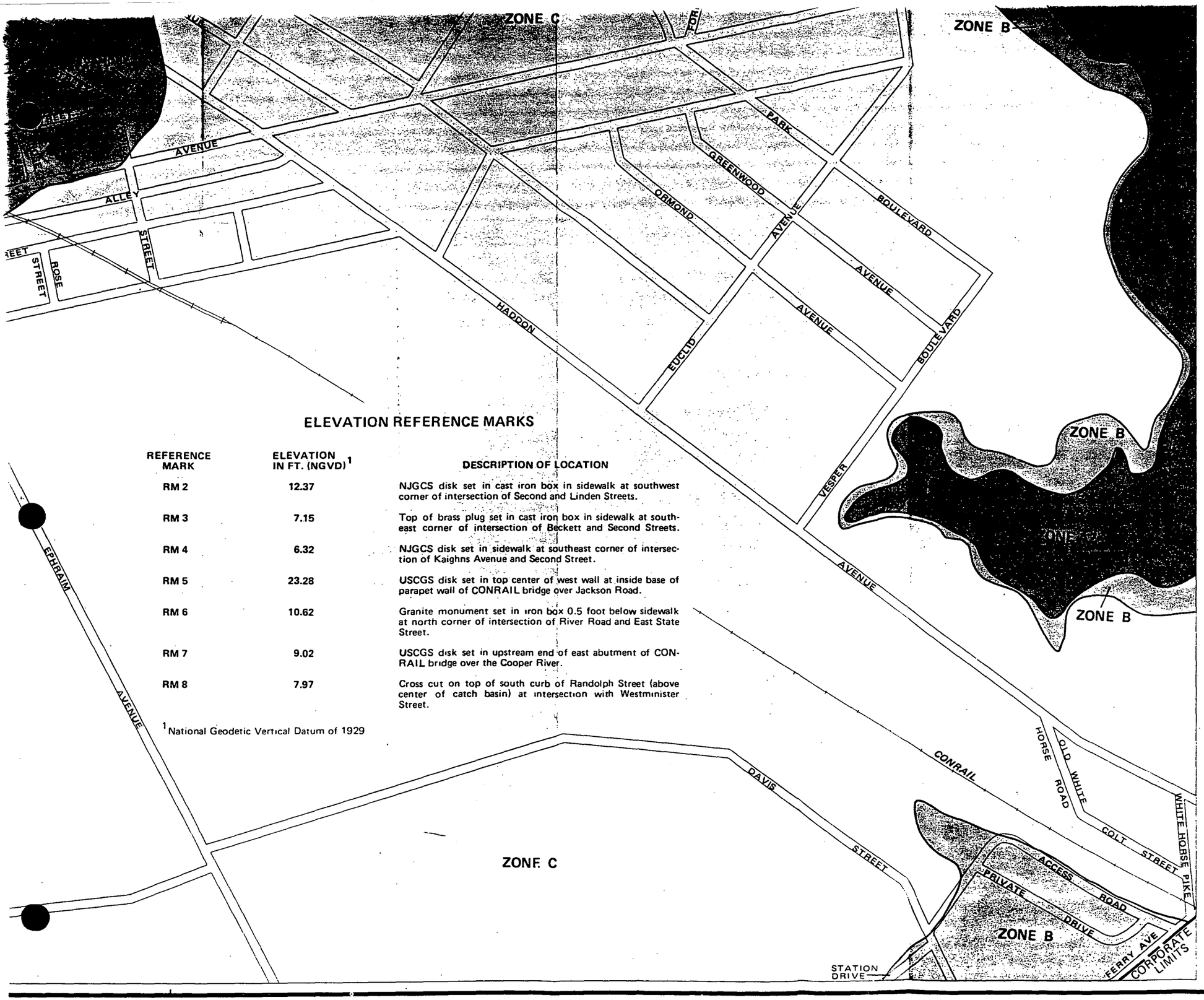
ZONE C
ZONE B
STATE
STREET
HOWELL
STEWART
HIGH
STREET
22ND
23RD
21ST
STREET
STREET
STREET
COOPER STREET
SCOTT
ALLEY
STREET
20TH
STREET
18TH
FEDERAL
STREET
STREET
STREET
ZONE B
ZONE B
MEMORIAL AVENUE
STREET
AVENUE
MEMORIAL AVENUE
ADMIRAL
ANDERS
ZONE B
ZONE B
ZONE B
MEMORIAL AVENUE
MEMORIAL
STREET
AVENUE
MAGNOLIA
EMPIRE
LANGHAM
BOULEVARD
AVENUE
KENWOOD
AVENUE
AVENUE
PRINCESS
AVENUE
PARK
AVENUE
JOINT
ALLEY
AVENUE
NON STREET
ROSS ST
LOUIS
ORCAHRD STREET
STREET
SYCAMORE STREET
STREET
STREET
LOUIS
STREET
ROSE
AVENUE
ZONE C
BAIRD
MEADOW DRIVE
SUNNYSIDE DRIVE
MEADOW
GLEN
FOREST DRIVE
PARK

structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

400 0 400 FEET



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 2	12.37	NJGCS disk set in cast iron box in sidewalk at southwest corner of intersection of Second and Linden Streets.
RM 3	7.15	Top of brass plug set in cast iron box in sidewalk at southeast corner of intersection of Beckett and Second Streets.
RM 4	6.32	NJGCS disk set in sidewalk at southeast corner of intersection of Kaighns Avenue and Second Street.
RM 5	23.28	USCGS disk set in top center of west wall at inside base of parapet wall of CONRAIL bridge over Jackson Road.
RM 6	10.62	Granite monument set in iron box 0.5 foot below sidewalk at north corner of intersection of River Road and East State Street.
RM 7	9.02	USCGS disk set in upstream end of east abutment of CONRAIL bridge over the Cooper River.
RM 8	7.97	Cross cut on top of south curb of Randolph Street (above center of catch basin) at intersection with Westminister Street.

[1] National Geodetic Vertical Datum of 1929

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF CAMDEN, NEW JERSEY
CAMDEN COUNTY

PANEL 3 OF 5
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
340128 0003 B

EFFECTIVE DATE:
DECEMBER 1, 1981

federal emergency management agency
federal insurance administration

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation In Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7 ×

River Mile — • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
APRIL 12, 1974
FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 22, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
DECEMBER 1, 1981
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

N

APPROXIMATE SCALE
400 0 400 FEET

REFERENCE NO. 18

POPULATION DATA FOR MONSANTO SITE

	0-0.25 mile	.25-0.5 mil	0.5-1.0 mile	1.0-2.0 mile	2.0-3.0 mile	3.0-4.0 mile	Total
NJ-Area	921.67	4379.78	28559.79	59961.2	46262.04	45663.48	185748
PA-Area	0	0	0	247.7	79555.92	198555	278358.6
Total	921.67	4379.78	28559.79	60208.9	125818	244218.5	**464106.6**
cum.-total	921.67	5301.45	33861.24	94070.14	219888.1	464106.6	464106.6

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(860) 767-7644 FAX (860) 767-1971

June 18, 1996

To: Roy F. Weston Inc Region II START
1090 King Georges Post Road
Suite 201
Edison, NJ 088837-3703

Attn: Dennis Foerter

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Camden, NJ Site
Camden, NJ NEW JERSEY PORTION

CERCLIS:

Job: 1277

Site Longitude: 75-06-15 75.104156
Site Latitude : 39-56-20 39.938889

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to

determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

No.	City	Block Group ID	Blk Grp People	House Holds	Public Water	Drilled Wells	Dug Wells	Other
1	Camden	34007 6001 1	477	11	3	0	0	0
2	Camden	34007 6001 2	136	11	8	0	0	0
3	Camden	34007 6001 3	159	26	29	0	0	0
4	Camden	34007 6001 4	41	6	7	0	0	0
5	Camden	34007 6001 5	46	17	17	0	0	0
6	Camden	34007 6001 6	1377	5	0	0	0	0
7	Camden	34007 6002 1	10	4	7	0	0	0
8	Camden	34007 6002 2	1	1	0	0	0	0
9	Camden	34007 6002 3	44	30	32	0	0	0
10	Camden	34007 6002 4	546	189	207	0	0	0
11	Camden	34007 6002 5	399	160	188	0	0	0
12	Camden	34007 6002 6	613	283	307	0	0	0
13	Camden	34007 6002 7	1333	480	418	0	0	0
14	Camden	34007 6003 1	1029	380	350	0	0	13
15	Camden	34007 6003 2	1071	530	537	0	0	0
16	Camden	34007 6003 3	853	290	302	0	0	0
17	Camden	34007 6003 4	1153	408	406	0	0	0
18	Camden	34007 6004 1	1243	469	498	0	0	0
19	Camden	34007 6004 2	641	221	233	0	0	7
20	Camden	34007 6004 3	668	249	216	0	0	26
21	Camden	34007 6004 4	712	219	183	0	0	0
22	Camden	34007 6004 5	1157	370	362	0	0	0
23	Camden	34007 6005 1	52	24	14	0	0	0
24	Camden	34007 6005 2	310	116	116	0	0	0
25	Camden	34007 6005 3	474	455	464	0	0	0
26	Camden	34007 6006 1	41	27	19	0	0	0
27	Camden	34007 6006 2	320	203	203	0	0	0
28	Camden	34007 6006 3	147	51	57	0	0	0
29	Camden	34007 6006 4	68	33	39	0	0	0
30	Camden	34007 6006 5	0	0	0	0	0	0
31	Camden	34007 6007 1	802	198	212	0	0	0
32	Camden	34007 6007 2	145	63	65	0	0	0
33	Camden	34007 6007 3	224	54	54	0	0	0
34	Camden	34007 6007 4	522	154	175	0	0	0
35	Camden	34007 6007 5	858	76	73	0	0	0
36	Camden	34007 6008 1	816	220	215	0	0	0
37	Camden	34007 6008 2	1082	279	293	0	0	0
38	Camden	34007 6008 3	998	479	445	0	0	0
39	Camden	34007 6008 4	245	79	68	0	0	0
40	Camden	34007 6008 5	1	1	0	0	0	0
41	Camden	34007 6008 6	546	350	395	0	0	0
42	Camden	34007 6008 7	952	265	229	0	0	0
43	Camden	34007 6008 8	1536	392	386	0	0	0
44	Camden	34007 6009 1	431	134	118	0	0	0
45	Camden	34007 6009 2	447	136	142	0	0	0
46	Camden	34007 6009 3	1128	307	306	0	0	0
47	Camden	34007 6009 4	603	174	189	0	0	0
48	Camden	34007 6009 5	1998	633	614	0	8	7
49	Camden	34007 6010 1	1824	655	662	0	0	0
50	Camden	34007 6010 2	1164	367	368	0	0	0
51	Camden	34007 6010 3	1174	443	432	0	0	0
52	Camden	34007 6010 4	1338	414	409	8	0	0
53	Camden	34007 6011 1	2918	1165	1171	0	13	0
54	Camden	34007 6011 2	1561	526	501	0	0	0
55	Camden	34007 6011 3	1310	407	336	0	84	0

56	Camden	34007	6011	4	1722	547	509	0	36	0
57	Camden	34007	6011	5	1019	390	372	6	0	0
58	Camden	34007	6011	6	1615	455	398	16	48	0
59	Camden	34007	6012	1	1295	412	372	0	0	0
60	Camden	34007	6012	2	1572	478	441	0	0	0
61	Camden	34007	6012	3	1903	541	593	0	0	0
62	Camden	34007	6012	4	1703	518	543	0	0	0
63	Camden	34007	6013	1	1191	385	392	0	0	0
64	Camden	34007	6013	2	2050	692	682	0	0	0
65	Camden	34007	6013	3	1882	648	677	0	0	0
66	Camden	34007	6013	4	1312	566	546	0	0	0
67	Camden	34007	6013	5	169	41	35	0	0	0
68	Camden	34007	6014	1	1058	360	317	0	0	0
69	Camden	34007	6014	2	1125	389	425	0	0	0
70	Camden	34007	6014	3	958	349	351	0	0	0
71	Camden	34007	6014	4	1313	421	426	0	0	0
72	Camden	34007	6014	5	1161	397	397	0	0	0
73	Camden	34007	6015	1	891	318	301	0	0	0
74	Camden	34007	6015	2	1657	543	549	0	0	0
75	Camden	34007	6015	3	1505	490	507	0	0	0
76	Camden	34007	6015	4	951	330	286	0	0	9
77	Camden	34007	6015	5	1785	867	896	0	0	0
78	Camden	34007	6016	1	551	167	162	0	0	0
79	Camden	34007	6016	2	435	159	137	0	0	0
80	Camden	34007	6016	3	453	193	217	0	0	0
81	Camden	34007	6016	4	315	112	108	0	0	0
82	Camden	34007	6016	5	931	309	296	0	0	0
83	Camden	34007	6017	1	591	155	179	0	0	0
84	Camden	34007	6017	2	355	179	195	0	0	0
85	Camden	34007	6017	3	363	153	168	0	0	0
86	Camden	34007	6017	4	1274	453	449	0	0	0
87	Camden	34007	6017	5	473	145	127	0	0	0
88	Camden	34007	6017	6	507	183	170	0	0	0
89	Camden	34007	6018	1	187	63	43	0	0	0
90	Camden	34007	6018	2	18	8	4	0	0	0
91	Camden	34007	6018	3	708	221	203	0	0	0
92	Camden	34007	6018	4	440	162	148	0	0	0
93	Camden	34007	6018	5	411	134	112	0	0	0
94	Camden	34007	6018	6	587	194	182	0	0	0
95	Camden	34007	6019	1	1487	483	475	0	0	0
96	Camden	34007	6019	2	1980	680	748	0	0	0
97	Camden	34007	6019	3	492	147	177	0	0	0
98	Camden	34007	6020	1	1222	685	761	0	0	0
99	Camden	34007	6020	2	966	418	432	0	0	0
100	Camden	34007	6020	3	776	331	300	0	0	0
101	Camden	34007	6020	4	985	430	409	0	0	0
102	Camden	34007	6020	5	604	259	231	0	0	0
103	Camden	34007	6020	6	800	339	329	0	0	0
104	Pennsauken	34007	6028	1	757	283	291	0	0	0
105	Pennsauken	34007	6028	2	1121	405	412	0	0	0
106	Pennsauken	34007	6028	3	924	317	302	0	0	0
107	Merchantville	34007	6031	1	1020	419	411	0	0	0
108	Merchantville	34007	6031	2	1202	452	481	0	0	0
109	Merchantville	34007	6031	3	921	396	398	0	0	0
110	Merchantville	34007	6031	4	927	381	357	0	0	0
111	Cherry Hill	34007	6032	1	1036	379	407	0	0	0
112	Cherry Hill	34007	6032	2	1781	389	374	8	0	0
113	Cherry Hill	34007	6032	3	510	285	302	0	0	0
114	Cherry Hill	34007	6032	4	1114	413	387	0	0	0
115	Cherry Hill	34007	6032	5	1087	397	389	0	0	0
116	Cherry Hill	34007	6032	6	650	234	233	0	0	0

117	Cherry Hill	34007	6037	4	444	179	154	0	0	0
118	Haddon	34007	6038	1	826	310	312	0	0	0
119	Haddon	34007	6038	2	978	346	347	0	0	0
120	Haddon	34007	6038	3	722	286	287	0	0	0
121	Haddon	34007	6038	4	930	331	296	0	0	9
122	Haddon	34007	6038	5	936	387	416	0	0	0
123	Haddon	34007	6038	6	803	321	322	0	0	0
124	Haddon	34007	6040	1	221	83	85	0	0	0
125	Haddon	34007	6040	2	265	113	119	0	0	0
126	Haddon	34007	6040	3	334	134	132	0	0	0
127	Haddon	34007	6040	4	236	91	79	0	0	0
128	Haddon	34007	6040	5	297	115	102	0	0	0
129	Haddon	34007	6040	6	395	150	139	0	0	0
130	Woodlynne	34007	6041	1	1215	428	434	0	0	0
131	Woodlynne	34007	6041	2	1332	511	513	0	0	0
132	Collingswood	34007	6042	1	764	302	312	0	0	0
133	Collingswood	34007	6042	2	752	334	327	0	0	0
134	Collingswood	34007	6042	3	827	315	309	0	0	0
135	Collingswood	34007	6042	4	1377	625	613	0	0	7
136	Collingswood	34007	6043	1	648	253	236	0	0	0
137	Collingswood	34007	6043	2	1140	426	397	0	0	0
138	Collingswood	34007	6043	3	1235	537	533	0	0	0
139	Collingswood	34007	6043	4	1043	458	491	0	0	0
140	Collingswood	34007	6044	1	760	282	290	0	0	0
141	Collingswood	34007	6044	2	1244	491	485	0	0	0
142	Collingswood	34007	6044	3	650	278	272	0	0	0
143	Collingswood	34007	6044	4	809	363	367	0	0	0
144	Collingswood	34007	6045	1	510	250	226	0	0	0
145	Collingswood	34007	6045	2	2370	1333	1388	4	0	0
146	Collingswood	34007	6045	3	567	234	205	0	0	0
147	Collingswood	34007	6045	4	617	261	255	0	0	0
148	Oaklyn	34007	6046	1	1178	489	494	0	0	0
149	Oaklyn	34007	6046	2	1122	590	606	0	0	0
150	Oaklyn	34007	6047	1	1182	447	417	0	0	0
151	Oaklyn	34007	6047	2	948	361	370	0	0	0
152	Audubon Park	34007	6048	1	1150	498	511	1	0	0
153	Gloucester City	34007	6049	1	1056	388	361	0	0	0
154	Gloucester City	34007	6049	2	573	222	220	0	0	0
155	Gloucester City	34007	6049	3	702	244	252	0	0	0
156	Gloucester City	34007	6049	4	958	346	367	0	0	0
157	Gloucester City	34007	6050	1	1161	405	445	0	0	0
158	Gloucester City	34007	6050	2	995	351	372	0	0	0
159	Gloucester City	34007	6050	3	404	171	161	0	0	0
160	Gloucester City	34007	6051	1	1428	538	501	0	0	0
161	Gloucester City	34007	6051	2	1127	409	395	0	0	0
162	Gloucester City	34007	6052	1	868	361	336	0	0	0
163	Gloucester City	34007	6052	2	1088	482	452	7	0	0
164	Gloucester City	34007	6052	3	1225	593	625	0	0	0
165	Brooklawn	34007	6053	1	911	364	355	0	0	0
166	Brooklawn	34007	6053	2	668	296	291	0	0	0
167	Mount Ephraim	34007	6054	1	856	315	282	0	0	0
168	Mount Ephraim	34007	6055	1	928	391	356	0	0	0
169	Mount Ephraim	34007	6055	2	847	390	401	0	0	0
170	Audubon	34007	6057	1	915	351	354	0	0	0
171	Audubon	34007	6057	2	1207	437	421	0	0	0
172	Audubon	34007	6057	3	968	459	455	0	17	0
173	Audubon	34007	6057	4	772	352	352	0	0	0
174	Haddonfield	34007	6061	1	1093	446	429	0	0	0
175	Haddonfield	34007	6061	2	1172	440	424	0	0	0
176	Haddonfield	34007	6062	1	1075	378	376	0	0	0
177	Haddonfield	34007	6062	4	1277	530	536	0	0	0

178	Pennsauken	34007	6101 1	110	9	7	0	0	0
179	Gloucester City	34007	6102 1	1290	527	542	2	0	0
180	Pennsauken	34007	6025011	20	4	0	0	0	0
181	Pennsauken	34007	6025012	0	0	0	0	0	0
182	Pennsauken	34007	6025021	1436	771	789	0	0	0
183	Pennsauken	34007	6025031	935	317	299	0	0	0
184	Pennsauken	34007	6025032	623	227	234	0	0	0
185	Pennsauken	34007	6025033	964	308	305	0	0	0
186	Pennsauken	34007	6026011	549	203	223	0	0	0
187	Pennsauken	34007	6026012	889	324	319	0	0	0
188	Pennsauken	34007	6026013	391	144	137	0	0	0
189	Pennsauken	34007	6026014	825	300	300	0	0	0
190	Pennsauken	34007	6026021	1451	563	559	0	0	0
191	Pennsauken	34007	6026022	1088	409	403	0	0	0
192	Pennsauken	34007	6027019	50	21	18	0	0	0
193	Pennsauken	34007	6027021	778	276	301	0	0	0
194	Pennsauken	34007	6027022	768	340	366	0	0	0
195	Pennsauken	34007	6027023	976	318	313	0	0	0
196	Pennsauken	34007	6027024	613	210	205	0	0	0
197	Pennsauken	34007	6027025	635	214	247	0	0	0
198	Pennsauken	34007	6027031	955	365	329	0	0	0
199	Pennsauken	34007	6027032	1312	469	434	0	0	0
200	Pennsauken	34007	6027999	0	0	0	0	0	0
201	Pennsauken	34007	6029011	2551	790	746	0	0	0
202	Pennsauken	34007	6029014	603	211	215	0	0	0
203	Pennsauken	34007	6029021	1649	529	513	0	0	0
204	Pennsauken	34007	6029022	1624	648	665	0	0	0
205	Pennsauken	34007	6030011	679	239	237	0	0	0
206	Pennsauken	34007	6030012	1036	390	413	0	0	0
207	Pennsauken	34007	6030013	694	224	214	0	0	0
208	Pennsauken	34007	6030014	781	273	268	0	0	0
209	Pennsauken	34007	6030015	617	224	220	0	0	0
210	Pennsauken	34007	6030021	760	288	260	0	0	0
211	Pennsauken	34007	6030022	968	347	301	0	0	0
212	Pennsauken	34007	6030023	680	251	227	0	0	0
213	Pennsauken	34007	6030024	1197	433	440	0	0	0
214	Pennsauken	34007	6030025	947	309	400	0	0	0
215	Cherry Hill	34007	6033011	2981	1606	1585	0	0	0
216	Cherry Hill	34007	6033012	733	250	213	7	0	0
217	Haddon	34007	6039011	303	119	117	0	0	0
218	Haddon	34007	6039012	887	376	369	0	0	0
219	Haddon	34007	6039013	471	191	171	0	0	0
220	Haddon	34007	6039014	912	389	393	0	0	0
221	Haddon	34007	6039015	939	493	507	0	0	0
222	Haddon	34007	6039016	954	443	447	0	0	0
223	Haddon	34007	6039017	639	245	252	0	0	0
224	Haddon	34007	6039021	2765	1458	1497	0	0	0
225	Audubon	34007	6056011	1160	551	547	0	0	0
226	Audubon	34007	6056012	1150	426	426	0	0	0
227	Audubon	34007	6056021	987	412	426	0	0	0
228	Audubon	34007	6056022	965	369	370	0	0	0
229	Audubon	34007	6056023	1081	399	388	0	0	0
230	Westville	34015	5001 1	1050	386	366	0	0	0
	Totals:			205064	77047	76484	59	206	78

City	Census Tract ID	Tract People	House Count	Public Water	Drilled Wells	Dug Wells	Other Sources
Audubon	34007 6057 4	772	352	352	0	0	0
Audubon	34007 6056023	1081	399	388	0	0	0
Audubon	34007 6057 1	915	351	354	0	0	0
Audubon	34007 6056011	1160	551	547	0	0	0
Audubon	34007 6056012	1150	426	426	0	0	0
Audubon	34007 6056022	965	369	370	0	0	0
Audubon	34007 6057 2	1207	437	421	0	0	0
Audubon	34007 6057 3	968	459	455	0	17	0
Audubon	34007 6056021	987	412	426	0	0	0
	Sub Totals:	9205	3756	3739	0	17	0
Audubon Park	34007 6048 1	1150	498	511	1	0	0
	Sub Totals:	1150	498	511	1	0	0
Brooklawn	34007 6053 2	668	296	291	0	0	0
Brooklawn	34007 6053 1	911	364	355	0	0	0
	Sub Totals:	1579	660	646	0	0	0
Camden	34007 6001 3	159	26	29	0	0	0
Camden	34007 6001 4	41	6	7	0	0	0
Camden	34007 6001 5	46	17	17	0	0	0
Camden	34007 6002 4	546	189	207	0	0	0
Camden	34007 6003 4	1153	408	406	0	0	0
Camden	34007 6004 1	1243	469	498	0	0	0
Camden	34007 6001 6	1377	5	0	0	0	0
Camden	34007 6004 3	668	249	216	0	0	26
Camden	34007 6002 1	10	4	7	0	0	0
Camden	34007 6004 2	641	221	233	0	0	7
Camden	34007 6003 3	853	290	302	0	0	0
Camden	34007 6005 2	310	116	116	0	0	0
Camden	34007 6002 5	399	160	188	0	0	0
Camden	34007 6002 6	613	283	307	0	0	0
Camden	34007 6002 7	1333	480	418	0	0	0
Camden	34007 6004 4	712	219	183	0	0	0
Camden	34007 6002 2	1	1	0	0	0	0
Camden	34007 6001 2	136	11	8	0	0	0
Camden	34007 6007 1	802	198	212	0	0	0
Camden	34007 6007 2	145	63	65	0	0	0
Camden	34007 6007 3	224	54	54	0	0	0
Camden	34007 6007 4	522	154	175	0	0	0
Camden	34007 6007 5	858	76	73	0	0	0
Camden	34007 6008 1	816	220	215	0	0	0
Camden	34007 6002 3	44	30	32	0	0	0
Camden	34007 6008 3	998	479	445	0	0	0
Camden	34007 6008 4	245	79	68	0	0	0
Camden	34007 6008 5	1	1	0	0	0	0
Camden	34007 6008 6	546	350	395	0	0	0
Camden	34007 6003 1	1029	380	350	0	0	13
Camden	34007 6003 2	1071	530	537	0	0	0
Camden	34007 6009 1	431	134	118	0	0	0
Camden	34007 6009 2	447	136	142	0	0	0
Camden	34007 6009 3	1128	307	306	0	0	0
Camden	34007 6009 4	603	174	189	0	0	0

Camden	34007 6009	5	1998	633	614	0	8	7
Camden	34007 6010	1	1824	655	662	0	0	0
Camden	34007 6004	5	1157	370	362	0	0	0
Camden	34007 6005	1	52	24	14	0	0	0
Camden	34007 6010	4	1338	414	409	8	0	0
Camden	34007 6005	3	474	455	464	0	0	0
Camden	34007 6006	1	41	27	19	0	0	0
Camden	34007 6006	2	320	203	203	0	0	0
Camden	34007 6008	7	952	265	229	0	0	0
Camden	34007 6008	8	1536	392	386	0	0	0
Camden	34007 6006	5	0	0	0	0	0	0
Camden	34007 6012	1	1295	412	372	0	0	0
Camden	34007 6012	2	1572	478	441	0	0	0
Camden	34007 6012	3	1903	541	593	0	0	0
Camden	34007 6012	4	1703	518	543	0	0	0
Camden	34007 6013	1	1191	385	392	0	0	0
Camden	34007 6013	2	2050	692	682	0	0	0
Camden	34007 6013	3	1882	648	677	0	0	0
Camden	34007 6013	4	1312	566	546	0	0	0
Camden	34007 6013	5	169	41	35	0	0	0
Camden	34007 6014	1	1058	360	317	0	0	0
Camden	34007 6014	2	1125	389	425	0	0	0
Camden	34007 6014	3	958	349	351	0	0	0
Camden	34007 6014	4	1313	421	426	0	0	0
Camden	34007 6014	5	1161	397	397	0	0	0
Camden	34007 6015	1	891	318	301	0	0	0
Camden	34007 6015	2	1657	543	549	0	0	0
Camden	34007 6015	3	1505	490	507	0	0	0
Camden	34007 6015	4	951	330	286	0	0	9
Camden	34007 6015	5	1785	867	896	0	0	0
Camden	34007 6016	1	551	167	162	0	0	0
Camden	34007 6016	2	435	159	137	0	0	0
Camden	34007 6016	3	453	193	217	0	0	0
Camden	34007 6016	4	315	112	108	0	0	0
Camden	34007 6016	5	931	309	296	0	0	0
Camden	34007 6017	1	591	155	179	0	0	0
Camden	34007 6006	3	147	51	57	0	0	0
Camden	34007 6006	4	68	33	39	0	0	0
Camden	34007 6001	1	477	11	3	0	0	0
Camden	34007 6017	5	473	145	127	0	0	0
Camden	34007 6017	6	507	183	170	0	0	0
Camden	34007 6018	1	187	63	43	0	0	0
Camden	34007 6018	2	18	8	4	0	0	0
Camden	34007 6018	3	708	221	203	0	0	0
Camden	34007 6018	4	440	162	148	0	0	0
Camden	34007 6018	5	411	134	112	0	0	0
Camden	34007 6018	6	587	194	182	0	0	0
Camden	34007 6019	1	1487	483	475	0	0	0
Camden	34007 6019	2	1980	680	748	0	0	0
Camden	34007 6019	3	492	147	177	0	0	0
Camden	34007 6020	1	1222	685	761	0	0	0
Camden	34007 6020	2	966	418	432	0	0	0
Camden	34007 6020	3	776	331	300	0	0	0
Camden	34007 6020	4	985	430	409	0	0	0
Camden	34007 6020	5	604	259	231	0	0	0
Camden	34007 6020	6	800	339	329	0	0	0
Camden	34007 6011	2	1561	526	501	0	0	0
Camden	34007 6017	2	355	179	195	0	0	0
Camden	34007 6017	3	363	153	168	0	0	0
Camden	34007 6017	4	1274	453	449	0	0	0
Camden	34007 6010	2	1164	367	368	0	0	0

Camden	34007	6010	3	1174	443	432	0	0	0
Camden	34007	6011	1	2918	1165	1171	0	13	0
Camden	34007	6011	3	1310	407	336	0	84	0
Camden	34007	6011	5	1019	390	372	6	0	0
Camden	34007	6011	6	1615	455	398	16	48	0
Camden	34007	6008	2	1082	279	293	0	0	0
Camden	34007	6011	4	1722	547	509	0	36	0
	Sub Totals:			87492	30138	29857	30	189	62
Cherry Hill	34007	6037	4	444	179	154	0	0	0
Cherry Hill	34007	6033	011	2981	1606	1585	0	0	0
Cherry Hill	34007	6032	5	1087	397	389	0	0	0
Cherry Hill	34007	6032	1	1036	379	407	0	0	0
Cherry Hill	34007	6032	2	1781	389	374	8	0	0
Cherry Hill	34007	6032	4	1114	413	387	0	0	0
Cherry Hill	34007	6033	012	733	250	213	7	0	0
Cherry Hill	34007	6032	6	650	234	233	0	0	0
Cherry Hill	34007	6032	3	510	285	302	0	0	0
	Sub Totals:			10336	4132	4044	15	0	0
Collingswood	34007	6042	2	752	334	327	0	0	0
Collingswood	34007	6042	1	764	302	312	0	0	0
Collingswood	34007	6045	3	567	234	205	0	0	0
Collingswood	34007	6045	4	617	261	255	0	0	0
Collingswood	34007	6042	3	827	315	309	0	0	0
Collingswood	34007	6042	4	1377	625	613	0	0	7
Collingswood	34007	6043	4	1043	458	491	0	0	0
Collingswood	34007	6044	1	760	282	290	0	0	0
Collingswood	34007	6044	2	1244	491	485	0	0	0
Collingswood	34007	6044	3	650	278	272	0	0	0
Collingswood	34007	6043	2	1140	426	397	0	0	0
Collingswood	34007	6043	1	648	253	236	0	0	0
Collingswood	34007	6044	4	809	363	367	0	0	0
Collingswood	34007	6045	2	2370	1333	1388	4	0	0
Collingswood	34007	6045	1	510	250	226	0	0	0
Collingswood	34007	6043	3	1235	537	533	0	0	0
	Sub Totals:			15313	6742	6706	4	0	7
Gloucester City	34007	6051	2	1127	409	395	0	0	0
Gloucester City	34007	6052	1	868	361	336	0	0	0
Gloucester City	34007	6052	2	1088	482	452	7	0	0
Gloucester City	34007	6052	3	1225	593	625	0	0	0
Gloucester City	34007	6049	1	1056	388	361	0	0	0
Gloucester City	34007	6049	2	573	222	220	0	0	0
Gloucester City	34007	6049	3	702	244	252	0	0	0
Gloucester City	34007	6049	4	958	346	367	0	0	0
Gloucester City	34007	6051	1	1428	538	501	0	0	0
Gloucester City	34007	6102	1	1290	527	542	2	0	0
Gloucester City	34007	6050	1	1161	405	445	0	0	0
Gloucester City	34007	6050	3	404	171	161	0	0	0
Gloucester City	34007	6050	2	995	351	372	0	0	0
	Sub Totals:			12875	5037	5029	9	0	0
Haddon	34007	6038	4	930	331	296	0	0	9
Haddon	34007	6039	014	912	389	393	0	0	0
Haddon	34007	6038	2	978	346	347	0	0	0
Haddon	34007	6038	3	722	286	287	0	0	0

Haddon	34007	6038 6	803	321	322	0	0	0
Haddon	34007	6039015	939	493	507	0	0	0
Haddon	34007	6040 3	334	134	132	0	0	0
Haddon	34007	6039013	471	191	171	0	0	0
Haddon	34007	6039012	887	376	369	0	0	0
Haddon	34007	6040 2	265	113	119	0	0	0
Haddon	34007	6039016	954	443	447	0	0	0
Haddon	34007	6038 5	936	387	416	0	0	0
Haddon	34007	6040 5	297	115	102	0	0	0
Haddon	34007	6038 1	826	310	312	0	0	0
Haddon	34007	6039011	303	119	117	0	0	0
Haddon	34007	6040 4	236	91	79	0	0	0
Haddon	34007	6040 1	221	83	85	0	0	0
Haddon	34007	6040 6	395	150	139	0	0	0
Haddon	34007	6039017	639	245	252	0	0	0
Haddon	34007	6039021	2765	1458	1497	0	0	0
	Sub Totals:		14813	6381	6389	0	0	9
Haddonfield	34007	6062 4	1277	530	536	0	0	0
Haddonfield	34007	6061 2	1172	440	424	0	0	0
Haddonfield	34007	6062 1	1075	378	376	0	0	0
Haddonfield	34007	6061 1	1093	446	429	0	0	0
	Sub Totals:		4617	1794	1765	0	0	0
Merchantville	34007	6031 3	921	396	398	0	0	0
Merchantville	34007	6031 4	927	381	357	0	0	0
Merchantville	34007	6031 1	1020	419	411	0	0	0
Merchantville	34007	6031 2	1202	452	481	0	0	0
	Sub Totals:		4070	1648	1647	0	0	0
Mount Ephraim	34007	6055 2	847	390	401	0	0	0
Mount Ephraim	34007	6055 1	928	391	356	0	0	0
Mount Ephraim	34007	6054 1	856	315	282	0	0	0
	Sub Totals:		2631	1096	1039	0	0	0
Oaklyn	34007	6047 1	1182	447	417	0	0	0
Oaklyn	34007	6047 2	948	361	370	0	0	0
Oaklyn	34007	6046 2	1122	590	606	0	0	0
Oaklyn	34007	6046 1	1178	489	494	0	0	0
	Sub Totals:		4430	1887	1887	0	0	0
Pennsauken	34007	6101 1	110	9	7	0	0	0
Pennsauken	34007	6026012	889	324	319	0	0	0
Pennsauken	34007	6026022	1088	409	403	0	0	0
Pennsauken	34007	6027019	50	21	18	0	0	0
Pennsauken	34007	6027021	778	276	301	0	0	0
Pennsauken	34007	6025011	20	4	0	0	0	0
Pennsauken	34007	6025012	0	0	0	0	0	0
Pennsauken	34007	6025021	1436	771	789	0	0	0
Pennsauken	34007	6025031	935	317	299	0	0	0
Pennsauken	34007	6025032	623	227	234	0	0	0
Pennsauken	34007	6025033	964	308	305	0	0	0
Pennsauken	34007	6026011	549	203	223	0	0	0
Pennsauken	34007	6026013	391	144	137	0	0	0
Pennsauken	34007	6029014	603	211	215	0	0	0
Pennsauken	34007	6029021	1649	529	513	0	0	0

Pennsauken	34007	6029022	1624	648	665	0	0	0
Pennsauken	34007	6030011	679	239	237	0	0	0
Pennsauken	34007	6030012	1036	390	413	0	0	0
Pennsauken	34007	6030013	694	224	214	0	0	0
Pennsauken	34007	6030014	781	273	268	0	0	0
Pennsauken	34007	6030015	617	224	220	0	0	0
Pennsauken	34007	6030021	760	288	260	0	0	0
Pennsauken	34007	6030022	968	347	301	0	0	0
Pennsauken	34007	6030023	680	251	227	0	0	0
Pennsauken	34007	6030024	1197	433	440	0	0	0
Pennsauken	34007	6030025	947	309	400	0	0	0
Pennsauken	34007	6029011	2551	790	746	0	0	0
Pennsauken	34007	6027023	976	318	313	0	0	0
Pennsauken	34007	6026014	825	300	300	0	0	0
Pennsauken	34007	6026021	1451	563	559	0	0	0
Pennsauken	34007	6028 1	757	283	291	0	0	0
Pennsauken	34007	6028 2	1121	405	412	0	0	0
Pennsauken	34007	6028 3	924	317	302	0	0	0
Pennsauken	34007	6027022	768	340	366	0	0	0
Pennsauken	34007	6027031	955	365	329	0	0	0
Pennsauken	34007	6027024	613	210	205	0	0	0
Pennsauken	34007	6027025	635	214	247	0	0	0
Pennsauken	34007	6027032	1312	469	434	0	0	0
Pennsauken	34007	6027999	0	0	0	0	0	0
	Sub Totals:		32956	11953	11912	0	0	0
Westville	34015	5001 1	1050	386	366	0	0	0
	Sub Totals:		1050	386	366	0	0	0
Woodlynne	34007	6041 1	1215	428	434	0	0	0
Woodlynne	34007	6041 2	1332	511	513	0	0	0
	Sub Totals:		2547	939	947	0	0	0

For Radius of 4 Mi., Circle Area = 50.265482

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Camden	34007 60011	0.022881	0.022881	100.00
2	Camden	34007 60012	0.022881	0.022881	100.00
3	Camden	34007 60013	0.036266	0.036266	100.00
4	Camden	34007 60014	0.041426	0.041426	100.00
5	Camden	34007 60015	0.044570	0.044570	100.00
6	Camden	34007 60016	0.033299	0.033299	100.00
7	Camden	34007 60021	0.069084	0.069084	100.00
8	Westville	34015 50011	0.600858	0.007973	1.33
9	Camden	34007 60023	0.065511	0.065511	100.00
10	Camden	34007 60024	0.067451	0.067451	100.00
11	Camden	34007 60025	0.032816	0.032816	100.00
12	Camden	34007 60026	0.054773	0.054773	100.00
13	Camden	34007 60027	0.071501	0.071501	100.00
14	Camden	34007 60031	0.061598	0.061598	100.00
15	Camden	34007 60032	0.049709	0.049709	100.00
16	Camden	34007 60033	0.066575	0.066575	100.00
17	Camden	34007 60034	0.067653	0.067653	100.00
18	Camden	34007 60041	0.063480	0.063480	100.00
19	Camden	34007 60042	0.081184	0.081184	100.00
20	Camden	34007 60043	0.050971	0.050971	100.00
21	Camden	34007 60044	0.047933	0.047933	100.00
22	Camden	34007 60045	0.077679	0.077679	100.00
23	Camden	34007 60051	0.028779	0.028779	100.00
24	Camden	34007 60052	0.085835	0.085835	100.00
25	Camden	34007 60053	0.623238	0.623238	100.00
26	Camden	34007 60061	0.011543	0.011543	100.00
27	Camden	34007 60062	0.027862	0.027862	100.00
28	Camden	34007 60063	0.026798	0.026798	100.00
29	Camden	34007 60064	0.019444	0.019444	100.00
30	Camden	34007 60065	0.207860	0.207860	100.00
31	Camden	34007 60071	0.046461	0.046461	100.00
32	Camden	34007 60072	0.022536	0.022536	100.00
33	Camden	34007 60073	0.025769	0.025769	100.00
34	Camden	34007 60074	0.028787	0.028787	100.00
35	Camden	34007 60075	0.325354	0.325354	100.00
36	Camden	34007 60081	0.190157	0.190157	100.00
37	Camden	34007 60082	0.100468	0.100468	100.00
38	Camden	34007 60083	0.031524	0.031524	100.00
39	Camden	34007 60084	0.056659	0.056659	100.00
40	Camden	34007 60085	0.029510	0.029510	100.00
41	Camden	34007 60086	0.029033	0.029033	100.00
42	Camden	34007 60087	0.046172	0.046172	100.00
43	Camden	34007 60088	0.058049	0.058049	100.00
44	Camden	34007 60091	0.365730	0.365730	100.00
45	Camden	34007 60092	0.043778	0.043778	100.00
46	Camden	34007 60093	0.164956	0.164956	100.00
47	Camden	34007 60094	0.035042	0.035042	100.00
48	Camden	34007 60095	0.191785	0.191785	100.00
49	Camden	34007 60101	0.306302	0.306302	100.00
50	Camden	34007 60102	0.141508	0.141508	100.00
51	Camden	34007 60103	0.106349	0.106349	100.00
52	Camden	34007 60104	0.085048	0.085048	100.00
53	Camden	34007 60111	0.211057	0.211057	100.00

54	Camden	34007	60112	0.087717	0.087717	100.00
55	Camden	34007	60113	0.082296	0.082296	100.00
56	Camden	34007	60114	0.110488	0.110488	100.00
57	Camden	34007	60115	0.059344	0.059344	100.00
58	Camden	34007	60116	0.100856	0.100856	100.00
59	Camden	34007	60121	0.074113	0.074113	100.00
60	Camden	34007	60122	0.093474	0.093474	100.00
61	Camden	34007	60123	0.065854	0.065854	100.00
62	Camden	34007	60124	0.071842	0.071842	100.00
63	Camden	34007	60131	0.068218	0.068218	100.00
64	Camden	34007	60132	0.073606	0.073606	100.00
65	Camden	34007	60133	0.084083	0.084083	100.00
66	Camden	34007	60134	0.146840	0.146840	100.00
67	Camden	34007	60135	0.199462	0.199462	100.00
68	Camden	34007	60141	0.099770	0.099770	100.00
69	Camden	34007	60142	0.035942	0.035942	100.00
70	Camden	34007	60143	0.161873	0.161873	100.00
71	Camden	34007	60144	0.059953	0.059953	100.00
72	Camden	34007	60145	0.342625	0.342625	100.00
73	Camden	34007	60151	0.040325	0.040325	100.00
74	Camden	34007	60152	0.093353	0.093353	100.00
75	Camden	34007	60153	0.065104	0.065104	100.00
76	Camden	34007	60154	0.035368	0.035368	100.00
77	Camden	34007	60155	0.209855	0.209855	100.00
78	Camden	34007	60161	0.031730	0.031730	100.00
79	Camden	34007	60162	0.021639	0.021639	100.00
80	Camden	34007	60163	0.027330	0.027330	100.00
81	Camden	34007	60164	0.030463	0.030463	100.00
82	Camden	34007	60165	0.087130	0.087130	100.00
83	Camden	34007	60171	0.085984	0.085984	100.00
84	Camden	34007	60172	0.076579	0.076579	100.00
85	Camden	34007	60173	0.022000	0.022000	100.00
86	Camden	34007	60174	0.076433	0.076433	100.00
87	Camden	34007	60175	0.033358	0.033358	100.00
88	Camden	34007	60176	0.039900	0.039900	100.00
89	Camden	34007	60181	0.055726	0.055726	100.00
90	Camden	34007	60182	0.097103	0.097103	100.00
91	Camden	34007	60183	0.063754	0.063754	100.00
92	Camden	34007	60184	0.071060	0.071060	100.00
93	Camden	34007	60185	0.382403	0.382403	100.00
94	Camden	34007	60186	0.438386	0.438386	100.00
95	Camden	34007	60191	0.135165	0.135165	100.00
96	Camden	34007	60192	0.223138	0.223138	100.00
97	Camden	34007	60193	0.047307	0.047307	100.00
98	Camden	34007	60201	0.245405	0.245405	100.00
99	Camden	34007	60202	0.223479	0.223479	100.00
100	Camden	34007	60203	0.045605	0.045605	100.00
101	Camden	34007	60204	0.056752	0.056752	100.00
102	Camden	34007	60205	0.032331	0.032331	100.00
103	Camden	34007	60206	0.135875	0.135875	100.00
104	Pennsauken	34007	60281	0.265876	0.149044	56.06
105	Pennsauken	34007	60282	0.316736	0.273254	86.27
106	Pennsauken	34007	60283	0.222141	0.179736	80.91
107	Merchantville	34007	60311	0.152924	0.152924	100.00
108	Merchantville	34007	60312	0.165704	0.165704	100.00
109	Merchantville	34007	60313	0.148697	0.148697	100.00
110	Merchantville	34007	60314	0.117212	0.117212	100.00
111	Cherry Hill	34007	60321	0.497673	0.000312	0.06
112	Cherry Hill	34007	60322	1.027298	0.770825	75.03
113	Cherry Hill	34007	60323	0.954457	0.954457	100.00
114	Cherry Hill	34007	60324	0.555169	0.555169	100.00

115	Cherry Hill	34007	60325	0.257331	0.257331	100.00
116	Cherry Hill	34007	60326	0.132164	0.110186	83.37
117	Cherry Hill	34007	60374	0.226558	0.021142	9.33
118	Haddon	34007	60381	0.137360	0.137360	100.00
119	Haddon	34007	60382	0.223188	0.223188	100.00
120	Haddon	34007	60383	0.119046	0.119046	100.00
121	Haddon	34007	60384	0.111326	0.111326	100.00
122	Haddon	34007	60385	0.102294	0.102294	100.00
123	Haddon	34007	60386	0.151660	0.151660	100.00
124	Haddon	34007	60401	0.036431	0.036431	100.00
125	Haddon	34007	60402	0.034187	0.034187	100.00
126	Haddon	34007	60403	0.074106	0.074106	100.00
127	Haddon	34007	60404	0.147114	0.147114	100.00
128	Haddon	34007	60405	0.058919	0.058919	100.00
129	Haddon	34007	60406	0.163848	0.163848	100.00
130	Woodlynne	34007	60411	0.102639	0.102639	100.00
131	Woodlynne	34007	60412	0.120103	0.120103	100.00
132	Collingswood	34007	60421	0.182686	0.182686	100.00
133	Collingswood	34007	60422	0.070475	0.070475	100.00
134	Collingswood	34007	60423	0.077494	0.077494	100.00
135	Collingswood	34007	60424	0.107202	0.107202	100.00
136	Collingswood	34007	60431	0.095508	0.095508	100.00
137	Collingswood	34007	60432	0.091614	0.091614	100.00
138	Collingswood	34007	60433	0.113682	0.113682	100.00
139	Collingswood	34007	60434	0.097180	0.097180	100.00
140	Collingswood	34007	60441	0.075273	0.075273	100.00
141	Collingswood	34007	60442	0.175068	0.175068	100.00
142	Collingswood	34007	60443	0.261660	0.261660	100.00
143	Collingswood	34007	60444	0.153407	0.153407	100.00
144	Collingswood	34007	60451	0.074941	0.074941	100.00
145	Collingswood	34007	60452	0.174944	0.174944	100.00
146	Collingswood	34007	60453	0.051024	0.051024	100.00
147	Collingswood	34007	60454	0.078552	0.078552	100.00
148	Oaklyn	34007	60461	0.187129	0.187129	100.00
149	Oaklyn	34007	60462	0.133625	0.133625	100.00
150	Oaklyn	34007	60471	0.209575	0.209575	100.00
151	Oaklyn	34007	60472	0.134812	0.134812	100.00
152	Audubon Park	34007	60481	0.155697	0.155697	100.00
153	Gloucester City	34007	60491	0.165118	0.165118	100.00
154	Gloucester City	34007	60492	0.031187	0.031187	100.00
155	Gloucester City	34007	60493	0.051893	0.051893	100.00
156	Gloucester City	34007	60494	0.044832	0.044832	100.00
157	Gloucester City	34007	60501	0.076950	0.076950	100.00
158	Gloucester City	34007	60502	0.055477	0.055477	100.00
159	Gloucester City	34007	60503	0.079447	0.079447	100.00
160	Gloucester City	34007	60511	0.293388	0.293388	100.00
161	Gloucester City	34007	60512	0.216699	0.216699	100.00
162	Gloucester City	34007	60521	0.230828	0.230828	100.00
163	Gloucester City	34007	60522	0.211655	0.155795	73.61
164	Gloucester City	34007	60523	0.255696	0.255696	100.00
165	Brooklawn	34007	60531	0.252633	0.037388	14.80
166	Brooklawn	34007	60532	0.087777	0.007244	8.25
167	Mount Ephraim	34007	60541	0.152380	0.110946	72.81
168	Mount Ephraim	34007	60551	0.212929	0.212024	99.57
169	Mount Ephraim	34007	60552	0.168895	0.035223	20.85
170	Audubon	34007	60571	0.134276	0.134276	100.00
171	Audubon	34007	60572	0.142213	0.047111	33.13
172	Audubon	34007	60573	0.149371	0.087903	58.85
173	Audubon	34007	60574	0.108625	0.108625	100.00
174	Haddonfield	34007	60611	0.192752	0.002261	1.17
175	Haddonfield	34007	60612	0.207551	0.002751	1.33

176	Haddonfield	34007	60621	0.346036	0.003590	1.04
177	Haddonfield	34007	60624	0.244590	0.153375	62.71
178	Pennsauken	34007	61011	2.364901	0.223629	9.46
179	Gloucester City	34007	61021	1.148099	1.030121	89.72
180	Pennsauken	34007	6025011	0.507893	0.507893	100.00
181	Pennsauken	34007	6025012	0.004585	0.004585	100.00
182	Pennsauken	34007	6025021	0.264881	0.264881	100.00
183	Pennsauken	34007	6025031	0.140197	0.140197	100.00
184	Pennsauken	34007	6025032	0.113179	0.113179	100.00
185	Pennsauken	34007	6025033	0.129099	0.129099	100.00
186	Pennsauken	34007	6026011	0.125061	0.125061	100.00
187	Pennsauken	34007	6026012	0.131449	0.131449	100.00
188	Pennsauken	34007	6026013	0.056435	0.056435	100.00
189	Pennsauken	34007	6026014	0.221827	0.221827	100.00
190	Pennsauken	34007	6026021	0.112458	0.112458	100.00
191	Pennsauken	34007	6026022	0.144852	0.144852	100.00
192	Pennsauken	34007	6027019	2.418039	2.418039	100.00
193	Pennsauken	34007	6027021	0.074200	0.074200	100.00
194	Pennsauken	34007	6027022	0.045825	0.045825	100.00
195	Pennsauken	34007	6027023	0.067804	0.067804	100.00
196	Pennsauken	34007	6027024	0.099100	0.099100	100.00
197	Pennsauken	34007	6027025	0.058755	0.058755	100.00
198	Pennsauken	34007	6027031	0.517131	0.517131	100.00
199	Pennsauken	34007	6027032	0.150766	0.150766	100.00
201	Pennsauken	34007	6029011	0.925004	0.025951	2.81
202	Pennsauken	34007	6029014	0.118520	0.096086	81.07
203	Pennsauken	34007	6029021	0.335854	0.331422	98.68
204	Pennsauken	34007	6029022	0.267763	0.237785	88.80
205	Pennsauken	34007	6030011	0.126589	0.126589	100.00
206	Pennsauken	34007	6030012	0.170814	0.170814	100.00
207	Pennsauken	34007	6030013	0.099845	0.099845	100.00
208	Pennsauken	34007	6030014	0.106700	0.106700	100.00
209	Pennsauken	34007	6030015	0.096322	0.096322	100.00
210	Pennsauken	34007	6030021	0.102792	0.102792	100.00
211	Pennsauken	34007	6030022	0.102752	0.102752	100.00
212	Pennsauken	34007	6030023	0.092451	0.092451	100.00
213	Pennsauken	34007	6030024	0.119186	0.119186	100.00
214	Pennsauken	34007	6030025	0.112185	0.112185	100.00
215	Cherry Hill	34007	6033011	0.810956	0.102244	12.61
216	Cherry Hill	34007	6033012	0.582442	0.128994	22.15
217	Haddon	34007	6039011	0.040176	0.040176	100.00
218	Haddon	34007	6039012	0.207229	0.207229	100.00
219	Haddon	34007	6039013	0.087092	0.087092	100.00
220	Haddon	34007	6039014	0.123085	0.123085	100.00
221	Haddon	34007	6039015	0.154393	0.151608	98.20
222	Haddon	34007	6039016	0.141993	0.121472	85.55
223	Haddon	34007	6039017	0.128254	0.059614	46.48
224	Haddon	34007	6039021	0.496764	0.496764	100.00
225	Audubon	34007	6056011	0.204432	0.204432	100.00
226	Audubon	34007	6056012	0.320900	0.320900	100.00
227	Audubon	34007	6056021	0.096605	0.093450	96.73
228	Audubon	34007	6056022	0.125780	0.003314	2.63
229	Audubon	34007	6056023	0.187100	0.120086	64.18
230	Camden	34007	60022	0.088768	0.088768	100.00
	Totals:			39.558075	31.606190	

For Radius of 3 Mi., Circle Area = 28.274334

Camden, NJ Site
Camden, NJ

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Camden	34007 60011	0.022881	0.022881	100.00
2	Camden	34007 60012	0.022881	0.022881	100.00
3	Camden	34007 60013	0.036266	0.036266	100.00
4	Camden	34007 60014	0.041426	0.041426	100.00
5	Camden	34007 60015	0.044570	0.044570	100.00
6	Camden	34007 60016	0.033299	0.033299	100.00
7	Camden	34007 60021	0.069084	0.069084	100.00
9	Camden	34007 60023	0.065511	0.065511	100.00
10	Camden	34007 60024	0.067451	0.067451	100.00
11	Camden	34007 60025	0.032816	0.032816	100.00
12	Camden	34007 60026	0.054773	0.054773	100.00
13	Camden	34007 60027	0.071501	0.071501	100.00
14	Camden	34007 60031	0.061598	0.061598	100.00
15	Camden	34007 60032	0.049709	0.049709	100.00
16	Camden	34007 60033	0.066575	0.066575	100.00
17	Camden	34007 60034	0.067653	0.067653	100.00
18	Camden	34007 60041	0.063480	0.063480	100.00
19	Camden	34007 60042	0.081184	0.081184	100.00
20	Camden	34007 60043	0.050971	0.050971	100.00
21	Camden	34007 60044	0.047933	0.047933	100.00
22	Camden	34007 60045	0.077679	0.077679	100.00
23	Camden	34007 60051	0.028779	0.028779	100.00
24	Camden	34007 60052	0.085835	0.085835	100.00
25	Camden	34007 60053	0.623238	0.623238	100.00
26	Camden	34007 60061	0.011543	0.011543	100.00
27	Camden	34007 60062	0.027862	0.027862	100.00
28	Camden	34007 60063	0.026798	0.026798	100.00
29	Camden	34007 60064	0.019444	0.019444	100.00
30	Camden	34007 60065	0.207860	0.207860	100.00
31	Camden	34007 60071	0.046461	0.046461	100.00
32	Camden	34007 60072	0.022536	0.022536	100.00
33	Camden	34007 60073	0.025769	0.025769	100.00
34	Camden	34007 60074	0.028787	0.028787	100.00
35	Camden	34007 60075	0.325354	0.325354	100.00
36	Camden	34007 60081	0.190157	0.190157	100.00
37	Camden	34007 60082	0.100468	0.100468	100.00
38	Camden	34007 60083	0.031524	0.031524	100.00
39	Camden	34007 60084	0.056659	0.056659	100.00
40	Camden	34007 60085	0.029510	0.029510	100.00
41	Camden	34007 60086	0.029033	0.029033	100.00
42	Camden	34007 60087	0.046172	0.046172	100.00
43	Camden	34007 60088	0.058049	0.058049	100.00
44	Camden	34007 60091	0.365730	0.365730	100.00
45	Camden	34007 60092	0.043778	0.043778	100.00
46	Camden	34007 60093	0.164956	0.164956	100.00
47	Camden	34007 60094	0.035042	0.035042	100.00
48	Camden	34007 60095	0.191785	0.191785	100.00
49	Camden	34007 60101	0.306302	0.306302	100.00
50	Camden	34007 60102	0.141508	0.141508	100.00
51	Camden	34007 60103	0.106349	0.106349	100.00
52	Camden	34007 60104	0.085048	0.085048	100.00
53	Camden	34007 60111	0.211057	0.211057	100.00
54	Camden	34007 60112	0.087717	0.087717	100.00
55	Camden	34007 60113	0.082296	0.082296	100.00
56	Camden	34007 60114	0.110488	0.110488	100.00
57	Camden	34007 60115	0.059344	0.059344	100.00
58	Camden	34007 60116	0.100856	0.100856	100.00
59	Camden	34007 60121	0.074113	0.074113	100.00

60	Camden	34007 60122	0.093474	0.093474	100.00
61	Camden	34007 60123	0.065854	0.065854	100.00
62	Camden	34007 60124	0.071842	0.071842	100.00
63	Camden	34007 60131	0.068218	0.068218	100.00
64	Camden	34007 60132	0.073606	0.073606	100.00
65	Camden	34007 60133	0.084083	0.084083	100.00
66	Camden	34007 60134	0.146840	0.146840	100.00
67	Camden	34007 60135	0.199462	0.199462	100.00
68	Camden	34007 60141	0.099770	0.099770	100.00
69	Camden	34007 60142	0.035942	0.035942	100.00
70	Camden	34007 60143	0.161873	0.161873	100.00
71	Camden	34007 60144	0.059953	0.059953	100.00
72	Camden	34007 60145	0.342625	0.342625	100.00
73	Camden	34007 60151	0.040325	0.040325	100.00
74	Camden	34007 60152	0.093353	0.093353	100.00
75	Camden	34007 60153	0.065104	0.065104	100.00
76	Camden	34007 60154	0.035368	0.035368	100.00
77	Camden	34007 60155	0.209855	0.209855	100.00
78	Camden	34007 60161	0.031730	0.031730	100.00
79	Camden	34007 60162	0.021639	0.021639	100.00
80	Camden	34007 60163	0.027330	0.027330	100.00
81	Camden	34007 60164	0.030463	0.030463	100.00
82	Camden	34007 60165	0.087130	0.087130	100.00
83	Camden	34007 60171	0.085984	0.085984	100.00
84	Camden	34007 60172	0.076579	0.076579	100.00
85	Camden	34007 60173	0.022000	0.022000	100.00
86	Camden	34007 60174	0.076433	0.076433	100.00
87	Camden	34007 60175	0.033358	0.033358	100.00
88	Camden	34007 60176	0.039900	0.039900	100.00
89	Camden	34007 60181	0.055726	0.055726	100.00
90	Camden	34007 60182	0.097103	0.097103	100.00
91	Camden	34007 60183	0.063754	0.063754	100.00
92	Camden	34007 60184	0.071060	0.071060	100.00
93	Camden	34007 60185	0.382403	0.382403	100.00
94	Camden	34007 60186	0.438386	0.438386	100.00
95	Camden	34007 60191	0.135165	0.135165	100.00
96	Camden	34007 60192	0.223138	0.223138	100.00
97	Camden	34007 60193	0.047307	0.047307	100.00
98	Camden	34007 60201	0.245405	0.245405	100.00
99	Camden	34007 60202	0.223479	0.223479	100.00
100	Camden	34007 60203	0.045605	0.045605	100.00
101	Camden	34007 60204	0.056752	0.056752	100.00
102	Camden	34007 60205	0.032331	0.032331	100.00
103	Camden	34007 60206	0.135875	0.135875	100.00
107	Merchantville	34007 60311	0.152924	0.034461	22.53
108	Merchantville	34007 60312	0.165704	0.006583	3.97
109	Merchantville	34007 60313	0.148697	0.148646	99.97
110	Merchantville	34007 60314	0.117212	0.117212	100.00
113	Cherry Hill	34007 60323	0.954457	0.585043	61.30
114	Cherry Hill	34007 60324	0.555169	0.239541	43.15
119	Haddon	34007 60382	0.223188	0.020816	9.33
120	Haddon	34007 60383	0.119046	0.058576	49.20
122	Haddon	34007 60385	0.102294	0.066061	64.58
123	Haddon	34007 60386	0.151660	0.151660	100.00
124	Haddon	34007 60401	0.036431	0.036431	100.00
125	Haddon	34007 60402	0.034187	0.034187	100.00
126	Haddon	34007 60403	0.074106	0.074106	100.00
127	Haddon	34007 60404	0.147114	0.139727	94.98
128	Haddon	34007 60405	0.058919	0.003199	5.43
130	Woodlynne	34007 60411	0.102639	0.102639	100.00
131	Woodlynne	34007 60412	0.120103	0.120103	100.00

132	Collingswood	34007	60421	0.182686	0.182686	100.00
133	Collingswood	34007	60422	0.070475	0.070475	100.00
134	Collingswood	34007	60423	0.077494	0.077494	100.00
135	Collingswood	34007	60424	0.107202	0.107202	100.00
136	Collingswood	34007	60431	0.095508	0.088474	92.63
137	Collingswood	34007	60432	0.091614	0.091614	100.00
138	Collingswood	34007	60433	0.113682	0.113682	100.00
139	Collingswood	34007	60434	0.097180	0.097180	100.00
140	Collingswood	34007	60441	0.075273	0.059224	78.68
141	Collingswood	34007	60442	0.175068	0.175068	100.00
142	Collingswood	34007	60443	0.261660	0.261660	100.00
143	Collingswood	34007	60444	0.153407	0.153407	100.00
144	Collingswood	34007	60451	0.074941	0.074941	100.00
145	Collingswood	34007	60452	0.174944	0.174944	100.00
146	Collingswood	34007	60453	0.051024	0.051024	100.00
147	Collingswood	34007	60454	0.078552	0.078552	100.00
148	Oaklyn	34007	60461	0.187129	0.187129	100.00
149	Oaklyn	34007	60462	0.133625	0.095548	71.50
150	Oaklyn	34007	60471	0.209575	0.204710	97.68
151	Oaklyn	34007	60472	0.134812	0.040939	30.37
152	Audubon Park	34007	60481	0.155697	0.077490	49.77
153	Gloucester City	34007	60491	0.165118	0.125296	75.88
154	Gloucester City	34007	60492	0.031187	0.028307	90.77
155	Gloucester City	34007	60493	0.051893	0.051893	100.00
156	Gloucester City	34007	60494	0.044832	0.041913	93.49
157	Gloucester City	34007	60501	0.076950	0.001130	1.47
160	Gloucester City	34007	60511	0.293388	0.119491	40.73
161	Gloucester City	34007	60512	0.216699	0.039743	18.34
179	Gloucester City	34007	61021	1.148099	0.342358	29.82
180	Pennsauken	34007	6025011	0.507893	0.507893	100.00
181	Pennsauken	34007	6025012	0.004585	0.004585	100.00
182	Pennsauken	34007	6025021	0.264881	0.264881	100.00
183	Pennsauken	34007	6025031	0.140197	0.140197	100.00
184	Pennsauken	34007	6025032	0.113179	0.113179	100.00
185	Pennsauken	34007	6025033	0.129099	0.129099	100.00
186	Pennsauken	34007	6026011	0.125061	0.124560	99.60
187	Pennsauken	34007	6026012	0.131449	0.131449	100.00
188	Pennsauken	34007	6026013	0.056435	0.056435	100.00
189	Pennsauken	34007	6026014	0.221827	0.221827	100.00
190	Pennsauken	34007	6026021	0.112458	0.112458	100.00
191	Pennsauken	34007	6026022	0.144852	0.144852	100.00
192	Pennsauken	34007	6027019	2.418039	2.001665	82.78
193	Pennsauken	34007	6027021	0.074200	0.074200	100.00
194	Pennsauken	34007	6027022	0.045825	0.045825	100.00
195	Pennsauken	34007	6027023	0.067804	0.067804	100.00
196	Pennsauken	34007	6027024	0.099100	0.099100	100.00
197	Pennsauken	34007	6027025	0.058755	0.058755	100.00
198	Pennsauken	34007	6027031	0.517131	0.162783	31.48
199	Pennsauken	34007	6027032	0.150766	0.150766	100.00
207	Pennsauken	34007	6030013	0.099845	0.030386	30.43
208	Pennsauken	34007	6030014	0.106700	0.092802	86.97
209	Pennsauken	34007	6030015	0.096322	0.096322	100.00
210	Pennsauken	34007	6030021	0.102792	0.034852	33.90
211	Pennsauken	34007	6030022	0.102752	0.102752	100.00
212	Pennsauken	34007	6030023	0.092451	0.092451	100.00
213	Pennsauken	34007	6030024	0.119186	0.119186	100.00
214	Pennsauken	34007	6030025	0.112185	0.112185	100.00
217	Haddon	34007	6039011	0.040176	0.039825	99.13
218	Haddon	34007	6039012	0.207229	0.016196	7.82
224	Haddon	34007	6039021	0.496764	0.087267	17.57
230	Camden	34007	60022	0.088768	0.088768	100.00

Totals:			25.093307	20.728899	

For Radius of 2 Mi., Circle Area = 12.566371

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Camden	34007 60011	0.022881	0.022881	100.00
2	Camden	34007 60012	0.022881	0.022881	100.00
3	Camden	34007 60013	0.036266	0.036266	100.00
4	Camden	34007 60014	0.041426	0.041426	100.00
5	Camden	34007 60015	0.044570	0.044570	100.00
6	Camden	34007 60016	0.033299	0.033299	100.00
7	Camden	34007 60021	0.069084	0.069084	100.00
9	Camden	34007 60023	0.065511	0.065511	100.00
10	Camden	34007 60024	0.067451	0.067451	100.00
11	Camden	34007 60025	0.032816	0.032816	100.00
12	Camden	34007 60026	0.054773	0.054773	100.00
13	Camden	34007 60027	0.071501	0.071501	100.00
14	Camden	34007 60031	0.061598	0.061598	100.00
15	Camden	34007 60032	0.049709	0.049709	100.00
16	Camden	34007 60033	0.066575	0.066575	100.00
17	Camden	34007 60034	0.067653	0.067653	100.00
18	Camden	34007 60041	0.063480	0.063480	100.00
19	Camden	34007 60042	0.081184	0.081184	100.00
20	Camden	34007 60043	0.050971	0.050971	100.00
21	Camden	34007 60044	0.047933	0.047933	100.00
22	Camden	34007 60045	0.077679	0.077679	100.00
23	Camden	34007 60051	0.028779	0.028779	100.00
24	Camden	34007 60052	0.085835	0.085835	100.00
25	Camden	34007 60053	0.623238	0.623238	100.00
26	Camden	34007 60061	0.011543	0.011543	100.00
27	Camden	34007 60062	0.027862	0.027862	100.00
28	Camden	34007 60063	0.026798	0.026798	100.00
29	Camden	34007 60064	0.019444	0.019444	100.00
30	Camden	34007 60065	0.207860	0.207860	100.00
31	Camden	34007 60071	0.046461	0.046461	100.00
32	Camden	34007 60072	0.022536	0.022536	100.00
33	Camden	34007 60073	0.025769	0.025769	100.00
34	Camden	34007 60074	0.028787	0.028787	100.00
35	Camden	34007 60075	0.325354	0.325354	100.00
36	Camden	34007 60081	0.190157	0.190157	100.00
37	Camden	34007 60082	0.100468	0.100468	100.00
38	Camden	34007 60083	0.031524	0.031524	100.00
39	Camden	34007 60084	0.056659	0.056659	100.00
40	Camden	34007 60085	0.029510	0.029510	100.00
41	Camden	34007 60086	0.029033	0.029033	100.00
42	Camden	34007 60087	0.046172	0.046172	100.00
43	Camden	34007 60088	0.058049	0.058049	100.00
44	Camden	34007 60091	0.365730	0.365730	100.00
45	Camden	34007 60092	0.043778	0.043778	100.00
46	Camden	34007 60093	0.164956	0.164956	100.00
47	Camden	34007 60094	0.035042	0.035042	100.00
48	Camden	34007 60095	0.191785	0.191785	100.00
49	Camden	34007 60101	0.306302	0.241619	78.88
50	Camden	34007 60102	0.141508	0.141508	100.00
51	Camden	34007 60103	0.106349	0.106349	100.00
52	Camden	34007 60104	0.085048	0.085048	100.00

53	Camden	34007	60111	0.211057	0.211057	100.00
54	Camden	34007	60112	0.087717	0.079806	90.98
55	Camden	34007	60113	0.082296	0.077119	93.71
56	Camden	34007	60114	0.110488	0.110488	100.00
57	Camden	34007	60115	0.059344	0.059344	100.00
58	Camden	34007	60116	0.100856	0.100856	100.00
59	Camden	34007	60121	0.074113	0.068731	92.74
60	Camden	34007	60122	0.093474	0.093474	100.00
61	Camden	34007	60123	0.065854	0.065854	100.00
62	Camden	34007	60124	0.071842	0.071842	100.00
63	Camden	34007	60131	0.068218	0.068218	100.00
64	Camden	34007	60132	0.073606	0.073606	100.00
65	Camden	34007	60133	0.084083	0.084083	100.00
66	Camden	34007	60134	0.146840	0.146840	100.00
67	Camden	34007	60135	0.199462	0.199462	100.00
68	Camden	34007	60141	0.099770	0.099770	100.00
69	Camden	34007	60142	0.035942	0.035942	100.00
70	Camden	34007	60143	0.161873	0.161873	100.00
71	Camden	34007	60144	0.059953	0.059953	100.00
72	Camden	34007	60145	0.342625	0.342625	100.00
73	Camden	34007	60151	0.040325	0.040325	100.00
74	Camden	34007	60152	0.093353	0.093353	100.00
75	Camden	34007	60153	0.065104	0.065104	100.00
76	Camden	34007	60154	0.035368	0.035368	100.00
77	Camden	34007	60155	0.209855	0.209855	100.00
78	Camden	34007	60161	0.031730	0.031730	100.00
79	Camden	34007	60162	0.021639	0.021639	100.00
80	Camden	34007	60163	0.027330	0.027330	100.00
81	Camden	34007	60164	0.030463	0.030463	100.00
82	Camden	34007	60165	0.087130	0.087130	100.00
83	Camden	34007	60171	0.085984	0.085984	100.00
84	Camden	34007	60172	0.076579	0.076579	100.00
85	Camden	34007	60173	0.022000	0.022000	100.00
86	Camden	34007	60174	0.076433	0.076433	100.00
87	Camden	34007	60175	0.033358	0.033358	100.00
88	Camden	34007	60176	0.039900	0.039900	100.00
89	Camden	34007	60181	0.055726	0.055726	100.00
90	Camden	34007	60182	0.097103	0.027079	27.89
91	Camden	34007	60183	0.063754	0.063754	100.00
92	Camden	34007	60184	0.071060	0.071060	100.00
93	Camden	34007	60185	0.382403	0.382403	100.00
94	Camden	34007	60186	0.438386	0.201362	45.93
95	Camden	34007	60191	0.135165	0.135165	100.00
96	Camden	34007	60192	0.223138	0.157392	70.54
97	Camden	34007	60193	0.047307	0.047307	100.00
98	Camden	34007	60201	0.245405	0.099719	40.63
130	Woodlynne	34007	60411	0.102639	0.102639	100.00
131	Woodlynne	34007	60412	0.120103	0.120103	100.00
132	Collingswood	34007	60421	0.182686	0.150423	82.34
133	Collingswood	34007	60422	0.070475	0.070475	100.00
134	Collingswood	34007	60423	0.077494	0.064855	83.69
135	Collingswood	34007	60424	0.107202	0.032027	29.88
142	Collingswood	34007	60443	0.261660	0.026653	10.19
143	Collingswood	34007	60444	0.153407	0.125532	81.83
144	Collingswood	34007	60451	0.074941	0.074941	100.00
145	Collingswood	34007	60452	0.174944	0.019987	11.42
147	Collingswood	34007	60454	0.078552	0.055568	70.74
180	Pennsauken	34007	6025011	0.507893	0.507893	100.00
181	Pennsauken	34007	6025012	0.004585	0.004585	100.00
182	Pennsauken	34007	6025021	0.264881	0.155448	58.69
183	Pennsauken	34007	6025031	0.140197	0.140197	100.00

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June 18, 1996

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Sub: Camden, NJ Site
Camden, NJ NEW JERSEY PORTION

CERCLIS:

Job: 1277

Site Longitude: 75-06-15 75.104156
Site Latitude : 39-56-20 39.938889

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to

184	Pennsauken	34007 6025032	0.113179	0.113179	100.00
185	Pennsauken	34007 6025033	0.129099	0.129099	100.00
189	Pennsauken	34007 6026014	0.221827	0.065659	29.60
190	Pennsauken	34007 6026021	0.112458	0.044981	40.00
191	Pennsauken	34007 6026022	0.144852	0.038153	26.34
192	Pennsauken	34007 6027019	2.418039	0.680163	28.13
196	Pennsauken	34007 6027024	0.099100	0.026958	27.20
197	Pennsauken	34007 6027025	0.058755	0.047049	80.08
214	Pennsauken	34007 6030025	0.112185	0.075921	67.67
230	Camden	34007 60022	0.088768	0.088768	100.00
	Totals:		15.376913	11.916609	

For Radius of 1 Mi., Circle Area = 3.141593

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Camden	34007 60011	0.022881	0.000750	3.28
2	Camden	34007 60012	0.022881	0.010139	44.31
3	Camden	34007 60013	0.036266	0.024514	67.59
4	Camden	34007 60014	0.041426	0.026357	63.63
5	Camden	34007 60015	0.044570	0.044570	100.00
6	Camden	34007 60016	0.033299	0.020433	61.36
7	Camden	34007 60021	0.069084	0.069084	100.00
9	Camden	34007 60023	0.065511	0.065511	100.00
10	Camden	34007 60024	0.067451	0.067451	100.00
11	Camden	34007 60025	0.032816	0.032816	100.00
12	Camden	34007 60026	0.054773	0.054773	100.00
13	Camden	34007 60027	0.071501	0.071501	100.00
14	Camden	34007 60031	0.061598	0.061598	100.00
15	Camden	34007 60032	0.049709	0.049709	100.00
16	Camden	34007 60033	0.066575	0.066575	100.00
17	Camden	34007 60034	0.067653	0.026561	39.26
18	Camden	34007 60041	0.063480	0.063480	100.00
19	Camden	34007 60042	0.081184	0.074705	92.02
20	Camden	34007 60043	0.050971	0.050971	100.00
21	Camden	34007 60044	0.047933	0.029352	61.24
22	Camden	34007 60045	0.077679	0.014551	18.73
36	Camden	34007 60081	0.190157	0.012093	6.36
37	Camden	34007 60082	0.100468	0.095568	95.12
38	Camden	34007 60083	0.031524	0.031524	100.00
39	Camden	34007 60084	0.056659	0.056659	100.00
40	Camden	34007 60085	0.029510	0.029510	100.00
41	Camden	34007 60086	0.029033	0.015436	53.17
42	Camden	34007 60087	0.046172	0.002864	6.20
44	Camden	34007 60091	0.365730	0.065458	17.90
46	Camden	34007 60093	0.164956	0.126305	76.57
47	Camden	34007 60094	0.035042	0.022855	65.22
48	Camden	34007 60095	0.191785	0.175879	91.71
58	Camden	34007 60115	0.100856	0.082649	81.95
63	Camden	34007 60131	0.068218	0.057566	84.39
64	Camden	34007 60132	0.073606	0.048715	66.18
65	Camden	34007 60133	0.084083	0.084083	100.00
66	Camden	34007 60134	0.146840	0.146840	100.00
67	Camden	34007 60135	0.199462	0.199462	100.00
68	Camden	34007 60141	0.099770	0.099770	100.00
69	Camden	34007 60142	0.035942	0.035942	100.00
70	Camden	34007 60143	0.161873	0.161857	99.99

71	Camden	34007 60144	0.059953	0.059953	100.00
72	Camden	34007 60145	0.342625	0.163287	47.66
73	Camden	34007 60151	0.040325	0.040325	100.00
74	Camden	34007 60152	0.093353	0.084532	90.55
75	Camden	34007 60153	0.065104	0.052102	80.03
78	Camden	34007 60161	0.031730	0.031730	100.00
79	Camden	34007 60162	0.021639	0.016018	74.02
80	Camden	34007 60163	0.027330	0.000308	1.13
81	Camden	34007 60164	0.030463	0.020990	68.90
82	Camden	34007 60165	0.087130	0.041239	47.33
89	Camden	34007 60181	0.055726	0.014352	25.75
180	Pennsauken	34007 6025011	0.507893	0.027441	5.40
185	Pennsauken	34007 6025033	0.129099	0.023881	18.50
230	Camden	34007 60022	0.088768	0.088768	100.00
	Totals:		4.922065	3.141363	

For Radius of .5 Mi., Circle Area = 0.785398

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
7	Camden	34007 60021	0.069084	0.059430	86.03
9	Camden	34007 60023	0.065511	0.063236	96.53
10	Camden	34007 60024	0.067451	0.061864	91.72
11	Camden	34007 60025	0.032816	0.024537	74.77
12	Camden	34007 60026	0.054773	0.014151	25.84
14	Camden	34007 60031	0.061598	0.015146	24.59
18	Camden	34007 60041	0.063480	0.007636	12.03
37	Camden	34007 60082	0.100468	0.023168	23.06
39	Camden	34007 60084	0.056659	0.011289	19.92
48	Camden	34007 60095	0.191785	0.014422	7.52
66	Camden	34007 60134	0.146840	0.062687	42.69
67	Camden	34007 60135	0.199462	0.108281	54.29
68	Camden	34007 60141	0.099770	0.099770	100.00
69	Camden	34007 60142	0.035942	0.035942	100.00
70	Camden	34007 60143	0.161873	0.072861	45.01
71	Camden	34007 60144	0.059953	0.007979	13.31
230	Camden	34007 60022	0.088768	0.088768	100.00
	Totals:		1.556233	0.771165	

For Radius of .25 Mi., Circle Area = 0.196350

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
7	Camden	34007 60021	0.069084	0.007731	11.19
9	Camden	34007 60023	0.065511	0.006520	9.95
10	Camden	34007 60024	0.067451	0.010074	14.94
67	Camden	34007 60135	0.199462	0.047658	23.89
68	Camden	34007 60141	0.099770	0.056933	57.06
69	Camden	34007 60142	0.035942	0.006064	16.87
230	Camden	34007 60022	0.088768	0.061370	69.13
	Totals:		0.625987	0.196350	

Camden, NJ Site
Camden, NJ

========== Site Data ==========

Population:	185747.97
Households:	69448.45
Drilled Wells:	49.50
Dug Wells:	199.00
Other Water Sources:	78.00

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	45663.48
Households:	18174.70
Drilled Wells:	14.41
Dug Wells:	10.00
Other Water Sources:	9.00

** Population On Private Wells: 61.33

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	46262.04
Households:	18813.73
Drilled Wells:	4.64
Dug Wells:	5.28
Other Water Sources:	4.91

** Population On Private Wells: 24.40

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	59961.20
Households:	20882.98
Drilled Wells:	17.35
Dug Wells:	137.04
Other Water Sources:	12.23

** Population On Private Wells: 443.30

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	28559.79
Households:	9674.02
Drilled Wells:	13.11
Dug Wells:	46.07
Other Water Sources:	48.14

** Population On Private Wells: 174.72

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	4379.78
Households:	1589.81
Drilled Wells:	0.00
Dug Wells:	0.60
Other Water Sources:	3.72

** Population On Private Wells: 1.66

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	921.67
Households:	313.21
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: 0.00

** Total Population On Private Wells: 705.40

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June 18, 1996

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Sub: Camden, NJ Site
Caamden NJ PENNSYLVANIA PORTION

CERCLIS:

Job: 1277

Site Longitude: 75-06-15 75.104156
Site Latitude : 39-56-20 39.938889

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adja-

cent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

PENNSYLVANIA PORTION

No.	City	Block Group ID	Blk Grp	People	House Holds	Public Water	Drilled Wells	Dug Wells	Other
1	Philadelphia	42101 0001	1	167	106	76	0	0	0
2	Philadelphia	42101 0001	2	290	289	270	0	0	0
3	Philadelphia	42101 0001	3	490	415	432	0	0	0
4	Philadelphia	42101 0001	4	84	11	9	0	0	0
5	Philadelphia	42101 0001	5	1042	844	871	0	0	0
6	Philadelphia	42101 0002	1	238	43	38	0	0	0
7	Philadelphia	42101 0002	2	937	350	375	0	0	0
8	Philadelphia	42101 0002	3	126	32	25	0	0	0
9	Philadelphia	42101 0002	4	102	12	6	0	0	0
10	Philadelphia	42101 0003	1	429	166	160	0	0	0
11	Philadelphia	42101 0003	2	455	364	367	0	0	0
12	Philadelphia	42101 0003	3	1543	1108	1168	0	0	0
13	Philadelphia	42101 0004	1	38	0	0	0	0	0
14	Philadelphia	42101 0004	2	2358	1979	1983	0	0	0
15	Philadelphia	42101 0004	3	810	747	685	0	0	0
16	Philadelphia	42101 0005	1	530	435	457	0	0	0
17	Philadelphia	42101 0005	2	110	10	0	0	0	0
18	Philadelphia	42101 0005	3	415	361	348	0	0	0
19	Philadelphia	42101 0006	1	349	228	230	0	0	0
20	Philadelphia	42101 0007	1	30	4	0	0	0	0
21	Philadelphia	42101 0007	2	2176	1657	1580	0	0	0
22	Philadelphia	42101 0007	3	863	673	734	0	0	0
23	Philadelphia	42101 0008	1	1937	1576	1611	0	0	0
24	Philadelphia	42101 0008	2	1157	1148	1122	0	0	0
25	Philadelphia	42101 0008	3	1568	1284	1207	0	0	0
26	Philadelphia	42101 0008	4	1637	1446	1482	0	0	0
27	Philadelphia	42101 0008	5	537	384	428	0	0	0
28	Philadelphia	42101 0008	6	801	572	580	0	0	0
29	Philadelphia	42101 0009	1	859	716	736	0	0	0
30	Philadelphia	42101 0009	2	1491	1141	1171	0	0	0
31	Philadelphia	42101 0009	3	843	746	738	0	0	0
32	Philadelphia	42101 0009	4	1041	926	923	0	0	0
33	Philadelphia	42101 0010	1	511	287	271	0	0	0
34	Philadelphia	42101 0010	2	1213	762	757	0	0	0
35	Philadelphia	42101 0010	3	1866	1325	1340	0	0	0
36	Philadelphia	42101 0010	4	2125	1412	1379	0	0	0
37	Philadelphia	42101 0011	1	469	347	328	0	0	0
38	Philadelphia	42101 0011	2	440	265	249	0	0	0
39	Philadelphia	42101 0011	3	981	672	669	0	0	0
40	Philadelphia	42101 0011	4	569	468	468	0	0	0
41	Philadelphia	42101 0011	5	588	424	432	0	0	0
42	Philadelphia	42101 0011	6	353	257	274	0	0	0
43	Philadelphia	42101 0011	7	583	463	455	0	0	0
44	Philadelphia	42101 0011	8	1611	1217	1238	0	0	0
45	Philadelphia	42101 0012	1	1062	546	560	0	0	0
46	Philadelphia	42101 0012	2	1152	688	665	0	0	0
47	Philadelphia	42101 0012	3	639	461	448	0	0	0
48	Philadelphia	42101 0012	4	824	604	608	0	0	0
49	Philadelphia	42101 0012	5	833	485	468	0	0	0
50	Philadelphia	42101 0012	7	1204	886	873	0	0	0
51	Philadelphia	42101 0012	8	2005	1712	1777	0	0	0
52	Philadelphia	42101 0013	1	680	435	460	0	0	0
53	Philadelphia	42101 0013	2	937	517	562	0	0	0
54	Philadelphia	42101 0013	3	586	321	330	0	0	0
55	Philadelphia	42101 0013	7	369	168	130	0	0	0

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56	Philadelphia	42101 0014	1	145	99	114	0	0	0
57	Philadelphia	42101 0014	2	646	393	375	0	0	0
58	Philadelphia	42101 0014	3	325	147	164	0	0	0
59	Philadelphia	42101 0014	4	343	219	191	0	0	0
60	Philadelphia	42101 0014	5	570	267	253	0	0	0
61	Philadelphia	42101 0014	6	862	458	442	0	0	0
62	Philadelphia	42101 0014	7	571	360	313	0	0	0
63	Philadelphia	42101 0014	8	301	205	220	0	0	0
64	Philadelphia	42101 0015	1	811	490	444	0	0	0
65	Philadelphia	42101 0015	2	470	311	327	0	0	0
66	Philadelphia	42101 0015	3	510	278	249	0	0	0
67	Philadelphia	42101 0015	4	746	393	407	0	9	0
68	Philadelphia	42101 0016	1	507	293	286	0	0	0
69	Philadelphia	42101 0016	2	1001	610	623	0	0	0
70	Philadelphia	42101 0016	3	435	293	323	0	0	0
71	Philadelphia	42101 0017	2	1083	708	723	16	0	0
72	Philadelphia	42101 0017	3	878	519	447	0	0	0
73	Philadelphia	42101 0017	4	532	295	283	0	0	0
74	Philadelphia	42101 0018	1	782	446	411	0	0	0
75	Philadelphia	42101 0018	2	477	298	319	0	0	0
76	Philadelphia	42101 0018	3	437	258	251	0	0	0
77	Philadelphia	42101 0018	4	306	133	125	0	0	0
78	Philadelphia	42101 0018	5	1245	569	651	0	0	0
79	Philadelphia	42101 0019	1	114	87	81	0	0	0
80	Philadelphia	42101 0019	2	424	205	226	0	0	0
81	Philadelphia	42101 0019	3	309	134	151	0	0	0
82	Philadelphia	42101 0019	4	399	184	177	0	0	0
83	Philadelphia	42101 0019	5	386	221	217	0	0	0
84	Philadelphia	42101 0019	6	787	453	406	0	0	0
85	Philadelphia	42101 0020	1	374	186	182	0	0	0
86	Philadelphia	42101 0020	2	429	210	222	0	0	0
87	Philadelphia	42101 0020	3	680	267	270	0	0	0
88	Philadelphia	42101 0021	1	515	212	222	0	0	0
89	Philadelphia	42101 0021	2	636	303	282	0	0	6
90	Philadelphia	42101 0021	3	464	238	245	0	0	0
91	Philadelphia	42101 0021	4	341	122	117	0	0	0
92	Philadelphia	42101 0021	5	680	330	320	0	0	0
93	Philadelphia	42101 0022	1	573	337	358	0	0	0
94	Philadelphia	42101 0022	2	677	295	309	0	0	0
95	Philadelphia	42101 0022	3	452	240	242	0	0	0
96	Philadelphia	42101 0022	4	493	227	203	0	0	0
97	Philadelphia	42101 0023	1	364	186	189	0	0	0
98	Philadelphia	42101 0023	2	611	293	304	0	0	0
99	Philadelphia	42101 0023	3	660	307	286	0	0	0
100	Philadelphia	42101 0023	4	894	451	473	0	0	0
101	Philadelphia	42101 0024	1	735	389	381	0	0	0
102	Philadelphia	42101 0024	2	428	221	234	0	0	0
103	Philadelphia	42101 0024	3	661	304	255	0	0	0
104	Philadelphia	42101 0024	4	575	303	316	0	0	0
105	Philadelphia	42101 0024	5	536	263	245	0	0	0
106	Philadelphia	42101 0024	6	292	144	168	0	0	0
107	Philadelphia	42101 0024	7	529	249	262	0	0	0
108	Philadelphia	42101 0024	8	555	300	297	0	0	0
109	Philadelphia	42101 0025	1	312	192	189	0	0	0
110	Philadelphia	42101 0025	2	243	135	135	0	0	0
111	Philadelphia	42101 0025	3	709	352	378	0	0	0
112	Philadelphia	42101 0025	4	1152	760	784	0	0	0
113	Philadelphia	42101 0025	5	1019	594	547	0	0	0
114	Philadelphia	42101 0026	1	0	0	0	0	0	0
115	Philadelphia	42101 0027	1	344	160	145	0	0	0
116	Philadelphia	42101 0027	2	941	435	431	0	0	0

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117	Philadelphia	42101 0027	3	772	372	374	0	0	0
118	Philadelphia	42101 0027	4	1133	427	387	0	0	0
119	Philadelphia	42101 0027	5	1566	652	704	0	10	0
120	Philadelphia	42101 0027	6	950	462	488	0	0	0
121	Philadelphia	42101 0027	7	871	459	453	0	0	0
122	Philadelphia	42101 0027	8	788	361	336	0	0	0
123	Philadelphia	42101 0028	1	1350	578	569	0	0	0
124	Philadelphia	42101 0028	2	1411	686	763	0	0	0
125	Philadelphia	42101 0028	3	1066	460	467	0	0	0
126	Philadelphia	42101 0028	4	958	423	394	0	0	0
127	Philadelphia	42101 0028	5	952	428	428	0	0	0
128	Philadelphia	42101 0028	6	971	472	463	0	0	0
129	Philadelphia	42101 0028	7	1302	549	516	0	0	0
130	Philadelphia	42101 0028	8	958	426	422	0	0	0
131	Philadelphia	42101 0029	1	356	168	151	0	0	0
132	Philadelphia	42101 0029	2	433	213	195	0	0	0
133	Philadelphia	42101 0029	3	538	261	235	0	0	0
134	Philadelphia	42101 0029	4	338	173	188	0	0	0
135	Philadelphia	42101 0029	5	420	198	179	0	0	0
136	Philadelphia	42101 0029	6	766	400	437	0	0	0
137	Philadelphia	42101 0029	7	574	332	383	0	0	9
138	Philadelphia	42101 0029	8	592	296	264	0	0	0
139	Philadelphia	42101 0030	1	1065	475	448	0	0	0
140	Philadelphia	42101 0030	2	1427	571	597	0	0	0
141	Philadelphia	42101 0030	3	732	325	287	0	0	0
142	Philadelphia	42101 0030	4	981	431	470	0	0	0
143	Philadelphia	42101 0030	5	1258	450	428	0	0	0
144	Philadelphia	42101 0030	6	940	346	347	0	0	0
145	Philadelphia	42101 0030	7	1014	438	448	0	0	0
146	Philadelphia	42101 0030	8	947	367	378	0	0	0
147	Philadelphia	42101 0031	1	586	262	264	0	0	0
148	Philadelphia	42101 0031	2	611	278	296	0	0	0
149	Philadelphia	42101 0031	3	686	289	286	0	0	0
150	Philadelphia	42101 0031	4	1162	488	499	0	0	0
151	Philadelphia	42101 0031	5	1224	574	597	0	0	0
152	Philadelphia	42101 0031	6	784	410	368	0	0	0
153	Philadelphia	42101 0031	7	421	215	206	0	0	0
154	Philadelphia	42101 0031	8	428	196	200	0	0	0
155	Philadelphia	42101 0037	1	1278	536	578	0	0	0
156	Philadelphia	42101 0037	2	1423	619	613	0	0	0
157	Philadelphia	42101 0037	3	956	418	377	0	0	0
158	Philadelphia	42101 0037	7	1902	761	761	0	0	0
159	Philadelphia	42101 0037	8	1278	476	509	0	0	0
160	Philadelphia	42101 0039	1	1363	688	760	0	0	0
161	Philadelphia	42101 0039	2	1264	656	664	0	0	0
162	Philadelphia	42101 0039	3	1385	678	671	0	0	6
163	Philadelphia	42101 0039	4	1161	478	461	0	0	0
164	Philadelphia	42101 0039	5	1243	532	511	0	0	0
165	Philadelphia	42101 0039	6	2091	884	826	0	0	0
166	Philadelphia	42101 0039	7	1975	854	848	0	0	0
167	Philadelphia	42101 0039	8	1371	668	691	0	0	0
168	Philadelphia	42101 0040	1	1391	632	629	0	0	0
169	Philadelphia	42101 0040	2	1262	611	612	0	0	0
170	Philadelphia	42101 0040	3	1306	582	581	0	0	0
171	Philadelphia	42101 0040	4	1559	675	679	0	0	0
172	Philadelphia	42101 0040	5	1251	557	557	0	0	0
173	Philadelphia	42101 0040	6	1093	514	511	0	0	0
174	Philadelphia	42101 0040	7	685	344	345	0	0	0
175	Philadelphia	42101 0040	8	900	450	451	0	0	0
176	Philadelphia	42101 0041	1	1340	472	484	0	0	0
177	Philadelphia	42101 0041	2	1196	426	365	0	0	0

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178	Philadelphia	42101	0041	3	1908	737	750	0	0	0
179	Philadelphia	42101	0041	4	3041	1218	1263	0	0	0
180	Philadelphia	42101	0041	5	2124	868	829	0	0	0
181	Philadelphia	42101	0041	6	1252	572	587	0	0	0
182	Philadelphia	42101	0041	7	1261	495	523	0	0	0
183	Philadelphia	42101	0041	8	1204	569	556	0	0	0
184	Philadelphia	42101	0042	1	731	316	310	0	0	0
185	Philadelphia	42101	0042	2	793	342	350	0	0	0
186	Philadelphia	42101	0042	3	1504	561	572	0	0	0
187	Philadelphia	42101	0042	4	1499	480	509	0	0	0
188	Philadelphia	42101	0042	5	1445	498	499	0	0	0
189	Philadelphia	42101	0042	6	1490	551	549	0	0	0
190	Philadelphia	42101	0042	7	1793	701	712	0	0	0
191	Philadelphia	42101	0042	8	1826	762	710	0	0	0
192	Philadelphia	42101	0043	1	46	24	17	0	0	0
193	Philadelphia	42101	0043	2	0	0	0	0	0	0
194	Philadelphia	42101	0044	1	252	96	102	0	0	0
195	Philadelphia	42101	0044	2	826	347	366	0	0	0
196	Philadelphia	42101	0045	1	529	228	232	0	0	0
197	Philadelphia	42101	0045	2	931	405	406	0	0	0
198	Philadelphia	42101	0045	3	309	127	123	0	0	0
199	Philadelphia	42101	0045	4	737	323	314	0	0	0
200	Philadelphia	42101	0045	5	749	328	318	0	0	0
201	Philadelphia	42101	0048	1	526	216	228	0	0	0
202	Philadelphia	42101	0049	1	0	0	0	0	0	0
203	Philadelphia	42101	0050	9	2229	464	433	0	0	0
204	Philadelphia	42101	0125	1	149	112	112	0	0	0
205	Philadelphia	42101	0125	2	848	603	634	0	0	0
206	Philadelphia	42101	0125	3	1233	1044	1060	0	0	0
207	Philadelphia	42101	0125	4	1382	1266	1252	0	0	0
208	Philadelphia	42101	0126	1	221	116	120	0	0	0
209	Philadelphia	42101	0126	2	23	13	14	0	0	0
210	Philadelphia	42101	0126	3	311	224	228	0	0	0
211	Philadelphia	42101	0126	4	80	33	8	0	0	0
212	Philadelphia	42101	0127	1	339	182	171	0	0	0
213	Philadelphia	42101	0127	2	0	0	0	0	0	0
214	Philadelphia	42101	0127	3	60	25	24	0	0	0
215	Philadelphia	42101	0128	1	111	85	82	0	0	0
216	Philadelphia	42101	0128	2	52	32	30	0	0	0
217	Philadelphia	42101	0129	1	56	36	30	0	0	0
218	Philadelphia	42101	0129	2	79	76	81	0	0	0
219	Philadelphia	42101	0129	3	292	184	203	0	0	0
220	Philadelphia	42101	0129	4	3	3	0	0	0	0
221	Philadelphia	42101	0130	1	307	151	150	0	0	0
222	Philadelphia	42101	0130	2	249	171	177	0	0	0
223	Philadelphia	42101	0130	3	453	165	185	0	0	0
224	Philadelphia	42101	0131	1	547	267	260	0	0	0
225	Philadelphia	42101	0131	2	940	394	358	11	0	0
226	Philadelphia	42101	0131	3	719	329	321	0	0	0
227	Philadelphia	42101	0132	1	2270	1002	1029	0	0	5
228	Philadelphia	42101	0132	2	478	170	127	0	0	0
229	Philadelphia	42101	0132	3	565	224	241	0	0	0
230	Philadelphia	42101	0132	4	10	7	15	0	0	0
231	Philadelphia	42101	0132	5	438	3	1	0	0	0
232	Philadelphia	42101	0132	6	247	103	107	0	0	0
233	Philadelphia	42101	0132	7	99	51	39	0	0	0
234	Philadelphia	42101	0132	8	59	34	30	0	0	0
235	Philadelphia	42101	0133	1	74	64	60	0	0	0
236	Philadelphia	42101	0133	2	239	172	147	0	0	11
237	Philadelphia	42101	0133	3	147	134	125	0	0	16
238	Philadelphia	42101	0133	4	341	232	227	0	0	0

239	Philadelphia	42101 0133	5	353	272	294	0	13	0
240	Philadelphia	42101 0133	6	619	296	308	0	0	0
241	Philadelphia	42101 0133	7	494	210	195	0	0	0
242	Philadelphia	42101 0134	1	694	341	368	0	0	0
243	Philadelphia	42101 0134	2	597	392	407	0	0	0
244	Philadelphia	42101 0134	3	657	419	420	0	0	0
245	Philadelphia	42101 0134	4	491	260	269	0	0	0
246	Philadelphia	42101 0134	6	669	417	367	0	0	0
247	Philadelphia	42101 0134	7	1109	668	687	0	0	0
248	Philadelphia	42101 0135	1	285	110	97	0	0	0
249	Philadelphia	42101 0135	2	543	148	171	0	0	0
250	Philadelphia	42101 0135	3	402	135	132	0	0	0
251	Philadelphia	42101 0135	4	415	154	126	0	0	0
252	Philadelphia	42101 0135	5	694	287	286	0	0	0
253	Philadelphia	42101 0139	3	1495	319	327	0	0	0
254	Philadelphia	42101 0140	1	295	113	113	0	0	0
255	Philadelphia	42101 0140	2	570	423	434	0	0	0
256	Philadelphia	42101 0140	3	262	184	192	0	0	0
257	Philadelphia	42101 0140	4	293	168	164	0	0	0
258	Philadelphia	42101 0140	5	254	121	120	0	0	0
259	Philadelphia	42101 0140	6	368	217	212	0	0	0
260	Philadelphia	42101 0140	7	912	521	502	0	0	0
261	Philadelphia	42101 0140	8	639	271	274	0	0	0
262	Philadelphia	42101 0141	1	315	172	174	0	0	0
263	Philadelphia	42101 0141	2	315	277	279	0	0	0
264	Philadelphia	42101 0141	3	688	247	248	0	0	0
265	Philadelphia	42101 0141	4	579	227	235	0	0	0
266	Philadelphia	42101 0141	5	24	16	17	0	0	0
267	Philadelphia	42101 0141	6	466	153	149	0	0	0
268	Philadelphia	42101 0141	7	381	112	109	0	0	0
269	Philadelphia	42101 0142	1	129	67	79	0	0	0
270	Philadelphia	42101 0142	2	143	87	72	0	0	0
271	Philadelphia	42101 0142	3	360	214	225	0	0	0
272	Philadelphia	42101 0142	4	919	455	442	0	0	0
273	Philadelphia	42101 0142	5	470	208	163	0	0	0
274	Philadelphia	42101 0142	6	177	80	66	0	0	0
275	Philadelphia	42101 0143	1	82	46	68	0	0	0
276	Philadelphia	42101 0143	2	204	103	106	0	0	0
277	Philadelphia	42101 0143	3	498	269	310	0	0	0
278	Philadelphia	42101 0143	4	688	285	283	0	0	0
279	Philadelphia	42101 0144	1	344	120	118	0	0	0
280	Philadelphia	42101 0144	2	286	134	116	0	0	0
281	Philadelphia	42101 0144	3	470	215	184	0	0	0
282	Philadelphia	42101 0144	4	587	325	316	0	0	0
283	Philadelphia	42101 0144	5	464	175	188	0	13	0
284	Philadelphia	42101 0144	6	677	218	235	0	0	0
285	Philadelphia	42101 0144	7	501	178	163	0	0	0
286	Philadelphia	42101 0145	1	659	187	179	0	0	13
287	Philadelphia	42101 0145	2	603	196	199	0	0	0
288	Philadelphia	42101 0145	3	411	136	170	0	0	0
289	Philadelphia	42101 0145	4	134	75	68	0	0	0
290	Philadelphia	42101 0145	5	199	149	146	0	0	0
291	Philadelphia	42101 0146	1	187	71	70	0	0	0
292	Philadelphia	42101 0146	2	739	292	291	0	0	0
293	Philadelphia	42101 0146	3	767	290	292	0	0	0
294	Philadelphia	42101 0146	4	181	72	73	0	0	0
295	Philadelphia	42101 0146	5	889	296	288	0	0	0
296	Philadelphia	42101 0146	6	560	0	0	0	0	0
297	Philadelphia	42101 0147	1	494	328	326	0	0	0
298	Philadelphia	42101 0147	2	619	292	282	0	0	0
299	Philadelphia	42101 0147	3	776	666	674	0	0	0

300	Philadelphia	42101	0153	1	694	345	331	0	0	14
301	Philadelphia	42101	0154	1	722	216	217	0	0	0
302	Philadelphia	42101	0154	2	54	1	1	0	0	0
303	Philadelphia	42101	0154	3	1043	73	78	0	0	0
304	Philadelphia	42101	0155	1	408	128	118	0	0	0
305	Philadelphia	42101	0155	2	419	162	166	0	0	0
306	Philadelphia	42101	0155	3	567	207	222	0	0	0
307	Philadelphia	42101	0155	4	103	23	27	0	0	0
308	Philadelphia	42101	0155	5	710	244	233	0	0	0
309	Philadelphia	42101	0155	6	343	108	103	0	0	0
310	Philadelphia	42101	0155	7	864	268	271	0	0	0
311	Philadelphia	42101	0156	1	458	130	107	0	0	0
312	Philadelphia	42101	0156	2	290	93	99	0	0	0
313	Philadelphia	42101	0156	3	280	77	70	0	0	0
314	Philadelphia	42101	0156	4	293	89	79	0	0	0
315	Philadelphia	42101	0156	5	544	203	201	0	0	0
316	Philadelphia	42101	0156	6	527	164	150	0	0	0
317	Philadelphia	42101	0157	1	272	109	123	0	0	0
318	Philadelphia	42101	0157	2	293	92	90	0	0	0
319	Philadelphia	42101	0157	3	186	70	76	0	0	0
320	Philadelphia	42101	0157	4	917	323	344	0	0	0
321	Philadelphia	42101	0157	5	1096	407	418	0	0	0
322	Philadelphia	42101	0158	1	474	210	234	0	0	0
323	Philadelphia	42101	0158	2	533	232	243	0	0	0
324	Philadelphia	42101	0158	3	676	325	328	0	0	0
325	Philadelphia	42101	0158	4	1227	515	484	0	0	0
326	Philadelphia	42101	0158	5	633	232	226	0	0	0
327	Philadelphia	42101	0158	6	1001	408	400	0	0	0
328	Philadelphia	42101	0158	7	1097	436	435	0	0	0
329	Philadelphia	42101	0158	8	419	210	230	0	0	0
330	Philadelphia	42101	0159	1	846	359	362	0	0	0
331	Philadelphia	42101	0159	2	492	245	236	0	0	0
332	Philadelphia	42101	0159	3	11	8	5	0	0	0
333	Philadelphia	42101	0159	4	416	212	209	0	0	0
334	Philadelphia	42101	0160	1	794	303	299	0	0	0
335	Philadelphia	42101	0160	2	493	196	202	0	0	0
336	Philadelphia	42101	0160	3	1120	449	456	0	0	0
337	Philadelphia	42101	0160	4	1066	438	401	0	0	0
338	Philadelphia	42101	0160	5	998	427	451	0	0	0
339	Philadelphia	42101	0160	6	1171	479	492	0	0	0
340	Philadelphia	42101	0160	7	1468	545	504	0	0	0
341	Philadelphia	42101	0160	8	861	319	351	0	0	0
342	Philadelphia	42101	0161	1	1230	528	511	0	0	0
343	Philadelphia	42101	0161	2	662	258	257	0	0	0
344	Philadelphia	42101	0161	3	374	151	173	0	0	0
345	Philadelphia	42101	0161	4	402	179	212	0	0	0
346	Philadelphia	42101	0161	5	966	392	374	0	0	0
347	Philadelphia	42101	0161	6	528	236	218	0	0	0
348	Philadelphia	42101	0161	7	781	300	327	0	0	0
349	Philadelphia	42101	0161	8	1092	372	344	0	0	0
350	Philadelphia	42101	0162	1	572	197	199	0	0	0
351	Philadelphia	42101	0162	2	209	70	67	0	0	0
352	Philadelphia	42101	0162	3	644	234	219	0	0	0
353	Philadelphia	42101	0162	4	106	23	20	0	0	0
354	Philadelphia	42101	0162	5	497	164	178	0	0	0
355	Philadelphia	42101	0162	6	404	121	136	0	0	0
356	Philadelphia	42101	0162	7	431	140	130	0	0	0
357	Philadelphia	42101	0163	1	883	275	313	0	0	0
358	Philadelphia	42101	0163	2	324	107	112	0	0	0
359	Philadelphia	42101	0163	3	671	205	163	0	0	0
360	Philadelphia	42101	0163	4	127	38	36	0	0	0

361	Philadelphia	42101	0163	5	278	85	70	0	0	0
362	Philadelphia	42101	0163	6	571	168	179	0	0	0
363	Philadelphia	42101	0163	7	563	176	163	0	0	0
364	Philadelphia	42101	0163	8	724	227	245	0	0	0
365	Philadelphia	42101	0164	1	468	131	139	0	0	0
366	Philadelphia	42101	0164	2	779	282	307	0	0	0
367	Philadelphia	42101	0164	3	660	188	183	0	0	0
368	Philadelphia	42101	0164	4	63	14	11	0	0	0
369	Philadelphia	42101	0164	5	651	198	195	0	0	0
370	Philadelphia	42101	0164	6	817	257	266	0	0	0
371	Philadelphia	42101	0164	7	1278	358	317	0	0	12
372	Philadelphia	42101	0165	2	932	377	364	0	0	0
373	Philadelphia	42101	0165	3	451	149	138	0	0	0
374	Philadelphia	42101	0165	4	269	144	158	0	0	0
375	Philadelphia	42101	0165	5	249	136	137	0	0	0
376	Philadelphia	42101	0166	3	314	136	152	0	0	0
377	Philadelphia	42101	0176	1	1917	721	733	0	0	0
378	Philadelphia	42101	0176	2	1530	519	492	0	0	0
379	Philadelphia	42101	0176	3	1084	366	354	0	0	0
380	Philadelphia	42101	0176	4	2479	801	819	0	0	0
381	Philadelphia	42101	0176	7	1161	347	319	0	0	0
382	Philadelphia	42101	0177	1	1303	492	495	0	0	0
383	Philadelphia	42101	0177	2	1276	498	507	0	0	0
384	Philadelphia	42101	0177	3	1089	487	486	0	0	0
385	Philadelphia	42101	0177	4	953	360	361	0	0	0
386	Philadelphia	42101	0177	5	1198	461	448	0	0	0
387	Philadelphia	42101	0177	6	855	330	321	0	0	0
388	Philadelphia	42101	0177	7	801	322	332	0	0	0
389	Philadelphia	42101	0177	8	1123	461	461	0	0	0
390	Philadelphia	42101	0178	1	965	402	388	0	6	0
391	Philadelphia	42101	0178	2	837	375	365	0	0	0
392	Philadelphia	42101	0178	3	837	386	378	0	0	0
393	Philadelphia	42101	0178	4	703	345	358	0	0	0
394	Philadelphia	42101	0178	5	507	253	251	0	0	0
395	Philadelphia	42101	0178	6	206	92	82	0	0	0
396	Philadelphia	42101	0178	7	1052	484	493	0	0	0
397	Philadelphia	42101	0178	8	1142	475	491	0	0	0
398	Philadelphia	42101	0179	1	466	195	204	0	0	0
399	Philadelphia	42101	0179	2	1715	727	674	0	0	0
400	Philadelphia	42101	0179	3	877	324	303	0	0	0
401	Philadelphia	42101	0179	4	229	89	90	0	0	0
402	Philadelphia	42101	0179	5	426	167	191	0	0	0
403	Philadelphia	42101	0179	6	670	288	324	0	0	0
404	Philadelphia	42101	0179	7	66[illegible]	255	265	0	0	0
405	Philadelphia	42101	0179	8	138[illegible]	565	559	0	0	0
406	Philadelphia	42101	0180	1	154[illegible]	677	660	0	0	0
407	Philadelphia	42101	0180	2	123[illegible]	609	623	0	0	0
408	Philadelphia	42101	0180	3	867	418	402	0	0	0
409	Philadelphia	42101	0180	4	55	248	240	0	0	0
410	Philadelphia	42101	0180	5	257	103	112	0	0	0
411	Philadelphia	42101	0180	6	100[illegible]	436	434	0	0	0
412	Philadelphia	42101	0180	7	900	404	413	0	0	0
413	Philadelphia	42101	0180	8	2057	860	871	0	0	0
414	Philadelphia	42101	0181	1	197	103	99	0	0	0
415	Philadelphia	42101	0182	1	[illegible]	0	0	0	0	0
416	Philadelphia	42101	0182	2	377	179	210	0	0	0
417	Philadelphia	42101	0182	3		0	0	0	0	0
418	Philadelphia	42101	0183	1	127	44	41	0	0	0
419	Philadelphia	42101	0183	2	68[illegible]	281	270	0	0	0
420	Philadelphia	42101	0183	3	581	250	236	0	0	0
421	Philadelphia	42101	0185	1	13[illegible]	69	70	0	0	0

PENNSYLVANIA PORTION

422	Philadelphia	42101 0186	1	546	247	223	0	0	0
423	Philadelphia	42101 0186	2	377	156	170	0	0	0
424	Philadelphia	42101 0186	3	751	352	353	0	0	0
425	Philadelphia	42101 0186	4	839	386	388	0	0	0
426	Philadelphia	42101 0186	5	734	325	318	0	0	0
427	Philadelphia	42101 0186	6	987	435	423	0	0	0
428	Philadelphia	42101 0186	7	589	267	270	0	0	0
429	Philadelphia	42101 0187	1	479	202	199	0	0	0
430	Philadelphia	42101 0187	2	964	390	384	0	0	0
431	Philadelphia	42101 0187	3	330	135	167	0	0	0
432	Philadelphia	42101 0188	1	1290	488	468	0	0	0
433	Philadelphia	42101 0188	2	879	343	354	0	0	0
434	Philadelphia	42101 0188	3	443	184	182	0	0	0
435	Philadelphia	42101 0188	4	475	225	243	0	0	0
436	Philadelphia	42101 0188	5	709	341	340	0	0	0
437	Philadelphia	42101 0189	6	761	310	330	0	0	0
438	Philadelphia	42101 0188	7	1526	609	582	0	0	0
439	Philadelphia	42101 0189	2	587	228	274	0	0	0
440	Philadelphia	42101 0366	1	403	355	372	0	0	0
441	Philadelphia	42101 7038981		981	425	441	0	0	0
442	Philadelphia	42101 0366991		31	0	0	0	0	0
	Totals:			319327	153829	153707	27	51	92

PENNSYLVANIA PORTION

City	Census Tract ID		Tract People	House Count	Public Water	Drilled Wells	Dug Wells	Other Sources
Philadelphia	42101 0001	1	167	106	76	0	0	0
Philadelphia	42101 0001	2	290	289	270	0	0	0
Philadelphia	42101 0001	3	490	415	432	0	0	0
Philadelphia	42101 0001	4	84	11	9	0	0	0
Philadelphia	42101 0001	5	1042	844	871	0	0	0
Philadelphia	42101 0002	1	238	43	38	0	0	0
Philadelphia	42101 0002	2	937	350	375	0	0	0
Philadelphia	42101 0002	3	126	32	25	0	0	0
Philadelphia	42101 0002	4	102	12	6	0	0	0
Philadelphia	42101 0003	1	429	166	160	0	0	0
Philadelphia	42101 0003	2	455	364	367	0	0	0
Philadelphia	42101 0003	3	1543	1108	1168	0	0	0
Philadelphia	42101 0004	1	38	0	0	0	0	0
Philadelphia	42101 0004	2	2358	1979	1983	0	0	0
Philadelphia	42101 0004	3	810	747	685	0	0	0
Philadelphia	42101 0005	1	530	435	457	0	0	0
Philadelphia	42101 0005	2	110	10	0	0	0	0
Philadelphia	42101 0005	3	415	361	348	0	0	0
Philadelphia	42101 0006	1	349	208	230	0	0	0
Philadelphia	42101 0007	1	30	4	0	0	0	0
Philadelphia	42101 0007	2	2176	1657	1580	0	0	0
Philadelphia	42101 0007	3	863	673	734	0	0	0
Philadelphia	42101 0008	1	1937	1576	1611	0	0	0
Philadelphia	42101 0008	2	1157	1148	1122	0	0	0
Philadelphia	42101 0008	3	1568	1284	1207	0	0	0
Philadelphia	42101 0008	4	1637	1446	1482	0	0	0
Philadelphia	42101 0008	5	537	384	428	0	0	0
Philadelphia	42101 0008	6	801	572	580	0	0	0
Philadelphia	42101 0009	1	859	716	736	0	0	0
Philadelphia	42101 0009	2	1491	1141	1171	0	0	0
Philadelphia	42101 0009	3	843	746	738	0	0	0
Philadelphia	42101 0009	4	1041	926	923	0	0	0
Philadelphia	42101 0010	1	511	287	271	0	0	0
Philadelphia	42101 0010	2	1213	762	757	0	0	0
Philadelphia	42101 0010	3	1866	1305	1340	0	0	0
Philadelphia	42101 0010	4	2125	1412	1379	0	0	0
Philadelphia	42101 0011	1	469	347	328	0	0	0
Philadelphia	42101 0011	2	440	265	249	0	0	0
Philadelphia	42101 0011	3	981	672	669	0	0	0
Philadelphia	42101 0011	4	569	468	468	0	0	0
Philadelphia	42101 0011	5	588	424	432	0	0	0
Philadelphia	42101 0011	6	353	257	274	0	0	0
Philadelphia	42101 0011	7	583	403	455	0	0	0
Philadelphia	42101 0011	8	1611	1277	1238	0	0	0
Philadelphia	42101 0012	1	1062	546	560	0	0	0
Philadelphia	42101 0012	2	1152	638	665	0	0	0
Philadelphia	42101 0012	3	639	461	448	0	0	0
Philadelphia	42101 0012	4	824	604	608	0	0	0
Philadelphia	42101 0012	5	833	485	468	0	0	0
Philadelphia	42101 0012	7	1204	896	873	0	0	0
Philadelphia	42101 0012	8	2005	1712	1777	0	0	0
Philadelphia	42101 0013	1	680	435	460	0	0	0
Philadelphia	42101 0013	2	937	517	562	0	0	0
Philadelphia	42101 0013	3	586	381	330	0	0	0
Philadelphia	42101 0013	7	369	138	130	0	0	0
Philadelphia	42101 0014	1	145	99	114	0	0	0

Philadelphia	42101	0014	2	646	393	375	0	0	0
Philadelphia	42101	0014	3	325	147	164	0	0	0
Philadelphia	42101	0014	4	343	219	191	0	0	0
Philadelphia	42101	0014	5	570	207	253	0	0	0
Philadelphia	42101	0014	6	862	458	442	0	0	0
Philadelphia	42101	0014	7	571	360	313	0	0	0
Philadelphia	42101	0014	8	301	205	220	0	0	0
Philadelphia	42101	0015	1	811	490	444	0	0	0
Philadelphia	42101	0015	2	470	311	327	0	0	0
Philadelphia	42101	0015	3	510	278	249	0	0	0
Philadelphia	42101	0015	4	746	393	407	0	9	0
Philadelphia	42101	0016	1	507	293	286	0	0	0
Philadelphia	42101	0016	2	1001	610	623	0	0	0
Philadelphia	42101	0016	3	435	293	323	0	0	0
Philadelphia	42101	0017	2	1083	708	723	16	0	0
Philadelphia	42101	0017	3	878	519	447	0	0	0
Philadelphia	42101	0017	4	532	235	283	0	0	0
Philadelphia	42101	0018	1	782	416	411	0	0	0
Philadelphia	42101	0018	2	477	238	319	0	0	0
Philadelphia	42101	0018	3	437	258	251	0	0	0
Philadelphia	42101	0018	4	306	103	125	0	0	0
Philadelphia	42101	0018	5	1245	539	651	0	0	0
Philadelphia	42101	0019	1	114	37	81	0	0	0
Philadelphia	42101	0019	2	424	205	226	0	0	0
Philadelphia	42101	0019	3	309	134	151	0	0	0
Philadelphia	42101	0019	4	399	184	177	0	0	0
Philadelphia	42101	0019	5	386	221	217	0	0	0
Philadelphia	42101	0019	6	787	453	406	0	0	0
Philadelphia	42101	0020	1	374	186	182	0	0	0
Philadelphia	42101	0020	2	429	210	222	0	0	0
Philadelphia	42101	0020	3	680	257	270	0	0	0
Philadelphia	42101	0021	1	515	212	222	0	0	0
Philadelphia	42101	0021	2	636	303	282	0	0	6
Philadelphia	42101	0021	3	464	238	245	0	0	0
Philadelphia	42101	0021	4	341	102	117	0	0	0
Philadelphia	42101	0021	5	680	330	320	0	0	0
Philadelphia	42101	0022	1	573	337	358	0	0	0
Philadelphia	42101	0022	2	677	285	309	0	0	0
Philadelphia	42101	0022	3	452	240	242	0	0	0
Philadelphia	42101	0022	4	493	227	203	0	0	0
Philadelphia	42101	0023	1	364	186	189	0	0	0
Philadelphia	42101	0023	2	611	293	304	0	0	0
Philadelphia	42101	0023	3	660	307	286	0	0	0
Philadelphia	42101	0023	4	894	451	473	0	0	0
Philadelphia	42101	0024	1	735	389	381	0	0	0
Philadelphia	42101	0024	2	428	201	234	0	0	0
Philadelphia	42101	0024	3	661	304	255	0	0	0
Philadelphia	42101	0024	4	575	303	316	0	0	0
Philadelphia	42101	0024	5	536	243	245	0	0	0
Philadelphia	42101	0024	6	292	144	168	0	0	0
Philadelphia	42101	0024	7	529	239	262	0	0	0
Philadelphia	42101	0024	8	555	300	297	0	0	0
Philadelphia	42101	0025	1	312	192	189	0	0	0
Philadelphia	42101	0025	2	243	105	135	0	0	0
Philadelphia	42101	0025	3	709	352	378	0	0	0
Philadelphia	42101	0025	4	1152	760	784	0	0	0
Philadelphia	42101	0025	5	1019	594	547	0	0	0
Philadelphia	42101	0026	1	0	0	0	0	0	0
Philadelphia	42101	0027	1	344	170	145	0	0	0
Philadelphia	42101	0027	2	941	445	431	0	0	0
Philadelphia	42101	0027	3	772	372	374	0	0	0

Philadelphia	42101	0027	4	1133	427	387	0	0	0
Philadelphia	42101	0027	5	1566	652	704	0	10	0
Philadelphia	42101	0027	6	950	462	488	0	0	0
Philadelphia	42101	0027	7	871	459	453	0	0	0
Philadelphia	42101	0027	8	788	361	336	0	0	0
Philadelphia	42101	0028	1	1350	578	569	0	0	0
Philadelphia	42101	0028	2	1411	636	763	0	0	0
Philadelphia	42101	0028	3	1066	430	467	0	0	0
Philadelphia	42101	0028	4	958	423	394	0	0	0
Philadelphia	42101	0028	5	952	428	428	0	0	0
Philadelphia	42101	0028	6	971	472	463	0	0	0
Philadelphia	42101	0028	7	1302	549	516	0	0	0
Philadelphia	42101	0028	8	958	426	422	0	0	0
Philadelphia	42101	0029	1	356	168	151	0	0	0
Philadelphia	42101	0029	2	433	213	195	0	0	0
Philadelphia	42101	0029	3	538	261	235	0	0	0
Philadelphia	42101	0029	4	338	173	188	0	0	0
Philadelphia	42101	0029	5	420	198	179	0	0	0
Philadelphia	42101	0029	6	766	400	437	0	0	0
Philadelphia	42101	0029	7	574	302	383	0	0	9
Philadelphia	42101	0029	8	592	296	264	0	0	0
Philadelphia	42101	0030	1	1065	475	448	0	0	0
Philadelphia	42101	0030	2	1427	571	597	0	0	0
Philadelphia	42101	0030	3	732	325	287	0	0	0
Philadelphia	42101	0030	4	981	431	470	0	0	0
Philadelphia	42101	0030	5	1258	450	428	0	0	0
Philadelphia	42101	0030	6	940	346	347	0	0	0
Philadelphia	42101	0030	7	1014	438	448	0	0	0
Philadelphia	42101	0030	8	947	367	378	0	0	0
Philadelphia	42101	0031	1	586	262	264	0	0	0
Philadelphia	42101	0031	2	611	278	296	0	0	0
Philadelphia	42101	0031	3	686	299	286	0	0	0
Philadelphia	42101	0031	4	1162	488	499	0	0	0
Philadelphia	42101	0031	5	1224	574	597	0	0	0
Philadelphia	42101	0031	6	784	410	368	0	0	0
Philadelphia	42101	0031	7	421	215	206	0	0	0
Philadelphia	42101	0031	8	428	196	200	0	0	0
Philadelphia	42101	0037	1	1278	536	578	0	0	0
Philadelphia	42101	0037	2	1423	619	613	0	0	0
Philadelphia	42101	0037	3	956	418	377	0	0	0
Philadelphia	42101	0037	7	1902	761	761	0	0	0
Philadelphia	42101	0037	8	1278	476	509	0	0	0
Philadelphia	42101	0039	1	1363	638	760	0	0	0
Philadelphia	42101	0039	2	1264	636	664	0	0	0
Philadelphia	42101	0039	3	1385	678	671	0	0	6
Philadelphia	42101	0039	4	1161	478	461	0	0	0
Philadelphia	42101	0039	5	1243	532	511	0	0	0
Philadelphia	42101	0039	6	2091	824	826	0	0	0
Philadelphia	42101	0039	7	1975	854	848	0	0	0
Philadelphia	42101	0039	8	1371	668	691	0	0	0
Philadelphia	42101	0040	1	1391	632	629	0	0	0
Philadelphia	42101	0040	2	1262	611	612	0	0	0
Philadelphia	42101	0040	3	1306	582	581	0	0	0
Philadelphia	42101	0040	4	1559	675	679	0	0	0
Philadelphia	42101	0040	5	1251	547	557	0	0	0
Philadelphia	42101	0040	6	1093	514	511	0	0	0
Philadelphia	42101	0040	7	685	316	345	0	0	0
Philadelphia	42101	0041	8	900	430	451	0	0	0
Philadelphia	42101	0041	1	1340	472	484	0	0	0
Philadelphia	42101	0041	2	1196	416	365	0	0	0
Philadelphia	42101	0041	3	1908	727	750	0	0	0

PENNSYLVANIA PORTION

Philadelphia	42101	0041	4	3041	12[illegible]6	1263	0	0	0
Philadelphia	42101	0041	5	2124	8[illegible]8	829	0	0	0
Philadelphia	42101	0041	6	1252	572	587	0	0	0
Philadelphia	42101	0041	7	1261	495	523	0	0	0
Philadelphia	42101	0041	8	1204	539	556	0	0	0
Philadelphia	42101	0042	1	731	316	310	0	0	0
Philadelphia	42101	0042	2	793	342	350	0	0	0
Philadelphia	42101	0042	3	1504	561	572	0	0	0
Philadelphia	42101	0042	4	1499	430	509	0	0	0
Philadelphia	42101	0042	5	1445	498	499	0	0	0
Philadelphia	42101	0042	6	1490	531	549	0	0	0
Philadelphia	42101	0042	7	1793	701	712	0	0	0
Philadelphia	42101	0042	8	1826	742	710	0	0	0
Philadelphia	42101	0043	1	46	24	17	0	0	0
Philadelphia	42101	0043	2	0	0	0	0	0	0
Philadelphia	42101	0044	1	252	96	102	0	0	0
Philadelphia	42101	0044	2	826	347	366	0	0	0
Philadelphia	42101	0045	1	529	208	232	0	0	0
Philadelphia	42101	0045	2	931	405	406	0	0	0
Philadelphia	42101	0045	3	309	127	123	0	0	0
Philadelphia	42101	0045	4	737	303	314	0	0	0
Philadelphia	42101	0045	5	749	318	318	0	0	0
Philadelphia	42101	0049	1	526	216	228	0	0	0
Philadelphia	42101	0049	1	0	0	0	0	0	0
Philadelphia	42101	0049	9	2229	454	433	0	0	0
Philadelphia	42101	0105	1	149	112	112	0	0	0
Philadelphia	42101	0105	2	848	603	634	0	0	0
Philadelphia	42101	0105	3	1233	1044	1060	0	0	0
Philadelphia	42101	0105	4	1382	1266	1252	0	0	0
Philadelphia	42101	0106	1	221	116	120	0	0	0
Philadelphia	42101	0106	2	23	13	14	0	0	0
Philadelphia	42101	0106	3	311	204	228	0	0	0
Philadelphia	42101	0106	4	80	33	8	0	0	0
Philadelphia	42101	0107	1	339	192	171	0	0	0
Philadelphia	42101	0107	2	0	0	0	0	0	0
Philadelphia	42101	0107	3	60	25	24	0	0	0
Philadelphia	42101	0108	1	111	85	82	0	0	0
Philadelphia	42101	0108	2	52	32	30	0	0	0
Philadelphia	42101	0109	1	56	36	30	0	0	0
Philadelphia	42101	0109	2	79	76	81	0	0	0
Philadelphia	42101	0109	3	292	194	203	0	0	0
Philadelphia	42101	0109	4	3	3	0	0	0	0
Philadelphia	42101	0110	1	307	171	150	0	0	0
Philadelphia	42101	0110	2	249	171	177	0	0	0
Philadelphia	42101	0110	3	453	150	185	0	0	0
Philadelphia	42101	0111	1	547	207	260	0	0	0
Philadelphia	42101	0111	2	940	394	358	11	0	0
Philadelphia	42101	0111	3	713	319	321	0	0	0
Philadelphia	42101	0112	1	2270	1012	1029	0	0	5
Philadelphia	42101	0112	2	478	170	127	0	0	0
Philadelphia	42101	0112	3	565	214	241	0	0	0
Philadelphia	42101	0112	4	10	7	15	0	0	0
Philadelphia	42101	0112	5	438	3	1	0	0	0
Philadelphia	42101	0112	6	247	171	107	0	0	0
Philadelphia	42101	0112	7	99	1	39	0	0	0
Philadelphia	42101	0112	8	59	34	30	0	0	0
Philadelphia	42101	0112	1	74	44	60	0	0	0
Philadelphia	42101	0113	2	239	172	147	0	0	11
Philadelphia	42101	0113	3	144	197	125	0	0	16
Philadelphia	42101	0113	4	341	212	227	0	0	0
Philadelphia	42101	0113	5	353	277	294	0	13	0

Philadelphia	42101	0133	6	619	2.5	308	0	0	0
Philadelphia	42101	0[illegible]	7	494	2	195	0	0	0
Philadelphia	42101	0[illegible]	1	694	3	368	0	0	0
Philadelphia	42101	0[illegible]4	2	597	3.[illegible]	407	0	0	0
Philadelphia	42101	0[illegible]	3	657	4.[illegible]	420	0	0	0
Philadelphia	42101	0.[illegible]	4	431	2	269	0	0	0
Philadelphia	42101	0.[illegible]	6	889	4	367	0	0	0
Philadelphia	42101	0134	7	1109	6.8	687	0	0	0
Philadelphia	42101	0135	1	285	1.0	97	0	0	0
Philadelphia	42101	0135	2	543	148	171	0	0	0
Philadelphia	42101	0135	3	402	135	132	0	0	0
Philadelphia	42101	0135	4	415	164	126	0	0	0
Philadelphia	42101	0135	5	694	287	286	0	0	0
Philadelphia	42101	0139	3	1495	3.9	327	0	0	0
Philadelphia	42101	0140	1	295	1.3	113	0	0	0
Philadelphia	42101	0.[illegible]	2	570	4.[illegible]	434	0	0	0
Philadelphia	42101	0.[illegible]	3	262	1.[illegible]	192	0	0	0
Philadelphia	42101	0.[illegible]	4	295	1.[illegible]	164	0	0	0
Philadelphia	42101	0.[illegible]	5	254	1	120	0	0	0
Philadelphia	42101	0.[illegible]	6	383	2	212	0	0	0
Philadelphia	42101	0[illegible]	7	912	5	502	0	0	0
Philadelphia	42101	0.[illegible]	8	638	2.[illegible]	274	0	0	0
Philadelphia	42101	0141	1	315	1.72	174	0	0	0
Philadelphia	42101	0141	2	315	277	279	0	0	0
Philadelphia	42101	0.41	3	688	2.7	248	0	0	0
Philadelphia	42101	0.41	4	579	227	235	0	0	0
Philadelphia	42101	0141	5	24	.6	17	0	0	0
Philadelphia	42101	0141	6	466	1.32	149	0	0	0
Philadelphia	42101	0141	7	381	1.2	109	0	0	0
Philadelphia	42101	0142	1	128	[illegible]	79	0	0	0
Philadelphia	42101	0[illegible]	2	143	[illegible]	72	0	0	0
Philadelphia	42101	0.[illegible]	3	360	2	225	0	0	0
Philadelphia	42101	0.[illegible]	4	912	4.[illegible]	442	0	0	0
Philadelphia	42101	0[illegible]	5	470	2.[illegible]	163	0	0	0
Philadelphia	42101	0[illegible]	6	177		66	0	0	0
Philadelphia	42101	0.[illegible]	1	82	[illegible]	68	0	0	0
Philadelphia	42101	0143	2	204	1.43	106	0	0	0
Philadelphia	42101	0.43	3	495	2.79	310	0	0	0
Philadelphia	42101	0.43	4	689	2.5	283	0	0	0
Philadelphia	42101	0144	1	344	1.10	118	0	0	0
Philadelphia	42101	0.44	2	286	1.44	116	0	0	0
Philadelphia	42101	0.44	3	472	2.5	184	0	0	0
Philadelphia	42101	0144	4	587	3.75	316	0	0	0
Philadelphia	42101	0.4	5	464	1.[illegible]	188	0	13	0
Philadelphia	42101	0.[illegible]	6	677	2.[illegible]	235	0	0	0
Philadelphia	42101	0.[illegible]	7	501	1.[illegible]	163	0	0	0
Philadelphia	42101	0[illegible]	1	659	1	179	0	0	13
Philadelphia	42101	0[illegible]	2	603	1.[illegible]	199	0	0	0
Philadelphia	42101	0.[illegible]	3	410	1	170	0	0	0
Philadelphia	42101	0[illegible]	4	131		68	0	0	0
Philadelphia	42101	0.[illegible]	5	193	1.[illegible]	146	0	0	0
Philadelphia	42101	0[illegible]	1	137	[illegible]	70	0	0	0
Philadelphia	42101	0.[illegible]	2	738	2.2	291	0	0	0
Philadelphia	42101	0.[illegible]	3	747	2.[illegible]	292	0	0	0
Philadelphia	42101	0.[illegible]	4	181	[illegible]	73	0	0	0
Philadelphia	42101	0.[illegible]	5	899	2.[illegible]	288	0	0	0
Philadelphia	42101	0[illegible]	6	560	[illegible]	0	0	0	0
Philadelphia	42101	0[illegible]	1	494	3.[illegible]	326	0	0	0
Philadelphia	42101	0[illegible]	2	610	2.[illegible]	282	0	0	0
Philadelphia	42101	0.[illegible]	3	776	6	674	0	0	0
Philadelphia	42101	0[illegible]	1	694	3	331	0	0	14

PENNSYLVANIA PORTION

Philadelphia	42101	0154	1	722	2.6	217	0	0	0
Philadelphia	42101	0154	2	54	1	1	0	0	0
Philadelphia	42101	0154	3	1043	[illegible]	78	0	0	0
Philadelphia	42101	0155	1	408	1.8	118	0	0	0
Philadelphia	42101	0155	2	418	1.2	166	0	0	0
Philadelphia	42101	0155	3	567	2.7	222	0	0	0
Philadelphia	42101	0155	4	103	[illegible]	27	0	0	0
Philadelphia	42101	0155	5	710	2.4	233	0	0	0
Philadelphia	42101	0155	6	343	1.9	103	0	0	0
Philadelphia	42101	0155	7	864	2.8	271	0	0	0
Philadelphia	42101	0156	1	458	1.0	107	0	0	0
Philadelphia	42101	0156	2	290	[illegible]	99	0	0	0
Philadelphia	42101	0156	3	280	[illegible]	70	0	0	0
Philadelphia	42101	0156	4	293	[illegible]	79	0	0	0
Philadelphia	42101	0156	5	544	2.3	201	0	0	0
Philadelphia	42101	0156	6	521	1.4	150	0	0	0
Philadelphia	42101	0157	1	272	1.9	123	0	0	0
Philadelphia	42101	0157	2	293	[illegible]	90	0	0	0
Philadelphia	42101	0157	3	186	[illegible]	76	0	0	0
Philadelphia	42101	0157	4	917	3.0	344	0	0	0
Philadelphia	42101	0157	5	1096	4.7	418	0	0	0
Philadelphia	42101	0158	1	474	2.0	234	0	0	0
Philadelphia	42101	0158	2	533	2.2	243	0	0	0
Philadelphia	42101	0158	3	676	3.5	328	0	0	0
Philadelphia	42101	0158	4	1227	5.5	484	0	0	0
Philadelphia	42101	0158	5	633	2.2	226	0	0	0
Philadelphia	42101	0158	6	1001	4.8	400	0	0	0
Philadelphia	42101	0158	7	1097	4.6	435	0	0	0
Philadelphia	42101	0158	8	418	2.0	230	0	0	0
Philadelphia	42101	0159	1	846	3.9	362	0	0	0
Philadelphia	42101	0159	2	492	2.5	236	0	0	0
Philadelphia	42101	0159	3	11	8	5	0	0	0
Philadelphia	42101	0159	4	416	2.2	209	0	0	0
Philadelphia	42101	0160	1	794	3.3	299	0	0	0
Philadelphia	42101	0160	2	493	1.6	202	0	0	0
Philadelphia	42101	0160	3	1122	4.9	456	0	0	0
Philadelphia	42101	0160	4	1066	4.8	401	0	0	0
Philadelphia	42101	0160	5	999	4.7	451	0	0	0
Philadelphia	42101	0160	6	1171	4.9	492	0	0	0
Philadelphia	42101	0160	7	1468	5.5	504	0	0	0
Philadelphia	42101	0160	8	861	3.9	351	0	0	0
Philadelphia	42101	0161	1	1236	5.8	511	0	0	0
Philadelphia	42101	0161	2	662	2.8	257	0	0	0
Philadelphia	42101	0161	3	374	1.1	173	0	0	0
Philadelphia	42101	0161	4	402	1.9	212	0	0	0
Philadelphia	42101	0161	5	966	3.2	374	0	0	0
Philadelphia	42101	0161	6	520	2.6	218	0	0	0
Philadelphia	42101	0161	7	781	3.0	327	0	0	0
Philadelphia	42101	0161	8	1093	3.2	344	0	0	0
Philadelphia	42101	0162	1	572	1.7	199	0	0	0
Philadelphia	42101	0162	2	209	[illegible]	67	0	0	0
Philadelphia	42101	0162	3	644	2.4	219	0	0	0
Philadelphia	42101	0162	4	105	[illegible]	20	0	0	0
Philadelphia	42101	0162	5	493	1.4	178	0	0	0
Philadelphia	42101	0162	6	404	1.1	136	0	0	0
Philadelphia	42101	0162	7	431	1.0	130	0	0	0
Philadelphia	42101	0163	1	889	2.5	313	0	0	0
Philadelphia	42101	0163	2	320	1.[illegible]	112	0	0	0
Philadelphia	42101	0163	3	678	2.5	163	0	0	0
Philadelphia	42101	0163	4	125	[illegible]	36	0	0	0
Philadelphia	42101	0163	5	278	[illegible]	70	0	0	0

Philadelphia	42101	0163	6	570	1.8	179	0	0	0
Philadelphia	42101	0163	7	563	1.6	163	0	0	0
Philadelphia	42101	0163	8	724	2.7	245	0	0	0
Philadelphia	42101	0164	1	466	1.1	139	0	0	0
Philadelphia	42101	0164	2	779	2.2	307	0	0	0
Philadelphia	42101	0164	3	660	1.8	183	0	0	0
Philadelphia	42101	0164	4	63	.4	11	0	0	0
Philadelphia	42101	0164	5	651	1.8	195	0	0	0
Philadelphia	42101	0164	6	817	2.7	266	0	0	0
Philadelphia	42101	0164	7	1278	3.8	317	0	0	12
Philadelphia	42101	0165	2	933	3.7	364	0	0	0
Philadelphia	42101	0165	3	451	1.9	138	0	0	0
Philadelphia	42101	0165	4	269	1.4	158	0	0	0
Philadelphia	42101	0165	5	248	1.6	137	0	0	0
Philadelphia	42101	0166	3	314	1.6	152	0	0	0
Philadelphia	42101	0176	1	1915	7.1	733	0	0	0
Philadelphia	42101	0176	2	1530	5.9	492	0	0	0
Philadelphia	42101	0176	3	1084	3.6	354	0	0	0
Philadelphia	42101	0176	4	2479	8.1	819	0	0	0
Philadelphia	42101	0176	7	1166	3.7	319	0	0	0
Philadelphia	42101	0177	1	1305	4.2	495	0	0	0
Philadelphia	42101	0177	2	1276	4.9	507	0	0	0
Philadelphia	42101	0177	3	1086	4.7	486	0	0	0
Philadelphia	42101	0177	4	953	3.0	361	0	0	0
Philadelphia	42101	0177	5	1198	4.1	448	0	0	0
Philadelphia	42101	0177	6	855	3.0	321	0	0	0
Philadelphia	42101	0177	7	801	3.2	332	0	0	0
Philadelphia	42101	0177	8	1123	4.1	461	0	0	0
Philadelphia	42101	0178	1	965	4.2	388	0	6	0
Philadelphia	42101	0178	2	838	3.5	365	0	0	0
Philadelphia	42101	0179	3	837	3.8	378	0	0	0
Philadelphia	42101	0179	4	703	3.5	358	0	0	0
Philadelphia	42101	0178	5	509	2.3	251	0	0	0
Philadelphia	42101	0178	6	206	.2	82	0	0	0
Philadelphia	42101	0178	7	1052	4.4	493	0	0	0
Philadelphia	42101	0178	8	1142	4.5	491	0	0	0
Philadelphia	42101	0179	1	466	1.5	204	0	0	0
Philadelphia	42101	0179	2	1715	7.7	674	0	0	0
Philadelphia	42101	0179	3	877	3.4	303	0	0	0
Philadelphia	42101	0179	4	223	.9	90	0	0	0
Philadelphia	42101	0179	5	426	1.7	191	0	0	0
Philadelphia	42101	0179	6	678	2.8	324	0	0	0
Philadelphia	42101	0179	7	664	2.5	265	0	0	0
Philadelphia	42101	0179	8	1386	5.5	559	0	0	0
Philadelphia	42101	0170	1	1541	6.7	660	0	0	0
Philadelphia	42101	0170	2	1233	6.9	623	0	0	0
Philadelphia	42101	0170	3	869	4.8	402	0	0	0
Philadelphia	42101	0170	4	550	2.9	240	0	0	0
Philadelphia	42101	0170	5	259	1.3	112	0	0	0
Philadelphia	42101	0170	6	1009	4.6	434	0	0	0
Philadelphia	42101	0170	7	902	4.4	413	0	0	0
Philadelphia	42101	0170	8	2056	8.0	871	0	0	0
Philadelphia	42101	0171	1	197	1.1	99	0	0	0
Philadelphia	42101	0172	1	0	0	0	0	0	0
Philadelphia	42101	0172	2	375	1.9	210	0	0	0
Philadelphia	42101	0172	3	0	0	0	0	0	0
Philadelphia	42101	0173	1	129	.4	41	0	0	0
Philadelphia	42101	0173	2	688	2.[illegible]	270	0	0	0
Philadelphia	42101	0173	3	582	2.[illegible]	236	0	0	0
Philadelphia	42101	0175	1	134	.9	70	0	0	0
Philadelphia	42101	0178	1	546	2.[illegible]	223	0	0	0

PENNSYLVANIA PORTION

Philadelphia	42101	0186	2	377	1.6	170	0	0	0
Philadelphia	42101	0186	3	750	3.2	353	0	0	0
Philadelphia	42101	0186	4	839	3.6	388	0	0	0
Philadelphia	42101	0186	5	734	3.5	318	0	0	0
Philadelphia	42101	0186	6	987	4.5	423	0	0	0
Philadelphia	42101	0186	7	588	2.7	270	0	0	0
Philadelphia	42101	0187	1	479	2.2	199	0	0	0
Philadelphia	42101	0187	2	964	3.0	384	0	0	0
Philadelphia	42101	0187	3	330	1.5	167	0	0	0
Philadelphia	42101	0188	1	1290	4.8	468	0	0	0
Philadelphia	42101	0188	2	879	3.6	354	0	0	0
Philadelphia	42101	0188	3	443	1.4	182	0	0	0
Philadelphia	42101	0188	4	475	2.5	243	0	0	0
Philadelphia	42101	0188	5	709	3.1	340	0	0	0
Philadelphia	42101	0188	6	761	3.0	330	0	0	0
Philadelphia	42101	0188	7	1526	6.9	582	0	0	0
Philadelphia	42101	0189	2	587	2.3	274	0	0	0
Philadelphia	42101	0386	1	400	3.5	372	0	0	0
Philadelphia	42101	0039981		981	4.5	441	0	0	0
Philadelphia	42101	0356991		31	[illegible]	0	0	0	0
Sub Totals:				319327	1538.9	153707	27	51	92

For Radius of 4 Mi., Circle Area = 50.265482

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Philadelphia	42101 11	0.026890	0.026890	100.00
2	Philadelphia	42101 12	0.020314	0.020314	100.00
3	Philadelphia	42101 13	0.066485	0.066485	100.00
4	Philadelphia	42101 14	0.106851	0.106851	100.00
5	Philadelphia	42101 15	0.046762	0.046762	100.00
6	Philadelphia	42101 21	0.039871	0.039871	100.00
7	Philadelphia	42101 22	0.057316	0.057316	100.00
8	Philadelphia	42101 23	0.027425	0.027425	100.00
9	Philadelphia	42101 24	0.028114	0.028114	100.00
10	Philadelphia	42101 31	0.063797	0.063797	100.00
11	Philadelphia	42101 32	0.060202	0.060202	100.00
12	Philadelphia	42101 33	0.091807	0.055703	60.67
13	Philadelphia	42101 41	0.074183	0.074183	100.00
14	Philadelphia	42101 42	0.065955	0.065955	100.00
15	Philadelphia	42101 43	0.061195	0.038437	62.81
16	Philadelphia	42101 51	0.060877	0.060877	100.00
17	Philadelphia	42101 52	0.041265	0.041265	100.00
18	Philadelphia	42101 53	0.060248	0.060248	100.00
19	Philadelphia	42101 61	0.063642	0.063642	100.00
20	Philadelphia	42101 71	0.027809	0.027809	100.00
21	Philadelphia	42101 72	0.041694	0.041694	100.00
22	Philadelphia	42101 73	0.028329	0.014129	49.87
23	Philadelphia	42101 81	0.028768	0.028768	100.00
24	Philadelphia	42101 82	0.026603	0.026603	100.00
25	Philadelphia	42101 83	0.026376	0.026376	100.00
26	Philadelphia	42101 84	0.030688	0.030688	100.00
27	Philadelphia	42101 85	0.010067	0.010067	100.00
28	Philadelphia	42101 86	0.032026	0.004776	14.91
29	Philadelphia	42101 91	0.030498	0.030498	100.00
30	Philadelphia	42101 92	0.027761	0.027761	100.00
31	Philadelphia	42101 93	0.020756	0.020756	100.00
32	Philadelphia	42101 94	0.019188	0.019188	100.00
33	Philadelphia	42101 101	0.037160	0.037160	100.00
34	Philadelphia	42101 102	0.057006	0.057006	100.00
35	Philadelphia	42101 103	0.064414	0.064414	100.00
36	Philadelphia	42101 104	0.106030	0.106030	100.00
37	Philadelphia	42101 111	0.026175	0.026175	100.00
38	Philadelphia	42101 112	0.021732	0.021732	100.00
39	Philadelphia	42101 113	0.019366	0.019366	100.00
40	Philadelphia	42101 114	0.013654	0.013654	100.00
41	Philadelphia	42101 115	0.011924	0.011924	100.00
42	Philadelphia	42101 116	0.006406	0.006406	100.00
43	Philadelphia	42101 117	0.013324	0.013324	100.00
44	Philadelphia	42101 118	0.028123	0.028123	100.00
45	Philadelphia	42101 121	0.029042	0.029042	100.00
46	Philadelphia	42101 122	0.024498	0.024498	100.00
47	Philadelphia	42101 123	0.023044	0.023044	100.00
48	Philadelphia	42101 124	0.024847	0.024847	100.00
49	Philadelphia	42101 125	0.022338	0.010744	48.10
50	Philadelphia	42101 127	0.031091	0.028381	91.28
51	Philadelphia	42101 128	0.041853	0.041853	100.00
52	Philadelphia	42101 131	0.020442	0.019253	94.19
53	Philadelphia	42101 132	0.020802	0.017826	85.70

51	Philadelphia	42101 133	0.025471	0.018908	74.23
52	Philadelphia	42101 137	0.017237	0.000558	3.24
53	Philadelphia	42101 141	0.010738	0.010738	100.00
54	Philadelphia	42101 142	0.018079	0.018079	100.00
55	Philadelphia	42101 143	0.011336	0.011336	100.00
56	Philadelphia	42101 144	0.017643	0.017643	100.00
60	Philadelphia	42101 145	0.012531	0.012531	100.00
61	Philadelphia	42101 146	0.019207	0.019207	100.00
62	Philadelphia	42101 147	0.014955	0.014955	100.00
63	Philadelphia	42101 148	0.015299	0.015299	100.00
64	Philadelphia	42101 151	0.027261	0.027261	100.00
65	Philadelphia	42101 152	0.019444	0.019444	100.00
66	Philadelphia	42101 153	0.018380	0.018380	100.00
67	Philadelphia	42101 154	0.024883	0.024883	100.00
68	Philadelphia	42101 161	0.015667	0.015667	100.00
69	Philadelphia	42101 162	0.032639	0.032639	100.00
70	Philadelphia	42101 163	0.026658	0.026658	100.00
71	Philadelphia	42101 172	0.037662	0.037662	100.00
72	Philadelphia	42101 173	0.026468	0.026468	100.00
73	Philadelphia	42101 174	0.013152	0.013152	100.00
74	Philadelphia	42101 181	0.023828	0.023828	100.00
75	Philadelphia	42101 182	0.013763	0.013763	100.00
76	Philadelphia	42101 183	0.012746	0.012746	100.00
77	Philadelphia	42101 184	0.015394	0.015394	100.00
78	Philadelphia	42101 185	0.024225	0.024225	100.00
79	Philadelphia	42101 191	0.009576	0.009576	100.00
80	Philadelphia	42101 192	0.037090	0.037090	100.00
81	Philadelphia	42101 193	0.013101	0.013101	100.00
82	Philadelphia	42101 194	0.018007	0.018007	100.00
83	Philadelphia	42101 195	0.020341	0.020341	100.00
84	Philadelphia	42101 196	0.025110	0.025110	100.00
85	Philadelphia	42101 201	0.029476	0.002159	7.32
86	Philadelphia	42101 202	0.015666	0.000395	2.52
87	Philadelphia	42101 203	0.013816	0.000001	0.00
88	Philadelphia	42101 211	0.015155	0.015155	100.00
89	Philadelphia	42101 212	0.013888	0.013888	100.00
90	Philadelphia	42101 213	0.014858	0.014017	94.34
91	Philadelphia	42101 214	0.019969	0.019969	100.00
92	Philadelphia	42101 215	0.025626	0.025626	100.00
93	Philadelphia	42101 221	0.025439	0.025439	100.00
94	Philadelphia	42101 222	0.025095	0.025095	100.00
95	Philadelphia	42101 223	0.014408	0.014408	100.00
96	Philadelphia	42101 224	0.023480	0.023480	100.00
97	Philadelphia	42101 231	0.016518	0.016518	100.00
98	Philadelphia	42101 232	0.015207	0.015207	100.00
99	Philadelphia	42101 233	0.019854	0.019854	100.00
100	Philadelphia	42101 234	0.027842	0.027842	100.00
101	Philadelphia	42101 241	0.020647	0.020647	100.00
102	Philadelphia	42101 242	0.017493	0.017493	100.00
103	Philadelphia	42101 243	0.020120	0.020120	100.00
104	Philadelphia	42101 244	0.026261	0.026261	100.00
105	Philadelphia	42101 245	0.028302	0.028302	100.00
106	Philadelphia	42101 246	0.035469	0.035469	100.00
107	Philadelphia	42101 247	0.030979	0.030979	100.00
108	Philadelphia	42101 248	0.022080	0.022080	100.00
109	Philadelphia	42101 251	0.022468	0.022468	100.00
110	Philadelphia	42101 252	0.011211	0.011211	100.00
111	Philadelphia	42101 253	0.020918	0.020918	100.00
112	Philadelphia	42101 254	0.047060	0.047060	100.00
113	Philadelphia	42101 255	0.048025	0.048025	100.00
114	Philadelphia	42101 261	0.297411	0.297411	100.00

1[illegible]6	Philadelphia	42101 271	0.020521	0.020521	100.00
1[illegible]5	Philadelphia	42101 272	0.025378	0.025378	100.00
1[illegible]7	Philadelphia	42101 273	0.028021	0.028021	100.00
1[illegible]	Philadelphia	42101 274	0.028215	0.028215	100.00
1[illegible]	Philadelphia	42101 275	0.028715	0.028715	100.00
1[illegible]	Philadelphia	42101 276	0.028386	0.028386	100.00
1[illegible]	Philadelphia	42101 277	0.031525	0.031525	100.00
122	Philadelphia	42101 278	0.032076	0.032076	100.00
123	Philadelphia	42101 281	0.028070	0.028070	100.00
124	Philadelphia	42101 282	0.028583	0.028583	100.00
125	Philadelphia	42101 283	0.028009	0.028009	100.00
126	Philadelphia	42101 284	0.023636	0.023636	100.00
127	Philadelphia	42101 285	0.031027	0.031027	100.00
128	Philadelphia	42101 286	0.024276	0.024276	100.00
1[illegible]9	Philadelphia	42101 287	0.034669	0.034669	100.00
1[illegible]7	Philadelphia	42101 288	0.024498	0.024498	100.00
1[illegible]	Philadelphia	42101 291	0.026635	0.026635	100.00
1[illegible]	Philadelphia	42101 292	0.010401	0.010401	100.00
1[illegible]	Philadelphia	42101 293	0.014066	0.014066	100.00
1[illegible]	Philadelphia	42101 294	0.008111	0.008111	100.00
1[illegible]5	Philadelphia	42101 295	0.017837	0.017837	100.00
1[illegible]6	Philadelphia	42101 296	0.019066	0.019066	100.00
1[illegible]7	Philadelphia	42101 297	0.019287	0.019287	100.00
1[illegible]8	Philadelphia	42101 298	0.021586	0.021586	100.00
1[illegible]9	Philadelphia	42101 301	0.025673	0.025673	100.00
1[illegible]	Philadelphia	42101 302	0.023588	0.023588	100.00
1[illegible]	Philadelphia	42101 303	0.019938	0.019938	100.00
1[illegible]	Philadelphia	42101 304	0.017894	0.017894	100.00
1[illegible]3	Philadelphia	42101 305	0.019789	0.019789	100.00
1[illegible]4	Philadelphia	42101 306	0.027456	0.027456	100.00
1[illegible]5	Philadelphia	42101 307	0.023653	0.023653	100.00
1[illegible]6	Philadelphia	42101 308	0.018323	0.018323	100.00
1[illegible]7	Philadelphia	42101 311	0.013032	0.013032	100.00
1[illegible]8	Philadelphia	42101 312	0.013214	0.013214	100.00
1[illegible]9	Philadelphia	42101 313	0.012969	0.012969	100.00
1[illegible]9	Philadelphia	42101 314	0.024000	0.010369	43.21
1[illegible]	Philadelphia	42101 315	0.025103	0.024769	98.67
1[illegible]	Philadelphia	42101 316	0.028702	0.009985	34.79
1[illegible]8	Philadelphia	42101 317	0.017054	0.017054	100.00
1[illegible]4	Philadelphia	42101 318	0.014414	0.014414	100.00
1[illegible]	Philadelphia	42101 371	0.023236	0.023217	99.92
1[illegible]5	Philadelphia	42101 372	0.032610	0.023043	70.66
1[illegible]7	Philadelphia	42101 373	0.026277	0.000102	0.39
1[illegible]	Philadelphia	42101 377	0.036100	0.000406	1.12
1[illegible]	Philadelphia	42101 378	0.025248	0.002935	11.63
1[illegible]	Philadelphia	42101 381	0.043716	0.043716	100.00
1[illegible]	Philadelphia	42101 382	0.028908	0.028908	100.00
1[illegible]	Philadelphia	42101 383	0.030137	0.030137	100.00
1[illegible]	Philadelphia	42101 384	0.047248	0.037690	79.77
1[illegible]	Philadelphia	42101 385	0.042720	0.002802	6.56
1[illegible]	Philadelphia	42101 386	0.055133	0.011252	20.41
1[illegible]	Philadelphia	42101 387	0.044733	0.041651	93.11
1[illegible]7	Philadelphia	42101 388	0.044268	0.044268	100.00
1[illegible]	Philadelphia	42101 401	0.027660	0.027660	100.00
1[illegible]	Philadelphia	42101 402	0.027931	0.027931	100.00
1[illegible]	Philadelphia	42101 403	0.027549	0.027549	100.00
1[illegible]	Philadelphia	42101 404	0.028921	0.028921	100.00
1[illegible]	Philadelphia	42101 405	0.034410	0.034410	100.00
1[illegible]	Philadelphia	42101 406	0.033503	0.033503	100.00
1[illegible]	Philadelphia	42101 407	0.033667	0.033667	100.00
1[illegible]	Philadelphia	42101 408	0.029377	0.029377	100.00

1[illegible]	Philadelphia	42101 411	0.037265	0.037265	100.00
1[illegible]	Philadelphia	42101 412	0.028730	0.028730	100.00
1[illegible]	Philadelphia	42101 413	0.043535	0.043535	100.00
1[illegible]	Philadelphia	42101 414	0.050073	0.050073	100.00
1[illegible]	Philadelphia	42101 415	0.039205	0.039205	100.00
1[illegible]	Philadelphia	42101 416	0.029868	0.029868	100.00
1[illegible]	Philadelphia	42101 417	0.025621	0.025621	100.00
1[illegible]	Philadelphia	42101 418	0.036672	0.036672	100.00
1[illegible]	Philadelphia	42101 421	0.020389	0.020389	100.00
1[illegible]	Philadelphia	42101 422	0.021560	0.021560	100.00
1[illegible]	Philadelphia	42101 423	0.051538	0.051538	100.00
1[illegible]	Philadelphia	42101 424	0.067336	0.067336	100.00
1[illegible]	Philadelphia	42101 425	0.023602	0.023602	100.00
1[illegible]	Philadelphia	42101 426	0.031762	0.031762	100.00
1[illegible]	Philadelphia	42101 427	0.039976	0.039976	100.00
1[illegible]	Philadelphia	42101 428	0.045699	0.045699	100.00
1[illegible]	Philadelphia	42101 431	0.852176	0.852176	100.00
1[illegible]	Philadelphia	42101 432	0.145859	0.145859	100.00
1[illegible]	Philadelphia	42101 441	0.195436	0.195436	100.00
1[illegible]	Philadelphia	42101 442	0.021326	0.021326	100.00
1[illegible]	Philadelphia	42101 451	0.023346	0.023346	100.00
1[illegible]	Philadelphia	42101 452	0.050971	0.050971	100.00
1[illegible]	Philadelphia	42101 453	0.068025	0.067114	98.66
1[illegible]	Philadelphia	42101 454	0.022751	0.022751	100.00
1[illegible]	Philadelphia	42101 455	0.021934	0.021934	100.00
2[illegible]	Philadelphia	42101 481	0.170658	0.067898	39.79
2[illegible]	Philadelphia	42101 491	1.840081	1.489566	80.95
2[illegible]	Philadelphia	42101 509	0.535676	0.018602	3.47
2[illegible]	Philadelphia	42101 1251	0.073686	0.073686	100.00
2[illegible]	Philadelphia	42101 1252	0.052369	0.052369	100.00
2[illegible]	Philadelphia	42101 1253	0.145499	0.032820	22.56
2[illegible]	Philadelphia	42101 1254	0.061931	0.055045	88.88
2[illegible]	Philadelphia	42101 1261	0.035191	0.035191	100.00
2[illegible]	Philadelphia	42101 1262	0.028137	0.028137	100.00
2[illegible]	Philadelphia	42101 1263	0.033465	0.033465	100.00
2[illegible]	Philadelphia	42101 1264	0.040387	0.040387	100.00
2[illegible]	Philadelphia	42101 1271	0.047734	0.047734	100.00
2[illegible]	Philadelphia	42101 1272	0.046319	0.046319	100.00
2[illegible]	Philadelphia	42101 1273	0.033396	0.033396	100.00
2[illegible]	Philadelphia	42101 1281	0.044575	0.044575	100.00
2[illegible]	Philadelphia	42101 1282	0.052422	0.052422	100.00
2[illegible]	Philadelphia	42101 1291	0.021258	0.021258	100.00
2[illegible]	Philadelphia	42101 1292	0.055252	0.055252	100.00
2[illegible]	Philadelphia	42101 1293	0.044562	0.044562	100.00
2[illegible]	Philadelphia	42101 1294	0.013607	0.013607	100.00
2[illegible]	Philadelphia	42101 1301	0.025224	0.025224	100.00
2[illegible]	Philadelphia	42101 1302	0.026912	0.026912	100.00
2[illegible]	Philadelphia	42101 1303	0.025855	0.025855	100.00
2[illegible]	Philadelphia	42101 1311	0.045963	0.045963	100.00
2[illegible]	Philadelphia	42101 1312	0.031804	0.031804	100.00
2[illegible]	Philadelphia	42101 1313	0.042798	0.042798	100.00
2[illegible]	Philadelphia	42101 1321	0.053799	0.053799	100.00
2[illegible]	Philadelphia	42101 1322	0.017632	0.017632	100.00
2[illegible]	Philadelphia	42101 1323	0.017811	0.017811	100.00
2[illegible]	Philadelphia	42101 1324	0.015595	0.015595	100.00
2[illegible]	Philadelphia	42101 1325	0.011357	0.011357	100.00
2[illegible]	Philadelphia	42101 1326	0.017473	0.017473	100.00
2[illegible]	Philadelphia	42101 1327	0.016707	0.016707	100.00
2[illegible]	Philadelphia	42101 1328	0.012579	0.012579	100.00
2[illegible]	Philadelphia	42101 1331	0.015247	0.015247	100.00
2[illegible]	Philadelphia	42101 1332	0.015549	0.015549	100.00

PENNSYLVANIA PORTION

[illegible]	Philadelphia	42101 1333	0.022498	0.022498	100.00
[illegible]	Philadelphia	42101 1334	0.022120	0.022120	100.00
[illegible]	Philadelphia	42101 1335	0.025293	0.025293	100.00
[illegible]	Philadelphia	42101 1336	0.018113	0.018113	100.00
[illegible]	Philadelphia	42101 1337	0.016560	0.016560	100.00
[illegible]	Philadelphia	42101 1341	0.021830	0.021830	100.00
[illegible]	Philadelphia	42101 1342	0.024395	0.024395	100.00
[illegible]	Philadelphia	42101 1343	0.019498	0.019498	100.00
[illegible]	Philadelphia	42101 1344	0.019484	0.001959	10.05
[illegible]	Philadelphia	42101 1346	0.021665	0.000030	0.14
[illegible]	Philadelphia	42101 1347	0.028072	0.025698	91.54
[illegible]	Philadelphia	42101 1351	0.014804	0.014804	100.00
[illegible]	Philadelphia	42101 1352	0.018705	0.018705	100.00
[illegible]	Philadelphia	42101 1353	0.020676	0.020676	100.00
[illegible]	Philadelphia	42101 1354	0.017320	0.013016	75.15
[illegible]	Philadelphia	42101 1355	0.019573	0.004642	23.71
[illegible]	Philadelphia	42101 1393	0.109268	0.000958	0.88
[illegible]	Philadelphia	42101 1401	0.020765	0.020765	100.00
[illegible]	Philadelphia	42101 1402	0.012607	0.012607	100.00
[illegible]	Philadelphia	42101 1403	0.025604	0.025604	100.00
[illegible]	Philadelphia	42101 1404	0.022928	0.022866	99.73
[illegible]	Philadelphia	42101 1405	0.011680	0.005348	45.79
[illegible]	Philadelphia	42101 1406	0.013127	0.000016	0.12
[illegible]	Philadelphia	42101 1407	0.034928	0.028067	80.36
[illegible]	Philadelphia	42101 1408	0.019634	0.019634	100.00
[illegible]	Philadelphia	42101 1411	0.022169	0.022169	100.00
[illegible]	Philadelphia	42101 1412	0.046343	0.046343	100.00
[illegible]	Philadelphia	42101 1413	0.023577	0.023577	100.00
[illegible]	Philadelphia	42101 1414	0.019439	0.019439	100.00
[illegible]	Philadelphia	42101 1415	0.035796	0.035796	100.00
[illegible]	Philadelphia	42101 1416	0.029370	0.029370	100.00
[illegible]	Philadelphia	42101 1417	0.037972	0.037972	100.00
[illegible]	Philadelphia	42101 1421	0.219797	0.219797	100.00
[illegible]	Philadelphia	42101 1422	0.027892	0.027892	100.00
[illegible]	Philadelphia	42101 1423	0.036382	0.036382	100.00
[illegible]	Philadelphia	42101 1424	0.031493	0.031493	100.00
[illegible]	Philadelphia	42101 1425	0.040200	0.040200	100.00
[illegible]	Philadelphia	42101 1426	0.039227	0.039227	100.00
[illegible]	Philadelphia	42101 1431	0.186081	0.186081	100.00
[illegible]	Philadelphia	42101 1432	0.047877	0.047877	100.00
[illegible]	Philadelphia	42101 1433	0.042769	0.042769	100.00
[illegible]	Philadelphia	42101 1434	0.033541	0.033541	100.00
[illegible]	Philadelphia	42101 1441	0.033305	0.033305	100.00
[illegible]	Philadelphia	42101 1442	0.033441	0.033441	100.00
[illegible]	Philadelphia	42101 1443	0.040106	0.040106	100.00
[illegible]	Philadelphia	42101 1444	0.035432	0.035432	100.00
[illegible]	Philadelphia	42101 1445	0.028636	0.028636	100.00
[illegible]	Philadelphia	42101 1446	0.020622	0.020622	100.00
[illegible]	Philadelphia	42101 1447	0.041116	0.041116	100.00
[illegible]	Philadelphia	42101 1451	0.025400	0.025400	100.00
[illegible]	Philadelphia	42101 1452	0.024600	0.024600	100.00
[illegible]	Philadelphia	42101 1453	0.020049	0.020049	100.00
[illegible]	Philadelphia	42101 1454	0.025384	0.025384	100.00
[illegible]	Philadelphia	42101 1455	0.026572	0.026572	100.00
[illegible]	Philadelphia	42101 1461	0.034589	0.034589	100.00
[illegible]	Philadelphia	42101 1462	0.032540	0.032540	100.00
[illegible]	Philadelphia	42101 1463	0.023378	0.023378	100.00
[illegible]	Philadelphia	42101 1464	0.019632	0.019632	100.00
[illegible]	Philadelphia	42101 1465	0.040022	0.040022	100.00
[illegible]	Philadelphia	42101 1466	0.021455	0.021455	100.00
[illegible]	Philadelphia	42101 1471	0.035574	0.024306	68.33

PENNSYLVANIA PORTION

[illegible]	Philadelphia	42101 1472	0.026257	0.022545	85.86
[illegible]	Philadelphia	42101 1473	0.040739	0.000208	0.51
[illegible]	Philadelphia	42101 1531	0.035836	0.001546	4.31
[illegible]	Philadelphia	42101 1541	0.029733	0.017121	57.58
[illegible]	Philadelphia	42101 1542	0.058156	0.050891	87.51
[illegible]	Philadelphia	42101 1543	0.029042	0.002072	7.13
[illegible]	Philadelphia	42101 1551	0.024267	0.024267	100.00
[illegible]	Philadelphia	42101 1552	0.016933	0.016933	100.00
[illegible]	Philadelphia	42101 1553	0.027329	0.027329	100.00
[illegible]	Philadelphia	42101 1554	0.021089	0.021089	100.00
[illegible]	Philadelphia	42101 1555	0.031240	0.031240	100.00
[illegible]	Philadelphia	42101 1556	0.017279	0.017277	99.99
[illegible]	Philadelphia	42101 1557	0.019763	0.019763	100.00
[illegible]	Philadelphia	42101 1561	0.033218	0.033218	100.00
[illegible]	Philadelphia	42101 1562	0.022483	0.022483	100.00
[illegible]	Philadelphia	42101 1563	0.039069	0.039069	100.00
[illegible]	Philadelphia	42101 1564	0.019831	0.019831	100.00
[illegible]	Philadelphia	42101 1565	0.031622	0.031622	100.00
[illegible]	Philadelphia	42101 1566	0.015422	0.015422	100.00
[illegible]	Philadelphia	42101 1571	0.051859	0.051859	100.00
[illegible]	Philadelphia	42101 1572	0.024908	0.024908	100.00
[illegible]	Philadelphia	42101 1573	0.038917	0.038917	100.00
[illegible]	Philadelphia	42101 1574	0.043830	0.043830	100.00
[illegible]	Philadelphia	42101 1575	0.025178	0.025178	100.00
[illegible]	Philadelphia	42101 1581	0.024450	0.024450	100.00
[illegible]	Philadelphia	42101 1582	0.028952	0.028952	100.00
[illegible]	Philadelphia	42101 1583	0.025072	0.025072	100.00
[illegible]	Philadelphia	42101 1584	0.046641	0.046641	100.00
[illegible]	Philadelphia	42101 1585	0.029332	0.029332	100.00
[illegible]	Philadelphia	42101 1586	0.024961	0.024961	100.00
[illegible]	Philadelphia	42101 1587	0.026903	0.026903	100.00
[illegible]	Philadelphia	42101 1588	0.017221	0.017221	100.00
[illegible]	Philadelphia	42101 1591	0.028744	0.028744	100.00
[illegible]	Philadelphia	42101 1592	0.020712	0.020712	100.00
[illegible]	Philadelphia	42101 1593	0.163982	0.163982	100.00
[illegible]	Philadelphia	42101 1594	0.029697	0.029697	100.00
[illegible]	Philadelphia	42101 1601	0.023612	0.023612	100.00
[illegible]	Philadelphia	42101 1602	0.043399	0.043399	100.00
[illegible]	Philadelphia	42101 1603	0.043942	0.043942	100.00
[illegible]	Philadelphia	42101 1604	0.030865	0.030865	100.00
[illegible]	Philadelphia	42101 1605	0.032401	0.032401	100.00
[illegible]	Philadelphia	42101 1606	0.034144	0.034144	100.00
[illegible]	Philadelphia	42101 1607	0.038340	0.038340	100.00
[illegible]	Philadelphia	42101 1608	0.023302	0.023302	100.00
[illegible]	Philadelphia	42101 1611	0.044311	0.044311	100.00
[illegible]	Philadelphia	42101 1612	0.032572	0.032572	100.00
[illegible]	Philadelphia	42101 1613	0.024142	0.024142	100.00
[illegible]	Philadelphia	42101 1614	0.025831	0.025831	100.00
[illegible]	Philadelphia	42101 1615	0.034292	0.034292	100.00
[illegible]	Philadelphia	42101 1616	0.032817	0.032817	100.00
[illegible]	Philadelphia	42101 1617	0.032466	0.032466	100.00
[illegible]	Philadelphia	42101 1618	0.034211	0.034211	100.00
[illegible]	Philadelphia	42101 1621	0.015929	0.015929	100.00
[illegible]	Philadelphia	42101 1622	0.017380	0.017380	100.00
[illegible]	Philadelphia	42101 1623	0.018586	0.018586	100.00
[illegible]	Philadelphia	42101 1624	0.020806	0.020806	100.00
[illegible]	Philadelphia	42101 1625	0.023525	0.023525	100.00
[illegible]	Philadelphia	42101 1626	0.014591	0.014591	100.00
[illegible]	Philadelphia	42101 1627	0.021089	0.021089	100.00
[illegible]	Philadelphia	42101 1631	0.043006	0.043006	100.00
[illegible]	Philadelphia	42101 1632	0.022072	0.022072	100.00

[illegible]	Philadelphia	42101 1633	0.020080	0.020080	100.00
[illegible]	Philadelphia	42101 1634	0.019266	0.019266	100.00
[illegible]	Philadelphia	42101 1635	0.024867	0.024867	100.00
[illegible]	Philadelphia	42101 1636	0.039184	0.039028	99.60
[illegible]	Philadelphia	42101 1637	0.021811	0.021811	100.00
[illegible]	Philadelphia	42101 1638	0.023113	0.023113	100.00
[illegible]	Philadelphia	42101 1641	0.019869	0.015033	75.66
[illegible]	Philadelphia	42101 1642	0.019995	0.019995	100.00
[illegible]	Philadelphia	42101 1643	0.021901	0.021901	100.00
[illegible]	Philadelphia	42101 1644	0.014514	0.004293	29.58
[illegible]	Philadelphia	42101 1645	0.017907	0.017781	99.30
[illegible]	Philadelphia	42101 1646	0.032599	0.010126	31.06
[illegible]	Philadelphia	42101 1647	0.024334	0.000001	0.00
[illegible]	Philadelphia	42101 1652	0.017867	0.000000	0.00
[illegible]	Philadelphia	42101 1653	0.025225	0.017368	68.85
[illegible]	Philadelphia	42101 1654	0.022705	0.020671	91.04
[illegible]	Philadelphia	42101 1655	0.018274	0.000086	0.47
[illegible]	Philadelphia	42101 1663	0.016708	0.000358	2.14
[illegible]	Philadelphia	42101 1761	0.043015	0.000843	1.96
[illegible]	Philadelphia	42101 1762	0.042922	0.037408	87.15
[illegible]	Philadelphia	42101 1763	0.048862	0.048664	99.59
[illegible]	Philadelphia	42101 1764	0.049096	0.014853	30.25
[illegible]	Philadelphia	42101 1767	0.044172	0.005985	13.55
[illegible]	Philadelphia	42101 1771	0.030282	0.019392	64.04
[illegible]	Philadelphia	42101 1772	0.037926	0.035035	92.38
[illegible]	Philadelphia	42101 1773	0.032920	0.032920	100.00
[illegible]	Philadelphia	42101 1774	0.033703	0.033703	100.00
[illegible]	Philadelphia	42101 1775	0.042734	0.037380	87.47
[illegible]	Philadelphia	42101 1776	0.046578	0.000667	1.43
[illegible]	Philadelphia	42101 1777	0.022588	0.004372	19.35
[illegible]	Philadelphia	42101 1778	0.022107	0.000879	3.98
[illegible]	Philadelphia	42101 1781	0.028022	0.028022	100.00
[illegible]	Philadelphia	42101 1782	0.033350	0.033350	100.00
[illegible]	Philadelphia	42101 1783	0.022451	0.022451	100.00
[illegible]	Philadelphia	42101 1784	0.016632	0.016632	100.00
[illegible]	Philadelphia	42101 1785	0.022961	0.022961	100.00
[illegible]	Philadelphia	42101 1786	0.033624	0.033624	100.00
[illegible]	Philadelphia	42101 1787	0.046265	0.046265	100.00
[illegible]	Philadelphia	42101 1788	0.051856	0.051856	100.00
[illegible]	Philadelphia	42101 1791	0.026572	0.026572	100.00
[illegible]	Philadelphia	42101 1792	0.038239	0.038239	100.00
[illegible]	Philadelphia	42101 1793	0.018483	0.018483	100.00
[illegible]	Philadelphia	42101 1794	0.048044	0.048044	100.00
[illegible]	Philadelphia	42101 1795	0.033054	0.033054	100.00
[illegible]	Philadelphia	42101 1796	0.013740	0.013740	100.00
[illegible]	Philadelphia	42101 1797	0.036388	0.036388	100.00
[illegible]	Philadelphia	42101 1798	0.039757	0.039757	100.00
[illegible]	Philadelphia	42101 1801	0.040759	0.040759	100.00
[illegible]	Philadelphia	42101 1802	0.037904	0.037904	100.00
[illegible]	Philadelphia	42101 1803	0.029855	0.029855	100.00
[illegible]	Philadelphia	42101 1804	0.059906	0.059906	100.00
[illegible]	Philadelphia	42101 1805	0.009157	0.009157	100.00
[illegible]	Philadelphia	42101 1806	0.038022	0.038022	100.00
[illegible]	Philadelphia	42101 1807	0.039026	0.039026	100.00
[illegible]	Philadelphia	42101 1808	0.053232	0.053232	100.00
[illegible]	Philadelphia	42101 1811	0.269219	0.269219	100.00
[illegible]	Philadelphia	42101 1821	0.192331	0.192331	100.00
[illegible]	Philadelphia	42101 1822	1.096372	1.096372	100.00
[illegible]	Philadelphia	42101 1823	0.171631	0.171631	100.00
[illegible]	Philadelphia	42101 1831	0.275080	0.282942	50.97
[illegible]	Philadelphia	42101 1832	0.063273	0.011577	18.30

PENNSYLVANIA PORTION

4	Philadelphia	4[illegible]101 1933	0.[illegible]78762	0.000106	0.14
4[illegible]	Philadelphia	4[illegible]101 1951	0.[illegible]48419	0.210707	84.82
4[illegible]	Philadelphia	4[illegible]101 1961	0.[illegible]48460	0.048460	100.00
4[illegible]	Philadelphia	4[illegible]101 1962	0.[illegible]44057	0.044057	100.00
4[illegible]	Philadelphia	4[illegible]101 1963	0.[illegible]41008	0.041008	100.00
4[illegible]	Philadelphia	4[illegible]101 1964	0.[illegible]26704	0.026704	100.00
4[illegible]	Philadelphia	4[illegible]101 1965	0.[illegible]24838	0.024838	100.00
4[illegible]	Philadelphia	4[illegible]101 1966	0.[illegible]41790	0.041790	100.00
4[illegible]	Philadelphia	4[illegible]101 1967	0.[illegible]40888	0.040888	100.00
4[illegible]	Philadelphia	4[illegible]101 1971	0.[illegible]09038	0.104879	96.19
4[illegible]	Philadelphia	4[illegible]101 1972	0.[illegible]96837	0.096837	100.00
4[illegible]	Philadelphia	4[illegible]101 1973	0.[illegible]96827	0.096827	100.00
4[illegible]	Philadelphia	4[illegible]101 1981	0.[illegible]35389	0.001073	3.03
4[illegible]	Philadelphia	4[illegible]101 1982	0.[illegible]21847	0.013222	60.52
4[illegible]	Philadelphia	4[illegible]101 1983	0.[illegible]17916	0.017916	100.00
4[illegible]	Philadelphia	4[illegible]101 1984	0.[illegible]24702	0.024702	100.00
4[illegible]	Philadelphia	4[illegible]101 1985	0.[illegible]38102	0.038102	100.00
4[illegible]	Philadelphia	4[illegible]101 1986	0.[illegible]26898	0.023351	86.81
4[illegible]	Philadelphia	4[illegible]101 1987	0.[illegible]49188	0.019218	39.07
4[illegible]	Philadelphia	4[illegible]101 1992	0.[illegible]06255	0.031337	10.23
4[illegible]	Philadelphia	4[illegible]101 3361	0.[illegible]94382	0.894382	100.00
4[illegible]	Philadelphia	4[illegible]101 39981	0.[illegible]25018	0.005663	22.63
	==========	==========	==========	==========	======
	Totals:		21.[illegible]34450	18.425043	

For Radius of 3 Mi., Circle Area = 28.274334

N	City	Block Group ID	Total Area	Partial Area	% Within Radius
	Philadelphia	4[illegible]101 11	0.[illegible]26890	0.026890	100.00
	Philadelphia	4[illegible]101 12	0.[illegible]20314	0.020314	100.00
	Philadelphia	4[illegible]101 13	0.[illegible]66485	0.066485	100.00
	Philadelphia	4[illegible]101 14	0.[illegible]06851	0.106851	100.00
	Philadelphia	4[illegible]101 15	0.[illegible]46762	0.046762	100.00
	Philadelphia	4[illegible]101 21	0.[illegible]39871	0.039871	100.00
	Philadelphia	4[illegible]101 21	0.[illegible]57316	0.042232	73.68
	Philadelphia	4[illegible]101 51	0.[illegible]60877	0.060877	100.00
	Philadelphia	4[illegible]101 53	0.[illegible]41265	0.031419	76.14
	Philadelphia	4[illegible]101 6	0.[illegible]63642	0.041059	64.52
	Philadelphia	4[illegible]101 91	0.[illegible]30498	0.030498	100.00
	Philadelphia	4[illegible]101 92	0.[illegible]27761	0.027761	100.00
	Philadelphia	4[illegible]101 3[illegible]	0.[illegible]20756	0.003206	15.45
	Philadelphia	4[illegible]101 101	0.[illegible]37160	0.037160	100.00
	Philadelphia	4[illegible]101 102	0.[illegible]57006	0.057006	100.00
	Philadelphia	4[illegible]101 103	0.[illegible]64414	0.064414	100.00
	Philadelphia	4[illegible]101 104	0.[illegible]06030	0.106030	100.00
	Philadelphia	4[illegible]101 111	0.[illegible]26175	0.026175	100.00
	Philadelphia	4[illegible]101 112	0.[illegible]21732	0.021732	100.00
	Philadelphia	4[illegible]101 113	0.[illegible]19366	0.003873	20.00
	Philadelphia	4[illegible]101 117	0.[illegible]13324	0.009579	71.89
	Philadelphia	4[illegible]101 118	0.[illegible]28123	0.028123	100.00
	Philadelphia	4[illegible]101 121	0.[illegible]27261	0.027261	100.00
	Philadelphia	4[illegible]101 122	0.[illegible]19444	0.019444	100.00
	Philadelphia	4[illegible]101 123	0.[illegible]18380	0.013402	72.91
	Philadelphia	4[illegible]101 131	0.[illegible]15667	0.015667	100.00
	Philadelphia	4[illegible]101 132	0.[illegible]32639	0.032639	100.00
	Philadelphia	4[illegible]101 133	0.[illegible]26658	0.026658	100.00
	Philadelphia	4[illegible]101 132	0.[illegible]37662	0.037662	100.00

[illegible]	Philadelphia	42101 173	0.026468	0.026468	100.00
[illegible]	Philadelphia	42101 174	0.013152	0.013152	100.00
[illegible]	Philadelphia	42101 181	0.023828	0.023828	100.00
[illegible]	Philadelphia	42101 182	0.013763	0.013763	100.00
[illegible]	Philadelphia	42101 183	0.012746	0.012746	100.00
[illegible]	Philadelphia	42101 184	0.015394	0.008636	56.10
[illegible]	Philadelphia	42101 231	0.016518	0.016518	100.00
[illegible]	Philadelphia	42101 232	0.015207	0.001681	11.05
[illegible]	Philadelphia	42101 234	0.027842	0.003222	11.57
[illegible]	Philadelphia	42101 241	0.020647	0.020647	100.00
[illegible]	Philadelphia	42101 242	0.017493	0.017493	100.00
[illegible]	Philadelphia	42101 243	0.020120	0.020120	100.00
[illegible]	Philadelphia	42101 244	0.026261	0.026261	100.00
[illegible]	Philadelphia	42101 245	0.028302	0.026646	94.15
[illegible]	Philadelphia	42101 246	0.035469	0.000090	0.25
[illegible]	Philadelphia	42101 247	0.030979	0.001229	3.97
[illegible]	Philadelphia	42101 248	0.022080	0.022080	100.00
[illegible]	Philadelphia	42101 251	0.022468	0.022468	100.00
[illegible]	Philadelphia	42101 252	0.011211	0.011211	100.00
[illegible]	Philadelphia	42101 253	0.020918	0.020918	100.00
[illegible]	Philadelphia	42101 254	0.047060	0.047060	100.00
[illegible]	Philadelphia	42101 255	0.048025	0.048025	100.00
[illegible]	Philadelphia	42101 261	0.297411	0.297411	100.00
[illegible]	Philadelphia	42101 271	0.020521	0.020521	100.00
[illegible]	Philadelphia	42101 272	0.025378	0.025378	100.00
[illegible]	Philadelphia	42101 273	0.028021	0.028021	100.00
[illegible]	Philadelphia	42101 274	0.028215	0.028215	100.00
[illegible]	Philadelphia	42101 275	0.028715	0.028715	100.00
[illegible]	Philadelphia	42101 276	0.028386	0.028386	100.00
[illegible]	Philadelphia	42101 277	0.031525	0.031525	100.00
[illegible]	Philadelphia	42101 278	0.032076	0.032076	100.00
[illegible]	Philadelphia	42101 281	0.028070	0.028070	100.00
[illegible]	Philadelphia	42101 282	0.028583	0.028583	100.00
[illegible]	Philadelphia	42101 283	0.028009	0.026374	94.16
[illegible]	Philadelphia	42101 284	0.023636	0.000925	3.91
[illegible]	Philadelphia	42101 287	0.034669	0.027752	80.05
[illegible]	Philadelphia	42101 288	0.024498	0.008824	36.02
[illegible]	Philadelphia	42101 291	0.026635	0.002366	8.88
[illegible]	Philadelphia	42101 411	0.037265	0.030734	82.47
[illegible]	Philadelphia	42101 412	0.028730	0.004181	14.55
[illegible]	Philadelphia	42101 413	0.036672	0.001714	4.67
[illegible]	Philadelphia	42101 421	0.020389	0.020389	100.00
[illegible]	Philadelphia	42101 422	0.021560	0.021560	100.00
[illegible]	Philadelphia	42101 423	0.051538	0.051538	100.00
[illegible]	Philadelphia	42101 424	0.067336	0.030570	45.40
[illegible]	Philadelphia	42101 425	0.023602	0.015588	66.05
[illegible]	Philadelphia	42101 426	0.031762	0.028968	91.20
[illegible]	Philadelphia	42101 427	0.039976	0.039976	100.00
[illegible]	Philadelphia	42101 428	0.045699	0.045699	100.00
[illegible]	Philadelphia	42101 431	0.852176	0.830948	97.51
[illegible]	Philadelphia	42101 432	0.145859	0.145859	100.00
[illegible]	Philadelphia	42101 441	0.195436	0.016520	8.45
[illegible]	Philadelphia	42101 442	1.840081	0.150219	8.16
[illegible]	Philadelphia	42101 1061	0.035191	0.000106	0.30
[illegible]	Philadelphia	42101 1062	0.028137	0.005155	18.32
[illegible]	Philadelphia	42101 1071	0.047734	0.047734	100.00
[illegible]	Philadelphia	42101 1072	0.046319	0.046319	100.00
[illegible]	Philadelphia	42101 1073	0.033396	0.026641	79.78
[illegible]	Philadelphia	42101 1081	0.044575	0.044575	100.00
[illegible]	Philadelphia	42101 1082	0.052422	0.052422	100.00
[illegible]	Philadelphia	42101 1091	0.021258	0.021258	100.00

PENNSYLVANIA PORTION

2[illegible]	Philadelphia	42101 1192	0.055252	0.055252	100.00
2[illegible]	Philadelphia	42101 1193	0.044562	0.044562	100.00
2[illegible]	Philadelphia	42101 1294	0.013607	0.013607	100.00
2[illegible]	Philadelphia	42101 1301	0.025224	0.025224	100.00
2[illegible]	Philadelphia	42101 1302	0.026912	0.026912	100.00
2[illegible]	Philadelphia	42101 1303	0.025855	0.025855	100.00
2[illegible]	Philadelphia	42101 1311	0.045963	0.029956	65.17
2[illegible]	Philadelphia	42101 1312	0.031804	0.026095	82.05
2[illegible]	Philadelphia	42101 1312	0.046343	0.003057	6.60
2[illegible]	Philadelphia	42101 1421	0.219797	0.219797	100.00
2[illegible]	Philadelphia	42101 1422	0.027892	0.027892	100.00
2[illegible]	Philadelphia	42101 1423	0.036382	0.036382	100.00
2[illegible]	Philadelphia	42101 1424	0.031493	0.026552	84.31
2[illegible]	Philadelphia	42101 1425	0.040200	0.040175	99.94
2[illegible]	Philadelphia	42101 1426	0.039227	0.039227	100.00
2[illegible]	Philadelphia	42101 1431	0.186081	0.186081	100.00
2[illegible]	Philadelphia	42101 1432	0.047877	0.047877	100.00
2[illegible]	Philadelphia	42101 1433	0.042769	0.042769	100.00
2[illegible]	Philadelphia	42101 1434	0.033541	0.033541	100.00
2[illegible]	Philadelphia	42101 1441	0.033305	0.033305	100.00
2[illegible]	Philadelphia	42101 1442	0.033441	0.033441	100.00
2[illegible]	Philadelphia	42101 1443	0.040106	0.040101	99.99
2[illegible]	Philadelphia	42101 1444	0.035432	0.021997	62.08
2[illegible]	Philadelphia	42101 1447	0.041116	0.016341	39.74
3[illegible]	Philadelphia	42101 1571	0.051859	0.023764	45.83
3[illegible]	Philadelphia	42101 1572	0.024908	0.010455	41.97
3[illegible]	Philadelphia	42101 1573	0.038917	0.000286	0.73
3[illegible]	Philadelphia	42101 1581	0.024450	0.024450	100.00
3[illegible]	Philadelphia	42101 1582	0.028952	0.028952	100.00
3[illegible]	Philadelphia	42101 1583	0.025072	0.025072	100.00
3[illegible]	Philadelphia	42101 1584	0.046641	0.046641	100.00
3[illegible]	Philadelphia	42101 1585	0.029332	0.029332	100.00
3[illegible]	Philadelphia	42101 1586	0.024961	0.024961	100.00
3[illegible]	Philadelphia	42101 1587	0.026903	0.026903	100.00
3[illegible]	Philadelphia	42101 1588	0.017221	0.016216	94.17
3[illegible]	Philadelphia	42101 1591	0.028744	0.028744	100.00
3[illegible]	Philadelphia	42101 1592	0.020712	0.020712	100.00
3[illegible]	Philadelphia	42101 1593	0.163982	0.163982	100.00
3[illegible]	Philadelphia	42101 1594	0.029697	0.029697	100.00
[illegible]	Philadelphia	42101 1602	0.043399	0.034121	78.62
3[illegible]	Philadelphia	42101 1603	0.043942	0.043942	100.00
3[illegible]	Philadelphia	42101 1604	0.030865	0.030865	100.00
[illegible]	Philadelphia	42101 1605	0.032401	0.013434	41.46
[illegible]	Philadelphia	42101 1606	0.034144	0.012510	36.64
3[illegible]	Philadelphia	42101 1607	0.038340	0.035996	93.89
3[illegible]	Philadelphia	42101 1608	0.023302	0.000178	0.76
4[illegible]	Philadelphia	42101 1694	0.048044	0.000257	0.53
4[illegible]	Philadelphia	42101 1702	0.037904	0.023489	61.97
4[illegible]	Philadelphia	42101 1703	0.029855	0.029855	100.00
4[illegible]	Philadelphia	42101 1704	0.059906	0.056979	95.11
4[illegible]	Philadelphia	42101 1705	0.009157	0.009157	100.00
4[illegible]	Philadelphia	42101 1706	0.038022	0.023675	62.27
4[illegible]	Philadelphia	42101 1707	0.039026	0.017601	45.10
4[illegible]	Philadelphia	42101 1708	0.053232	0.006926	13.01
4[illegible]	Philadelphia	42101 1721	0.269219	0.269219	100.00
4[illegible]	Philadelphia	42101 1722	0.192331	0.192331	100.00
4[illegible]	Philadelphia	42101 1723	1.096372	0.306116	27.92
4[illegible]	Philadelphia	42101 1723	0.171631	0.171631	100.00
4[illegible]	Philadelphia	42101 1724	0.016704	0.000008	0.03
[illegible]	Philadelphia	42101 3361	0.894382	0.894382	100.00
[illegible]	==========	==========	==========	==========	==========

Totals: 11.[illegible]36451 7.565963

For Radius of 2 Mi., Circle Area = 12.56637[illegible]

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1[illegible]	Philadelphia	4[illegible]101 261	0.[illegible]97411	0.089411	30.06
1[illegible]	Philadelphia	4[illegible]101 431	0.[illegible]52176	0.013275	1.56
2[illegible]	Philadelphia	4[illegible]101 1421	0.[illegible]19797	0.026812	12.20
2[illegible]	Philadelphia	4[illegible]101 1431	0.[illegible]86081	0.023695	12.73
4[illegible]	Philadelphia	4[illegible]101 1323	0.[illegible]71631	0.002626	1.53
4[illegible]	Philadelphia	4[illegible]101 3661	0.[illegible]94382	0.493990	55.23
	Totals:		2.[illegible]21478	0.649810	

For Radius of 1 Mi., Circle Area = 3.14159[illegible]

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
	Totals:		0.000000	0.000000	

For Radius of .5 Mi., Circle Area = 0.785398

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
	Totals:		0.000000	0.000000	

For Radius of .25 Mi., Circle Area = 0.196350

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
	Totals:		0.000000	0.000000	

========== Site Data ==========

Population:	278358.59
Households:	136498.13
Drilled Wells:	27.00
Dug Wells:	51.00
Other Water Sources:	66.60

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	198554.97
Households:	95428.78
Drilled Wells:	1.97
Dug Wells:	41.00
Other Water Sources:	66.60

** Population On Private Wells: 89.42

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	79555.92
Households:	40858.86
Drilled Wells:	25.03
Dug Wells:	10.00
Other Water Sources:	0.00

** Population On Private Wells: 63.20

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	247.70
Households:	210.48
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: 0.00

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

---- Within Ring: .5 Mile(s) and .25 Mile(s ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

** Total Population On Private Wells: 157.61

REFERENCE NO. 19

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — PROJECT NOTES

TO: Monsanto Company DATE: 19th Feb, 1997.

FROM: SWAMY KETHA COPIES:

SUBJECT: Sensitive Environments - Wetland Acerage.

REFERENCE:

A wetland map covering 4-mile radius around the site and 15-mile surface water pathway was prepared using 7.5 minute series Quadrangles for Camden, PA-NJ, Philadelphia, NJ-PA; Runnemed, NJ; Woodbury, NJ and Bridgewater, NJ. Concentric rings around the site were drawn on these wetland maps. The concentric rings cover: 0-1/4 mile, 1/4 mile - 1/2 mile, 1/2 mile - 1 mile, 1-2 miles, 2-3 miles, and 3-4 miles around the site. (KS) Using HRS Guidance manual Highlight A-8, HRS Eligible wetlands were delineated for the site within each concentric ring. The approximate ~~acerage~~ (KS) acerage for each delineated and HRS eligible wetland was calculated based on the Map scale. The acreage for each concentric ring is as follows:

Distance	Acreage
on-site	0
0-1/4 mile	0
1/4 - 1/2 mile	0
1/2 - 1 mile	7.5
1 - 2 miles	23
2 - 3 mile	56
3 - 4 mile	89.

(Contd on next page)

Swamy S. Ketha

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — PROJECT NOTES

TO: Monsanto Company DATE: 19th Feb, 97

FROM: SWAMY KETHA COPIES:

SUBJECT: Sensitive Environments.

REFERENCE:

Based on the ~~the~~ (KJ) NJDEP's Generalized Natural Heritage Index Maps there no Sensitive Environments on the site and within 0.5 mile radius. One Federal designated Endangered Special and 7 State designated Endangered species have been documented to have been observed between 0.5 mile and 4-mile radius from the site.

Swamy S. Ketha

GENERAL VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
FALCO PEREGRINUS	PEREGRINE FALCON	E(S/A)	E		G4	S1	1992-SUMMER	Y
FALCO PEREGRINUS	PEREGRINE FALCON	E(S/A)	E		G4	S1	1993-SUMMER	Y
FALCO PEREGRINUS	PEREGRINE FALCON	E(S/A)	E		G4	S1	1985-??-??	Y
*** Ecosystems								
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?	1987-09-11	Y
*** Invertebrates								
ALASMIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3	????-??-??	Y
LAMPSILIS CARIOSA	YELLOW LAMPMUSSEL				G4	S1	????-??-??	Y
LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3	1909-??-??	Y
LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3	????-??-??	Y
LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1	1909-??-??	Y
LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1	????-??-??	Y
*** Vascular plants								
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1971-09-22	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1923-09-11	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1888-09-13	Y
CUSCUTA POLYGONORUM	SMARTWEED DODDER				G5	S2	1903-08-15	Y
EUPATORIUM CAPILLIFOLIUM	DOG-FENNEL THOROUGHWORT		E		G5	S1	1866-10-27	Y
GLYCERIA GRANDIS	AMERICAN MANNAGRASS		E		G5	S1	1917-09-21	?
HETERANTHERA MULTIFLORA	MUD PLANTAIN				G4	S2	1926-07-24	Y
LEMNA PERPUSILLA	MINUTE DUCKWEED		E		G5	S1	1910-05-10	Y
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT		E		GH	SH	1923-09-11	Y

GENERAL VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
MYRIOPHYLLUM TENELLUM	SLENDER WATER-MILFOIL		E		G5	S1	1907-09-30	Y

24 Records Processed

ON OR IN THE IMMEDIATE VICINITY OF ASSOCIATED WATERWAYS
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
FALCO PEREGRINUS	PEREGRINE FALCON	E(S/A)	E		G4	S1	1993-SUMMER	Y
FALCO PEREGRINUS	PEREGRINE FALCON	E(S/A)	E		G4	S1	1985-??-??	Y
*** Invertebrates								
ALASMIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3	????-??-??	Y
LAMPSILIS CARIOSA	YELLOW LAMPMUSSEL				G4	S1	????-??-??	Y
LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1	????-??-??	Y
LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1	????-??-??	Y
LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1	1902-04-13	Y
*** Vascular plants								
ANEMONE CANADENSIS	CANADA ANEMONE				G5	SX	18??-??-??	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1897-09-??	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1888-09-13	Y
BIDENS BIDENTOIDES	BUR-MARIGOLD		E		G3	S2	1900-09-20	Y
DRABA REPTANS	CAROLINA WHITLOW-GRASS		E		G5	SH	1871-05-??	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT				G3	S2	1870-08-??	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT				G3	S2	1849-09-03	Y
ERIOCAULON PARKERI	PARKER'S PIPEWORT				G3	S2	1884-08-11	Y
GLYCERIA GRANDIS	AMERICAN MANNAGRASS		E		G5	S1	1917-09-21	?
LEMNA PERPUSILLA	MINUTE DUCKWEED		E		G5	S1	1873-09-03	Y
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT		E		GH	SH	1879-09-??	Y
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT		E		GH	SH	1868-07-19	Y

22 Records Processed

NATURAL HERITAGE INDEX MAPS

The Natural Heritage Database contains several thousand records of individual occurrences of endangered and threatened species and ecosystems. Many of these occurrences either have not been documented in recent years or have not had habitat boundaries delineated. Because much work remains to be done to delineate habitat boundaries and determine current status for these occurrences, Natural Heritage Index Maps were devised to red flag general areas in which the occurrences are located. The index maps are meant to be used as a tool to point to areas which may be of significance for endangered biological diversity. These maps do not depict all endangered species habitat in the state, but merely general areas which contain documented occurrences. Many additional areas may contain unidentified or poorly documented occurrences.

The maps have been produced using a computer generated grid which shades a grid cell approximately 330 acres in size if an endangered or threatened species or ecosystem has been documented anywhere within the cell. To use these maps, we suggest that you first find the location to be checked on the quad maps and then refer to the same grid location of the Natural Heritage Index Maps. The Natural Heritage Program can be contacted for additional information as specific projects are planned.

Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity

Documented Location Known Precisely

Documented Location Known Within 1.5 Miles

Major Roads

Municipalities

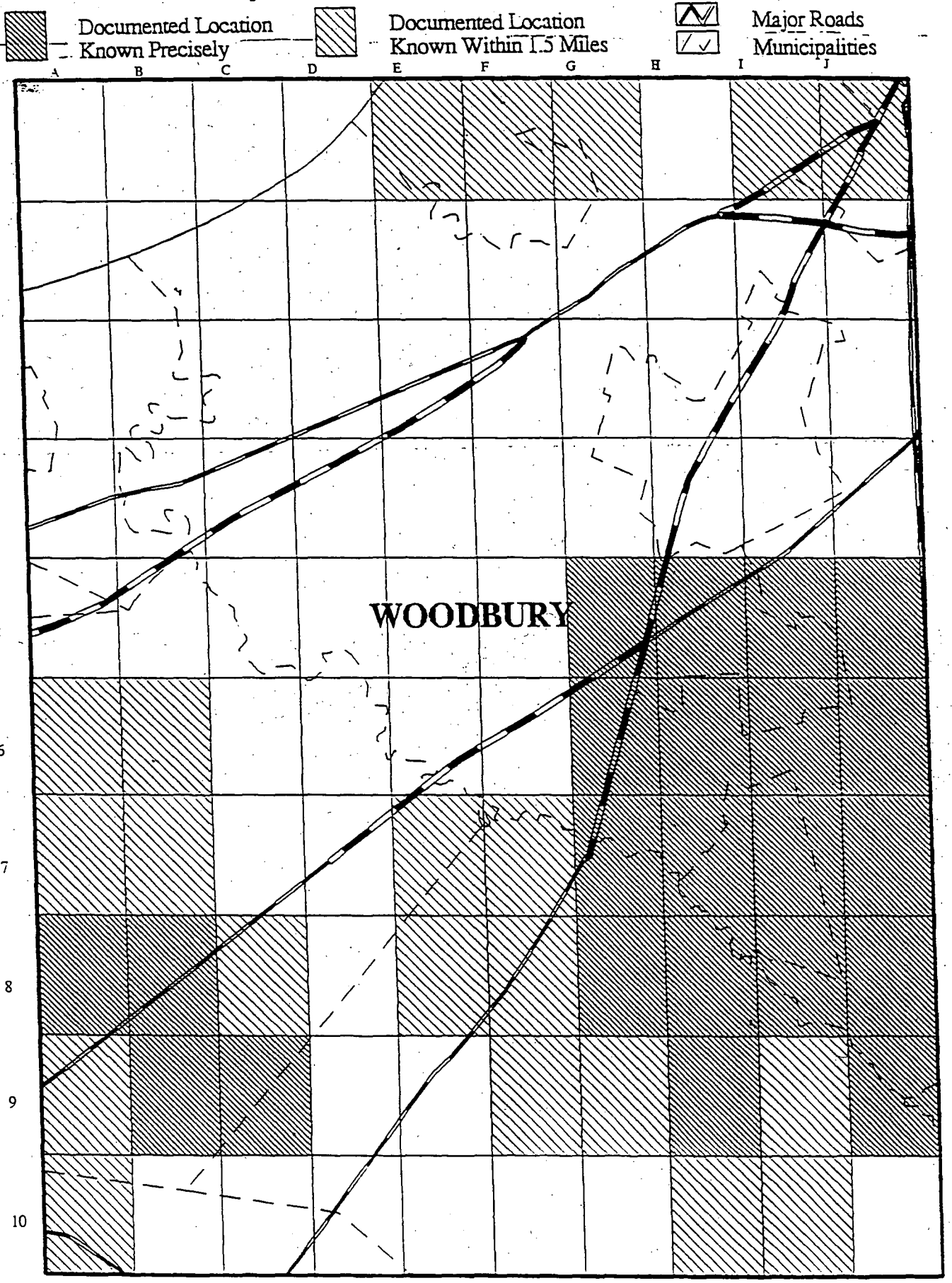
NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

JULY 1996

Updated semiannually

Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity

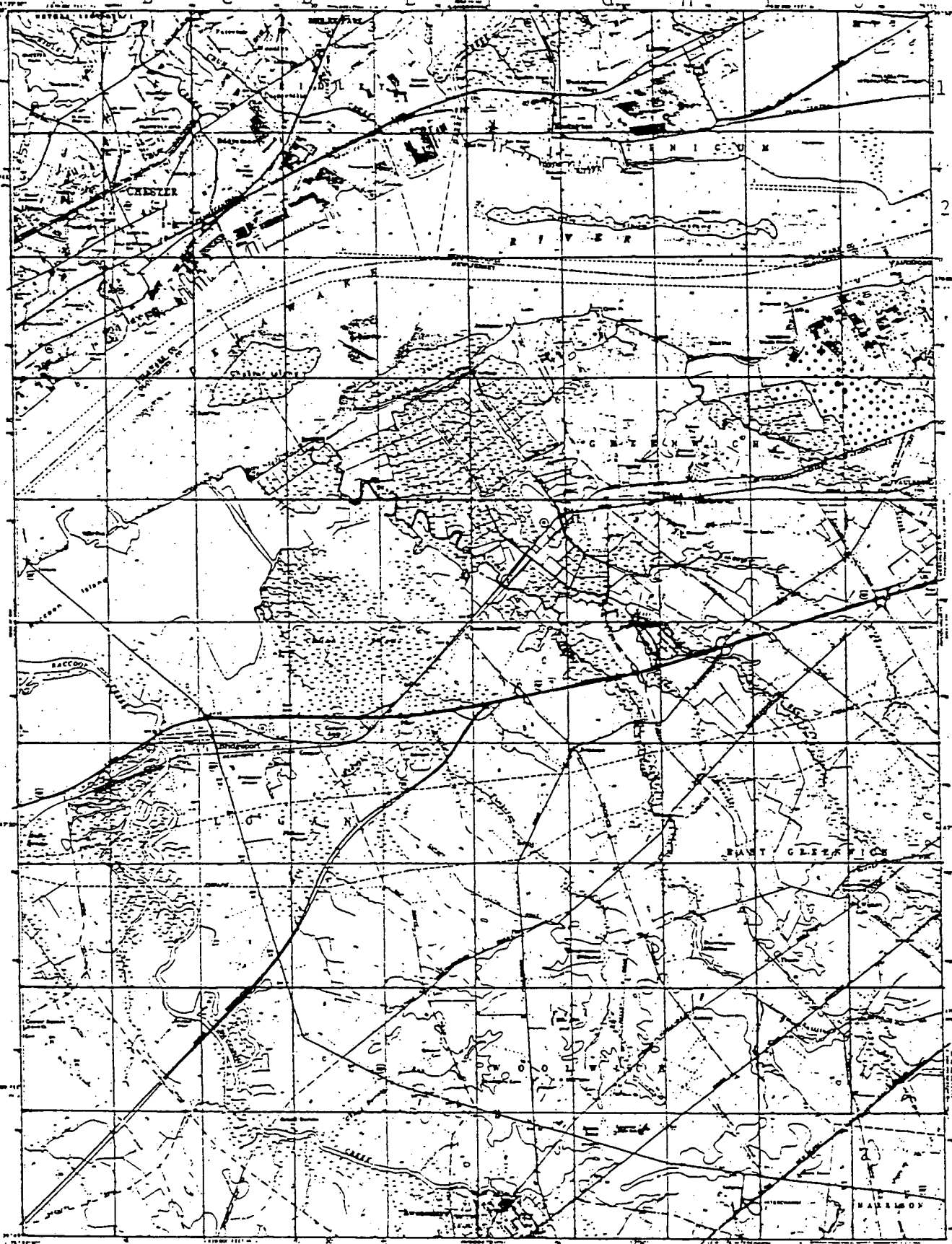


NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

JULY 1996
Updated semiannually

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BRIDGEPORT QUADRANGLE
NEW JERSEY - PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



SCALE 1:24000

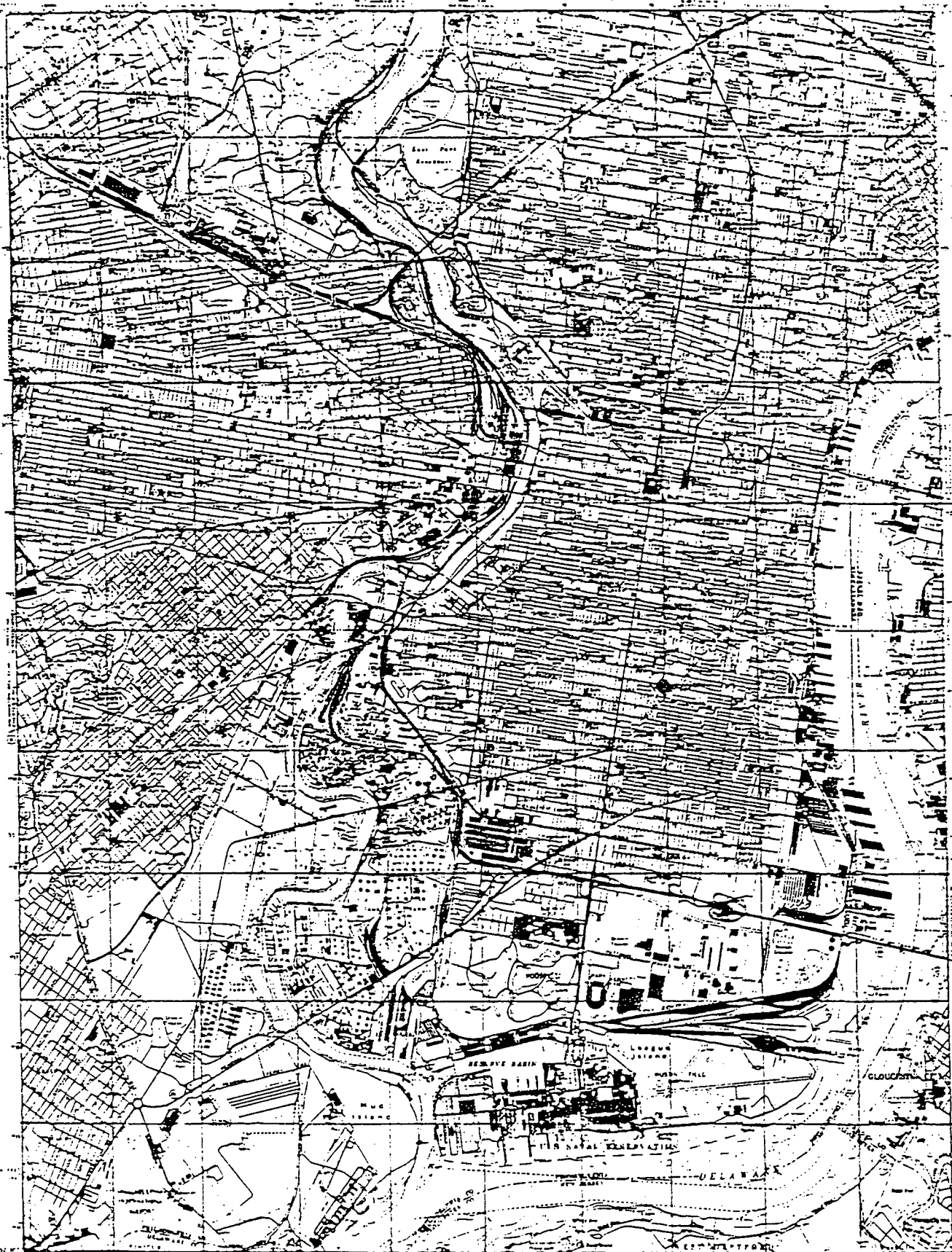
CONTOUR INTERVAL 10 FEET

ROAD CLASSIFICATION

BRIDGEPORT, N.J.-PA.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PHILADELPHIA QUADRANGLE



SCALE 1:24000

CONTOUR INTERVAL 20 FEET

PHILADELPHIA PA-N.J.

102

4 JUN 1996

GLOUCESTER COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
** Vertebrates						
AMBYSTOMA TIGRINUM TIGRINUM	EASTERN TIGER SALAMANDER		E		G5T5	S2
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW	C2	E		G3G4	S1
ARDEA HERODIAS	GREAT BLUE HERON		T/S		G5	S2
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1
BUTEO LINEATUS	RED-SHOULDERED HAWK		E/T		G5	S2
CLEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3
CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G3	S2
FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E		G4	S1
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	LELTNL	E		G4	S1
HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3
PITUOPHIS MELANOLEUCUS MELANOLEUCUS	NORTHERN PINE SNAKE	C2	T		G5T4	S3
POOECETES GRAMINEUS	VESPER SPARROW		E		G5	S2
STRIX VARIA	BARRED OWL		T/T		G5	S3
** Ecosystems						
FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?
** Invertebrates						
ALASMIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3
CATOCALA PRETIOSA PRETIOSA	PRECIOUS UNDERWING	C2			G4T2T3	S2S3
CELITHEMIS MARTHA	MARTHA'S PENNANT				G4	S3S4
ENALLAGMA PICTUM	SCARLET BLUET				G4	S3?
FARONTA RUBRIPENNIS	PINK STREAK				G3G4	SU
LAMPSILIS CARIOSA	YELLOW LAMPMUSSEL	C2			G4	S1
LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3
LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1
LIBELLULA AURIPENNIS	GOLDEN-WINGED SKIMMER				G5	S1?
LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1

GLOUCESTER COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
MACROCHILO LOUISIANA	A NOCTUID MOTH				G4	S2S3
MACROCHILO SANTERIVALIS	A NOCTUID MOTH				GU	S1S3
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	LE	E		G1	SH
PYRGUS WYANDOT	SOUTHERN GRIZZLED SKIPPER	C2			G2	SH
*** Other types						
BALD EAGLE WINTERING SITE	BALD EAGLE WINTERING SITE				G?	S?
*** Vascular plants						
AESCHYNOMENE VIRGINICA	SENSITIVE JOINT-VETCH	LT	E	LP	G2	S1
AGASTACHE NEPETOIDES	YELLOW GIANT HYSSOP				G5	S2
AMIANTHIUM MUSCITOXICUM	FLY POISON				G4G5	S2
ANEMONE CANADENSIS	CANADA ANEMONE				G5	SX
APLECTRUM HYEMALE	PUTTYROOT		E		G5	S1
ARISTIDA BASIRAMEA VAR CURTISSII	CURTIS' THREE-AWNED GRASS				G5T4T5	S2
ASCLEPIAS RUBRA	RED MILKWEED			LP	G4G5	S2
ASCLEPIAS VARIEGATA	WHITE MILKWEED				G5	S2
ASCLEPIAS VERTICILLATA	WHORLED MILKWEED				G5	S2
ASIMINA TRILOBA	PAWPAW		E		G5	S1
ASTER INFIRMUS	CORNEL-LEAVED ASTER				G5	S2
ASTER RADULA	LOW ROUGH ASTER		E		G5	S1
BIDENS BIDENTOIDES	BUR-MARIGOLD	C2	E		G3	S2
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMMA GRASS		E		G5	S1
CACALIA ATRIPLICIFOLIA	PALE INDIAN PLANTAIN		E		G4G5	S1
CALLITRICHE VERNA	SPRING WATER STARWORT				G5	S2
CARDAMINE LONGII	LONG'S BITTER CRESS	3C	E		G3G4Q	SH
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G4	S4
CAREX FRANKII	FRANK'S SEDGE				G5	S3
CAREX LIMOSA	MUD SEDGE		E		G5	S1

GLOUCESTER COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
CAREX MITCHELLIANA	MITCHELL'S SEDGE				G3G4	S2
CAREX POLYMORPHA	VARIABLE SEDGE	C2	E		G2G3	S1
CAREX ROSTRATA	BEAKED SEDGE				G5	S2
CASTANEA PUMILA	ALLEGHENY CHINQUAPIN		E		G5	S1
CASTILLEJA COCCINEA	SCARLET INDIAN PAINTBRUSH				G5	S2
CORALLORRHIZA WISTERIANA	SPRING CORAL-ROOT				G5	SX.1
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2
CROTONOPSIS ELLIPTICA	ELLIPTICAL RUSHFOIL			LP	G5	S2
CYPERUS ENGELMANNII	ENGELMANN'S FLATSEDGE				G4Q	S2
CYPERUS LANCASTRIENSIS	LANCASTER FLATSEDGE				G5	S2
CYPERUS RETROFRACTUS	ROUGH FLATSEDGE		E		G5	SH
DALIBARDA REPENS	ROBIN-RUN-AWAY		E		G5	SH.1
DESMODIUM LAEVIGATUM	SMOOTH TICK-TREFOIL				G5	S3
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G4	S2
DRABA REPTANS	CAROLINA WHITLOW-GRASS		E		G5	SH
ELEOCHARIS EQUISETOIDES	KNOTTED SPIKERUSH		E	LP	G4	SH
ELEOCHARIS TORTILIS	TWISTED SPIKERUSH		E		G5	S1
ELEPHANTOPUS CAROLINIANUS	ELEPHANT'S FOOT		E		G5	SH
ERIOCAULON PARKERI	PARKER'S PIPEWORT	3C			G3	S2
ERIOPHORUM GRACILE	SLENDER COTTONGRASS		E		G5	SH
ERIOPHORUM TENELLUM	ROUGH COTTONGRASS		E		G5	S1
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G3	S2
GLYCERIA LAXA	NORTHERN MANNAGRASS				G5	S2
GYMNOPOGON BREVIFOLIUS	SHORT-LEAVED SKELETON GRASS		E		G5	S1
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G3	S3
HETERANTHERA MULTIFLORA	MUD PLANTAIN				G4	S2
LUZULA ACUMINATA	HAIRY WOODRUSH		E		G5	S1
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT	C2*	E		GH	SH
MUHLENBERGIA CAPILLARIS	LONG-AWNED SMOKE GRASS		E		G5	S1

GLOUCESTER COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	3C		LP	G3	S3
NYMPHOIDES CORDATA	FLOATING HEART			LP	G5	S3
ONOSMODIUM VIRGINIANUM	VIRGINIA FALSE-GROMWELL		E		G4	S1
PANICUM ACICULARE	BRISTLING PANIC GRASS		E		G4G5	S1
PENSTEMON LAEVIGATUS	SMOOTH BEARD TONGUE		E		G5	S1
PHASEOLUS POLYSTACHIOS	WILD KIDNEY BEAN				G4	S2
POLYGALA INCARNATA	PINK MILKWORT		E		G5	SH
POLYGONUM OPELOUSANUM	NORTHEASTERN SMARTWEED				G5	S2
PRUNUS ANGUSTIFOLIA	CHICKASAW PLUM		E		G5	S2
PYCNANTHEMUM TORREI	TORREY'S MOUNTAIN MINT		E		G2	S1
QUERCUS IMBRICARIA	SHINGLE OAK		E		G5	S1.1
RHYNCHOSPORA GLOBULARIS	GRASS-LIKE BEAKED RUSH		E		G5	S1
RHYNCHOSPORA INUNDATA	HORNED BEAKED RUSH			LP	G4	S2
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3	S3
RHYNCHOSPORA SCIRPOIDES	LONGBEAKED BALDRUSH				G4	S2
SCHEUCHZERIA PALUSTRIS	ARROW-GRASS		E		G5	SH
SCHIZAEA PUSILLA	CURLY GRASS FERN	3C		LP	G3	S3
SPIRANTHES LACINIATA	LACE-LIP LADIES'-TRESSES		E		G4G5	S1
SPIRANTHES ODORATA	FRAGRANT LADIES'-TRESSES				G5	S2
THASPIUM BARBINODE	HAIRY-JOINTED MEADOW-PARSNIP				G5	SX.1
TIPULARIA DISCOLOR	CRANEFLY ORCHID				G4G5	S3
UTRICULARIA BIFLORA	TWO-FLOWERED BLADDERWORT		E		G5	S1
VALERIANELLA RADIATA	BEAKED CORN-SALAD		E		G5	S1
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN		E		G5	S1
VERNONIA GLAUCA	BROAD-LEAVED IRONWEED		E		G5	S1
VULPIA ELLIOTEA	SQUIRREL FESCUE		E		G5	SH

105 Records Processed

4 JUN 1996

CAMDEN COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

	NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
** Vertebrates							
	CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G3	S2
	FALCO PEREGRINUS	PEREGRINE FALCON	E/SA	E		G4	S1
	HYLA ANDERSONII	PINE BARRENS TREEFROG	3C	E		G4	S3
	MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T/T		G5	S3
	PITUOPHIS MELANOLEUCUS MELANOLEUCUS	NORTHERN PINE SNAKE	C2	T		G5T4	S3
** Ecosystems							
	COASTAL PLAIN INTERMITTENT POND	VERNAL POND				G3?	S2S3
	FRESHWATER TIDAL MARSH COMPLEX	FRESHWATER TIDAL MARSH COMPLEX				G4?	S3?
	PITCH PINE LOWLAND FOREST	PITCH PINE LOWLAND FOREST				G3	S3
** Invertebrates							
	ANAX LONGIPES	COMET DARNER				G5	S2?
	CELITHEMIS MARTHA	MARTHA'S PENNANT				G4	S3S4
	ENALLAGMA PICTUM	SCARLET BLUET				G4	S3?
	ENALLAGMA RECURVATUM	PINE BARRENS BLUET	3C			G3	S3
	EPITHECA SPINOSA	ROBUST BASKETTAIL				G3G4	S1
	ERYNNIS MARTIALIS	MOTTLED DUSKY WING				G4	SH
	GOMPHUS APOMYIUS	BANNER CLUBTAIL				G4	S1?
	HELICODISCUS SINGLEYANUS	SMOOTH COIL				G4G5	S2S3
	HESPERIA ATTALUS SLOSSONAE	DOTTED SKIPPER				G4T3	S2S3
	INCISALIA IRUS	FROSTED ELFIN				G4	SU
	LAMPSILIS RADIATA	EASTERN LAMPMUSSEL				G5	S3
	LEPTODEA OCHRACEA	TIDEWATER MUCKET				G4	S1
	LIBELLULA AXILENA	BAR-WINGED SKIMMER				G5	S1?
	LIGUMIA NASUTA	EASTERN PONDMUSSEL				G4	S1
	NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	LE	E		G1	SH

4 JUN 1996

CAMDEN COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
PIERIS VIRGINIENSIS	WEST VIRGINIA WHITE				G4	SH
POLYGONIA PROGNE	GRAY COMMA				G5	SH
SPARTINIPHAGA CARTERAE	CARTER'S NOCTUID MOTH	C2			G2G3	S2
** Vascular plants						
AESCHYNOMENE VIRGINICA	SENSITIVE JOINT-VETCH	LT	E	LP	G2	S1
AGASTACHE SCROPHULARIIFOLIA	PURPLE GIANT HYSSOP				G4	S2
AMIANTHIUM MUSCITOXICUM	FLY POISON				G4G5	S2
ARISTIDA BASIRAMEA VAR CURTISSII	CURTIS' THREE-AWNED GRASS				G5T4T5	S2
ARISTIDA LANOSA	WOOLLY THREE-AWNED GRASS		E		G5	S1
ARISTIDA VIRGATA	WAND-LIKE THREE-AWNED GRASS				G5T4T5	S2
ASCLEPIAS RUBRA	RED MILKWEED			LP	G4G5	S2
ASCLEPIAS VARIEGATA	WHITE MILKWEED				G5	S2
ASCLEPIAS VERTICILLATA	WHORLED MILKWEED				G5	S2
ASTER INFIRMUS	CORNEL-LEAVED ASTER				G5	S2
ASTER RADULA	LOW ROUGH ASTER		E		G5	S1
BIDENS BIDENTOIDES	BUR-MARIGOLD	C2	E		G3	S2
BOTRYCHIUM ONEIDENSE	BLUNT-LOBED GRAPE-FERN				G4?	S2
CACALIA ATRIPLICIFOLIA	PALE INDIAN PLANTAIN		E		G4G5	S1
CACALIA MUHLENBERGII	GREAT INDIAN PLANTAIN				G4	SX.1
CALAMOVILFA BREVIPILIS	PINE BARREN REEDGRASS	3C		LP	G4	S4
CALYSTEGIA SPITHAMAEA	ERECT BINDWEED		E		G4G5	S1
CAREX AQUATILIS	WATER SEDGE		E		G5	S1
CAREX BARRATTII	BARRATT'S SEDGE	3C		LP	G4	S4
CAREX CUMULATA	CLUSTERED SEDGE		E		G4?	SH
CAREX MITCHELLIANA	MITCHELL'S SEDGE				G3G4	S2
CAREX ROSTRATA	BEAKED SEDGE				G5	S2
CASTILLEJA COCCINEA	SCARLET INDIAN PAINTBRUSH				G5	S2
CERCIS CANADENSIS	REDBUD		E		G5	S1

JUN 1996

CAMDEN COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
CHENOPODIUM RUBRUM	RED GOOSEFOOT		E		G5	S1
COELOGLOSSUM VIRIDE	LONG-BRACTED GREEN ORCHID				G5	S2
COMMELINA ERECTA	SLENDER DAYFLOWER		E		G5	SH.1
COREOPSIS ROSEA	PINK TICKSEED			LP	G3	S2
CROTONOPSIS ELLIPTICA	ELLIPTICAL RUSHFOIL			LP	G5	S2
CUSCUTA POLYGONORUM	SMARTWEED DODDER				G5	S2
CYPERUS ENGELMANNII	ENGELMANN'S FLATSEDGE				G4Q	S2
CYPERUS LANCASTRIENSIS	LANCASTER FLATSEDGE				G5	S2
CYPERUS RETROFRACTUS	ROUGH FLATSEDGE		E		G5	SH
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL			LP	G4	S2
DESMODIUM VIRIDIFLORUM	VELVETY TICK-TREFOIL				G5?	S2
DIODIA VIRGINIANA	LARGER BUTTONWEED		E		G5	S1
DRABA REPTANS	CAROLINA WHITLOW-GRASS		E		G5	SH
EPILOBIUM STRICTUM	DOWNY WILLOW-HERB				G5?	S2
ERIOCAULON PARKERI	PARKER'S PIPEWORT	3C			G3	S2
ERIOPHORUM TENELLUM	ROUGH COTTONGRASS		E		G5	S1
ERYNGIUM YUCCIFOLIUM	RATTLESNAKE MASTER				G5	SX
EUPATORIUM CAPILLIFOLIUM	DOG-FENNEL THOROUGHWORT		E		G5	S1
EUPATORIUM RESINOSUM	PINE BARREN BONESET	C2	E	LP	G3	S2
GENTIANA AUTUMNALIS	PINE BARREN GENTIAN	3C		LP	G3	S3
GLYCERIA GRANDIS	AMERICAN MANNAGRASS		E		G5	S1
GNAPHALIUM HELLERI	HELLER'S EVERLASTING		E		G4G5	SH
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G3	S3
HEMICARPHA MICRANTHA	HEMICARPHA		E		G4	S1
HETERANTHERA MULTIFLORA	MUD PLANTAIN				G4	S2
HYDRASTIS CANADENSIS	GOLDEN SEAL	3C			G4	SH
JUNCUS CAESARIENSIS	NEW JERSEY RUSH	C2	E	LP	G2	S2
JUNCUS TORREYI	TORREY'S RUSH				G5	S1
KUHNIA EUPATORIOIDES	FALSE BONESET		E		G5	S1
LEMNA PERPUSILLA	MINUTE DUCKWEED		E		G5	S1

JUN 1996

CAMDEN COUNTY

RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
LIMOSELLA SUBULATA	MUDWEED		E		G4?	S1
LINUM INTERCURSUM	SANDPLAIN FLAX		E		G4G5	S1
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE			LP	G4	S2
LYTHRUM HYSSOPIFOLIA	HYSSOP LOOSESTRIFE				G5	SX
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT	C2*	E		GH	SH
MUHLENBERGIA TORREYANA	PINE BARREN SMOKE GRASS	3C		LP	G3	S3
MYRIOPHYLLUM TENELLUM	SLENDER WATER-MILFOIL		E		G5	S1
NELUMBO LUTEA	AMERICAN LOTUS		E		G4	S1
NUPHAR MICROPHYLLUM	SMALL YELLOW POND LILY		E		G5	SH
ONOSMODIUM VIRGINIANUM	VIRGINIA FALSE-GROMWELL		E		G4	S1
PLANTAGO PUSILLA	SLENDER PLANTAIN		E		G5	SH
PLATANTHERA FLAVA VAR FLAVA	SOUTHERN REIN ORCHID	3C	E		G4T4?Q	S1
PLUCHEA FOETIDA	STINKING FLEABANE		E		G5	S1
POLYGALA INCARNATA	PINK MILKWORT		E		G5	SH
POLYGONUM GLAUCUM	SEA-BEACH KNOTWEED		E		G3	S1
PRUNUS ANGUSTIFOLIA	CHICKASAW PLUM		E		G5	S2
PYCNANTHEMUM CLINOPODIOIDES	BASIL MOUNTAIN MINT		E		G2	S1
RHYNCHOSPORA GLOBULARIS	GRASS-LIKE BEAKED RUSH		E		G5	S1
RHYNCHOSPORA INUNDATA	HORNED BEAKED RUSH			LP	G4	S2
RHYNCHOSPORA KNIESKERNII	KNIESKERN'S BEAKED RUSH	LT	E	LP	G1	S1
RHYNCHOSPORA PALLIDA	PALE BEAK RUSH				G3	S3
SAGITTARIA TERES	SLENDER ARROW HEAD		E		G3	S1
SCHEUCHZERIA PALUSTRIS	ARROW-GRASS		E		G5	SH
SCHIZAEA PUSILLA	CURLY GRASS FERN	3C		LP	G3	S3
SCHWALBEA AMERICANA	CHAFFSEED	LE	E	LP	G2	S1
SCIRPUS LONGII	LONG'S BULRUSH	C2	E	LP	G2	S2
SCIRPUS MARITIMUS	SALT MARSH BULRUSH		E		G5	SH
SPIRANTHES ODORATA	FRAGRANT LADIES'-TRESSES				G5	S2
STELLARIA PUBERA	STAR CHICKWEED		E		G5	SH

JUN 1996

CAMDEN COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
THASPIUM BARBINODE	HAIRY-JOINTED MEADOW-PARSNIP				G5	SX.1
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN		E		G5	S1
VULPIA ELLIOTEA	SQUIRREL FESCUE		E		G5	SH
XYRIS FIMBRIATA	FRINGED YELLOW-EYED GRASS		E		G5	S1

14 Records Processed

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

LE	Taxa formally listed as endangered.
LT	Taxa formally listed as threatened.
PE	Taxa already proposed to be formally listed as endangered.
PT	Taxa already proposed to be formally listed as threatened.
C	Taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
S/A	Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D	Declining species-a species which has exhibited a continued decline in population numbers over the years.
E	Endangered species-an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
EX	Extirpated species-a species that formerly occurred in New Jersey, but is not now known to exist within the state.
I	Introduced species-a species not native to New Jersey that could not have established itself here without the assistance of man.
INC	Increasing species-a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
T	Threatened species-a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
P	Peripheral species-a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
S	Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
U	Undetermined species-a species about which there is not enough information available to determine the status.

state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

S5 Demonstrably secure in state and essentially ineradicable under present conditions.

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include european strays or western birds on the East Coast and visa-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.

SN Regularly occurring, usually migratory and typically nonbreeding species for which no significant or effective habitat conservation measures can be taken in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in the winter (or, in a few cases, the summer); included also are certain lepidoptera which regularly migrate to a state where they reproduce, but then completely die out every year with no return migration. Species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation. Other nonbreeding, high globally-ranked species (such as the bald eagle, whooping crane or some seal species) which regularly spend some portion of the year at definite localities (and therefore have a valid conservation need in the state) are not ranked SN but rather S1, S2, etc.

SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.

SRF Elements erroneously reported from New Jersey, but this error persists in the literature.

SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.

SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
CN 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

Robert C. Shinn, Jr.
Commissioner

December 9, 1996

Dennis Foerter
Roy F. Weston, Inc.
1090 King Georges Post Road, Suite 201
Edison, NJ 08837-3703

Re: Monsanto Company (Site 1277) & Associated Waterways

Dear Mr. Foerter:

Thank you for your data request regarding rare species information for the above referenced project site in Camden and Gloucester Counties.

The Natural Heritage Data Base does not have any records for rare plants, animals, or natural communities on the Monsanto site. However, there are records for a number of occurrences for rare species which may be on, or in the immediate vicinity of the waterways that you have associated with this site. The attached list provides additional information about these occurrences. Also attached is a list of rare species from records in the general vicinity of the project site (within approximately 4 miles).

Also attached are lists of rare species and natural communities which have been documented from Camden and Gloucester Counties. If suitable habitat is present at the project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife, Endangered and Nongame Species Program.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Bridgeport, Camden, Philadelphia and Woodbury USGS quadrangles.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact

us again regarding any future data requests.

Sincerely,

Thomas F. Breden
Supervisor

cc: Lawrence Niles
Thomas Hampton
NHP File No. 96-3907581

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

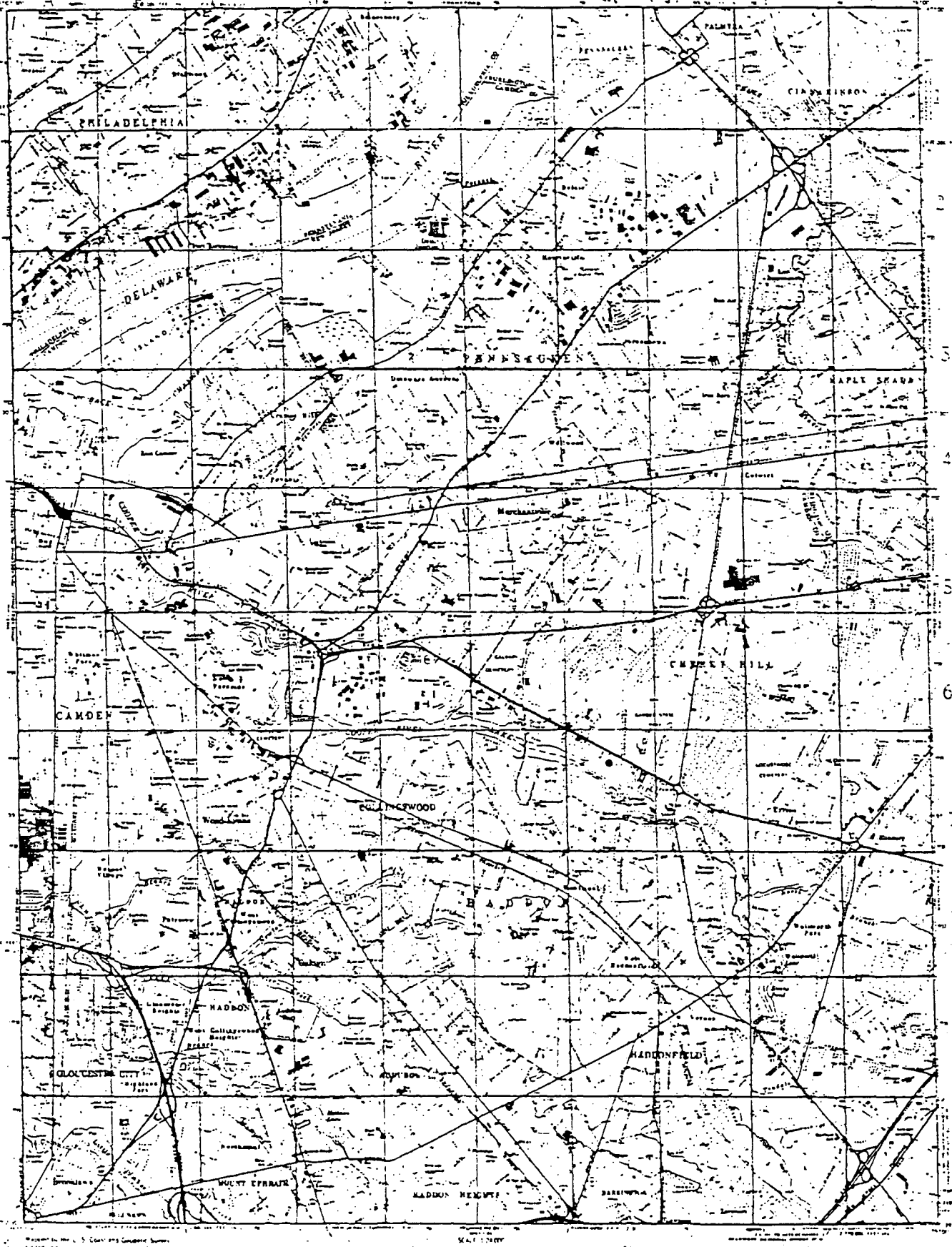
The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, CN 401, Trenton, NJ 08625-0401.

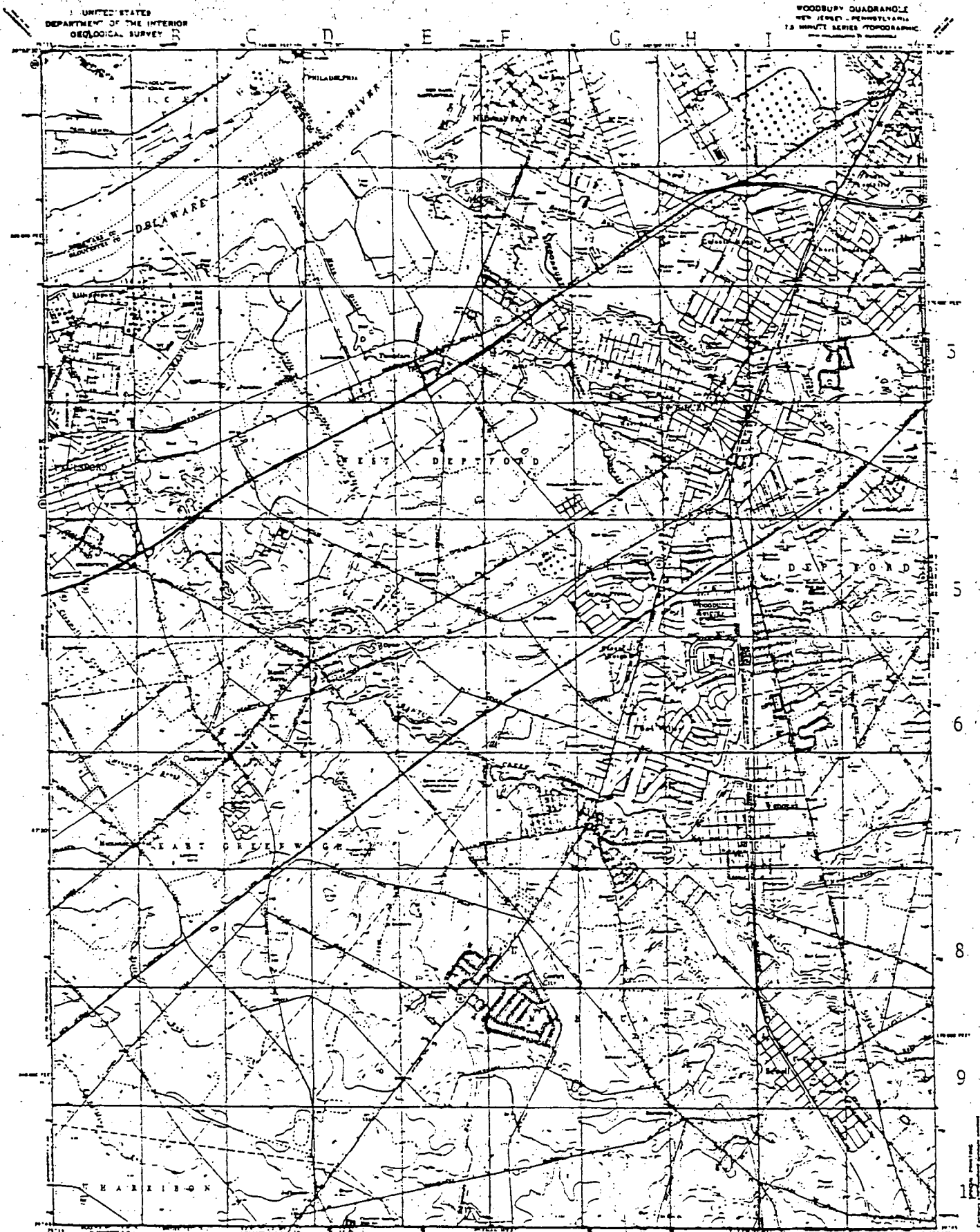
This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CAMDEN QUADRANGLE
NEW JERSEY-PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



103


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WOODBURY QUADRANGLE
NEW JERSEY - PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
B C D E F G H I
PHILADELPHIA
DELAWARE RIVER
WEST DEPTFORD
DEPTFORD
EAST GLOUCESTER
HARRISON
5
4
5
6
7
8
9
10

Generalized Natural Heritage Index Map

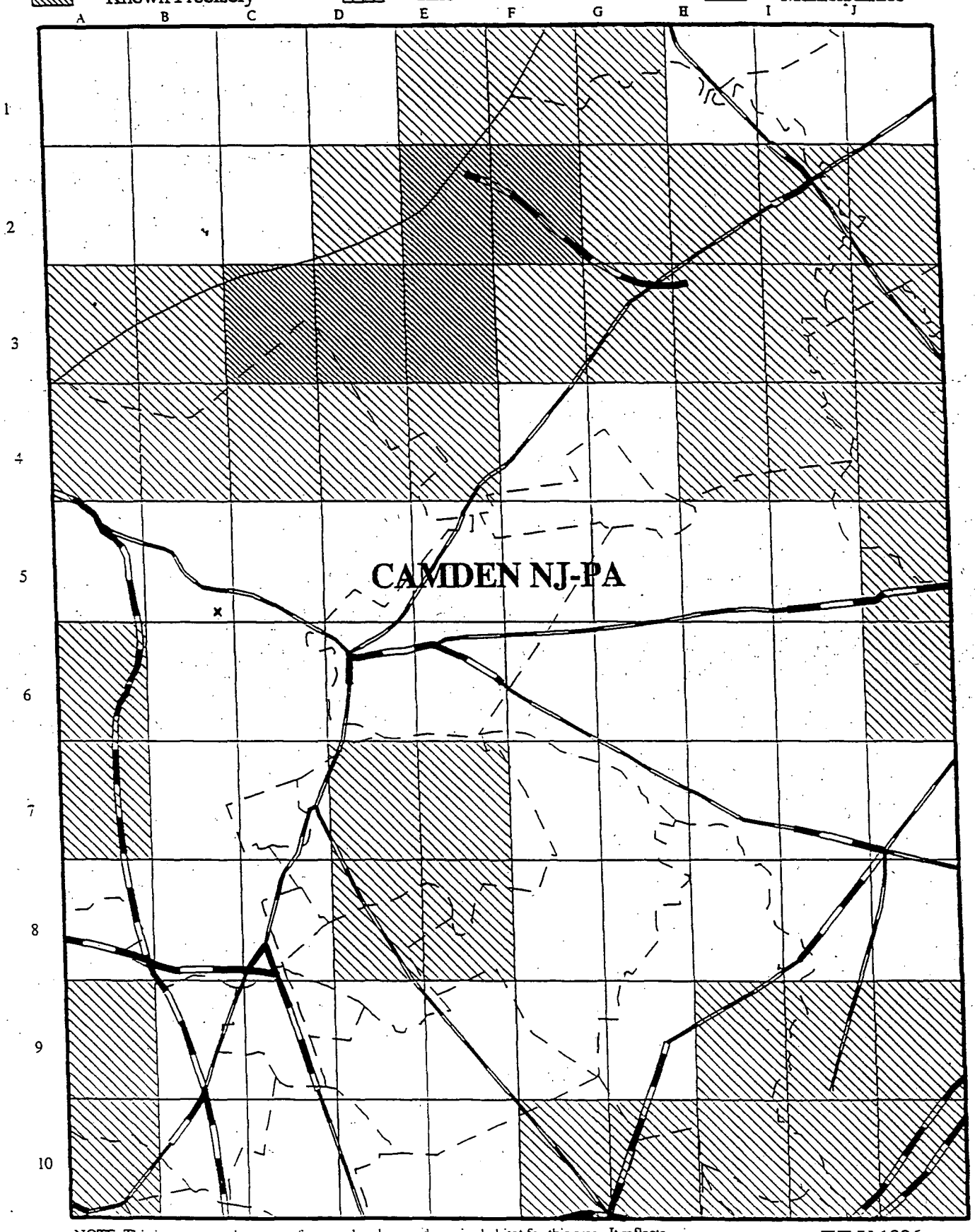
Generalized Locations for Rare and Endangered Elements of Natural Diversity

Documented Location Known Precisely

Documented Location Known Within 1.5 Miles

Major Roads

Municipalities



NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

JULY 1996
Updated semiannually

Generalized Natural Heritage Index Map

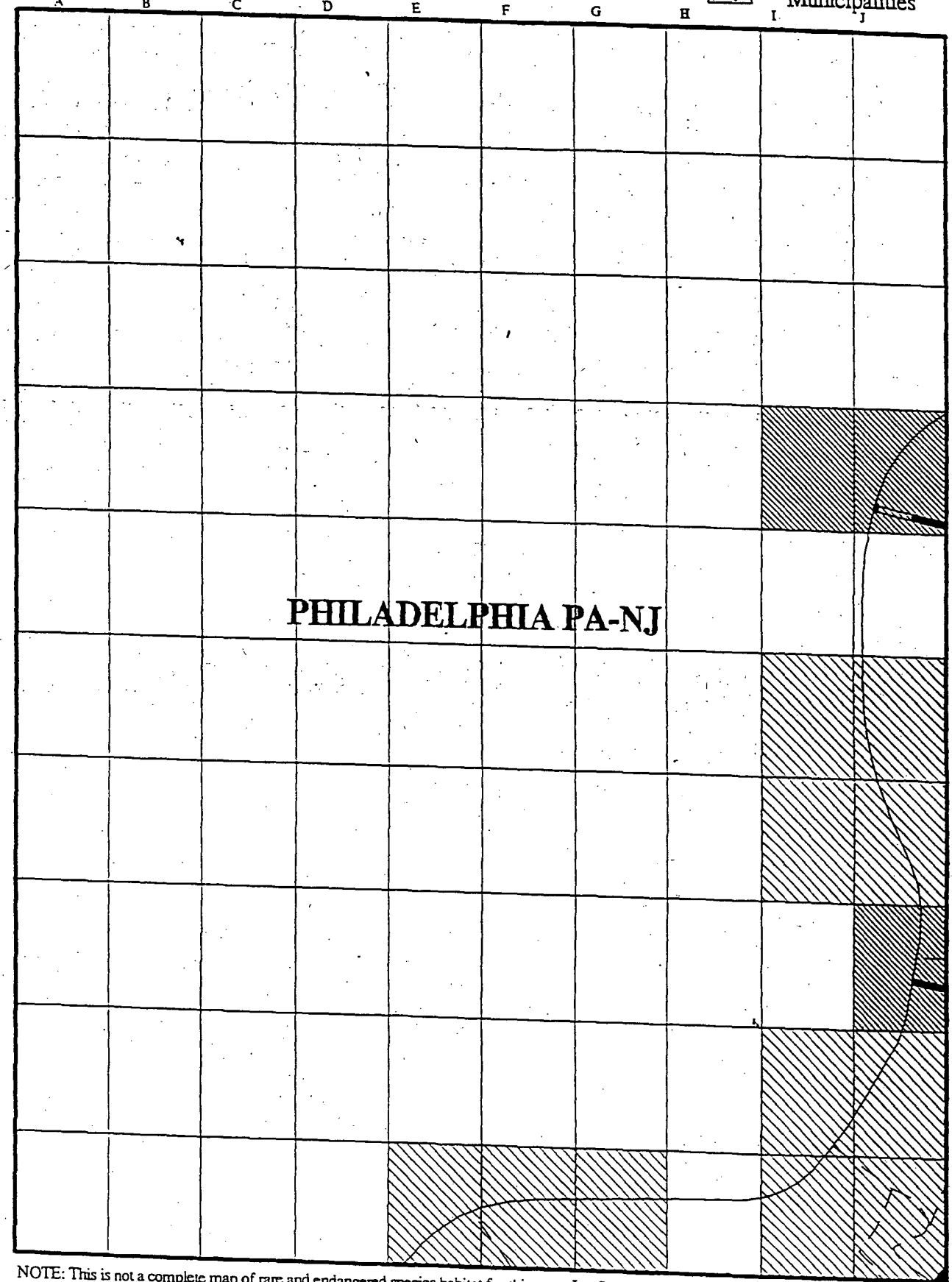
Generalized Locations for Rare and Endangered Elements of Natural Diversity

Documented Location Known Precisely

Documented Location Known Within 1.5 Miles

Major Roads

Municipalities



NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

JULY 1996
Updated semiannually

REFERENCE NO. 20

34	100CNZC	CENOZOIC ERATHEM
34	110QRNR	QUATERNARY SYSTEM
34	111ALVM	HOLOCENE ALLUVIUM
34	111HLCN	HOLOCENE SERIES
34	111HPPM	UNDIFFERENTIATED HOLOCENE,PLEISTOCENE,PLIOCENE,AND MIOCENE
34	111SWMP	SWAMP DEPOSIT
34	112BRDG	BRIDGETON FORMATION
34	112CPMY	CAPE MAY FORMATION
34	112DLTC	DELTAIC SAND FACIES
34	112ESRNC	ESTUARINE CLAY FACIES
34	112ESRNS	ESTUARINE SAND FACIES
34	112GCLK	GLACIAL LAKE DEPOSITS
34	112GKMK	KAME AND KAME TERRACE DEPOSITS
34	112GLCD	GLACIAL DELTA DEPOSITS
34	112HLBC	HOLLY BEACH WATER-BEARING ZONE
34	112MORN	MORAINE
34	112MRIN	MARINE SAND FACIES
34	112PKBG	PENSAUKEN-BRIDGETON FORMATIONS
34	112PLCC	PLEISTOCENE SERIES-COHANSEY SAND
34	112PLSC	PLEISTOCENE SERIES
34	112PNSK	PENSAUKEN FORMATION
34	112SFDF	STRATIFIED DRIFT
34	112TILL	TILL
34	120TRTR	TERTIARY SYSTEM
34	121BCHL	BEACON HILL GRAVEL
34	121CKKD	COHANSEY SAND-KIRKWOOD FORMATION
34	121CNSY	COHANSEY SAND
34	121PCMC	PLIOCENE-MIOCENE SERIES
34	121PLCN	PLIOCENE SERIES
34	122KRKD	KIRKWOOD FORMATION
34	122KRKDL	KIRKWOOD FORMATION,LOWER SAND
34	122KRKDU	KIRKWOOD FORMATION,UPPER SAND
34	122MOCN	MIOCENE SERIES
34	123OLGC	OLIGOCENE SERIES
34	124EOCN	EOCENE SERIES
34	124MNSQ	MANASQUAN FORMATION
34	124MQVC	MANASQUAN-VINCENTOWN FORMATIONS
34	124PNPN	PINEY POINT FORMATION
34	124SKRV	SHARK RIVER MARL
34	125HRRS	HORNERSTOWN SAND
34	125PLCN	PALEOCENE SERIES
34	125VCHR	VINCETOWN FORMATION-HORNERSTOWN SAND
34	125VNCN	VINCENTOWN FORMATION
34	200MSZC	MESOZOIC ERATHEM
34	210CRCS	CRETACEOUS SYSTEM
34	211EGLS	ENGLISHTOWN FORMATION
34	211FRNG	FARRINGTON SAND MEMBER OF RARITAN FORMATION
34	211MCVL	MERCHANTVILLE FORMATION
34	211MGRR	MAGOTHY-RARITAN FORMATIONS
34	211MGTY	MAGOTHY FORMATION
34	211MLRL	MOUNT LAUREL SAND
34	211MLRW	MOUNT LAUREL SAND-WENONAH FORMATION
34	211MRPA	MAGOTHY-RARITAN-POTOMAC AQUIFER SYSTEM, UNDIFFERENTIATED
34	211MRPAL	MAGOTHY-RARITAN-POTOMAC AQUIFER SYSTEM, LOWER AQUIFER
34	211MRPAM	MAGOTHY-RARITAN-POTOMAC AQUIFER SYSTEM, MIDDLE AQUIFER
34	211MRPAU	MAGOTHY-RARITAN-POTOMAC AQUIFER SYSTEM, UPPER AQUIFER
34	211MRSL	MARSHALLTOWN FORMATION
34	211NVSK	NAVESINK FORMATION
34	211ODBG	OLD BRIDGE SAND MEMBER OF MAGOTHY FORMATION
34	211RDBK	RED BANK SAND
34	211RRTN	RARITAN FORMATION
34	211SRVL	SAYREVILLE SAND MEMBER OF RARITAN FORMATION
34	211TNTN	TINTON SAND
34	211WBMV	WOODBURY CLAY-MERCHANTVILLE FORMATION
34	211WDBR	WOODBURY CLAY
34	211WNNH	WENONAH FORMATION
34	217PTMC	POTOMAC GROUP
34	227BNTN	BOONTON FORMATION
34	227BRCK	BRUNSWICK GROUP
34	227BRCKS	BRUNSWICK GROUP SEDIMENTARY
34	227BSLT	BASALT
34	227CGLM	CONGLOMERATE
34	227DIBS	DIABASE
34	227FLVL	FELTVILLE FORMATION

34	227HKMN	HOOK MOUNTAIN BASALT
34	227NWRK	NEWARK SUPERGROUP
34	227ORGM	ORANGE MOUNTAIN BASALT
34	227PRKS	PREAKNESS BASALT
34	227PSSC	PASSAIC FORMATION
34	227TOWC	TOWACO FORMATION
34	230TRSC	TRIASSIC SYSTEM
34	231CGLMU	UNCLASSIFIED CONGLOMERATES
34	231HMCK	HAMMER CREEK FORMATION
34	231LMCG	LIMESTONE CONGLOMERATE
34	231LCKG	LOCKATONG FORMATION
34	231QRCG	QUARTZITE CONGLOMERATE
34	231SCKN	STOCKTON FORMATION
34	300PLZC	PALEOZOIC ERATHEM
34	300WSCK	WISSAHICKON GNEISS
34	324KTTNL	LOWER KITTATINY LIMESTONE
34	324KTTNM	MIDDLE KITTATINY LIMESTONE
34	340DVNN	DEVONIAN SYSTEM
34	341SKMK	SKUNNEMUNK CONGLOMERATE
34	344BLVL	BELLVALE SANDSTONE
34	344CRNL	CORNWALL SHALE
34	344ESPS	ESOPUS FORMATION
34	344KNUS	KANOUSE SANDSTONE
34	344MRCL	MARCELLUS SHALE
34	344ONDG	ONONDAGA LIMESTONE
34	347CMNS	COEYMANS FORMATION
34	347DEPU	DEPUE LIMESTONE MEMBER OF COEYMANS FORMATION
34	347DNVL	DUTTONVILLE MEMBER OF RONDOUT FORMATION
34	347FBKV	FLATBROOKVILLE MEMBER OF NEW SCOTLAND FORMATION
34	347KKBG	KALKBERG LIMESTONE
34	347MNSK	MINISINK LIMESTONE
34	347MPCG	MASHIPACONG MEMBER OF RONDOUT FORMATION
34	347MSKZ	MASKENOZHA MEMBER
34	347NSCD	NEW SCOTLAND FORMATION
34	347ORSK	ORISKANY FORMATION
34	347PREN	PORT EWEN SHALE
34	347PRVL	PETERS VALLEY MEMBER OF COEYMANS FORMATION
34	347RNDT	RONDOUT FORMATION
34	347RVEN	RAVENA MEMBER OF COEYMANS LIMESTONE
34	347SILD	SHAWNEE ISLAND MEMBER OF COEYMANS FORMATION
34	347SMVL	STORMVILLE MEMBER OF COEYMANS FORMATION
34	347TCKR	THACKER MEMBER OF MANLIUS LIMESTONE
34	347WTPR	WHITEPORT DOLOMITE MEMBER OF RANDOUT FORMATION
34	350GRPD	GREEN POND CONGLOMERATE
34	350HGFL	HIGH FALLS FORMATION
34	350SLRN	SILURIAN SYSTEM
34	351BDVL	BOSSARDVILLE LIMESTONE
34	351CVBK	CLOVE BROOK MEMBER OF DECKER FORMATION
34	351DCKR	DECKER FORMATION
34	351LNGD	LONGWOOD SHALE
34	351PXID	POXONO ISLAND FORMATION
34	351WPKC	WALLPACK CENTER MEMBER OF DECKER FORMATION
34	354SNGK	SHAWANGUNK FORMATION
34	360KTTN	KITTATINNY LIMESTONE
34	360ODVC	ORDOVICIAN SYSTEM
34	361BSKL	BUSHKILL MEMBER OF MARTINSBURG SHALE
34	361MRBG	MARTINSBURG SHALE
34	361PAGL	PEN ARGYL MEMBER OF MARTINSBURG SHALE
34	361RMBG	RAMSEYBURG MEMBER OF MARTINSBURG SHALE
34	364JKBG	JACKSONBURG LIMESTONE
34	367EPLR	EPLER FORMATION
34	367KTTNU	UPPER KITTATINY LIMESTONE
34	367RCKB	RICKENBACH DOLOMITE
34	370CMBR	CAMBRIAN SYSTEM
34	371ALNN	ALLENTOWN DOLOMITE
34	374LSVL	LEITHSVILLE FORMATION
34	377HRDS	HARDYSTON QUARTZITE
34	400BLMR	BALTIMORE GNEISS
34	400FRKL	FRANKLIN LIMESTONE
34	400PCMB	PRECAMBRIAN ERATHEM
34	BASEMENT	BASEMENT
34	BEDROCK	BEDROCK

FORM NO. 9-1904-A
Revised February 1987

Coded by _____ File Code _____

Checked by _____ Date _____

Entered by _____

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

GROUND-WATER SITE SCHEDULE
General Site Data

AGENCY CODE (C4) U S G S SITE ID (C1) PROJECT NO. (C5)

STATION NAME (C12)

LATITUDE (C9) LONGITUDE (C10) LAT-LONG ACCURACY (C11) S F T M
sec. 5 sec. 10 sec. min

DISTRICT (C6) STATE (C7) COUNTY or TOWN (C8) _____ County code

LAND NET (C13) ¼ ¼ ¼ S section T township R range mend

LOCATION MAP (C14) MAP SCALE (C15)

ALTITUDE (C16) . METHOD OF MEASUREMENT (C17) A L M
altimeter, level, map ACCURACY (C18) HYDROLOGIC UNIT CODE (C20)

DRAINAGE BASIN CODE (C801) TOPOGRAPHIC SETTING (C19)

A	B	C	D	E	F	G	H	K	L	M	O	P	S	T	U	V	W
alluvial fan,	playa,	stream channel,	depression,	dunes,	flat,	flood plain,	hilltop,	sinkhole,	lake or swamp,	mangrove swamp,	offshore,	pediment,	hillside,	terrace,	undulating,	valley flat,	upland draw

AGENCY USE (C803) A I O
active, inactive, inventory only DATE INVENTORIED (C711) ___ - ___ - 19__
month day year STATION TYPE (C802) (Place a 'Y' in the appropriate box) W T Y
well

DATA TYPE (C804) (Place an 'A' (active), an 'I' (inactive), or an 'O' (inventory) in the appropriate box)
WL cont., WL int., QW cont., QW int., State water use

INSTRUMENTS (C805) (Place a 'Y' in the appropriate box):
digital recorder, graphic recorder, telemetry land line, telemetry radio, telemetry satellite, AHDAS, deflection meter, bubble gage, CR type recorder, weighing rain gage, tipping bucket rain gage

REMARKS (C806)

GROUND-WATER SITE DATA

DATA RELIABILITY (C3): C L M U
field checked, poor location, minimal data, unchecked

SITE TYPE (C2): C D E H I M O P T W X
collector, drain, excavation, sinkhole, connector well, multiple wells, outcrop, pond, tunnel, well, test hole

DATE OF CONSTRUCTION (C21): month – day – 19 year

USE OF SITE (C23): A C D E G H M O P R S T U W X Z
anode, standby, emer. supply, drain, geothermal, seismic, heat reservoir, mine, observation, oil or gas, recharge, repressurize, test, unused, withdrawal, waste, destroyed.

SECONDARY USE OF SITE (C301) (SEE USE OF SITE)

TERTIARY USE OF SITE (C302) (SEE USE OF SITE)

USE OF WATER (C24): A B C D E F H I J K M N P Q R S T U Y Z
air cond., bottling, commercial, dewater, power, fire, domestic, irrigation, industrial (cooling), mining, medicinal, industrial, public supply, aquaculture, recreation, stock, institutional, unused, desalination, other

SECONDARY USE OF WATER (C25) (SEE USE OF WATER)

TERTIARY USE OF WATER (C26) (SEE USE OF WATER)

AQUIFER TYPE (C713): U N C M X
unconfined, single; unconfined, multiple; confined, single; confined, multiple; mixed

PRIMARY AQUIFER (C714)

HOLE DEPTH (C27) .

WELL DEPTH (C28) .

SOURCE OF DEPTH DATA (C29): A D G L M O R S Z
other gov't., driller, geologist, logs, memory, owner, other reported, reporting agency, other

WATER LEVEL (C30) .

DATE WATER LEVEL MEASURED (C31) (Mandatory if C30, water level, has a value): month – day – 19 year

METHOD OF WATER-LEVEL MEASUREMENT (C34): A B C E G H L M N R S T V Z
airline, analog, calibrated airline, estimated, pressure gage, calibrated press. gage, geophysical logs, manometer, non-rec. gage, reported, steel tape, electric tape, calibrated elec. tape, other

SITE STATUS FOR WATER LEVEL (C37): D E F G H I J N O P R S T V W X Z
dry, recently flowing, flowing, nearby flowing, nearby recently flowing, injector site, injector site monitor, measurement discon., obstruction, pumping, recently pumped, nearby pumping, nearby recently pumped, foreign substance, well destroyed, surface water effects, other

SOURCE OF WATER-LEVEL DATA (C33): A D G L M O R S Z
other gov't., driller, geologist, logs, memory, owner, other reported, reporting agency, other

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CONSTRUCTION DATA

RECORD TYPE (C754): CONS

RECORD SEQUENCE NO. (C723)

DATE OF CONSTRUCTION (C60): month – day – 19 year

NAME OF CONTRACTOR (C63)

SOURCE OF DATA (C64): A D G L M O R S Z
other gov't., driller, geologist, logs, memory, owner, other reported, reporting agency, other

METHOD OF CONSTRUCTION (C65): A B C D H J P R T V W Z
air-rotary, bored or augered, cable tool, dug, hydraulic rotary, jetted, air percussion, reverse rotary, trenching, driven, drive wash, other

TYPE OF FINISH (C66): C F G H O P S T W X Z
porous concrete, gravel w/perf., gravel screen, horiz. gallery, open end, perf. or slotted, screen, sand point, walled, open hole, other

TYPE OF SEAL (C67): B C G N Z
bentonite, clay, cement grout, none, other

BOTTOM OF SEAL (C68)

METHOD OF DEVELOPMENT (C69): A B C J N P S Z
air-lift pump, bailed, compressed air, jetted, none, pumped, surged, other

HOURS OF DEVELOPMENT (C70)

SPECIAL TREATMENT (C71): C D E F H M Z
chemicals, dry ice, explosives, deflocculent, hydrofracturing, mechanical, other

RECORD TYPE (C756) HOLE RECORD SEQUENCE NO. (C724) SEQUENCE NO. OF PARENT RECORD (C59)

DEPTH TO TOP OF INTERVAL (C73) . DEPTH TO BOTTOM OF INTERVAL (C74) . DIAMETER OF INTERVAL (C75) .

RECORD SEQUENCE NO. (C724)

DEPTH TO TOP OF INTERVAL (C73) . DEPTH TO BOTTOM OF INTERVAL (C74) . DIAMETER OF INTERVAL (C75) .

RECORD SEQUENCE NO. (C724)

DEPTH TO TOP OF INTERVAL (C73) . DEPTH TO BOTTOM OF INTERVAL (C74) . DIAMETER OF INTERVAL (C75) .

CONSTRUCTION CASING DATA (3 sets shown)

RECORD TYPE (C758) CSNG RECORD SEQUENCE NO. (C725) SEQUENCE NO. OF PARENT RECORD (C59)

DEPTH TO TOP OF CASING (C77) . DEPTH TO BOTTOM OF CASING (C78) . DIAMETER OF CASING (C79) .

[1] CASING MATERIAL (C80) CASING THICKNESS (C81) .

RECORD SEQUENCE NO. (C725)

DEPTH TO TOP OF CASING (C77) . DEPTH TO BOTTOM OF CASING (C78) . DIAMETER OF CASING (C79) .

[1] CASING MATERIAL (C80) CASING THICKNESS (C81) .

RECORD SEQUENCE NO. (C725)

DEPTH TO TOP OF CASING (C77) . DEPTH TO BOTTOM OF CASING (C78) . DIAMETER OF CASING (C79) .

[1] CASING MATERIAL (C80) CASING THICKNESS (C81) .

FOOTNOTE:

[1] CASING MATERIAL CODES:

B	C	D	G	I	M	P	R	S	T	U	W	Z
brick,	concrete,	copper,	galv. iron,	wrought iron,	other metal,	PVC or plastic,	rock or stone,	steel,	tile,	coated steel,	wood,	other material

CONSTRUCTION OPENINGS DATA (3 sets shown)

RECORD TYPE (C760) OPEN RECORD SEQUENCE NO. (C726) SEQUENCE NO. OF PARENT RECORD (C59)

TH TO TOP OF RVAL (C83) . DEPTH TO BOTTOM OF INTERVAL (C84) . DIAMETER OF INTERVAL (C87) .

2 MATERIAL TYPE (C86) 3 TYPE OF OPENING (C85) LENGTH OF OPENING (C89) . WIDTH OF OPENING (C88) .

RECORD SEQUENCE NO. (C726)

DEPTH TO TOP OF INTERVAL (C83) . DEPTH TO BOTTOM OF INTERVAL (C84) . DIAMETER OF INTERVAL (C87) .

2 MATERIAL TYPE (C86) 3 TYPE OF OPENING (C85) LENGTH OF OPENING (C89) . WIDTH OF OPENING (C88) .

RECORD SEQUENCE NO. (C726)

DEPTH TO TOP OF INTERVAL (C83) . DEPTH TO BOTTOM OF INTERVAL (C84) . DIAMETER OF INTERVAL (C87) .

ATERIAL TYPE (C86) 3 TYPE OF OPENING (C85) LENGTH OF OPENING (C89) . WIDTH OF OPENING (C88) .

FOOTNOTES:

2 TYPE OF MATERIAL CODES FOR OPEN SECTIONS:

B	C	G	I	M	P	R	S	T	Z
brass or bronze,	concrete,	galv. iron,	wrought iron,	other metal,	PVC or plastic,	stainless steel,	steel,	tile,	other

3 TYPE OF OPENINGS CODES:

F	L	M	P	R	S	T	W	X	Z
fractured rock,	louvered shuttered,	mesh,	perf. or slotted,	wire-wound,	screen, (unk.)	sand point,	walled,	open hole,	other

CONSTRUCTION MEASURE POINT DATA

RECORD TYPE (C766) MPNT RECORD SEQUENCE NO. (C726) BEGINNING DATE (C321) - - 19 (month, day, year) ENDING DATE (C322) - - 19 (month, day, year)

M.P. HEIGHT (C323) . M.P. REMARKS (C324)

CONSTRUCTION LIFT DATA

RECORD TYPE (C752) LIFT

RECORD SEQUENCE NO. (C254)

TYPE OF LIFT (C43) A B C J P R S T U Z
air, bucket, centrifugal, jet, piston, rotary, submersible, turbine, unknown, other

DATE RECORDED (C38) __ - __ - 19__
month day year

PUMP INTAKE DEPTH (C44)

TYPE OF POWER (C45) D E G H L N W Z
diesel, electric, gasoline, hand, LP gas, natural gas, windmill, other

HORSE-POWER RATING (C46) ___ . __

MANUFACTURER (C48)

SERIAL NO. (C49)

POWER COMPANY (C50)

POWER COMPANY ACCOUNT NUMBER (C51)

POWER METER NUMBER (C52)

PUMP RATING (C53) (million gallons/unit of fuel) ___ . ____

ADDITIONAL LIFT (C255)

PERSON OR COMPANY MAINTAINING PUMP (C54)

RATED PUMP CAPACITY (gpm) (C268)

STANDBY POWER (C56) (see TYPE OF POWER)

HORSEPOWER OF STANDBY POWER SOURCE (C57) ___ . __

MISCELLANEOUS OWNER DATA

RECORD TYPE (C768) OWNR

RECORD SEQUENCE NO. (C718)

DATE OF OWNERSHIP (C159) __ - __ - 19__
month day year

NAME (C161)

EXAMPLES: JONES, RALPH A.
JONES CONSTRUCTION COMPANY

MISCELLANEOUS OTHER ID DATA

RECORD TYPE (C770) OTID

RECORD SEQUENCE NUMBER (C736)

OTHER ID (C190)

ASSIGNER (C191)

MISCELLANEOUS OTHER DATA

RECORD TYPE (C772) OTDT

RECORD SEQUENCE NUMBER (C312)

OTHER DATA TYPE (C181)

OTHER DATA LOCATION (C182) C D R Z
Cooperator's Office, District Office, Reporting Agency, other

DATA FORMAT (C261) F M P Z
files, machine readable, published, other

MISCELLANEOUS VISIT DATA

RECORD TYPE (C774) VIST

RECORD SEQUENCE NO. (C737)

DATE OF VISIT (C187) __ - __ - 19__
month day year

NAME OF PERSON (C188)

MISCELLANEOUS QW DATA (3 sets shown)

RECORD TYPE (C776) QUAL RECORD SEQUENCE NO. (C738) DATE OF QW MEASUREMENT (C193) – – (month, day, year)

AQUIFER SAMPLED (C195) PARAMETER CODE (C196) VALUE (C197)

RECORD TYPE (C776) QUAL RECORD SEQUENCE NO. (C738) DATE OF QW MEASUREMENT (C193) – – (month, day, year)

AQUIFER SAMPLED (C195) PARAMETER CODE (C196) VALUE (C197)

RECORD TYPE (C776) QUAL RECORD SEQUENCE NO. (C738) DATE OF QW MEASUREMENT (C193) – – (month, day, year)

AQUIFER SAMPLED (C195) PARAMETER CODE (C196) VALUE (C197)

MISCELLANEOUS LOGS DATA (3 sets shown)

RECORD TYPE (C778) LOGS RECORD SEQUENCE NO. (C739)

TYPE OF LOG (C199) A B C D E F G H I J K L M N O P Q S T U V X Z

time, collar, caliper, driller's, elec., fluid conduct, geologist, magnetic, induction, gamma ray, dip meter, lateral log, micro-log, neutron, micro-lateral, log, photo video, radio-active, sonic, temp., gamma-gamma, fluid velocity, core, other

BEGINNING DEPTH (C200) . ENDING DEPTH (C201) . SOURCE OF DATA (C202) A D G L M O R S Z

other gov't, driller, geologist, logs, memory, owner, other reported, reporting agency, other

RECORD SEQUENCE NO. (C739)

TYPE OF LOG (C199) A B C D E F G H I J K L M N O P Q S T U V X Z

time, collar, caliper, driller's, elec., fluid conduct, geologist, magnetic, induction, gamma ray, dip meter, lateral log, micro-log, neutron, micro-lateral, log, photo video, radio-active, sonic, temp., gamma-gamma, fluid velocity, core, other

BEGINNING DEPTH (C200) . ENDING DEPTH (C201) . SOURCE OF DATA (C202) A D G L M O R S Z

other gov't, driller, geologist, logs, memory, owner, other reported, reporting agency, other

RECORD SEQUENCE NO. (C739)

TYPE OF LOG (C199) A B C D E F G H I J K L M N O P Q S T U V X Z

time, collar, caliper, driller's, elec., fluid conduct, geologist, magnetic, induction, gamma ray, dip meter, lateral log, micro-log, neutron, micro-lateral, log, photo video, radio-active, sonic, temp., gamma-gamma, fluid velocity, core, other

BEGINNING DEPTH (C200) . ENDING DEPTH (C201) . SOURCE OF DATA (C202) A D G L M O R S Z

other gov't, driller, geologist, logs, memory, owner, other reported, reporting agency, other

MISCELLANEOUS NETWORK DATA (3 types shown)

RECORD TYPE (C780): NETW | RECORD SEQUENCE NO. (C730): 1 | TYPE OF NETWORK (C706): QW (water quality) | BEGINNING YEAR (C115): 19 | ENDING YEAR (C116): 19

TYPE OF ANALYSES (C120):

A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Z
physical properties,	common ions,	trace elements,	pesticides,	nutrients,	sanitary elements,	codes B&D,	codes B&E,	codes B&C	codes B&F,	codes D&E,	codes C,D&E,	all or most,	codes B&C& radio active,	codes B,C&A,	other

SOURCE AGENCY (C117): | [4] FREQUENCY OF COLLECTION (C118): | ANALYZING AGENCY (C307): | [5] PRIMARY NETWORK SITE (C257): | [5] SECONDARY NETWORK SITE (C708):

RECORD TYPE (C780): NETW | RECORD SEQUENCE NO. (C730): 1 | TYPE OF NETWORK (C706): WL (water level) | BEGINNING YEAR (C115): 19 | ENDING YEAR (C116): 19

SOURCE AGENCY (C117): | [4] FREQUENCY OF COLLECTION (C118): | [5] PRIMARY NETWORK SITE (C257): | [5] SECONDARY NETWORK SITE (C708):

RECORD TYPE (C780): NETW | RECORD SEQUENCE NO. (C730): 1 | TYPE OF NETWORK (C706): WD (pumpage or withdrawals) | BEGINNING YEAR (C115): 19 | ENDING YEAR (C116): 19

SOURCE AGENCY (C117): | [4] FREQUENCY OF COLLECTION (C118): | METHOD OF COLLECTION (C133):

C	E	M	U	Z
calculated,	estimated	metered,	unknown,	other

[5] PRIMARY NETWORK SITE (C257): | [5] SECONDARY NETWORK SITE (C708):

FOOTNOTES:

[4] FREQUENCY OF COLLECTION CODES

A	B	C	D	F	I	M	O	Q	S	W	Z	2	3	4	5	X
annually,	bi monthly,	continuously,	daily,	semi-monthly,	intermittent,	monthly,	one-time only,	quarterly,	semi-annually,	weekly,	other,	bi-annually,	every 3 years,	every 4 years,	every 5 years,	every 10 years

[5] NETWORK SITE CODES

1	2	3	4
national,	district,	project,	co-operator

MISCELLANEOUS REMARKS DATA

RECORD TYPE (C788): RMKS | RECORD SEQUENCE NO. (C311): 1 | DATE OF REMARK (C184): month – day – year 19

REMARKS (C185):

DISCHARGE DATA

RECORD SEQUENCE NO. (C147)

DATE DISCHARGE MEASURED (C148) __ - __ - 19__ (month, day, year)

TYPE OF DISCHARGE (C703) P F (pumped, flow)

DISCHARGE (gpm) (C150) ____ . __

SOURCE OF DATA (C151): A D G L M O R S Z
A other government, D driller, G geologist, L logs, M memory, O owner, R other reported, S reporting agency, Z other

METHOD OF DISCHARGE MEASUREMENT (C152): A B C D E F M O P R T U V W Z
A acoustic meter, B bailer, C current meter, D Doppler meter, E estimated, F flume, M totaling meter, O orifice, P pitot-tube meter, R reported, T trajectory, U venturi meter, V volumetric meas., W weir, Z other

PRODUCTION WATER LEVEL (C153) ____ . __

STATIC WATER LEVEL (C154) ____ . __

SOURCE OF DATA (C155): A D G L M O R S Z
A other government, D driller, G geologist, L logs, M memory, O owner, R other reported, S reporting agency, Z other

METHOD OF WATER LEVEL MEASUREMENT (C156): A B C E G H L M N R S T V Z
A airline, B analog, C calib. airline, E estimated, G pressure gage, H calib. pressure gage, L geophysical logs, M manometer, N non-rec. gage, R reported, S steel tape, T electric tape, V calib., elec. tape, Z other

PUMPING PERIOD (C157) ____ . __

SPECIFIC CAPACITY (C272) ____ . __

DRAWDOWN (C309) ____ . __

GEOHYDROLOGIC DATA

RECORD TYPE (C748) G E O H

RECORD SEQUENCE NO. (C721)

DEPTH TO TOP OF UNIT (C91) ____ . __

DEPTH TO BOTTOM OF UNIT (C92) ____ . __

UNIT IDENTIFIER (C93)

LITHOLOGY (C96)

CONTRIBUTING UNIT (C304): P S N U
P principal aquifer, S secondary aquifer, N no contribution, U unknown

THOLOGIC MODIFIER (C97)

GEOHYDROLOGIC AQUIFER DATA

RECORD TYPE (C750) A Q F R

RECORD SEQUENCE NO. (C742)

SEQUENCE NO. OF PARENT RECORD (C258)

DATE (C95) __ - __ - 19__ (month, day, year)

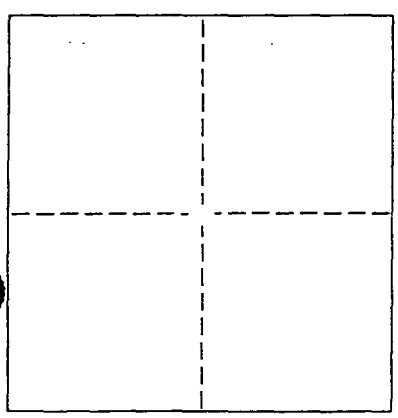
STATIC WATER LEVEL (C126) ____ . __

CONTRIBUTION (C132)

SITE LOCATION SKETCH AND DIRECTIONS

Township _____ Range _____

Section# _____



☆ U.S. GOVERNMENT PRINTING OFFICE: 1987 - 174-608 - 82/50257

NEW JERSEY UNIQUE NUMBER	LATITUDE (DEGREES)	LONGITUDE (DEGREES)	TOWNSHIP	LOCATION MAP NAME	OWNER	TOP OF OPEN INTERVAL (FEET)	BOTTOM OF OPEN INTERVAL (FEET)	PRIMARY USE OF SITE	PRIMARY USE OF WATER	AQUIFER CODE	LOCAL WELL NUMBER
[redacted]	Ex. 9	[redacted]	CINNAMINSON TWP	CAMDEN QUAD	Ex. 9	[redacted]	[redacted]	W	P	211MRPAL	Ex. 9
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	CAMDEN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	U	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	CAMDEN QUAD	[redacted]	[redacted]	[redacted]	W	I	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	W	I	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	T	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	Z	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	MOORESTOWN TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	T	U	211MRPA	[redacted]
[redacted]	[redacted]	[redacted]	MOORESTOWN TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	MOORESTOWN TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	O	U	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	MOORESTOWN TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	R	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	MOORESTOWN TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	A	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	Z	U	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	Z	U	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	Z	U	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	Z	U	112CPMY	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAU	[redacted]
[redacted]	[redacted]	[redacted]	MAPLE SHADE TWP	MOORESTOWN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	W	N	111HFPM	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	X	U	211MRPAM	[redacted]
[redacted]	[redacted]	[redacted]	CINNAMINSON TWP	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	X	U	211MRPA	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	110QRNR	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	110QRNR	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	110QRNR	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	110QRNR	[redacted]
[redacted]	[redacted]	[redacted]	PALMYRA BORO	FRANKFORD QUAD	[redacted]	[redacted]	[redacted]	O	U	110QRNR	[redacted]
[redacted]	[redacted]	[redacted]	CAMDEN CITY	CAMDEN QUAD	[redacted]	[redacted]	[redacted]	W	M	211MRPAL	[redacted]
[redacted]	[redacted]	[redacted]	CAMDEN CITY	CAMDEN QUAD	[redacted]	[redacted]	[redacted]	W	P	211MRPAL	[redacted]
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DATE: 02/28/97

PUCHACK WELLFIELD

NEW JERSEY UNIQUE NUMBER	LATITUDE (DEGREES)	LONGITUDE (DEGREES)	TOWNSHIP	LOCATION MAP NAME	OWNER	TOP OF OPEN INTERVAL (FEET)	BOTTOM OF OPEN INTERVAL (FEET)	PRIMARY USE OF SITE	PRIMARY USE OF WATER	AQUIFER CODE	LOCAL WELL NUMBER
[redacted]	Ex. 9		CAMDEN CITY	CAMDEN QUAD	[redacted]	Ex. 9		Z	U	211MRPAL	Ex. 9
			CAMDEN CITY	CAMDEN QUAD				Z	U	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				W	P	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				Z	U	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				Z	U	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				W	N	211MRPAL	
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			CAMDEN CITY	CAMDEN QUAD				W	N	211MRPAL	
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			CAMDEN CITY	CAMDEN QUAD				W	P	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				Z	U	211MRPAL	
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			CAMDEN CITY	CAMDEN QUAD				Z	U	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				W	P	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				-	-	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				W	P	211MRPAL	
			CHERRY HILL TWP	CAMDEN QUAD				W	H	211MRPAU	
			CHERRY HILL TWP	CAMDEN QUAD				W	I	211MRPAU	
			CHERRY HILL TWP	CAMDEN QUAD				W	N	211MRPAM	
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			CHERRY HILL TWP	CAMDEN QUAD				W	H	211MCVL	
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			CHERRY HILL TWP	CAMDEN QUAD				W	P	211MRPAL	
			COLLINGSWOOD BORO	CAMDEN QUAD				W	P	211MRPAL	
			COLLINGSWOOD BORO	CAMDEN QUAD				W	P	211MRPAL	
			COLLINGSWOOD BORO	CAMDEN QUAD				W	P	211MRPAL	
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			COLLINGSWOOD BORO	CAMDEN QUAD				W	P	211MRPAL	
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			MERCHANTVILLE BORO	CAMDEN QUAD				W	P	211MRPAL	
			MERCHANTVILLE BORO	CAMDEN QUAD				W	H	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				W	H	211MRPAU	
			PENNSAUKEN TWP	CAMDEN QUAD				W	C	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				Z	P	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				T	U	211MRPA	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	H	211MRPAU	
			PENNSAUKEN TWP	CAMDEN QUAD				T	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				T	U	211MRPAM	

NEW JERSEY UNIQUE NUMBER	LATITUDE (DEGREES)	LONGITUDE (DEGREES)	TOWNSHIP	LOCATION MAP NAME	OWNER	TOP OF OPEN INTERVAL (FEET)	BOTTOM OF OPEN INTERVAL (FEET)	PRIMARY USE OF SITE	PRIMARY USE OF WATER	AQUIFER CODE	LOCAL WELL NUMBER
[redacted] Ex. 9			PENNSAUKEN TWP	CAMDEN QUAD	[redacted] Ex. 9			W	N	211MRPAL	[redacted] Ex. 9
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			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				T	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	P	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	N	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	N	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	H	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				U	Z	211MRPA	
			PENNSAUKEN TWP	CAMDEN QUAD				U	Z	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	H	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	U	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	C	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				W	P	211MRPAL	
			PENNSAUKEN TWP	CAMDEN QUAD				O	U	211MRPA	
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			PENNSAUKEN TWP	CAMDEN QUAD				W	N	211MRPAU	
			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAM	
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			MERCHANTVILLE BORO	CAMDEN QUAD				W	P	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				O	U	211MRPAL	
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			CAMDEN CITY	CAMDEN QUAD				O	U	211MRPAL	
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			PENNSAUKEN TWP	CAMDEN QUAD				O	U	211MRPAM	
			PENNSAUKEN TWP	CAMDEN QUAD				O	U	--	
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			PENNSAUKEN TWP	CAMDEN QUAD				Z	U	211MRPAL	
			CAMDEN CITY	CAMDEN QUAD				W	P	211MRPAL	

REFERENCE NO. 21

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
NEW JERSEY DISTRICT
Mountain View Office Park
810 Bear Tavern Road, Suite 206
West Trenton, New Jersey 08628
FAX: 609-771-3915

DATE: March 26, 1997

TO: Swamy Ketha

OFFICE: Royal Western

FAX NUMBER: 8-908-225-7037

FROM THE DESK OF:

Robert D. Schopp

Phone: 609-771-3968

2 Pages, including cover page

Here are the estimated mean annual flows for the Delaware River and 5 tributaries that you requested.

Bob Schopp

ESTIMATED MEAN ANNUAL FLOWS OF SELECTED RIVERS

Site	Drainage Area	Estimated Mean Annual Discharge
Delaware River upstream of Cooper River	~8,000 sq mi	~13,000 cfs
Cooper River at mouth	40.4 sq mi	72 cfs
Newton Creek at Mouth	10.6 sq mi	10 cfs
Little Timber Creek at Mouth	4.31 sq mi	8 cfs
Big Timber Creek at mouth	64.4 sq mi	124 cfs
Delaware River upstream of Woodbury Creek and downstream of Schuylkill River	9,971 sq mi	17,000 cfs
Woodbury Creek at mouth	12.3 sq mi	21 cfs
Mantua Creek a: mouth	50.2 sq mi	76 cfs

RD Schopp/GA Brown 03/26/97
USGS, West Trenton, NJ

REFERENCE NO. 22

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — **TELECON NOTE**

CONTROL NO: 96-03-0021 **DATE:** 4/8/97 **TIME:** 0950

DISTRIBUTION:

MONSANTO COMPANY

BETWEEN: Robert Limbeck **OF:** Delaware River Water Commission **PHONE:** 609-883-9500 Ext 23d

AND

SWAMY S. KETHA

DISCUSSION

I called Mr. Limbeck to find out if the surface (Delaware River) is used for ~~re~~ (15) drinking, recreation and irrigation. Mr. Limbeck informed that are no intakes in the Delaware River (15) for drinking water or for agriculture, south of the Cooper River. However it is a popular recreational area for boating and recreational fishing.

Swamy S. Ketha

ACTION ITEMS: