164676

CAMDEN MUNICIPAL WELLS
THE CITY OF CAMDEN AND PENNSAUKEN TOWNSHIP, CAMDEN COUNTY, NEW JERSEY
EPA ID # NJD980769087

GENERAL INFORMATION AND SITE HISTORY

The City of Camden Municipal Wells provide some 50,000 residents with over 2.34 billion gallons of water per year (1988 figures). City owned wells are located in Pennsauken Township and within the City of Camden. The wells occupy 22 separate Block and Lots in Pennsauken Township (attachment A) and Block 1279, Lots 1 and 5 in Camden City. The City of Camden has owned the land the wells are located on since at least the 1930s. Prior to the 1930s, Camden owned and operated approximately 100 shallow wells in and around the Morris Wellfield in Pennsauken Township. Past information on these wells is limited, but they were eventually replaced by the current, deeper municipal wells. Because the aquifer from which Camden obtains its raw water contains numerous organic and inorganic pollutants, the City has closed wells, drilled new wells and provided treatment to water. Other municipal wells in the same aquifer near Camden's wells have also shown contamination problems in the past. In 1984, Merchantville-Pennsauken's National Highway Well # 1 was closed due to high levels of mercury and volatile organic compounds (VOCs). With the addition of air strippers, Well #1 has resumed pumping potable water.

SITE OPERATIONS OF CONCERN

Currently the City has 19 operable wells in four wellfields. City-owned Wellfields in the neighboring Township of Pennsauken include Morris, Delair and Puchack with nine, three and three working wells, respectively (Table 1). Water withdrawal within the City boundaries includes three wells at the Parkside Wellfield and City Well #7 on 9th and Florence if needed. All remaining 17 City wells (Table 2) have been abandoned, sealed or are used for groundwater monitoring purposes only. The closing of the City wells is the result of water quality problems that have plagued the city for many years. Not all of the City's operable wells are constantly pumped at a standard rate. Many factors, including water demand, pumping capacities and contaminants in water, influence pumping rates of individual wells. The City pumps approximately 24 million gallons per day (mgd) in the peak months of production (July, August and September) and approximately 12 mgd in the winter months.

The Morris Wellfield is located in Pennsauken Township, Camden County and is bounded to the west by the Delaware River, to the south by the Betsy Ross Bridge, to the east by Penn Central Railroad tracks and to the north by Pennsauken Creek. With its nine operable wells, it is the City of Camden's most productive wellfield. There are four Morris Wells not in operation. Well # 1 is abandoned and currently under water, Well # 2 is out of service and has been sealed since 1979, Well # 5 is out of service and has been sealed since 1973 and Well # 9 was abandoned in 1977 due to its low capacity. Excluding wells not being pumped, the Morris Wellfield is designed to produce approximately 23 mgd but actually produces about 18 mgd. Recent sampling of the Morris Wellfield raw water by the NJDEP Division of Water Resources (DWR), Bureau of Southern Enforcement has shown all wells with contaminants below Maximum Contaminant Levels (MCL)

for drinking water. Well # 7 was the only well showing VOC levels approaching, but not exceeding, MCL.

In general, the Morris Wellfield has had a history of high levels of iron and manganese and low levels of VOCs including trichloroethylene (TCE), tetrachloroethylene (PCE) and 1,2-dichloroethane. In addition, the presence of phenols has been recorded in some wells. Morris Wells # 2 and # 5 have been abandoned because of this. Carbon chloroform extraction (CCE) tests have indicated the presence of some organics but in levels lower than NJDEP standards for drinking water.

The presence of iron and manganese has been the most troublesome and costly to the public and industry in the city. Several wells were abandoned because of the high iron and manganese content. Iron and manganese content in well water is known to increase as a result of surface water recharge, whether it is salt or fresh water. Therefore, recharge waters from the Delaware River are probably taking iron and manganese into solution from the Potomac-Raritan-Magothy sand minerals thus increasing their concentrations. Also, it is believed that much of the iron and manganese comes from disposals on the land surface leaching down into the groundwaters.

The Delair Wellfield, also located in Pennsauken Township, Camden County, is several hundred feet south of the Betsy Ross Bridge and is bordered by the Delaware River to the west. The wellfield consists of three operable wells with a total capacity of 5340 gallons per minute (gpm).

The quality of water from the Delair Wells is slightly better than that from of all other wellfields. Contaminants of concern include iron and manganese and small amounts of VOCs.

Because of the close proximity to each other and the fact that the two wellfields share the same water treatment facility (Morris-Delair Water Treatment Plant) much of the literature examined refers to the two as the Morris-Delair Wellfield. Together, the Morris-Delair Wellfields produce approximately two-thirds of the city's potable water.

The Morris-Delair Water Treatment Plant, located at 8900 Zimmermon Avenue, was constructed in 1960 and is the major water supply and treatment facility for the city. It treats water from the Morris Wellfield, the Delair Wellfield and during periods of low pumping, the Puchack Wellfield. Unit processes at the plant include aeration, pre-chlorination, pH adjustment (lime), clarification (flocculation), flash mixing, sedimentation, phosphate filtration and post-chlorination. Generally, the iron and the manganese contained in the Morris-Delair Wells can be removed by the treatment processes used at the Morris-Delair Plant.

A recent daily report (November 26, 1989) indicated Morris Wells # 6, 10, 11, 12 and 13 and Delair Wells # 2 and 3 pump a total of approximately 23 mgd. According to Frank Al-Greene, supervisor and program analyst for the City of Camden's Wells, the meters that record pumping capacities are faulty and give incorrect readings. He is currently working on a system to correct the discrepancies between the inaccurate meter readings and the actual flow readings. Figures of 9 to 12 mgd are more realistic for the Morris-Delair Wellfield. He computes the average "over-reporting" of water to be around 40% above actual readings.

The Puchack Wellfield and treatment plant are located in Pennsauken Township, a highly urbanized area of Camden County. The site is bordered on the northeast by the Betsy Ross Bridge and Puchack Creek and on the southwest by the Pennsylvania Reading Seashore Lines. The Delaware River lies approximately 1 mile to the northwest and private homes border the Wellfield. This wellfield supplies approximately 15% of the city's total potable water.

The Puchack Wellfield is contaminated by a variety of compounds including hexavalent chromium, mercury and VOCs. Chromium contamination has been Puchacks biggest problem and was first detected in the early 1970s at Well # 6 (southernmost well). The well was removed from service in 1975, a significant loss because it was one of the city's most productive wells (3.15 mgd). Soon after, chromium began appearing in Wells # 2, 3, 5 and 7 Well # 4 was sealed in 1970 because of the construction of the Betsy Ross Bridge. Wells # 5, 6 and 7 were abandoned due to hexavalent chromium in 1978, 1980 and 1983, respectively. As of 1978, mercury contamination has also been detected at the Puchack Wellfield.

The Puchack Water Treatment Facility was constructed in 1959 and treats water for the removal of iron and carbon dioxide. Unit processes include aeration and chlorination. Currently, water from Puchack Wells # 1, 2 and 3 is pumped to the Morris-Delair Treatment Plant where it is blended and treated with water from the three operable Delair Wells and the nine operable Morris Wells. The Puchack Run Water Treatment Plant is available for use but at the present time it is more feasible for the City of Camden to pump and treat Puchack's water with that of Morris-Delair's. The NJDEP, DWR, Bureau of Safe Drinking Water allows Camden to blend water from Puchack Wells # 1, 2 and 3 as long as the finished water is below MCL.

The localized cone of depression around the Puchack Wellfield is significant enough to capture soluble contaminants introduced at the groundwater table. A 1986 report by Camp Dresser and McKee Inc. (CDM) entitled "Summary of Conclusions and Recommendations of Chromium Contamination Analysis at Puchack Wellfield" (attachment H) suggests several originating sources of the chromium.

A Directive and Notice to Insurers was drafted by the NJDEP, DWR, Bureau of Southern Enforcement in September 1989 (attachment L) for parties involved in the Puchack Wellfield contamination. It lists 24 potentially responsible parties (PRPs) and a brief description of each facility's operations. The PRPs included Swope Oil and Chemical Company (a Superfund site), SGL Modern Hard Chrome Service, Pennsauken Solid Waste Management Authority and other small electroplaters, metal finishers and chemical companies in the area. In addition to the 24 listed PRPs, all companies who previously disposed of waste at the Swope Oil site are being included as PRPs.

The City of Camden also owns and operates three wells within the city limits at the Parkside Wellfield. Located just south of the Cooper River, the wells (# 13, 17 and 18) are designed to produce 3900 gpm.

Raw water from the Parkside Wells contains high levels of carbon dioxide, moderately high levels of iron and manganese and various levels of VOCs including TCE, tetrachloroethylene, carbon tetrachloride and 1,2-dichloroethane. The water from the three wells is pumped to the Parkside Water Treatment Plant, located on Vesper and Park Boulevards where it undergoes aeration, pH adjustment (lime) and chlorination filtration. The Parkside Plant was constructed in 1958 as a carbon dioxide and iron removal facility. The maximum capacity of the wells and well pumps is estimated to be 4.0 mgd but the actual pumping is approximately 3.6 mgd.

NJDEP, DWR, BSDW sampling of the treatment plant's finished water on November 21, 1985 found unacceptable levels of VOCs in the drinking water(Attachment AA 32). The NJDEP requires monthly monitoring of the Parkside Plant for VOCs.

The removal efficiency of the plant's aerator with respect to VOCs was investigated in September 1981 by Malcolm Pirnie, Inc. (attachment N). During operations at the time of the study, removal of TCE, PCE, carbon tetrachloride and carbon dioxide from raw water was 50%. By reducing the loading rate and cutting off air recirculation, the removal efficiency could be increased upwards of 80 to 90%.

Recent daily logs (November 24, 1989) of the Parkside Water Treatment Plant (attachment G) indicated only Wells # 17 and 18 pump a total of 1500 gpm. The treatment plant is currently in operation and supplies approximately 18% of the total potable water to the city.

The City of Camden owns 18 wells within the city boundaries (excluding the Parkside Wells) most of which have been abandoned or sealed. Currently, Wells # 7 and 11 are used only in emergency situations. Seven of the wells are being used for groundwater monitoring, seven wells have been sealed and Well # 9 was removed. A list of city wells, locations, etc. is given in Table 2.

Three Water Treatment Plants (Plants # 4, 5 and 6) that had previously treated water drawn from the city's wells have since closed. Plant # 4 treated raw water containing moderate to high levels of various VOCs and was eventually closed because of high levels of hexavalent chromium. Plant # 5 had high iron and manganese levels and the treatment processes at the plant were unable to reduce those contaminants to acceptable levels. Also of concern were high levels of TCE which greatly exceeded the state guidelines. Plant # 6, fed by Wells # 7 and 11, has had high levels of mercury and VOCs.

Records of chemical analysis of the city wells have been sparse. Some wells do not have reported chemical analysis for more than ten years, and others even longer.

The water system in Camden has the following interconnections with adjacent systems:

NAME OF SYSTEM	SIZE OF INTERCONNECTION
Gloucester City	1 to 6 inch line
New Jersey Water Company	2 to 12 inch line and via Five fire hydrants
Collingswood Borough	2 to 6 inch lines
Merchantville-Pennsauken	Via two fire hydrants

The Camden Department of Utilities water system has a total of 331 meters in the water system. The connections that are not metered are residential customers, most of those being hardship cases. The commercial establishments are 100% metered. The system has approximately 150 miles of water mains throughout the city. Water from the Morris-Delair and Puchack Wellfields is pumped 5 miles through parallel 30-inch and 36-inch transmission mains back into the city service area. The City of Camden, Department of Utilities applied for a loan in September 1989 to replace all 3-and 4-inch water mains with 8-inch water mains. The system upgrade will benefit all current and future consumers as the municipal system is in need of repair and updating.

There are currently three finished water storage tanks in Camden. They are the North Camden Tank located on Delaware and Elm Streets with a capacity of 5 million gallons (mg), elevated storage tank on Locust and Kaighn Avenues with a 2 mg capacity and Whitman Park Standpipe on Rose and Whitman Avenues with a 0.57 mg capacity. The Whitman Park Standpipe is currently not being used.

GROUNDWATER ROUTE

The City of Camden's Wells and Wellfields all draw water from the Potomac-Raritan-Magothy (PRM) Aquifer. This aquifer is the largest water bearing stratum in the area and in fact, the most heavily used aquifer in New Jersey. The PRM formations are of early to late Cretaceous Age and overlie crystalline bedrock which is approximately 200 feet deep.

The PRM outcrops on both sides of the Delaware River in one of the most urbanized and industrial corridors of the northeast. The outcrop area of the PRM is 21 square miles in Camden County, 48 square miles in Burlington County and 32 square miles in Gloucester County. The width of the outcrop ranges from 2 to 3 miles and forms a wedge-shaped body that thickens in a down dip direction. The thickness of the PRM ranges from about 200 feet to over 1,000 feet in Winslow Township.

The PRM Aquifer System consists of aquifers composed of sand and gravel and confining units of silt and clay. Three major aquifers have been defined within the aquifer system the upper, middle and lower aquifers. The hydrogeology of this system is extremely complex with several clay layers exhibiting discontinuities throughout the upper and middle PRM system. All of Camden's municipal wells draw water from the lower aquifer.

Groundwater in the lower aquifer system flows from the northeast to the southwest. Originally, the natural groundwater flow was northerly, towards the Delaware River, but increased pumpage in the PRM Aquifer System has reversed the groundwater direction toward the pumping centers and the Delaware River is now a recharge boundary.

The major sources of recharge are induced infiltration of river water (40 to 50%), leaching from overlying aquifers (30%) and rainfall on the outcrop areas (15 to 25%). The remaining 5 to 10% comes from lateral groundwater inflow and aquifer storage.

The amount of Delaware River water induced into the PRM has increased over the years as the regional cone of depression has widened and deepened. The USGS estimates that induced infiltration of Delaware River water began in the late 1950s. Today, the cone of depression has widened and deepened causing the gradient from river to aquifer to become steeper.

Many of the city wells that have been abandoned due to contamination are currently being used as monitoring wells. Seven City Wells and two wells in the Puchack Wellfield are used solely for groundwater monitoring. All of the wells are set in the lower aquifer.

Along with Camdens Municipal Wells, there are other water companies and industries having wells within a 5 mile radius of the Morris Wellfield. The New Jersey-American Water Company owns 21 wells ranging in depth from 130 to 453 feet within 5 miles, the Merchantville-Pennsauken Water Commission owns 14 wells ranging in depth from 140 to 290 feet and the Riverton-Palmyra Water Company owns eight wells with depths between 76 and 325 feet. Other municipalities with wells in the area include Maple Shade Township with five wells and Moorestown Township with four wells.

Our Lady of Lourdes Hospital owns a 277-foot well about 4 miles south of the Morris-Delair Wells. Because of high levels of VOCs, the hospital is not currently using the well and is connected to the public water lines of Camden.

There are two industrial wells within a 1 mile radius and 15 wells within a 4 mile radius of the site .

The Merchantville-Pennsauken Water Commission (serving 50,000 residents), the New Jersey-American Water Company (serving 36,500 residents) and the Maple Shade Township Municipal Water System (serving 20,500 residents) also supply water to residents within 4 miles of the site. Well logs indicate several domestic supply wells in the area but Leo Holland of the Merchantville-Pennsauken Water Commission and the NJDEP, DWR, Bureau of Southern Enforcement (BSE) have no knowledge of any private domestic wells currently being used.

Camden City has VOCs, especially TCE, in their groundwater. The Puchack Wellfield also has chromium contamination. The City of Camden and NJDEP, DWR, BSDW discovered the contamination around 1978. The city itself has numerous operating and abandoned industrial facilities which probably contributed to the groundwater contamination. The contamination may have also occurred as a result of direct discharge to the ground and/or seepage of sewage containing industrial waste from the sewer system.

The City's sewer system is an old brick lined system that is plagued by frequent main ruptures and leaks.

Monitoring at each production well is required twice a year by the NJDEP, DWR, BSDW (A-280 Monitoring). The individual wells are monitored once during peak production in August and once during the winter in February. The finished water from the Puchack and Parkside Treatment Plants is monitored for VOCs quarterly and Morris-Delair's finished water is monitored for VOCs monthly.

The Morris-Delair Water Treatment Plant has a NJPDES Permit (# NJ0031984) to discharge effluent to Pennsauken Creek, the nearest surface water in the area and also to discharge to groundwater via infiltration/percolation lagoons and overland flow. The sludge from the clarifiers is stored in an unlined sludge drying lagoon and occasionally removed and dumped on the ground next to the lagoon. The sludge consists mainly of iron which is removed by the clarifiers. The iron in the sludge is not considered a problem and does not contribute to any additional groundwater contamination according to the NJDEP, DWR, BSE.

The city has water withdrawal permits for the derivation of water from Morris Wells #11, 12 and 13 and for Parkside Well #18 (Attachment U) issued by NJDEP.

The City of Camden was issued an Administrative Order (AO) by the NJDEP on August 18, 1971 because of the many substandard conditions which existed within the water system at that time. The Order required the City to make extensive improvements in the operation and maintenance of the system, to seal abandoned wells, to provide treatment and disinfection where lacking, to maintain operating records and to provide additional elevated storage capacity. The City complied with most of the requirements, however, some of the deficiencies which were addressed in the Order remained uncorrected several years later. On March 25, April 2 and May 14, 1980, the NJDEP, DWR, BSE conducted inspections of Camden's potable water system. Besides the aforementioned deficiencies, additional problems were noted including the pumping of raw, untreated groundwater directly into the city's distribution system and exceeding levels set forth in the New Jersey Safe Drinking Water Act Regulations for one or more of the following parameters: chromium, iron, manganese, color and corrosivity.

Since July 1981, the NJDEP, DWR has endeavored to enter with the City into an Administrative Consent Order (ACO) but the City has repeatedly stated its preference to correct the deficiencies on its own schedule and declined to enter into the ACO. On September 14, 1983, the City of Camden was issued an Administrative Order by NJDEP, DWR, BSE. The Order summoned the City to correct the deficiencies established in the permit.

The deficiencies included sealing four wells, modifying five different wells for groundwater monitoring purposes, and providing additional above ground finished water storage.

The Morris-Delair Water Treatment Facility has had a number of Compliance Evaluation Inspections by the NJDEP, DWR with "unacceptable" ratings. The dates of inspection and deficiencies are as follows:

September 26, 1985. The treatment facility's discharge was not being sampled quarterly as per the NJPDES permit.

April 28, 1987. The facility did not meet required limitations on suspended solids or pH as stated in the permit for discharge.

January 6, 1988. The facility did not meet required limitations on suspended solids or pH for effluent.

October 6, 1988. The plant's flow meter was giving inaccurate readings, holding times on aqueous samples were not adhered to and the second quarter Discharge Monitoring Report for 1988 was not submitted on time.

April 4, 1989. Wells in the system lacked totalizing flow meters and protective covers. Also, there were defective valves and undersized water mains within the system.

On January 30, 1989, the City of Camden was issued an Administrative Order and Notice of Civil Administrative Penalty Assessment by the NJDEP, Division of Environmental Quality, (Attachment X). Findings of the Order and Notice stated that the state certified lab (NJ certification # 04127) at the Morris-Delair Water Treatment Plant failed to observe certain testing and quality control procedures, thereby violating provisions of the Safe Drinking Water Act (SWDA) and related legislation. The lab undertook corrective actions in response to the violations listed.

SURFACE WATER ROUTE

The Delaware River lies several hundred feet to the west (River Mile 106) of the Morris-Delair Wellfields and about 2500 feet west of the Puchack Wellfield. Puchack Creek parallels the Betsy Ross Bridge which bisects the Morris-Delair Wellfields. Pennsauken Creek borders the Morris Wellfield to the north.

The amount of Delaware River water induced into the PRM has increased over the years as has the regional cone of depression. In general, the quality of water from the Delaware River is of equal or better quality than that which is being pumped from wells by the City of Camden. In fact, upon recharging, it serves as a means of diluting the chemicals present in high concentrations in the shallow groundwaters which seep down into deeper aquifers in Philadelphia and Camden.

Due to the close proximity to the Delaware River, wells are at risk from high chloride concentrations. Saltwater intrusion of wells in Camden is enhanced by overpumping and drought conditions.

Pennsauken Creek, classified as FW-2 Non-Trout waters, receives the surface water discharge which consists of untreated filter backwash from the production of potable water from the Morris-Delair Treatment Plant. The effluent limitations for suspended solids are based upon regional USEPA guidelines for filter backwash discharges and the limitations for pH, oil and grease are requirements of the Delaware River Basin Commission (DRBC). Monitoring for iron is required due to the nature of activity. The monitoring reports for effluent discharge must be reported quarterly to NJDEP, DWR. The City of Camden has a NJPDES permit (# NJ0031984) for surface water discharge. The NJPDES permit was issued on December 7, 1983 and expired on January 14, 1989. The City of Camden has intentions of renewing the permit but as of yet has not.

There is a potential for surface water contamination via discharge of contaminated groundwater into the Delaware River.

AIR ROUTE
There are no records of air sampling and no potential for air contamination due to the types of operations at the facilities.

SOIL
No soil sampling has been documented. Sludge from clarifiers is stored in an unlined sludge drying lagoon and is occasionally removed and dumped on the ground next to the lagoon. The sludge consists mainly of iron from the groundwater clarifying process.

DIRECT CONTACT
There are no reports of direct contact and there is no potential due to the types of operations.

FIRE AND EXPLOSION
There have been no reported incidents of fire or explosion at Camden's Wells and no potential due to the type of operations and materials used. Delair Well # 1 was struck by lightning in 1983 resulting in a burned out motor.

ADDITIONAL CONSIDERATIONS
There has been no damage to flora, fauna, off-site property or contamination to the food chain and no potential due to practices at Camden's Municipal Wells.

SUMMARY OF SAMPLING DATA

1. Sampling dates: Representative samples from 1969 to 1989.

Sampled by: NJDEP, DWR, Bureau of Safe Drinking Water, Trenton, New Jersey

NJDEP, DWR, Bureau of Ground Water Pollution Assessment, Trenton, New Jersey

City of Camden, Department of Utilities
Morris-Delair Water Treatment Plant
Pennsauken, New Jersey

Note: Sampling data from a 1984 U.S. Geological Survey report entitled "Water Quality Data for the PRM Aquifer System in Southwestern New Jersey, 1923-83" was also used in this report.

Samples: Numerous groundwater samples used for drinking water.

Laboratories: New Jersey State Department of Health (DOH)
Public Health and Environmental Lab
Trenton, New Jersey Lab # 11148

Campbell Soup Company, Central Environmental Laboratory
Campbell Place, Camden, New Jersey
Lab # 04013

Technological Resources, Inc. (TRI) Camden, New Jersey

City of Camden, Morris-Delair Water Treatment Plant, Pennsauken, New Jersey
Lab # 04127

Rossnagel and Associates, Inc. (R & A)
Medford, New Jersey

Rutgers-State University, Department of Environmental Science, Cook College,
New Brunswick, New Jersey
Lab # 12150

Chemical Samples and Analytical Services Company (CSAS)
Thorofare, New Jersey

Northeastern Analytical Corporation (NAC)
Medford, New Jersey
Lab # 03117

Bureau of Environmental Laboratories (BEL)
Scotch Rd., Trenton, New Jersey

Parameters:	Volatile organic compounds and metals
Sample description:	All samples were obtained from the City potable wells prior to treatment
Contaminants detected:	Contaminants detected are summarized in the following tables.

QA/QC: QA/QC data included spike, chain of custody, duplicates and surrogate was provided by NJDEP.

File location: NJDEP, DWR, Bureau of Southern Enforcement
20 E. Clementon Rd., Suite 301 S,
Gibbsboro, New Jersey

NJDEP, DWR, Bureau of Safe Drinking Water
401 E. State St., Trenton, New Jersey

PRIORITY DESIGNATION

Camdens municipal wells are given a high priority due to documented groundwater contamination and the possibility of the groundwater discharging into the Delaware River.

RECOMMENDATIONS/CONCLUSIONS

The Camden area has a history of groundwater contamination. Camden's Municipal Wells all draw water from the lower PRM Aquifer which is influenced by regional pumping centers. The NJDEP, DWR, Bureau of Southern Enforcement, is currently idenifying responsible parties and conducting sampling of the Morris-Delair Wellfields. The NJDEP, DWR, Bureau of Safe Drinking Water is also sampling the Morris-Delair Wellfield and oversees all of Camden's potable wells for any contamination problems in finished drinking water that may occur. All hydrologic information is being compiled by the NJDEP, DWR, Bureau of Groundwater Pollution Assessment. Due to the extensive sampling previously conducted, sampling by the NJDEP, Division of Hazardous Waste Management, Bureau of Planning and Assessment is not warranted at this time.

Submitted by:

Dan Maltese
HSMS IV
NJDEP, BPA
December 27, 1989

WELL # 1 AND SAMPLING DATA FROM Pochack WELLFIELD

CONTAMINANTS (PPB) / SAMPLING DATE / LAB	10-8-81 DOH	1-4-82 DOH	7-13-82 USGS	7-30-82 USGS	10-2-84 DOH	2-27-87 NAC	8-30-88 NJDEP
1,2-DICHLOROBENZENE							
1,1-DICHLOROETHENE							
TRANS-1,2-DICHLOROETHENE						1.2	
1,1-DICHLOROETHANE							
CIS-1,2-DICHLOROETHENE							
1,1,1-TRICHLOROETHANE			—				
1,2-DICHLOROETHANE						1.7	
TCE						2.5*	
1,2-DICHLOROPROPANE			—				
TETRACHLOROETHENE (PCE)			—			2.8*	
CHLOROBENZENE						1.2	
TOLUENE			—				
BENZENE							
METHYLENE CHLORIDE			—				
VINYL CHLORIDE			—				
CHROMIUM-TOTAL	—	—	<10	BMDL	10		70*
CHROMIUM-HEX	—	5	<1	BMDL	—		30
MERCURY	—	—		—	0.20		—

— = NONE DETECTED

BMTL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 2 AND SAMPLING DATA FROM Puchack WELLFIELD

CONTAMINANTS (PPB)	6-8-81 DOH	1-4-82 DOH	9-15-82 USGS	10-2-84 DOH	12-13-85 DOH	2-27-87 NAC	9-21-87 NAC	3-28-88 NAC	10-23-89 NJDEP
1,2-DICHLOROBENZENE									
1,1-DICHLOROETHENE									
TRANS-1,2-DICHLOROETHENE					10.80*	6.50	3.60	9.80	
1,1-DICHLOROETHANE					5.54	3.90			
CIS-1,2-DICHLOROETHENE									
1,1,1-TRICHLOROETHANE			<1		0.64	3.70			
1,2-DICHLOROETHANE					1.75	1.50			
TCE			<1		21.10*	40.00*	18.00*	22.00*	
1,2-DICHLOROPROPANE			<1		0.91				
TETRACHLOROETHENE (PCE)			<1		6.68*	9.50*	9.00*	9.00*	
CHLOROBENZENE					3.40	1.80	4.40*	3.40	
TOLUENE			<1						
BENZENE					1.31*	1.60*			
METHYLENE CHLORIDE			<1		1.09		2.60*	1.90	
VINYL CHLORIDE			<1			2.60*			
CHROMIUM-TOTAL	49	26	40	56*					—
CHROMIUM-HEX	15	5	3	54*					2620*
MERCURY	—	—	—	0.30					BMDL

— = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 3 AND SAMPLING DATA FROM Pochack WELLFIELD

CONTAMINANTS (PPB)	7-21-1980 USGS	7-27-81 USGS	10-8-81 DOH	1-4-82 DOH	1-19-82 DOH	10-2-84 DOH	12-13-85 DEL	3-28-88 NAC	10-23-89 NJDEP
1,2-DICHLOROBENZENE									
1,1-DICHLOROETHENE							3.75*		
TRANS-1,2-DICHLOROETHENE	–	–					25.30*	16.00*	
1,1-DICHLOROETHANE							6.46		
CIS-1,2-DICHLOROETHENE									
1,1,1-TRICHLOROETHANE	<1.0	<1.0					14.8		
1,2-DICHLOROETHANE							2.29*		
TCE	14*	11*					111.00*	63.00*	
1,2-DICHLOROPROPANE	–	–					0.73		
TETRACHLOROETHENE (PCE)	<1.0	5*					12.00*	9.50*	
CHLOROBENZENE							1.20		
TOLUENE	<1.0	<1.0							
BENZENE							2.79*		
METHYLENE CHLORIDE	<1.0	<1.0					1.01	1.00	
VINYL CHLORIDE	–	–							
CHROMIUM-TOTAL		–	40	14	9	155*			–
CHROMIUM-HEX		BMDL	31	14	5	169*			4180*
MERCURY						0.80			BMDL

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 5 AND SAMPLING DATA FROM Puchack WELLFIELD

CONTAMINANTS (PPB)	10-20-81 DOH	1-4-82 DOH	1-19-82 DOH	10-8-89 DOH														
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE																		
1,2-DICHLOROETHANE																		
TCE	56*																	
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)																		
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL		500*	621*	897*														
CHROMIUM-HEX		472*	594*	757*														
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 7 AND SAMPLING DATA FROM Pochack WELLFIELD

CONTAMINANTS (PPB)	7-10-75 Camden	7-13-82 USGS	10-23-89 NJDEP															
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE		<1.0																
1,2-DICHLOROETHANE																		
TCE		64*																
1,2-DICHLOROPROPANE		<1.0																
TETRACHLOROETHENE (PCE)		<1.0																
CHLOROBENZENE																		
TOLUENE		<1.0																
BENZENE																		
METHYLENE CHLORIDE		<1.0																
VINYL CHLORIDE		<1.0																
CHROMIUM-TOTAL	—	10	—															
CHROMIUM-HEX	—	BMDL	—															
MERCURY	—	—	BMDL															

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 1 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	5-19-82 DOH	3-28-88 NAC																
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE	1																	
1,2-DICHLOROETHANE																		
TCE		2.0																
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)		3.1																
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL																		
CHROMIUM-HEX	—																	
MERCURY	—																	

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL #3 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	10-16-69 USGS	7-22-80 USGS	7-27-81 USGS	5-19-82 DOH	7-12-82 USGS	2-27-87 NAC												
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE				3.5														
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE			<1		<1													
1,2-DICHLOROETHANE																		
TCE			3	1.5	<1													
1,2-DICHLOROPROPANE					<1													
TETRACHLOROETHENE (PCE)			<1		<1													
CHLOROBENZENE				11		8.2												
TOLUENE			<1		<1													
BENZENE		2																
METHYLENE CHLORIDE			<1		<1													
VINYL CHLORIDE					<1													
CHROMIUM-TOTAL	20			—	<10													
CHROMIUM-HEX	—			—	<1													
MERCURY	—			—	—													

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 4 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	5-19-82 DOH	2-27-87 NAC																
1,2-DICHLOROBENZENE	--	--																
1,1-DICHLOROETHENE	--	--																
TRANS-1,2-DICHLOROETHENE	--	--																
1,1-DICHLOROETHANE	--	--																
CIS-1,2-DICHLOROETHENE	--	--																
1,1,1-TRICHLOROETHANE	--	--																
1,2-DICHLOROETHANE	--	--																
TCE	--	--																
1,2-DICHLOROPROPANE	--	--																
TETRACHLOROETHENE (PCE)	--	--																
CHLOROBENZENE	--	--																
TOLUENE	--	--																
BENZENE	--	--																
METHYLENE CHLORIDE	--	--																
VINYL CHLORIDE	--	--																
CHROMIUM-TOTAL																		
CHROMIUM-HEX	--																	
MERCURY	0.15																	

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 6 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	7-22-80 USGS	7-27-81 USGS	3-28-88 NAC	8-26-88
1,2-DICHLOROBENZENE			-	<1
1,1-DICHLOROETHENE			-	<1
TRANS-1,2-DICHLOROETHENE			-	<1
1,1-DICHLOROETHANE			-	<1
CIS-1,2-DICHLOROETHENE			-	<1
1,1,1-TRICHLOROETHANE	<1	<1	-	<1
1,2-DICHLOROETHANE			-	<1
TCE	<1	<1	-	<1
1,2-DICHLOROPROPANE			-	<1
TETRACHLOROETHENE (PCE)	<1	<1	-	<1
CHLOROBENZENE			-	<1
TOLUENE	<1	<1	-	<1
BENZENE			-	<1
METHYLENE CHLORIDE	<1	<1	-	<1
VINYL CHLORIDE			-	<1
CHROMIUM-TOTAL				
CHROMIUM-HEX				
MERCURY				

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 7 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	2-27-87 NAC	3-28-88 NAC	8-26-88 CSAS															
1,2-DICHLOROBENZENE	--	--	--															
1,1-DICHLOROETHENE	--	--	--															
TRANS-1,2-DICHLOROETHENE	--	--	--															
1,1-DICHLOROETHANE	--	--	--															
CIS-1,2-DICHLOROETHENE	--	--	--															
1,1,1-TRICHLOROETHANE	--	--	--															
1,2-DICHLOROETHANE	--	--	--															
TCE	--	--	--															
1,2-DICHLOROPROPANE	--	--	--															
TETRACHLOROETHENE (PCE)	--	--	--															
CHLOROBENZENE	--	--	--															
TOLUENE	--	--	--															
BENZENE	--	--	--															
METHYLENE CHLORIDE	--	--	--															
VINYL CHLORIDE	--	--	--															
CHROMIUM-TOTAL																		
CHROMIUM-HEX																		
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 8 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	12-13-85 BEL	3-28-88 NAC	8-26-88 CSAS															
1,2-DICHLOROBENZENE	--	--	--															
1,1-DICHLOROETHENE	--	--	--															
TRANS-1,2-DICHLOROETHENE	--	--	--															
1,1-DICHLOROETHANE	--	--	--															
CIS-1,2-DICHLOROETHENE	--	--	--															
1,1,1-TRICHLOROETHANE	--	--	--															
1,2-DICHLOROETHANE	--	--	--															
TCE	--	--	--															
1,2-DICHLOROPROPANE	--	--	--															
TETRACHLOROETHENE (PCE)	--	--	--															
CHLOROBENZENE	--	--	--															
TOLUENE	--	--	--															
BENZENE	--	--	--															
METHYLENE CHLORIDE	--	--	--															
VINYL CHLORIDE	--	--	--															
CHROMIUM-TOTAL																		
CHROMIUM-HEX																		
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 9 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	2-27-87 NAC	3-28-88 NAC																
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE																		
1,2-DICHLOROETHANE	1.20																	
TCE																		
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)	1.80*	2.10*																
CHLOROBENZENE	1.50																	
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL																		
CHROMIUM-HEX																		
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 10 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	12-21-70 USGS	7-21-80 USGS	7-27-81 USGS	3-28-88 NAC	8-26-88 CSAS													
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE		<1	<1	–	<1													
1,2-DICHLOROETHANE																		
TCE		<1	2*	–	<1													
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)		<1	<1	–	<1													
CHLOROBENZENE																		
TOLUENE		5	<1	–	<1													
BENZENE																		
METHYLENE CHLORIDE		<1	<1	–	<1													
VINYL CHLORIDE																		
CHROMIUM-TOTAL	5																	
CHROMIUM-HEX	–																	
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 11 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	1-21-80 DoH	7-12-82 USGS	3-28-88 NAC	8-26-88 GSAS														
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE		<1	–	<1														
1,2-DICHLOROETHANE																		
TCE		<1	–	<1														
1,2-DICHLOROPROPANE		<1	–	<1														
TETRACHLOROETHENE (PCE)		<1	–	<1														
CHLOROBENZENE																		
TOLUENE		<1	–	<1														
BENZENE																		
METHYLENE CHLORIDE		<1	–	<1														
VINYL CHLORIDE		<1	–	<1														
CHROMIUM-TOTAL	5																	
CHROMIUM-HEX																		
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 12 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	2-4-81 DOH	7-27-81 USGS	7-13-82 USGS	3-28-88 NAC	8-26-88 CSAS													
1,2-DICHLOROBENZENE	--			--														
1,1-DICHLOROETHENE	--			--														
TRANS-1,2-DICHLOROETHENE	--			--														
1,1-DICHLOROETHANE	--			--														
CIS-1,2-DICHLOROETHENE	--			--														
1,1,1-TRICHLOROETHANE	--	<1	<1	--	<1													
1,2-DICHLOROETHANE	--			--														
TCE	--	<1	<1	--	<1													
1,2-DICHLOROPROPANE	--	<1	<1	--	<1													
TETRACHLOROETHENE (PCE)	--	<1	<1	--	<1													
CHLOROBENZENE	--			--														
TOLUENE	--	<1	<1	--	<1													
BENZENE	--			--														
METHYLENE CHLORIDE	--	<1	8*	--	<1													
VINYL CHLORIDE	--	<1	<1	--	<1													
CHROMIUM-TOTAL		1	<10															
CHROMIUM-HEX	5	<1	<1															
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 13 AND SAMPLING DATA FROM Morris WELLFIELD

CONTAMINANTS (PPB)	2-4-81 DOH	7-27-81 USGS	2-27-87 NAC	3-28-88 NAC	4-27-88 NAC	8-26-88 CSAS	9-29-88 CSAS	10-28-88 CSAS	11-30-88 CSAS	12-8-88 CSAS	1-12-89 CSAS						
1,2-DICHLOROBENZENE							—	—	—	—	—						
1,1-DICHLOROETHENE							—	—	—	—	—						
TRANS-1,2-DICHLOROETHENE							—	—	—	—	—						
1,1-DICHLOROETHANE																	
CIS-1,2-DICHLOROETHENE																	
1,1,1-TRICHLOROETHANE		<1				<1	—	—	—	—	—						
1,2-DICHLOROETHANE							—	—	—	—	—						
TCE		<1				<1	—	—	—	—	—						
1,2-DICHLOROPROPANE	8.30									—							
TETRACHLOROETHENE (PCE)		<1				<1	—	—	—	—	—						
CHLOROBENZENE							—	—	—	—	—						
TOLUENE		<1				<1	—	—	—	—	—						
BENZENE							—	—	—	—	—						
METHYLENE CHLORIDE		<1	—	—	—	<1	—	—	—	—	—						
VINYL CHLORIDE																	
1,4 DICHLOROBENZENE						3.3											
CHROMIUM-TOTAL																	
CHROMIUM-HEX																	
MERCURY																	

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 1 AND SAMPLING DATA FROM Delair WELLFIELD

CONTAMINANTS (PPB)	7-22-80 USGS	7-27-81 USGS	9-15-82 USGS															
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE	<1	<1	<1															
1,2-DICHLOROETHANE																		
TCE	<1	<1	<1															
1,2-DICHLOROPROPANE			<1															
TETRACHLOROETHENE (PCE)	<1	<1	<1															
CHLOROBENZENE																		
TOLUENE	<1	<1	<1															
BENZENE																		
METHYLENE CHLORIDE	<1	<1	<1															
VINYL CHLORIDE			<1															
CHROMIUM-TOTAL			<10															
CHROMIUM-HEX			<1															
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 2 AND SAMPLING DATA FROM Delair WELLFIELD

CONTAMINANTS (PPB)	9-15-82 USGS	2-27-87 NAC	3-28-88 NAC	8-26-88 CSAS														
1,2-DICHLOROBENZENE				<1														
1,1-DICHLOROETHENE				<1														
TRANS-1,2-DICHLOROETHENE				<1														
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE	<1			<1														
1,2-DICHLOROETHANE				<1														
TCE	<1			<1														
1,2-DICHLOROPROPANE	<1																	
TETRACHLOROETHENE (PCE)	3*			<1														
CHLOROBENZENE				<1														
TOLUENE	<1			<1														
BENZENE				<1														
METHYLENE CHLORIDE	<1			<1														
VINYL CHLORIDE	<1																	
CHROMIUM-TOTAL	<10																	
CHROMIUM-HEX	<1																	
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 3 AND SAMPLING DATA FROM Delair WELLFIELD

CONTAMINANTS (PPB)	7-21-80 USGS	9-15-82 USGS	2-27-87 NAC	3-28-88 NAC	8-26-88 CSAS													
1,2-DICHLOROBENZENE					<1													
1,1-DICHLOROETHENE					<1													
TRANS-1,2-DICHLOROETHENE					<1													
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE	<1	<1			<1													
1,2-DICHLOROETHANE					<1													
TCE	14*	<1			<1													
1,2-DICHLOROPROPANE		<1																
TETRACHLOROETHENE (PCE)	<1	<1			<1													
CHLOROBENZENE					<1													
TOLUENE	<1	<1			<1													
BENZENE					<1													
METHYLENE CHLORIDE	<1	<1			2.40*													
VINYL CHLORIDE		<1																
CHROMIUM-TOTAL		10																
CHROMIUM-HEX		<1																
MERCURY																		

--- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 13 AND SAMPLING DATA FROM Parkside WELLFIELD

CONTAMINANTS (PPB)	4-20-78 Rutgers	1-31-80 TR-I	10-3-80 TR-I	12-23-80 DOH	8-26-88 CSAS													
1,2-DICHLOROBENZENE					<1													
1,1-DICHLOROETHENE					<1													
TRANS-1,2-DICHLOROETHENE					<1													
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE					<1													
1,2-DICHLOROETHANE		18.7*	15.54*		8.3*													
TCE	23.8*	39.5*	30.97*		130.0*													
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)		5.55*	4.07*		<1													
CHLOROBENZENE					<1													
TOLUENE					230.0													
BENZENE					<1													
METHYLENE CHLORIDE					<1													
VINYL CHLORIDE																		
CHROMIUM-TOTAL																		
CHROMIUM-HEX				5														
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 17 AND SAMPLING DATA FROM Parkside WELLFIELD

CONTAMINANTS (PPB)	6-9-77 DOH	10-23-78 DOH	8-21-79 DOH	12-26-79 TRI	7-5-79 DOH	1-31-80 TRI	4-3-80 TRI	8-26-88 CSAS
1,2-DICHLOROBENZENE								<1
1,1-DICHLOROETHENE								<1
TRANS-1,2-DICHLOROETHENE								5.9
1,1-DICHLOROETHANE								
CIS-1,2-DICHLOROETHENE								
1,1,1-TRICHLOROETHANE		<10						<1
1,2-DICHLOROETHANE		<100	<100	2.89*		2.39*	2.26*	6.7*
TCE		45*	120*	51.9*	30*	61.7*	48.3*	17.0*
1,2-DICHLOROPROPANE								
TETRACHLOROETHENE (PCE)		220*	20*	18.3*	16*	27.8*	79.17*	<1
CHLOROBENZENE								52*
TOLUENE								<1
BENZENE								<1
METHYLENE CHLORIDE								2.5*
VINYL CHLORIDE								
carbon tetrachloride		<10	<10					
CHROMIUM-TOTAL								
CHROMIUM-HEX	—							
MERCURY								

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL #18 AND SAMPLING DATA FROM Parkside WELLFIELD

CONTAMINANTS (PPB)	4-20-78 DOH	7-20-78 TRI	7-5-79 DOH	12-26-79 TRI	2-29-80 TRI	6-3-80 TRI	12-23-80 DOH	8-26-88 CSAS
1,2-DICHLOROBENZENE								<1
1,1-DICHLOROETHENE								<1
TRANS-1,2-DICHLOROETHENE		—						4.8
1,1-DICHLOROETHANE								
CIS-1,2-DICHLOROETHENE								
1,1,1-TRICHLOROETHANE								<1
1,2-DICHLOROETHANE		<1		3.29*	<1	2.33*		5.9*
TCE	20*	20.6*	8*	8.33*	24.75*	1502*		19.0*
1,2-DICHLOROPROPANE								
TETRACHLOROETHENE (PCE)	22*	20*	19*	21.30*	15.46*	18.81*		<1
CHLOROBENZENE								<1
TOLUENE		—						34.0
BENZENE								<1
METHYLENE CHLORIDE								<1
VINYL CHLORIDE								
Chloroform				7.20	<1	<1		<1
CHROMIUM-TOTAL								
CHROMIUM-HEX							5	
MERCURY								

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 4 AND SAMPLING DATA FROM the City WELLFIELD

CONTAMINANTS (PPB)	6-9-77 DOH	4-3-80 TRI	5-2-80 TRI	5-14-80 DOH	6-26-80 DOH	6-3-80 TRI	11-4-81 DOH
1,2-DICHLOROBENZENE							
1,1-DICHLOROETHENE							
TRANS-1,2-DICHLOROETHENE							
1,1-DICHLOROETHANE							
CIS-1,2-DICHLOROETHENE							
1,1,1-TRICHLOROETHANE					1.40		
1,2-DICHLOROETHANE		21.04*	<1		3.10*		—
TCE		31.41*	31.88*		62.70*	28.09*	12*
1,2-DICHLOROPROPANE							
TETRACHLOROETHENE (PCE)		6.70*	5.86*		15.60*	6.56*	60*
CHLOROBENZENE							
TOLUENE							
BENZENE							
METHYLENE CHLORIDE							
VINYL CHLORIDE							
CHROMIUM-TOTAL							
CHROMIUM-HEX	—			1141.2*	2230*		30
MERCURY							

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 5 AND SAMPLING DATA FROM the City WELLFIELD

CONTAMINANTS (PPB)	4-20-78 DOH	9-1-78 TR+I	2-27-79 DOH	3-16-79 DOH	4-25-79 DOH	1-31-80 TR+I	2-29-80 TRI	6-26-80 DOH	12-23-80 DOH									
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE								8.6										
1,1-DICHLOROETHANE								3.60										
CIS-1,2-DICHLOROETHENE																		
1,1,2-TRICHLOROETHANE			30*	37*	16	3.73	3.09											
1,2-DICHLOROETHANE		6.6*						4.50*										
TCE	91.6*	24.2*				54.8*	39.44*	72.50*										
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)		<1			26*	1.33*	<1	3.80*										
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL																		
CHROMIUM-HEX									16									
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 10 AND SAMPLING DATA FROM the City WELLFIELD

CONTAMINANTS (PPB)	9-20-78 DOH																	
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE																		
1,2-DICHLOROETHANE																		
TCE																		
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)																		
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL	10																	
CHROMIUM-HEX																		
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 11 AND SAMPLING DATA FROM the City WELLFIELD

CONTAMINANTS (PPB)	4-20-78 Rutgers	4-20-78 DOH	12-23-89 DOH															
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE																		
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE																		
1,2-DICHLOROETHANE																		
TCE	36.2*	15*																
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)																		
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL																		
CHROMIUM-HEX			5															
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

WELL # 16 AND SAMPLING DATA FROM the City WELLFIELD

CONTAMINANTS (PPB)	4-24-78 DOH	4-20-78 DOH	4-20-78 DOH	2-27-79 DOH	7-25-80
1,2-DICHLOROBENZENE					
1,1-DICHLOROETHENE					
TRANS-1,2-DICHLOROETHENE					
1,1-DICHLOROETHANE					
CIS-1,2-DICHLOROETHENE					
1,1,1-TRICHLOROETHANE				40*	
1,2-DICHLOROETHANE					
TCE	500*	275*	290*		
1,2-DICHLOROPROPANE					
TETRACHLOROETHENE (PCE)	15*	45*	41*		
CHLOROBENZENE					
TOLUENE					
BENZENE					
METHYLENE CHLORIDE					
VINYL CHLORIDE					
CHROMIUM-TOTAL					
CHROMIUM-HEX					5
MERCURY					

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

Effluent SAMPLING DATA FROM Parkside Treatment Plant

CONTAMINANTS (PPB)	1-31-80 TRI	6-26-80 DOH	11-2-80 TRI	4-3-85 Campbell Soup	11-21-85 DOH	3-6-86 DOH	3-26-86 R+A	5-20-87 DOH	7-18-88 CSAS	10-28-88 CSAS
1,2-DICHLOROBENZENE										
1,1-DICHLOROETHENE		2.20*			3.80*	2.00*				
TRANS-1,2-DICHLOROETHENE						4.50	3.00	2.80	9.40	<1
1,1-DICHLOROETHANE		4.00				3.00				
CIS-1,2-DICHLOROETHENE										
1,1,1-TRICHLOROETHANE		1.20								
1,2-DICHLOROETHANE	5.90*	7.20*	6.98*		6.50*	8.90*	8.00*		6.90*	<1
TCE	20.00*	26.50*	17.05*	26.7*	18.30*	22.00*	14.00*	18.00*	23.00*	66.00*
1,2-DICHLOROPROPANE										
TETRACHLOROETHENE (PCE)	9.71*	9.70*	3.83*	6.45*	7.50*	5.20*	12.00*	6.10*	6.45*	5.20*
CHLOROBENZENE		4.20*								
TOLUENE										
BENZENE		0.10				2.10*				
METHYLENE CHLORIDE										
VINYL CHLORIDE										
CHROMIUM-TOTAL										
CHROMIUM-HEX										
MERCURY										

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

Effluent SAMPLING DATA FROM Puchack Run Treatment Plant

CONTAMINANTS (PPB)	4-3-80 TRI	6-26-80 DOH	1-4-82	1-17-82	3-26-86 R+A	8-13-86 NAC	4-20-87 NAC	4-30-87 NAC	5-29-87 NAC	1-25-88 NAC	5-20-88 CSAS	10-28-88 CSAS	3-3-89 CSAS	5-8-89 CSAS				
1,2-DICHLOROBENZENE																		
1,1-DICHLOROETHENE																		
TRANS-1,2-DICHLOROETHENE					2.0	3.0	3.1	13.0*	1.7									
1,1-DICHLOROETHANE																		
CIS-1,2-DICHLOROETHENE																		
1,1,1-TRICHLOROETHANE	<1												25					
1,2-DICHLOROETHANE									1.7		3.9*							
TCE	16.2*	25.7*			6.0*	4.4*	7.0*	5.3*	5.2*	13.0*		27*	9.7*					
1,2-DICHLOROPROPANE																		
TETRACHLOROETHENE (PCE)	<1	3.1*			1.0*	1.7*			1.3*			5.80*	5.4*					
CHLOROBENZENE																		
TOLUENE																		
BENZENE																		
METHYLENE CHLORIDE																		
VINYL CHLORIDE																		
CHROMIUM-TOTAL			185*	378*														
CHROMIUM-HEX			185*	203*														
MERCURY																		

-- = NONE DETECTED

BMDL = BELOW MINIMUM DETECTABLE LIMITS

* = EXCEEDED NJDEP MAXIMUM CONTAMINANT LEVEL

BLANK SPACES INDICATE NO SAMPLING

QA/QC:	No QA/QC data was found in the files.
File location:	NJDEP, DWR, Bureau of Southern Enforcement 20 E. Clementon Rd., Suite 301 S Gibbsboro, New Jersey NJDEP, DWR, Bureau of Safe Drinking Water 401 E. State Street, Trenton, New Jersey NJDEP, DWR, Central Files 401 E. State Street, Trenton, New Jersey

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2.	Sampling dates:	October 23, 1989 November 13, 1989
	Sampled by:	NJDEP, DWR, Bureau of Southern Enforcement 20 E. Clementon Rd., Suite 301 S, Gibbsboro, New Jersey NJDEP, DWR, Bureau of Safe Drinking Water 401 E. State St., Trenton, New Jersey
	Samples:	Thirteen groundwater samples used for drinking water.
	Laboratory:	NJDEP DEQ Analytical Services 380 Scotch Rd., Trenton, New Jersey 08628
	Parameters:	VOCs, chromium-total, chromium-hex and mercury.
	Sample description:	All samples were obtained from the city potable wells prior to treatment.
	Contaminants detected:	VOC levels in Puchack's Wells # 2, 3 and 7 exceeded MCL for drinking water. Also high levels of hexavalent chromium were found in Puchack Wells # 2 and 3. Contaminants detected are summarized in the following table.

CONTAMINANTS (ppb)	WELL NUMBERS AND DATES SAMPLED												
	Morris #4 10-23-89	Morris #6 10-23-89	Morris #7 11-13-89	Morris #8 10-23-89	Morris #10 10-23-89	Morris #11 11-13-89	Morris #12 11-13-89	Morris #13 11-13-89	Delair #1 11-13-89	Delair #3 11-13-89	Puchack #2 10-23-89	Puchack #3 10-23-89	Puchack #7 10-23-89
1,2-DICHLOROBENZENE													
1,1-DICHLOROETHENE											6.92*	7.41*	5.35*
TRANS-1,2-DICHLOROETHENE			0.44			0.26		0.27					
1,1-DICHLOROETHANE		0.36	0.35								0.81	0.98	0.52
CIS-1,2-DICHLOROETHENE		0.46	1.33								0.78	0.78	1.17
1,1,1-TRICHLOROETHANE											21.21	20.71	14.77
1,2-DICHLOROETHANE											0.74	1.29	1.33
TCE			0.39								75.00*	58.00*	88.00*
1,2-DICHLOROPROPANE											0.74	1.43	0.84
TETRACHLOROETHENE		0.84	0.97								2.16*		1.16*
CHLOROBENZENE	0.48	0.83	0.53	0.48									
CHROMIUM-TOTAL (ppm)			ND			ND	ND	ND	ND	ND			
CHROMIUM-HEX (ppm)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.62*	4.18*	ND
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	BMDL	BMDL	BMDL

* - Exceeded NJDEP Maximum Contaminant Levels

Blank space = none detected

BMDL - below minimum detectable limit

TABLE 1: CAMDEN MUMICIPAL WELLS IN PENNSAUKEN TOWNSHIP

WELL #	PERMIT #	STATUS	DEPTH	CAPACITY (gpm)	ORIGINAL YIELD (gpm)	YEAR DRILLED	DEPTH TO SCREEN (feet)	NOTES
MORRIS 1	51-50	(UNDER WATER) ABANDONED	107	1600	1180	1/1/61	77-107	OUT OF SERVICE
2		SEALED (1979)	115	1600		1/1/32	93-123	REDRILLED 1941, OUT OF SERVICE
3	31-945	OPERATING	136	1800	1000	7/53	73-107	
4	31-4252	OPERATING	138	1600	1585	1/1/60	95-130	
5	31-4253	SEALED (1973)	117		1529	1960	79-114	REDRILLED 1932, OUT OF SERVICE
6	51-51	OPERATING	133	1700	1944	7/11/32	98-133	
7	51-52	OPERATING	127	1680	1630	1/1/32	85-120	
8	31-944	OPERATING	128	1670	1412	1/1/53	89-124	
9	51-76	OPERATING	143	1670	1900	7/3/32	89-99 118-143	MULTIPLE SCREEN INTERVAL
10	31-4251	OPERATING	118	1450	1529	10/29/60	75-115	
11	31-15745	OPERATING	156	2030	2030	8/1/79	102-144	
12	31-16814	OPERATING	123	2030	2030	1/7/81	86-95	

TABLE 1: CAMDEN MUMICIPAL WELLS IN PENNSAUKEN TOWNSHIP

WELL #	PERMIT #	STATUS	DEPTH	CAPACITY (gpm)	ORIGINAL YIELD (gpm)	YEAR DRILLED	DEPTH TO SCREEN (feet)	NOTES
13	31-16813	OPERATING	136	2060	2060	6/4/80	90-94 98-124 126-130	MULTIPLE SCREEN INTERVAL
DELAIR 1	51-53	OPERATING	138	1680	1980	10/31/30	103-138	
2	51-54	OPERATING	141	1830	1330	10/31/30	111-141	
3	51-55	OPERATING	128	1830	1850	10/31/30	87-97 107-127	MULTIPLE SCREEN INTERVAL
PUCHACK 1	51-56	OPERATING	140	1500	1320	10/16/24	108-140	
2	51-57	OPERATING	169	1000	1440	1/1/24	126-165	REDRILLED IN 1961
3	51-58	OPERATING	175	1280	1184	5/29/24	127-175	REDRILLED IN 1957
4		SEALED (1970)	184			1924	136-180	SEALED BECAUSE OF THE CONST. OF THE BETSY ROSS BRIDGE, 1970
5*	51-59	ABANDONED GW MONITORING	186	1324	1119	8/23/24	136-181	OUT SINCE 1980, REDRILLED IN 1961 INCREASED CHROMIUM
6		ABANDONED GW MONITORING	180		1100			OUT SINCE 1977-1978, LOST TO CHROMIUM
7*	31-8526A	ABANDONED	190	2260	1287	1/29/75	140-180	OUT SINCE 1983, LOST TO CHRO

* ONLY TO BE USED FOR EMERGENCY PURPOSES AS PER AN ORDER BY THE BUREAU OF POTABLE WATER.

TABLE 2 CITY WELLS

WELL #	PERMIT #	STATUS	DEPTH	CAPACITY (gpm)	YEAR DRILLED	DEPTH TO SCREEN	CONTAM. PROBLEM	YEAR CLOSED FROM PRODUCTION	LOCATION
CITY WELL 1*	31-940	GW MONITORING ONLY	183		1922	135-170	Fe, Mn	1978	14TH & FEDERAL STS.
2	31-941	SEALED 1973			1926			1960	SOUTHWEST CORNER 3RD & KAIGHS AVE.
3	31-942	SEALED 1983			1922	90-115	Cr	1976	SYCAMORE & ORCHARD ST.
4*		MONITORING	160	1000	1922	131-156	Cr, Mn	1981	ROSE & EVERET STS.
5	31-4649	MONITORING	144		1928				RINGOLD & LINE STS.
6*	31-13	MONITORING			1928	111-135	Fe, Cl, Cr	1975	9TH & JACKSON STS.
7	51-60	NOT IN USE, TO BE REFURBISHED		1500	1928	123-163			9TH & FLORENCE STS.
8	31-944	SEALED 1973			1928			MID-60's	FERRY AVE. BETWEEN ATLANTIC & MECHANIC STS.
9		REMOVED MID-60'S	145		1935			MID-60's	WAYNE AVE. 100 FT. NORTH OF STATE ST.
10		MONITORING	155		1935	115-155	Fe	1972	E. STATE ST. & RIVER ROAD.
11	51-61	ONLY USED IN EMERGENCY		1010	1961	124-154			9TH & FERRY
12		CAPPED-GW MONITORING ONLY	170		1945			1978	CLINTON ST. & ST. JOHN STREET

TABLE 2: CITY WELLS

WELL #	PERMIT #	STATUS	DEPTH	CAPACITY (gpm)	YEAR DRILLED	DEPTH TO SCREEN	CONTAM. PROBLEM	YEAR CLOSED FROM PRODUCTION	LOCATION
CITY WELL 13	31-904			1200	1953	185-225			EUCLID & KAIGHNS AVES.
14	31-905	SEALED 1973						MID-60's	17TH & HARRISON AVES.
15	31-1248	SEALED 1983	141			116-136	Fe	1970	HARRISON AVE.
16*	31-1249	MONITORING	180		1954	149-179		1980	19TH ST. & RI RD.
17	31-1250	SEALED	265	1500	1954	230-265			PARK & VESPER BLVDS.
18	31-9574	SEALED	288	1200	1976	258-288			

NOTE: CITY WELLS 13, 17 AND 18 ARE ALSO CONSIDERED PARKSIDE WELLS

* WELLS TO BE USED FOR GROUNDWATER MONITORING AS PER ADMINISTRATIVE ORDER OF SEPTEMBER 14, 1983.

CAMDEN MUNICIPAL WELLS
THE CITY OF CAMDEN AND PENNSAUKEN TOWNSHIP,
CAMDEN COUNTY, NEW JERSEY
EPA ID # NJD980769087

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7. NEW JERSEY ATLAS WATER SUPPLY MAP
8. NEW JERSEY ATLAS GEOLOGIC MAP
9. COMPUTER GENERATED WATER WITHDRAWAL MAP

ATTACHMENTS

A. PENNSAUKEN TAX SHEET LISTING CAMDENS WELLS BLOCK AND LOT NUMBERS, CAMDEN DEPT. OF UTILITIES, CITY HALL.

B. WATER UTILIZATION REPORT FOR 1988, CAMDEN DEPT. OF UTILITIES, CITY HALL.

C. WELL RECORDS FOR CAMDENS WELLS, DWR, WATER ALLOCATION, NJDEP.

D. ENGINEERING REPORT BY MALCOLM PIRNIE, INC. ENTITLED "WATER SYSTEM IMPROVEMENTS" FOR THE CITY OF CAMDEN, SEPTEMBER 1981, NJDEP, DWR, BSDW.

E. CITY OF CAMDEN WATER SYSTEM STUDY BY WHITMAN, REQUARDT, AND ASSOCIATES, OCTOBER 1976. NJDEP, DWR - SFO/ENF.

F. CITY OF CAMDEN STATUS OF DIVERSION, CAMDEN DEPT. OF UTILITIES, CITY HALL.

G. CITY OF CAMDEN PUMPING RECORDS AND DIVERSION REPORTS, 1985-1989, DEPT. OF UTILITIES, CITY HALL.

H. CAMP, DRESSER & MCKEE INC. REPORT ENTITLED "SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS OF CHROMIUM CONTAMINATION AT PUCHACK WELL FIELD, CAMDEN, NEW JERSEY" JANUARY 1986, NJDEP, DWR - SFO/ENF.

I. LETTER CONCERNING ACTUAL PUMPAGE FROM CAMDENS WELLS, SEPTEMBER 14, 1989, CAMDEN DEPT. OF UTILITIES, CITY HALL.

J. MEMO ABOUT PUCHACK WELL FIELD, DECEMBER 21, 1983, NJDEP, DWR - SFO/ENF.

K. LETTER REGARDING THE CITY'S GROUNDWATER CONTAMINATION PROBLEM, JUNE 23, 1986, NJDEP, DWR - SFO/ENF.

L. A DRAFT DIRECTIVE AND NOTICE TO INSURERS FROM DWR-SFO/ENF, NJDEP FOR THE IDENTIFICATION OF POTENTIALLY RESPONSIBLE PARTIES FOR PUCHACK WELLFIELD CONTAMINATION, SEPTEMBER 25, 1989, NJDEP, BGWPA.

M. FAX CONCERNING A JUNE 21, 1989 CAMDEN CITY WELL CONTAMINATION MEETING, NJDEP, DWR - SFO/ENF.

N. A SEPTEMBER, 1981 REPORT ON PARKSIDE WATER TREATMENT PLANT BY MALCOLM PIRNIE, INC., DWR - SFO/ENF, NJDEP.

O. STAFF REPORT CONCERNING PERMIT RENEWAL FOR THE CITY OF CAMDENS WELLS, OCTOBER 31, 1985. NJDEP, DWR - SFO/ENF.

P. INTERCONNECTION REPORT FOR CAMDENS WELLS BY THE DEPT. OF UTILITIES, CAMDEN CITY, DWR - SFO/ENF, NJDEP.

Q. LETTER CONCERNING THE CITY REPLACING WATER MAINS, SEPTEMBER 14, 1989, NJDEP, DWR, BSDW.

R. A CAMP DRESSER AND MCKEE REPORT ENTITLED "WATER SUPPLY SOURCE LOCATION AND ANALYSIS", DECEMBER 1984 NJDEP, DWR - SFO/ENF.

S. NJPDES PERMIT (#NJ0031984) FOR MORRIS-DELAIR WATER TREATMENT PLANT TO DISCHARGE TO PENNSAUKEN CREEK, ISSUED DECEMBER 7, 1983, NJDEP, DWR, CENTRAL FILES.

T. MEMO CONCERNING PERMIT AND PROCESSES AT MORRIS-DELAIR WATER TREATMENT PLANT, JUNE 8, 1983, NJDEP, DWR, CENTRAL FILES.

U. PERMITS TO CONSTRUCT AND DERIVE WATER FROM CAMDEN WELLS # 11, 12, 13 AND 18, NJDEP, DWR, CENTRAL FILES.

V. COMPLIANCE EVALUATION INSPECTIONS OF CAMDEN CITY WATER DEPARTMENT BY SOUTHERN BUREAU OF REGIONAL ENFORCEMENT, DWR, NJDEP, SEPTEMBER 26, 1985 TO APRIL 4, 1989, NJDEP, DWR, BSDW AND CENTRAL FILES.

W. ADMINISTRATIVE ORDER TO CAMDEN CITY WATER DEPARTMENT FROM DWR, NJDEP, SEPTEMBER 14, 1983, NJDEP, DWR - SFO/ENF.

X. ADMINISTRATIVE ORDER AND NOTICE OF CIVIL ADMINISTRATIVE PENALTY ASSESSMENT FOR MORRIS-DELAIR WATER TREATMENT PLANT, JANUARY 30, 1989, NJDEP, DWR, CENTRAL FILES.

Y. LETTER RESPONDING TO ADMINISTRATIVE ORDER AND NOTICE, FEBRUARY 1, 1989, NJDEP, DWR, CENTRAL FILES.

Z. DRINKING WATER STANDARDS AND MCL FOR POTABLE WATER, DECEMBER 1989, NJDEP, DWR, BSDW.

AA. NJDEP POTABLE WATER SAMPLING DATA FOR THE CITY OF CAMDENS MUNICIPAL WELLS, FROM MAY 1972 TO JULY 1988. NJDEP, DWR, BSDW AND CENTRAL FILES.

BB. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS FROM CAMPBELL SOUP ENVIRONMENTAL LAB, APRIL 11, 1985, NJDEP, DWR - SFO/ENF.

CC. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS FROM TECHNOLOGICAL RESOURCES, INC. (TRI), LAB., 1978-1980, NJDEP, DWR - SFO/ENF.

DD. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS FROM ROSSNAGEL AND ASSOCIATES INC., LAB., APRIL, 1986 NJDEP, DWR, BSDW.

EE. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS FROM RUTGERS LAB., 1978 NJDEP, DWR - SFO/ENF.

FF. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS CHEMICAL SAMPLES AND ANALYTICAL SVCS CO. LAB., AUGUST 1988 TO MARCH 1989, NJDEP, DWR - SFO/ENF.

GG. SAMPLING DATA FOR CAMDENS MUNICIPAL WELLS FROM NORTHEASTERN ANALYTICAL CORP. (NAC), MAY, JULY AND AUGUST 1986, NJDEP, DWR, BSDW.

HH. RECENT SAMPLING DATA FROM MORRIS WELLS #4, 6, 7, 8, 10, 11, 12 AND 13, OCTOBER 23, 1989 AND NOVEMBER 13, 1989, NJDEP, DWR, BSDW.

II. RECENT SAMPLING DATA FROM DELAIR WELLS #1 AND 3, NOVEMBER 13, 1989, NJDEP, DWR, BSDW.

JJ. RECENT SAMPLING DATA FROM PUCHACK WELLS #2, 3 AND 7, OCTOBER 23, 1989, NJDEP, DWR, BSDW.

KK. SUMMARY OF SAMPLING DATA FROM NJDEP, DWR, BSDW WITH ADDITIONAL SAMPLING DATA ADDED BY NJDEP, DHWM, BPA.

CAM
NEW
7.5 MINU

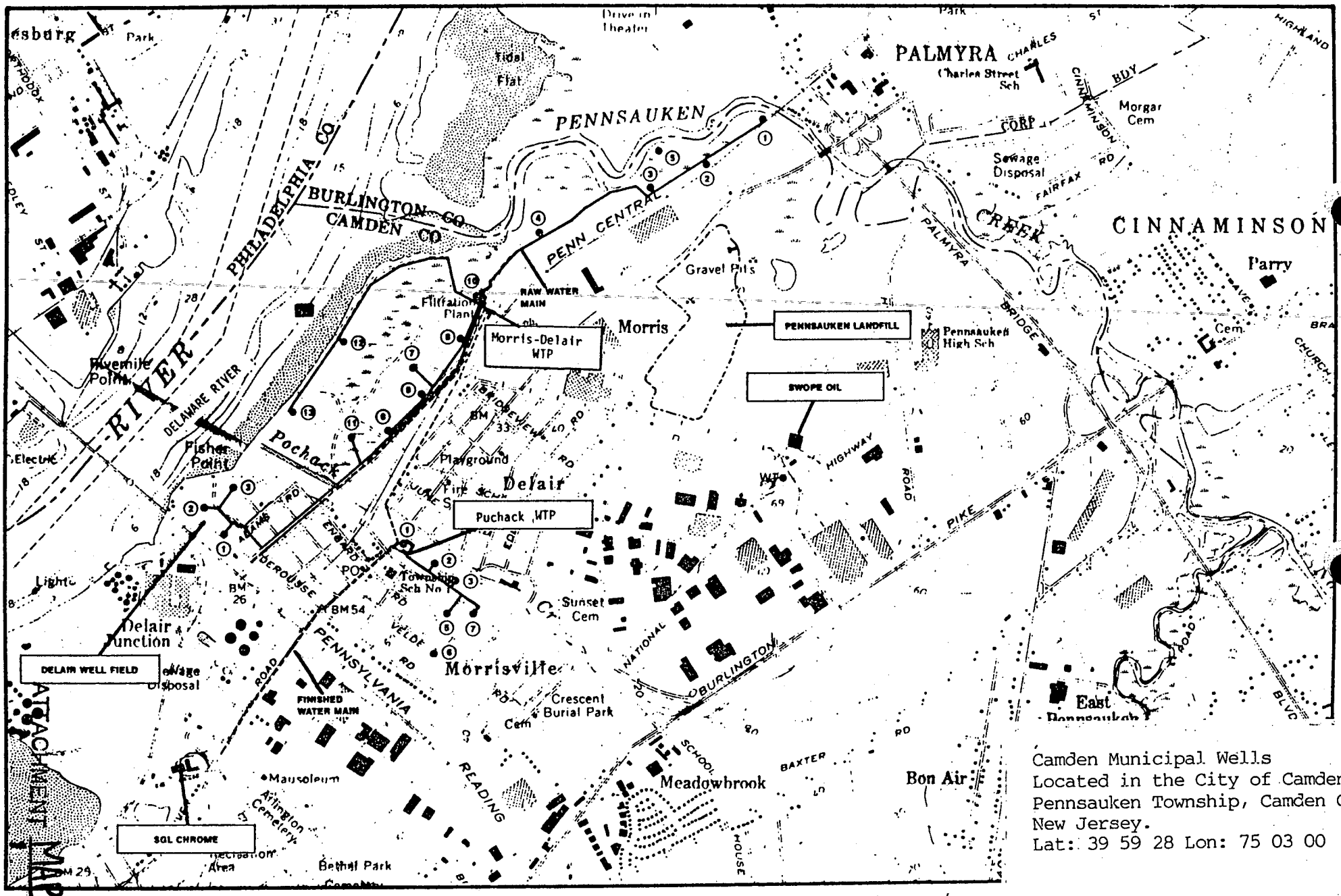
CAMDEN QUADRANGLE
NEW JERSEY—PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

ATTACHMENT MAP 1

Camden Municipal Wells
Located in the City of Camden an
Pennsauken Township, Camden Co.,
New Jersey.
Lat: 39 59 28 Lon: 75 03 00

ATTACHMENT MAP 1A

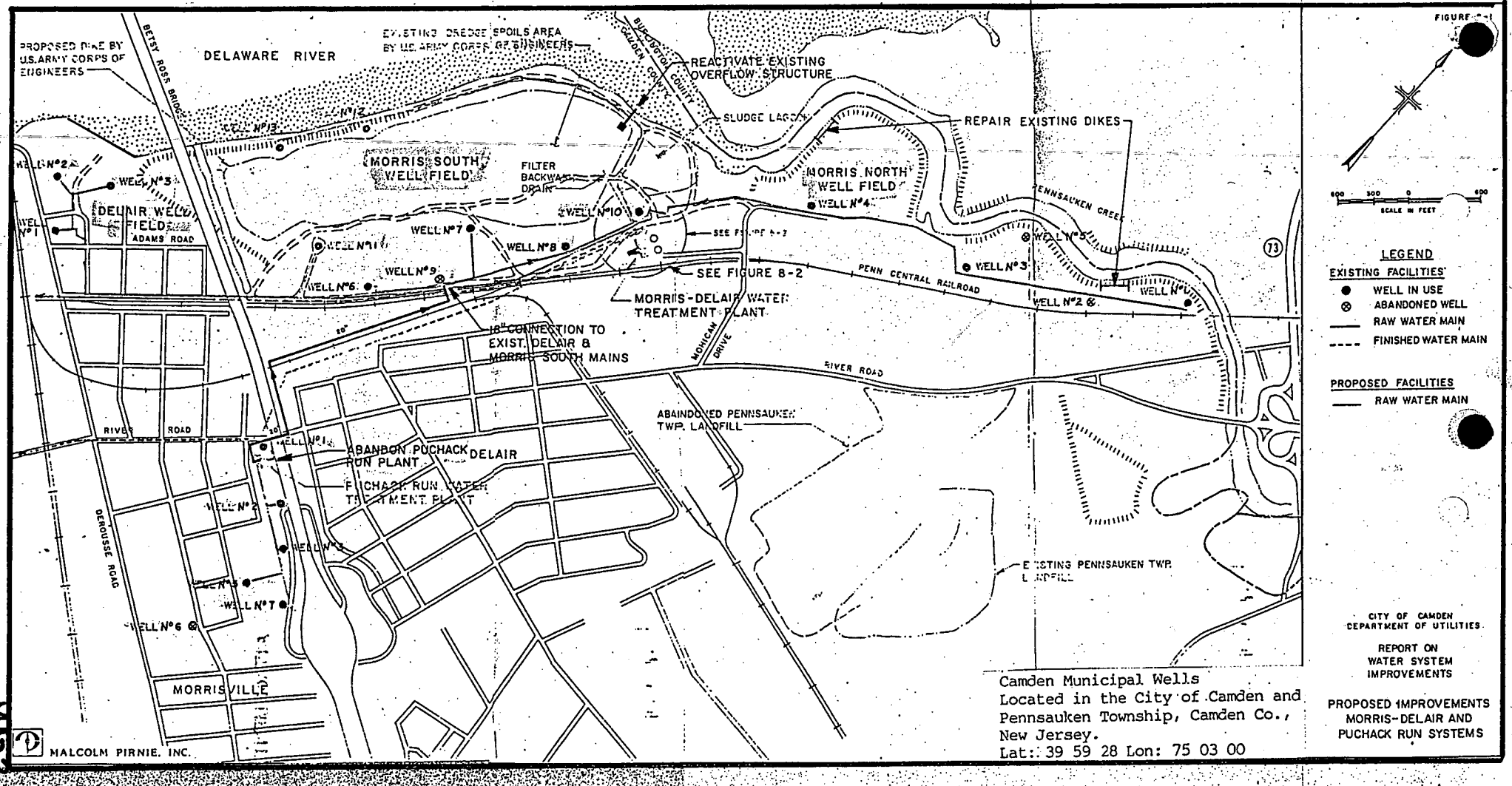
Camden Municipal Wells
Located in the City of Camden an
Pennsauken Township, Camden Co.,
New Jersey.
Lat:: 39 59 28 Lon: 75 03 00



Camden Municipal Wells
Located in the City of Camden and Pennsauken Township, Camden Co., New Jersey.
Lat: 39 59 28 Lon: 75 03 00

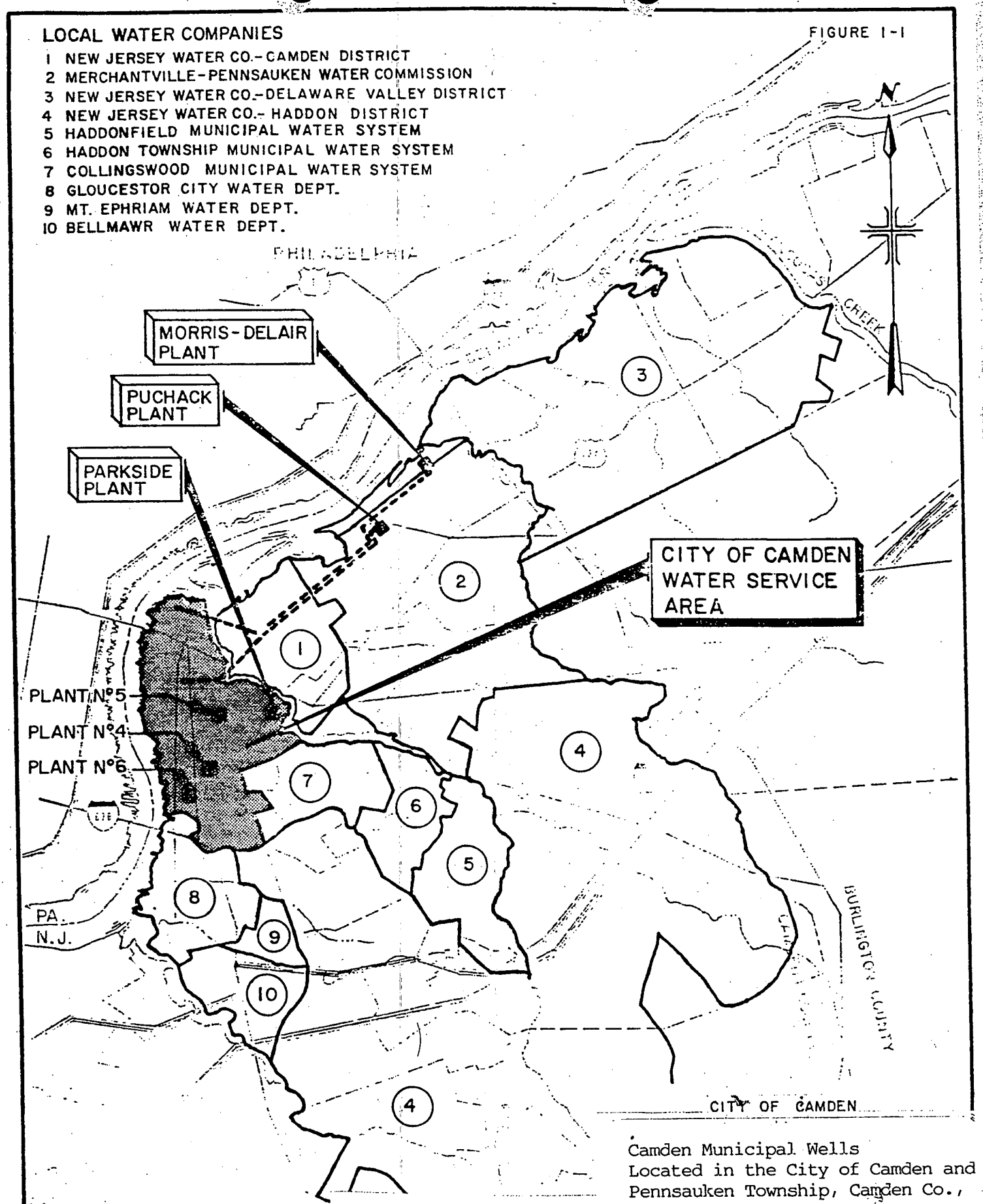
No Scale

ATTACHMENT MAP 2



Camden Municipal Wells
Located in the City of Camden and Pennsauken Township, Camden Co., New Jersey.
Lat.: 39 59 28 Lon: 75 03 00

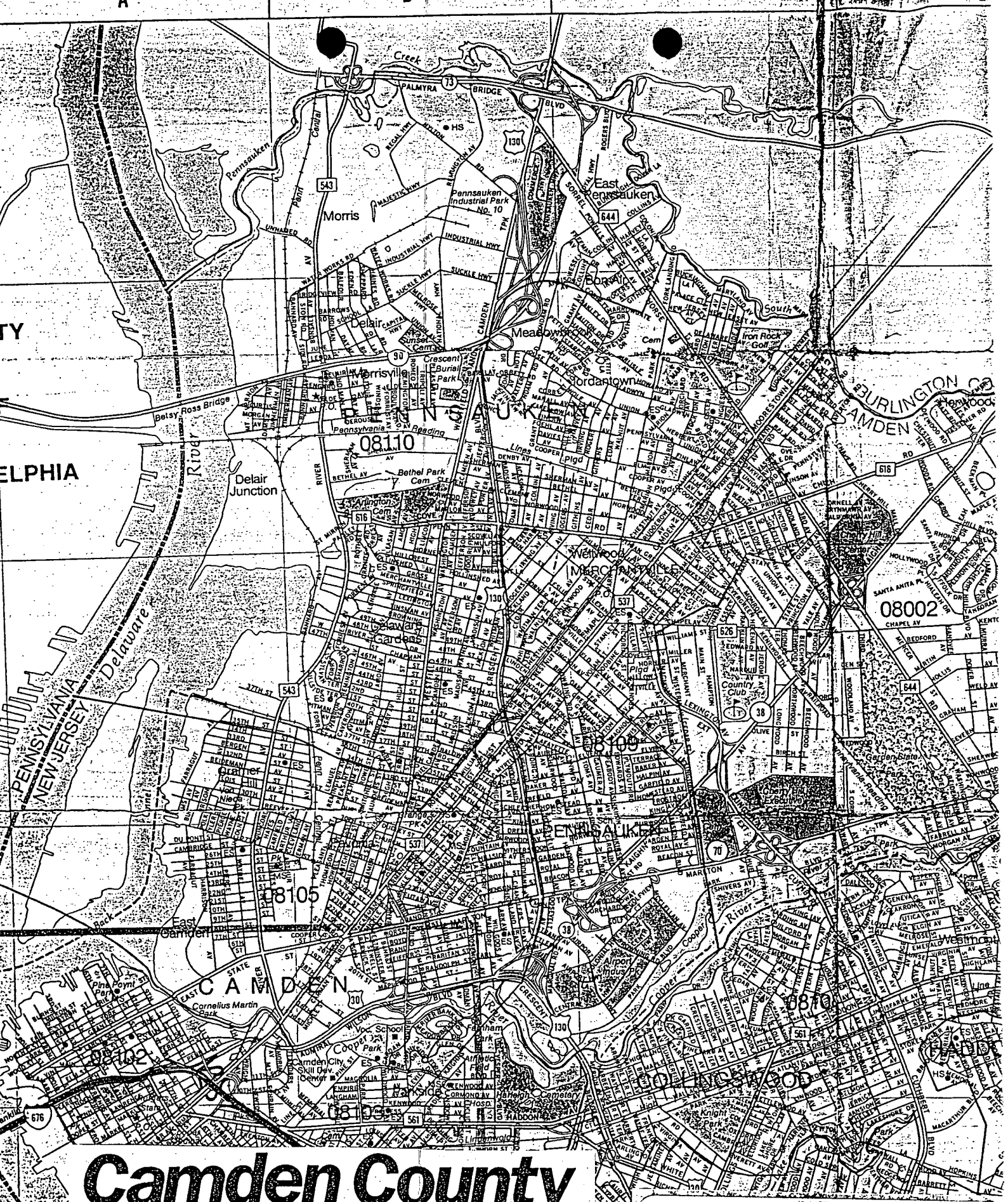
ATTACHMENT MAP 3



Camden Municipal Wells
Located in the City of Camden and Pennsauken Township, Camden Co., New Jersey.
Lat: 39 59 28 Lon: 75 03 00

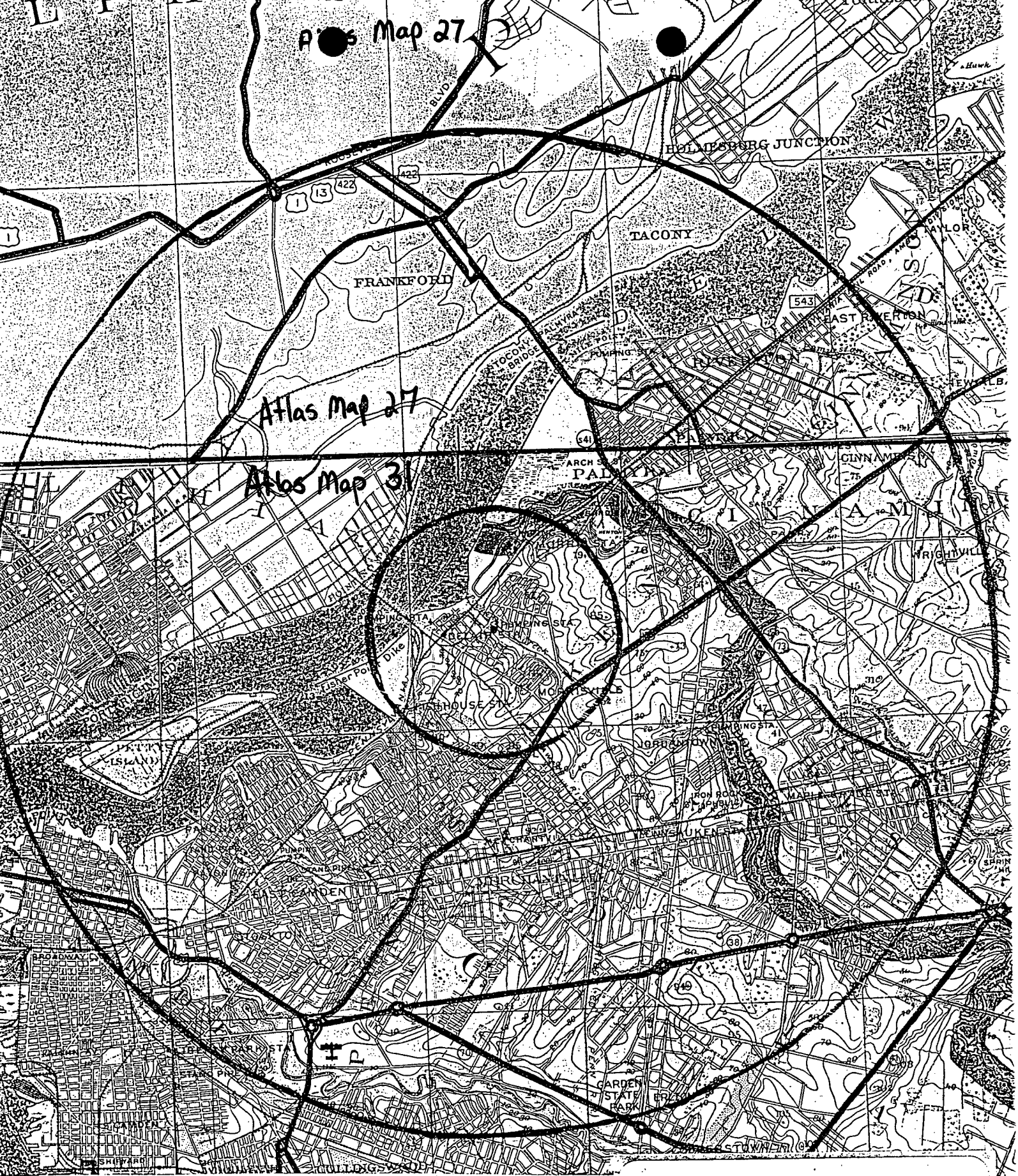
ATTACHMENT MAP4

MALCOLM PIRNIE, INC.



Camden Municipal Wells
Located in the City of Camden and Pennsauken Township, Camden Co., New Jersey.
Lat: 39 59 28 Lon: 75 03 00

ATTACHMENT MAP5



ATLAS BASE MAP

Scale: 1 Mile to a Inch.

Miles 1 ¾ ½ ¼ 0 1 2 3

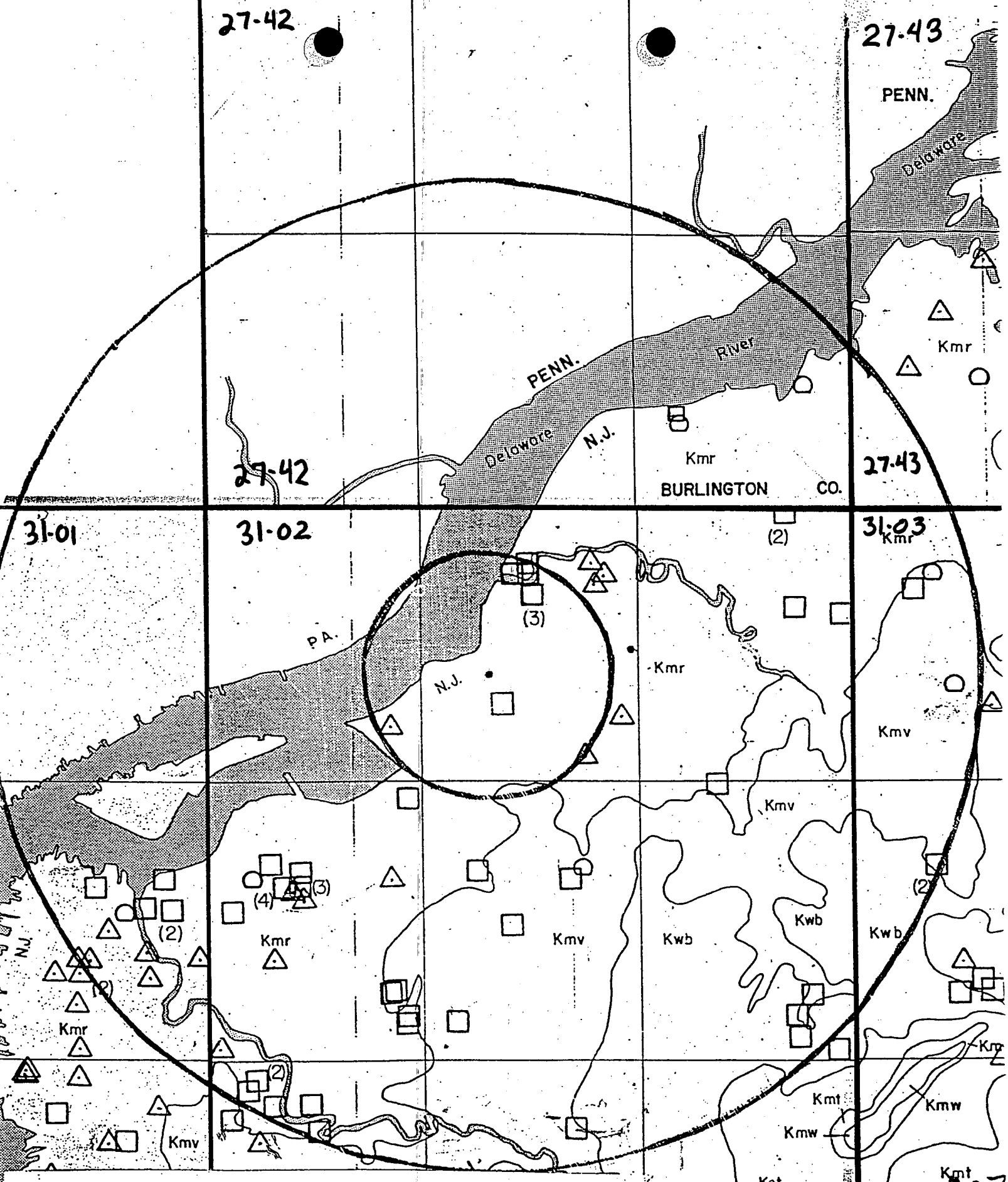
Yards 500 — 0 1000 2000 3000

Meters 1000 500 0 1000 2000 3000

A. HOEN & CO. BALTIMORE, MD.

Camden Municipal Wells
Located in the City of Camden and Pennsauken Township, Camden Co., New Jersey.
Lat: 39 59 28 Lon: 75 03 00

ATTACHMENT Map 6

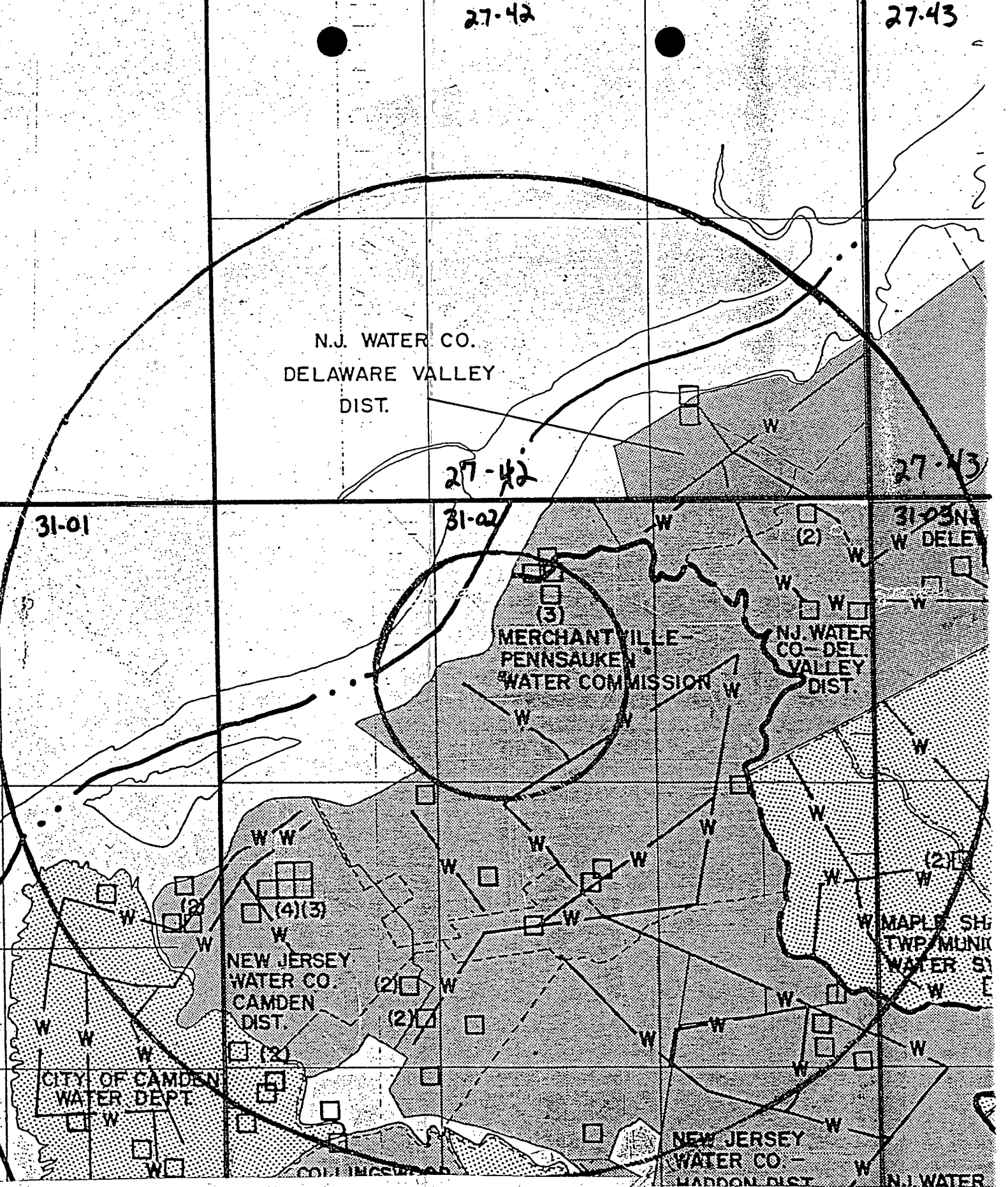


GEOLOGIC MAP

Scale: 1 Mile to an Inch.
Miles
Yards
Meters

ATTACHMENT Map 7

Camden Municipal Wells
Located in the City of Camden and
Pennsauken Township, Camden Co.,
New Jersey.
Lat.: 39 59 28 Lon: 75 03 00



WATER SUPPLY MAP

Scale: 1 Mile to a Inch.

Miles 1 ¾ ½ ¼ 0 1 2 3

Yards 1000 500 0 1000 2000 3000

Meters 1000 500 0 1000 2000 3000

Camden Municipal Wells
Located in the City of Camden and
Pennsauken Township, Camden Co.,
New Jersey.
Lat: 39 59 28 Lon: 75 03 00

ATTACHMENT Map 8

LEGEND FOR ATLAS SHEET 31

△ 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

[1] 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

ATTACHMENT Map 8A

LEGEND

WATER SUPPLY

- AREA SERVED BY PRIVATE WATER SERVICE COMPANIES
- AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIE
- AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIE
- AREA NOT PRESENTLY SERVED BY WATER SERVICE
- PUBLIC SUPPLY WELLS
- WATER MAIN ACROSS HIGHWAY 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

ATTACHMENT Map 8

BLOCK #27-42

A. Frankford

B. Delaware River-Pompeston Creek, Pennsauken

C. 2. Map No. Location Period of Record
193 Delaware River at Palmyra 1962-

3. 193 Delaware River at Palmyra 1964

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

D. Magothy and Raritan Formation (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 50, valleys 0
Relief (ft.): 50

2. a. Normal Year: 43"
Dry Year: 36"
Wet Year: 49"

b. January: 33°F
July: 76°F

c. 250 days. Last killing frost: 4/15; first killing frost: 10/25

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
27-42-648	Riverton-Palmyra Water Co.	1955	62/84	100	503	Qps
27-42-667	Natl. Casin	1955	-	22	75	"
27-42-672	Riverton-Palmyra Water Co.	1958	51/71	76	503	"

J. Geodetic Control Survey monuments described
Index Map 44; adjacent Index Maps 48,49

ATTACHMENT Map 8c

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

ATTACHMENT Map 8D

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	"

ATTACHMENT Map 8 E

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	"

*Indicates use as a recharge well.

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

ATTACHMENT Map 8F

I. Water Well Records

Location	Owner	Year Drilled	Screen Setting or Depth of Casing	Total Depth	g/m Yield	Formation
31-03-119	Riverton-Palmyra Water Co. #12	1961	157-196	201	900	Kmr
31-03-127	#10	1959	240-281	308	1051	"
31-03-135	#15	1964	166-225	229	1060	"
31-03-136	#14	1964	179-229	325	1266	"
31-03-158	Campbell Soup Co.	1959	-	264	-	Kr
31-03-183	"	1971	339-369	395	602	"
31-03-258	Moorestown Field Club,#1	1964	274-302	304	400	"
31-03-328	Twp.of Moorestown, #4	1960	298-337	360	700	Kmr
31-03-336	" #8	1967	282-332	362	717	"
31-03-368	R.C.A.	1959	-	221	-	"
31-03-389	Harold Collins	1953	253-283	283	500	"
31-03-427	Twp. of Maple Shade	1955	211-272	282	1020	"
31-03-427	"	1972	210-270	280	700	"
31-03-458	Interface Corp.	1956	146-156	156	159	"
31-03-465	Twp. of Moorestown	1963	248-288	302	805	"
31-03-466	Moorestown Water Co.	1963	248-288	290	1000	"
31-03-467	Savar Corp.	1955	155-166	166	120	"
31-03-482	Twp. of Maple Shade	1961	414-463	494	1001	"
31-03-483	"	1965	173-209	212	1034	"
31-03-483	"	1975	160-200	220	1007	"
31-03-483	"	1975	440-500	523	1438	"
31-03-489	Layne-New York Co., Inc.	1960	267-287	291	250	"
31-03-541	Town of Moorestown	1914	-	517	-	Wgn
31-03-589	Mt.Laurel Water Co.,#1	1961	558-589	594	548	Kmr
31-03-594	" #2	1965	362-399	399	750	"
31-03-671	Colonial Pipeline Co.	1963	-	188	150	"
31-03-676	Mt.Laurel Twp.M.U.A.,Test #2	1973	596-616	689	108	"
31-03-684	" " #1	1973	627-647	681	250	"
31-03-692	Merchantville-Pennsauken Water Comm.	1960	207-237	240	875	"
31-03-746	N. J. Water Co., #27	1963	366-417	541	812	"
31-03-762	" #28	1964	175-207	268	857	"
31-03-795	Arthur Champion	1960	-	299	-	"
31-03-816	Sea Jay Swim Club	1963	227-237	237	150	"
31-03-818	H.D.& H. Development Co.	1962	410-460	465	550	"
31-03-827	PSE&G Co.	1958	239-245	245	75	"
31-03-898	Evesham Twp.Utility Auth.#3	1967	288-334	341	608	"
31-03-938	Joseph Rudderow	1954	440-456	458	250	Kr
31-03-961	Cherry Valley Const.Co.	1961	-	274	-	"

J. Geodetic Control Survey monuments described in Index Map 49; adjacent Index Maps 44,45,48,54,55

ATTACHMENT Map 8G

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

LATITUDE 395956
LONGITUDE 750300

DRAFT

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

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

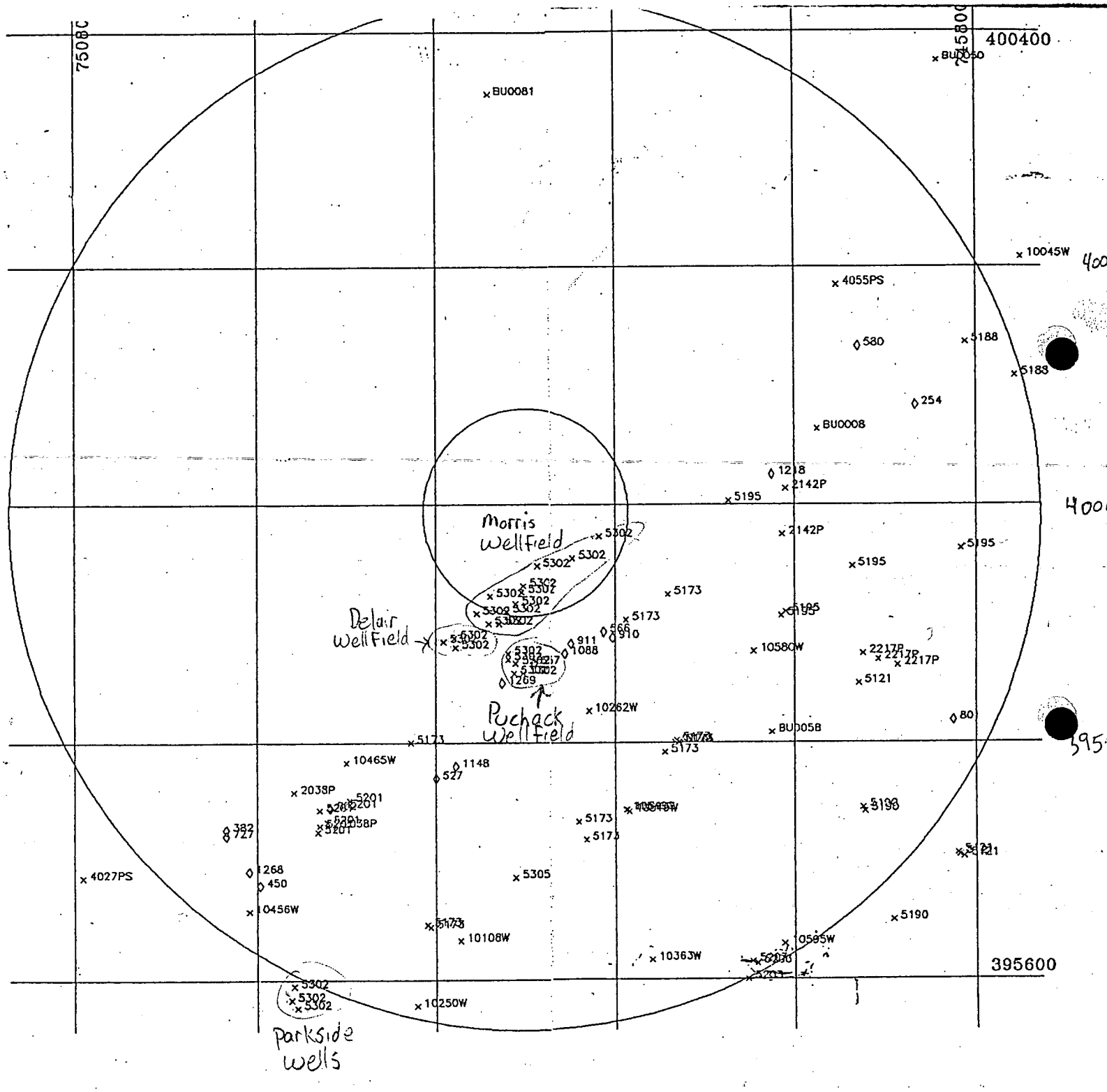
NJGS CASE INDEX DATA RETRIEVED FROM:
NEW JERSEY GEOLOGICAL SURVEY
ON 12/22/87

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

DATE: 10/06/89

SUBJECT TO REVISION

ATTACHMENT Map 9



NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
10045W	RIVERSIDE BOARD OF EDUCATION	2704523	1	400205	745730	T	5.4	05	30		GKMR		
10109W	CAMDEN CO VOC. & TECH. SCHOOLS	3105139	1	395620	750344	F	4.2	07	15	401	GKMR		
10250W	BISHOP EUSTACE PREP SCHOOL	3117884	1	395547	750413	T	4.9	07	27	150	GKMR		200
10262W	SCHAEVITZ ENGINEERING	3103338	1	395816	750218	T	2.0	07	27		GKMR		
	SCHAEVITZ ENGINEERING	3103437	2	395816	750218	T	2.0	07	27		GKMR		
	SCHAEVITZ ENGINEERING	3103444	3	395816	750218	T	2.0	07	27		GKMR		
10363W	CHERRY HILL INN	UNKNOWN	1	395610	750136	T	4.5	07	16	179	GKMR		400
10456W	CONCORD CHEMICAL CO., INC.	5100154	1	395635	750605	F	4.7	07	08	140	GKMW		400
10465W	WEST BANK OIL	DELAWARE	RIVER	395750	750500	F	3.0	07	27		SDDEL		
10549W	SYCAMORE RIDGE APARTMENTS	3127629	3	395725	750151	T	3.1	07	27		GKMR		45
10580W	STAR GAS SERVICE	3129179	1	395846	750027		2.6	05	19		GKMR		50
10595W	GENTILE, ALBERT JR/PRODUCE JNT	3130128		395618	750007	T	4.9	05	19				
2038P	GENERAL COLOR CO.	3119275	7	395735	750535		3.5	07	08	194	GKR		180
	GENERAL COLOR CO.	3105064	6	395718	750507		3.5	07	06	184	GKR		200
2142P	RIVERTON COUNTRY CLUB	3118428	1A	400008	750006	S	2.5	05	31	119	GKMR		500
	RIVERTON COUNTRY CLUB	2704844	2	395945	750008	S	2.5	05	31	174	GKMR		500
2217P	CAMPBELL CONTAINER COMPANY	3105715	1	395839	745852	T	3.9	05	22	272	GKMR		500
	CAMPBELL CONTAINER COMPANY	3103673	2 RECHARGE	395845	745915	T	3.6	05	22	266	GKMR		
	CAMPBELL CONTAINER COMPANY	3103674	1 OBS.	395842	745905	T	3.7	05	22	268	GKMR		
4027PS	GENERAL ELECTRIC CO.	DELAWARE RIVER		395652	750754	T	5.5	07	08		SDDEL		
4055PS	NEW JERSEY AMERICAN WATER CO.	SURFACE WATER	1	400151	745932		3.7	05	08		SDDEL		315
5121	MOORESTOWN TOWNSHIP	5100041	3	395703	745811		5.4	05	22	299	GKMR		700
	MOORESTOWN TOWNSHIP	3104663	5	395704	745812		5.3	05	22	290	GKMR		700
	MOORESTOWN TOWNSHIP	3104727	6	395702	745808		5.4	05	22	290	GKMR		700
	MOORESTOWN TOWNSHIP	3105202	7	395830	745918		3.6	05	22	385	GKMR		
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105641	BROWNING1A	395627	750404		4.1	07	24	152	GKMR		875
	MERCHANTVILLE-PENNSAUKEN WATER	3101417	DEL GARD 2	395800	750417		2.5	07	27	147	GKMR		700
	MERCHANTVILLE-PENNSAUKEN WATER	3102915	MARION 1	395720	750225		3.0	07	27	279	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104641	MARION 2	395711	750220		3.2	07	27	262	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3104836	BROWNING2A	395628	750406		4.1	07	27	140	GKMR		900
	MERCHANTVILLE-PENNSAUKEN WATER	3105110	NATL HWY 1	395902	750153		1.4	07	27	231	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100010	PARK AVE 1	395800	750117		2.7	07	27	274	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	5100064	PARK AVE 2	395800	750118		2.7	07	27	262	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3103534	PARK AVE 3	395801	750119		2.6	07	27	277	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3100011	PARK AVE 5	395800	750120		2.7	07	27	290	GKMR		1005
	MERCHANTVILLE-PENNSAUKEN WATER	3114564	PARK AVE 6	395755	750127		2.7	07	27	270	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN WATER	3119207	NATL HWY 2	395915	750125		1.6	07	27	211	GKMR		1000
5188	NEW JERSEY-AMERICAN WATER CO.	2705202	FAIRVIEW30	400122	745807		4.6	05	10	235	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	2703080	LEON 19	400122	745807		4.6	05	10	130	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	2704247	CHESTER 23	400105	745734		4.9	05	10	168	GKMR		
	NEW JERSEY-AMERICAN WATER CO.	2704680	CHESTER 24	400105	745734		4.9	05	10	150	GKMR		
5190	MAPLE SHADE TOWNSHIP	3100060	2	395725	745914		4.4	05	19	126	GKMR		140
	MAPLE SHADE TOWNSHIP	3106020	8	395727	745915		4.3	05	19	280	GKMR		760
	MAPLE SHADE TOWNSHIP	3108922	9	395630	745855		5.3	05	19	220	GKMR		1000
	MAPLE SHADE TOWNSHIP	3108923	10	395630	745855		5.3	05	19	523	GKMR		1500
	MAPLE SHADE TOWNSHIP	3112925	11	395727	745915		4.3	05	19	450	GKMR		1250
5195	NEW JERSEY-AMERICAN WATER CO.	3104697	14NEWALBAN	395938	745810		4.2	05	08	325	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3104733	26NEWALBAN	395938	745810		4.2	05	08	225	GKMR		800
	NEW JERSEY-AMERICAN WATER CO.	3103835	10 POMONA	395929	745922		3.2	05	08	281	GKMR		800
	NEW JERSEY-AMERICAN WATER CO.	3104276	12 POMONA	395929	745922		3.2	05	08	196	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3105321	28 STEPHEN	395904	750009		2.7	05	08	264	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3105437	31 STEPHEN	395906	750006		2.7	05		263	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3104576	13HIGHLAND	400002	750044		2.0	05		197	GKMR		700
	NEW JERSEY-AMERICAN WATER CO.	3104964	27HIGHLAND	400002	750044		2.0	05		176	GKMR		1000
5201	NEW JERSEY-AMERICAN WATER CO.	3103456	50	395726	750518		3.5	07	08	170	GKMR		700

ATTACHMENT Map 9 B

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
	NEW JERSEY-AMERICAN WATER CO.	3104780	51	395720	750513		3.6	07	08	192	GKMR		1300
	NEW JERSEY-AMERICAN WATER CO.	3104847	52	395715	750519		3.7	07	08	198	GKMR		1050
	NEW JERSEY-AMERICAN WATER CO.	3118947	53	395728	750502		3.3	07	08	194	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3118944	54	395731	750458		3.3	07	08	195	GKMR		1000
	NEW JERSEY-AMERICAN WATER CO.	3120270	55	395718	750518		3.6	07	08	176	GKMR		1050
5203	NEW JERSEY-AMERICAN WATER CO.	3104051	COLUMBIA22	395609	750028		4.9	07	09	453	GKMR		1050
	NEW JERSEY-AMERICAN WATER CO.	3104274	COLUMBIA24	395608	750025		4.9	07	09	167	GKMR		900
	NEW JERSEY-AMERICAN WATER CO.	3105033	COLUMBIA31	395600	750031		5.0	07	09	427	GKMR		1050
5302	CAMDEN CITY, WATER DIVISION	5100050	MORRIS 1	395944	750211		0.8	07	27	107	GKMR		1600
	CAMDEN CITY, WATER DIVISION	3100945	MORRIS 3	395933	750229		0.6	07	27	107	GKMR		1800
	CAMDEN CITY, WATER DIVISION	3104252	MORRIS 4	395929	750253		0.5	07	27	134	GKMR		1600
	CAMDEN CITY, WATER DIVISION	5100051	MORRIS 6	395900	750318		1.1	07	27	138	GKMR		1700
	CAMDEN CITY, WATER DIVISION	5100052	MORRIS 7	395916	750303		0.8	07	27	125	GKMR		1680
	CAMDEN CITY, WATER DIVISION	3100944	MORRIS 8	395910	750307		0.9	07	27	128	GKMR		1670
	CAMDEN CITY, WATER DIVISION	3104251	MORRIS 10	395919	750302		0.7	07	27	118	GKMR		1400
	CAMDEN CITY, WATER DIVISION	5100076	MORRIS 9	395906	750313		1.0	07	27	148	GKMR		1670
	CAMDEN CITY, WATER DIVISION	3116814	MORRIS 12	395914	750324		0.9	07	27	122	GKMR		2030
	CAMDEN CITY, WATER DIVISION	3115745	MORRIS 11	395900	750325		1.1	07	27	149	GKMR		2030
	CAMDEN CITY, WATER DIVISION	3116813	MORRIS 13	395905	750333		1.1	07	27	135	GKMR		2060
	CAMDEN CITY, WATER DIVISION	5100053	DELAIR 1	395848	750347		1.5	07	27	141	GKMR		1680
	CAMDEN CITY, WATER DIVISION	5100054	DELAIR 2	395851	750335		1.5	07	27	146	GKMR		1830
	CAMDEN CITY, WATER DIVISION	5100055	DELAIR 3	395853	750348		1.4	07	27	135	GKMR		1830
	CAMDEN CITY, WATER DIVISION	5100056	PUCHACK 1	395845	750312		1.4	07	27	141	GKMR		1500
	CAMDEN CITY, WATER DIVISION	5100057	PUCHACK 2	395842	750312		1.4	07	27	169	GKMR		1000
	CAMDEN CITY, WATER DIVISION	5100058	PUCHACK 3	395840	750307		1.5	07	27	176	GKMR		1280
	CAMDEN CITY, WATER DIVISION	5100059	PUCHACK 5	395835	750308		1.6	07	27	186	GKMR		1324
	CAMDEN CITY, WATER DIVISION	3108526A	PUCHACK 7	395835	750302		1.5	07	27	180	GKMR		2260
	CAMDEN CITY, WATER DIVISION	3100904	CITY 13	395557	750535		5.1	07	08	230	GKMR		1200
	CAMDEN CITY, WATER DIVISION	3101250	CITY 17	395546	750533		5.3	07	08	270	GKMR		1500
	CAMDEN CITY, WATER DIVISION	3109574	CITY 18	395550	750537		5.2	07	08	290	GKMR		1200
5305	MERCHANTVILLE-PENNSAUKEN	3104642	WOODBINE 1	395452	750307		3.5	07	24	288	GKMR		1000
	MERCHANTVILLE-PENNSAUKEN	3114563	WOODBINE 2	395452	750307		3.5	07	24	227	GKMR		1000
BU0008	HUNTER, JOHN	POND 1	POND 1	400038	745945	F	3.0	05	08	12	SDDEL		800
BU0050	VARSACI, JAMES & SONS	RANCOCAS CREEK	STREAM 1	400345	745825	F	5.9	05	12		SDRAN		
BU0058	VOTTA, LOUIS	STREAM 1	STREAM 1	395905	750015	F	3.2	05	24		SDRAN		
	VOTTA, LOUIS	POND 1	POND 1	395805	750015	F	3.2	05	24	15	GKET		
BU0081	HEISLER, EDGAR B.	WELL 1	P-121	400328	746325	U	4.1	05	06	210	GKMR		500

Number of Observations: 92

ATTACHMENT Map 9 B

Page 1 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 395958 LAT. 750300 LON. (IN ORDER BY DECREASING LONGITUDE) - 10/06/89

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
4027PS	GENERAL ELECTRIC CO.	DELAWARE RIVER		395652	750754	T	5.5	07	08		SDDEL		
10456W	CONCORD CHEMICAL CO., INC.	5100154	1	395635	750605	F	4.7	07	08	140	GKMW		400
5302	CAMDEN CITY, WATER DIVISION	3109574	CITY 18	395550	750537		5.2	07	08	290	GKMR		1200
2038P	GENERAL COLOR CO.	3119275	7	395735	750535		3.5	07	08	194	GKR		180
5302	CAMDEN CITY, WATER DIVISION	3100904	CITY 13	395557	750535		5.1	07	08	230	GKMR		1200
5302	CAMDEN CITY, WATER DIVISION	3101250	CITY 17	395546	750533		5.3	07	08	270	GKMR		1500
5201	NEW JERSEY-AMERICAN WATER CO.	3104847	52	395715	750519		3.7	07	08	198	GKMR		1050
5201	NEW JERSEY-AMERICAN WATER CO.	3103456	50	395726	750518		3.5	07	08	170	GKMR		700
5201	NEW JERSEY-AMERICAN WATER CO.	3120270	55	395718	750518		3.6	07	08	176	GKMR		1050
5201	NEW JERSEY-AMERICAN WATER CO.	3104780	51	395720	750513		3.6	07	08	192	GKMR		1300
2038P	GENERAL COLOR CO.	3105064	6	395718	750507		3.5	07	08	184	GKR		200
5201	NEW JERSEY-AMERICAN WATER CO.	3118947	53	395728	750502		3.3	07	08	194	GKMR		1000
10465W	WEST BANK OIL	DELAWARE	RIVER	395750	750500	F	3.0	07	27		SDDEL		
5201	NEW JERSEY-AMERICAN WATER CO.	3118944	54	395731	750458		3.3	07	08	195	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3101417	DEL GARD 2	395800	750417		2.5	07	27	147	GKMR		700
10250W	BISHOP EUSTACE PREP SCHOOL	3117884	1	395547	750413	T	4.9	07	27	150	GKMR		200
5173	MERCHANTVILLE-PENNSAUKEN WATER	3104836	BROWNING2A	395628	750406		4.1	07	27	140	GKMR		900
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105641	BROWNING1A	395627	750404		4.1	07	24	152	GKMR		875
5302	CAMDEN CITY, WATER DIVISION	5100054	DELAIR 2	395851	750355		1.5	07	27	146	GKMR		1830
5302	CAMDEN CITY, WATER DIVISION	5100055	DELAIR 3	395853	750348		1.4	07	27	135	GKMR		1830
5302	CAMDEN CITY, WATER DIVISION	5100053	DELAIR 1	395848	750347		1.5	07	27	141	GKMR		1680
10108W	CAMDEN CO VOC. & TECH. SCHOOLS	3105139	1	395620	750344	F	4.2	07	15	401	GKMR		
5302	CAMDEN CITY, WATER DIVISION	3116813	MORRIS 13	395905	750333		1.1	07	27	135	GKMR		2060
5302	CAMDEN CITY, WATER DIVISION	3115745	MORRIS 11	395900	750325		1.1	07	27	149	GKMR		2030
5302	CAMDEN CITY, WATER DIVISION	3116814	MORRIS 12	395914	750324		0.9	07	27	122	GKMR		2030
5302	CAMDEN CITY, WATER DIVISION	5100051	MORRIS 6	395900	750318		1.1	07	27	138	GKMR		1700
5302	CAMDEN CITY, WATER DIVISION	5100076	MORRIS 9	395906	750313		1.0	07	27	148	GKMR		1670
5302	CAMDEN CITY, WATER DIVISION	5100056	PUCHACK 1	395845	750312		1.4	07	27	141	GKMR		1500
5302	CAMDEN CITY, WATER DIVISION	5100057	PUCHACK 2	395842	750312		1.4	07	27	169	GKMR		1000
5302	CAMDEN CITY, WATER DIVISION	5100059	PUCHACK 5	395835	750308		1.6	07	27	186	GKMR		1324
5302	CAMDEN CITY, WATER DIVISION	3100944	MORRIS 8	395910	750307		0.9	07	27	128	GKMR		1670
5302	CAMDEN CITY, WATER DIVISION	5100058	PUCHACK 3	395840	750307		1.5	07	27	176	GKMR		1280
5305	MERCHANTVILLE-PENNSAUKEN	3104642	WOODBINE 1	395652	750307		3.5	07	24	288	GKMR		1000
5305	MERCHANTVILLE-PENNSAUKEN	3114563	WOODBINE 2	395652	750307		3.5	07	24	227	GKMR		1000
5302	CAMDEN CITY, WATER DIVISION	5100052	MORRIS 7	395916	750303		0.8	07	27	125	GKMR		1680
5302	CAMDEN CITY, WATER DIVISION	3104251	MORRIS 10	395919	750302		0.7	07	27	118	GKMR		1400
5302	CAMDEN CITY, WATER DIVISION	3108526A	PUCHACK 7	395835	750302		1.5	07	27	180	GKMR		2260
5302	CAMDEN CITY, WATER DIVISION	3104252	MORRIS 4	395929	750253		0.5	07	27	134	GKMR		1600
5302	CAMDEN CITY, WATER DIVISION	3100945	MORRIS 3	395933	750229		0.6	07	27	107	GKMR		1800
5173	MERCHANTVILLE-PENNSAUKEN WATER	3102915	MARION 1	395720	750225		3.0	07	27	279	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3104641	MARION 2	395711	750220		3.2	07	27	262	GKMR		1000
10262W	SCHAEVITZ ENGINEERING	3103338	1	395816	750218	T	2.0	07	27		GKMR		
10262W	SCHAEVITZ ENGINEERING	3103437	2	395816	750218	T	2.0	07	27		GKMR		
10262W	SCHAEVITZ ENGINEERING	3103444	3	395816	750218	T	2.0	07	27		GKMR		
5302	CAMDEN CITY, WATER DIVISION	5100050	MORRIS 1	395944	750211		0.8	07	27	107	GKMR		1600
5173	MERCHANTVILLE-PENNSAUKEN WATER	3105110	NATL HWY 1	395902	750153		1.4	07	27	231	GKMR		1000
10549W	SYCAMORE RIDGE APARTMENTS	3127629	3	395725	750151	T	3.1	07	27		GKMR		45
10363W	CHERRY HILL INN	UNKNOWN	1	395610	750136	T	4.5	07	16	179	GKMR		400
5173	MERCHANTVILLE-PENNSAUKEN WATER	3114554	PARK AVE 6	395755	750127		2.7	07	27	270	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3119207	NATL HWY 2	395915	750125		1.6	07	27	211	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3100011	PARK AVE 5	395800	750120		2.7	07	27	290	GKMR		1005
5173	MERCHANTVILLE-PENNSAUKEN WATER	3103534	PARK AVE 3	395801	750119		2.6	07	27	277	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	5100064	PARK AVE 2	395800	750118		2.7	07	27	262	GKMR		1000
5173	MERCHANTVILLE-PENNSAUKEN WATER	3100010	PARK AVE 1	395800	750117		2.7	07	27	274	GKMR		1005
5195	NEW JERSEY-AMERICAN WATER CO.	3104576	13HIGHLAND	400002	750044		2.0	05		197	GKMR		700
5195	NEW JERSEY-AMERICAN WATER CO.	3104864	27HIGHLAND	400002	750044		2.0	05		176	GKMR		1000

ATTACHMENT Map 9c

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
5203	NEW JERSEY-AMERICAN WATER CO.	3105033	COLUMBIA31	395600	750031		5.0	07	09	427	GKMR		1050
5203	NEW JERSEY-AMERICAN WATER CO.	3104051	COLUMBIA22	395609	750028		4.9	07	09	453	GKMR		1050
10580W	STAR GAS SERVICE	3129179	1	395846	750027		2.6	05	19		GKMR		50
5203	NEW JERSEY-AMERICAN WATER CO.	3104274	COLUMBIA24	395608	750025		4.9	07	09	167	GKMR		900
BU0058	VOTTA, LOUIS	STREAM 1	STREAM 1	395805	750015	F	3.2	05	24		SDRAN		
BU0058	VOTTA, LOUIS	POND 1	POND 1	395805	750015	F	3.2	05	24	15	GKET		
5195	NEW JERSEY-AMERICAN WATER CO.	3105321	28 STEPHEN	395904	750009		2.7	05	08	264	GKMR		1000
2142P	RIVERTON COUNTRY CLUB	2704844	2	395945	750008	S	2.5	05	31	174	GKMR		500
10595W	GENTILE, ALBERT JR/PRODUCE JNT	3130128		395618	750007	T	4.9	05	19				
2142P	RIVERTON COUNTRY CLUB	3118428	1A	400008	750006	S	2.5	05	31	119	GKMR		500
5195	NEW JERSEY-AMERICAN WATER CO.	3105437	31 STEPHEN	395906	750006		2.7	05		263	GKMR		1000
BU0081	HEISLER, EDGAR B.	WELL 1	P-121	400328	746325	U	4.1	05	06	210	GKMR		500
BU0008	HUNTER, JOHN	POND 1	POND 1	400038	745945	F	3.0	05	08	12	SDDEL		800
4055FS	NEW JERSEY AMERICAN WATER CO.	SURFACE WATER	1	400151	745932		3.7	05	08		SDDEL		315
5195	NEW JERSEY-AMERICAN WATER CO.	3103835	10 POMONA	395929	745922		3.2	05	08	281	GKMR		800
5195	NEW JERSEY-AMERICAN WATER CO.	3104276	12 POMONA	395929	745922		3.2	05	08	196	GKMR		700
5121	MOORESTOWN TOWNSHIP	3105202	7	395830	745918		3.6	05	22	385	GKMR		
2217P	CAMPBELL CONTAINER COMPANY	3103673	2 RECHARGE	395845	745915	T	3.6	05	22	266	GKMR		
5190	MAPLE SHADE TOWNSHIP	3106020	8	395727	745915		4.3	05	19	280	GKMR		760
5190	MAPLE SHADE TOWNSHIP	3112925	11	395727	745915		4.3	05	19	450	GKMR		1250
5190	MAPLE SHADE TOWNSHIP	3100060	2	395725	745914		4.4	05	19	126	GKMR		140
2217P	CAMPBELL CONTAINER COMPANY	3103674	1 OBS.	395842	745905	T	3.7	05	22	268	GKMR		
5190	MAPLE SHADE TOWNSHIP	3108922	9	395630	745855		5.3	05	19	220	GKMR		1000
5190	MAPLE SHADE TOWNSHIP	3108923	10	395630	745855		5.3	05	19	523	GKMR		1500
2217P	CAMPBELL CONTAINER COMPANY	3105715	1	395839	745852	T	3.9	05	22	272	GKMR		500
BU0050	VARSACI, JAMES & SONS	RANCOCAS CREEK	STREAM 1	400345	745825	F	5.9	05	12		SDRAN		
5121	MOORESTOWN TOWNSHIP	3104663	5	395704	745812		5.3	05	22	290	GKMR		700
5121	MOORESTOWN TOWNSHIP	5100041	3	395703	745811		5.4	05	22	299	GKMR		700
5195	NEW JERSEY-AMERICAN WATER CO.	3104697	14NEWA_BAN	395938	745810		4.2	05	08	325	GKMR		1000
5195	NEW JERSEY-AMERICAN WATER CO.	3104733	26NEWA_BAN	395938	745810		4.2	05	08	225	GKMR		800
5121	MOORESTOWN TOWNSHIP	3104727	6	395702	745808		5.4	05	22	290	GKMR		700
5188	NEW JERSEY-AMERICAN WATER CO.	2705202	FAIRVIEW30	400122	745807		4.6	05	10	235	GKMR		1000
5188	NEW JERSEY-AMERICAN WATER CO.	2703080	LEON 19	400122	745807		4.6	05	10	130	GKMR		700
5188	NEW JERSEY-AMERICAN WATER CO.	2704247	CHESTER 23	400105	745734		4.9	05	10	168	GKMR		
5188	NEW JERSEY-AMERICAN WATER CO.	2704680	CHESTER 24	400105	745734		4.9	05	10	150	GKMR		
10045W	RIVERSIDE BOARD OF EDUCATION	2704523	1	400205	745730	T	5.4	05	30		GKMR		

Number of Observations: 92

ATTACHMENT Map 9

 NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 395956 LAT. 750300 LON. AS OF 12/22/87 (IN ORDER BY DECREASING LONGITUDE) - 10/06/89

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
382	CAMDEN MUNICIPAL WELLS, CAMDEN CITY, CAMDEN CO.	395716	750620	4.2	00	0102	2080	1	
727	HARRISON AVE. LANDFILL, CAMDEN, CAMDEN CO.	395713	750620	4.3	0	2080	0	9	
1268	ADVANCED CHEMICAL TECHNOLOGY, CAMDEN CITY, CAMDEN CO.	395655	750605	4.4	68	0102	2080	1	B
450	CONRAIL, PAVONIA YARD, CAMDEN, CAMDEN CO.	395648	750558	4.4	53	103	160	1	
802	LANGSTON DIV-MOLINS MACHINE CO., CAMDEN, CAMDEN CO.	395727	750511	3.4	00	2080		1	B
527	SGL MODERN HARD CHROME SERVICE, PENNSAUKEN, CAMDEN CO.	395742	750400	2.7	39	2080	0	9	
1148	SHELL SERVICE STATION, 61-130 & FORWING RD, PENNSAUKEN, CAMDEN CO.	395748	750347	2.5	51			3	
1269	ADVANCED PROCESS SUPPLY, PENNSAUKEN, CAMDEN CO.	395830	750316	1.7	00	2090		1	B
657	CAMDEN'S PUCHACK WELL FIELD, CAMDEN CO.	395840	750255	1.5	39	2080	0	1	
1088	GARDEN STATE MOTORS, PENNSAUKEN, CAMDEN CO.	395845	750234	1.4	53	2080	0	1	B
911	PENLAR ANODIZING, PENNSAUKEN, CAMDEN CO.	395850	750230	1.3	00	2080	0	1	C
566	SWOPE OIL AND CHEMICAL, PENNSAUKEN, CAMDEN CO.	395856	750208	1.4	00	2080	0	1	E
910	MERCHANTVILLE/PENNSAUKEN WATER COMMISION, PENNSAUKEN, CAMDEN CO.	395853	750202	1.5	00	0102	2080	1	C
1218	NEW JERSEY WATER COMPANY, RIVERTON-PALMYRA, BURLINGTON CO.	400015	750015	2.4	05	2068		1	
580	HOEGANAES-INTERLAKE, CINNAMINSON TWP., BURLINGTON CO.	400120	745918	3.6	00	2080	0	9	
254	CINNAMINSON WELL CONTAMINATION, BURLINGTON CO.	400050	745840	3.9	00	2080	0	1	E
801	KSM FASTENING SYSTEMS, MOORESTOWN, BURLINGTON CO.	395811	745815	4.6	00	2050	2060	1	B

Number of Observations: 17

ATTACHMENT Map 9E

 NJGS CASE INDEX SITES WITHIN 5.0 MILES OF 395956 LAT. 750300 LON. AS OF 12/22/87 (IN ORDER BY SITE NUMBER) - 10/06/89

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
254	CINNAMINSON WELL CONTAMINATION, BURLINGTON CO.	400050	745840	3.9	00	2080	0	1	E
382	CAMDEN MUNICIPAL WELLS, CAMDEN CITY, CAMDEN CO.	395716	750620	4.2	00	0102	2080	1	
450	CONRAIL, PAVONIA YARD, CAMDEN, CAMDEN CO.	395648	750558	4.4	53	103	160	1	
527	SGL MODERN HARD CHROME SERVICE, PENNSAUKEN, CAMDEN CO.	395742	750400	2.7	39	2080	0	9	
566	SWOPE OIL AND CHEMICAL, PENNSAUKEN, CAMDEN CO.	395856	750208	1.4	00	2080	0	1	E
580	HOEGANAES-INTERLAKE, CINNAMINSON TWP., BURLINGTON CO.	400120	745918	3.6	00	2080	0	9	
657	CAMDEN'S FUCHACK WELL FIELD, CAMDEN CO.	395840	750255	1.5	39	2080	0	1	
727	HARRISON AVE. LANDFILL, CAMDEN, CAMDEN CO.	395713	750620	4.3	0	2080	0	9	
801	KSM FASTENING SYSTEMS, MOORESTOWN, BURLINGTON CO.	395811	745815	4.6	00	2050	2060	1	B
802	LANGSTON DIV-MOLINS MACHINE CO., CAMDEN, CAMDEN CO.	395727	750511	3.4	00	2080		1	B
910	MERCHANTVILLE/PENNSAUKEN WATER COMMISION, PENNSAUKEN, CAMDEN CO.	395853	750202	1.5	00	0102	2080	1	C
911	PENLAR ANODIZING, PENNSAUKEN, CAMDEN CO.	395850	750230	1.3	00	2080	0	1	C
1088	GARDEN STATE MOTORS, PENNSAUKEN, CAMDEN CO.	395845	750234	1.4	53	2080	0	1	B
1148	SHELL SERVICE STATION, RT 130 & BORWING RD, PENNSAUKEN, CAMDEN CO.	395748	750347	2.5	51			3	
1218	NEW JERSEY WATER COMPANY, RIVERTON-PALMYRA, BURLINGTON CO.	400015	750015	2.4	05	2068		1	
1268	ADVANCED CHEMICAL TECHNOLOGY, CAMDEN CITY, CAMDEN CO.	395655	750605	4.4	68	0102	2080	1	B
1269	ADVANCED PROCESS SUPPLY, PENNSAUKEN, CAMDEN CO.	395830	750316	1.7	00	2090		1	B

Number of Observations: 17

ATTACHMENT Map 9

(29)

All Pennsauken Blocks + Lots

PENNSAUKEN TAXES

QUARTER 3RD 1989

BLOCK #	LOT #	LOCATION	TAXES	INTEREST	TOTAL DUE
165	1	Derousse & Mt Vernon	1432.60		1432.60
167	1	Mt Vernon Avenue	30.60		30.60
168	1.YA	Derousse & Mt Vernon	233.39		233.39
169	1	Morgan & Adams	244.77		244.77
170	1	Mt Vernon & Velde	109.78		109.78
171	1	Mt Vernon & Velde	169.18		169.18
177	2	Engard Avenue	62.99		62.99
182	1	Delair & Zimmerman	66.59		66.59
182	4	Delair & Bannard	154.78		154.78
192	1.YA	River & Delair	352.75		352.75
196	1.YA	Delair & Holman	394.15		394.15
199	1.YA	Engard & Day M17	392.34		392.34
200	1.YA	Delair & Day	485.93		485.93
201	1.A	Velde Avenue	55.79		55.79
203	1.YA	Engard & Balfour	388.75		388.75
204	1.YA	Delair & Balfour	136.78		136.78
205	3	Velde Avenue	34.20		34.20
247	1.YA	C & ARR	22295.30		22295.30
249	1	Pennsauken Creek	2148.90		2148.90
249	4	C & ARR	122.38		122.38
249	4.A	C & ARR Co	136.78		136.78
249	5	C & ARR	1673.77		1673.77

Parkside (Block ~~707~~ old 880 Lot 1

New 1279 Lot 1+5

ATTACHMENT A

WATER PURVEYOR: City of Camden, Utilities Department

PWS ID #: 0408001

ATTACHMENT B

WATER UTILIZATION REPORT
Bureau of Safe Drinking Water
CN-029, Trenton, N.J. 08625
For The Year 1988

(Thousands of Gallons)

CALENDAR QUARTER	A	B	C	D*	E	F
uary, February, March	1,627,525	1,566,271	776,144	141,960	---	648,170
ril, May, June	1,397,469	1,344,655	856,876	141,960	---	342,819
ly, August, September	1,526,272	1,464,482	521,659	143,520	---	799,303
tober, November, December	1,622,248	1,559,318	863,731	143,520	---	552,067
TAL	6,173,514	5,931,726	3,018,407	570,960	---	2,342,359,000
	TOTAL WITHDRAWN FROM SURFACE OR GROUNDWATER SOURCE (MGD)	TOTAL AMOUNT DELIVERED AFTER PROCESSING TO DISTRIBUTION SYSTEM (MGD)	TOTAL AMOUNT ACCOUNTABLE AT METERED DELIVERY POINTS OF DISTRIBUTION SYSTEM (MGD)	TOTAL AMOUNT ESTIMATED AT UN-METERED POINTS OF DISTRIBUTION SYSTEM (MGD)	TOTAL AMOUNT OF BULK SALE TO OTHER WATER PURVEYORS (MGD)	TOTAL AMOUNT LOST OR UNACCOUNTED FOR IN DISTRIBUTION SYSTEM (MGD)

*"D" includes estimated usage by remaining flat rate residential customers, estimated hydrant flushing usage, estimated fire usage, and estimated public building usage.

ATTACHMENT B

31-02-228D

Form 87-5M

Permit No. 31-945

Application No. 576

County

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

Division of Water Policy & Supply

WELL RECORD

LAYNE WELL # 3-A

Norris #3

1. OWNER CITY OF CAMDEN ADDRESS CAMDEN, NEW JERSEY

Owner's Well No. SURFACE ELEVATION Feet (Above mean sea level)

2. LOCATION CAMDEN, NEW JERSEY

3. DATE COMPLETED 7-28-53 DRILLER LAYNE NEW YORK CO., INC.

4. DIAMETER: Top 18 Inches Bottom 18 Inches TOTAL DEPTH ~~107~~ 136 Feet

5. CASING: Type STEEL Diameter 30, 24, 18 Inches Length 41, 70 & 73 Feet

6. SCREEN: Type LAYNE Size of Opening SHUTTER Diameter 18 Inches Length 30' Feet

Range in Depth { Top ~~103~~ 73 Feet Bottom 107 Feet } Geologic Formation COARSE SAND

Tail piece. Diameter 18 Inches Length 4 Feet

7. WELL FLOWS NATURALLY Gallons per Minute at Feet above surface

Water rises to Feet above surface

8. RECORD OF TEST: Date 7-28-53 Yield 1,000 Gallons per minute

Static water level before pumping 12 Feet below surface

Pumping level 46 feet below surface after 8 hours pumping

Drawdown 34 Feet Specific Capacity 1,000/34 Gals. per min. per ft. of drawdown

How Pumped ELEC. How measured ORIFICE

Observed effect on nearby wells

9. PERMANENT PUMPING EQUIPMENT:

Type TURBINE Capacity 1,000 Gallons per minute

How Driven ELEC. Horse Power 50 R.P.M. 870

Depth of pump in well 67 Feet Depth of Foot piece in well 77 Feet

Depth of Air Line in well 77 Feet Type of Meter on Pump

10. USED FOR PUBLIC SUPPLY AMOUNT { Average Gallons Daily; Maximum Gallons Daily }

11. QUALITY OF WATER Sample: Yes No.

Taste Odor Color Temperature °F

12. LOG SEE REVERSE SIDE Are samples available?
(Give details on back of sheet or on separate sheet)

13. SOURCE OF DATA LAYNE NEW YORK COMPANY, INC.

14. DATA OBTAINED BY LAYNE NEW YORK COMPANY, INC. DATE SEPTEMBER 9, 1954

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

ATTACHMENT G-1

FORM 87

31.2.225

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 31-4252
Application No. _____
County _____

WELL RECORD

1. OWNER City of Camden ADDRESS Camden, N. J.
   Owner's Well No. 4A Morris Sta. SURFACE ELEVATION +8.0 ± Feet (Above mean sea level)
2. LOCATION Morris Station Plant
3. DATE COMPLETED 10/24/60 DRILLER Layne-New York Co., Inc.
4. DIAMETER: top 18 inches Bottom 18 inches TOTAL DEPTH 134'5" Feet
5. CASING: Type Steel Diameter 18 inches Length 95 Feet
6. SCREEN: Type Stainless Steel Size of Opening Shutter Diameter 18 inches Length 35 Feet
   Range in Depth { Top 95 Feet, Bottom 130 Feet } Geologic Formation Gray sand & gravel, little white clay
   Tail piece: Diameter 18 inches Length 4'5" Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 10/24/60 Yield 1585 Gallons per minute
   Static water level before pumping 13 Feet below surface
   Pumping level 41 feet below surface after 8 hours pumping
   Drawdown 28 Feet Specific Capacity 58.5 Gals. per min. per ft. of drawdown
   How Pumped Gasoline Engine How measured Orifice
   Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
   Type Turbine Mfrs. Name Layne, & Bowler, Memphis, Tenn.
   Capacity 1400 G.P.M. How Driven Elect. Motor H.P. 60 R.P.M. 1800
   Depth of Pump in well 99 Feet Depth of Footpiece in well 10 Feet
   Depth of Air Line in well 109 Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR Domestic Supply AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes ___ No. ___
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG see reverse side Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Layne - New York Co., Inc.
14. DATA OBTAINED BY Layen - New York Co., Inc. Date 2/9/61

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-2

31.2.227

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 31-4253
Application No. _____
County _____

WELL RECORD

1. OWNER City of Camden ADDRESS Camden, N. J.
   Owner's Well No. 5 NA Morris Sta. SURFACE ELEVATION +4.0 + Feet (Above mean sea level)
2. LOCATION Morris Station Plant
3. DATE COMPLETED 10/18/60 DRILLER Layne - New York Co., Inc.
4. DIAMETER: top 18 inches Bottom 18 inches TOTAL DEPTH 117 Feet
5. CASING: Type Steel Diameter 18 inches Length 79 Feet
6. SCREEN: Type Stainless Steel Size of Opening Shutter Diameter 18 inches Length 35 Feet
   Range in Depth { Top 79 Feet, Bottom 114 Feet } Geologic Formation Sand gravel &lay & boulders
   Tail piece: Diameter 18 inches Length 3 Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 10/18/60 Yield 1529 Gallons per minute
   Static water level before pumping 12 Feet below surface
   Pumping level 59 feet below surface after 8 hours pumping
   Drawdown 47 Feet Specific Capacity 32.6 Gals. per min. per ft. of drawdown
   How Pumped Gasoline Engine How measured Orifice
   Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
   Type Turbine Mfrs. Name Layne & Bowler, Memphis, Tenn.
   Capacity 1400 G.P.M. How Driven Elect. Motor H.P. 60 R.P.M. 1800
   Depth of Pump in well 84 Feet Depth of Footpiece in well 10 Feet
   Depth of Air Line in well 94 Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR Domestic Supply AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes ___ No. ___
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG see reverse side Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Layne - New York Co., Inc.
14. DATA OBTAINED BY Layne - New York Co., Inc. Date 2/9/61

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-3

Form 07
12/8/78

12/16/78

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit No. 31-1456B
Application No. _____
County _____

WELL RECORD

31-02-246

1. OWNER CITY OF CAMDEN ADDRESS CAMDEN, N.J.
Owner's Well No. TEST #6 SURFACE ELEVATION — Feet (Above mean sea level)

2. LOCATION MORRIS WELL FIELD

3. DATE COMPLETED 1-25-79 DRILLER JOE DREBES

4. DIAMETER: top 12" inches Bottom 4" inches TOTAL DEPTH 144'-5" Feet

5. CASING: Type STEEL T&C Diameter 4 inches Length 100'11" Feet

6. SCREEN: Type PVC Size of Opening 40 Diameter 4" inches Length 42' Feet
Range in Depth { Top 101-106 Feet / Bottom 142 Feet } # 116' TO 142' Geologic Formation _____
Tail piece: Diameter 4" inches Length 2'5" Feet

7. WELL FLOWS NATURALLY — Gallons per Minute at — Feet above surface
Water rises to — Feet above surface

8. RECORD OF TEST: Date 2-2-79 Yield 106 Gallons per minute
Static water level before pumping 39.7 Feet below surface
Pumping level 43 feet below surface after 12 hours pumping
Drawdown 3.3 Feet Specific Capacity 32 Gals. per min. per ft. of drawdown
How Pumped SUBMERSIBLE How measured ORIFICE
Observed effect on nearby wells N/A

9. PERMANENT PUMPING EQUIPMENT: — NONE - TEST WELL ONLY —
Type N/A Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily }

11. QUALITY OF WATER _____ Sample: Yes _____ No. _____
Taste _____ Odor _____ Color _____ Temp. _____ °F

12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)

13. SOURCE OF DATA DRILLERS LOGS

14. DATA OBTAINED BY [signature] Date 4-6-79

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT

1/16/78

12/5/78

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit No. 31 14569

Application No. _____

County _____

WELL RECORD

31-02-246

1. OWNER CITY OF CAMDEN ADDRESS CAMDEN, N.J.
   Owner's Well No. TEST WELL #7 SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION (MORRIS STATION) ZIMMERMAN AVE.
3. DATE COMPLETED 1-10-79 DRILLER JOE ANDREWS
4. DIAMETER: top 10 Inches Bottom 6 Inches TOTAL DEPTH 141' Feet
5. CASING: Type WELDED STEEL Diameter 10 Inches Length 86'6" Feet
6. SCREEN: Type PVC Size of Opening 40 Diameter 6 Inches Length 98'-108' 118'-138' Feet
   Range in Depth { Top 98'-108' Feet / Bottom 118'-138' Feet } Geologic Formation _____
   Tail piece: Diameter 6" Inches Length 3' Feet
7. WELL FLOWS NATURALLY — Gallons per Minute at — Feet above surface
   Water rises to — Feet above surface
8. RECORD OF TEST: Date 2-7-79 Yield 608 Gallons per minute
   Static water level before pumping 35'8" Feet below surface
   Pumping level 48' feet below surface after 6 hours pumping
   Drawdown 12'4" Feet Specific Capacity 49 Gals. per min. per ft. of drawdown
   How Pumped VERTICAL TURBINE How measured ORIFICE
   Observed effect on nearby wells NONE
9. PERMANENT PUMPING EQUIPMENT:
   Type N/A Mfrs. Name _____
   Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
   Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
   Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR TEST AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes ____ No. ____
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG SEE ATTACHED Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA DRILLERS' RECORDS
14. DATA OBTAINED BY [signature] Date 4-6-79

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT 6-5

31-02-22

Form 87-5M

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
Division of Water Policy & Supply

Permit No. 31-944
Application No. 576
County _____

Morris #8

WELL RECORD

LAYNE WELL # 8-A

1. OWNER CITY OF CAMDEN ADDRESS CAMDEN, NEW JERSEY
   Owner's Well No. _____ SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION CAMDEN, NEW JERSEY
3. DATE COMPLETED 7-29-53 DRILLER LAYNE-NEW YORK COMPANY, INC.
4. DIAMETER: Top 18 Inches Bottom 18 Inches TOTAL DEPTH 128 Feet
5. CASING: Type STEEL Diameter 30,24,18 Inches Length 34,85,89 Feet
6. SCREEN: Type LAYNE Size of Opening SHUTTER Diameter 18 Inches Length 35 Feet
   Range in Depth { Top 89 Feet, Bottom 124 Feet } Geologic Formation SAND AND GRAVEL
   Tail piece. Diameter 18 Inches Length 4 Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 7-29-53 Yield 1,000 Gallons per minute
   Static water level before pumping 12' Feet below surface
   Pumping level 42 feet below surface after 8 hours pumping
   Drawdown 30 Feet Specific Capacity 1000/30 Gals. per min. per ft. of drawdown
   How Pumped Elec. How measured ORIFICE
   Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
   Type TURBINE Capacity 1,000 Gallons per minute
   How Driven ELEC. Horse Power 50 R.P.M. 870
   Depth of pump in well 77 Feet Depth of Foot piece in well 87 Feet
   Depth of Air Line in well 87 Feet Type of Meter on Pump _____
10. USED FOR PUBLIC SUPPLY AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No. _____
    Taste _____ Odor _____ Color _____ Temperature _____ °F
12. LOG SEE REVERSE SIDE (Give details on back of sheet or on separate sheet) Are samples available? _____
13. SOURCE OF DATA LAYNE NEW YORK COMPANY, INCORPORATED
14. DATA OBTAINED BY LAYNE NEW YORK COMPANY, INC. DATE SEPTEMBER 10, 1954

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

ATTACHMENT C-6

31.2.228

FORM 87

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 31-4251
Application No. _____
County _____

WELL RECORD

1. OWNER City of Camden ADDRESS Camden, N. J.
   Owner's Well No. 10 Morris Sta. SURFACE ELEVATION + 8.0 ± Feet (Above mean sea level)
2. LOCATION Morris Station Plant
3. DATE COMPLETED 11/29/60 DRILLER Layne - New York Co., Inc.
4. DIAMETER: top 18 inches Bottom 18 inches TOTAL DEPTH 118 Feet
5. CASING: Type Steel Diameter 18 inches Length 75 Feet
6. SCREEN: Type Stainless Steel Size of Opening Shutter Diameter 18 inches Length 40 Feet
   Range in Depth { Top 75 Feet, Bottom 115 Feet } Geologic Formation White sand gravel white clay, Brown sand and gravel & clay
   Tail piece: Diameter 18 inches Length 3 Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 11/29/60 Yield 1529 Gallons per minute
   Static water level before pumping 11 Feet below surface
   Pumping level 36 feet below surface after 8 hours pumping
   Drawdown 25 Feet Specific Capacity 61.2 Gals. per min. per ft. of drawdown
   How Pumped Gasoline Engine How measured Orifice
   Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
   Type Turbine Mfrs. Name Layne & Bowler, Memphis, Tenn.
   Capacity 1400 G.P.M. How Driven Elect. Motor H.P. 60 R.P.M. 1800
   Depth of Pump in well 84 Feet Depth of Footpiece in well 10 Feet
   Depth of Air Line in well 94 Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR Domestic supply AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes ___ No. ___
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG see reverse side Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Layne - New York Co., Inc.
14. DATA OBTAINED BY Layne - New York Co., Inc. Date 2/9/61

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-1

Form D7

5/15/79 31-2249

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit No. 31-15745

Application No. _____

County _____

WELL RECORD

1. OWNER City of Camden ADDRESS City Hall - Camden, N.J.
   Owner's Well No. Morris Station #11 SURFACE ELEVATION Gr. Level Feet (Above mean sea level)
2. LOCATION Lot #1 Block # S-247 Pennsauken, Camden County
3. DATE COMPLETED 8/1/79 DRILLER Drebes, Burke
4. DIAMETER: top 24 Inches Bottom 16 Inches TOTAL DEPTH 149 Feet
5. CASING: Type Black Steel Diameter 24 Inches Length 98 Feet
6. SCREEN: Type Stainless Steel, W.W. Size of Opening .40 & .70 Diameter 16 Inches Length 42 Feet
   Range in Depth { Top 102 Feet, Bottom 144 Feet } Geologic Formation _____
   Tail piece: Diameter 16 Inches Length 5 Feet
7. WELL FLOWS NATURALLY N/A Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 6/7/79 Yield 2030 Gallons per minute
   Static water level before pumping 39 Feet below surface
   Pumping level 85 feet below surface after 24 hours pumping
   Drawdown 46 Feet Specific Capacity 44.13 Gals. per min. per ft. of drawdown
   How Pumped Vertical Turbine How measured M-Scope & Orifice
   Observed effect on nearby wells None
9. PERMANENT PUMPING EQUIPMENT:
   Type Vertical Turbine Mfrs. Name Layne & Bowler
   Capacity 1250 G.P.M. How Driven Elect H.P. 100 R.P.M. 1770
   Depth of Pump in well 100 Feet Depth of Footpiece in well 2'-5" Feet
   Depth of Air Line in well 102 Feet Type of Meter on Pump Vertiflow Size 10 Inches
10. USED FOR Public Supply AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER Good Sample: Yes ✓ No. ____
    Taste None Odor None Color None Temp. 52 °F
12. LOG Attached Are samples available? ____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Layne-New York Co. - Linden, N.J.
14. DATA OBTAINED BY R. Hesse Date 4/14/80

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-8

31-02-251

FORM 87

4/20/81

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit No. 31-16814
Application No. _____
County _____

WELL RECORD

1. OWNER CITY OF CAMDEN, N.J. ADDRESS CITY HALL-CAMDEN, N.J. 08101
   Owner's Well No. WELL #12 - SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION N/SIDE OF RIVER ROAD + PENN R.R. PENNSAUKEN, N.J.
3. DATE COMPLETED JAN 7, 1981 DRILLER J. DREBES - LAYNE-N.Y. CO. INC
4. DIAMETER: top 18" Inches Bottom 18" Inches TOTAL DEPTH 122'-6" Feet
5. CASING: Type BLACK STEEL WELDED Diameter 18" Inches Length 86' Feet
6. SCREEN: Type 304 STAINLESS WIRE WRAP Size of Opening #70 Diameter 16" Inches Length 24' Feet
   Range in Depth { Top 86'-TO 95' Feet / Bottom 102'6"-117'6" Feet } Geologic Formation _____
   Tail piece: Diameter 16" Inches Length 5'-0" Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 7-7-80 Yield 2030 Gallons per minute
   Static water level before pumping 32' Feet below surface
   Pumping level 70' feet below surface after 8 hours pumping
   Drawdown 38.0' Feet Specific Capacity 53.42 Gals. per min. per ft. of drawdown
   How Pumped VERTICAL TURBINE How measured ORIFICE
   Observed effect on nearby wells NONE
9. PERMANENT PUMPING EQUIPMENT:
   Type VERTICAL TURBINE Mfrs. Name LAYNE + BOWLER INC - MEMPHIS, TENN.
   Capacity 1500 G.P.M. How Driven ELECT MOTOR H.P. 75 R.P.M. 1800
   Depth of Pump in well 84'-9" Feet Depth of Footpiece in well 94'-9" Feet
   Depth of Air Line in well 80' Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR PUBLIC SUPPLY AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily }
11. QUALITY OF WATER Good Sample: Yes ___ No. ___
    Taste NO Odor NO Color NO Temp. _____ °F
12. LOG _____ Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA LAYNE - NEW YORK CO. INC. 1250 W. ELIZ AVE - LINDEN, N.J. 07036
14. DATA OBTAINED BY DW Date 8/29/83

NOTE: [illegible]

ATTACHMENT C-9

31 02 246

FORM 87

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit No. 31-16813
Application No. _____
County _____

4/23/80

WELL RECORD

1. OWNER CITY OF CAMDEN, N.J. ADDRESS CITY HALL, CAMDEN, N.J. 08101
   Owner's Well No. 13 SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION N/SIDE OF PENN R.R. + RIVER ROAD - PENNSAUKEN, N.J.
3. DATE COMPLETED 6-4-80 DRILLER J. DREDES - LNY CO. INC.
4. DIAMETER: top 18" inches Bottom 135' 18" inches TOTAL DEPTH 135' Feet
5. CASING: Type BLACK STEEL PIPE WELDED Diameter 375"x18" Inches Length 90' Feet
6. SCREEN: Type 16"-304 STAINLESS WIRE WRAP Size of Opening 55+ 70 Diameter 16" Inches Length 40' Feet
   Range in Depth { Top 90'-94' 98'-124' 126'-130' Feet / Bottom _____ Feet } Geologic Formation _____
   Tail piece: Diameter 16" Inches Length 5'-0" Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 6-4-80 Yield 2060 Gallons per minute
   Static water level before pumping 33' Feet below surface
   Pumping level 78' feet below surface after 8 HRS ~~[illegible]~~' hours pumping
   Drawdown 45' Feet Specific Capacity 45.77 Gals. per min. per ft. of drawdown
   How Pumped VERTICAL TURBINE PUMP How measured ORIFICE
   Observed effect on nearby wells NONE
9. PERMANENT PUMPING EQUIPMENT:
   Type VERTICAL TURBINE Mfrs. Name LAYNE + BOWLER INC - MEMPHIS, TENN.
   Capacity 1500 G.P.M. How Driven ELECT. MOTOR H.P. 75 R.P.M. 1800
   Depth of Pump in well 84'- Feet Depth of Footpiece in well 94' Feet
   Depth of Air Line in well 80' Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR PUBLIC SUPPLY AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily }
11. QUALITY OF WATER Good Sample: Yes ___ No. ___
    Taste ~~[illegible]~~ NO Odor NO Color NO Temp. _____ °F
12. LOG _____ Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA LAYNE - NEW YORK CO. INC - 1250 W. ELIZ AVE - LINDEN, N.J. 07036
14. DATA OBTAINED BY LAYNE - N.Y. CO. INC. Date 8/29/83 [illegible]

[illegible]

ATTACHMENT C-10

31 02 28147

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Permit No. 31-85264
Application No. _____
County _____

WELL RECORD

1. OWNER CITY OF CAMDEN ADDRESS CITY HALL, CAMDEN, N.J.
   Owner's Well No. 67 SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION PUCHACK WELL FIELD, CAMDEN, N.J.
3. DATE COMPLETED _____ DRILLER LAYNE NEW YORK CO. INC.
4. DIAMETER: top 24 Inches Bottom 18 Inches TOTAL DEPTH 180 Feet
5. CASING: Type BLACK STEEL Diameter 18 Inches Length 130 Feet
6. SCREEN: Type LAYNE SHUTTER Size of Opening 7 Diameter 18 Inches Length 40 Feet
   Range in Depth { Top 140 Feet, Bottom 180 Feet } Geologic Formation KMR
   Tail piece: Diameter NONE Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date JANUARY 29, 1975 Yield 1287 Gallons per minute
   Static water level before pumping 56 Feet below surface
   Pumping level 79 feet below surface after 8 hours pumping
   Drawdown 23 Feet Specific Capacity 55.96 Gals. per min. per ft. of drawdown
   How Pumped VERTICLE TURBINE How measured ORIFICE
   Observed effect on nearby wells NONE OBSERVED
9. PERMANENT PUMPING EQUIPMENT:
   Type VERTICLE TURBINE Mfrs. Name SINGER, LAYNE, AND BOWLER
   Capacity 1200 G.P.M. How Driven ELECT. MOTOR H.P. 75 R.P.M. 1800
   Depth of Pump in well 124 Feet Depth of Footpiece in well 134 Feet
   Depth of Air Line in well 134 Feet Type of Meter on Pump TUBE Size 10 Inches
10. USED FOR PUBLIC SUPPLY AMOUNT { Average 1200 GPM Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER SEE ATTACHED Sample: Yes ____ No. ____
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG SEE REVERSE Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA LAYNE NEW YORK CO. INC.
14. DATA OBTAINED BY DOUGLAS E. SIMMONS Date JULY 18, 1975

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-11

FORM 87

31-02-257

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Permit No. 31-8001
Application No. _____
County _____

WELL RECORD

1. OWNER CITY OF CAMDEN ADDRESS CITY HALL, CAMDEN
   Owner's Well No. TEST 1-74 SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION CITY OF CAMDEN, CAMDEN N.J.- PUCHACK WELL FIELD
3. DATE COMPLETED MAY 1974 DRILLER LAYNE NEW YORK CO. INC.
4. DIAMETER: top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
   ALL MATERIAL REMOVED
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
   Range in Depth { Top _____ Feet, Bottom _____ Feet } Geologic Formation KMR
   Tail piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date APRIL 11, 1974 Yield 524 Gallons per minute
   Static water level before pumping 57 Feet below surface
   Pumping level 75 feet below surface after 8 hours pumping
   Drawdown 18 Feet Specific Capacity 29.11 Gals. per min. per ft. of drawdown
   How Pumped VERTICLE TURBINE How measured ORIFICE
   Observed effect on nearby wells NONE OBSERVED
9. PERMANENT PUMPING EQUIPMENT:
   Type NONE Mfrs. Name _____
   Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
   Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
   Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR TEST AMOUNT { Average _____ Gallons Daily, Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No. _____
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG SEE ATTACHED Are samples available? _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA LAYNE NEW YORK CO. INC.
14. DATA OBTAINED BY DOUGLAS E. SIMMONS Date FEB. 21, 1975

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-12

cc Salem
Linden
10.8.70
31.02.273
31-5450

LAYNE-NEW YORK CO., INC.

1250 WEST ELIZABETH AVE., LINDEN, N. J.

LOG OF WELL

Well No. 4R (Puchack) Job No. M460-70 Test No.

Log of Well for (Owner) City of Camden

Address Camden, N. J.

Representative, if any

Well Located at Velde Ave in Camden County, State of New Jersey

Furnish sketch of location Date Drilling started 8-18-70 Date ~~Test Hole~~ Completed & pumped 8/28/70

Total depth to bottom of Well 220' Diameter ~~[illegible]~~ 24" & 18" Elevation at Ground Level, if available

Elevation at Ground Level, if available Distance from where measurements were taken to ground level

Water stands when not pumping 82 feet inches from the surface of the ground

All Measurements taken from

THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATA	Length of Core Taken	FORMATION FOUND EACH STRATUM	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATA	Length of Core Taken	FORMATION FOUND EACH STRATUM
2'	2'		Top soil				
18'	20'		Fine to coarse sand, gravel, streaks of clay				
10'	30'		White clay				
15'	45'		Fine to coarse sand, gravel, streaks of clay				
15'	60'		Yellow, white, grey clay - streaks of sand				
35'	95'		Fine to coarse sand, gravel, streaks of soft clay				
70'	165'		Red, white, grey clay				
25'	190'		Fine to coarse sand, gravel				
30'	220'		Fine to coarse sand, gravel, large rocks.				

Remarks and opinion of Test

ATTACHMENT C-13

CHECK TYPE OF RIG USED { Reverse X Jed-A Rig / Rotary / Cable Tool

J. E. Thompson
Driller

31.2.7.1.2

Form 87-5M

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
Division of Water Policy & Supply

Permit No. 31-904
Application No. 7
County

WELL RECORD
LAYNE WELL #13

1. OWNER City of Camden ADDRESS Camden, New Jersey
   Owner's Well No. SURFACE ELEVATION Feet (Above mean sea level)
2. LOCATION Kaighn Avenue and Euclid Street, Camden, N. J.
3. DATE COMPLETED 6/19/53 DRILLER Layne-New York Company, Inc.
4. DIAMETER: Top 18 Inches Bottom 18 Inches TOTAL DEPTH 230 Feet
5. CASING: Type Steel Diameter 30-24 & 18" Inches Length 40, 180, 185 Feet
6. SCREEN: Type Layne Size of Opening Shutter Diameter 18 Inches Length 40 Feet
   Range in Depth { Top 185 Feet, Bottom 225 Feet } Geologic Formation Coarse Sand and Gravel
   Tail piece. Diameter 18 Inches Length 5 Feet
7. WELL FLOWS NATURALLY Gallons per Minute at Feet above surface
   Water rises to Feet above surface
8. RECORD OF TEST: Date 6/19/53 Yield 1,000 Gallons per minute
   Static water level before pumping 46 Feet below surface
   Pumping level 70 feet below surface after 8 hours pumping
   Drawdown 24 Feet Specific Capacity $\frac{1000}{24}$ Gals. per min. per ft. of drawdown
   How Pumped Elec. How measured Orifice
   Observed effect on nearby wells
9. PERMANENT PUMPING EQUIPMENT:
   Type Turbine Capacity 1,000 Gallons per minute
   How Driven Elec. Horse Power 75 R.P.M. 1800
   Depth of pump in well 95 Feet Depth of Foot piece in well 107 Feet
   Depth of Air Line in well 107 Feet Type of Meter on Pump
10. USED FOR Public Supply
    AMOUNT { Average Gallons Daily; Maximum Gallons Daily }
11. QUALITY OF WATER Sample: Yes No.
    Taste Odor Color Temperature °F
12. LOG SEE REVERSE SIDE (Give details on back of sheet or on separate sheet) Are samples available?
13. SOURCE OF DATA Layne-New York Company, Inc.
14. DATA OBTAINED BY Layne-New York Co., Inc. DATE September 9, 1954

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

ATTACHMENT C-14

31·02·444

Form 87-5M

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
Division of Water Policy & Supply

Permit No. 31-1249
Application No. 785
County

WELL RECORD
LAYNE WELL NO. 16

1. OWNER City of Camden ADDRESS Camden, N. J.
   Owner's Well No. #16 SURFACE ELEVATION ~25 Feet (Above mean sea level)
2. LOCATION Camden, New Jersey
3. DATE COMPLETED 5/3/54 DRILLER Layne-New York Co., Inc.
4. DIAMETER: Top 18 Inches Bottom 18 Inches TOTAL DEPTH 180 Feet
5. CASING: Type Steel Diameter 30,24 & 18 Inches Length 40,140, 149 Feet
6. SCREEN: Type Layne Size of Opening Shutter Diameter 18 Inches Length 30 Feet
   Range in Depth { Top 149 Feet, Bottom 179 Feet } Geologic Formation Sand, Gravel & Boulders
   Tail piece. Diameter Inches Length Feet
7. WELL FLOWS NATURALLY Gallons per Minute at Feet above surface
   Water rises to Feet above surface
8. RECORD OF TEST: Date 5/3/54 Yield 1,000 Gallons per minute
   Static water level before pumping 50 Feet below surface
   Pumping level 103 feet below surface after 8 hours pumping
   Drawdown 53 Feet Specific Capacity $\frac{1000}{53}$ Gals. per min. per ft. of drawdown
   How Pumped Elec. How measured Orifice
   Observed effect on nearby wells
9. PERMANENT PUMPING EQUIPMENT:
   Type Turbine Capacity 1000 Gallons per minute
   How Driven Elec. Horse Power 75 R.P.M. 1800
   Depth of pump in well 135 Feet Depth of Foot piece in well 145 Feet
   Depth of Air Line in well 145 Feet Type of Meter on Pump
10. USED FOR Public Supply AMOUNT { Average Gallons Daily, Maximum Gallons Daily }
11. QUALITY OF WATER Sample: Yes No.
    Taste Odor Color Temperature °F
12. LOG SEE REVERSE SIDE Are samples available?
    (Give details on back of sheet or on separate sheet)
13. SOURCE OF DATA Layne-New York Company, Inc.
14. DATA OBTAINED BY Layne-New York Company, Inc. DATE September 14, 1954

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

ATTACHMENT C-15

37.104

31.2.7.1.2.0

Permit No. 31/1250
Application No. 786
County

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

WELL RECORD

1. OWNER City of Camden ADDRESS Camden, N. J.
   Owner's Well No. 17 SURFACE ELEVATION ±35 Feet (Above mean sea level)
2. LOCATION Camden, N. J.
3. DATE COMPLETED 5/13/54 DRILLER Layne-New York Co., Inc.
4. DIAMETER: top 18 Inches Botton 18 Inches TOTAL DEPTH 270 Feet
5. CASING: Type steel Diameter 30, 24, & 18 Inches Length 45, 225, 230 Feet
6. SCREEN: Type Layne Size of Opening shutter Diameter 18 Inches, Length 35 Feet
   Range { Top 230 Feet / Bottom 265 Feet } Geologic Formation sand and gravel
   Tail piece. Diameter 18 Inches Length 5 Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
   Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 5/13/54 Yield 1,000 Gallons per minute
   Static water level before pumping 56 Feet below surface
   Pumping level 86 feet below surface after 8 hours pumping
   Drawdown 30 Feet Specific Capacity 1000/30 Gals. per min. per ft. of drawdown
   How Pumped elec. How measured orifice
   Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
   Type turbine Mfrs. Name _____
   Capacity 1,000 G.P.M. How Driven elec. H.P. 75 R.P.M. 1800
   Depth of Pump in well 115 Feet Depth of Footpiece in well 125 Feet
   Depth of Air Line in well 125 Feet Depth of Meter on Pump _____
10. USED FOR public supply AMOUNT Average _____ Gallons Daily
    Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes ____ No. ____
    Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG see reverse side Are samples available _____
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA N. J. State Geologist
14. DATA OBTAINED BY KCC Date 9/14/54

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

ATTACHMENT C-16

(26)

Engineering Report

Interconnects p. 9-2

WATER SYSTEM IMPROVEMENTS

For

City of Camden
Department of Utilities
Camden , New Jersey

SEPTEMBER 1981

MALCOLM PIRNIE, INC.
CONSULTING ENVIRONMENTAL ENGINEERS

ATTACHMENT D-1

- 1,2-Dichloroethane
- Vinyl chloride

The U.S. Environmental Protection Agency has taken steps toward developing MCL's for some volatile organic chemicals. To date none have been set due to the limited data available on their health effects. The State of New Jersey has accepted as its guideline a maximum of 50 ug/l for any one compound and 100 ug/l for the total of all VOC's.

Raw Water Quality

The City draws its entire water supply from wells tapping the Raritan-Magothy aquifer, the largest water bearing stratum in the area. Water quality conditions in the aquifer have been studied in detail by federal and state agencies and by consultants to the City. A partial list of previous reports is presented in Appendix A - References.

Groundwater quality depends on several factors. Inorganic matter in groundwater usually occurs as dissolved solids. Therefore, the soluble chemical constituents in the soil and sediment layers through which the groundwater passes are largely responsible for the chemical characteristics of the groundwater. As the chemical make-up of underground deposits varies greatly from one location to another, so too can groundwater quality.

Another factor influencing the quality of groundwater is its proximity to sources of pollution. Leachate from industrial waste lagoons, septic systems, sanitary landfills, and also indiscriminate disposal of hazardous materials, can adversely affect the quality of local groundwater.

The water quality of wells near a river or watercourse can be affected by the quality of water from that river or watercourse. In the case of several Camden wells which are close to the Delaware River, studies have shown that significant amounts of recharge into the Raritan-Magothy Aquifer at these wells comes from the Delaware River.

Available data on the raw water quality at each of the 25 active wells was reviewed in detail. Table 4-2 summarizes data on those contaminants at each well which approach or exceed drinking water standards. It should be noted that, for most contaminants listed, the data base is relatively small.

ATTACHMENT D-2

TABLE 4-2

SUMMARY OF RAW WATER QUALITY

System and Well No.	Contaminants of Concern	Unit	Range	Allowed Level (3)	Number of Tests
Morris					
1	Iron	mg/l	0.5-5	0.3	5
	Manganese	mg/l	0.1-4	0.05	6
	Trichloroethylene, (TCE)	ug/l	35	50	1
	Tetrachloroethylene	ug/l	6	50	1
3	Iron	mg/l	1-7	0.3	5
	Manganese	mg/l	0.1-8	0.05	5
	Turbidity	TU	15	1-5	1
	Hardness	mg/l	176	250	1
	Color	color units	25	10	1
4	Iron	mg/l	31-64	0.3	4
	Manganese	mg/l	0.5-5	0.05	4
	Turbidity	TU	135	1-5	1
	Color	color units	700	10	1
6	Iron	mg/l	0.4-5	0.3	5
	Manganese	mg/l	0.5-4	0.05	6
	TCE	ug/l	3	50	1
	1, 2-Dichloroethane	ug/l	4	50	1
7	Iron	mg/l	8-20	0.3	3
	Manganese	mg/l	2-4	0.05	2
	TCE	ug/l	3	50	1
	1, 2-Dichloroethane	ug/l	2	50	1
8	Iron	mg/l	7-14	0.3	2
	Manganese	mg/l	3-4	0.05	2
	Sodium	mg/l	58	50	1
10	Iron	mg/l	27.2	0.3	1
	Manganese	mg/l	6.3	0.05	1
	Turbidity	TU	100	1-5	1
	Color	color units	280	10	1
11 (TW-6)	Iron	mg/l	1.8	0.3	1
	Manganese	mg/l	1.9	0.05	1
	Color	color units	40	10	1
	1, 2-Dichloroethane	ug/l	2.8	50	1
	1, 2-Dichloropropane	ug/l	15	50	1

ATTACHMENT D-3

TABLE 4-2 (cont'd)

SUMMARY OF RAW WATER QUALITY

System and Well No.	Contaminants of Concern	Unit	Range	Allowed Level (3)	Number of Tests
Morris					
12 (TW-5)	Iron	mg/l	5.2	0.3	1
	Manganese	mg/l	1.2	0.05	1
	Turbidity	TU	73	1-5	1
	Color	color units	40	10	1
	Chloroform	ug/l	5.6	50	1
	1, 2-Dichloroethane	ug/l	2.0	50	1
	1, 1, 1-Trichloroethane	ug/l	3.8	50	1
	1, 2-Dichloropropane	ug/l	9.6	50	1
13 (TW-3)	Iron	mg/l	5.6	0.3	1
	Manganese	mg/l	1.3	0.05	1
	Color	color units	20	10	1
	Chloroform	ug/l	11	50	1
	1, 2-Dichloroethane	ug/l	1.7	50	1
	1, 2-Dichloropropane	ug/l	9.6	50	1
Delair					
1	Iron	mg/l	3-7	0.3	7
	Manganese	mg/l	0.3-6	0.05	7
	TCE	ug/l	5	50	1
	1, 2-Dichloroethane	ug/l	2.5	50	1
2	Iron	mg/l	1-12	0.3	7
	Manganese	mg/l	0.5-3	0.05	8
	Color	color units	50	10	1
	1, 2-Dichloroethane	ug/l	3	50	1
3	Iron	mg/l	2-9	0.3	8
	Manganese	mg/l	0.1-5	0.05	8
	TCE	ug/l	4	50	1
Puchack Run					
1	Manganese	mg/l	0.2-3	0.05	5
	TCE	ug/l	1	50	1
	1, 2-Dichloroethane	ug/l	2.5	50	1
2	Manganese	mg/l	0.16-0.7	0.05	1

ATTACHMENT D-4

TABLE 4-2 (cont'd)

SUMMARY OF RAW WATER QUALITY

System and Well No.	Contaminants of Concern	Unit	Range	Allowed Level (3)	Number of Tests
Puchack Run					
3	Manganese	mg/l	0.52	0.05	1
	Chromium	mg/l	0.018	0.05	1
	Mercury	mg/l	0.0023	0.002	1
5	Manganese	mg/l	0.08-0.12	0.05	3
	Chromium	mg/l	0.67	0.05	1
	Mercury	mg/l	0.0084	0.002	1
	TCE	ug/l	31	50	1
7	Iron	mg/l	0.45-0.66	0.3	2
	Manganese	mg/l	0.05-0.3	0.05	4
	Turbidity	TU	7	1-5	1
	TCE	ug/l	70	50	1
Parkside					
13	Iron	mg/l	0.93-2.1	0.3	8
	Manganese	mg/l	0.07-0.32	0.05	8
	Turbidity	TU	7.4	1-5	1
	TCE	ug/l	18-40	50	4
	1, 2-Dichloroethane	ug/l	6-19	50	4
	Tetrachloroethylene	ug/l	1.8-5.6	50	3
	Carbon Tetrachloride	ug/l	2-2.6	50	3
	Chloroform	ug/l	3-4.8	50	4
17	Iron	mg/l	1.2-1.6	0.3	9
	Manganese	mg/l	0.05-0.15	0.05	7
	TCE	ug/l	11-62	50	8
	Tetrachloroethylene	ug/l	4-28	50	7
	1, 2-Dichloroethane	ug/l	1.5-2.9	50	8
	Chloroform	ug/l	1.76	50	1
18	Iron	mg/l	1.2	0.3	1
	Manganese	mg/l	0.16	0.05	1
	TCE	ug/l	8.3-25	50	9
	Tetrachloroethylene	ug/l	15.5-21.8	50	8
	1, 2-Dichloroethane	ug/l	0.92-3.29	50	8
	Chloroform	ug/l	7.2	50	1

ATTACHMENT D-5

TABLE 4-2 (cont'd)

SUMMARY OF RAW WATER QUALITY

System and Well No.	Contaminants of Concern	Unit	Range	Allowed Level (3)	Number of Tests
Plant No. 4					
4	Manganese	mg/l	0.1-0.19	0.05	2
	Hardness	mg/l	146-278	250	3
closed because of →	Chromium	mg/l	0.47	0.05	1
	TCE	ug/l	28-53	50	3
	Tetrachloroethylene	ug/l	5.9-6.6	50	3
	1, 2-Dichloroethane	ug/l	0.5-3	50	3
	Chlorodibromomethane	ug/l	15-21	50	2
	Chloroform	ug/l	26-28	50	2
Plant No. 5					
5	Iron	mg/l	0.2-2.18	0.3	4
closed because of →	Manganese	mg/l	0.1-0.95	0.05	5
	TCE	ug/l	28-140	50	4
	1, 2-Dichloroethane	ug/l	2.8-10	50	4
	Tetrachloroethylene	ug/l	1.14-1.88	50	3
	Chloroform	ug/l	0.5-3.5	50	2
Plant No. 6					
7	Iron	mg/l	0.21-13.8	0.3	3
	Manganese	mg/l	0.1-0.25	0.05	2
	Turbidity	TU	8	1-5	1
	Mercury	mg/l	0.0034	0.002	1
11	Iron	mg/l	0.5	0.3	1
	Manganese	mg/l	0.2-0.24	0.05	2
	TCE	ug/l	1	50	1
	Tetrachloroethylene	ug/l	0.5	50	1

ATTACHMENT D-6

TABLE 4-2 (cont'd)

SUMMARY OF RAW WATER QUALITY

Notes:

1. Data which appears on the above table was obtained from Camden well water analyses contained in the following references in Appendix A: 34, 32, 28, 29, 3, 1, 21, and 31.

2. This table lists only the contaminants which exist at levels approaching or exceeding drinking water standards. Many wells have not been tested for all potential contaminants.

3. Allowed levels are maximum contaminant levels (primary regulations), recommended upper levels (secondary regulations), or NJDEP guidelines (volatile organic chemicals).

Several wells in the City system have been closed over the years due to contamination. Others are presently in danger. Table 4-3 lists the abandoned wells, their reason for abandonment and approximate date each well was removed from service.

Finished Water Quality

Table 4-4 summarizes available data on finished water quality for the City's system. When comparing data from Table 4-4 to existing drinking water requlations, it can be seen that in terms of iron and manganese content, none of the treatment facilities consistently delivers acceptable water to the consumer. Also, Plant No. 5 consistently produces substandard water. Hexavalent chromium was detected at the Puchack Run Plant and Plant No. 4 at levels well above the MCL. In terms of the organic chemical content in finished water, the only available data indicate the City's supplies to be within the 50 ug/l guideline used by the State.

The two factors affecting finished water quality are (1) the quality of the raw water and (2) the types and efficiencies of treatment processes. Both factors contribute to the finished water quality summarized on Table 4-4.

Acceptability/Treatability of Water Supply Sources

It is evident from Table 4-2 that none of the City's wells are acceptable drinking water sources without prior treatment. A discussion of the treatability of each source follows.

Morris-Delair System - Generally, the iron and manganese contained in the Morris-Delair wells can be removed by the treatment processes now used at the Morris-Delair Plant. The quality of water from the Delair wells is slightly better than that from the Morris wells. In particular, Morris Wells No. 4, 7, 8, and 10 have greater concentrations of iron and/or manganese. Although turbidity and color are high at several Morris/Delair wells, the existing treatment readily reduces both parameters to acceptable levels.

TABLE 4-3

WELLS REMOVED FROM SERVICE

System	Well No.	Approximate Date of Abandonment	Reason
Morris	2	1962	Phenols
	5	1962	Phenols
	9	1977	Low capacity
Puchack Run	4	1972	Construction of Betsy Ross Bridge
	6	1975	Chrome
City Wells	1	1978	Iron, Manganese
	2	1960's	Iron
	3	1976	Low capacity
	6	1975	Iron, radionuclides, chlorides
	8	mid-1960's	Iron
	9	mid-1960's	Iron
	10	1972	Iron, color
	12	1978	Iron, low capacity
	14	mid-1960's	Iron
	15	1970	Iron
	16	1980	Iron, TCE, ammonia

Source: City Records.

ATTACHMENT D-9

TABLE 4-4

SUMMARY OF FINISHED WATER QUALITY

Treatment Plant	Iron[1] mg/l	Manganese[1] mg/l	pH[1]	TCE ug/l[2]	PCE ug/l[2]	1,2-D ug/l[2]	Chromium mg/l
	Parameter						
Morris-Delair	0.12-0.59	0.02-0.16	8.5-8.7	<5	ND[3]	ND	NT[3]
Puchack Run	0.05-0.2[4]	0.2-0.9[4]	6.5-6-8	10-20	ND	ND	0.09[5]
Parkside	0.20-0.87	0.11-0.25	6.4-7.0	1-20[2]	ND-10[2]	<1-8[2]	NT
Plant No. 4	0.06-0.21	0.19-0.22	NT	NT	NT	NT	0.181[6]
Plant No. 5	1.58-1.98	1.06-1.11	NT	NT	NT	NT	NT
Plant No. 6	0.22-0.60	0.09-0.20	NT	NT	NT	NT	NT
Allowed Level[7]	0.3	0.05	6.5-8.5	50	50	50	0.05

Notes:
1. Typical range from City analyses.
2. Technological Resources, Inc. organic analyses, 1979 and 1980.
3. ND - Not Detected; NT - Not Tested.
4. Estimated from raw water data.
5. Technological Resources, Inc. chemical analyses, 1978.
6. NJDEP Routine Inspection Report 1980.
7. Maximum contaminant level (primary regulations), recommended upper level (secondary regulations) or NJDEP guidelines (volatile organic chemicals).

Puchack Run System - Puchack Run wells generally contain little or no iron, but have high manganese levels. One well in this field (No. 6) has been closed and two others (No. 3 and No. 5) are in danger of being ordered closed by the State due to hexavalent chromium contamination. Wells No. 3 and No. 5 also have mercury levels exceeding the standards. Although the remaining three wells show no traces of either chromium or mercury, it is possible that contamination of these wells eventually may occur. In addition, trichloroethylene (TCE) has been discovered in three Puchack Run wells; at Well No. 7 the level has exceeded the guideline recommended by the State.

The existing treatment processes are incapable of removing manganese, chromium or mercury from the raw water. However, the plant's aeration system is undoubtedly reducing TCE levels to a certain extent.

Parkside System - Water from the Parkside wells contains iron and manganese at levels which can be treated with existing facilities to produce acceptable drinking water. Several volatile organic chemicals are present in the raw water in concentrations from 0.5 to 62 ug/l. These levels may be cause for concern as some VOC's approach or exceed the State's 50 ug/l guideline. The removal efficiency of the plant's aerator with respect to volatile organic chemicals is being investigated by Malcolm Pirnie, Inc. in an ongoing study. Initial results indicate that the aerator is reducing volatile organic contaminant levels considerably.

Plant No. 4 - Water from Well No. 4 contains virtually no iron and very low levels of manganese. The raw water also contains moderate to high levels of various volatile organic chemicals, which may pose a problem although the levels are probably reduced by the plant aerator. However, as with the Puchack Run Plant, chromium is a severe problem at Plant No. 4 because it is not removable by the existing treatment processes.

Plant No. 5 - Well No. 5 has moderately high iron and manganese levels. Treatment at this plant is unable to reduce these contaminants to acceptable levels. Of additional concern is the existence of trichloroethylene at levels which greatly exceed the State guideline. The present levels of TCE are probably reduced to a certain extent by the plant's aerator.

ATTACHMENT D-11

Plant No. 6 - Wells No. 7 and 11 feed Plant No. 6. The iron and manganese levels of these wells is easily treatable with existing treatment facilities. Trace amounts of volatile organic chemicals were detected at Well No. 11, but these do not pose a problem at present. Mercury from Well No. 7 exceeds the MCL and may present a serious problem. However, the ion-exchange facilities at the plant, if operating efficiently, can effectively remove mercury from the raw water.

Conclusions

Table 4-5 summarizes the relative acceptability and treatability of the water produced by the 25 active wells of the City's system, based on the data presented in this chapter. The following major conclusions can be drawn:

1. The wells of the Morris-Delair, Parkside and Plant No. 6 systems are generally acceptable with existing treatment processes, if operated efficiently, although minor modifications to improve contaminant removals may be necessary.

2. The existing treatment processes at Puchack Run Plant and Plants No. 4 and 5 cannot produce water meeting all drinking water standards. Major treatment additions, including some form of filtration, would be required at these plants in order to produce water of acceptable quality.

The available data do not permit the detailed evaluation of trends in water quality conditions. However, it is reasonable to assume that no significant changes in raw water quality will occur over the next five years. Sources where water quality contamination would most likely occur or increase appear to be the Puchack Run well field and the wells located within the City limits (Parkside Plant and Plants No. 4, 5 and 6).

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ATTACHMENT D-12

(12)

WHITMAN, REQUARDT AND ASSOCIATES

Engineers - Consultants

1304 ST. PAUL STREET
BALTIMORE, MARYLAND 21202
TELEPHONE
(301) 727-3450
REPLY TO
1111 NORTH CHARLES ST., BALTIMORE, MD. 21201

EZRA B. WHITMAN, 1963
GUSTAV J. REQUARDT
ROY H. RITTER
WILLIAM F. NEALE
HENRY A. NAYLOR, JR.
RAYMOND C. REGNIER
KENNETH A. MCCORD
FREDERICK R. KNOOP, JR.
CHARLES F. MILLARD
H. HUDSON MYERS, JR.
THOMAS J. SHAFER
JOHN B. GILLETT

ROLAND A. [illegible]
VADEN J. HARLEWAY
KENNETH W. MALACH
J. DONALD FAULUS
BERT P. SMITH
THOMAS P. [illegible]
HARRY B. [illegible]
CHARLES W. [illegible]
ROBERT W. [illegible]
HARRY C. [illegible]
WILLIAM O. [illegible]
ROBERT B. NAENY

October 7, 1976

Mr. Thomas P. Corcoran
Sr. Administrative Analyst
City of Camden
Department of Community Development
City Hall
Camden, New Jersey 08101

Re: City of Camden
Water System Study

Dear Mr. Corcoran:

In accordance with your authorization we have prepared a report on the City of Camden's Water System and have included in this report a program of water improvements that are necessary to furnish the needs of the City of Camden today and in the foreseeable future. This report is required by you to accompany the City of Camden's application to the Economic Development Administration for a grant under the P. L. 94-369 Sec. 107 of the Federal Works Employment Act. The report encompasses an overall water improvement program estimated to cost $16,000,000. Of this total program $4,700,000 has been designated for the P. L. 94-369 program for the City of Camden.

Due to the short time available for the preparation of this report because of the urgency of making a submission for the grant, it was not possible in some areas to make detailed field studies in all areas upon which to base recommendations. The field studies made were supplemented by discussions with the City's Administrative Staff, Engineering and Water Department personnel. Plans and specifications of some pertinent water system facilities were reviewed. Reports by or prepared for the City, State and Federal governments which pertain to the City's water system and neighboring systems were used as other sources of information.

The program outlined herein is the result of compilation of available information about the system and a detailed study of that information. We have not conducted chemical analysis of water, individual or group pump testing of the wells,

ATTACHMENT E-1

flow tests on the transmission and distribution system, sub-surface investigation or taken other similar exploratory measures required for compiling a definitive program. The first effort in the improvement program must be testing. Results of the complete testing project may show changes to the program as presently envisioned.

We will be available to discuss this report with you and/or regulatory agencies at a convenient time.

Very truly yours,

WHITMAN, REQUARDT and ASSOCIATES

By K. A. McCord

K. A. McCord/bs
W.O. 7090-1

ATTACHMENT E-2

of the proposed test well site. This stretch of land along the river could develop into one of the best producing areas in terms of yield and minimized drawdown effects due to the proximity of the river.

The addition of 4 to 6 new wells in the Morris-Delair area might add another 6,000 gpm or 8.5 mgd. All of this raw water, if of reasonable quality, would be treated at the Morris-Delair plant which would have to be expanded for such an increase.

All of the above discussion on the existing wells has been on yields and drawdown effects, however, water quality is another controlling factor.

Groundwater Quality

The quality of the groundwater in the City of Camden area has changed from that shown in earlier records of the Potomac-Raritan-Magothy aquifer.

Farlekas and other (1976) report that "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 . . . ". But for the City of Camden area they report that "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." "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,

ATTACHMENT E-3

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".

Graphs were plotted from data collected for this report, for bicarbonates sulfates, chlorides, dissolved solids and hardness. (See attached)

A number of the existing City wells had a rise and decline in bicarbonates and sulfates, fluctuations in chlorides and general rises and fluctuations in dissolved solids and hardness. The several scattered declines and numerous fluctuations and levelings off suggest a dilution by recharge waters from the Delaware River. Most of the quality counts of the Delaware River waters are well below those in some of the City wells. Evidently there has been some industrial and other types of disposal in the area which caused changes in the quality of the groundwater within the City and vicinity.

However, the highly contaminated waters in the Magothy-Raritan-Magothy aquifer system in Philadelphia are a potential threat to the City of Camden wells. If pumping by industry and the Navy, for use in cooling, etc., were stopped in Philadelphia, the groundwater gradient would reverse toward the City of Camden and there would be a movement of the Philadelphia waters under the Delaware River towards Camden. If a movement has already occurred, then there would be an increase in movement. It is possible that such migration took place to the City of Camden Wells 2 and 8 near the river, which were abandoned because of poor quality; but there is not enough available data to make such a determination.

ATTACHMENT E-4

The quality of the water from the Morris, Delair and Puchack wells has been comparatively unaffected for the most part by chemicals mentioned above. In addition, the presence of phenols has been recorded for some wells. The objection to phenols is odor and taste. Morris Wells No. 2 and No. 5 have been abandoned because of this. Carbon chloroform extraction (CCE) tests have indicated the presence of some organics in some of the wells but not in alarming quantities. There were not, to our knowledge, any further tests to identify the organics. Chromates appeared in City Well No. 4. This well was not used for 3 or 4 years but now the concentration has apparently reduced well below the standard limit. Chromates recently appeared in Puchack Well No. 6. This has been closed down pending an investigation. Traces of detergents have appeared in several of the City owned wells. Lead was reported above the standard limit for Puchack Well No. 2 at 0.6 ppm but the finished water at the plant was 0.0. Also, the New Jersey Bureau of Public Water Supply reported (telephone communication) a below the standard limit radioactive count for a grab sample from the system in the City of Camden. The source well or wells was not traced.

The presence of iron and manganese has been the most troublesome and costly to the public and industry in the City. Several wells were abandoned because of the high iron and manganese content. Iron and manganese contents, in well water, are known to increase from surface water recharge, whether it be salty or fresh water. Therefore, recharge waters from the Delaware River are probably taking

ATTACHMENT E-5

iron and manganese into solution from the Potomac-Raritan-Magothy sand minerals thus increasing the concentrations. Also, it is believed that much of the iron and manganese comes from disposals on the land surface leaching down into the ground-waters. Surprisingly, the higher concentrations of iron and manganese have developed in the Delair and Morris areas while there were relatively minor increases in sulfates and bicarbonates. In the City, where individual treatment plants at wells are required, economics must be evaluated when considering new well locations.

Carbon dioxide has been quite high in the City wells and the Morris Delair wells, but in most cases a decrease was noted. Most of the readings were in 1950 and 1952. If the water has been corrosive in any particular well it is probably due to the presence of carbon dioxide.

The pH in most of the wells has been above 6.0. In some wells where the pH has been 5 or below, initially, it has risen to 6 or above after years of pumping. This is possibly due to the recharge waters coming from the Delaware River in which the average pH is above 6.50. pH apparently is not important in any corrosiveness after long term pumping but it may be initially, if the pH is low.

Records of chemical analysis of the City owned wells have been sparse. Some wells do not have reported chemical analysis for more than 10 years, some even longer. With the presence of various tracer materials such as sulfates, phenols,

ATTACHMENT E-6

etc., indicative of man made disposals, rather extensive chemical analyses should be run on each well by an accredited laboratory. A tentative suggested list is attached of chemical analyses to be performed, whereby a fairly good screening can be made on the quality of water which could be uniquely indicative and possibly objectionable in any one well.

Quality of Delaware River Water

Since there is considerable recharge into the aquifers of the City of Camden owned wells from the Delaware River, the quality of this water should be discussed. Briefly, the Delaware River water is of equal or better quality than that which is being pumped from wells by the City of Camden. In fact, upon recharging, it serves as a means of diluting the chemicals present in high concentrations in the shallow ground waters which seep down into the deeper aquifers in Philadelphia and the City of Camden.

Saltwater

The question of salt water up the river during dry periods might be of concern. But salt water does not quite reach as far up the river as the City of Camden. Only once did it reach the Benjamin Franklin Bridge at approximately 250 ppm which is the recommended maximum but not serious even if it occurred occassionally.

ATTACHMENT E-7

Conclusions and Recommendations from Available Data on Groundwater

1. Water levels have dropped in the City of Camden area with increased pumpage throughout the region, but the drop has been relatively small.

2. Large quantities of recharge waters are induced into the aquifer system from the Delaware River. The average quality of the Delaware River water is good for recharge purposes. Some waters are induced from shallow overlying aquifers which often contain a poorer quality of water, but they are partially diluted by recharge waters from the Delaware River.

3. The groundwater in the City of Camden wells has deteriorated in quality in the past, probably due to local waste disposal. The quality apparently varies between individual wells and between well fields.

4. Considerable migration of contaminated groundwater from Philadelphia to the City of Camden, if it hasn't already occurred, is a potential threat if pumping were to decrease in Philadelphia and increase in Camden.

5. There has been an adequate supply of groundwater in the past and there is a good possibility of increasing the present supply by several million gallons per day without adverse effect on the aquifer. Pump tests and chemical analyses are required to confirm or reject this assumption.

CITY OF CAMDEN
STATUS OF DIVERSION

WELL# LOCATION	GPM DESIGN	GMP-CURRENT GPM AT LBS. ON	LEVELIN FEET STATIC	PUMPING	INSTALLED LEVEL IN (YRS) STATIC/PUMPING
City #7 8th & Ferry	1500				60' (46) 85
City #11 9th & Chelton	1010				47' (72) 100
TOTAL PLANT #6	2710				
City #13 Kaighn & Euclid	1200	963 at 21# on 11-09-84	61'	158'	58' (58) 88'
City #17 Park & Vesper	1500				64' (55) 96'
City #18 Euclid & Park	1200	900 at 40# on 6-20-82	78'	113	85 (76) 135'
TOTAL PARKSIDE	3900 ✓				
Puchack #1 Delair Ave. Penn.	1500	902 at 40# on 7-29-83	46'	84'	28' (57) 79'
Puchack #2 Delair Ave. Penn.	1000				36' (61) 99'
Puchack #3 Delair Ave. Penn.	1280				28' (57) 79'
Puchack #5 Delair Ave. Penn.	1324	1324 at 3# on 11-20-84	71'	131'	46' (61) 84'
Puchack #7 Delair Ave. Penn.	2260				83' (70) 121'
TOTAL PUCHACK	7364 ✓				
Morris Station 1	1600	out of service			11' (44) 51
Morris Station 2	1600	out of service			12' (41) 30'
Morris Station 3	1800	1073 at 15 lbs. - 10-16-84	30'	73'	12' (55) 52
Morris Station 4	1600	1345 at 32 lbs. - 10-16-84	14'	50'	13' (61) 42'
Morris Station 6	1700	403 at 12 lbs. - 10-18-84	44'	111'	14' (32) 65'
Morris Station 7	1680	1324 at 12 lbs. - 10-18-84	31'	60'	20' (32) 46'
Morris Station 8	1670	448 at 49 lbs. - 10-17-84	32'	88 1/2'	12'6" (55) 60'
Morris Station 9	1670	648 at 16 lbs. - 10-17-84	27'1"	85 1/2'	12'8" (32) 51'
Morris Station 10	1400				19' (61) 45'
Morris Station 11	2030				39.28 (79) 85 7"
Morris Station 12	2030	2030 at			33' (81) 70'
	15540				
	2000				
	17640				

ATTACHMENT F.1

CITY OF CAMDEN
STATUS OF DIVERSION

WELL# LOCATION	GPM DESIGN	GMP-CURRENT GPM AT LBS. ON	LEVEL IN FEET STATIC PUMPING		INSTALLED LEVEL IN (YES) STATIC PUMPING
Morris Station 13	2060	2060 at 6-04-84			34'7" (80) 70'
Morris Station 14	2060	to replace wells	out of service		
Morris Station 15	2060	to replace wells	out of service		
TOTAL MORRIS	24,960 23360				
Delair 1	~~1680~~	1443 @ 30 lbs. 2-06-84	40'	99'	
Delair 2	1830	483 @ 33 #1 4-06-84	28'6"	108'10"	
Delair 3	1830	1353 @ 9 lbs. 4-08-84	21'	97	
TOTAL DELAIR	5340 ✓				
GRAND TOTAL	44,274				

MUN. - PENNSAUKEN

ATTACHMENT F-2

Actual Pumpage

Pumpage, Month of September 1989

(000) Gallons

1	11,572				17	8,011			
2	11,437				18	10,357			
3	8,467				19	10,843			
4	8,467				20	14,647			
5	10,273				21	15,046			
6	11,419				22	15,739			
7	11,419				23	15,739			
8	11,419				24	15,595			
9	11,419				25	12,703			
10	10,022				26	13,363			
11	9,601				27	9,979			
12	11,089				28	9,979			
13	11,419				29	9,979			
14	11,419				30	11,107			
15	11,995				31				
16	10,863				Total	345,387			
	M-D	Puch	Parks	Tot		M-D	Puch	Parks	Tot

ATTACHMENT G-1

	1985	1986	1987	1988	1989
January	596,750	477,930	446,170	484,210	417,970
February	523,850	379,760	402,900	445,900	396,420
March	543,690	419,340	435,930	456,810	433,440
April	443,620	415,990	391,560	418,250	496,350
May	619,000	445,470	400,920	370,417	516,420
June	436,840	420,450	453,270	362,260	
July	472,710	435,070	454,050	443,518	
August	521,240	396,140	468,840	436,678	
September	504,660	385,220	403,430	419,830	
October	477,340	444,220	435,900	440,770	
November	465,710	416,340	426,850	406,430	
December	470,190	445,860	451,160	418,780	
Annual total	6,075,600	5,081,790	5,170,980	5,103,853	

Reported Production, Morris-Delair Wellfield, thousands of gallons

ATTACHMENT G-2

	1985	1986	1987	1988	1989
January	80,545	88,745	48,376	84,801	57,077
February	80,500	79,418	43,713	72,858	51,548
March	84,170	67,574	55,021	82,946	57,071
April	84,369	41,114	64,114	82,047	55,230
May	83,633	38,201	66,347	81,469	57,071
June	86,528	68,118	69,967	83,026	
July	89,914	65,431	77,666	85,038	
August	87,786	79,741	82,571	57,657	
September	86,729	72,318	77,998	55,237	
October	90,003	60,884	84,596	57,068	
November	86,211	46,965	73,821	55,222	
December	89,368	48,725	84,785	57,068	
Annual total	1,029,756	757,234	828,975	854,437	

Reported Production, Puchack Run Wellfield, thousands of gallons

ATTACHMENT G3

Date September 30, 1989

Well	A GPM	B operating hrs	total gallons A x B x 60
Morris 3			
4			
6	450	24	648,000
7	1050	24	1,512,000
8	600	13	468,000
9			
10	1000	11	660,000
11	1050	24	1,512,000
12	1100	24	1,584,000
13	1100	24	1,584,000
Delair 1	900	24	1,296,000
2	630	24	907,200
3	650	24	936,000

Total 11,107,200

ATTACHMENT G-4

DWR-017 B
3/88

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
BUREAU OF WATER ALLOCATION
CN 029, TRENTON, N.J. 08625

PUBLIC WATER SUPPLY DIVERSION REPORT

INSTRUCTIONS:

1. Reports must be filed within 30 days following the close of each quarter.
2. Report all quantities in units of 1,000 gallons.
3. Use reverse side of this form to report diversion from individual wells, when required, and to report water from and/or to other systems.
4. Obtain the correct name, address and permit number of the permittee from the mailing label of the envelope sent to you.
5. The sums of Items 1 and 2 should equal the sums of Items 3 and 4.
6. Other data required such as static water levels, chlorides and separate well reports should be placed on back of sheet or attached.

NAME OF PERMITTEE			WATER ALLOCATION PERMIT #
Camden City, Department of Utilities			5302
STREET ADDRESS	CITY	STATE	ZIP
Room 419A, City Hall	Camden	NJ	08101

FOR THE QUARTER ENDING: ☐ March 31 ☒ Sept. 30 ☐ June 30 ☐ Dec. 31

FOR THE YEAR: 1988

		SUMMARY OF DIVERSION IN UNITS OF 1,000		
		1st Month	2nd Month	3rd Month
1. Diversion from own sources	Surface			
	Wells	602,902	512,533	503,381
	Total	602,902	512,533	503,381
2. Received from other systems (see 6)				
3. Delivered to other systems (see 7)				
4. Net diversion for territory served (see 8)		602,902	512,533	503,381

5. How is diversion determined? If estimated, give basis of estimate Impeller meters

6. Systems from which water is received Raritan-Magothy aquifer

7. Systems to which water is delivered City of Camden, exclusive of 11th and 12th wards

8. Municipalities supplied in territory served " "

9. Population supplied in territory served approximately 50,000

Summer population (if different than above)

10. Number of service connections in territory served 14,400

11. Number of service meters in territory served 13,700

Frederick H. Martin, Jr.
Name (Please Print)

Director of Utilities
Title

Signature

ATTACHMENT G-5

DWR-017 B
3/88

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
BUREAU OF WATER ALLOCATION
CN 029, TRENTON, N.J. 08625

PUBLIC WATER SUPPLY DIVERSION REPORT

INSTRUCTIONS:

1. Reports must be filed within 30 days following the close of each quarter.
2. Report all quantities in units of 1,000 gallons.
3. Use reverse side of this form to report diversion from individual wells, when required, and to report water from and/or to other systems.
4. Obtain the correct name, address and permit number of the permittee from the mailing label of the envelope sent to you.
5. The sums of Items 1 and 2 should equal the sums of Items 3 and 4.
6. Other data required such as static water levels, chlorides and separate well reports should be placed on back of sheet or attached.

NAME OF PERMITTEE	WATER ALLOCATION PERMIT #
Camden City, Department of Utilities	5302

STREET ADDRESS	CITY	STATE	ZIP
Room 419A, City Hall	Camden	NJ	08101

FOR THE QUARTER ENDING:
☐ March 31 ☐ Sept. 30
☐ June 30 ☒ Dec. 31

FOR THE YEAR: 1988

		SUMMARY OF DIVERSION IN UNITS OF 1,000		
		1st Month	2nd Month	3rd Month
1. Diversion from own sources	Surface			
	Wells	560,334	524,434	537,480
	Total	560,334	524,434	537,480
2. Received from other systems (see 6)				
3. Delivered to other systems (see 7)				
4. Net diversion for territory served (see 8)		560,334	524,434	537,480

5. How is diversion determined? If estimated, give basis of estimate Impeller meters

6. Systems from which water is received Raritan-Magothy aquifer

7. Systems to which water is delivered City of Camden, exclusive of 11th and 12th wards

8. Municipalities supplied in territory served " "

9. Population supplied in territory served approximately 50,000

Summer population (if different than above)

10. Number of service connections in territory served 14,400

11. Number of service meters in territory served 13,700

Frederick H. Martin, Jr.
Name (Please Print)

Director of Utilities
Title

Signature

ATTACHMENT G-6

PARKSIDE WATER TREATMENT PLANT

DAILY LOG 9/14/84 (date)

WELLS 17 Gal.	WELLS 17 Pres. Disch.	WELLS 18 Gal.	WELLS 18 Pres. Disch.	Total Pump GPM	pH INF.	pH EFF.	Settled Basin Main Press.		Serv. Pump Discharge Pressure 1	Serv. Pump Discharge Pressure 2	LIME Used Amt.	LIME Tank Level 1	LIME Tank Level 2	CHLORINE Lbs. Remain 1	CHLORINE Lbs. Remain 2	CHLORINE Residual	FILTERS BACKWASH 1	FILTERS BACKWASH 2	REMARKS, INCLUDING TIMES IN & OUT OF STATION TIME OF WELL INSPECTION OILING, ETC.
ON		ON								ON		ON							
"		"								"		"							
"		"								"		"							
"		"								"		"							
"		"								"		"							
"		"								"		"							
"		"								"		"							
650		750		1500		7.3	9.2	30		6½	50	"		160		0.35			1 BAG LIME
650		750		1500		7.3	9.4	30		"		"				0.35			
650		700		1500		7.4	9.6	32		"	50	"				0.25			1 BAG LIME
650		700		1500		7.5	9.6	32		"		"				0.25			
650		700		1500		7.5	9.6	34		"	50	"				0.25			1 BAG LIME
650		700		1500		7.5	9.6	34		"		"				0.25			
650		700		1500		7.5	9.6	34		"	50	"				0.25			1 BAG LIME
650		700		1500		7.4	9.6	36		"		"				0.25			
650		700		1500		7.4	9.6	36		"		"				0.25			Cl2 FEEDING GAS
650		700		1500		7.7	9.6	35		"		"				0.25			
650		750		1250		7.7	9.4	33		"		"				0.25			B.W.F. #1 - 4:45pm - 6:15pm CB
650		750		1550		7.7	9.2	32		"		"				0.25			
650		700		1500		7.8	9.4	33		"		"				0.25			CL2 FEEDING CB
650		700		1500		7.8	9.8	35		"		"				0.25			
650		700		1500		7.8	9.8	36		"		"				0.25			
650		750		1500		7.8	9.6	35		"		"				0.25			
650		750		1500		7.8	9.6	34		"	50	"				0.25			ADDED 1 BAG LIME. CL2 FEEDING - CB
24		24		21,6000						24		24							

ATTACHMENT 6-1

DATE Sept. 14 1989

DAILY REPORT

Puchack Run Pumping Station, Camden Water Dept., Delair, N. J.

WELLS No.

Time A.M.	1 Start	1 Stop	2 Start	2 Stop	3 Start	3 Stop	5 Start	5 Stop	7 Start	7 Stop	High Duty Pump Running 1	2	3	4	Main Pressure	Water Level	Watt Meter Reading	Venturi Meter Reading 1000 Gals.	K. W. Input	Rate of Flow 1000 Gallons	Oil Used Pints	REMARKS
1	"											"			54	5				1300		1/2 feeding
2	"											"			44	5				1300		
3	"											"			44	5				1300		
4	"											"			44	5				1300		
5	"											"			44	4				1.8 1300		
6	"											"			52	4				1300		1/2 feeding
7												"			54	4				1300		
8	"											"			54	[illegible]				1300		
9	"											"			54	[illegible]				1300		
10	"											"			54	[illegible]				1300		
11	"											"			54	[illegible]				1300		
12	"											"			54	[illegible]				1300		
P.M. 1															54	[illegible]				1.8 1300		
2															[illegible]	[illegible]				1300		
3															[illegible]	[illegible]				1300		CL2 FEEDING
4															[illegible]	[illegible]				1300		
5															[illegible]	[illegible]				1300		
6															[illegible]	[illegible]				[illegible]		
7															[illegible]	[illegible]				[illegible]		
8															[illegible]	[illegible]				[illegible]		
9															[illegible]	[illegible]				[illegible]		
10															[illegible]	[illegible]				[illegible]		
11															[illegible]	[illegible]				[illegible]		
12															[illegible]	[illegible]				[illegible]		
Total Number of Hours Run	24											24			52			1,872,000				
Totals																						
Average																						

ATTACHMENT G-8

(23)

CDM

environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC.

One Center Plaza
Boston, Massachusetts 02108
617 742-5151

January 10, 1986

General William Whipple, Jr.
New Jersey Department of Environmental Protection
1474 Prospect Street
Trenton, NJ

RE: Submittal of Report of "Summary of Conclusions and Recommendations of Chromium Contamination Analyses at Puchack Well Field, Camden, New Jersey"

Dear General Whipple:

We are pleased to submit twenty-five (25) copies of our report which summarizes the conclusions and recommendations of our analyses of the chromium and mercury contamination problem at the City of Camden's Puchack well field. As you know, the Puchack supply is important to the City of Camden in that it produces up to 25% of the City's average day water demand. The Puchack plant produced an average of 5.6 mgd in 1980; presently because of the contamination problem, Puchack is only producing about 3 mgd. Continued production from the Puchack well field is essential if the City of Camden is to meet its peak summer demands.

THE NATURE OF THE CONTAMINATION PROBLEM

The Puchack well field is presently contaminated by a variety of compounds including hexavalent chromium, mercury, and volatile organic compounds. The contamination was first detected in the early 1970s at well no. 6. Since then, the contamination has moved into wells 5, 7, 3, and 2 in response to the abandonment of contaminated wells and heavier pumping from the remaining wells. Historical chromium concentrations -- of which 90% is in the form of hexavalent chromium -- reached their highest levels at well 7 (1 ppm) in 1984. Other maximum chromium concentrations include well 5 (0.6 ppm), well 3 (0.18 ppm), and well 2 (0.08 ppm). Concentrations at each of these wells are in violation of the drinking water standard for total chromium of 0.05 ppm.

As of 1981, mercury contamination has also been detected at the Puchack well field in no. 2 (5.5 ppb), no. 3 (2.3 ppb), and no. 5 (8.4 ppb). The New Jersey standard for mercury in drinking water is 2 ppb.

In addition to chromium and mercury, water quality analyses show the presence of TCE in significant concentrations (30 to 70 ppb). Other volatile organic compounds that have been detected in trace concentrations include chloroform, 1, 2 Dichloroethane, and tetrachloroethylene.

ATTACHMENT II-L

POSSIBLE SOURCES OF CONTAMINATION

The source of the contamination at the Puchack well field is not known, but there are several sites in the area that have been identified by the NJDEP Enforcement Element as possible sources including:

SGL Modern Hard Chrome Service - a plating company that discharged over 9,000 gallons per day of chrome plating wastes to a septic system from the late 1960s to the early 1980s.

Swope Oil and Chemical Company - a chemical reclamation company that dumped chrome and mercury wastes into an unlined on-site lagoon in the late 1960s.

Pennsauken Landfill - a municipal landfill that previously served as a gravel pit. Chromium has been detected at monitoring wells at the landfill.

Pennsauken Sewage Authority - the sewage collection system that serves the area proximate to Puchack where over 70 ppm of chromium caused by illegal hook-ups was found in the wastewater.

Other small electroplaters, metal finishers, and chemical companies in the area.

Given the number of contaminants found at Puchack, the number of possible contamination sources, the long time prior history of potential contamination, as well as the complexity of the hydrogeology of the area, it is possible that the responsible party (or parties) may never be ascertained.

OBJECTIVES OF THE STUDY

The objectives of this study fall generally into two categories: 1. those aimed at determining the likely direction of movement of the contamination plume under various pumping schemes at the Puchack and Morris-Delair well fields; and 2. those aimed at determining both short-term and long-term alternatives to either treating or replacing the contaminated supply.

There is an urgent need to evaluate remediation and water supply replacement alternatives to preserve the water supply and protect the public health.

An evaluation of groundwater flow and contaminant transport using a mathematical model was undertaken to address the first set of objectives. The analysis was aimed at specifically answering the following questions:

1. What are the likely directions of the sources of the contaminants that have been found at the Puchack well field?

2. What are the likely effects to contaminant migration of either continuing or terminating use of the Puchack well field?

3. What are the likely effects of increasing pumpage from the Morris-Delair well field?

4. Can the Puchack well field (or certain Puchack wells) be used for contaminant recovery?

5. What additional field investigations are required to more completely evaluate the extent of solutions to the Puchack well field contamination problems?

A second set of evaluations was undertaken to determine whether drinking water quality could be maintained at the Puchack water treatment plant (WTP), or to find a replacement supply should the contamination at Puchack be untreatable, or treatable only at a prohibitively high cost. These evaluations address the second set of objectives, and specifically focus on answering the following questions:

1. What emergency actions can be taken to reduce dependence on the Puchack supply, meet all of the City's summer water demands, and reduce the risk to users given that Puchack water is needed to some extent to meet those summer demands?

2. Are there economical methods available to remove hexavalent chromium and mercury from the Puchack supply so that concentrations fall within drinking water standards?

3. How much would these treatment methods cost if they are available, and how do these costs compare with comparable costs to replace the contaminated water with another source?

4. What long-term permanent actions can be taken to provide the City with a permanent potable supply?

CONCLUSIONS OF GROUNDWATER FLOW AND CONTAMINANT TRANSPORT EVALUATIONS

The localized cone of depression around the Puchack well field is significant enough so that it could capture soluble contaminants introduced at the groundwater table at Swope Oil, SGL Chrome, Pennsauken Landfill, and the high leakage area of the Pennsauken Sewage Authority's sewer system. However, based on the historical pattern of contamination movement at Puchack (i.e., well no. 6 was first to be contaminated), it would appear that the source is consistent with a chromium source originating in the direction of SGL Chrome or the Pennsauken Sewage Authority's sewer system. While SGL Chrome and the sewer are possible chromium sources, other sources located even closer to the Puchack well field could produce similar results. Water quality analyses performed as part of this study show well no. 7 -- which had some of the highest recorded chromium levels to date --

is now clean. This finding, coupled with the fact that chromium concentrations at wells 1, 2, and 3 are increasing, suggests that the plume is quite narrow and localized near the wells.

If the contamination source is SGL Chrome or the leaking sewer, then the highest concentrations may have already been observed, assuming that illegal dumping at SGL Chrome began in the late 1960s and ceased in the late 1970s, and the leaking sewer was repaired in the early 1980s. If plumes at Swope Oil or Pennsauken Landfill exist, and illegal dumping at either location actually began in the late 1960s - early 1970s as recorded, then the bulk of the contamination may not have had enough time to reach the Puchack well field. Additional field investigations would be required to verify this, however.

If the Puchack well field is completely abandoned, then plumes from SGL Chrome and the leaking sewer would follow the regional groundwater flow direction to the southeast. Within five years, contamination could be detected at the Merchantville-Pennsauken Water Commission's Marion well field. Plumes from Swope Oil and Pennsauken Landfill would begin to migrate towards the Morris-Delair well field, eventually reaching it within several years. Therefore, some level of pumping must be sustained at Puchack to protect these other wells.

Increasing production at Morris to replace a large portion of the contaminated production at Puchack would cause greater drawdowns and consequently increase the risk of drawing contaminated water into the Morris system.

No decision can be made at this time as to where new wells at Morris should be sited. If plumes exist at or near the Pennsauken Landfill, then increasing production at the northern end of the Morris well field (near existing wells 1, 2, and 3) could draw the plume into the Morris wells. Additional field investigations are required to determine whether plumes exist in this area.

CONCLUSIONS OF SUPPLY TREATMENT AND REPLACEMENT EVALUATIONS

Several methods exist to reduce chromium concentrations to within the drinking water standard of 0.05 ppm. The most feasible process for hexavalent chrome treatment is electrochemical reduction. A ferrous ion generator was considered for treatment of the chromium-laden Puchack well water. The treatment scheme is based on experience gained in treating industrial wastes, not in producing potable water. Results reported at industrial waste water treatment plants indicate that the equipment can reduce hexavalent chrome to less than 0.05 mg/l, which is the New Jersey drinking water standard for total chromium.

There are several methods available to remove mercury to within the New Jersey drinking water standard of 2 ppb. The recommended treatment process to remove mercury is reduction followed by coagulation. Adding powdered activated carbon (PAC) to the coagulation unit will further enhance mercury removal. Pilot testing is required to prove the effectiveness of the process.

SECTION 1.0 - PROBLEM STATEMENT AND STUDY OBJECTIVES

1.1 BACKGROUND

The City of Camden, New Jersey owns and operates the Morris-Delair and Puchack well fields and treatment plants. The Morris-Delair plant, constructed in 1960, is the major water supply and treatment facility of the city. It treats water from three active wells in the Delair well field and ten active wells in the Morris well field. Unit processes at the plant include aeration, pH adjustment, flash mixing, flocculation, sedimentation, pressure filtration, and chlorination which are aimed at removing carbon dioxide, iron, and manganese. The Morris-Delair plant provided about 10 mgd (million gallons per day) in 1980, almost 50% of the City's total average day water demand of 20.9 mgd. Pump capacity is 19 mgd but the treatment capacity is only 15 mgd.

The Puchack water treatment facility was constructed in 1959 and treats water from five wells in the Puchack well field, principally for the removal of iron and carbon dioxide. Unit processes include aeration and chlorination. The Puchack plant produced an average of 5.6 mgd in 1980, about 25% of the City's total average day demand. It's maximum capacity is 6 mgd. However, production has been cut back at Puchack in recent years because of groundwater contamination. Today, Puchack is only producing about 3 mgd.

water main size

The Puchack and Morris-Delair facilities are located outside the City in the adjacent community of Pennsauken (see Figure 1.1). Water from Puchack and Morris is pumped 5 miles through parallel 30-inch and 36-inch transmission mains back into the City service area.

In total, the Morris-Delair and Puchack well fields provide up to 75% of the City's average day water needs. The remaining 25% of the City's average day water needs is supplied from wells within the City limits.

ATTACHMENT H-5

1.2 PROBLEM STATEMENT

The City of Camden's average day water demand is 20.9 mgd. Historically, this demand has been met by pumping 10 mgd from the Morris-Delair wells, 5.6 mgd from the Puchack wells, 2.9 mgd from the Parkside wells, and 2.4 mgd from the City wells. The maximum day demand, however, is 33.4 mgd or 160% of average day demands. The available pumping capacity of the entire system is 34.2 mgd, and includes 19.5 mgd from the Morris well field, 6.2 mgd from the Puchack well field, 4.0 mgd frm the Parkside well field, and 4.5 mgd from the City well field. Thus, the City is just able to meet maximum day demands with all of its wells pumping. Production from the Puchack well field is essential if the City of Camden is to meet its peak summer demands. The overall problem is how to meet those peak demands given that a significant portion of the supply is contaminated, and may become even more so in the future.

1.2.1 THE NATURE OF THE CONTAMINATION PROBLEM

A description of the nature and extent of the contamination problems that have plagued the Puchack well field follows.

Chromium

In the early 1970s, chromium contamination was detected in Puchack Well no. 6. The well was removed from service in 1975, a significant loss because it was one of the City's most productive wells (3.15 mgd). In 1978, chromium contamination was detected in Puchack well no. 5. This well was removed from service sometime between 1981 and 1983. Subsequently, the chromium plume was detected in the remaining Puchack well field pumping wells.

In 1982, chromium contamination was detected at Puchack well nos. 7, 3, and 2. Puchack well No. 7 was taken out of service sometime between 1981 and 1983. Historical chromium concentrations -- of which 90% is in the form of

ATTACHMENT H-6

hexavalent chromium -- are shown in Figure 1.2. (Note that well no. 4 was destroyed during construction at the Ben Franklin Bridge, and water quality records for well no. 6 are not available).

The New Jersey drinking water standard for hexavalent chromium is 0.05 ppm. As of November 1985, finished water from Puchack (with only wells 1, 2, and 3 pumping) contained hexavalent chromium concentrations of 0.23 ppm.

Hexavalent chromium at total strength readily induces skin sensitations and ulcers, and produces lung tumors when inhaled. It has not been proved to be either an essential or beneficial element, and the amount of chromium that can be ingested over a lifetime without producing adverse health effects is still not completely known.

Mercury

Since 1978, mercury contamination has also been detected at the Puchack well field in well no. 2 (5.5 ppb), no. 3 (2.3 ppb), and no. 5 (8.4 ppb). These results are based on up to three samples taken at each well between the period 1978 through the present.

The New Jersey standard for mercury in drinking water is 2 ppb. Mercury occurs in inorganic and organic forms. Organic mercury compounds are the most toxic. However, the drinking water standard for mercury of 2 ppb is based on human consumption of aquatic organisms containing concentrated levels of methylmercury. This is unlikely to occur in water supply wells. To date, water quality analyses of Puchack well water have not differentiated whether the mercury is of the organic or inorganic form.

Volatile Organics

In addition to chromium and mercury, water quality analyses show the presence of volatile organics (VOCs) at most of the Puchack wells. The prevalent VOC is trichloroethylene, which has been detected in

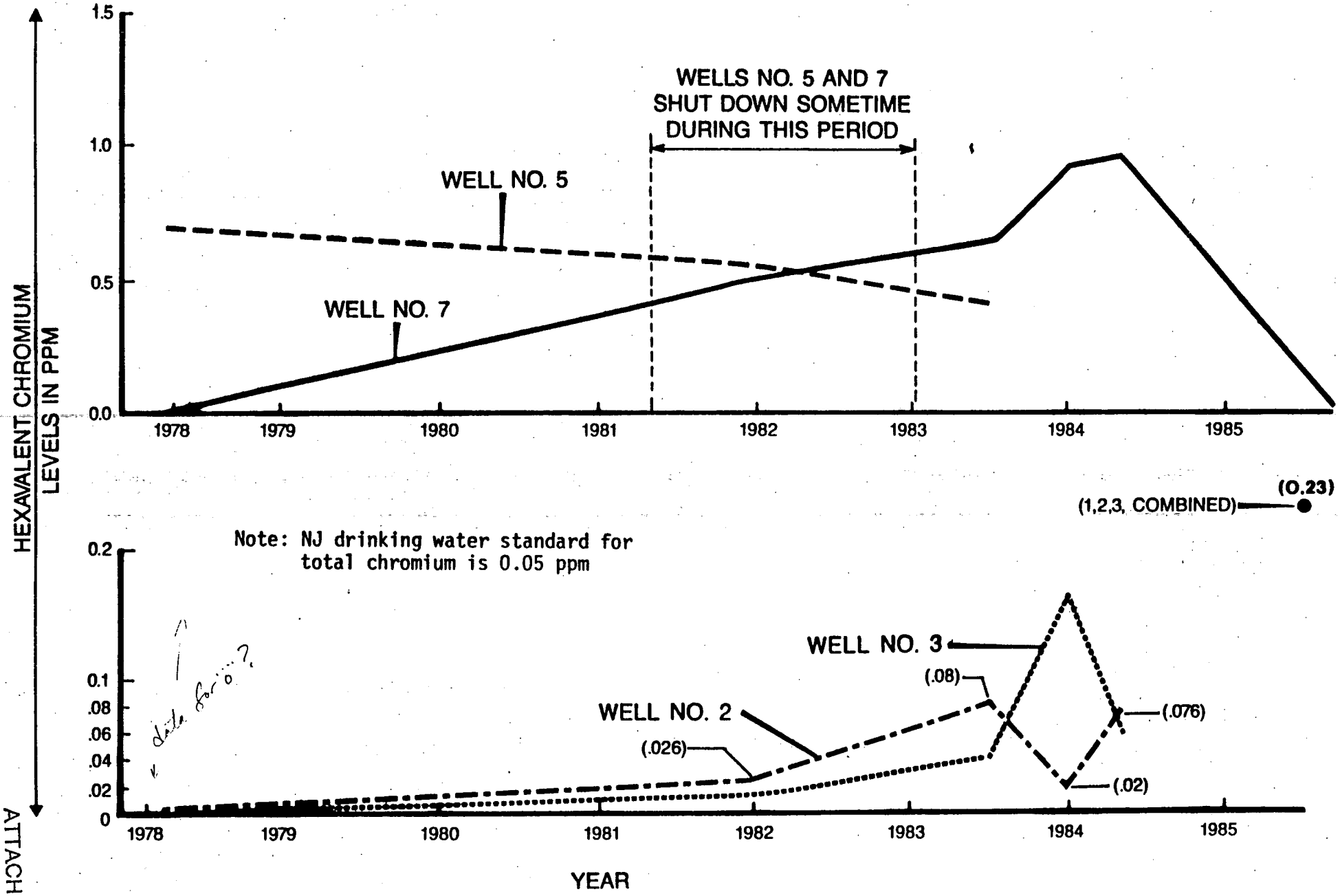

FIGURE 1.2
HEXAVALENT CHROMIUM CONCENTRATIONS AT PUCHACK WELLS

ATTACHMENT H-8

TABLE 2.4

PUCHACK STUDY
PUMPAGE HISTORY OF THE PUCHACK
AND MORRIS-DELAIR WELL FIELDS

	PUCHACK WELL FIELD	MORRIS-DELAIR WELL FIELD
1965-1975	1 - 1.02 MGD 2 - .85 MGD 3 - 1.02 MGD 5 - 1.1 MGD 6 - 2.05 MGD	9.3 MGD Combined
1975-1981	1 - 1.02 MGD 2 - .85 MGD 3 - 1.02 MGD 5 - 1.1 MGD 7 - 2.05 MGD	11.5 MGD Combined
1981-1983	1 - 1.25 MGD 2 - 1.04 MGD 3 - 1.25 MGD 7 - 2.4 MGD	12.7 MGD Combined
1983-1985	1 - 1.05 MGD 2 - .88 MGD 3 - 1.05 MGD	12.7 MGD Combined

ATTACHMENT H-9

2.2.4 CONTAMINANT MIGRATION

One of the more significant insights into the Puchack well field contamination problem is the pattern and history of failure of the production wells. Figure 1.2 represents a graph of the chromium levels in each of the Puchack wells over time. Several data gaps exist, however. In particular, the pre-1978 chromium values (well No. 6 was reportedly shut down in 1972-1975 for chromium contamination) would be helpful in determining dilution rates and travel times to wells 5 and 6. Compounding the problem is the fact that there are no records of when each well was in and out of service. Existing information does suggest, however, that wells failed as follows:

- Chromium contamination was detected at well No. 6 first. Well No. 7 was put into service in approximately 1975 to replace well no. 6.

- Well No. 5 and then Well No. 7 became polluted by chromium contamination quite probably as a result of the removal of Well No. 6 from service.

- Well No. 3 (and to a lesser extent, No. 2 and No. 1) became contaminated with chromium as a result of the removal of well No. 5 and No. 7 from service. The removal of well No. 7 (in about 1983) has apparently caused the plume to accelerate towards wells No. 3, 2 and 1.

  This general pattern of well failure is significant, and as will be demonstrated later, sheds light on which direction the contaminant source is likely to be located. Although other contaminants (mercury and volatiles) have affected the wellfield, chromium has been the most significant and persistent and has therefore, been focused on for this study. It should be noted, however, that the existence of other contaminants could be indicating that several sources affected the Puchack wells.

A literature review was conducted to evaluate the behavior of hexavalent chromium in the groundwater environment. In general, little work has been conducted on heavy metals contamination problems. However, one USGS study evaluated a cadmium and hexavalent chrome contamination problem in Nassau County, New York (Perlmutter, 1970). The results, which pertain to the Puchack problem, were that the hexavalent chromium moves at the same

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CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

Allen Dillon
Bureau of Safe Drinking Water
NJDEP
CN 029
Trenton, NJ 08625

September 14, 1989

Dear Mr. Dillon,

Your Bureau has expressed concern about our ability to supply water to New Jersey American for their customers in East Camden. This concern is, in my opinion, unfounded.

A comparison of our individual wells' pumping capacities with withdrawals reported in past years might indicate that we do not have the water to sell, but such a conclusion would be erroneous. My examination of this utility's pumping records of previous years shows that, to the contrary, our actual pumpage has been much lower than our reported pumpage and the capacity does exist to supply the requested purchases by NJAWC. To see that this is the case, consider Camden's reported pumpage for January 28, 1988, which was, curiously enough, alleged to be the peak withdrawal day for last year.

The reported withdrawal for January 28, 1988 was 23,736,000 gallons. This value cannot be correct. Given the number of Morris-Delair wells operating then and assuming that they all pumped for twenty-four hours, the average withdrawal rate must have been over 1,300 GPM--greater than the tested capacity of any individual well. Indeed, on nearly any day last year you choose to examine, you will see that the computed average GPM exceeds the physical capacities of the wells in operation. Clearly, this Department has been over-reporting withdrawals.

That over-reporting has occurred is further evidenced by the percent "unaccounted-for" water computed by this Department. Last year this was reported to be nearly 40% of total reported withdrawals, or enough water to cover our service area to a depth of about two feet. Common sense and recent leak tests show that we are not actually losing such a vast amount of water but that the data from which the unaccounted-for values have been computed are faulty.

ATTACHMENT E-1

A recent inspection by your Department at our main plant noted the need for better production metering. Faulty meters are the basis for our overreporting of withdrawals. I have used the operating hours and physical capacities of our wells to estimate our actual 1989 pumpage. These estimates may be compared to data based on the meters at Morris-Delair. Here is an example from the month of June, 1989:

A.	Total pumpage estimated at all plants.--	463,928,000 gallons
B.	Total pumpage metered.--	644,836,000 gallons
C.	A/B.--	72%

This result is typical. My estimate of actual pumpage is, on the average, about 70% of the metered withdrawal. I expect that, when the meters at Morris-Delair are operating properly, we will find that our actual pumpage is even less than that.

So, you see, our rate of withdrawal is nowhere near either our wells' physical capacity or our NJDEP permit level. We can provide water to our residents who live in NJAWC's East Camden service area in the amount requested by the company.

Sincerely,

Frank Al-Greene

ATTACHMENT I-2

ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

RECEIVED

TO Joe Douglass through Jim Hamilton, Chief, Southern Region Enforcement

FROM Kari Andres through Richard Dalton and Haig Kasabach, Deputy State Geologist, N.J. Geological Survey DATE December 21, 1983

SUBJECT Geophysical Study, Puchack Well Field, Camden County

A limited geophysical survey was conducted in the vicinity of the Puchack well field in Pennsauken Township, Camden County, in response to a request by Joe Douglass (Southern Region, Enforcement). The purpose of this survey was to attempt to determine the source and extent of elevated levels of chromium and volatile organics in the ground water in this area. A number of sources, which include SGL Modern Hard Chrome Service and the sewage collection system of the Pennsauken Sewerage Authority, are suspected. However, monitor wells at SGL do not indicate contamination. SGL is shown on Figure 2.

Hydrogeology

The Puchack well field is located in Pennsauken Township, a highly urbanized area of Camden County. The site is bordered on the northeast by the Betsy Ross Bridge and the Puchack Creek, and on the southwest by the Pennsylvania Reading Seashore Lines. The Delaware River lies approximately one mile to the northwest. Private homes border the well field.

The well field is located in the Atlantic Coastal Plain physiographic province and lies approximately 40 - 60 feet above mean sea level. The well field is underlain by the Magothy and Raritan Formations of Early to Late Cretaceous Age. The Magothy and Raritan Formations are described in Bulletin 39, "Ground Water Supplies of the Camden Area, New Jersey" as alternating beds of sand, gravel, and clay. The Raritan Formation is dominantly light colored, but the Magothy beds include some darker lignitic and glauconitic material. Underlying the Magothy and Raritan Formations at a depth of approximately 200 feet are crystalline rocks. Sample logs of wells in the well field from Bulletin 39 are shown on Figure 1.

Electrical Resistivity

The Bison 2390 electrical resistivity unit was used to measure the apparent resistivity of the site. In this approach, four electrodes were placed in the ground, in a straight line, equidistant from each other (Wenner Electrode Array). An electrical current is applied to the ground through the two outer electrodes and the voltage drop across the inner electrodes is measured. The apparent resistivity is then proportional to the ratio of the measured voltage drop to the induced current. Vertical electrical soundings were done to measure the variation of apparent resistivity with increasing depth. This is accomplished by expanding the electrode array outward from a central point.

A total of four soundings to an electrode spacing of 200 feet were completed in areas free of cultural interference. Additional areas were not available. The data is shown in tabulated form on Table 1, with the locations shown on Figure 2.

ATTACHMENT J-1

Figure 1

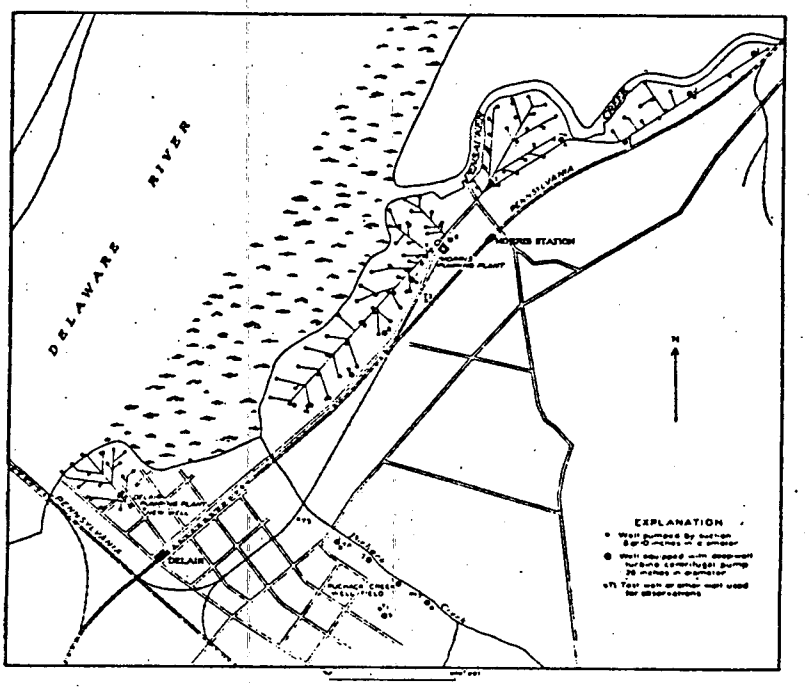


PLATE 2.—Map showing Morris, Puchack, and Delair well fields of the Camden Water Department.

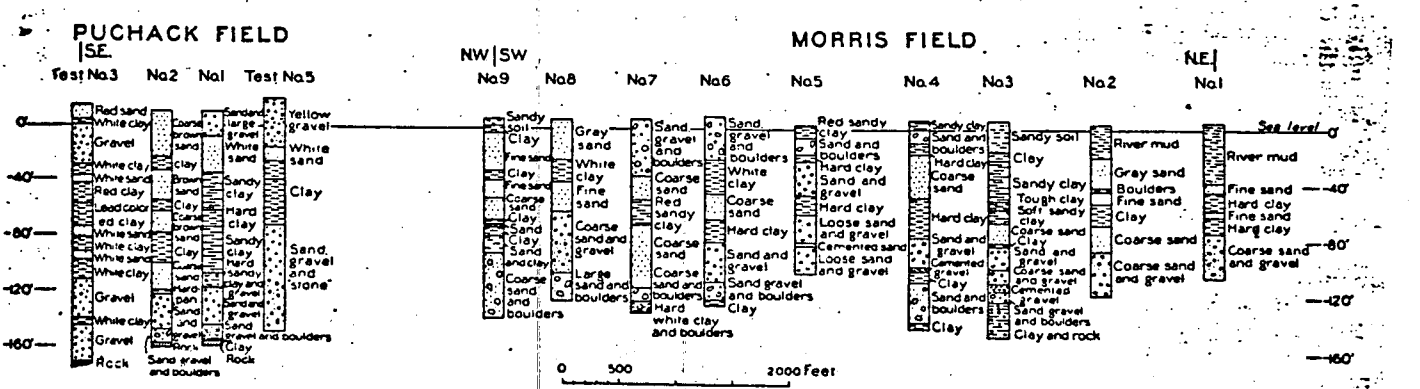


FIG. 2—Logs of wells in the Morris and Puchack well fields.

ATTACHMENT J.2

PLATE 2.—Map showing Morris, Puchack, and Delair well fields of the Camden Water Department.

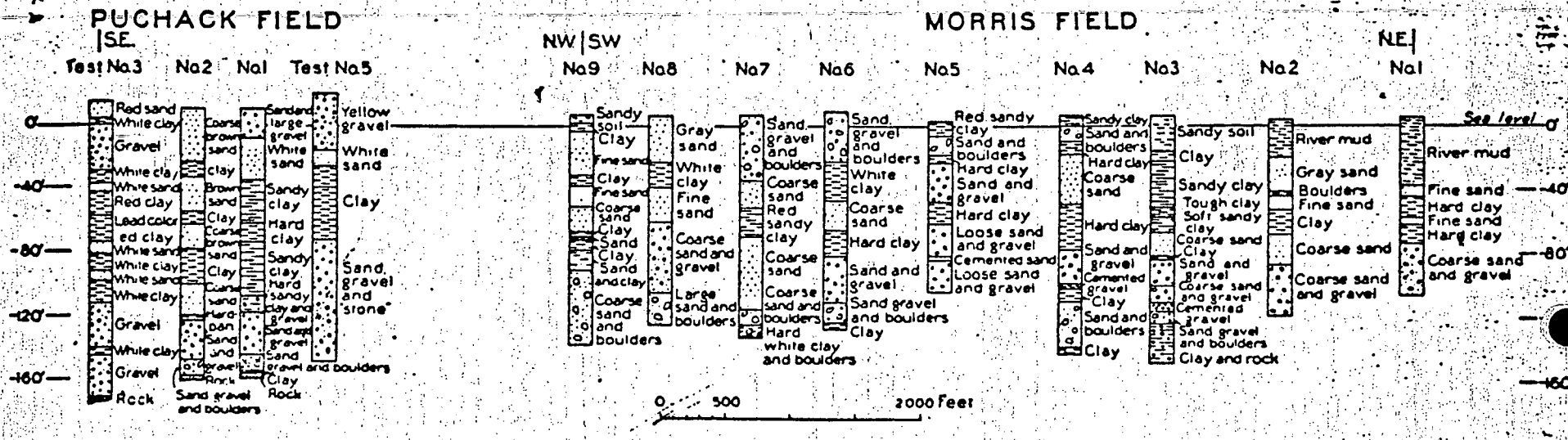
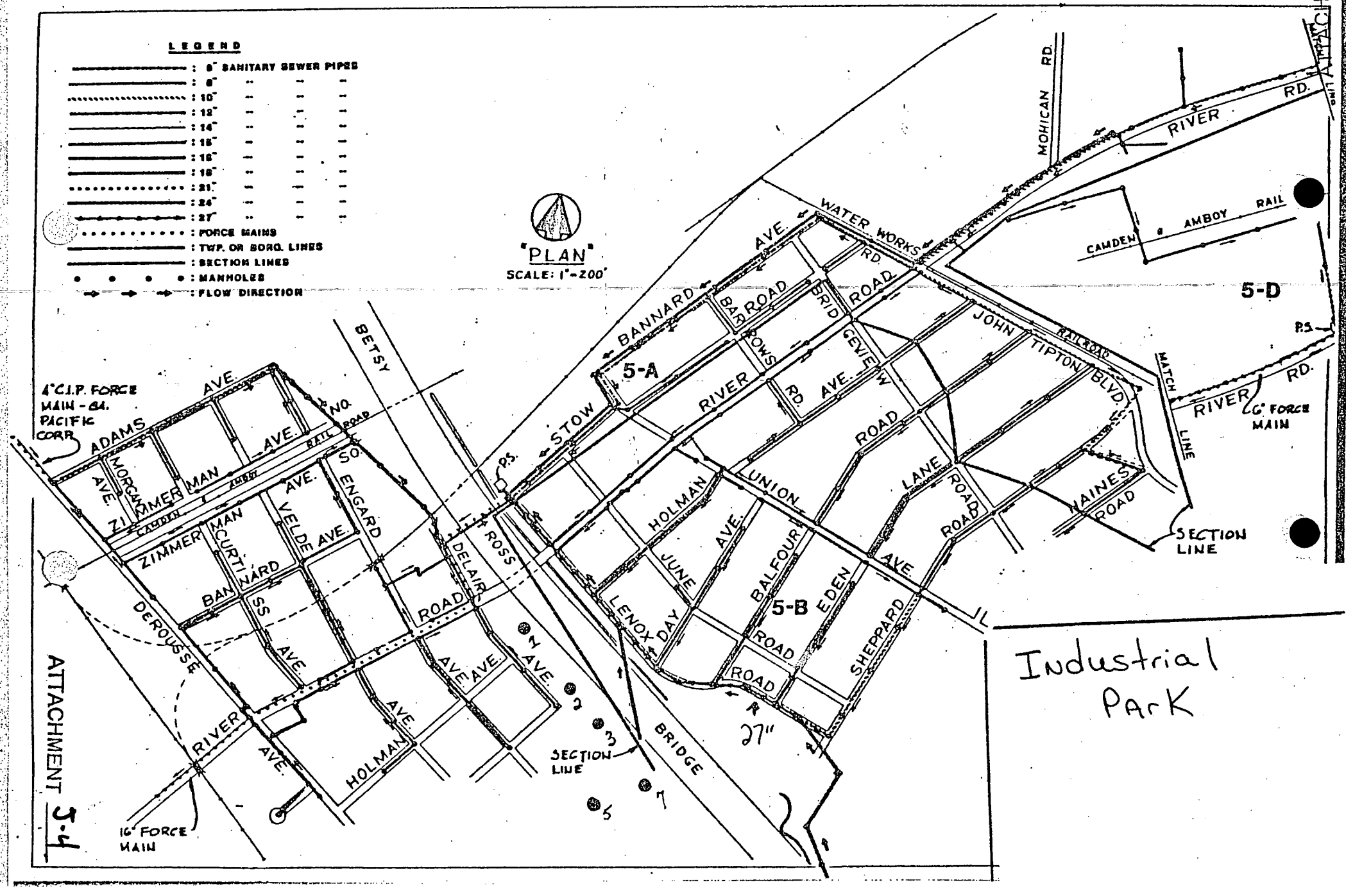


FIG. 2—Logs of wells in the Morris and Puchack well fields.

ATTACHMENT J-3

- Well #7 First well to show Cr^{+6} contamination.
- Well #5 Well #7 closes. Well #5 contaminated with Cr^{+6}.
- Well #3 Well #5 closes. Well #3 shows levels of Cr^{+6}.

Puchack Well Field



Industrial Park

ATTACHMENT 5-4

(19)

file NJDEP

RECEIVED
DIVISION OF WATER RESOURCES
ENFORCEMENT ELEMENT

JUN 23 12 12 PM '86

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

DIRECTOR'S OFFICE

JOHN W. GASTON JR., P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

APR 25 1986

The Honorable Melvin R. Primas Jr.
Mayor, City of Camden
City Hall, Mayor's Office
4th Floor
6th & Market Street
Camden, NJ 08101

Dear Mayor Primas:

The Department of Environmental Protection has had a report prepared by the firm of Camp, Dresser & McKee (CDM) evaluating the contamination of Camden City's water supply at the Puchack Wellfield.

The Puchack Wellfield is presently contaminated by a variety of compounds including hexavalent chromium, mercury, and volatile organic compounds. The contamination was first detected in the early 1970's at well no. 6. Since then, the contamination has moved into wells #5,#7,#3, and #2.

Historical chromium concentrations -- of which 90% is in the form of hexavalent chromium--reached their highest levels at well 7 (1ppm) in 1984. Other maximum chromium concentrations include well 5 (0.6ppm), well 3 (0.18ppm), and well 2 (0.08ppm). Concentrations at each of these wells are in violation of the drinking water standard for total chromium of 0.05 ppm.

As of 1981, mercury contamination has also been detected at the Puchack Wellfield.

As a result, use of water from the Puchack Wellfield is to be reduced to a minimum until treatment for the removal of these contaminants is in place. However, serious threat to the Morris-Delair fields may follow a complete shut down of the Puchack field. The Division therefore recommends maintaining a 2 mgd minimum withdrawal at Puchack, and blending this water thoroughly with Morris-Delair withdrawals.

ATTACHMENT K-1

The Division recommends that the city of Camden immediately institute measures to insure that the peak summer demands of 1986 can be satisfied, with water of satisfactory quality. Three measures which were detailed in the CDM report could provide the City with the water it will need. They are as follows:

Conservation Program

The City should institute an aggressive conservation program primarily aimed at reducing Camden's excessive distribution system leakage.

Blending

The City of Camden should tie the two parallel mains between 25th Street and State Street into a single 48" main for approximately 100 feet and then back to ensure complete blending between the Puchack and Morris/Delair supplies.

Rehabilitation

The City should rehabilitate existing wells at the Morris Wellfield. Camden would thereby gain significant additional yields at a reasonable cost.

It is the responsibility of the City of Camden to institute either these three measures or similar options which can provide a safe, dependable supply of water for its residents for the impending peak summer demands. The Department is concerned that inattention to these matters might result in the inability of the city to provide an adequate and safe supply of water during the approaching summer months.

We are interested in discussing which course of action the City is prepared to take. The urgency of this matter dictates that this discussion take place within the next two weeks.

Meanwhile, we expect to initiate further monitoring and analysis looking toward a longer range solution.

If you have any questions, please feel free to call John Preczewski at (609) 984-5862.

Very truly yours,

George G. McCann

George G. McCann, P.E.
Acting Director
Division of Water Resources

ATTACHMENT K-2

(22)

Responsible Parties

DRAFT

SEP 25 1989

IN THE MATTER OF : DIRECTIVE

THE CITY OF CAMDEN : AND

PUCHACK WELLFIELD : NOTICE TO INSURERS

- AND - :

PENLER ANODIZING COMPANY; :
SGL MODERN HARD CHROME; :
ALPHA TOOL & MACHINE COMPANY; :
PENNSAUKEN SOLID WASTE MANAGEMENT AUTHORITY; :
ALUMINUM SHAPES, INC.; :
UNITED STEEL & WIRE; :
ADVANCED PROCESS SUPPLY; :
DeVOE MARINE COATINGS COMPANY; :
GROW COMPANY, INC.; :
SWOPE OIL & CHEMICAL COMPANY; :
CHAPMAN INDUSTRIAL FINISHES, INC; :
DENTON PLASTIC PRODUCTS COMPANY; :
DeSOTO, INC; :
E.I. DuPONT de NEMOURS & CO., INC :
HOBART CORPORATION; :
McCLOSKEY VARNISH COMPANY :
MINNESOTA MINING & MANUFACTURING COMPANY (3-M); :
NL INDUSTRIES, INC; :
PHILADELPHIA NEWSPAPERS, INC.; :
ROHM & HAAS COMPANY; :
TRIANGLE PUBLICATIONS, INC.; :
UNITED STATES STEEL CORPORATION; :
MERCON Industries
King Arthur Inc
Advanced Process Supply
Garden State Motors
Wavenhauser
SuperTire Engineering

RECEIVED
SEP 27 1989
Ground Water Quality Mgt.
BGWPA

Most

Respondents

This Directive and Notice to Insurers is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP" or "Department") by N.J.S.A. 13:1D-1 et seq. and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. (or "Act"), and duly delegated to the Director of the Division of Water Resources or other authorized representative of the Division pursuant to N.J.S.A. 13:1B-4. This Directive and Notice to Insurers is issued in order to notify the above captioned Respondents and their Insurers that the Department, pursuant to the provisions of the Act, has determined that it is necessary to remove or arrange for the removal of hazardous substances, and in order to notify the Respondents that the Department has determined them to be responsible for the discharge of hazardous substances and to notify the Insurers of the Respondents that claims for the cost and/or damages as set forth in or arising out

ATTACHMENT L1

of this Directive and Notice to Insurers may be directly asserted by the Department against the Insurers.

FINDINGS

A. The Site

__. The City of Camden owns and operates the Puchack Wellfield, a public community water system (P.W. ID No. 0408001) located at Lot ___ , Block ____ , in Pennsauken Township, Camden County, New Jersey. The Wellfield was constructed in 1959 and consists of seven (7) wells which are screened in the lower aquifer of the Potomac, Raritan, and Magothy aquifer system. In 1980 the wellfield produced on average 5.6 million gallons per day ("mgd") of potable water, twenty-five (25) percent of the City's total average daily demand. Today, due to groundwater contamination, the wellfield produces approximately three (3) mgd. The wellfield is bordered on the northeast by the Betsy Ross Bridge and the Puchack Creek, on the southwest by the Pennsylvania Reading Seashore Lines, on the northwest, approximately one mile away, by the Delaware River, and on the southeast by private homes.

B. Respondents

__. The City of Camden owns and operates ~~of~~ the Puchack Wellfield ("the Wellfield") which contains hazardous substances as defined in N.J.A.C. 7:1E-1.3.

___. Penler Anodizing Company ("Penler") of Pennsauken, New Jersey is a company involved with the electroplating of metal products. Penler uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. SGL Modern Hard Chrome ("SGL") of Camden, New Jersey is a company involved with the electroplating of metal products. SGL uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Alpha Tool & Machine Company ("Alpha Tool") of Pennsauken, New Jersey is a company involved with the manufacture of machine parts. Alpha Tool uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Pennsauken Solid Waste Management Authority ("Pennsauken SLF") owns and operates the Pennsauken Sanitary Landfill of Pennsauken, New Jersey. The landfill was permitted to

ATTACHMENT L2

accept municipal, bulky, vegetative and non-chemical industrial wastes as well as dry sewage sludge.

__. Aluminum Shapes Inc. ("Aluminum Shapes") of Pennsauken, New Jersey is a corporation involved with aluminum smelting, extruding and the manufacturing of aluminum shapes. Aluminum Shapes uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. United Steel and Wire ("United Steel") of Pennsauken, New Jersey was a company involved in the manufacturing and electroplating of shopping carts. United Steel used and discharged various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Advance Process Supply ("Advance Process") of Pennsauken, New Jersey is a company involved in the manufacturing and storing of water-based textile inks and dyes. Advance Process uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. DeVoe Marine Coatings Company ("DeVoe") of Pennsauken, New Jersey is a company involved in the manufacturing of corrosion resistant paints and coatings. DeVoe uses and discharges various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Grow Group, Inc. ("Grow Group") of____ is the parent corporation of DeVoe.

__. Swope Oil and Chemical Company/Ashborne Company ("Swope Oil") of____ was a company involved in solvent reprocessing Swope used and discharged various chemical-based products and wastes, including Chromate which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Chapman Industrial Finishers, Inc. ("Chapman") of___is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Denton Plastic Products Company ("Denton") of___is a company involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. DeSoto, Inc. ("DeSoto") of___is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous

ATTACHMENT L3

substance as defined in N.J.A.C. 7:1E-1.3.

__. E.I.DuPont de Nemours & Company, Inc. ("DuPont") of Wilmington, Delaware is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Hobart Corporation ("Hobart") of ____ is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. McCloskey Varnish Company ("McCloskey") of ____ is a company involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Minnesota Mining & Manufacturing Company (3-M) ("Minnesota Mining") of ___is a company involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. NL Industries, Inc. ("NL Industries") of ___ is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Philadelphia Newspapers, Inc. ("Philadelphia Newspapers") of Philadelphia, Pennsylvania is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Rohm & Haas Company ("Rohm & Haas") of ____ is a company involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. Triangle Publications, Inc. ("Triangle") of ____ is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

__. United States Steel Corporation (U.S. Steel") of ____is a corporation involved in the manufacture and distribution of various chemical-based products and wastes, including _____ which is a hazardous substance as defined in N.J.A.C. 7:1E-1.3.

C. Site History

STATE OF NEW JERSEY

DEPARTMENT OF ENVIRONMENTAL PROTECTION

TELECOPIER DATA

TRANSMITTAL SHEET

DOCUMENT SENT TO: Bob Gallagher

SENDING ADDRESS: Pollution Assessment

DATE: Aug. 14, 1989 NUMBER OF PAGES: 4

CONTACT PERSON TO CONFIRM RECEIPT OF DOCUMENT:

NAME: Cheryl Boharsik TELEPHONE: (609) 346-8032

DEP OFFICE: Southern Bureau of Regional Enforcement

ATTACHMENT M1

CAMDEN CITY WELL CONTAMINATION MEETING - JUNE 21, 1989

NEW JERSEY AMERICAN WATER COMPANY & CAMDEN CITY WATER SYSTEM

(Camden System)	(north of the Cooper River)
PW ID # 0408002	PW ID # 0408001

Contamination of New Jersey American Water Company's potable water supply initially referred to SBRE in December 1985. 12.7 to 13.1 ppb (Level II) of Trichloroethene (TCE) were detected in Wells number 51 (31st & Cleveland), 52 (29th & Cleveland) and 53 (32nd & Cleveland). Analysis of 04-06-88 indicated TCE contamination in Well # 51 - 36 ppb (Level III); # 52 - 76 ppb (Level III); # 53 - 1.1 ppb (Level I) first by the water company and confirmed by NJDEP-BSDW. TCE contamination of Camden City Wells in the same area occurred prior to 1985 referral of New Jersey American contamination.

Potential Responsible Parties

NO

MAGNETIC METALS - 21st & Hayes
- Stored chemical drums - some labeled TCE
- facility had oil like substance that discharged to the ground which flowed onto Conrail's property.

Yes High P

CONRAIL PAVONIA RAILYARD -
- Major spill of diesel fuel in 1981
- TCE and other VOCs have been detected in MWs
- Facility had documented plume of diesel fuel and possibly kerosene which disappeared a few years ago, concensus at the time among the people involved with the case suggested that it migrated toward the Delaware River (NJ American Wells cone of influence was not taken into account due to previous studies that indicated that groundwater flow was tidal in that area.)
- Site investigation conducted by Conrail in November 1988, SBRE has requested a copy of the data but to date has not received it

DEHAWK TRANSMISSION - 2795 River Road
- discharged transmission fluid and degreasers into storm drains that flowed into the Cooper River

FLOWEN OIL-DELAWARE VALLEY CORPORATION - 18th & Carmen Avenue
- treated and stored hazardous waste
- facility had numerous spills

CONCORD CHEMICAL - 17th & Federal
- has USTs for chemical storage
- numerous spills have occurred at the facility's storage area

CLASSIC CHEMICAL - 17th & Admiral Wilson Blvd
- site of numerous chemical spills
- stored kerosene, methanol, naptha, mineral spirits and various solvents on site
- process wastewater discharged into sewer system
- facility now closed

HARRISON AVENUE LANDFILL - Harrison Avenue
- current MW data shows no VO contamination
- no GW monitoring data prior to 1986

ATTACHMENT M2

CAMDEN CITY WATER SYSTEM (south of the Cooper River)
PW ID # 0408001

Camden City has Volatile Organics, especially TCE, in their groundwater. The contamination was discovered around 1978 by the City of Camden and NJDEP-BSDW.

Camden City contains many abandoned industrial facilities. Contamination may have occurred as a result of direct discharge to the ground and/or seepage of sewage containing industrial waste from the sewer system. (Camden's sewer system is an old brick lined system and is plagued by frequent main ruptures and leaks).

Potential Responsible Parties

KRAMER CHEMICAL - Atlantic Avenue at the Delaware River
- inactive hazardous waste facility
- Discharged to septic system
- Facility had numerous documented spills

DRUM SERVICE OF CAMDEN - 1542 South Broadway
-Discharged hazardous waste into sewer system
-Facility had partially submerged surface basins into the ground
-Currently a Criminal Justice case

ELECTRIC EQUIPMENT & MACHINE COMPANY - 1929 South 6th Street
- Discharged hydrofluoric acid mixture and industrial wastewater from cleaning and rebuilding of air conditioning units and locomotive radiator cooling cores into the city sewer system and onto the facility's parking lot
- past Criminal Justice Case

CLARKSON LABS - Ferry Avenue
- Chemical manufacturing company
- process wastewater discharged to drainage ditch
- sampling of ditch confirmed presence of VOCs
- facility is closed

Numerous Drum Storage/Cleaning operations and Salvage Yards that have operated in the City of Camden over the past twenty years.

PARKSIDE WELLFIELD & OUR LADY OF LOURDES HOSPITAL
- Parkside is part of the Camden City water system
- Our Lady of Lourdes Hospital has a private potable well that is used for supplemental purposes only
- all the wells are located within the same area
- TCE , 1,2-Dichlorethane and Tetrachloroethene contamination
- area is mostly residential - responsible parties are not known at this time - may be same companies as noted above

ATTACHMENT M3

PUCHACK WELLFIELD
- Camden City Wellfield located in Pennsauken Twp.
- Chromium contamination first noted in 1982

Potential Responsible Parties

SGL MODERN HARD CHROME - 432 Cove & River Road
- has three (3) septic systems - two (2) of which accepted process wastewater
- chrome plating waste and steam condensation discharged to the ground via shallow ditches that lead to the septic system which were frequently overflowing
- soil around the facility has yellow color - soil samples are positive for Chromium
- ACO of 2/28/82 cites them as a suspected source of the wellfield contamination
- 1987 MW data showed Chromium (total) contamination of 300 ppm
- 1988 MW data (1st Quarter) no Chromium
- facility closed

PENLER ANODIZING COMPANY - 1400 Suckle Highway
- electroplating company
- site inspection in 1985 revealed an illegal discharge to the ground of process wastewater - Directive sent to cease discharge and redirect flow to Pennsauken Sewage Authority
- soil samples positive for Chromium

UNITED STEEL & WIRE - 1650 Suckle Highway
- nickel & chrome plating company
- past information indicates process wastewater may have been discharged to IPLs
- facility closed

SWOPE OIL - National Highway
- Superfund site
- Chromium contamination exists in the soil and groundwater at the site

ALUMINUM SHAPES - 9000 River Road
- aluminum smelting and molding company
- facility had documented chrome contamination in the soil and MWs
- RCRA facility for Chrome
- Past discharges to septic system
- currently has a parts cleaning pit (concrete lined), water in this pit has a pH of 2.0 to 3.0 SU
- history of petroleum products leaking from UST

PENNSAUKEN LANDFILL - River Road
- Chromium contamination noted in MWs
- contamination may come from adjacent Aluminum Shapes property

DEVOE MARINE COATINGS - River Road
- manufactures marine paints
- uses products that contain chrome in manufacturing process
- soil samples taken at facility contain chromium

ATTACHMENT M1

(27)

CITY OF CAMDEN

DEPARTMENT OF UTILITIES

REPORT ON PARKSIDE WATER TREATMENT PLANT ORGANICS STUDY

SEPTEMBER 1981

MALCOLM PIRNIE, INC.
100 Eisenhower Drive
Paramus, New Jersey 07652

1617 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19102

Walter T. McPhee
Registered Professional
Engineer
State of New Jersey
No. 15660

ATTACHMENT N1

1. INTRODUCTION

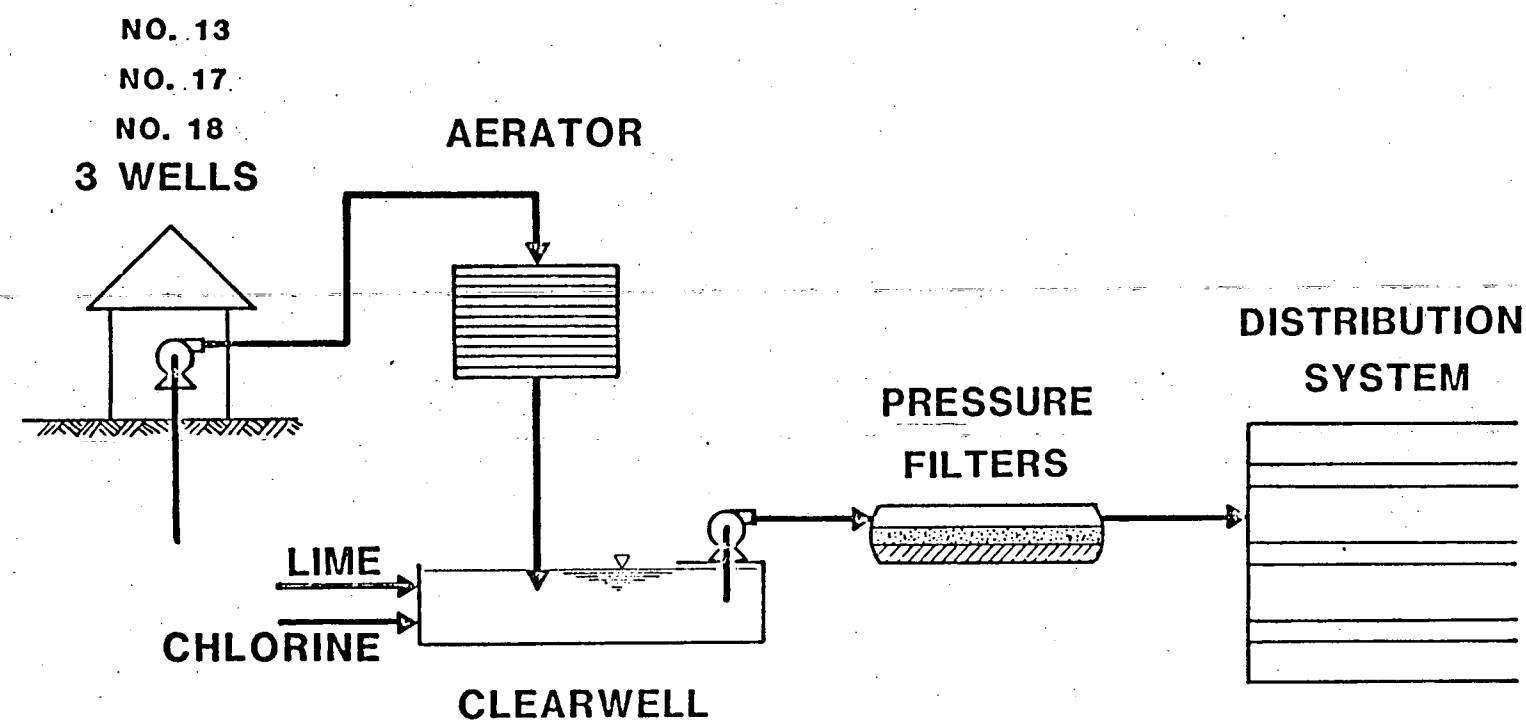
The Parkside Water Treatment Plant is one of three major facilities which provide water for the City of Camden, New Jersey. The Parkside Plant was constructed in 1958 as a carbon dioxide and iron removal facility. Raw water is supplied by three wells (Nos. 13, 17 and 18) in the Parkside well field. The maximum capacity of the wells and well pumps is estimated to be 4.0 million gallons per day (mgd).

The existing treatment facilities at the Parkside Plant are shown schematically on Figure 1 and consist of an aerator for carbon dioxide removal and iron oxidation, lime storage and feed facilities for iron oxidation and precipitation, chlorine storage and feed facilities for disinfection, and two pressure filters for iron and solids removal. The plant is rated at 3.6 mgd based on the capacity of the pressure filters.

Water from the Parkside wells contains high levels of carbon dioxide (around 100 to 200 mg/l) and moderately high levels of iron (1.0 to 2.0 mg/l) and manganese (0.15 to 0.30 mg/l). In addition to these constituents, various levels of four volatile organic chemicals (trichloroethylene*, tetrachloroethylene*, carbon tetrachloride*, and 1,2-dichloroethane*) have been identified in the three wells. Reports that these chemicals, even in very low concentrations, are potentially harmful to human health have caused a growing concern over their presence in ground water supplies throughout the country. Currently, the U.S. Environmental Protection Agency (EPA) is considering setting maximum contaminant levels for these and other volatile organic chemicals (VOCs) which have been detected in ground waters.

In the absence of federal regulations, the New Jersey State Department of Environmental Protection (NJDEP) is

ATTACHMENT N2



MALCOLM PIRNIE, INC.

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
PARKSIDE WATER TREATMENT PLANT

SCHEMATIC OF EXISTING FACILITIE

ATTACHMENT N3

FIGURE

utilizing the following guidelines concerning VOCs in the state's drinking waters:

	Maximum Level
Single VOC	50 ug/l
Total VOCs	100 ug/l

If VOC levels in a well exceed these concentrations, NJDEP will determine whether the well should be taken out of service considering the size and importance of the well in relation to the remainder of a municipality's water supply.

As a result of the VOCs being detected in the Parkside wells and recent concern over these chemicals, the City of Camden retained Malcolm Pirnie to study the use of the existing aerator at the Parkside Plant for VOC removal. The purpose of the study is to evaluate the VOC removal efficiency of the existing aerator and to identify measures which might be implemented to optimize the aerator performance.

ATTACHMENT N4

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the results of the testing program, the Parkside aerator may be optimized for VOC removal by reducing air recirculation and/or by increasing the A:W ratio via reducing the liquid loading rate. Removal of CO_2 also is improved under these conditions. The estimated performance of the aerator with these modifications are summarized below:

	TCE, PCE and Carbon Tetrachloride Removal	1,2-Dichloroethane Removal	CO_2 Removal
Existing Operations	50%	20%	50%
w/o Air Recirculation	60%	30%	70%
w/o Air Recirculation and w/Reduced Loading Rate	80%	50%	90%

Reducing air recirculation may be achieved by extending the exhaust outlets to the roof grating and by installing louvers in the three walls surrounding the aerator. In this manner, intake air would be drawn from the wall louvers and exhaust air would exit the aerator room above the walls. Also, the doorway to the aerator room could be kept closed during the winter months. It is estimated that these modifications would cost $10,000 to implement.

Reducing the liquid loading rate to the existing unit would require the installation of another aerator to maintain a 3.6 mgd capacity in the aeration process. A unit similar to the existing aerator with a cross-sectional area of 210 square feet as manufactured by Layne would be required. Also, piping modifications and extension of the existing building would be necessary. The costs to implement these modifications are estimated to be $150,000.

The efficiency of the aerator also could be improved by increasing the height of the aerator to increase the contact

ATTACHMENT N5

time, or by replacing the media with more efficient media which will provide a higher available area for mass transfer. Increasing the height of the aerator appears to be impractical because it is estimated that the height would have to be doubled to achieve 80 to 90 percent removal of TCE, PCE and carbon tetrachloride, and to achieve similar removal of 1,2-dichloroethane would require increasing the height by almost five times.

The use of a more efficient packing media could increase the VOC removal efficiency of the aerator while continuing to operate the unit at the current liquid loading rate. For instance, the use of 1-inch plastic media (such as berl saddles) could improve the aerator efficiency to greater than 90 percent for TCE, PCE, and carbon tetrachloride, and to about 90 percent for 1,2-dichloroethane. Pilot-scale tests should be conducted to verify these theoretical removal efficiencies. This type of media would provide a surface area of about 80 square feet per cubic foot of packing, while the existing redwood-slat media is estimated to provide an area of approximately 2 square feet per cubic foot. The cost of replacing the existing media with plastic packing is estimated to be about $50,000.

Recommendations

As indicated in the first section of this report, the NJDEP currently uses as a guideline for VOC levels in ground water supplies 50 ug/l for a single VOC and 100 ug/l for total VOCs. On this basis, the Parkside wells do not exceed the current state guidelines. Therefore, under the existing regulations, the Parkside aerator is adequate for maintaining VOC levels equal to or less than 50 ug/l, and thus no modifications currently are required. If VOC levels in the wells rise to 80 ug/l, modification of the aerator to minimize recirculation would help to reduce this level to below the current guidelines.

ATTACHMENT N6

Currently, USEPA is considering the promulgation of maximum contaminant levels (MCLs) for each of the organic compounds which have been detected in the Parkside wells. Potential MCLs range from less than 5 ug/l for some compounds to 50 ug/l for other compounds. If 50 ug/l is selected for all compounds, the Parkside aerator would be adequate to meet the MCL, provided that influent VOC levels remain the same as they are currently. However, if an MCL of 5 or less is selected, the aerator would have to be modified to provide greater removal efficiencies to meet the MCL. Because of the characteristics of the compounds, the required removal of 1,2-dichloroethane will govern the design of the unit. Based on the cost estimates outlined above, the most economical method of upgrading the aerator involves replacing the packing media as previously described.

ATTACHMENT N7

For Linda EXTRA COPY

STAFF REPORT

IN THE MATTER OF:

City of Camden

Application No. 5302 to renew permit to divert water from twenty-three wells and two proposed wells in the Township of Pennsauken and the City of Camden, Camden County

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., the City of Camden, Room 419A, City Hall, Camden, New Jersey, filed an application with the Division of Water Resources on July 8, 1982 for renewal of a permit to divert a maximum of 1,048 million gallons of water during any month (mgm) at a maximum rate of 42,474 gallons per minute from existing City Well Nos. 7, 11, 13, 17 and 18; Well Nos. 1, 3, 4, 6-13 in the Morris Wellfield; Well Nos. 1-3 in the Delair Wellfield; and Well Nos. 1-3, 5 and 7 in the Puchack Wellfield; and proposed Well Nos. 14 and 15 in the Morris Wellfield. All wells are screened in the Raritan-Magothy formation. The Morris and Delair wellfields are located along the Delaware River from Pennsauken Creek to just south of the Betsy Ross Bridge. The Puchack Wellfield is located east of the intersection of Engard Road and River Road. These wells are in the Township of Pennsauken. The City wells are located as follows: Well No. 7; at the intersection of Florence and 9th Streets; Well No. 11, at 9th Street and Ferry Avenue; Well No. 13, at Kaighn and Euclid Avenues; Well No. 17, at Park and Vesper Boulevards, and Well No. 18, 200 feet south of Euclid Avenue and 130 feet east of Park Boulevard. All City wells are located in the City of Camden. Diversion is for the purpose of public water supply.

parkside wells

Diversion is in the Delaware River Basin.

The applicant requests no change in their existing diversion rights and no public notice is required.

BACKGROUND

1. This permit is a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount (mgm)
W.S. 1799	10/18/79	All Sources	1048
		Morris-Delair Wellfield	821.6
		Puchack Wellfield	263.5
		City wells	349.89

ATTACHMENT O1

Permit No. W.S. 1799 also approved the construction of four proposed wells in the Morris wellfield - Nos. 12, 13, 14 and 15. These wells were to be completed within two years of issuance of the permit. To date only Well Nos. 12 and 13 have been drilled. Applicant still proposes to drill Well Nos. 14 and 15.

W.S. 1717	6/21/76	All Sources	1339.2
		Morris Wellfield	387.5
		Delair Wellfield	192.2
		Puchack Wellfield	263.5
W.S. 1518	7/13/70	All Sources	1339.2
W.S. 787	1/18/54	All Sources	1339.2
W.S. 786	1/18/54	All Sources	1339.2
W.S. 785	1/18/54	All Sources	1339.2
W.S. 758	3/16/53	All Sources	1339.2
W.S. 757	3/16/53	All Sources	1339.2
W.S. 612	12/06/45	Puchack Wellfield	263.5
W.S. 576	10/19/42	All Sources	1339.2
		Morris Wellfield	387.5
		Delair Wellfield	192.2
W.S. 490	11/16/38	City Wells	269.6*
W.S. 387	3/09/32	City Wells Nos. 9 and 10	63
W.S. 297	3/14/28	City Wells Nos. 5-8	155
W.S. 253	1/12/27	City Wells Nos. 1-4	186
		City Well No. 2	52.7
W.S. 156	1/16/24	Puchack Wellfield	310
W.S. 132	3/09/22	City Wells	186

*Rescinded on October 19, 1942

2. The diversion includes the following:

Well No.	Well Permit No.	Date Constructed	Screen Depth (ft.)	Design Pump Capacity (gpm)	Original Yield (gpm)
Morris Wellfield					
√ 1	51-50	1961	107	1600	
3	31-945	7/53	103-107	1800	1000
4	31-4252	10/60	95-130	1600	1585
6	51-51	1932	98-133	1700	1944
7	51-52	1960	85-120	1680	1630
8	31-944	7/53	89-124	1670	1000
9	51-76	1932	118-143	1670	1900
10	31-4251	11/60	75-115	1400	1529
11	31-15745	8/79	102-144	2030	2030
12	31-16814	1/81	102-108	2030	2030
13	31-16813	6/80	126-130	2060	2060

ATTACHMENT 0₂

14	Proposed		130	2060	
15	Proposed		130	2060	
Delair Wellfield					
1	51-53	1960	103-138	1680	1980
2	51-54	10/30	111-141	1830	1330
3	51-55	10/30	106-126	1830	1850
Puchack Wellfield					
1	51-56	1961	127-162	1500	1320
2	51-57	2/24	126-165	1000	1440
3	51-58	1939	137-177	1280	1184
5	51-59*	1938	-204	1324	1119
7	31-8526A*	7/75	140-180	2260	1287

Puchack No. 2 was redrilled in 1961, No. 3 redrilled in 1957 and No. 5 redrilled in 1961.

City Wells					
7	51-60	6/66	123-163	1500	1023
11	51-61*	9/42	124-154	1010	1005
13	31-904	6/53	185-225	1200	1000
17	31-1250	5/54	230-265	1500	1000
18	31-9574	1976	-185	1200	1250

*These wells are to be used only for emergency purposes as per an order by Bureau of Potable Water.

3. The diversion serves the City of Camden except the 11th and 12th wards.

FINDINGS OF FACT

1. A review of quarterly diversion reports indicate the following water use for 1983:

Source	Maximum Monthly Use (mgm)	Average Monthly Use (mgm)	Existing Allocation (mgm)
All Sources	820.9	692.0	1048
Morris-Delair Wellfields	553.7	457.4	821.6
Puchack Wellfield	154.3	117.6	263.5
City Wells	147.3	117.0	349.9

2. The population served is approximately 55,000, which represents an average consumption of 203 gpcd, and peak consumption of 240 gpcd. These figures are based on the assumption that approximately 50 percent of the water diverted is delivered to commercial and industrial establishments.

ATTACHMENT O3

3. The following static water level data is available:

Well No.	Static Water Levels (below well head) When Constructed (date)	(level)	Recent (date)	(level)
Morris Wellfield				
1	no data available		11/78	15'
			11/83	14'
3	7/53	12'	11/78	20'
			12/84	30'
			11/83	19'
4	10/60	13'	12/84	14'
6	7/32	14'	11/78	28'
			12/83	39'
			12/84	44'
7	no data available		12/84	31'
8	7/53	12'	11/78	25'
			11/83	32'
			12/84	32'
9	1941	13'	12/84	27'
10	11/60	11'	11/78	32'
			11/83	28'
11	6/79	39'		
12	7/80	32'		
13	6/80	33'		
Delair Wellfield				
1	no data available		11/78	23'
			12/84	40'
			12/83	32'
2	10/30	13'-		
			12/84	28'
3	10/30	11'	11/78	21'
			12/83	25'
			12/84	21'
Puchack Wellfield				
1	1957	28'		
2	2/24	20'	1961	36'
3	1957	28'		
5	1961	46'	12/84	71'
7	1/75	56'	11/78	43'
			12/83	48'
City Wells				
7	6/66	60'	11/78	55'
			11/83	52'
11	9/42	32'	11/78	44'
			11/83	40'

ATTACHMENT 04

13	6/53	46'	11/78	66'
			12/84	61'
			11/83	65'
17	5/54	56'	11/78	72'
			11/83	73'
18	—	—	11/78	77'
			12/84	78'
			11/83	77'

4. The following pump test data is available:

Well No.	Date of Test	Yield (gpm)	Drawdown (feet)	Static Level (feet)	Pumping Time (hours)
Morris Wellfield					
3	7/28/53	1000	34	12	8
4	10/24/60	1585	28	13	8
6	7/11/32	1700	46	14	8
8	7/29/53	1000	30	12	8
10	11/29/60	1529	25	11	8
11	6/07/79	2030	46	39	24
12	7/07/80	2030	38	32	8
13	6/04/80	2060	45	33	8
Delair Wellfield					
2	10/31/30	1330	75	13	8
3	10/31/30	1850	49	11	8
Puchack Wellfield					
2	2/24	1440	49	20	–
7	1/29/75	1287	23	56	8
City Wells					
7	6/02/66	1023	21	60	8
11	9/01/42	1005	30	32	8
13	6/19/53	1000	24	46	8
17	5/13/54	1000	30	56	8

5. Other sub-surface diversions within a one-mile radius include the following:

Well Owner	Well No.	Well Permit No.	Depth (ft.)	Capacity (gpm)	Distance (miles)
West Jersey Hospital	1	31-3689	140	200	0.5
Eavenson & Levering Co.	1	—	170	250	0.6
	2	—	171	—	0.6
	5	—	203	350	0.6
	6	—	173	350	0.6
MacAndrews & Forbes	1	31-290	103	300	0.7
	2	51-35	99	350	0.7
Shaevitz Engineering	1	31-3338	150	200	0.7
	2	31-3437	150	200	0.7

ATTACHMENT 05

Pennsauken Township	-	31-151	176	350	0.8
Collingswood	2	31-4053	278	800	0.9
	3	31-4054	287	870	0.9
	4	51-30	292	650	0.9
	5	31-79	306	700	0.9

6. Public water supply wells within a 5-mile radius include the following:

Well Owner	No. of Wells	Depth (ft.)	Capacity (gpm)	Distance (miles)
Collingswood	7	278-313	650-1000	0.95
Merchantville-Pennsauken	14	139-290	700-1005	1.1
Gloucester City	4	262-306	1000	1.4
NJ Water Co.-Camden Div.	6	170-198	700-1300	1.6
NJ Water Co.-Delaware Valley	9	51-236	600-1000	1.7
Haddon Township	4	448-479	800-1300	2.4
Brooklawn	3	321-327	200-400	2.7
Bellmawr	5	160-557	500-1000	3.0
Westville				3.2
Haddonfield	5	249-600	670-1000	3.6
Moorestown	7	290-378	700-1000	3.6
NJ Water Co.-Cherry Hill	15	167-741	700-1500	3.6
Maple Shade	5	121-500	140-1500	3.7
NJ Water Co.-Haddon Dist.	8	190-598	350-700	4.1
Deptford MUA				4.3
West Deptford				4.4

7. Nearest landfills and other hazardous surface disposal sites include:

Name of Source	Distance (miles)	Formation Affected	Status
Harrison Avenue Landfill	1.6	Raritan-Magothy	Case Closed
SGL Modern Hard Chrome Service	1.2	Raritan-Magothy	Investigation continuing
Exxon Station	1.4	Pennsauken	Case Closed
Conrail	1.2	Raritan-Magothy	Investigation continuing

8. The following wells have been abandoned or are unused:

Well No.	Well Permit No.	Depth (ft.)	Status
Morris Wellfield			
1	Drilled in 1926	107	
2	Drilled in 1926	116	
2	Drilled in 1941	115	Sealed (1979)

ATTACHMENT 06

	3	Drilled in 1926	120	
	4	Drilled in 1926	138	
	5	Drilled in 1926	100	
	5	Drilled in 1932	120	
	5	31-4253		Sealed (9/12/73)
	6	Drilled in 1926	128	
	7	Drilled in 1926	127	
	8	Drilled in 1926	125	
	9	Drilled in 1926	170	
Puchack Wellfield				
	1	Drilled in 1924	141	
	3	Drilled in 1924	175	
	4	Drilled in 1924	184	Sealed (12/4/70)
	5	Drilled in 1924	186	
City Wells				
	1	Drilled in 1922	183	
	1	Drilled in 1940	169	
	1	31-940	175	Monitoring*
	2	Drilled in 1926	183	
	2	31-941	182	Sealed (9/11/73)
	3	Drilled in 1922	116	
	3	Drilled in 1934	115	
	3	31-942	120	Sealed (11/83)
	4	Drilled in 1922	163	
	4	Drilled in 1935	160	
	4	Drilled in 1950	165	Monitoring*
	5	Drilled in 1928	174	
	5	31-943	144	Sealed (9/20/63)
	5	31-4649	171	To Be Sealed 10/84
	6	Drilled in 1928	135	
	6	31-13	140	Monitoring*
	7	Drilled in 1928	164	Sealed (7/15/66)
	7	Drilled in 1945		
	8	Drilled in 1928	174	
	8	31-944		Sealed (9/11/73)
	9	Drilled in 1935	145	
	9	Drilled in 1957		Sealed (9/13/73)
	10	Drilled in 1935	153	Monitoring*
	10	Drilled in 1957		
	12	Drilled in 1945	170	To Be Sealed (10/84)
	14	31-905		Sealed (9/18/73)
	15	31-1248	141	Sealed (11/4/83)
	16	31-1249	180	Monitoring*
Test Well No. 6		31-1246	181	
Euclid Avenue Test Well		31-9488	288	
Test Well No. 2		31-138	130	

*Wells to be used for groundwater monitoring as per Administrative Order of September 14, 1983.

ATTACHMENT 01

There are numerous other abandoned wells owned by the City of Camden. By 1922, the City operated approximately 25-8" wells at the Delair Wellfield, 95-8" wells at the Morris Wellfield and 4-24" wells in the City. The status of most of these wells is unknown.

9. Water, after use is discharged to the Camden County MUA for treatment. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.

The Water Quality Management Element has knowledge of this discharge activity.

10. The water system has storage capacity of 5 MG, as compared with a water demand of 22 MGD.

11. The system has the following interconnections with adjacent systems:

Name of System	Size of Interconnection
Gloucester City	1-6"
New Jersey Water Company	2-12" and via fire hydrants
Collingswood	1-6"
Merchantville-Pennsauken	via fire hydrants

12. Applicant has no agreements for sale or purchase of water.

13. The system is 92 percent metered. All of the connections that are not metered are residential customers. Most of these are hardship cases. Commercial establishments are 100 percent metered.

14. The applicant has obtained prior approval from the Delaware River Basin Commission (under Docket No. D-79-83CP).

STAFF ANALYSIS

1. The per capita water use is above average. This may be attributed to industrial and commercial uses. A water conservation plan will be required as a matter of State policy. A survey of unaccounted-for-water will be required under the newly-adopted General Management Regulations. (N.J.A.C. 7:19-6.4).

2. The diversion probably will not have an adverse affect on nearby wells because there have been no complaints of interference. It should be noted that there are several wells within a one-mile radius.

3. Natural replenishment of groundwater appears to be occurring in some wells because there has been no significant change in groundwater levels.

ATTACHMENT O8

However, other wells have experienced static water level declines between 20 and 30 feet. It is probable that there is adequate infiltration from the Delaware River.

4. Groundwater pollution does exist in this area. Several of the wells have been contaminated by organic and/or inorganic pollutants. Possible sources of contamination are the Harrison Avenue Landfill and SGL Modern Hard Chrome Service. Contamination may also be caused by leaking sanitary sewers. Leakage from the sewers may be transported to a lower aquifer by old abandoned wells which have not been sealed or were improperly sealed. There is no information available on which wells should be monitored for possible groundwater contamination.

The Recommendation Section of this Staff Report should include permit conditions which relate specifically to groundwater contamination.

5. There is some possibility of salt water intrusion because of the proximity of the Delaware River. The following chloride analysis data was obtained by the USGS:

Well No.	Date	Chloride (mg/l)
Morris 3	7/12/82	30
Morris 11	7/12/82	20
Morris 12	7/13/82	16
Delair 1	9/15/82	23
Delair 2	9/15/82	30
Delair 3	9/15/82	18
Puchack 1	7/13/82	23
Puchack 2	9/15/82	40
Puchach 7	7/13/82	15

Applicant will be required to submit data on chloride concentrations so that significant changes can be identified and corrective action initiated.

6. Because of regional deficiencies in the Raritan-Magothy formation, allocation will be issued for a limited period of time. It is anticipated that during 1986, the metropolitan region will be declared a "critical area" (as defined by N.J.A.C. 7:19-6.10). Extraordinary measures to reduce groundwater use or to require diversion from a non-critical source are to be expected.

7. This Staff Report has been coordinated with the Bureau of Groundwater Pollution Analysis of the New Jersey State Geological Survey.

ATTACHMENT 0a

CONCLUSIONS

1. The allocation is necessary and in the public interest.

2. The diversion may be contributing to groundwater pollution and salt water intrusion. Some water quality monitoring may be required.

3. The diversion probably will not exceed natural replenishment, and will not unduly interfere with other users.

RECOMMENDATIONS

Issuance of the permit is recommended subject to the standard conditions and to the following specific conditions:

1. The amount of water that may be diverted under this renewal permit shall be as follows:

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Formation
Morris wellfield			
51-50	1	1600	Raritan-Magothy
31-945	3	1800	Raritan-Magothy
31-4252	4	1600	Raritan-Magothy
51-51	6	1700	Raritan-Magothy
51-52	7	1680	Raritan-Magothy
31-944	8	1670	Raritan-Magothy
51-76	9	1670	Raritan-Magothy
31-4251	10	1400	Raritan-Magothy
31-15745	11	2030	Raritan-Magothy
31-16814	12	2030	Raritan-Magothy
31-16813	13	2060	Raritan-Magothy
Proposed	14	2060	Raritan-Magothy
Proposed	15	2060	Raritan-Magothy
Delair wellfield			
51-53	1	1680	Raritan-Magothy
51-54	2	1830	Raritan-Magothy
51-55	3	1830	Raritan-Magothy
Puchack wellfield			
51-56	1	1500	Raritan-Magothy
51-57	2	1000	Raritan-Magothy
51-58	3	1280	Raritan-Magothy
51-59	5	1324	Raritan-Magothy
31-8526A	7	2260	Raritan-Magothy
City wells			
51-60	7	1500	Raritan-Magothy
51-61	11	1010	Raritan-Magothy

ATTACHMENT 0.10

31-904	13	1200	Raritan-Magothy
31-1250	17	1500	Raritan-Magothy
31-9574	18	1200	Raritan-Magothy

Puchack Well Nos. 5 and 7 and City Well No. 11 shall only be used for emergency purposes.

2. The total allocation from the above sources shall not exceed 1,048 million gallons per month at a maximum rate of 42,474 gpm.

3. All wells shall be metered. The total diversion for each month from each well shall be reported quarterly to the Bureau of Water Allocation under Permit No. 5302. Applicant shall submit within 60 days of receipt of this permit a plan for monitoring diversions using the form or format available from the Bureau of Water Allocation. Wells shall be equipped with a tag showing the well permit numbers listed above.

4. The applicant shall submit, with the fourth quarterly diversion report: (a) the total annual commercial/industrial water use; (b) the percent of unaccounted for water not metered; (c) the annual daily peak water consumption in gallons per capita per day.

5. Morris wellfield Well Nos. 14 and 15 shall be constructed so that water level measurements can be made by tape at any time.

6. Applicant shall submit with quarterly diversion reports the monthly static water level of wells identified in the monitoring plan (See 3. above). Measurement shall be made when the well pump has been shut down for a recovery period of 12 to 24 hours.

7. Applicant shall submit with each quarterly report, an analysis of chloride concentration of a well in each wellfield, and the date sample was taken.

8. Each production well shall be monitored for volatile organics twice a year. Samples shall be taken in February and August of each year and shall be collected and analyzed by approved USEPA and NJDEP methods. Analyses shall be submitted to the Bureau of Potable Water, Division of Water Resources.

9. The Puchack, Morris-Delair and Parkside treatment plants shall be monitored for volatile organics in the finished water. Results shall be submitted quarterly to the Bureau of Potable Water, Division of Water Resources.

10. A plan for the Puchack, Morris-Delair, and the City Well Treatment Plants and each associated wellfield shall be submitted within six months of the adoption of the Camden Feasibility Study to the Bureau of Potable Water, Division of Water Resources. The plan shall evaluate alternatives

ATTACHMENT 0u

including controlled pumping and improving treatment to achieve the lowest level of organics.

Existing aeration facilities at the Puchack Run Treatment Plant which are not operable shall be returned to working order within six months. To the extent feasible, the most effective packing materials shall be used.

11. The pumping equipment capacity shall not be increased without prior approval by the Division.

12. All new services shall be metered upon installation.

13. The applicant shall proceed expeditiously to correct leakages in the total distribution system detected through a systematic and accounting program to monitor same, which program must be approved by the Division within six months of the date of this approval.

14. The applicant shall adopt and implement to the satisfaction of the Division, a continuous program to encourage water conservation in all types of use within the area served by the applicant. A report shall be submitted to the Division on or before October 31, 1985, and each year thereafter, on the actions taken pursuant to this program and the impact thereof.

15. Within six months of acceptance of the permit, permittee shall seal all abandoned wells which are not used for observation purposes in accordance with the regulations of the Division, and shall so inform the Bureau of Water Allocation.

16. Permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. Permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation. An application for renewal shall be filed 3 months prior to the expiration date.

17. If the permittee fails to comply with any of the terms and conditions herein, or in the public interest and after due process, this approval may be reviewed for possible modification or revocation thereof.

18. The Division, at its option, may cause the permit to be reviewed to examine the need for the allocation and to determine compliance with the terms and conditions of the permit and whether a modification to the permit is necessary.

19. The permittee is subject to such initial, renewal and annual fees as may be prescribed by the regulations.

20. Approval of this application is subject to the granting of any approval by the Delaware River Basin Commission which may be required under the provisions of the Delaware River Basin Compact.

21. This permit shall expire on July 1, 1988, or at such time as permit conditions may be changed by a critical area determination, whichever occurs sooner.

22. This permit shall not become operative unless and until the applicant has filed with the Division within 60 days from the date of transmittal hereof, written acceptance of the terms and conditions hereby imposed.

Respectfully submitted,

Diane E. Hart 10-31-85

Diane E. Hart
Bureau of Water Allocation

EHH

OK WW
11/4

ATTACHMENT O13

MEMORANDUM

FROM: FRANK AL-GREENE

TO: FRED MARTIN

SUBJECT: INDUSTRIAL METERS

AS OF THE END OF LAST MONTH THIS IS THE STATUS OF THE METER RECALIBRATION:

TOTAL NUMBER OF METERS	331
CALIBRATION CERTIFIED	109
CALIBRATION PENDING	5

ATTACHMENT 014

(16)

INTERCONNECTION REPORT
City of Camden
Water Utility

Collingswood

The intersection of South Collings Road and Mt. Ephraim Avenue. 6" Cast iron pipe controlled by one 6" line valve on 6" C.I. pipe from Collingswood.

Gloucester

A 6" line valve located at the Southwest Corner of South Collings Road and Tennessee Road, through 2250' ± of 6" Cast iron pipe to a valve located directly under the viaduct portion of the Walt Whitman Bridge in Gloucester City on the Southerly side of Collings Road. Note: There is a 4" Cast iron blow off valve and discharge pipe under the bridge crossing the Newton Creek. The pipe under the Newton Creek Bridge is a 10" Cast iron pipe.

Pennsauken

There exist two separate interconnection points between the City of Camden water system and the Merchantville-Pennsauken Water Commission system through fire hydrants only.

1. A City of Camden fire hydrant located on River Road the South side, 93' East of Delair Avenue (in front of Puchack pump station in Delair, New Jersey) and a MPWC fire hydrant located on the Northeast Corner of Delair Avenue and River Road, 150' between hydrants and across River Road.

2. A City of Camden fire hydrant located on the Southerly side of River Road 98' East of the Easterly curb line of 49th Street and a MPWC fire hydrant located adjacent to it on the Southerly side of River Road, East of 49th Street, there are 47' between hydrants. The City hydrants are connected to a 36" water main at both locations.

New Jersey Water Company in Camden City

There are seven interconnections between the City of Camden water system and the New Jersey Water Company system. Two connections are via direct pipe interconnection and five locations via fire hydrants located in relative close proximity to each other.

ATTACHMENT P1

A. Direct piped interconnections

1. The intersection of North 27th Street and River Road, from the City 36" cast iron main through a 36 x 12" tapping sleeve and valve via 12" cast iron pipe to the NJ Water Company 12" valve on 12" main in North 27th Street on the Southerly side of the intersection. Note: This interconnection was installed in 1983.

2. On River Road 258' East of Federal Street. A double valved interconnection between the City 30" main and the NJ Water Company 12" main via 12" C.I. pipe (See Plan #2841-1 cabinet 20)

B. Fire hydrant interconnections

1. Harrison Avenue, the North side, 73' South of North 21st Street, a City hydrant and a NJ Water Company hydrant located on Southwest Corner of Harrison Avenue and North 21st Street, the distance between hydrants is 99' across Harrison Avenue.

2. East State Street, the North side a City hydrant connected to the 30" water main, 200' West of River Avenue and a NJ Water Company hydrant on the Southerly side of River Road 175' West of East State Street. The distance between hydrants across both East State Street and River Avenue is 440'.

3. River Avenue, the North side 65' East of East State Street a City hydrant connected to the 30" water main and a NJ Water Company hydrant located on River Avenue the South side, 155' East of East State Street The distance between hydrants across River Avenue is 125'.

4. North 18th Street, the East side 92' North of River Avenue, a City hydrant connected via 120' of 8" C.I.P. to the 30" main in River Avenue and a NJ Water Company hydrant located on the North East Corner of North 18th Street and River Avenue. The distance between hydrants is 97'.

5. North 19th Street, the East side, 73' South of River Avenue a City hydrant connected via 80' of 8" C.I.P. to the 30" main in River Avenue and a NJ Water Company hydrant located on the North East Corner of River Avenue and North 19th Street. The distance between hydrants is 137'.

ATTACHMENT P2

(13)

B.H.
1/ Vince - info
2/ Nazir -
3/ Return to BH.

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

September 14, 1989

Barker Hamill
Department of Environmental Protection
Bureau of Water Resources
CN 029
Trenton, New Jersey 08625-0029

RE: THE CITY OF CAMDEN REPLACING ALL 3" AND 4" WATER MAINS WITH 8" WATER MAINS.

Dear Mr. Hamill:

Please accept this letter as notification that the City of Camden, Department of Utilities is applying for a loan to replace all 3" and 4" water mains with 8" water mains. This improvement will undeniably benefit all current and future consumers as the municipal system is currently antiquated and is in need of repair and updating.

Thank you for your attention to this matter and if the loan is granted further contact will be forth coming.

Sincerely,

Frederick H. Martin, Jr.
Director, Department of Utilities

ATTACHMENT Q1

25

PRELIMINARY

CDM

CAMDEN METRO STUDY AREA

TASK 4
WATER SUPPLY SOURCE LOCATION AND ANALYSIS

December 1984

Camp Dresser & McKee

4.2 THE PRM AQUIFER

4.2.1 How does the PRM aquifer operate?

- The Potomac-Raritan-Magothy Formation (PRM) make up a considerable part of the Coastal Plain sediments in New Jersey. The PRM outcrops on either side of the Delaware River in one of the most urbanized and industrialized corridors of the Northeast. The outcrop area of the PRM is 21 sq. mi. in Camden County, 48 sq. mi. in Burlington County, and 32 sq. mi. in Gloucester County. The width of the outcrop ranges from two to three miles. The PRM forms a wedge-shaped body that thickens in a downdip direction. The thickness of the PRM ranges from 260 feet in Collingswood to over 1,000 feet in Winslow Township. The PRM is the most heavily used aquifer in New Jersey. In 1980 over 105 mgd was withdrawn by public, commercial and industrial users in the study area.

- Major sources of recharge are 1) rainfall on outcrop; 2) induced infiltration of river water; and 3) leakage from overlying aquifers.

- Rainfall recharge is estimated to be 21 mgd in Camden County; 41 mgd in Burlington County (20 mgd within our study area); and 32 mgd in Gloucester County (6 mgd within our study area).

- The amount of Delaware River water induced into the PRM has increased over the years as the regional cone of depression has widened and deepened. The USGS estimates that induced infiltration of Delaware River water began to occur in the late 1950s (Luzier, 1980). The USGS estimated that about 12 mgd of river water was induced into the PRM in 1956. Today, the cone of depression has widened and deepened so that the gradient from river to aquifer has become steeper. Consequently, the USGS estimates that today, about 40 mgd to 50 mgd is moving from the river into the aquifer.

ATTACHMENT R2

- The amount of water leaking into the PRM (leakage) from the overlying Englishtown and Mt. Laurel-Wenonah aquifers increases as the differences between the piezometric surfaces of the aquifers increases. Thus, under natural pre-pumping conditions (about the year 1890), leakage was estimated by the USGS to be 10 mgd. Because the piezometric surface of the PRM has declined by 50 to 60 feet since the late 1950s while the piezometric surface of the Englishtown and Mt. Laurel-Wenonah aquifers has remained about the same during the same period, the amount of leakage has increased. The USGS estimates that, as of 1973, the amount of leakage had increased to about 44 mgd (Luzier, 1980). As the PRM has been drawn down even further since 1973, present day leakage is in excess of 44 mgd.

- The most recent modeling effort suggest that, of the water taken from the entire PRM, 40% to 50% is recharged from the river, 30% is recharged by leakage from the overlying aquifers, and 15% to 25% is recharged by rainfall. The remaining 5% to 10% comes from lateral groundwater inflow and aquifer storage.

- Groundwater withdrawals from th PRM were 105 mgd in the study area in 1980. About 93 mgd of this was used by public purveyors, the remainder by commercial and industrial users. About 43.3 mgd is taken in the Camden County between the Delaware and Cherry Hill.

ATTACHMENT R3

4.2.2. <u>How has the induced infiltration of Delaware River water affected the quality of the aquifer?</u>

- Chloride data were selected to evaluate what the affects of induced infiltration of river water were on aquifer quality. There were several reasons for selecting chlorides. First and foremost, because background chloride concentrations in the aquifer range from 5 to 10 mg/l and chloride concentrations in the river can be an order of magnitude greater, it is easier to evaluate the movement of high chloride river water into the aquifer rather than other constituents where the quality differences are not as pronounced. Second, a large body of chloride data exists as opposed to other constituents. Finally, chloride can be considered for the most part to be a conservative substance (i.e., does not decay) so that the effects of other chemical and biological reactions can be ignored. Trends observed in the chloride data (extent of movement, dilution, etc.) could be indicative of the movement of other constituents.

- Other constituents of concern from a water supply and treatment perspective are iron and manganese, pH, and organics. (Note that nitrates are not a concern in the PRM because 98% of the outcrop is sewered; nitrates are primarily a concern in areas with on-lot septic systems.)

- Using historical piezometric surfaces prepared by Gill and Farlekas (1976), the Project Team estimated the theoretical movement of river water into the aquifer. First, using flow net diagrams, a zone theoretically influenced by the river was delineated as shown in Exhibit 4.1. Next, theoretical velocities were calculated using hydraulic conductivities, piezometric surface gradients, and porosities. The Project Team estimated that water from the river moved into the aquifer at a rate of 0.7 ft/day during the 1950s, 1.3 ft/day in the 1960s, and 1.5 ft/day in the 1970s.

R4

- The present positioning of the toe, middle, and top of the deep salt transition zone is shown in Exhibit 4.10. The movement of the deep salt transition zone has been modeled by both the USGS (Luzier, 1980) and CDM (1981). Under pre-pumping conditions, CDM's modeling effort suggested that the leading edge of the deep salt was moving at a rate of 5 to 10 feet/year. Luzier estimated that the deep salt was moving at a rate of 12 ft/yr in 1956 and 31 ft/yr in 1973. Given the present day cone of depression, the deep salt is estimated to be moving at a rate upwards of 100 ft/yr (CDM, 1981). The General Management Regulation's definition of dependable yield, however, requires that groundwater withdrawals not "increase the risk of introducing salt water into the aquifer." The hydrologic conditions that have developed in the PRM in the Camden Metro area are in conflictwith f this definition. Continued pumping in stressed areas of the PRM will cause the deep salt to continue its inland movement - a clearly unacceptable situation and one that may require cutbacks in pumping in certain areas.

- If no additional withdrawals are made from the confined portion of the PRM and the present (1978) piezometric surface is maintained, then the deep salt would theoretically move 0.8 miles to Washington Township by 2000 (1.5 miles by 2020) and 0.6 miles under Wenonah by 2000 (1.2 miles by 2020).

- Local upconing of the deep salt is also a potential problem. Both Luzier (1980) and Meisler (1980) delineated chloride profiles in the study area; these profiles show chloride concentrations increasing from 250 mg/l to 1000 mg/l within a vertical distance of about 300 to 400 feet.

- An upconing analysis for a well in Washington Township shows potential for this problem. The well is a likely candidate because it is screened to a depth of 650 feet; the 250 mg/l isochlor in this area is at a depth of 800 feet. The analysis

ATTACHMENT R5

4.6 DELAWARE RIVER

4.6.1 How much water could we take out of the Delaware River?

- Upwards of 75% of any water taken from the Delaware River would be returned directly via wastewater treatment plant discharges. Looking at quantity alone, there is enough water to supply all the needs of the study area. Any withdrawal from the Delaware River, however, would be subject to DRBC restrictions; these restrictions could take the form of a requirement that a percentage of the water withdrawn be made up by low-flow augmentation.

4.6.2 What is the water quality of the Delaware River?

- Quality improves as one moves upstream as shown in Exhibit 4.19.

- Based on experience at the Torresdale Treatment Plant (renamed the Baxter Plant), problems with ammonia, dissolved oxygen, nutrients, and taste and odor could be expected, especially during low flow conditions.

- Volatile organics appear in concentrations less than 5 ppb and are probably not a problem, although a final determination will depend on the water quality standards ultimately developed by the state.

- Many organics are not presently legislated and little to no data exist to determine their presence in the River.

- There is concern about the susceptibility of a surface source to spills in the river and leachate from hazardous waste sites situated on or near the banks of the river (for example, the landfill owned by Rohm and Haas Corporation near Croyden in Bristol Township).

EXHIBIT 4.19

1983 Water Quality of Delaware River

Average Concentrations

Constituent	River Mile 98.7 (Walt Whitman Bridge)	River Mile 110.7 (Torresdale Intake)
pH (units)	6.8	7.2
Turbidity (units)	6	8
Dissolved Oxygen (mg/l)	3.4	7.0
Chloride (mg/l)	21	16
Ammonia (mg/l)	0.46	0.20
Nitrate (mg/l)	1.07	1.10
Total Coliform (MPN/100 ml)	117,717	1,245
Fecal Coliform (MPN/100 ml)	11,823	446
Zinc (mg/l)	0.03	0.03
Manganese (mg/l)	5.0	5.0
Iron (mg/l)	0.67	0.83
Nickel (mg/l)	0.02	0.02
Cadmium (mg/l)	0.005	0.01
Lead (mg/l)	0.0005	0.0004

ATTACHMENT R7

- Chlorides are not a problem except during low-flow conditions. The DRBC adopted an instantaneous sodium standard of 50 mg/l at the Torresdale intake to protect this surface supply during a recurrence of the 1960s drought of record.

4.6.3 Where would a surface supply be located?

- Based on the water quality data presented above, any surface supply should be located in the general vicinity of the Torresdale intake or even further upstream. Burlington City presently operates an intake on the Delaware River on the New Jersey side of the river.

ATTACHMENT R8

61

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CN 402
Trenton, N.J. 08625

PERMIT

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No.	Issuance Date	Effective Date	Expiration Date
NJ0031984	12-7-83	1-15-84	1-14-89

Name and Address of Applicant	Location of Activity/Facility	Name and Address of Owner
Morris-Delair Water Treatment Plant Room 403, City Hall Camden, N.J. 08101	Zimmerman Avenue Delair, Pennsauken Township Camden County, N.J.	City of Camden City Hall Camden, N.J. 08101

Issuing Division	Type of Permit	Statute(s)	Application No.
Water Resources	New Jersey Pollutant Discharge Elimination System (NJPDES)-DSW and DGW	N.J.S.A. 58:10A-1 et seq. N.J.A.C. 7:14-1 et seq.	NJ0031984

This permit grants permission to:

Discharge to Pennsauken Creek, classified as FW-2 Non-Trout waters, in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and Module B hereof; and discharge to groundwater via overland flow and infiltration/percolation lagoons as set forth in Modules H and I hereof.

Approved by the Department of Environmental Protection

By Authority of:
John W. Gaston, Jr., P.E.
Director
Division of Water Resources

Arnold Schiffman, Administrator
Water Quality Management

11/29/83
DATE

* *The word permit means "approval, certification, registration, etc."*

(GENERAL CONDITIONS ARE ON THE REVERSE SIDE.)

Form DEP-007 (8/83)

ATTACHMENT SL

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF AUTHORIZATION

PERMIT NO.	ISSUANCE DATE	EFFECTIVE DATE	EXPIRATION DATE
NJ0031984	12-7-83	1-15-84	1-14-89

ISSUED TO
Morris-Delair Water Treatment Plant
Room 403, City Hall
Camden, N.J. 08101

FOR ACTIVITY/FACILITY AT
Zimmerman Avenue
Delair, Pennsauken Township
Camden County, N.J.

OWNER
City of Camden
City Hall
Camden, N.J. 08101

ISSUING DIVISION
- [x] Water Resources
- [ ] Coastal Resources
- [ ] Environmental Quality

TYPE OF PERMIT
New Jersey Pollutant Discharge Elimination System (NJPDES)-DSW and DGW

STATUTE(S)
N.J.S.A.
58:10A-1 et seq.
N.J.A.C.
7:14-1 et seq.

APPLICATION NO.
NJ0031984

A PERMIT TO

Discharge to Pennsauken Creek, classified as FW-2 Non-Trout waters, in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and Module B hereof; and discharge to groundwater via overland flow and infiltration/percolation lagoons as set forth in Modules H and I hereof.

By Authority of:
John W. Gaston, Jr., P.E.
Director
Division of Water Resources

DEP AUTHORIZATION

Form DEP-008
7/80

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE ACTIVITY/FACILITY SITE.

ATTACHMENT 52

ADM-012
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MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO John J. Trela, Chief, Bureau of Ground Water Discharge Permits

FROM Carol Miller, BIWM, Industrial Permits DATE 6/8/83

SUBJECT Name of Facility: Morris-Delair Water Treatment Plant
Permit #: NJ0031984
Location of Facility (Township & County): Pennsauken Twp, Camden County

I. Description of facility: Municipal water treatment plant producing potable water from groundwater using aeration, flocculation, clarification and filtration. Sludge from clarifiers is stored in unlined sludge drying lagoon. Sludge from lagoon is occasionally removed and dumped on ground next to lagoon. Surface water discharge consists of untreated filter backwash which flows overland to Pennsauken Creek.

II. We are initiating review of the above TWA/permit application. This facility includes the following which may require a Discharge to Ground Water Permit.

- ____ spray irrigation
- ✓ overland flow
- ✓ lagoons
- ____ underground injection
- ✓ land application of sludge/septage
- ____ treatment ponds
- ____ evaporation ponds
- ____ recharge ponds
- ____ landfill
- ____ industrial septic system
- ____ waste piles
- ____ storage areas
- ____ polishing ponds
- ____ recharge beds
- ____ injection wells
- ____ commercial & community subsurface disposal (infiltration beds)

III. Additional Comments:
Above information obtained from site inspection on May 31, 1983 for surface water discharge permit.

ATTACHMENT T1

New Jersey Department of Environmental Protection
Division of Water Resources
Industrial Waste Management
CN-029
Trenton, N.J. 08625
(609) 292-4860

PUBLIC NOTICE

NOTICE: ISSUANCE OF DRAFT NJPDES PERMIT NJ0031984

Notice is hereby given that:

Morris-Delair Water Treatment Plant
Room 403, City Hall
Camden, New Jersey 08101

has applied to the New Jersey Department of Environmental Protection (NJDEP) for a New Jersey Pollutant Discharge Elimination System (NJPDES) permit to discharge from a facility located at Zimmerman Avenue, Delair, Pennsauken Township, Camden County, New Jersey to Pennsauken Creek classified as FW-2 Nontrout waters. The applicant produces 18 MGD of potable water from ground water using aeration, flocculation, sedimentation and filtration (SIC 4941). There is one existing discharge consisting of 0.225 MGD of filter backwash water which receives no treatment.

For an existing facility, issuance of the NJPDES permit is the enforcement mechanism by which pollutant discharges are brought into compliance with standards.

This notice is being given to inform the public that NJDEP has prepared a draft NJPDES permit. This draft permit contains conditions necessary to implement the provisions of the "Regulations Concerning the New Jersey Pollutant Discharge Elimination System" (N.J.A.C. 7:14A-1 et seq.), which were promulgated pursuant to the authority of the New Jersey "Water Pollution Control Act" (N.J.S.A. 58:10A-1 et seq.), "Solid Waste Management Act" (N.J.S.A. 13:1E-1 et seq.) and the "Pretreatment Standards for Sewage" (N.J.S.A. 58:11-49 et seq.).

The draft permit prepared by NJDEP is based on the administrative record which is on file at the offices of the NJDEP, Division of Water Resources, located at 1474 Prospect Street in the Township of Ewing, Mercer County, New Jersey. It is available for inspection, by appointment, between 8:30 a.m. and 4:00 p.m., Monday through Friday. Appointments for inspection may be scheduled by calling (609) 984-4428.

Interested persons may submit written comments on the draft permit to the Administrator, Water Quality Management, at the address cited above. All comments shall be submitted within 30 days of the date of this public notice. All persons, including applicants, who believe that any condition of this draft permit is inappropriate or

ATTACHMENT T2

that the Department's tentative decision to issue this draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of the public comment period. All comments submitted by interested persons in response to this notice, within the time limit, will be considered by the NJDEP with respect to the permit application. At the close of the public comment period, the Department will issue or deny the permit. The Department will respond to all significant and timely comments when a final permit is issued. The applicant and each person who has submitted written comments will receive notice of NJDEP's final decision.

Any interested person may request in writing that NJDEP hold a non-adversarial public hearing on the draft permit. This request shall state the nature of the issues to be raised in the proposed hearing and shall be submitted within 30 days of the date of this public notice to the Administrator, Water Quality Management at the address cited above. A public hearing will be conducted whenever the NJDEP determines that there is a significant degree of public interest in the permit decision. If a public hearing is held, the public comment period in this notice shall automatically be extended to the close of the public hearing.

Arnold Schiffman
Administrator
Water Quality Management

WQM69-J/PN:lml

ATTACHMENT T3

State of New Jersey
Department of Environmental Protection
Division of Water Resources
1474 Prospect St., CN-029
Trenton, New Jersey 08625

STATEMENT OF BASIS
DRAFT NJPDES PERMIT TO
DISCHARGE INTO THE WATERS OF
THE STATE OF NEW JERSEY

NJPDES APPLICATION No. NJ0031984

DESCRIPTION OF LIMITATIONS AND CONDITIONS

Discharge 001

The applicant discharges untreated filter backwash from the production of potable water. The effluent limitations for suspended solids are based upon regional EPA guidance for filter backwash discharges. The limitations for pH and oil and grease are requirements of the Delaware River Basin Commission (DRBC). Monitoring for iron is required due to the nature of the applicant's activity.

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CN 402
Trenton, N. J. 08625

PERMIT *

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No.	Issuance Date	Effective Date	Expiration Date
W-2-80-2979	November 22, 1982	November 22, 1982	not applicable

Name and Address of Applicant	Location of Activity/Facility	Name and Address of Owner
City of Camden Water Department Director-Dept. of Utilities City Hall Camden, New Jersey 08101	Pennsauken Township, County of Camden	City of Camden Water Department Director-Dept. of Utilities City Hall Camden, New Jersey 08101

Issuing Division	Type of Permit	Statute(s)	Application No.
[x] Water Resources [ ] Coastal Resources [ ] Environmental Quality [ ] Other	Potable Water Supply	N.J.S.A.58-12A et.seq;N.J.A.C. 7:10-et-seq	W-2-80-2979

This permit grants permission to:

1. derive water from Morris Well No. 12 and Morris Well No. 13;
2. construct
   a. A new source of water supply comprising Morris Well No. 12 and Morris Well No. 13 (treatment by existing facilities at the Morris-Delair Plant comprising aeration, pH adjustment (lime), flocculation, sedimentation, chlorination (gas), filtration, polyphosphate)

as shown on white prints, four in number entitled: "Plans For Construction Of Morris Wells No. 12 and No. 13 For The City Of Camden, N.J." dated February 8, 1980, received February 14, 1980, an Engineer's Report dated February 15, 1980, received February 21, 1980; Additional Data: one dated February 26, 1980, received March 3, 1980, one dated May 21, 1981, received May 27, 1981, one dated May 22, 1981, received May 27, 1981; and according to Specifications entitled: "U.S. Department of Commerce EDA Project No. 01-51-2122 Morris Wells No. 12 and 13" undated, received February 14, 1980; and all approved by the State Department of Environmental Protection of the State of New Jersey on November 22, 1982; said works to be located in the Pennsauken Township (Well No. 12 is about 1500 feet northeast of the Betsy Ross Bridge at the Delaware River; Well No. 13 is about 750 feet northeast of the Betsy Ross Bridge at the Delaware River), County of Camden New Jersey.

Distribute water for potable purposes from said works.

This permit is subject to the following specific conditions:

1. The operation of the public water facility shall be under the supervision of an operator or operators who shall be in possession of a valid license or licenses issued by the State Department of Environmental Protection of the State of New Jersey, Classification (s) W-1. T-1, or equivalent pursuant to the provisions of NJSA 58:11-14 through 58:11-18.22 and the supplements thereof and the amendments thereto.

SEE PAGE 2 FOR SPECIFIC CONDITIONS

Approved by the Department of Environmental Protection

By the authority of
John W. Gaston Jr., Director
Division of Water Resources

DATE

William Whipple, Administrator
Water Supply and Watershed Management Administration

The word permit means "approval, certification, registration, etc."

(GENERAL CONDITIONS ARE ON THE REVERSE SIDE.)

Form DEP-007

ATTACHMENT U1

STATE GEOLOGIST
P.O. BOX 1390 CN-029
TRENTON, N.J. 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTEC
OFFICE OF THE COMMISSIONER
TRENTON, N.J.

Permit No. 31-16813
31-02-246
Well #13

PERMIT TO DRILL WELL **VALID ONLY AFTER APPROVAL BY THE D.E.P.**

Owner City of Camden Driller Layne-New York Co., Inc.

Address City Hall Address P. O. Box 250

Camden, N.J. 08101 Moorestown, N.J. 08057

diameter of well	proposed depth of well	proposed capacity of pump
24"x18"x16" inches	130' ± feet	1500 G.P.M.
	method of drilling: Rotary (cable-tool, rotary, jet, etc.)	use of well: Public Supply (semi-public, domestic, industrial, public-supply, test, etc.)

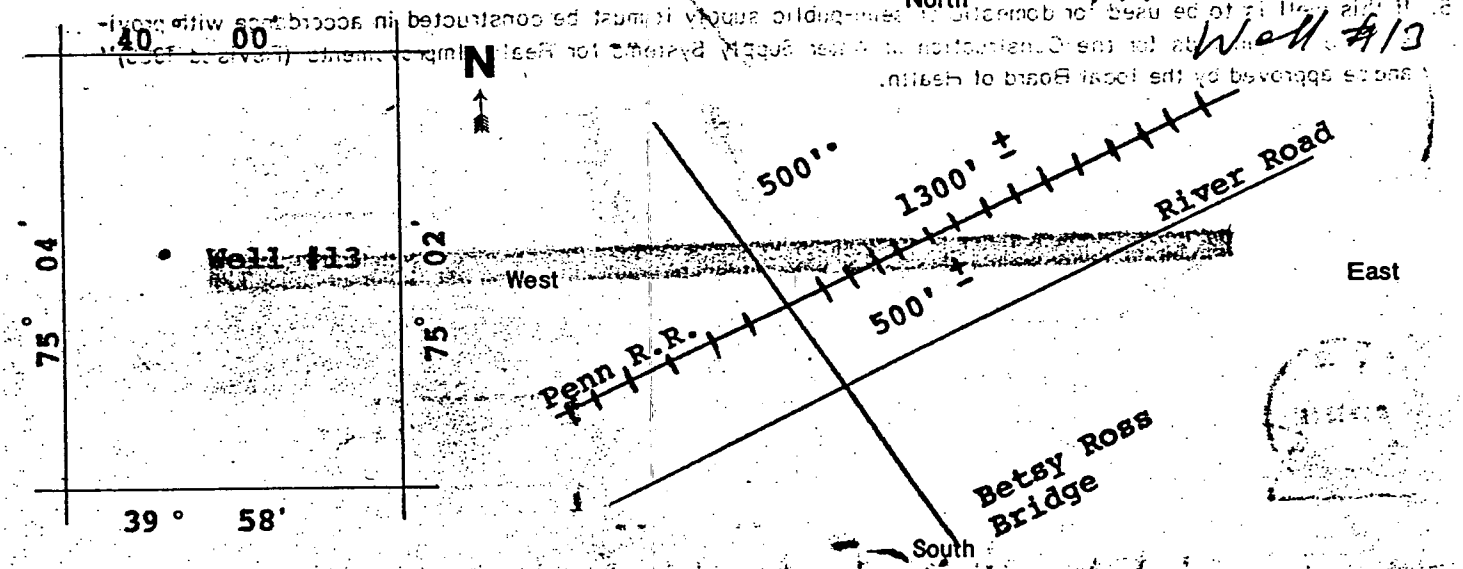
LOCATION OF WELL

lot #	block #	municipality	county
1	S247	Pennsauken	Camden

Draw sketch showing distance and relations of well site to nearest public roads, streets, septic systems, etc.

State Atlas Map No. _____

Application No. 1799
Well #13



SEE REVERSE SIDE for IMPORTANT PROVISIONS AND REGULATIONS pertaining to this permit. APPROVAL of this permit is made SUBJECT TO acceptance of and compliance with the following ADDITIONAL CONDITIONS:

- [x] Permit issued in accordance with provisions of letter of transmittal dated 4/23/80.
- [ ] It is necessary that Geophysical Logs of this well be made by the Division of Water Resources. The owner shall require the driller to notify the Division by PHONE (609-292-2232) when drilling is completed. Permanent pumping equipment SHALL NOT be installed until such logs are made.
- [ ] Samples of cuttings required every _____ feet.
- [ ] _____

This space for Approval Stamp

WELL PERMIT
APPROVED
APR 23 1980
DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

In compliance with R. S. 58:4A-14, application is made for a permit to drill a well as described above.

Date 4/14/80 Signature of Owner Michael D. Vera
Potable Water

~~LOCAL HEALTH DEPARTMENT COPY~~ ATTACHMENT U2

STATE GEOLOGIST
P.O. BOX ~~1890~~ CN-029
TRENTON, N.J. 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF THE COMMISSIONER
TRENTON, N.J.

Permit No. 31-16814
31-02 - 251

PERMIT TO DRILL WELL **VALID ONLY AFTER APPROVAL BY THE D.E.P.** Well #12

Owner City of Camden
Address City Hall
Camden, N.J. 08101

Driller Layne-New York Co., Inc.
Address P. O. Box 250
Moorestown, N.J. 08057

diameter of well	proposed depth of well	proposed capacity of pump
24"x18"x16" inches	130' ± feet	1500 G.P.M.
	method of drilling: Rotary (cable-tool, rotary, jet, etc.)	use of well: Public Supply (semi-public, domestic, industrial, public-supply, test, etc.)

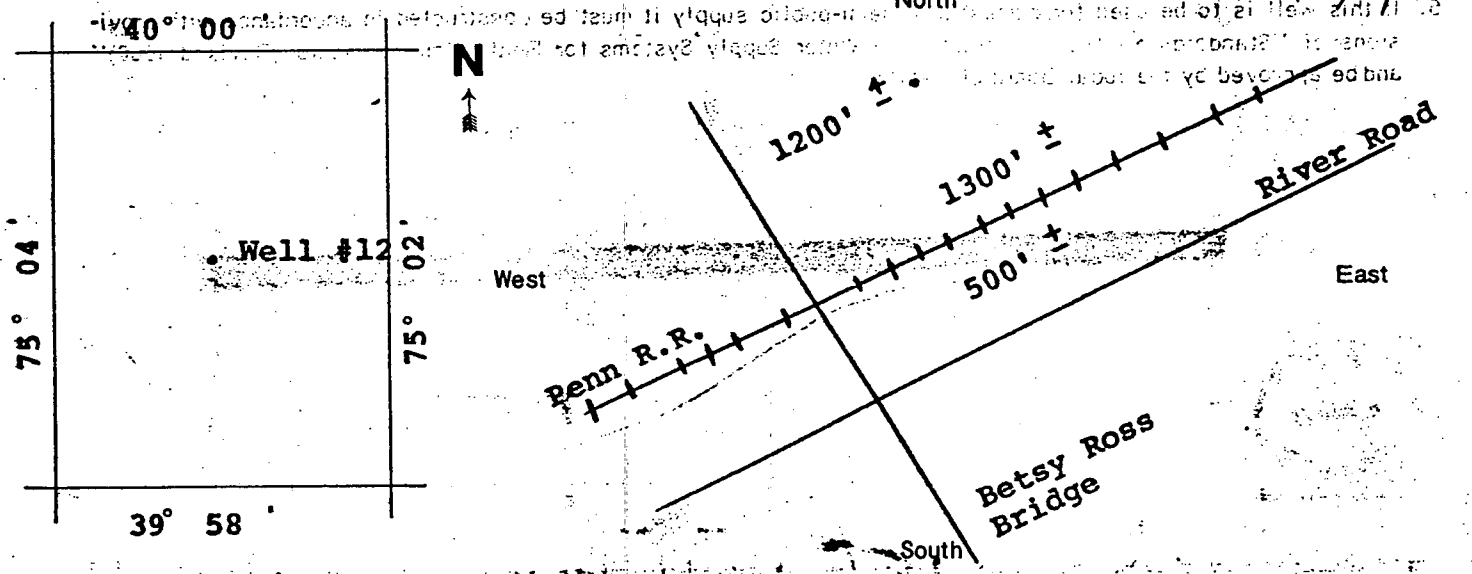
LOCATION OF WELL

lot #	block #	municipality	county
1	S247	Pennsauken	Camden

State Atlas Map No. _____

Draw sketch showing distance and relations of well site to nearest public roads, streets, septic systems, etc.

Well #12 #1799



SEE REVERSE SIDE for IMPORTANT PROVISIONS AND REGULATIONS pertaining to this permit. APPROVAL of this permit is made SUBJECT TO acceptance of and compliance with the following ADDITIONAL CONDITIONS:

- [x] Permit issued in accordance with provisions of letter of transmittal dated 4/23/80.
- [ ] It is necessary that Geophysical Logs of this well be made by the Division of Water Resources. The owner shall require the driller to notify the Division by PHONE (609-292-2232) when drilling is completed. Permanent pumping equipment SHALL NOT be installed until such logs are made.
- [ ] Samples of cuttings required every _____ feet.
- [ ] _____

This space for Approval Stamp

WELL PERMIT
APPROVED
APR 23 1980
DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

In compliance with R. S. 58:4A-14, application is made for a permit to drill a well as described above.

Date 4/14/80 Signature of Owner Michael D. Vena
Potable Water

ATTACHMENT 3

PW-5
NOV. 75

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit

This Permit, No. W- 3-76-2507 *dated* March 24 *19* 80 *certifies, pursuant to the applicable provisions of Title 58 of the Revised Statutes of New Jersey, that in accordance with an application dated* March 24 *19* 76 *received* March 25 *19* 76 *and signed by* Charles J. Di Bartolomeo

The City of Camden
Room 419, City Hall
Camden, New Jersey 08101

is hereby granted permission to (1) derive water from Well #18;

(2) construct a new source of water supply comprising Well #18, (treatment by existing facilities comprising aeration, pH adjustment (lime), chlorination, filtration);

as shown on white prints, five in number, entitled: "Plans for Construction of Water Well at Park Blvd. and Euclid Ave. in the City of Camden, N.J."; received March 25, 1976; an engineer's report, received March 25, 1976; and according to specification entitled: "Specifications for Water Well at Park Boulevard and Euclid Avenue in the City of Camden, New Jersey"; received March 25, 1976; and all approved by the State Department of Environmental Protection of the State of New Jersey on March 19, 1980;

said works to be located in City of Camden, (Park Blvd. and Euclid Ave.), County of Camden, New Jersey;

(3) distribute water for potable purposes from said works;

This Permit is subject to the following conditions:

1. *This Permit is revocable, or subject to modification or change, at any time when in the judgement of the State Department of Environmental Protection of the State of New Jersey such revocation, modification or change shall be necessary.*

ATTACHMENT U4

Permit No. W-3-76-2507

2. The issuance of this Permit shall not be deemed to affect in any way action by the State Department of Environmental Protection of the State of New Jersey on any future application.
3. The waterworks shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed fully in conformity with such plans and/or other engineering data and the said conditions.
4. In the examination of Plans and/or other engineering data, the State Department of Environmental Protection of the State of New Jersey does not examine into the structural features of the design, such as thickness of concrete, adequacy of reinforcing or the efficiency of any of the electrical or mechanical equipment or apparatus; and the approval herewith given does not include these features.
5. Water distributed by said works shall at all times meet the applicable standards for quality. Additional units for the derivation, treatment and for distribution of the water shall be established if and when required by the State Department of Environmental Protection of the State of New Jersey.
6. The operation of the public water facility shall be under the supervision of an operator or operators who shall be in possession of a valid license or licenses issued by the State Department of Environmental Protection of the State of New Jersey, classification(s) W-1, T-1, or equivalent, pursuant to the provisions of NJSA 58:11-14 through 58:11-18.22, and the supplements thereof and the amendments thereto.
7. This Permit does not exempt, nor shall be construed to exempt, the applicant from complying with the rules and regulations and policies or laws lodged in any agency or subdivision of this State having legal jurisdiction.

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

John Wilford, P.E.
Assistant Director
Division of Water Resources

ATTACHMENT V5

PW-5
NOV. 75

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Permit

This Permit, No. W- 3-79-2885 dated June 12 19 80 certifies, pursuant to the applicable provisions of Title 58 of the Revised Statutes of New Jersey, that in accordance with an application dated February 28 19 79 received March 1 19 79 and signed by Charles C. Shoemaker

City of Camden, Department of Utilities
Room 419A, City Hall
Camden, New Jersey

is hereby granted permission to (1) derive water from Well # 11;

(2) Construct new source of water supply comprising Well # 11, (treatment by existing facilities comprising aeration, lime, flocculation, sedimentation, chlorination (gas), filtration, polyphosphate);

as shown on white prints, four in number entitled: "Plans for Construction of Morris Well No. 11 and Pumps At The Puchack Plant for the City of Camden, New Jersey, dated February 27, 1979, received March 1, 1979; three additional data letters, one dated March 22, 1979; received March 26, 1979, one dated March 26, 1980, received March 31, 1980, one dated May 15, 1980, received May 19, 1980; and according to Specifications entitled: "Morris Well No. 11 and Pumps At The Puchack Plant" undated, and received March 1, 1979; and all approved by the State Department of Environmental Protection of the State of New Jersey on June 12, 1980.

said works to be located in the City of Camden (at approximately 1000 ft. south of the Pennsauken Creek, 500 ft. northwest of the Amboy Division of Pennsylvania Railroad and 560 ft. west of Morris Well # 6 in Pennsauken Township), County of Camden, New Jersey;

(3) distribute water for potable purposes from said works;

This Permit is subject to the following conditions:

1. *This Permit is revocable, or subject to modification or change, at any time when in the judgement of the State Department of Environmental Protection of the State of New Jersey such revocation, modification or change shall be necessary.*

ATTACHMENT U6

Permit No. 3-79-2885

2. The issuance of this Permit shall not be deemed to affect in any way action by the State Department of Environmental Protection of the State of New Jersey on any future application.
3. The waterworks shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed fully in conformity with such plans and/or other engineering data and the said conditions.
4. In the examination of Plans and/or other engineering data, the State Department of Environmental Protection of the State of New Jersey does not examine into the structural features of the design, such as thickness of concrete, adequacy of reinforcing or the efficiency of any of the electrical or mechanical equipment or apparatus; and the approval herewith given does not include these features.
5. Water distributed by said works shall at all times meet the applicable standards for quality. Additional units for the derivation, treatment and for distribution of the water shall be established if and when required by the State Department of Environmental Protection of the State of New Jersey.
6. The operation of the public water facility shall be under the supervision of an operator or operators who shall be in possession of a valid license or licenses issued by the State Department of Environmental Protection of the State of New Jersey, classification(s) W-1, T-1 or equivalent, pursuant to the provisions of NJSA 58:11-14 through 58:11-18.22, and the supplements thereof and the amendments thereto.
7. This Permit does not exempt, nor shall be construed to exempt, the applicant from complying with the rules and regulations and policies or laws lodged in any agency or subdivision of this State having legal jurisdiction.

By Authority of
Arnold Schiffman, Director
Division of Water Resources

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

John Wilford, P.E.
Assistant Director
Division of Water Resources

JW:el

ATTACHMENT 27

12-6-85

Fred Martin
Superintendent of Water
Room 403
City Hall
Camden, New Jersey 08101

RE: Compliance Evaluation Inspection
Morris-Delair Water Treatment Plant
NJPDES No. NJ0031984 DSW/DGW
Munic/County: Pennsauken/Camden County

Dear Mr. Martin:

A Compliance Evaluation Inspection of your facility was conducted by a representative of this Division on September 26,1985. A copy of the completed inspection report form is enclosed for your information.

Your facility received a rating of "UNACCEPTABLE" due to the following deficiency(ies):

Discharge outfall 001A is not being samples quarterly as required on page 36 of your NJPDES permit.

Since the deficiency(ies) cited are presently, or could, in the future, adversely affect effluent quality, you are DIRECTED to institute measures to correct the deficiency(ies). A written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable, must be submitted to this Department and USEPA, Permits Administration Branch, within fifteen (15) calendar days of the date of this correspondence.

Both the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.) provide for substantial monetary and criminal penalties in cases of permit violations.

ATTACHMENT V1

Please direct all correspondence and inquiries to Edward H. McCay, the Compliance Investigator responsible for this case, who can be reached at (609)626-0791 or by letter through this Division.

Failure to fully comply with the above will result in the initiation of enforcement action by this Department and/or the U.S. Environmental Protection Agency. This shall in no way be construed, however, to indicate any exemption on your part from possible penalties for violations indicated by the Compliance Evaluation Inspection, as stated above.

Very truly yours,

John M. Tomasiello, Supervisor
Compliance Monitoring Unit
Southern Bureau of
Regional Enforcement

00362:A11:G21
Enclosure
cc: Dr. Richard Baker, USEPA Region II
Paul Molinari, USEPA Region II
Camden County Health Department

bcc: John Tomasiello
Edward McCay
Marianne Montgomery
Southern Region File
Division File
Steve Madonna, Div. Criminal Justice

ATTACHMENT V2

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

GEORGE G. McCANN, P.E.
DIRECTOR

SOUTHERN BUREAU OF REGIONAL ENFORCEMENT
20 EAST CLEMENTON ROAD
THE PAINT WORKS
GIBBSBORO, NEW JERSEY 08026

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

MAY 14 1987

Fred Martin
Superintendent of Water
Room 403
City Hall
Camden, NJ 08101

Camden

RE: Compliance Evaluation Inspection
Morris-Delair Water Treatment Plant DGW/DSW
NJPDES No. NJ0031984
Munic/County: Pennsauken/Camden

Dear Mr. Martin

A Compliance Evaluation Inspection of your facility was conducted by a representative of this Division on April 28, 1987he completed inspection report form is enclosed for your information.

Your facility received a rating of "UNACCEPTABLE" due to the following deficiency(ies):

1.Facility did not meet required limitations on suspended solids as required on Page 6 of the NJPDES permit.
2. Facility did not meet required limitations on Ph as required on Page 3 of the NJPDES permit.

Since the deficiency(ies) cited are presently, or could, in the future, adversely affect effluent quality, you are DIRECTED to institute measures to correct the deficiency(ies). A written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable, must be submitted to this Department and USEPA, Permits Administration Branch, within fifteen (15) calendar days of the date of this correspondence.

Both the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.) provide for substantial monetary and criminal penalties in cases of permit violations.

ATTACHMENT V3

Please direct all correspondence and inquiries to Edward H. McCay, the Compliance Investigator responsible for this case, who can be reached at (609)346-8032 or by letter through this Division.

Failure to fully comply with the above will result in the initiation of enforcement action by this Department and/or the U.S. Environmental Protection Agency. This shall in no way be construed, however, to indicate any exemption on your part from possible penalties for violations indicated by the Compliance Evaluation Inspection, as stated above.

Very truly yours,

John M. Tomasiello, Supervisor
Compliance Monitoring Unit
Southern Bureau of
Regional Enforcement

396362:G2:A11
Enclosure
cc: Richard Baker, USEPA Region II
Paul Molinari, USEPA Region II
Camden County Health Dept.

ATTACHMENT V4

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

GEORGE G. McCANN, P.E.
DIRECTOR

SOUTHERN BUREAU OF REGIONAL ENFORCEMENT
20 EAST CLEMENTON ROAD
THE PAINT WORKS
GIBBSBORO, NEW JERSEY 08026

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

JAN 14 1988

Fred Martin
Superintendent of Water
Room 403
City Hall
Camden, New Jersey 08101

RE: Compliance Evaluation Inspection
Morris - Delair Water Treatment Plant - DGW/DSW
NJPDES No. NJ0031984
Munic/County: Pennsauken/Camden

Dear Mr. Martin:

A Compliance Evaluation Inspection of your facility was conducted by a representative of this Division on January 6, 1988. A copy of the completed inspection report form is enclosed for your information.

Your facility received a rating of "UNACCEPTABLE" due to the following deficiency(ies):

1. The facility did not meet suspended solids for the 001 effluent as per Table 1, Page 6 of your NJPDES permit.

2. The facility did not meet pH for the 001A effluent as per Table 1, Page 6 of your NJPDES permit.

Since the deficiency(ies) cited are presently, or could, in the future, adversely affect effluent quality, you are DIRECTED to institute measures to correct the deficiency(ies). A written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable, must be submitted to this Department and USEPA, Permits Administration Branch, within fifteen (15) calendar days of the date of this correspondence.

Both the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.) provide for substantial monetary and criminal penalties in cases of permit violations.

Please direct all correspondence and inquiries to Edward H. McCay, the Compliance Investigator responsible for this case, who can be reached at (609) 346-8032 or by letter through this Division.

Failure to fully comply with the above will result in the initiation of enforcement action by this Department and/or the U.S. Environmental Protection Agency. This shall in no way be construed, however, to indicate any exemption on your part from possible penalties for violations indicated by the Compliance Evaluation Inspection, as stated above.

Very truly yours,

John M. Tomasiello

John M. Tomasiello, Supervisor
Compliance Monitoring Unit
Southern Bureau of
Regional Enforcement

396362:A11:leh
Enclosure
cc: Dr. Richard Baker, USEPA Region II
Paul Molinari, USEPA Region II
Bruce Kiselica, USEPA Region II
Camden County Health Dept.
bcc: John Tomasiello
Ed McCay
Region File/Ricciardi
Debbie Latronica
Division File

ATTACHMENT V6

100 BSDW

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

GEORGE G. McCANN, P.E.
DIRECTOR

SOUTHERN BUREAU OF REGIONAL ENFORCEMENT
20 EAST CLEMENTON ROAD
THE PAINT WORKS
GIBBSBORO, NEW JERSEY 08026

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

City of Camden
City Hall
Room 403
Camden, New Jersey 08101

OCT 28 1988

Attention: Mr. Fred Martin

RE: Compliance Evaluation Inspection
Morris-Delair W.T.P. DSW-DGW
NJPDES No. NJ0031984
Munic/County: Pennsauken/Camden

Dear Mr. Martin:

A Compliance Evaluation Inspection of your facility was conducted by a representative of this Division on October 6, 1988. A copy of the completed inspection report form is enclosed for your information.

Your facility received a rating of "UNACCEPTABLE" due to the following deficiency(ies):

a) Accurate flow readings are not being recorded due to the inoperable condition of the plants' flow meter.

b) Discharge Monitoring Reports (DMRs) for Discharge 001 A were not submitted for the second quarter of 1988, as per Table 1, page 16 of your NJPDES Permit.

c) Holding times on aqueous samples were not adhered to, as per Part I, page 3, and Item 3 of your NJPDES Permit.

d) DMRs have not been submitted in a timely fashion, as per Part II, page 6 of your NJPDES Permit.

Since the deficiency(ies) cited are presently, or could, in the future, adversely affect effluent quality, you are DIRECTED to institute measures to correct the deficiency(ies). A written report concerning specific details of remedial measures to be instituted, as well as an implementation timetable, must be submitted to this Department and USEPA, Permits Administration Branch, within thirty (30) calendar days of the date of this correspondence.

ATTACHMENT V7

Both the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.) provide for substantial monetary and criminal penalties in cases of permit violations.

Please direct all correspondence and inquiries to Mike Zanwood, the Environmental Specialist responsible for this case, who can be reached at (609) 346-8032 or by letter through this Division.

Failure to fully comply with the above will result in the initiation of enforcement action by this Department and/or the U.S. Environmental Protection Agency. This shall in no way be construed, however, to indicate any exemption on your part from possible penalties for violations indicated by the Compliance Evaluation Inspection, as stated above.

Very truly yours,

William Malloy

William Malloy, Supervisor
Surface Water Unit
Southern Bureau of
Regional Enforcement

396362:MJZ:mel
Enclosure
cc: Camden County Health Department
Paul Molinari, USEPA Region II
Dr. Richard Baker, USEPA Region II

ATTACHMENT Vg

20 BSDW

APR 25 1989

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
SOUTHERN BUREAU OF REGIONAL ENFORCEMENT
20 EAST CLEMENTON ROAD
THE PAINT WORKS
GIBBSBORO, NEW JERSEY 08026

GEORGE G. McCANN, P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

Camden City Water Department
City Hall, Room 419A
Camden, New Jersey 08101

APR [illegible] 1989

Attention: Mr. F. Martin Jr., Director of Utilities

RE: Compliance Evaluation Inspection
Camden City Water Department
P.W. - ID No.: 0408001
Munic/County: Camden City/Camden

Dear Mr. Martin:

A Compliance Evaluation Inspection of your facility was conducted by a representative of this Division on April 4 and 5, 1989. A copy of the completed inspection report form is enclosed for your information.

Your facility received a rating of "UNACCEPTABLE" due to the following deficiency(ies):

1. The following well blowoffs lack protective covers in violation of N.J.A.C. 7:10-11.4(q)2.

   Morris Wells #3,4,6,7,8,9 and 10
   Delair Wells #1,2, and 3
   Puchack Wells #1,3 and 7
   Parkside Wells #13,17 and 18
   City Wells #7 and 11

2. The following wells lack a totalizing flow meter in violation of N.J.A.C. 7:10-11.3(b)1. and 11.4(q)3.

   Morris Wells #3,4,6,7,9 and 10
   Delair Wells #1,2 and 3
   Puchack Wells #3
   Parkside Wells #13 and 17
   City Wells #7 and 11

ATTACHMENT V9

3. The totalizing flow meter at the following wells were inoperative in violation of N.J.A.C. 7:10-11.3(b)2:

   Morris Wells #11,12 and 13
   Puchack Well #3.

4. The following well houses lack or have damaged security fences in violation of N.J.A.C. 7:10-11.6(b)2.

   Morris Wells #4,6,8,9 and 13
   Delair Well #3
   Puchack Well #3
   City Well #11

5. City Well #11 has a leaking valve in the valve pit in violation of N.J.A.C. 7:19-6.5(a)1.

6. Delair Well #2 discharge pressure gauge was inoperative in violation of N.J.A.C. 7:10-11.3(b)4.

7. Valve pit at Delair Well #3, Puchack Well #3 and Parkside Well #13 were filled with water in violation of N.J.A.C. 7:10-11.7(f)1.

8. The well pump air relief valve at Delair Wells #2 and 3 have water leakage in violation of N.J.A.C. 7:19-6.5(a)1.

9. Rapid Sand Filters #3,7,8 and 10 at the Morris-Delair Water Treatment Plant have numerous leaking valves and joints in violation of N.J.A.C. 7:19-6.5(a)1.

10. The influent flow meter at Morris Delair Water Treatment Plant is inoperative in violation of N.J.A.C. 7:10-11.3(b)2.

11. The chlorine room door at the Parkside Water Treatment Plant lacks a panic/push bar in violation of N.J.A.C. 7:10-11.13(f)1.

12. Morris well #4 is surrounded by construction debris and road cuttings in violation of N.J.A.C. 7:10-11.4(b)2.

13. The elevated storage tank at Locust & Kaighs Avenue has a damaged screen on the overflow pipe, in violation of N.J.A.C. 7:10-11.8(c)4.

14. Please note other minor deficiencies contained within the enclosed inspection report.

    NOTE: Undersized mains exist within your system. All future replacement of these mains and all new mains must be at least 6" in diameter, unless justified by hydraulic analysis and approved by the Department.

ATTACHMENT V10

Since the deficiency(ies) cited are presently, or could in the future, adversely affect the quantity and/or quality of water you provide to your customers, you are requested to institute measures to correct the deficiency(ies). A written report concerning specific details of the remedial measures to be instituted, as well as an implementation timetable, should be submitted to this Division within fifteen (15) calendar days of the date of this correspondence.

Please be advised that both the New Jersey Safe Drinking Water Act N.J.S.A. 58:12A-1 et seq. and the Water Supply Management Act N.J.S.A. 58:1A-1 et seq. provides for substantial penalties for violations of the Acts.

Please direct all correspondence and inquiries to Cheryl Boharsik, the Environmental Specialist Trainee responsible for this case, who can be reached at (609) 346-8032 or by letter through this Division.

Thank you for your cooperation.

Very truly yours,

Jerri Weigand

Jerri Weigand
Section Supervisor
Southern Bureau of
Regional Enforcement

396365:CB:leh
Enclosure
cc: Robert Williams, USEPA Region II
Bureau of Safe Drinking Water
Camden County Health Department
Sam Pine, Jr., Maintenance Supervisor,
Camden City Water Dept.

ATTACHMENT V

SOURCE DESCRIPTION WITH DEFICIENCIES NOTED

Morris Well # 1 - Not in operation, used for groundwater monitoring only

Morris Well # 2 - unable to locate, underwater

Morris Well # 3 - mineral oil lubricated, pump capacity 1.54 MG blowoff lacks protective cover, lacks totalizing flow meter

Morris Well # 4 - mineral oil lubricated, pump capacity 1.93 MG blowoff lacks protective cover, lacks totalizing flow meter, well surrounded by illegally dumped construction debris and road cuttings

Morris Well # 6 - mineral oil lubricated, pump capacity 0.58 MG blowoff lacks protective cover, lacks totalizing flow meter, fence damaged

Morris Well # 7 - mineral oil lubricated, pump capacity 1.9 MG blowoff lacks protective cover, lacks totalizing flow meter

Morris Well # 8 - mineral oil lubricated, pump capacity 0.64 MG blowoff lacks protective cover, fence damaged, well out of service for repairs

Morris Well # 9 - mineral oil lubricated, pump capacity 0.93 MG blowoff lacks protective cover, lacks security fence, lacks totalizing flow meter, well out of service for repairs

Morris Well # 10 - mineral oil lubricated, pump capacity 2.2 MG blowoff lacks protective cover, pump leaking oil, lack totalizing flow meter

Morris Well # 11 - mineral oil lubricated, pump capacity 2.92 MG totalizing flow meter not operating

Morris Well # 12 - mineral oil lubricated, pump capacity 2.92 MG totalizing flow meter not operating

Morris Well # 13 - mineral oil lubricated, pump capacity 2.96 MG totalizing flow meter not operating, fence damaged

ATTACHMENT V12

Delair Well # 1 - mineral oil lubricated, pump capacity 2.07 MG blowoff lacks protective cover, pump has oil leak, lacks totalizing flow meter, sample tap missing

Delair Well # 2 - mineral oil lubricated, pump capacity 0.7 MG blowoff lacks protective cover, pump has oil leak, pressure gauge not operating, lacks totalizing flow meter, pump has oil leak, pump air relief valve leaking water

Delair Well # 3 - mineral oil lubricated, pump capacity 1.95 MG blowoff lacks protective cover, lacks totalizing flow meter, valve pit full of water, fence damaged, fence gate missing lock, pump air relief valve leaking water, pump has oil leak

Puchack Well # 1 - mineral oil lubricated, pump capacity 1.3 MG blowoff lacks protective cover, out of service for repairs

Puchack Well # 2 - mineral oil lubicated, pump capacity 2.07 MG out of service for repairs

Puchack Well # 3 - mineral oil lubricated, pump capacity 1.84 MG blowoff lacks protective cover, water in valve pit, lacks fence gate, lacks totalizing flow meter, not operating at time of inspection

Puchack Well # 5 - not operating - groundwater monitoring only lacks fence around wellhouse, well reportly covered with steel plate, unable to observe well due to unavailability of keys

Puchack Well # 7 - mineral oil lubricated, pump capacity 1.85 MG blowoff lacks protective cover, not in service at time of inspection, used for groundwater monitoring only

ATTACHMENT V13

Parkside Well # 13	-	mineral oil lubricated, pump capacity 1.38 MG, blowoff lacks protective cover, lacks totalizing flow meter, water in valve pit, pump leaking oil, out of service for repairs
Parkside Well # 17 Park & Vesper	-	mineral oil lubricated, pump capacity 2.16 MG, blowoff lacks protective cover, lacks totalizing flow meter
Parkside Well # 18 Park Blvd (at ballfield)	-	mineral oil lubricated, pump capacity 1.3 MG, blowoff lacks protective cover.
City Well # 1 Federal St.	-	well capped - groundwater monitoring only
City Well # 3 Sycamore & Mt. Ephriam Ave.	-	well reported to be sealed but unable to locate
City Well # 4 Rose & Whitman	-	well capped - groundwater monitoring only
City Well # 5 Line & Memorial	-	well capped - groundwater monitoring only
City Well # 6 9th & Jackson	-	well reported to be covered with steel plate, unable to observe due to unavailabity of keys - groundwater monitoring only
City Well # 7 9th Street	-	mineral oil lubricated, pump capacity 1.44 MG, blowoff lacks protective cover, lacks totalizing flow meter, not in use - to be refurbished
City Well # 10 River Road	-	well capped - groundwater monitoring only
City Well # 11 9th Street	-	mineral oil lubricated, pump capacity 1.44 MG, blowoff lacks protective cover, lacks totalizing flow meter, lacks fence around well house, valve leaking in valve pit, well used only in emergencies, sodium hypochlorite added directly to this well

ATTACHMENT VII

City Well # 12 - well capped - groundwater monitoring only
Clinton & Broadway
(in schoolyard)

City Well # 15 - well sealed with concrete
21st & Harrison

City Well # 16 - well covered with steel plate - groundwater monitoring only
21st & River Rd

ATTACHMENT V15

104

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
P.O. BOX CN 029
TRENTON, NEW JERSEY 08625

JOHN W. GASTON JR., P.E.
DIRECTOR

IN THE MATTER OF

CITY OF CAMDEN

CAMDEN CITY WATER DEPARTMENT

****
* ADMINISTRATIVE *
* ORDER *
****

The following FINDINGS are made and ORDER issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (NJDEP) by N.J.S.A. 13:1D-1 et seq. and the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq. and duly delegated to the Assistant Director of Enforcement of the Division of Water Resources pursuant to N.J.S.A. 13:1B-4e and N.J.S.A. 58:12A-9g.

FINDINGS

1. The City of Camden, through the Camden City Water Department, (hereinafter "the City") owns, operates, and maintains a potable water supply and distribution system (hereinafter "the system") which serves residential and commercial users within the City. The wells supplying the system are situated in five locations within the City and two locations in neighboring Pennsauken Township. The total safe pumping capacity of the well network is approximately 31.8 million gallons per day (mgd).

2. On August 18, 1971, NJDEP issued an Administrative Order (hereinafter "1971 Order") to the City because of the many sub-standard conditions which existed within the system at that time. The 1971 Order required the City to make extensive improvements in the operation and maintenance of the system, to seal abandoned wells, to provide treatment and disinfection where lacking, to maintain operating records, and to provide additional elevated storage capacity. The City complied with most of the requirements of the 1971 Order. However, several of the deficiencies which were addressed in that Order remain uncorrected to date. The outstanding requirements of the 1971 Order are:

a. Provide effective chlorination facilities for City Well No. 11.

b. Improve operation of all water treatment facilities to attain delivered water with non-corrosive characteristics and with a total iron concentration of 0.3 mg/l or less.

c. Provide additional elevated storage capacity, or a combination of additional elevated storage capacity and auxiliary power to operate pumping equipment at the storage facility.

3. On March 25, April 2, and May 14, 1980, NJDEP conducted inspections of the City's potable water system. Besides the aforementioned deficiencies, additional major problems were noted during these inspections. The inspections revealed that several wells were pumping raw untreated ground water directly into the City's distribution system. Various wells in the system were found to produce water which violates maximum contaminant levels set forth in the New Jersey Safe Drinking Water Act Regulations for one or more of the following parameters: chromium, iron, manganese, color, and corrosivity. NJDEP also determined that the City required additional finished water storage capacity, as stated in the 1971 Order, and additional prime sources of water supply.

4. Since July of 1981, NJDEP has endeavored to enter with the City into an Administrative Consent Order. The objective of this proposed Consent Order was to bring the system into compliance with the requirements of the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., over a mutually agreeable period of time. The City has repeatedly stated its preference to correct the outstanding system deficiencies on its own schedule and has therefore declined to enter into the proposed Consent Order.

5. In June 1981, an engineering report entitled "Report on Exploratory Leak Detection Study" was completed by Malcolm Pirnie, Inc., consulting engineers for the City. In September 1981, a more comprehensive engineering report entitled "Water System Improvements" was completed by Malcolm Pirnie, Inc. These reports contain in-depth analyses of the existing facilities in the City's system, and recommend specific short and long term capital improvements necessary to insure an adequate and safe water supply to the City. The Malcolm Pirnie reports served as the basis for extensive discussions between NJDEP and the City, and were useful for the purpose of refining the proposed Consent Order and this Administrative Order.

ATTACHMENT W2

6. The purity and quantity of water as furnished by the City is presently endangered by numerous system deficiencies in the derivation, treatment, storage, and distribution of the water. The City does not have adequate treatment facilities, and has inadequate and insufficient treated water storage capacity. These conditions constitute violations of the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., the Safe Drinking Water Act Regulations N.J.A.C. 7:10-1 et seq.. Abandoned wells left unsealed pose a threat of further contamination to the aquifer serving as the City's prime source of water, and constitute violations of N.J.S.A. 58:4A-4 et seq.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT THE CITY OF CAMDEN shall:

7. Within twelve (12) months from the effective date of this Order, seal wells 3, 5, 12 and 15 pursuant to N.J.S.A. 58:4A-4.2 and in accordance with the provisions of N.J.A.C. 7:9-9.1 et seq.. Also within twelve (12) months from the effective date of this Order wells 1, 4, 6, 10, and 16 shall be modified as follows:

a. Disconnected from the system.

b. Made functional for ground water monitoring purposes.

c. Adequately protected from unauthorized access and vandalism..

The City shall provide NJDEP with at least one week prior notification of the intended date for performing each of the actions required above.

8. Immediately cease the discharge of water from City Well No. 11 into the City's distribution system. Until such time as the finished water from City Well No. 11 is brought into compliance with the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., Well No. 11 may be used in emergency situations only and chlorination must then be provided. Notification must subsequently be given to NJDEP within ten (10) days as to the nature of the emergency, the length of time the well was in use, and the total gallonage pumped into the system from the well.

ATTACHMENT W3

9. Develop and submit to NJDEP within twenty-four (24) months from the effective date of this Order a comprehensive operation and maintenance manual which will cover all treatment facilities, pumping stations, and distribution mains within the system.

10. Provide an additional effective above-ground finished water storage capacity of five (5) million gallons within forty-eight (48) months from the effective date of this Order.

11. Undertake a two-phase program of leak correction as discussed in the "Report on Exploratory Leak Detection Study" prepared by Malcolm Pirnie, Inc. dated June 1981. Phase I of this program shall correct the major system leaks and shall be completed by the City within thirty-six (36) months of the effective date of this Order. Phase II of the leak correction program will address all remaining identifiable leakage in the system, and shall be completed within sixty (60) months of the effective date of this Order. The City shall submit to NJDEP semi-annual status reports on the progress of the leak correction program until it has been completed. The first such report shall be due by June 1, 1984. Upon completion of both phases of this leak correction program, the City shall commence a program of routine system leak detection and correction. This routine program must be detailed in the operation and maintenance manual described in paragraph 9 of this Order.

12. Investigate and throughly evaluate all interconnections which exist between the system and neighboring public community water supplies. A detailed report on the findings of this effort shall be submitted to NJDEP within six (6) months from the effective date of this Order.

13. All submittals required by this Order shall be made to:

James K. Hamilton, Chief
Southern Region
Enforcement Element
Division of Water Resources
CN-029
Trenton, New Jersey 08625

14. Nothing in this Order shall constitute a waiver of any statutory or other right of NJDEP pertaining to the provision of an adequate potable water supply to the City of Camden should NJDEP determine that further remedial measures are necessary to protect the public health, safety and/or welfare.

ATTACHMENT W4

Upon completion of the feasibility study currently in progress for the State's Water Supply Master Plan, this Order shall be amended and expanded as required to resolve the remaining outstanding deficiencies in accordance with the Water Supply Master Plan.

15. NOTICE IS HEREBY GIVEN that pursuant to N.J.S.A. 52:14B-1 et seq., the Camden City Water Department is entitled to a hearing before NJDEP. Any hearing request shall be delivered to the address listed in paragraph thirteen (13) within twenty (20) days from receipt of this Order. Said hearing request shall not stay the terms or effects of this Order.

16. NOTICE IS FURTHER GIVEN that pursuant to N.J.S.A. 52:14B-9(b)(4) and N.J.A.C. 1:1-6.1(b), the applicant in its application for a hearing shall furnish NJDEP with the following:

a. A statement of the legal authority and jurisdiction under which the hearing or action to be held is requested pursuant to N.J.A.C. 1:1-6.1(b)(1);

b. A reference to the particular sections of the statutes and rules involved;

c. A short and plain statement of the matters of fact and law asserted; and

d. The Order provisions of which the applicant objects, the reasons for such objections, and any alternative provisions proposed by the applicant.

17. NOTICE IS FURTHER GIVEN that if no request for a hearing is received within twenty (20) calendar days, this shall become a final Order.

18. NOTICE IS FURTHER GIVEN that pursuant to N.J.S.A. 58:12A-10, any person who violates this Order shall be subject to civil penalties of up to $5,000 per day for each day of the violation.

19. The provisions of this Order shall be binding upon the City of Camden, its principals, agents, employees, successors, assigns and tenants.

ATTACHMENT W5

20. No obligations imposed by this Order are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations imposed by this Order shall constitute continuing regulatory obligations imposed pursuant to the police powers of the State of New Jersey, intended to protect the public, health, safety and welfare.

This Order shall be effective upon receipt.

DATE SEP 1 4 1983

BY AUTHORITY OF
JOHN W. GASTON, JR., P.E.
DIVISION OF WATER RESOURCES

George G. McCann

GEORGE G. McCANN
Assistant Director
Enforcement Element

ATTACHMENT W6

STATUS REPORT
NJDEP ADMINISTRATIVE ORDER
City of Camden
Water Utility

Order, Paragraph 7.

The City has sealed wells 3 and 15 (December, 1983) and made wells 1, 4, 5, 6, 10, 12, and 16 functional for groundwater monitoring. Wells 5 and 12 will be sealed during August, 1984.

The City will undertake a program of securing the well houses, and disconnecting the wells from the mains during the summer of 1984.

Order, Paragraph 8.

The City has removed key elements of the motor starter for well 11 to prevent its unauthorized use. It will be operated only through treatment plant #6 in the future.

Order, Paragraph 9.

The City has begun a program of writing instruction manuals for operation and maintenance of equipment as it is repaired. This will be supplemented with equipment maintenance logs, building entry logs, which will delineate proper procedure for operating and maintaining specific facilities.

Order, Paragraph 10.

The City has received financing from the Economic Development Administration for construction of a two million gallon (2MG) storage tank. Contracts have been let for the foundation and tank.

The City will evaluate the feasibility of rehabilitating the 0.6 MG tank at Rose and Everett.

The City is seeking developers for the construction of a 2.0 MG "hydroplex" -- water tank/office tower structure.

Order, Paragraph 11.

During the period of October 1, 1983 and May 31, 1984, the following leaks were repaired:

1-10" main
1- 8" main
13- 6" mains
1- 4" main
60- residential services

ATTACHMENT W1

Order, Paragraph 12.

Attached is the interconnection report which completes the requirement of this paragraph and will become part of the operation and maintenance manuals required in paragraph 9.

ATTACHMENT W8

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
CN 027, TRENTON, NJ 08625

Jorge H. Berkowitz, Ph.D.
Director

Anthony J. McMahon, Assistant Director
Environmental Enforcement

Let's protect our earth

FILE

IN THE MATTER OF	:	ADMINISTRATIVE ORDER AND
CITY OF CAMDEN	:	
MORRIS-DELAIR WATER TREATMENT PLANT	:	NOTICE OF CIVIL ADMINISTRATIVE
8900 ZIMMERMAN AVENUE	:	
PENNSAUKEN, NEW JERSEY 08110	:	PENALTY ASSESSMENT
LEWIS SCHNEIDER, MANAGER	:	
LOG #Q890013	:	

This ORDER and NOTICE is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection ("the Department") by N.J.S.A. 13:1D-1 et seq., the New Jersey Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., and the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., and duly delegated to the Assistant Director for Environmental Enforcement of the Division of Environmental Quality pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. City of Camden Morris-Delair Water Treatment Plant operates a laboratory which is certified by the Department (N.J. Certification #04127), and is located at 8900 Zimmerman Avenue, Pennsauken Township, County of Camden, State of New Jersey.

2. Pursuant to N.J.A.C. 7:18-2.11(d), on December 2, 1988, the Department conducted an investigation which disclosed the following offenses of the Safe Drinking Water Act and the regulations promulgated thereto:

   a) The investigation disclosed that you violated N.J.A.C. 7:18-3.7(a)1xii by failing to perform analytical quality control tests to ensure that general laboratory practices and methodology are in compliance with the requirements of this subchapter. Specifically, the laboratory did not examine a minimum of one polluted water source per month in addition to analyzing the required number of distribution samples.

   b) The investigation disclosed that you violated N.J.A.C. 7:18-3.7(a)2x by failing to follow the procedures required by this subchapter in performing quality control checks of laboratory media, equipment, and supplies. Specifically, the laboratory failed to check at least one sample bottle from each batch of sterilized sample bottles, by adding approximately 25 ml of sterile LTB to the bottle(s) and then incubating the preparation at 35° ± 0.5°C for 24 hours and then checking the bottle(s) for growth.

   c) The investigation disclosed that you violated N.J.A.C. 7:18-3.7(a)2xx by failing to follow the procedures required by this subchapter in performing quality control checks of laboratory media, equipment, and supplies. Specifically, the laboratory failed to discard outdated material since expired media consisting of Brilliant Green Bile 2%, manufactured by Difco, Lot #714223, expiration date of March, 1988, was being used for the analyses of Total Coliform..

ATTACHMENT X1

d) The investigation disclosed that you violated N.J.A.C. 7:18-4.7(e)1 by failing to insure that each analytical balance is checked monthly using at least two class "S" weights, one in the gram range and one in the milligram range. Specifically, the laboratory had not performed an analytical balance check with two class"S" weights since February 11, 1988.

e) The investigation disclosed that you violated N.J.A.C. 7:18-4.7(e)1iii by failing to conduct replicate sample analyses in the Limited Chemistry category to verify the precision of the method once a month and to document the result, the dates on which such verification analyses were performed, the method of verification, and the name of the analyst performing such verifications.

ORDER

3. NOW, THEREFORE, IT IS HEREBY ORDERED THAT on or before February 26, 1989, you cease the above listed violations of the New Jersey Administrative Code 7:18.

CIVIL ADMINISTRATIVE PENALTY ASSESSMENT

4. Based upon the above FINDINGS, and a review of the entire matter, the Department hereby assesses a Civil Administrative Penalty against you pursuant to N.J.S.A. 58:12A-10b of the Safe Drinking Water Act in the amount of $5,000.00.

5. Payment of the $5,000.00 Civil Administrative Penalty must be submitted to the Department within twenty (20) calendar days of receipt of this Order and Notice in accordance with the provisions of Paragraph 6. Payment shall be made by check payable to the New Jersey Department of Environmental Protection at the address listed in Paragraph B of Attachment I.

GENERAL PROVISIONS

6. Pursuant to N.J.S.A. 58:10A-10d and N.J.S.A. 58:12A-10b, you are entitled to a hearing if aggrieved by this Order and Notice. Application for such a hearing must be made in writing and received by the Department within twenty (20) calendar days from receipt of this Order and Notice. In applying for such hearing, you must furnish the Department with the information listed in Paragraph A of Attachment I. If no request for a hearing is received within twenty (20) calendar days, this Order and Notice shall become a final Order and the penalty will then become due and payable.

7. The provisions of this Order and Notice shall be binding on you, your principals, directors, officers, agents, successors, assigns, tenants, trustee in bankruptcy or any other trustee, and any receiver appointed pursuant to a proceeding in law or equity.

ATTACHMENT X2

8. No obligations imposed by this Order and Notice, with the exception of Paragraphs 4 and 5, are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations imposed by this Order and Notice shall constitute continuing regulatory obligations imposed pursuant to the police powers of the State of New Jersey, intended to protect the public health, safety and welfare.

9. NOTICE IS GIVEN that, pursuant to N.J.S.A. 58:12A-10b, any person who violates the provisions of the Safe Drinking Water Act or any rule, regulation or order promulgated pursuant to N.J.S.A. 58:12A-1 et seq. shall be liable to a civil administrative penalty of not more than $5,000 for the first offense, not less than $5,000 nor more than $10,000 for the second offense, and up to $25,000 for the third and each subsequent offense. If the violation is of a continuing nature, each day during which it continues subsequent to receipt of an order to cease the violation shall constitute an additional, separate and distinct offense.

Dated: January 27, 1989

Anthony J. McMahon, Assistant Director
Environmental Enforcement

CERTIFIED MAIL
QUALITY ASSURANCE

ATTACHMENT X3

QUALITY ASSURANCE ATTACHMENT I

A. The applicant in the application for an administrative hearing shall furnish the Department with the following:

a. A statement of the legal authority and jurisdiction under which the hearing or action to be taken is to be held;
b. A reference to the particular sections of the statutes and rules involved;
c. A short and plain statement of the matters of fact and law asserted; and
d. The specific provisions of this Order and Notice to which the applicant objects, the reasons for such objections, and any alternative provisions proposed by the applicant.

B. Any submission of information required by the attached Order and Notice shall be made to:

Anthony J. McMahon, Assistant Director
Environmental Enforcement
Department of Environmental Protection
Division of Environmental Quality
CN 027
Trenton, New Jersey 08625

C. Should you have any questions concerning this Order and Notice, please contact Mr. Jerry Bundy, Supervisor, Laboratory Certification, at (609)292-3950.

ATTACHMENT X4

(28)

FAO - We're you thinking along these lines?? Mark

OR IS THIS TOTALLY OFF BASE

DRAFT

CITY OF CAMDEN

M E M O R A N D U M

February 1, 1989

TO: Patricia A. Darden, City Attorney

FROM: Frederick H. Martin, Jr., Director of Utilities

RE: NJDEP Administrative Order and Notice of Civil Administrative Penalty Assessment (Attached)

Background

1. On 30 January 1989, this Department received the attached Administrative Order and Notice of Civil Administrative Penalty Assessment from the NJ Department of Environmental Protection (NJDEP).

2. This Order and Notice allege that the laboratory at the Morris-Delair Water Treatment Plant failed to observe certain testing and quality control procedures, thereby violating provisions of the Safe Drinking Water Act (SDWA) and related legislation.

3. As penalty for these alleged offenses, the Department has been assessed a fine in the amount of $5,000.00, payable within twenty (20) calendar days of receipt of this Order and Notice.

4. Pursuant to NJSA 58:10A-10d and NJSA 58:12A-10b, this Department is entitled to an administrative hearing should the Department make application for such action within twenty (20) days.

Conclusions

1. While the Department does not challenge the validity of NJDEP's findings with respect to laboratory deficiencies at the Morris-Delair Facility, this Department does regard the penalty assessed by NJDEP as excessive, given the Department's "good faith" efforts toward compliance.

ATTACHMENT X5

2. The Department has already taken corrective action to ensure that its laboratory is in full compliance with all relevant legislation, including the SDWA, and that similar violations do not recur.

3. This Department requests: (1) a legal review of the appeal procedures in this matter, and (2) a determination as to whether the Department has sufficient basis to support an appeal in this case.

4. I have designated a member of my staff, Mark Barnhart (x7253), to follow-up on this request.

cc: M. Barnhart
others?????

ATTACHMENT X6

(29)

DRAFT

February 1, 1989

A.J. McMahon, Assistant Director
Environmental Enforcement
NJ Department of Environmental Protection
Division of Environmental Quality
CN 027
Trenton, NJ 08625

RE: Administrative Order and Notice in the Matter of the City of Camden, Morris-Delair Water Treatment Plant Log #0890013

Dear Director McMahon:

I am in receipt of your Administrative Order and Notice, dated 27 January 1989.

Please be informed that the City of Camden, Morris-Delair Water Treatment Plant, New Jersey Certification Lab #04127 has taken the following corrective action in response to the violations listed in the aforementioned Order and Notice:

a. **Violation of NJAC 7:18-3.7(a)1xii** - one (1) polluted water source was examined in duplicate on 12/20/88 and 01/10/89, and will be continued on a monthly basis.

b. **Violation of NJAC 7:18-3.7(a)2x** - as of 12/07/88, approximately 25 ML of sterile LTB is being added to sterile bottle(s), incubated for 24 hours at 35°C (5°), checked for signs of growth, and the results recorded.

c. **Violation of NJAC 7:18-3.7(a)2xx** - as of 12/12/88, the outdated BGB was discarded and new BGB was being used for analyses of total coliform.

d. **Violation NJAC 7:18-4.7(e)1** - the analytical balance was checked with 2 class "S" weights on 12/07/88 and 01/09/89, and will be performed monthly.

e. **Violation NJAC 7:18-4.7(e)11ii** - as of 12/05/88, replicate samples are being analyzed on a monthly basis and the method of verification and the name of the analyst are being recorded.

ATTACHMENT 1

Please be advised that the above corrective actions were taken as soon as the deficiencies were identified by the inspector.

Please feel free to contact me if there are any additional questions concerning the City's laboratory procedures.

Sincerely,

Lew Schneider,
Chemist/Water Analyst
Morris-Delair Laboratory

cc: F. Martin

ATTACHMENT 12

Drinking water Standards.

appropriate analytical method as provided in N.J.A.C. 7:18-1 et seq.

"State Act" means the Safe Drinking Water Act, N.J.S.A. 58:12A-1 et seq., as amended by P.L. 1983, c.443.

7:10-16.5 Severability

If any section, subsection, provision, clause or portion of this subchapter is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this subchapter shall not be affected thereby.

7:10-16.6 Penalties

Failure by the owner or operator of a public community water system to comply with any requirement of the State Act or this subchapter may result in the penalties set forth in N.J.S.A. 58:12A-10 and N.J.A.C. 7:10-14.15.

7:10-16.7 Maximum contaminant levels (MCLs) for hazardous contaminants

(a) The maximum contaminant levels for hazardous contaminants applicable to all public community water systems shall be as follows:

Hazardous Contaminant	MCL (in parts per billon)
Benzene	1
Carbon tetrachloride	2
Chlordane	0.5
Chlorobenzene	4
Dichlorobenzene(s)+	
o-	600
m-	600
p-	+
1,2-Dichloroethane	2
1,1-Dichloroethylene	2
1,2-Dichloroethylene (cis & trans) (combined)	10
Ethylene Glycol	+
Formaldehyde	+
n-Hexane	+
Kerosene	+
Methyl ethyl ketone	+
Methylene chloride	2
Polychlorinated biphenyls (PCBs) (Total)	0.5
Tetrachloroethylene	1
Trichlorobenzene(s) (1,2,4-Trichlorobenzene)	8
1,1,1-Trichloroethane	26
Trichloroethylene TCE	1
Vinyl Chloride	2
Xylene(s)	44

+No MCL for these contaminants is established.

Chromium - total .05 ppm 50 ppb
Chromium - hex .05 ppm 50 ppb
mercury - .002 ppm 2 ppb

ATTACHMENT 2

ADM-0.

Nasir - F. Y. I.
f 6 - Community
Camden City W. I
correspondence

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File - Camden City Water Department

FROM Philip Royer, Potable Water DATE January 28, 1982

SUBJECT Chromium Sampling

Michael Vena, Licensed Operator and Director of Public Works for the City of Camden, telephoned on January 28, 1982 to report the following hexavalent chromium analysis results for water samples collected on January 22, 1982 by City personnel:

Location	Result (ppm)
Puchack Run Treatment Plant effluent	< 0.05
Morris-Delair Treatment Plant effluent	ND
Warehouse (11th & Wright Ave.)	< 0.05
Fire hydrant (Point & Erie Sts.)	ND

NOTE:

(1) "ND" implies not detectable.
(2) The minimum detection limit is unknown.
(3) A colorimetric analysis method (unapproved) was utilized.
(4) Laboratory personnel reported that, during the analysis, some color showed in the Puchack Plant and the Warehouse samples, but was less apparent in the Warehouse sample.
(5) Puchack Run Wells No. 1, No. 2 and No. 3 were in operation during the sampling; Wells No. 5 and No. 7 were not.

PR/sr

ATTACHMENT AA

f.b. - Community Camden County
Camden City W.D.
correspondence

PDR
1/11/82

Summary of Chromium Sampling Results for the City of Camden Water System

Date Sampled	Location Sampled	Result (ppm)
1/4/82	Puchack Run Plt. effluent	0.185 (hex)
	Puchack Well No. 1	0.005 (hex)
	Puchack Well No. 2	0.005 (hex)
	Puchack Well No. 3	0.014 (hex)
	Puchack Well No. 5	0.472 (hex)
	Puchack Well No. 7	out of service
	Camden W.D. warehouse @ 11th & Wright Ave.	0.128
2/4/81	Morris Well No. 12	0.005
	Morris Well No. 13	0.005
12/23/80	Parkside Well No. 13	0.005 ?
	Parkside Well No. 17	0.005
	Parkside Well No. 18	0.005
	City Well No. 4	1.648
	City Well No. 5	0.016
	City Well No. 11	0.005
7/29/80	City Well No. 16	0.005 ?
7/25/80	City Well No. 16	0.005 ?
6/26/80	City Well No. 4	2.230
5/14/80	City Well No. 4	? 1.1412
1/21/80	Parkside Well No. 18	0.005
1/21/80	Morris Well No. 11	0.005
9/20/78	City Well No. 10	ND
7/7/77	City Well No. 4	NEG
6/9/77	City Well No. 4	NEG
	Parkside Well No. 17	NEG
	City Well No. 5 (finished)	NEG
9/16/76	1439 Crestmond Ave.*	NEG
	Arco-Atlantic & Haddon Ave.*	NEG
	1477 Princess Ave.*	NEG
3/22/76	Exxon-Whitman & Haddon Ave.	NEG
7/10/75	Puchack Well No. 7	NEG
1/27/75	2915 Congress Rd.	NEG
1/24/74	917 Atlantic Ave.	0
2/7/73	City Well No. 6	NEG
	City Well No. 1	NEG

ATTACHMENT AA2

12/26/72	426 Mt. Ephraim Ave.	0.140
	City Well No. 4	0.180
	Parkside Well No. 17	0.004
	Parkside Well No. 13	0.004
	City Well No.5	0.018
	City Well No. 1	0.204
12/11/72	1426 Mt. Ephraim Ave.	0.150
5/17/72	1264 Atlantic Ave.	0

NOTE:
* Near Parkside Plant
"(hex)" implies hexavalent chromium

ATTACHMENT AA3

PW-2
May 77

70 1 OF 2
5:30 PM
1-19-8.

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TABULATION OF ANALYTICAL DATA FROM PUBLIC WATER SUPPLY

Supply CAMDEN CITY WATER DEPT. County CAMDEN

Municipality CAMDEN CITY Date Collected 1-~~18~~-82

Collected by Brian Keane Memo # 82-005 Project # W- 19

BACTERIOLOGICAL ANALYSES: Coliform organisms determined by the membrane filter technique are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

Sample Number	Point of Collection	Coliform Organisms ~~Fecal~~	Coliform Organisms Total	Chlorine Residual Free	Chlorine Residual Total
11232T-20	PUCHACK RUN PLANT - FINISHED WATER	10:40 AM	✓ 0	0.9	1.2
11233T-21	WELL No. 1 (RAW WATER)	10:50 AM	✓ 0	0	0
11234T-22	WELL No. 2	11:10 AM	✓ 0	↓	↓
11235T-23	WELL No. 3	11:15 AM	✓ 0	↓	↓
11236T-24	WELL No. 5	11:30 AM	✓ 0	↓	↓

PHYSICAL — CHEMICAL ANALYSES: Determinations are in ppm except color, odor, turbidity, and pH. Figures in parentheses are from the N. J. Potable Water Standards and/or National Interim Primary Regulations.

Sample Number	11232	11233	11234	Sample Number	11235	11236	
Color (10)				Arsenic (0.05)			
Odor (III)				Barium (1.0)			
Turbidity (5)				Cadmium (0.010)			
pH				Chromium^{+6} (0.05)			
Alkalinity to pH 4				Copper (1.0)			
Nitrate as NO_3 (45)				Cyanide (0.20)			
Chloride (250)				Lead (0.05)			
Total Dis. Solids (500)				Mercury (0.002)			
ABS/LAS (0.5)				Selenium (0.01)			
Total Hardness (150)				Silver (0.05)			
Total Iron (0.3)				Phenol (0.001)			
Manganese (0.05)				Endrin (0.0002)			
Sodium (50)				Lindane (0.004)			
Sulphate (250)				Methoxychlor (0.1)			
Fluoride (2.0)				Toxaphene (0.005)			
Zinc (5.0)				2.4-D (0.1)			
				Silvex (0.01)			
CHROMIUM-TOTAL	*✓0.378	✓0.005K	✓0.026		✓0.009	*✓0.621	
CHROMIUM-HEX	*✓0.203	✓0.005K	✓INTERFERENCE		✓0.005	*✓0.594	

Remarks REQUEST FOR PRIORITY ANALYSIS

* Exceed standard

SHEET 2 — WATER PURVEYOR

ATTACHMENT AA4

PW-2,
May 77

20 2 OF 2

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TABULATION OF ANALYTICAL DATA FROM PUBLIC WATER SUPPLY

Supply CAMDEN CITY WATER DEPT. County CAMDEN

Municipality CAMDEN CITY Date Collected 1-~~13~~-82

Collected by Brian Keune Memo # 82-005 Project # W- 19

RECEIVED MAR 17 1982 NJ DIV WATER MS&E

BACTERIOLOGICAL ANALYSES: Coliform organisms determined by the membrane filter technique are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

Sample Number	Point of Collection	Coliform Organisms		Chlorine Residual	
		~~Fecal~~	Total	Free	Total
11237	MORRIS - DELAIR PLANT - (FINISHED WATER)	9:40AM		0.1	1.5
11238	MORRIS - DELAIR - COMBINED RAW	9:50AM		0	0
11239	CAMDEN WATER DEPT. WAREHOUSE 11TH AND WRIGHT AVE.	12:00		1.2	1.2

PHYSICAL – CHEMICAL ANALYSES: Determinations are in ppm except color, odor, turbidity, and pH. Figures in parentheses are from the N. J. Potable Water Standards and/or National Interim Primary Regulations.

Sample Number	11237	11238	11239	Sample Number			
Color (10)				Arsenic (0.05)			
Odor (III)				Barium (1.0)			
Turbidity (5)				Cadmium (0.010)			
pH				Chromium^{+6} (0.05)			
Alkalinity to pH 4				Copper (1.0)			
Nitrate as NO_3 (45)				Cyanide (0.20)			
Chloride (250)				Lead (0.05)			
Total Dis. Solids (500)				Mercury (0.002)			
ABS/LAS (0.5)				Selenium (0.01)			
Total Hardness (150)				Silver (0.05)			
Total Iron (0.3)				Phenol (0.001)			
Manganese (0.05)				Endrin (0.0002)			
Sodium (50)				Lindane (0.004)			
Sulphate (250)				Methoxychlor (0.1)			
Fluoride (2.0)				Toxaphene (0.005)			
Zinc (5.0)				2.4-D (0.1)			
				Silvex (0.01)			
CHROMIUM-Total	<0.005K	<0.005K	*0.096				
CHROMIUM-Hex.	Interference	<0.005K	*0.096				

Remarks REQUEST FOR PRIORITY ANALYSIS

* Exceed Standard

SHEET 2 – WATER PURVEYOR

ATTACHMENT AA5

BSDW

DWR-018 (PW 2)
4/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

2-V

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT — County: CAMDEN
Municipality: Camden — Date Collected: 11-21-85
Collected by: John Berchtold — Memo #: 85-362 — Project # W-

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40507	Vesper & Park Blvds Parkside Treatment Pt. treated tap	11:45	59°F	0.2	0.5	X	X
40508	River Rd Puchack Treatment Plant treated tap	12:10	59°F	0.2	0.5	X	X
40509	8900 Zimmerman Ave Morris-Delair Treatment Plant treated tap	12:30	59°F	1.75	1.75	X	X

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER				SAMPLE NUMBER	40507	40508	40509
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness(as $CaCO_3$)(250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)	✓	✓	✓ 2K
Methoxychlor (0.1)		1,2 dichloroethane			6.5 II		
Toxaphene (0.005)		1,2 dichloroethene			3.8 I	2.6 I	
2,4-D (0.1)		Teteachloroethene			7.5 II		
Silvex (0.01)		Trichloroethene			18.3	8.6	

RECEIVED
DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

REPORT SUBMITTED
DEC 16 1985
NJDOH Environmental Chemistry Laboratory

Remarks: 210/2MP blank #16030 accompanied by Lew Schneider of WD
A280 Periodic 1/85 PRIORITY

ATTACHMENT AA6

LB (PW 2)

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

2

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT.
County: CAMDEN
Municipality: Camden
Date Collected: 11-21-85
Collected by: John Benedetti
Memo #: 85-362
Project # W-:

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40503	2430 Broadway Stelkr Technology Kitchen sink	10:35	61°F	0	0.1	X	X
40504	8th & Van Hook St Camden County Regional Health Ct. lab sink	10:50	67°F	0.1	0.2	X	X
40505	2977 Yorkship Sq. Lenny Agency bathroom sink	11:10	61°F	0	trace	X	X
40506	New Jersey Ave A.D. Malandra Hall Kitchen sink	11:25	63°F	0	trace	X	X

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER	40503			SAMPLE NUMBER	40504	40505	40506
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness(as$CaCO_3$)(250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)	✓	✓	✓
Methoxychlor (0.1)	2.2		Bromoform				
Toxaphene (0.005)	2.2 II		1,2dichloroethane				
2,4-D (0.1)	5.9 I		Trichloroethene		3.5	4.2	6.2
Silvex (0.01)							
VO Scan ppb ✓							

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DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

REPORT SUBMITTED
DEC 16 1985
NJDEP Environmental Chemistry Laboratory

Remarks: 210/2MP blank# 16030 accompanied by Lew Schneider of W.D
A 280 Periodic 1/85 PRIORITY

COPIES: White - Bureau of Potable Water; Blue - Water Purveyor; Green - Health Authority; Canary - Chemistry Lab; Pink - Bacteriological Lab; Gold - Extra

ATTACHMENT AA7
PAGE 1 OF 2

DWR-018 (PW 2)
/83

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

12

WATER ANALYSES REPORT

Supply: Camden City Water Dept — County: Camden
Municipality: Camden — Date Collected: 4-11-85
Collected by: John Berchtold — Memo #: 85 99 — Project # W-

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
35641	8th & Van Hook St, Camden Co. Dept Health Regional Health Center, Men's Room sink	10:05	—	—	—	—	—
35642	Park & Vesper Blvd, Parkside Water Treatment Plant, treated tap	10:35	—	0.1	0.8	—	—

PHYSICAL – CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER				SAMPLE NUMBER		35641	35642
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness (as $CaCO_3$) (250)				Iron (0.03)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb) J		2K	2K
Methoxychlor (0.1)						1	1
Toxaphene (0.005)							
2,4-D (0.1)							
Silvex (0.01)							

RECEIVED
JUN 24 1985
N.J. State Dept. of Environmental Protection
BUREAU OF POTABLE WATER

number of unidentified peaks

REPORT SUBMITTED
JUN 13 1985

Remarks: 210/2MP — Blank # 16398

NJDOH Environmental Chemistry Laboratory

ATTACHMENT AA

(PW 2)

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT.
County: CAMDEN
Municipality: Camden
Date Collected: 11-21-85
Collected by: John Bendtsen
Memo #: 85-362
Project # W-:

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION		TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40503	2430 Broadway Stelkr Technology	Kitchen sink	10:35	61°F	0	0.1		
40504	8th & Van Hook St Camden County Regional Health Ct.	kitchen sink	10:50	61°F	0.1	0.2		
40505	2977 Yorkship Sq. Lenny Agency	bathroom sink	11:10	61°F	0	trace		
40506	New Jersey Ave A.D. Malandra Hall	kitchen sink	11:25	63°F	0	trace		

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER	40503			SAMPLE NUMBER	40504	40505	40506
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness(as$CaCO_3$)(250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)	✓	✓	✓
Methoxychlor (0.1)	2.2		Bromoform				
Toxaphene (0.005)	2.2 II		1,2dichloroethane				
2,4-D (0.1)	5.9 I		Trichloroethene		3.5	4.2	6.2
Silvex (0.01)							
VO Scan only							

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DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

REPORT SUBMITTED
DEC 16 1985
NJDEP Environmental Chemistry Laboratory

ATTACHMENT AA9

Remarks: 210/2MP blank# 16030 accompanied by Lew Schneider of W.D
A 282 Periodic 1/85 PRIORITY

COPIES: White - Bureau of Potable Water Green - Health Authority

-018 (PW 2)
65

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT
County: CAMDEN
Municipality: Camden
Date Collected: 11-21-85
Collected by: John Berchtold
Memo #: 85-362
Project # W-:

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40507	Vesper & Park Blvds Parkside Treatment Pt. treated tap	11:45	59°F	0.2	0.5	X	X
40508	River Rd Puchack Treatment Plant treated tap	12:10	59°F	0.2	0.5	X	X
40509	8900 Zimmerman Ave Morris-Delair Treatment Plant treated tap	12:30	59°F	1.75	1.75	X	X

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER				SAMPLE NUMBER	40507	40508	40509
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness(as $CaCO_3$)(250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)	/	/	/ 2K
Methoxychlor (0.1)		1,2 dichloroethane			6.5 II		
Toxaphene (0.005)		1,2 dichloroethene			3.8 I	2.6 I	
2,4-D (0.1)		Teteachloroethene			7.5 II		
Silvex (0.01)		Trichloroethene			18.3	8.6	

REPORT SUBMITTED
DEC 16 1985
NJDOH Environmental Chemistry Laboratory

RECEIVED
DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

ATTACHMENT AA10

Remarks: 210/2MP blank #16030 accompanied by Lew Schneider of WD
A280 Periodic 1/85 PRIORITY

A280 STATUS REPORT

PWS ID#: 0408001 PURVEYOR: Camden City WD COUNTY: Camden

POPULATION SERVED: 50,900 AVG DAILY DEMAND: 22.42 MGD
OWN: 3 Treatment Plants PURCHASED: NONE
CONTAMINATED SOURCE(S) CAPACITY:
INTERCONNECTIONS: Gloucester City WD, N.J. Water Co(Haddon), Collingswood W

No. of Subsystems: 3 Current Action Level: 3

LEAD AGENCY: MEETING WITH PURVEYOR:

SUMMARY OF ACTIONS

- -Initial Sample-01/07/85 - Level 2 - PCE
- -Verification Sample- 04/11/85 - none detected
- -Periodic Sample- 06/28/85 - Level 3 - 1,2 Dichloroethane
- -Verification Sample (1/85) -(11/21/85)- Level 2 - 1,2 Dichloroethane
- -Action - Monthly monitoring notification (12/31/85) and re-evaluation after 3 months on (3/31/85)

ATTACHMENT AA11

ID	PURVEYOR	SOURCE	TYP	DATE	CONNAME	RESULTS	LEVEL	NONA260
0339001	New Lisbon Dev Ctr	D	PS185	85/06/10	TETRACHLOROETHYLENE	3.20	2	
		D	VS185	85/08/12	TETRACHLOROETHYLENE	5.40	2	
		D	VS185	85/08/12	1,2-DICHLOROETHANE	2.00	2	
	New Lisbon Dev Ctr	D	MS	85/10/04	TETRACHLOROETHYLENE	1.60	1	
		D	MS	85/10/11	TETRACHLOROETHYLENE	1.60	1	
	New Lisbon Dev Ctr	P	VS185	85/08/12	TETRACHLOROETHYLENE	3.80	2	
0404001	Bellmawr WD	D	IS	84/12/11	METHYLENE CHLORIDE	0.60	1	
0408001	Camden City WD		VS	85/04/11	NONE DETECTED	0.00		
		D	IS	85/01/07	TRICHLOROETHYLENE	4.50	1	
		D	IS	85/01/07	TETRACHLOROETHYLENE	13.60	2	
		D	IS	85/01/07	TRANS-1,2-DICHLOROETHYLEN	0.90	1	
		D-8th&VanHook	PS185	85/06/28	TRICHLOROETHYLENE	7.70	2	
		D-8th&VanHook	PS185	85/06/28	TETRACHLOROETHYLENE	1.80	1	
		D-8th&VanHook	PS185	85/06/28	1,1,1-TRICHLOROETHANE	0.72	1	
		D-8th&VanHook	PS185	85/06/28	1,2-DICHLOROETHANE	3.00	2	
		D-8th&VanHook	PS185	85/06/28	METHYLENE CHLORIDE	1.40	1	
		D-8th&VanHook	PS185	85/06/28	BENZENE	0.27	1	
		D-8th&VanHook	PS185	85/06/28	1,2-DICHLOROBENZENE	0.38	1	
		D-8th&VanHook	PS185	85/06/28	1,4-DICHLOROBENZENE	0.58	1	
		D-8th&VanHook	PS185	85/06/28	1,1-DICHLOROETHYLENE	0.73	1	
		D-Broadway	PS185	85/06/28	TRICHLOROETHYLENE	37.00	2	
		D-Broadway	PS185	85/06/28	TETRACHLOROETHYLENE	10.00	2	
		D-Broadway	PS185	85/06/28	CARBON TETRACHLORIDE	0.60	2	
		D-Broadway	PS185	85/06/28	1,1,1-TRICHLOROETHANE	0.93	1	
		D-Broadway	PS185	85/06/28	1,2-DICHLOROETHANE	16.00	3	
		D-Broadway	PS185	85/06/28	METHYLENE CHLORIDE	1.80	1	
		D-Broadway	PS185	85/06/28	BENZENE	0.33	1	
		D-Broadway	PS185	85/06/28	CHLOROBENZENE	0.62	-	
		D-Broadway	PS185	85/06/28	1,2-DICHLOROBENZENE	1.00	1	
		D-Broadway	PS185	85/06/28	1,3-DICHLOROBENZENE	0.44	1	
		D-Broadway	PS185	85/06/28	1,4-DICHLOROBENZENE	0.81	1	
		D-Broadway	PS185	85/06/28	1,1-DICHLOROETHYLENE	3.70	1	
		D-Broadway	PS185	85/06/28	TRANS-1,2-DICHLOROETHYLEN	1.00	1	
		D-NJAve	PS185	85/06/28	TRICHLOROETHYLENE	19.00	2	
		D-NJAve	PS185	85/06/28	TETRACHLOROETHYLENE	5.40	2	
		D-NJAve	PS185	85/06/28	1,2-DICHLOROETHANE	6.90	2	
		D-NJAve	PS185	85/06/28	METHYLENE CHLORIDE	1.00	1	
		D-NJAve	PS185	85/06/28	1,2-DICHLOROBENZENE	0.42	1	
		D-NJAve	PS185	85/06/28	1,3-DICHLOROBENZENE	0.25	1	
		D-NJAve	PS185	85/06/28	1,4-DICHLOROBENZENE	0.38	1	
		D-NJAve	PS185	85/06/28	TRICHLOROBENZENE	0.32	-	
		D-NJAve	PS185	85/06/28	1,1-DICHLOROETHYLENE	1.30	1	
		D-NJAve	PS185	85/06/28	TRANS-1,2-DICHLOROETHYLEN	0.49	1	
		D-NJAve	PS185	85/06/28	XYLENES	0.50	1	
		D-Yorkship	PS185	85/06/28	TRICHLOROETHYLENE	12.00	2	
		D-Yorkship	PS185	85/06/28	TETRACHLOROETHYLENE	1.80	1	
		D-Yorkship	PS185	85/06/28	1,1,1-TRICHLOROETHANE	1.10	1	
		D-Yorkship	PS185	85/06/28	1,2-DICHLOROETHANE	3.90	2	
		D-Yorkship	PS185	85/06/28	METHYLENE CHLORIDE	1.40	1	
		D-Yorkship	PS185	85/06/28	BENZENE	0.24	1	
		D-Yorkship	PS185	85/06/28	1,2-DICHLOROBENZENE	0.29	1	
		D-Yorkship	PS185	85/06/28	1,4-DICHLOROBENZENE	0.37	1	
		D-Yorkship	PS185	85/06/28	TRICHLOROBENZENE	0.32	-	
		D-Yorkship	PS185	85/06/28	1,1 DICHLOROBENZENE	0.66	1	

ATTACHMENT AA 12

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

JOHN W. GASTON JR., P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

December 31, 1985

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Camden City Water Department
City Hall, Room 419A
Camden, New Jersey 08101

ATTENTION: Fredrick H. Martin, Jr.
Licensed Water Plant Operator

Dear Mr. Martin:

Summarized below are the results of our analysis of samples collected by this office on November 21, 1985 and analyzed for volatile organics by the State Department of Health Laboratory. Our sampling was done in response to an A-280 sampling done by you on June 28, 1985.

CONTAMINANT	CONCENTRATION, PPB		
Location:	Vesper & Park Blvd. (Parkside T. P.)	River Road (Puchack T. P.)	8900 Zimmerman Ave. (Morris-Delair T. P.)
1,2 Dichloroethane	6.5		2K
1,2 Dichloroethene	3.8	2.6	2K
Tetrachloroethene	7.5		2K
Trichloroethene	18.3	8.6	2K

Location:	2430 Broadway (Stellar Tech.)	8th & Van Hook St. (Camden Co. Regional Health Ctr.)	2977 Yorkship Sq. (Lenny Agency)	New Jersey Ave. (A.D. Malandra Hall)
Bromoform	2.2			
1,2 Dichloroethane	2.2			
Trichloroethene	5.9	3.5	4.2	6.2

Although there are no current standards for these contaminants in water, legislation commonly referred to as A-280 will establish maximum permissible levels in the coming year. It is expected that levels for most of them will be considerably less than 100 ppb. In anticipation of more stringent standards to be adopted, we are

whenever they are present. Our approach is based on potential adverse health effects which may result from lifetime exposure to water containing such contamination. The higher the levels the greater the health risk to susceptible individuals and the greater the need to seek water of better quality. The goal over the long term is to reduce exposure to the lowest levels that are achievable so as to minimize the overall risk.

Therefore, you are warned that the levels of contaminants as shown through the DEP Sampling of the Parkside Treatment Plant are not acceptable in drinking water and it is our position that the source(s) of supply contributing to this contamination should not be used for public potable purposes if more acceptable water is available. Treatment, development of alternative prime source(s), use of existing and/or construction of new interconnections with other supplies is required to minimize long term continued consumer exposure. Such alternatives must be provided as soon as possible and no later than within one year of the date of this letter. This action should be taken for the well(s) found to be the source of the pollution.

It is required that you acknowledge your intentions concerning these wells and provide written confirmation of these intentions within 1 month of the date of this letter.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct monthly monitoring of the Parkside Treatment Plant. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Potable Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

You are also warned that the levels of contaminants as shown are not desirable in drinking water and it is our position that the source(s) of supply contributing to this contamination should normally not be used for public potable purposes if more acceptable water is available. Eventual treatment, development of alternate prime source(s), use of existing and/or construction of new interconnections with other supplies of better quality should be considered to minimize long term continued consumer exposure.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct monthly monitoring of the Parkside Treatment Plant whenever that source is used. At least three such monitoring reports must be submitted. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Safe Drinking Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

ATTACHMENT AA14

If you have any questions in this matter, please contact me at (609) 292-5550. By copy of this letter, other offices are being alerted to this problem.

Very truly ~~yours,~~

Steven Nieswand, Chief
Bureau of Safe Drinking Water

RB/lec
cc: Camden County Governing Body
Camden County Health Department
William Whipple, Water Supply & Watershed Management
John Preczewski, Bureau of Water Supply
George McCann, Enforcement
Haig Kasabach, NJ Geological Survey
Eric Evenson, Superfund Coordinator
Dr. Marwan Sadat, Division of Waste Management
Dr. Thomas Burke, Office of Science & Research
Dr. Kenneth Rosenman, NJ Department of Health
Ernest Hardin, Water Allocation
Paul Schorr, Special Water Treatment
Dr. Dhun Patel, DWR Risk Assessment

ATTACHMENT AA15

MOZER

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

JOHN W. GASTON JR., P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

January 7, 1986

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Camden City Water Department
City Hall
Room 419A
Camden NJ 08101

ATTENTION: Fredrick H. Martin, Jr.
Licensed Water Plant Operator

Dear Mr. Martin:

Summarized below are the results of our analysis of samples collected by this office on November 21, 1985, and analyzed for volatile organics by the State Department of Health laboratory. Our sampling was done in response to an A-280 sampling done by you on June 28, 1985.

CONTAMINANT	CONCENTRATION, PPB		
Location	Vesper & Park Blvd. (Parkside TP)	River Road (Puchack TP)	8900 Zimmermon Ave. (Morris-Delair TP)
1,2 Dichloroethane	6.5		2K
1,2 Dichloroethene	3.8	2.6	2K
Tetrachloroethene	7.5		2K
Trichloroethene	18.3	8.6	2K

Location	2430 Broadway (Stellar Tech)	8th & Van Hook St. (Camden Co Reg Health Ctr)	2977 Yorkship Sq. (Lenny Agency)	N.J. Avenue (AD Malandra Hall)
Bromoform	2.2			

ATTACHMENT AA16

1,2, Dichloroethane	2.2			
Trichloroethene	5.9	3.5	4.2	6.2

Although there are no current standards for these contaminants in water, legislation commonly referred to as A-280 will establish maximum permissible levels in the coming year. It is expected that levels for most of them will be considerably less than 100 ppb. In anticipation of more stringent standards to be adopted, we are currently reviewing these specific contaminants with concern and we are, therefore, using a stricter judgemental approach to determine the acceptability of the supply whenever they are present. Our approach is based on potential adverse health effects which may result from lifetime exposure to water containing such contamination. The higher the levels the greater the health risk to susceptible individuals and the greater the need to seek water of better quality. The goal over the long term is to reduce exposure to the lowest levels that are achievable so as to minimize the overall risk.

Therefore, you are warned that the levels of contaminants as shown through the DEP sampling of the Parkside Treatment Plant <u>are not acceptable</u> in drinking water and it is our position that the source(s) of supply contributing to this contamination should not be used for public potable purposes if more <u>acceptable</u> water is available. Treatment, development of alternative prime source(s), use of existing and/or construction of new interconnections with other supplies is required to minimize long term continued consumer exposure. Such alternatives must be provided as soon as possible and no later than <u>within one year</u> of the date of this letter. This action should be taken for the well(s) found to be the source of the pollution.

It is required that you acknowledge your intentions concerning these wells and provide written confirmation of these intentions within one month of the date of this letter.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct <u>monthly</u> monitoring of the Parkside Treatment Plant when this plant is used. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Safe Drinking Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

You are also warned that the levels of contaminants as shown through the DEP sampling of the Puchack Treatment Plant are not <u>desirable</u> in drinking water and it is our position that the source(s) of supply contributing to this contamination should normally not be used for public potable purposes if more acceptable water is available. Eventual treatment, development of alternate prime source(s), use of existing and/or construction of new interconnections

ATTACHMENT AA17

with other supplies of better quality should be considered to minimize long term continued consumer exposure.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct monthly monitoring of the Puchack Treatment Plant whenever that source is used. At least three such monitoring reports must be submitted. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Safe Drinking Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

If you have any questions in this matter, please contact me at (609)292-5550. By copy of this letter, other offices are being alerted to this problem.

Very truly yours,

Steven Nieswand

Steven Nieswand, Chief
Bureau of Safe Drinking Water

Attachment
cc: Mayor and Council, City of Camden
Camden Co. Health Department w/att.
William Whipple, Asst. Dir., Water Supply & Watershed Mgt.
John Preczewski, Bureau of Water Supply
George McCann, Asst. Dir., Enforcement
Haig Kasabach, NJ Geological Survey
Eric Evenson, Superfund Coordinator
Dr. Marwan Sadat, Division of Waste Management
Dr. Thomas Burke, Office of Science and Research w/att.
Dr. Kenneth Rosenman, NJ Dept. of Health w/att.
Ernest Hardin, Water Allocation
Paul Schorr, Special Water Treatment
Dr. Dhun Patel, DWR, Risk Assessment w/att.

ATTACHMENT AA18

DWR-18 (FW 2)
4/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT.
County: CAMDEN
Municipality: Camden
Date Collected: 11.21.85
Collected by: John Berchtold
Memo #: 85-362
Project # W-

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION		TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40503	2430 Broadway Stellar Technology	Kitchen sink	10:35	61°F	0	0.1		
40504	8th & Van Hook St Camden Co Regional Health Ct.	lab sink	10:50	67°F	0.1	0.2		
40505	2977 Yorkship Sq. Lenny Agency	bathroom sink	11:10	61°F	0	trace		
40506	New Jersey Ave A.D. Malandra Hall	Kitchen sink	11:25	63°F	0	trace		

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER	40503			SAMPLE NUMBER	40504	40505	40506
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness(as$CaCO_3$)(250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)			
Methoxychlor (0.1)	2.2		Bromoform				
Toxaphene (0.005)	2.2		1,2dichloroethane				
2,4-D (0.1)	5.9		Trichloroethene		3.5	4.2	6.2
Silvex (0.01)							
VO Scan ppb							

REPORT SUBMITTED
DEC 16 1985
NJDOH Environmental Chemistry Laboratory

RECEIVED
DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

Remarks: 210/2MP blank# 16030 accompanied by Lew Schneider of W.D
A280 Periodic 1/85 PRIORITY

ATTACHMENT AAA

BSDW

A280 File

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

JOHN W. GASTON JR., P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

MAY 27 1986

Camden City Water Department
City Hall
Room 419A
Camden, New Jersey 08101

ATTENTION: Fredrick H. Martin, Jr.
Licensed Water Plant Operator

Dear Mr. Martin:

Summarized below are the results of our analysis of samples collected by this office on March 6, 1986, and analyzed for volatile organics by the State Department of Health laboratory. Our sampling was done in response to an A-280 sampling done by you on December 31, 1985.

CONTAMINANT	CONCENTRATION, PPB/LEVEL	
	River Road (PUCHACK T.P.)	Vesper & Park Blvd. (PARKSIDE T.P.)
Benzene	-	2.1(II)
1,1-Dichloroethane	-	3.0
1,2-Dichloroethane	-	8.9(III)
1,1-Dichloroethylene	-	2.0(I)
trans-1,2-Dichloroethylene	2.37(I)	4.5(I)
Tetrachloroethylene	-	5.2(II)
Trichloroethylene	4.54(II)	22 (II)

Reference is also made to our letter of January 7, 1986, concerning the status of the "Puchack Run" and the "Parkside" water treatment plants. This latest sampling confirms that the "Puchack Run" water treatment plant and the "Parkside" water treatment plant continue to deliver water of undesirable (Level II) and unacceptable (Level III) quality respectively.

ATTACHMENT AA20

If you have any questions on this matter, please do not hesitate to contact us at (609)292-5550.

Very truly yours,

Nasir Butt
Principal Environmental Engineer
Bureau of Safe Drinking Water

cc: Camden County Health Dept. w/attachment

ATTACHMENT AA21

DWR-018 (PW 2)
4/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

TPR 197
198
199
200

WATER ANALYSES REPORT

DM

Supply: CAMDEN WATER DEPT
County: CAMDEN
Municipality: Camden
Date Collected: 3-6-86
Collected by: JL Benchtold
Memo #: 86-54
Project # W-

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
41591	Morris Delair Water T.P. Griffith Morgan Lane treated tap	9:45	58°F	0.1	2.5		
41592	Puchack Run Water T.P. River Rd at Delair Ave. treated tap	10:00	58°F	0.5	0.5		
41593	Parkside Water T.P. Vesper & Park Blvd treated tap	10:25	58°F	0.8	1.0		
41594	2430 Broadway Stellar Technology kitchen sink	10:50	55°F	0.1	0.2		

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER	41591		
Nitrate (as N) (10)			
Color (10)			
Odor (III)			
Turbidity (5)			
Total Dis. Solids (500)			
pH			
Alkalinity (as $CaCO_3$)			
Chloride (250)			
ABS/LAS (0.5)			
Hardness(as $CaCO_3$)(250)			
Sulfate (250)			
Cyanide			
Pesticide I, II, III			
Endrin (0.0002)			
Lindane (0.004)			
Methoxychlor (0.1)			
Toxaphene (0.005)			
2,4-D (0.1)			
Silver (0.01)	see attached		
VO			

SAMPLE NUMBER	41592	41593	41594
Arsenic (0.05)			
Barium (1.0)			
Cadmium (0.010)			
Chromium (0.05)			
Fluoride (2.0)			
Lead (0.05)			
Mercury (0.002)			
Selenium (0.01)			
Silver (0.05)			
Iron (0.3)			
Manganese (0.05)			
Sodium (50)			
Copper (1.0)			
Zinc (5.0)	see attached		
VO Scan (ppb)			

RECEIVED
APR 29 1986
N.J. State Dept. of Environmental Protection
BUREAU OF POTABLE WATER

REPORT SUBMITTED
APR 22 1986
NJDOH ENVIRONMENTAL CHEMISTRY LABORATORY

Remarks: 210 / 2MP blank # 16085 A 280 Per 100 ATTACHMENT AA 22
Morris / Delair TP W ...

New Jersey Department of Health
Division of Public Health and Environmental Laboratories

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANIC (GC/MS)

SAMPLE NUMBER	ANALYTICAL METHOD	DATE AND TIME OF SAMPLE EXTRACTION
#41591	#624	DATE: TIME:

GC/MS IDENTIFICATION NUMBER	DATE AND TIME OF ANALYSIS
M00101	DATE: 3/12/86 TIME: 20:57

SAMPLE RESULTS

TARGET COMPOUND	ION	SCAN No.	AREA	RF	CONC. IN PPB	MDL
Benzene					—	2 PPB
Bromodichloromethane					—	
Bromoform					—	
Bromomethane					—	
Carbon tetrachloride					—	
Chlorobenzene					—	
Chloroethane					—	
2-Chloroethylvinyl ether					—	
Chloroform					—	
Chloromethane					—	
Dibromochloromethane					—	
1,2-Dichlorobenzene					—	
1,3-Dichlorobenzene					—	
1,4-Dichlorobenzene					—	
1,1-Dichloroethane					—	
1,2-Dichloroethane					—	
1,1-Dichloroethene					—	
trans-1,2-Dichloroethene					—	
1,2-Dichloropropane					—	
cis-1,3-Dichloropropene					—	
trans-1,3-Dichloropropene					—	
Ethylbenzene					—	
Methylene Chloride					—	
Toluene					—	

REPORT SUBMITTED

APR 22 1986

NJDOH ENVIRONMENTAL CHEMISTRY LABORATORY

ATTACHMENT AA23

New Jersey Department of Health
Division of Public Health and Environmental Laboratories

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANIC (GC/MS)

SAMPLE NUMBER	ANALYTICAL METHOD	DATE AND TIME OF SAMPLE EXTRACTION
#41592	#624	DATE: TIME:

GC/MS IDENTIFICATION NUMBER	DATE AND TIME OF ANALYSIS
M00101	DATE: 3/12/86 TIME: 21:47

SAMPLE RESULTS

TARGET COMPOUND	ION	SCAN No.	AREA	$\bar{RF}$	CONC. IN PPB	MDL
Benzene					—	2 PPB
Bromodichloromethane					—	
Bromoform					—	
Bromomethane					—	
Carbon tetrachloride					—	
Chlorobenzene					—	
Chloroethane					—	
2-Chloroethylvinyl ether					—	
Chloroform					—	
Chloromethane					—	
Dibromochloromethane					—	
1,2-Dichlorobenzene					—	
1,3-Dichlorobenzene					—	
1,4-Dichlorobenzene					—	
1,1-Dichloroethane					—	
1,2-Dichloroethane					—	
1,1-Dichloroethene					—	
trans-1,2-Dichloroethene					2.37 (I)	
1,2-Dichloropropane					—	
cis-1,3-Dichloropropene					—	
trans-1,3-Dichloropropene					—	
Ethylbenzene					—	
Methylene Chloride					—	

REPORT SUBMITTED
APR 22 1986
NJDOH ENVIRONMENTAL CHEMISTRY

ATTACHMENT AA24

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANICS(GC/MS)

SAMPLE NUMBER
41592

SAMPLE RESULTS

TARGET COMPOUND	Ion	SCAN No.	AREA	RF	CONC IN PPB	MDL
1,1,2,2-Tetrachloroethane					—	2 PPB
Tetrachloroethene					—	
Toluene					—	
1,1,1-Trichloroethane					—	
1,1,2-Trichloroethane					—	
Trichloroethene					4.54 (II)	
Trichlorofluoromethane					—	
Vinyl chloride					—	

SURROGATE RECOVERIES

SURROGATE COMPOUND	CONC. ADDED TO SAMPLE (ppb)	PERCENT RECOVERY	Q.C. LIMITS (R ± 3s) LOWER	UPPER
1,2-Dichloroethane d-4	30.2	93.0	70	130
Toluene d-8	31.2	109.6	70	130
4-Bromofluorobenzene	29.4	104.9	70	130

ANALYST - PRINT: Mary Ann Kacsmar
SIGNATURE: Marylena Kacsmar
DATE: 3-18-1986
SUPERVISOR - PRINT: S R Funk
SIGNATURE: S R Funk
DATE: 3-24-86

REPORT SUBMITTED APR 22 1986 HUDSON ENVIRONMENTAL CHEMISTRY

ATTACHMENT AA25

New Jersey Department of Health
Division of Public Health and Environmental Laboratories

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANIC (GC/MS)

SAMPLE NUMBER	ANALYTICAL METHOD	DATE AND TIME OF SAMPLE EXTRACTION
#41593	#624	~~DATE: TIME:~~

GC/MS IDENTIFICATION NUMBER	DATE AND TIME OF ANALYSIS
M00101	DATE: 3/13/86 TIME: 18:02

SAMPLE RESULTS

TARGET COMPOUND	ION	SCAN No.	AREA	$\overline{RF}$	CONC. IN PPB	MDL
Benzene					2.1 (II)	2ppb
Bromodichloromethane					—	
Bromoform					—	
Bromomethane					—	
Carbon tetrachloride					—	
Chlorobenzene					—	
Chloroethane					—	
2-Chloroethylvinyl ether					—	
Chloroform					—	
Chloromethane					—	
Dibromochloromethane					—	
1,2-Dichlorobenzene					—	
1,3-Dichlorobenzene					—	
1,4-Dichlorobenzene					—	
1,1-Dichloroethane					3.0	
1,2-Dichloroethane					8.9 (III)	
1,1-Dichloroethene					2.0 (I)	
trans-1,2-Dichloroethene					4.5 (I)	
1,2 Dichloropropane					—	
cis-1,3-Dichloropropene					—	
trans-1,3-Dichloropropene					—	
Ethylbenzene					—	
Methylene Chloride					—	

REPORT SUBMITTED
APR 22 1986
NJDOH ENVIRONMENTAL

Chem-42.5
JAN 86

ATTACHMENT AA 26

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANICS(GC/MS)

SAMPLE NUMBER
#41593

SAMPLE RESULTS

TARGET COMPOUND	Ion	SCAN No.	AREA	$\bar{RF}$	CONC. IN PPb	MDL
1,1,2,2-Tetrachloroethane					—	2ppb
Tetrachloroethene					5.2 (II)	
Toluene					—	
1,1,1-Trichloroethane					—	
1,1,2-Trichloroethane					—	
Trichloroethene					22 (II)	
Trichlorofluoromethane					—	
Vinyl chloride					—	✓

SURROGATE RECOVERIES

SURROGATE COMPOUND	CONC. ADDED TO SAMPLE (ppb)	PERCENT RECOVERY	Q.C. LIMITS (R ± 3σ) LOWER	UPPER
1,2 Dichloroethane d-4	30.2	94.7	70	130
Toluene d-8	31.2	106.1	70	130
4-Bromofluorobenzene	29.4	101.6	70	130

ANALYST - PRINT	SIGNATURE	DATE
M.A. KACZMARZ	MA Kaczmarz	4-16-86
SUPERVISOR - PRINT	SIGNATURE	DATE
S.R. FUNK	S R Funk	4-16-86

REPORT SUBMITTED
APR 22 1986
INDOOR ENVIRONMENTAL CHEMISTRY

ATTACHMENT AA27

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANICS(GC/MS)

SAMPLE NUMBER
415,94

SAMPLE RESULTS

TARGET COMPOUND	Ion	SCAN No.	AREA	RF	CONC. IN PPB	MDL
1,1,2,2-Tetrachloroethane					—	2ppb
Tetrachloroethene					2.1 (II)	
Toluene					—	
1,1,1-Trichloroethane					—	
1,1,2-Trichloroethane					—	
Trichloroethene					7.4 (II)	
Trichlorofluoromethane					—	
Vinyl chloride					—	

SURROGATE RECOVERIES

SURROGATE COMPOUND	CONC. ADDED TO SAMPLE (ppb)	PERCENT RECOVERY	Q.C. LIMITS (R ± 3σ) LOWER	UPPER
1,2-Dichloroethane d-4	30.2	95.8	70	130
Toluene d-8	31.2	110.4	70	130
4-Bromofluorobenzene	29.4	106.2	70	130

ANALYST - PRINT: M.A. KACSMAR
SIGNATURE: MA Kacsmar
REPORT SUBMITTED: 4-16-86
SUPERVISOR - PRINT: S.R. FUNK
SIGNATURE: S R Funk
ADD 22 1986
DATE: 4-16-86
NJDOH ENVIRONMENTAL CHEMISTRY
CHEMICAL
PAGE

ATTACHMENT AA

New Jersey Department of Health
Division of Public Health and Environmental Laboratories

SAMPLE RESULTS AND SURROGATE RECOVERIES
VOLATILE ORGANIC (GC/MS)

SAMPLE NUMBER	ANALYTICAL METHOD	DATE AND TIME OF SAMPLE EXTRACTION
#41594	#624	DATE: — TIME:

GC/MS IDENTIFICATION NUMBER	DATE AND TIME OF ANALYSIS
M00101	DATE: 3/13/86 TIME: 18:53

SAMPLE RESULTS

TARGET COMPOUND	ION	SCAN No	AREA	$\overline{RF}$	CONC. IN PPB	MDL
Benzene					—	2ppb
Bromodichloromethane					—	
Bromoform					—	
Bromomethane					—	
Carbon tetrachloride					—	
Chlorobenzene					—	
Chloroethane					—	
2-Chloroethylvinyl ether					—	
Chloroform					—	
Chloromethane					—	
Dibromochloromethane					—	
1,2-Dichlorobenzene					—	
1,3-Dichlorobenzene					—	
1,4-Dichlorobenzene					—	
1,1-Dichloroethane					—	
1,2-Dichloroethane					3.9 (II)	
1,1-Dichloroethene					—	
trans-1,2-Dichloroethene					2.5 (I)	
1,2-Dichloropropane					—	
cis-1,3 Dichloropropene						
trans-1,3 Dichloropropene						
Ethylbenzene						
Methylene [illegible]						
[illegible]						

REPORT [illegible]

APR 29 1986

NJDOH [illegible]

ATTACHMENT AA29

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
Trenton, N.J. 08625-0029

George G. McCann, P.E.
Director

RECEIVED
JUL 21 1988
DEPT. ENVIRONMENTAL PROTECTION
Law Enforcement Southern Bureau

JUL 19 1988

Ms. P. Thelony
426 Garfield Avenue
Palmyra, NJ 08065

Dear Ms. Thelony:

Your request to Commissioner Dewling regarding drinking water test results for the City of Camden has been referred to the Bureau of Safe Drinking Water for response.

The most recent test results the Bureau has are from December 1987, we should be receiving results for the first half of 1988 within the next month. The results for December are as follows:

Location (in Distribution System)	Contaminant/Result (ppb)
Broadway	Trichloroethylene/1.8
Lenny Rea	Trichloroethylene/1.5
Malandra	Trichloroethylene/1.9
CamCare	Trichloroethylene/1.5

In addition, during portions of 1986 and 1987, special sampling of the Puchak plant delivered water was required of the water department. The results are as follows:

Date	Contaminant	Result (ppb)
3/86	Trichloroethylene	6.0
3/86	Tetrachloroethylene	1.0
3/86	Trans-1,2-dichloroethylene	2.0
7/86	Trichloroethylene	10.0
8/86	Trichloroethylene	4.4
8/86	Tetrachloroethylene	1.7
8/86	Trans-1,2-dichloroethylene	3.0
9/86	Trichloroethylene	3.6
9/86	Tetrachloroethylene	1.5
9/86	Trans-1,2-dichloroethylene	2.1

	Trichloroethylene	17.0
	Tetrachloroethylene	3.0
.7 /87	Trans-1,2-dichloroethylene	4.0

As can be seen from the available data the city does have low levels of trichloroethylene occurring within the distribution system. At least one source would appear to be the Puchak wellfield and treatment plant. The water department is aware of the problem and has informed the Department that they have retained consulting engineers to recommend and design treatment facilities to remove the chemicals in question. We expect the water department to commit to a course of action shortly.

If you need any additional information please contact this Bureau at (609) 292-5550.

Very truly yours,

Barker G. Hamill, Chief
Bureau of Safe Drinking Water

BGH:sr

c: Assistant Director Nieswand, WSE
Camden Water Department - Fred Martin
Southern Region Enforcement

ATTACHMENT AA 31

MOZER

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

JOHN W. GASTON JR., P.E.
DIRECTOR

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

January 7, 1986

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Camden City Water Department
City Hall
Room 419A
Camden NJ 08101

ATTENTION: Fredrick H. Martin, Jr.
Licensed Water Plant Operator

Dear Mr. Martin:

Summarized below are the results of our analysis of samples collected by this office on November 21, 1985, and analyzed for volatile organics by the State Department of Health laboratory. Our sampling was done in response to an A-280 sampling done by you on June 28, 1985.

CONTAMINANT	CONCENTRATION, PPB		
Location	Vesper & Park Blvd. (Parkside TP)	River Road (Puchack TP)	8900 Zimmermon Ave. (Morris-Delair TP)
1,2 Dichloroethane	6.5		2K
1,2 Dichloroethene	3.8	2.6	2K
Tetrachloroethene	7.5		2K
Trichloroethene	18.3	8.6	2K

Location	2430 Broadway (Stellar Tech)	8th & Van Hook St. (Camden Co Reg Health Ctr)	2977 Yorkship Sq. (Lenny Agency)	N.J. Avenue (AD Malandra Hall)
Bromoform	2.2			

ATTACHMENT AA32

1,2, Dichloroethane	2.2			
Trichloroethene	5.9	3.5	4.2	6.2

Although there are no current standards for these contaminants in water, legislation commonly referred to as A-280 will establish maximum permissible levels in the coming year. It is expected that levels for most of them will be considerably less than 100 ppb. In anticipation of more stringent standards to be adopted, we are currently reviewing these specific contaminants with concern and we are, therefore, using a stricter judgemental approach to determine the acceptability of the supply whenever they are present. Our approach is based on potential adverse health effects which may result from lifetime exposure to water containing such contamination. The higher the levels the greater the health risk to susceptible individuals and the greater the need to seek water of better quality. The goal over the long term is to reduce exposure to the lowest levels that are achievable so as to minimize the overall risk.

Therefore, you are warned that the levels of contaminants as shown through the DEP sampling of the Parkside Treatment Plant <u>are not acceptable</u> in drinking water and it is our position that the source(s) of supply contributing to this contamination should not be used for public potable purposes if more <u>acceptable</u> water is available. Treatment, development of alternative prime source(s), use of existing and/or construction of new interconnections with other supplies is required to minimize long term continued consumer exposure. Such alternatives must be provided as soon as possible and no later than <u>within one year</u> of the date of this letter. This action should be taken for the well(s) found to be the source of the pollution.

It is required that you acknowledge your intentions concerning these wells and provide written confirmation of these intentions within one month of the date of this letter.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct <u>monthly</u> monitoring of the Parkside Treatment Plant when this plant is used. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Safe Drinking Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

You are also warned that the levels of contaminants as shown through the DEP sampling of the Puchack Treatment Plant are not <u>desirable</u> in drinking water and it is our position that the source(s) of supply contributing to this contamination should normally not be used for public potable purposes if more acceptable water is available. Eventual treatment, development of alternate prime source(s), use of existing and/or construction of new interconnections

with other supplies of better quality should be considered to minimize long term continued consumer exposure.

Since flow conditions and water quality may vary with time, and since laboratory error is possible, it is required that you conduct monthly monitoring of the Puchack Treatment Plant whenever that source is used. At least three such monitoring reports must be submitted. This monthly monitoring report is to be forwarded with a letter of transmittal to the Bureau of Safe Drinking Water. All analysis must be done in laboratories certified for A-280 volatile organics. If this source is not used, this should be stated in the monthly letter.

If you have any questions in this matter, please contact me at (609)292-5550. By copy of this letter, other offices are being alerted to this problem.

Very truly yours,

Steven Nieswand

Steven Nieswand, Chief
Bureau of Safe Drinking Water

Attachment
cc: Mayor and Council, City of Camden
Camden Co. Health Department w/att.
William Whipple, Asst. Dir., Water Supply & Watershed Mgt.
John Preczewski, Bureau of Water Supply
George McCann, Asst. Dir., Enforcement
Haig Kasabach, NJ Geological Survey
Eric Evenson, Superfund Coordinator
Dr. Marwan Sadat, Division of Waste Management
Dr. Thomas Burke, Office of Science and Research w/att.
Dr. Kenneth Rosenman, NJ Dept. of Health w/att.
Ernest Hardin, Water Allocation
Paul Schorr, Special Water Treatment
Dr. Dhun Patel, DWR, Risk Assessment w/att.

DWR-18 (FW 2)
4/85

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES – BUREAU OF POTABLE WATER

WATER ANALYSES REPORT

DM

Supply: CAMDEN CITY WATER DEPT.
County: CAMDEN
Municipality: Camden
Date Collected: 11-21-85
Collected by: John Berdtold
Memo #: 85-362
Project # W-

BACTERIOLOGICAL: Coliform organisms are reported in colonies per 100 ml. Chlorine residuals are reported in ppm.

SAMPLE NUMBER	POINT OF COLLECTION	TIME	WATER TEMP.	Chlorine Residual FREE	Chlorine Residual TOTAL	Coliform Organisms FECAL	Coliform Organisms TOTAL
40503	2430 Broadway Stellar Technology Kitchen sin	10:35	61°F	0	0.1		
40504	8th & Van Hook St Camden Co Regional Health Ct. lab sink	10:50	67°F	0.1	0.2		
40505	2977 Yorkship Sq. Lenny Agency bathroom sink	11:10	61°F	0	trace		
40506	New Jersey Ave A.D. Malandra Hall Kitchen sink	11:25	63°F	0	trace		

PHYSICAL - CHEMICAL: Determinations are in ppm except color, odor, turbidity, pH, VO, and Pesticide. (N.J. Standards)

SAMPLE NUMBER	40503			SAMPLE NUMBER	40504	40505	40506
Nitrate (as N) (10)				Arsenic (0.05)			
Color (10)				Barium (1.0)			
Odor (III)				Cadmium (0.010)			
Turbidity (5)				Chromium (0.05)			
Total Dis. Solids (500)				Fluoride (2.0)			
pH				Lead (0.05)			
Alkalinity (as $CaCO_3$)				Mercury (0.002)			
Chloride (250)				Selenium (0.01)			
ABS/LAS (0.5)				Silver (0.05)			
Hardness (as $CaCO_3$) (250)				Iron (0.3)			
Sulfate (250)				Manganese (0.05)			
Cyanide				Sodium (50)			
Pesticide I, II, III				Copper (1.0)			
Endrin (0.0002)				Zinc (5.0)			
Lindane (0.004)				VO Scan (ppb)			
Methoxychlor (0.1)	2.2		Bromoform				
Toxaphene (0.005)	2.2		1,2dichloroethane				
2,4-D (0.1)	5.9		Trichloroethene		3.5	4.2	6.2
Silvex (0.01)							
VO Scan ppb							

REPORT SUBMITTED
DEC 16 1985
NJDEP Environmental Chemistry Laboratory

RECEIVED
DEC 23 1985
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF POTABLE WATER

Remarks: 210/2MP blank# 16030 accompanied by Lew Schneider of W.D
A280 Periodic 1/85 PRIORITY

ATTACHMENT AA35

COPIES: White - Bureau of Potable Water Green - Health Authority

99-00-292

CAMPBELL SOUP COMPANY
CENTRAL ENVIRONMENTAL LABORATORY

POTABLE WATER

cc: Mr. M. Vena

APR 12 1985
DIRECTOR OF UTILITIES OFFICE

Plant: City of Camden

Date: April 11, 1985

Reference: 2504-11;4/3-9/85

Page # Pg.4-11ES5;lm

Trihalomethane Analysis

	2504 Well #1 4/3/85	2505 Well #2 4/3/85	2506 Well #3 4/3/85	2507 Well #13 4/3/85
Chloroform (ug/l)	ND*	6.9	23.55	30.3
Bromodichloromethane (ug/l)	ND	ND	ND	ND
Chlorodibromomethane (ug/l)	ND	ND	ND	ND
Bromoform (ug/l)	ND	ND	ND	ND
Total Trihalomethanes	ND	6.9	23.55	30.3
Dichloroethane (ug/L)	-	0.95	-	-
Trichloroethane (ug/L)	-	<1	11.83	1.08
Carbon Tetrachloride (ug/L)	-	-	-	0.60
Trichloroethylene (ug/L)	0.122	8.9	~110	~136
Tetrachloroethylene (ug/L)	0.819	9.7	~21.7	~16.3
Unknown Peaks (Retention time, peak height in cm)		(9.55,0.2) (13.47,1) (19.52,0.2)	(9.24,1) (12.16,2.5) (15.8,1)	(12.31,12.5) (13.34,5.5) (15.59,10.5)

* ND = Not Detectable

Edward L Schwarz
Environmental Chemist

Attachment BB.

99-00-292

CAMPBELL SOUP COMPANY
CENTRAL ENVIRONMENTAL LABORATORY

POTABLE WATER

cc:

Plant: City of Camden

Date: 4/11/85

Reference: 2504-11

Page # _____

Trihalomethane Analysis

	2508 Well #17 4/3/85	2509 Well #18 4/3/85	2510 Puchack Effluent 4/3/85	2511 Parkside Effluent 4/3/85
Chloroform (ug/l)	12.91	2.38	3.56	3.06
Bromodichloromethane (ug/l)	ND	ND	ND	ND
Chlorodibromomethane (ug/l)	ND	ND	ND	ND
Bromoform (ug/l)	ND	ND	ND	ND
Total Trihalomethanes	12.91	2.38	3.56	3.06
Dichloroethane (ug/L)	16.35	7.33	0.849	8.0
Trichloroethane (ug/L)	2.10	< 1	0.881	--
Carbon Tetrachloride (ug/L)	1.57	--	--	--
Trichloroethylene (ug/L)	~81.7	~19.9	~20.1	~26.7
Tetrachloroethylene (ug/L)	~11.26	~15.7	2.81	6.45
Unknown Peaks (Retention time, peak height in cm)	(12.27,3) (13.50,2)	(12.27,0.5) (13.54,0.5)	(13.51,0.5)	(12.34,0.5) (13.44,0.5) (15.16,2)

ND = Not Detectable

Edward J. Schimmer
Environmental Chemist

ATTACHMENT BB2

CITY OF CAMDEN GROUND WATER ANALYSES FOR ORGANICS

Analyzed by		Q.C	T.R	T.R	T.R	T.R	T.R	T.R	T.R	T.R	T.R		
Dated of Collection		7/14/78	7/20/78	7/28/78	8/4/78	8/11/78	8/17/78	8/25/78	9/1/78	9/8/78	9/20/78		
Sampling points	Parameter (PPB)												
CITY WELL # 18	Trichloroethylene	<10	20.6	22.2	18.2	17.7	16.2	12.24	8.5	14.7	12		
PARKSIDE & VESPER BLVD	Tetrachloroethylene	<10	20.0	22.9	23.8	18.7	22.5	14.1	5.7	20.5	16.9		
	Carbontetrachloride	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1		
	1,2 Dichloroethane	<10	<1	1.2	<1	<1	<1	1.49	1.1	1.2	<1		
	111 Trichloroethane												
	Chloroform												
	Dibromochloromethane												
	Trichlorobenzene												

Remarks Q.C – Quality control lab.
T.R – Technological Resources Inc.

ATTACHMENT

5/77 TK ANALYTICAL DATA SUBMITTED TO N.J. STATE BUREAU OF POTABLE WATER BY CITY OF CAMDEN

CITY OF CAMDEN GROUND WATER ANALYSES FOR ORGANICS

Analyzed by		T.R	T. R	T.R									
Dated of Collection		8/25/78	9/1/78	9/20/78									
Sampling points	Parameter (PPB)												
CITY WELL #5	Trichloroethylene	21.25	24.2	18.3									
Line & Memorial Sts.	Tetrachloroethylene	<1.0	<1	<1									
	Carbontetrachloride	<1.0	<1	<1									
	1,2 Dichloroethane	5.66	6.6	5.4									
	111 Trichloroethane												
	Chloroform			2.2									
	Dibromochloromethane												
	Trichlorobenzene												

Remarks T.R – Technological Resources, Inc.,
Well #5 reportedly was out service on other dates as shown for well #16

ATTACHMENT CC2

CITY OF CAMDEN GROUND WATER ANALYSES FOR ORGANICS

Analyzed by		T.R	Q.C	T.R	T.R	T.R	T.R	T.R	T.R	T.R	T.R	T.R
Dated of Collection		5/17/78	7/14/78	7/20/78	7/28/78	8/4/78	8/11/78	8/17/78	8/25/78	*9/1/78	9/8/78	9/20/78
Sampling points	Parameter (PPB)											
CITY WELL #16	Trichloroethylene	125	60	163	180	210	208	177	157	165	185	167
RIVER AVE. & 21ST ST.	Tetrachloroethylene	2	<10	3.3	6	7.8	6.6	2.46	4.5	2	7	5.9
	Carbontetrachloride	N.D	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1,2 Dichloroethane	1.5	<10	<1	2.3	2.4	2.7	2.46	2.6	2.1	2.2	2.2
	111 Trichloroethane								—	—	—	—
	Chloroform								1.64	1.3	9.2	3.7
	Dibromochloromethane											
	Trichlorobenzene											
ALAN'S CAR WASH	Trichloroethylene									29.1	51.5	
1st SERVICE FROM	Tetrachloroethylene									<1	1.1	
WELL #16	1,2 Dichloroethane									2.3	2.6	
	Carbontetrachloride									<1	<1	
	Unknown, Total as Chloroform									1.7	3	
WAREHOUSE	TRICHLOROETHYLENE											18.3
	TETRACHLOROETHYLENE											<1.0
	1,2, DICHLOROETHANE											5.4
	CARBON TETRACHLORIDE											<1.0

Remarks T.R. – Technological Resources, Inc. N.D – NOT DETECTED.

Q.C. – Quality control lab. * Samples received by lab. on the date indicated were in plastic cubicontainers containing a head space.

ATTACHMENT CC3

CITY OF CAMDEN GROUND WATER ANALYSES FOR ORGANICS

Analyzed by		T.R	T.R										
Dated of Collection		9/8/78	9/20/78										
Sampling points	Parameter (PPB)												
WELL #17	Trichloroethylene	69.8	54.4										
PARKSIDE & VESPER	Tetrachloroethylene	15.1	18.6										
BLVD.	Carbontetrachloride	<1	<1										
	1,2 Dichloroethane	3.1	1.9										
	111 Trichloroethane												
	Chloroform												
	Dibromochloromethane												
	Trichlorobenzene												

Remarks T.R- Technological Resources, Inc.,
Reportedly Well #17 was down for repairs for other dates as shown for well #16.

ATTACHMENT CC4

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58658 P. 1

DATE SAMPLE REC'D: 12/26 & 12/27/79

DATA CALLED IN:

ANALYST: PW

REF. NO.: 1030 to 1034 & 1053 to 1057

Sample Identification / Analytical Results

	Well #5 (City) 12-27	Warehouse Wright Ave. 12-27	Parkside Area 1470 Haddon Ave. 12-27
Chloroform ug/l	.41	4.17	1.26
Bromodichloromethane ug/l	ND	ND	ND
Chlorodibromomethane "	ND	ND	.21
Bromoform "	ND	ND	ND
1,2 dichloroethane ug/l	2.62	.46	5.08
trichloroethylene "	15.8	15.4	16.1
tetrachloroethylene "	1.01	.92	6.93
Unknowns (as chloroform) (Retention time min.) ug/l	(11.07) .43 (11.75) 2.21	(11.76) .67 (16.34) .80	(11.07) .42 (11.75) 1.53 (14.28) .14

Attachment H

ATTACHMENT CC5

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58658 P. 2

DATE SAMPLE REC'D: 12/26 & 12/27/79

DATA CALLED IN:

ANALYST: PW

REF. NO.: 1030 to 1034 & 1053 to 1057

Sample Identification / Analytical Results	Whitman Park Bruno's 12-27	North Camden Point & Erie 12-27	Well #13 City Raw Wate 12-26
Chloroform ug/l	ND	.91	4.27
Bromodichloromethane ug/l	ND	.35	ND
Chlorodibromomethane "	9.03	ND	ND
Bromoform "	ND	ND	ND
1,2 dichloroehtane ug/l	1.67	.42	14.2
trichloroethylene "	31.8	5.62	28.5
tetrachloroethylene "	7.32	.22	3.88
Unknowns (as Chloroform) (Retention time min.) ug/l	(11.06) .15 (11.71) 13.67 (12.31) .21 (12.50) .21	(11.78) .24 (12.54) 2.67 (16.34) 1.09	(9.57) 6.85 (11.00) 2.77 (11.72) 4.88 (14.23) 1.24

ATTACHMENT CC6

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58658 P. 3

DATE SAMPLE REC'D: 12/26 & 12/27/79

DATA CALLED IN:

ANALYST: PW

REF. NO.: 1030 to 1034 & 105 to 105

Sample Identification / Analytical Results

	Well #17 City Raw Water 12-26	Well #18 City Raw Water 12-26	Fairview 2977 Yorkshir 12-26
Chloroform ug/l	1.76	7.20	1.02
Bromodichloromethane ug/l	ND	ND	ND
Chlorodibromomehtane "	ND	ND	0.20
Bromoform "	ND	ND	ND
1,2 dichloroethane ug/l	2.89	3.29	3.88
trichloroethylene "	51.9	8.33	14.1
tetrachloroethylene "	18.3	21.30	3.20
Unknowns (as chloroform) (Retention time min) - ug/l	(11.81) .43 (17.92) .34	(11.78) .68 (17.93) .24	(9.63) .06 (11.05) .40 (11.73) 1.64

ATTACHMENT CC7

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58658 P.4

DATE SAMPLE REC'D: 12/26 & 12/27/79

DATA CALLED IN:

ANALYST: PW

REF. NO.: 1030 to 1030 & 105

Sample Identification	Analytical Results to 105
	Parkside Treatment Plant - Effluent 12-26
Chloroform ug/l	.87
Bromodichloromethane ug/l	ND
Chlorodibromomethane "	0.21
Bromoform "	ND
1,2 dichloroethane ug/l	4.46
trichloroethylene "	16.0
tetrachloroethylene "	6.47
Unknowns (as chloroform) (Retention time min) - ug/l	(11.08) .37 (11.76) 1.46 (14.30) .11

ATTACHMENT CC4

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58670 P. 1

DATE SAMPLE REC'D: 1/31/80

DATA CALLED IN:

ANALYST: pw

REF. NO.: 1253 to 1262

Sample Identification	Well #5 1-31-80	Warehouse 1-31-80	Bruno's 1-31-80	2997 Yorksh Sq. 1-
Analytical Results				
Chloroform ug/l	ND	<1 (.94)	<1 (.25)	1.17
Bromodichloromethane "	ND	ND	ND	ND
Dibromochloromethane "	ND	ND	12.3	1.99
Bromoform "	ND	ND	ND	ND
1,2 dichloroethane ug/l	3.73	1.12	1.97	4.64
Trichloroethylene "	54.8	11.0	40.6	21.7
Tetrachloroethylene "	1.33	<1 (.13)	9.13	8.03
Carbon tetrachloride "				
Unknowns (as CHCl3) ug/l				
Retention Time (min)				
9.70 to 9.9	<1 (.18)			
11.09 to 11.28	<1 (.77)		<1 (.14)	<1 (.35
11.77 to 12.00	4.31	<1 (.47)	17.8	3.53
16.38 to 16.44		<1 (.39)		

ATTACHMENT CCa

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58670 P. 2

DATE SAMPLE REC'D: 1/31/80

DATA CALLED IN:

ANALYST: JW

REF. NO.: 1253 to 1262

Sample Identification	Parkside Trtmnt. Plant 1-31-80	Well #13 1-31-80	Well #17 1-31-80
	Analytical Results		
Chloroform ug/l	1.20	4.80	<1 (.28)
Bromodichloromethane "	ND	ND	ND
Dibromochloromethane "	<1 (.26)	ND	<1 (.45)
Bromoform "	ND	ND	ND
1,2 dichloroethane ug/l	5.90	18.7	2.39
Trichloroethylene "	20.0	39.5	61.7
Tetrachloroethylene "	9.71	5.55	27.8
Carbon tetrachloride "	<1 (.20)	2.57	<1 (.15)
Unknowns (as CHCl3) ug/l			
Retention Time (min)			
9.70 to 9.9	<1 (.19)	3.75	
11.09 to 11.28	<1 (.53)	4.26	
11.77 to 12.00	1.82	7.48	<1 (.68)
16.38 to 16.44			

ATTACHMENT CC10

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58670 P. 3

DATE SAMPLE REC'D: 1/31/80

DATA CALLED IN:

ANALYST: PW

REF. NO.: 1253 to 1262

Sample Identification

Analytical Results

	Well #18 1-31-80	Parkside Area 1470 Haddon Ave. 1-31-80	North Camden 1-31-80
Chloroform ug/l	< 1 (.56)	< 1 (.92)	< 1 (.91)
Bromodichloromethane "	ND	ND	ND
Dibromochloromethane "	ND	ND	ND
Bromoform "	ND	ND	ND
1,2 dichloroethane ug/l	1.35	4.29	< 1 (.72)
Trichloroethylene "	8.60	14.5	3.98
Tetrachloroethylene "	21.8	6.19	
Carbon tetrachloride "			
Unknowns (as CHCl3) ug/l			
Retention Time (min)			
9.70 to 9.9		< 1 (.10)	
11.09 to 11.28		< 1 (.10)	
11.77 to 12.00	< 1 (.95)	1.42	< 1 (.13)
16.38 to 16.44			< 1 (.76)

ATTACHMENT CC11

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58676 P.1

DATE SAMPLE REC'D: 2/29/80

DATA CALLED IN:

ANALYST: M.E.F.

REF. NO.: 1412 to 1419

Sample Identification	Well #17 2-29	Parkside Trtmnt Plant Effluent 2-29	Haddon Ave. 1470 2-29
	Analytical Results		
Chloroform ug/l	<1 (.43)	ND	-
Bromodichloromethane "	ND	<1 (.74)	ND
Dibromochloromethane "	<1 (.04)	2.94	<1 (.55)
Bromoform "	ND	1.79	<1 (.25)
1,2 dichloroethane ug/l	1.53	<1 (.95)	<1 (.49)
Trichloroethylene "	15.22	11.26	13.81
Tetrachloroethylene "	4.44	8.29	8.93
Carbon Tetrachloride "	ND	ND	ND
Unknowns as Chloroform ug/l			
Retention Time (min)			
11.58	<1 (.21)	-	
11.77	<1 (.26)	-	
12.89	-	1.00	

ATTACHMENT CC12

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58676 P.2

DATE SAMPLE REC'D: 2/29/80

DATA CALLED IN:

ANALYST: M.E.F.

REF. NO.: 1412 to 1419

Sample Identification	Well #5 (City)	Bruno's	2997 Yorkshire Square (City)	Point & Erie (City)
	2-29	2-29	2-29	2-29
Analytical Results				
Chloroform ug/l	5.97	30.18	13.43	< 1 (.81)
Bromodichloromethane "	ND	ND	ND	ND
Dibromochloromethane "	ND	13.05	3.60	ND
Bromoform "	ND	ND	ND	ND
1,2 dichloroethane ug/l	3.09	< 1 (.34)	1.11	ND
Trichloroethylene "	39.44	26.99	23.12	4.17
Tetrachloroethylene "	< 1 (.99)	6.67	2.03	ND
Carbon Tetrachloride "	ND	ND	ND	ND
Unknowns as Chloroform ug/l				
Retention Time (min)				
11.58	-			
11.77	-			
12.89	-			
16.46		-	-	< 1 (.46)

ATTACHMENT CCB

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58676 P.3

DATE SAMPLE REC'D: 2/29/80

DATA CALLED IN:

ANALYST: N. E. J.

REF. NO.: 1412 to 1419

Sample Identification

Analytical Results

	Warehouse 2-29	Well #18 2-29
Chloroform ug/l	< 1 (.56)	< 1 (.44)
Bromodichloromethane "	ND	ND
Dibromochloromethane "	ND	ND
Bromoform "	ND	ND
1,2 dichloroethane ug/l	< 1 (.25)	< 1 (.94)
Trichloroethylene "	13.14	24.75
Tetrachloroethylene "	ND	15.46
Carbon Tetrachloride "	ND	ND
Unknowns as Chloroform ug/l		
Retention Time (min)		
16.46	< 1 (.36)	-
11.84	-	.63
17.30	-	2.90

ATTACHMENT CC14

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58688 P. 1

DATE SAMPLE REC'D: 4/03/80

DATA CALLED IN:

ANALYST: N.E.F.

REF. NO.: 1602 to 1613

Sample Identification

Analytical Results

	Well #17 4-03	Well #18 4-03	Parkside Trtmnt Plant Effluent 4-03	1470 Haddon Avenue 4-03
Chloroform ug/l	ND	1.71	ND	ND
Bromodichloromethane "	ND	ND	< 1 (.03)	ND
Chlorodibromomethane "	ND	ND	2.23	< 1 (.24)
Bromoform "	ND	ND	4.00	< 1 (.34)
1,2 dichloroethane "	2.26	1.40	< 1 (.37)	< 1 (.20)
Trichloroethylene "	48.30	12.60	10.45	9.48
Tetrachloroethylene "	79.17	16.63	4.68	5.10
Carbon tetrachloride "	ND	ND	ND	ND

Unknowns (as Chloroform)

Retention Time (min)	ug/l		
24.96	-	-	< 1 (.03)

ATTACHMENT CL15

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58688 P. 2

DATE SAMPLE REC'D: 4/03/80

DATA CALLED IN:

ANALYST: R.E.J.

REF. NO.; 1602 to 1613

Sample Identification / Analytical Results

	Well #5 4-03	Bruno's 4-03	2997 Yorkshire Square 4-03	Point & Erie 4-03
Chloroform ug/l	5.23	21.17	< 1 (.21)	< 1 (.40)
Bromodichloromethane "	ND	ND	ND	ND
Chlorodibromomethane "	ND	9.00	ND	ND
Bromoform "	ND	ND	ND	ND
1,2 dichloroethane "	2.47	< 1 (.42)	< 1 (.1)	< 1 (.33)
Trichloroethylene "	44.68	27.88	3.2	4.26
Tetrachloroethylene "	2.50	4.75	ND	ND
Carbon tetrachloride "	ND	ND	< 1 (.3)	ND
Unknowns as Chloroform ug/l				
Retention Time (min)				
11.15	< 1 (.40)			
12.62			-	-
16.46			-	< 1 (.36)

ATTACHMENT CC16

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391 Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58688 P. 3

DATE SAMPLE REC'D: 4/03/80

DATA CALLED IN:

ANALYST: M-E.F.

REF. NO.: 1602 to 1613

Sample Identification — Analytical Results

	Warehouse 4-03	Well #4 4-03	MD Effluent 4-03	Pucheck Efflu 4-03
Chloroform ug/l	< 1 (.09)	ND	1.20	ND
Bromodichloromethane "	ND	ND	ND	ND
Chlorodibromomethane "	ND	19.96	ND	ND
Bromoform "	ND	ND	ND	ND
1,2 dichloroethane "	< 1 (.28)	21.04	< 1 (.41)	< 1 (.33)
Trichloroethylene "	8.35	31.41	< 1 (.22)	16.20
Tetrachloroethylene "	ND	6.70	ND	< 1 (.21)
Carbon tetrachloride "	ND	ND	ND	ND
Unknowns as Chloroform "				
Retention Time (min)				
12.62	< 1 (.04)			
16.46	-			
16.50		-	-	< 1 (.08)
16.60		-	-	< 1 (.05)

ATTACHMENT CCn

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58697

DATE SAMPLE REC'D: 5/02/80

DATA CALLED IN:

ANALYST: [illegible]

REF. NO.: 1725 to 1734

Sample Identification

Analytical Results

Sampling date: 5/02/80

	Well #4	Well #5	Well #17	Well #18
Chloroform ug/l	ND	ND	< 1(.47)	< 1(.65)
Bromodichloromethane "	ND	ND	ND	ND
Chlorodibromomethane "	14.95	ND	ND	ND
Bromoform "	ND	ND	ND	ND
1,2 Dichloroethane "	< 1 (.53)	2.79	2.30	2.01
Trichloroethylene "	31.88	36.79	37.05	11.92
Tetrachloroethylene "	5.86	1.25	19.57	16.33
Carbon Tetrachloride "	ND	ND	ND	ND
Unknowns as Chloroform ug/l				
Retention Time (min)				
10.95	-	< 1(.44)	-	-
11.54 - 11.66	28.27	4.37	.54	1.36

ATTACHMENT CC18

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58697 2 of 3

DATE SAMPLE REC'D: 5/02/80

DATA CALLED IN:

ANALYST: M.E.F.

REF. NO.: 1725 to 1734

Sample Identification — Analytical Results

Sampling date: 5/02/80

	2997 Yorkshire Square	1470 Haddon Ave.	Bruno's	Parkside Treatment Plant Effluent
Chloroform ug/l	ND	ND	ND	< 1 (.60)
Bromodichloromethane "	ND	ND	ND	ND
Chlorodibromomethane "	ND	< 1(.45)	10.37	ND
Bromoform "	ND	ND	ND	ND
1,2 Dichloroethane "	< 1(.48)	< 1(.88)	< 1(.57)	< 1 (.73)
Trichloroethylene "	1.40	6.98	28.55	6.62
Tetrachloroethylene "	ND	4.75	6.35	ND
Carbon Tetrachloride "	ND	ND	ND	ND
Unknowns as Chloroform ug/l				
Retention Time (min)				
11.54 - 11.66	< 1(.42)	-	22.46	< 1(.32)

ATTACHMENT LL19

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58697 3 of 3

DATE SAMPLE REC'D: 5/02/80

DATA CALLED IN:

ANALYST: [illegible]

REF. NO.: 1725 to 1734

Sample Identification

Analytical Results

Sampling date: 5/02/80

	Warehouse	Point & Erie
Chloroform ug/l	ND	< 1(.96)
Bromodichloromethane "	< 1(.21)	ND
Chlorodibromethane "	1.30	ND
Bromoform "	3.70	ND
1,2 Dichloroethane "	< 1(.75)	< 1(.14)
Trichloroethylene "	9.13	1.72
Tetrachloroethylene "	4.80	ND
Carbon Tetrachloride "	ND	ND
Unknowns as Chloroform ug/l		
Retention Time(min)		
11.54 - 11.66	< 1(.17)	-
16.31	-	< 1(.25)

ATTACHMENT CC20

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

Ref. No. 1869-1878
Sampling Date 6/3/80

ANALYTICAL DATA REPORT - PAGE 1

CLIENT: City of Camden

TRI ORDER #: 58706

DATE SAMPLE REC'D: 6/3/80

DATA CALLED IN:

ANALYST: JD, NF

Sample Identification	Analytical Results			
	Fairview	Warehouse	Haddon Avenue	Bruno's
Chloroform, ug/l	ND	<1 (.71)	<1 (.33)	20.46
Bromodichloromethane, ug/l	ND	ND	<1 (.26)	ND
Chlorodibromomethane, ug/l	ND	ND	<1 (.97)	19.90
Bromoform, ug/l	ND	ND	<1 (.90)	ND
1,2-Dichloroethane, ug/l	<1 (.59)	<1 (.86)	1.60	<1 (.78
Trichloroethylene, ug/l	1.57	7.31	11.34	27.21
Tetrachloroethylene, ug/l	ND	<1 (.52)	6.66	6.57
Carbontetrachloride, ug/l	2.07	ND	ND	ND
Unknown as Chloroform, ug/l				
Retention time (min.)				
11.50-11.60	<1 (.88)	<1 (.26)	<1 (.45)	-
16.20	-	<1 (.25)	-	-

ATTACHMENT CC21

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT - PAGE 2

CLIENT: City of Camden

TRI ORDER #: 58706

DATE SAMPLE REC'D: 6/3/80

DATA CALLED IN:

Sample Identification	Analytical Results			
	Point & Erie	Parkside Trmt. Plant Effluent	Well #4	Well #
Chloroform, ug/1	<1 (.69)	<1 (.59)	25.81	3.53
Bromodichloromethane, ug/1	ND	ND	ND	ND
Chlorodibromomethane, ug/1	ND	<1 (.94)	21.42	ND
Bromoform, ug/1	ND	1.24	ND	<1 (.11
1,2-Dichloroethane, ug/1	<1 (.49)	<1 (.79)	.68	2.39
Trichloroethylene, ug/1	2.46	1.16	28.09	28.03
Tetrachloroethylene, ug/1	ND	1.28	6.56	1.14
Carbontetrachloride, ug/1	ND	ND	ND	ND
Unknowns as Chloroform, ug/1				
Retention time (min.)				
10.89	-	-	-	<1 (.38
11.5	<1 (.27)	<1 (.17)	-	-
16.12	<1 (.49)	-	-	-

ATTACHMENT CC22

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT - PAGE 3

CLIENT: City of Camden

TRI ORDER #: 58706

DATE SAMPLE REC'D: 6/3/80

DATA CALLED IN:

Sample Identification	Analytical Results	
	Well #17	Well #18
Chloroform, ug/l	< 1 (.91)	< 1 (.73)
Bromodichloromethane, ug/l	ND	ND
Chlorodibromomethane, ug/l	< 1 (.51)	< 1 (.30)
Bromoform, ug/l	ND	ND
1,2-Dichloroethane, ug/l	1.72	2.33
Trichloroethylene, ug/l	10.80	15.02
Tetrachloroethylene, ug/l	8.09	18.81
Carbontetrachloride, ug/l	ND	ND
Unknowns as Chloroform, ug/l		
Retention time (min.)		
11.6	-	1.84

ATTACHMENT CC23

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58713

DATE SAMPLE REC'D: 7/2/80

DATA CALLED IN:

Sample Identification	Analytical Results			
	Well #5	Well #13	Well #17	Well #18
Chloroform, ug/l	<1 (.49)	2.84	ND	<1 (.69)
Bromodichloromethane, ug/l	ND	ND	ND	ND
Chlorodibromomethane, ug/l	ND	ND	<1 (.32)	<1 (.86)
Bromoform, ug/l	ND	ND	ND	ND
1,2-Dichloroethane, ug/l	3.41	17.98	2.33	3.00
Trichloroethylene, ug/l	39.19	28.81	27.68	11.22
Tetrachloroethylene, ug/l	1.88	1.81	11.42	16.13
Carbon Tetrachloride, ug/l	ND	2.52	ND	ND
Unknowns as Chloroform, "				
Retention Time (minutes)				
10.65 - 10.75	<1 (.75)	3.30	-	<1 (.43)
11.48 - 11.65	4.54	8.44	<1 (.30)	2.27

ATTACHMENT CC24

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58713

DATE SAMPLE REC'D: 7/2/80

DATA CALLED IN:

Sample Identification	Analytical Results			
	Parkside Trmt Plant Effluent	1470 Haddon Avenue	Pucheck Effluent	2997 Yorkshire Square
Chloroform, ug/l	1.13	<1 (.98)	<1 (.20)	<1 (.43)
Bromodichloromethane, "	ND	ND	ND	ND
Chlorodibromomethane, "	<1 (.38)	<1 (.44)	ND	ND
Bromoform, ug/l	ND	ND	ND	ND
1,2-Dichloroethane, ug/l	7.56	7.55	<1 (.95)	<1 (.52)
Trichloroethylene, ug/l	16.46	14.72	11.92	<1 (.30)
Tetrachloroethylene, "	5.66	7.06	1.09	ND
Carbon Tetrachloride, "	ND	1.73	ND	ND
Unknowns as Chloroform, "				
Retention Time (minutes)				
10.7	<1 (.86)	1.38	<1 (.29)	-
11.4	2.69	3.12	1.13	-
16.17	-	-	<1 (.35)	-

ATTACHMENT CC25

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58713

DATE SAMPLE REC'D: 7/2/80

DATA CALLED IN:

Sample Identification	Analytical Results			
	Point & Erie	Bruno's	Morris Delair	Warehouse
Chloroform, ug/1	<1 (.41)	<1 (.06)	1.6	<1 (.38)
Bromodichloromethane, ug/1	ND	ND	ND	ND
Chlorodibromomethane, "	ND	14.42	ND	ND
Bromoform, ug/1	ND	ND	ND	ND
1,2-Dichloroethane, ug/1	<1 (.42)	2.08	<1 (.15)	<1 (.51)
Trichloroethylene, "	2.25	21.57	<1 (.8)	8.27
Tetrachloroethylene, "	ND	5.84	ND	<1 (.67)
Carbon Tetrachloride, "	ND	ND	ND	ND
Unknowns as Chloroform, ug/1				
Retention Time (minutes)				
10.8	-	<1 (.23)	-	-
11.5	-	20.00	-	<1 (.28)
16.22	<1 (.30)	-	-	<1 (.43)

ATTACHMENT CC

p. 216-225
JPW(II)

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58721

DATE SAMPLE REC'D: 8-11-80

DATA CALLED IN:

REFERENCE: 4016 to 4025-0811/0825

Sample Identification		(4016) Well#5	(4017) Well#13	(4018) Well#17	(4019) Well#18	(4020) Bruno's	(4021) Haddon Ave.	(4022) Parkside Eff.
		8-11-80	8-11-80	8-11-80	8-11-80	8-11-80	8-11-80	8-11-80
Analytical Results								
Chloroform	ug/l	ND*	5.09	ND	<1(.65)	<1(.20)	1.14	1.28
Bromodichloromethane	"	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	"	ND	ND	<1(.23)	<1(.17)	12.3	ND	<1(.18)
Bromoform	"	ND	ND	ND	ND	ND	ND	ND
1,2 dichloroethane	"	2.63	20.7	2.53	2.81	2.65	6.61	7.42
Trichloroethylene	"	25.9	29.6	34.2	11.1	25.7	17.2	13.9
Tetrachloroethylene	"	<1(.78)	2.40	18.0	16.8	5.73	5.94	5.40
Carbon Tetrachloride	"		3.52					
Unknowns (as Chloroform)	"	<1(.31)	2.69	<1(.44)	1.27	20.3	<1(.60)	<1(.55)
(Retention time min.)		(10.89)	(9.51)	(11.63)	(11.60)	(11.62)	(10.88)	(1090)
		3.21	4.99	<1(.65)			1.75	1.77
		(11.57)	(10.85)	(18.82)			(11.58)	(11.58)
			7.63					
			(11.57)					

*-not detectable

JPW

ATTACHMENT LL27

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58728

DATE SAMPLE REC'D: 9/3/80

REFERENCE: 4136-4145

DATA CALLED IN:

SAMPLE IDENTIFICATION (all results expressed in ug/l)	ANALYTICAL RESULTS Well#5 9-3	Well#3 9-3	Well#17 9-3	Well#18 9-3	Bruno's 9-3
Chloroform	ND*	2.74	<1(.36)	1.02	2.90
Bromodichloromethane	ND	<1(.82)	ND	ND	ND
Chlorodibromomethane	ND	ND	ND	<1(.67)	26.39
Bromoform	ND	ND	ND	ND	ND
1,2 dichloroethane	2.12	7.47	<1(.89)	1.91	2.53
Trichloroethylene	1.52	8.76	23.84	8.69	23.86
Tetrachloroethylene	ND	ND	11.93	17.00	5.86
Carbon Tetrachloride	ND	1.35	ND	ND	ND
Unknowns (as Chloroform)					
Retention time min.					
1) 10.48		2.44			
2) 11.21-11.26		1.04			17.91

*ND: Not Detectable

M. Fox

ATTACHMENT CC28

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58735

DATE SAMPLE REC'D: 10/3/80

DATA CALLED IN:

REFERENCE: 4317 to 4326-1003

Sample Identification	Analytical Results				
	Warehouse	Point Erie	Parkside Effluent	Haddon Ave.	Yorkshire Square
All results expressed in ug/l					
date:	10-3	10-3	10-3	10-3	10-3
Chloroform	<1(.37)	<1(.47)	<1(.81)	<1(.84)	1(.20)
Bromodichloromethane	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	1.29	<1(.76)	7.35
Bromoform	ND	ND	ND	ND	ND
1,2-Dichbroethane	<1(.61)	<1(.29)	5.17	4.94	1.67
Trichloroethylene	8.63	3.34	12.07	11.84	16.42
Tetrachloroethylene	ND	ND	5.15	5.65	2.96
Carbon Tetrachloride	ND	ND	<1(.36)	<1(.33)	ND
Unknowns as Chloroform Retention Time:					
8.15-8.19	1.04	<1(.88)	--	--	--
10.35-10.45	--	--	<1(.53)	<1(.57)	--
11.07-11.20	<1(.41)	--	1.25	1.18	7.11
15.75-15.76	--	<1(.74)	--	--	.13

71 407

ATTACHMENT CC-29

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden (con't)

TRI ORDER #:

DATE SAMPLE REC'D:

DATA CALLED IN:

Sample Identification	Analytical Results				
	Well#5 10-3	Well#13 10-3	Well#17 10-3	Well#18 10-3	Bruno's 10-3
Chloroform	2.94	3.58	<1(.70)	<1(.31)	<1(.21)
Bromodichloromethane	ND	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	1.10	<1(.[illegible])	19.05
Bromoform	ND	ND	ND	ND	ND
1,2-Dichbroethane	2.28	15.54	1.85	2.04	2.57
Trichloroethylene	34.02	30.97	40.46	9.07	23.02
Tetrachloroethylene	1.48	4.07	19.00	18.19	5.80
Carbon Tetrachloride	ND	2.69	ND	ND	ND
Unknowns as Chloroform Retention Time:					
8.15-8.19	--	--	--	--	--
10.35-10.45	1(.65)	3.27	--	--	<1(.28)
11.07-11.20	--	4.71	--	1.17	14.76
15.75-15.76	--	--	--	--	--

ATTACHMENT CC30

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58743

DATE SAMPLE REC'D: 11/5/80

DATA CALLED IN:

REF: 4490-4499

Sample Identification — Analytical Results

	1470 Haddon Avenue	Parkside Treatment Plant-Eff.	Point & Erie	Warehouse	2997 Yorkshi Square
All results expressed in ug/l					
Chloroform	1.04	<1(.87)	<1(.61)	<1(.29)	1.82
Bromodichloromethane	ND	ND	ND	ND	ND
Chlorodibromomethane	<1(.75)	1.37	ND	ND	1.43
Bromoform	ND	ND	ND	ND	ND
1,2-Dichloroethane	4.89	5.45	<1(.51)	<1(.59)	<1(.80)
Trichloroethylene	10.90	12.92	4.62	10.31	3.27
Tetrarchloroethylene	7.77	5.70	ND	<1(.69)	<1(.85)
Carbon Tetrachloride	<1(.35)	<1(.40)	ND	ND	1.00
Unknowns as Chloroform Retention Time (min)					
10.33 - 10.50	<1(.6)	<1(.64)	--	--	<1(.24)
11.09 - 11.19	1.19	1.54	<1(.32)	<1(.56)	--
15.76	--	--	1.2	<1(.83)	--

Jonathan

ATTACHMENT CC31

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58743

DATE SAMPLE REC'D: 11/5/80

DATA CALLED IN:

REF: 4490-4499

Sample Identification	Analytical Results				
All results expressed in ug/l	Well #5	Well #13	Well #17	Well #18	Bruno's
Chloroform	3.61	3.56	<1 (.25)	<1 (.21)	<1 (.23)
Bromodichloromethane	ND*	ND	ND	ND	ND
Chlorodibromomethane	ND	ND	1.22	<1 (.72)	20.39
Bromoform	ND	ND	ND	ND	ND
1,2 - Dichloroethane	2.42	16.01	2.50	2.12	1.92
Trichloroethylene	44.07	32.76	42.20	9.12	26.79
Tetrachlorethylene	1.99	4.92	19.74	22.70	6.33
Carbon Tetrachloride	ND	2.85	<1(.32)	ND	<1(.27)
Unknowns as Chloroform Retention time (min)					
10.33 - 10.50	<1(.81)	3.54	--	--	--
11.09 - 11.19	--	5.36	<1(.88)	1.14	21.22

*ND: Not Detectable

Nancy Fox

ATTACHMENT CC32

TPI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden

TRI ORDER #: 58749

DATE SAMPLE REC'D: December 2, 1980

DATA CALLED IN:

Ref: 4582-4590

Sample Identification — Analytical Results

ll resulted expressed in ug/l	Well #5	Well #13	Well #17	Haddon Ave.
loroform	3.78	3.02	<1(.27)	<1(.78)
omodichloromethane	ND	ND	ND	ND
lorodibromomethane	ND	ND	<1(.71)	<1(.36)
moform	ND	ND	ND	ND
,2-Dichloroethane	2.56	11.10	2.56	4.16
ichloroethylene	48.56	29.87	44.49	12.31
rachloroethylene	1.73	3.69	17.45	5.11
rbontetrachloride	ND	2.70	<1(.33)	<1(.32)
knowns as chloroform				
tention Time (Min.)				
9.07 - 9.11	<1(.24)	2.55	--	--
10.48 - 10.60	<1(.89)	3.11	--	<1(.66)
11.26 - 11.35	--	5.11	<1(.97)	1.17

ATTACHMENT CC33

TRI
TECHNOLOGICAL RESOURCES, INC.
A Subsidiary of Campbell Soup Company
P.O. Box 391, Camden, N.J. 08101
(609) 964-5603

ANALYTICAL DATA REPORT

CLIENT: City of Camden - Cont'd. TRI ORDER #: 58749

DATE SAMPLE REC'D: DATA CALLED IN:

Sample Identification	Analytical Results				
	Point & Erie	Bruno's	Parkside Effluent	Yorkshire Square	Warehouse
ll results expressed n ug/l					
loroform	<1(.36)	<1(.85)	1.13	<1(.79)	<1(.63)
romodichloromethane	ND	ND	ND	ND	ND
prodibromomethane	ND	6.11	<1(.38)	ND	ND
omoform	ND	ND	ND	ND	ND
,2-Dichloroethane	<1(.78)	3.80	6.98	<1(.63)	<1(.57)
richloroethylene	4.27	20.64	17.05	2.35	9.78
trachloroethylene	<1(.36)	4.70	3.83	<1(.51)	<1(.70)
rbontetrachloride	ND	<1(.25)	<1(.48)	<1(.95)	ND
knowns as chloroform tention Time (Min.)					
10.48 - 10.60	--	<1(.44)	<1(.84)	<1(.29)	--
11.26 - 11.35	--	10.16	1.79	--	--
15.95	1.18	--	--	--	<1(.87)

N.F.

ATTACHMENT CC 34

BSDW
0408 001

ENTERED
MAY 2 - 1986
NJ DEP Bureau of Potable Water

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

May 27, 1986

Bureau of Safe Drinking Water
Division of Water Resources
NJDEP
CN 029
Trenton, NJ 08625

Gentlemen,

Here are the lab results for the April volatile organic scans for the Parkside and Puchack plants. These are submitted as per your letter of January 7.

Note that where a "K" appears in the "remarks" column, the substance listed was not detected.

This table summarizes the results of the April 10 sampling:

Concentration (PPB) of Listed Substances,
Sample of April 10, 1986

	Parkside	Puchack	Level III
1,1 Dichloroethane	1.0	ND	unlisted
1,2 Dichloroethane	5.0 - II	ND	7<C<70
Trichloroethylene	5.0 - II	2.0 - I	30<C<309

The original lab report is available at Rossnagel & Associates. If you have any questions concerning these results, contact them or me.

Sincerely,

Frank Al-Greene
Administrative Analyst

RECEIVED
MAY 30 1986
N.J. State Dept. of Environmental Protection
BUREAU OF POTABLE WATER

ATTACHMENT DD

N. C. Associate Firm
Analytical Testing Consultants
506 Broad Street
Kannapolis, N. C. 28081
(704) 932-3193

ROSSNAGEL & ASSOCIATES INC

Engineering & Testing Consultants
234 RT. 70
MEDFORD, N. J. 08055
(609) 654-1441

R.C.R.A. - RESOURCE CONSERVATION & RECOVERY ACT

E.C.R.A. - ENVIRONMENTAL CLEANUP RESPONSIBILITY ACT

AIR - WATER - ENERGY - INDUSTRIAL HYGIENE - NOISE - WASTE

- STACK & EXHAUST TESTING
- DESIGN OF AIR/WATER/NOISE POLLUTION CONTROL SYSTEMS
- BACTERIA / MOLD / FUNGUS / SPORES
- SPECIFICATIONS / DRAWINGS
- WATER / WASTEWATER / SLUDGE
- CHEMICAL ANALYSES
- GAS CHROMATOGRAPHY, I.R. & A.A.
- ENVIRONMENTAL IMPACT STUDIES

TEST REPORT # 24,353

May 23, 1986

Lab Report # 21,101

City of Camden
Department of Utilities
City Hall, Room 419A
Sixth & Market Streets
Camden, NJ 08101

Attention: Mr. Frank Al-Greene

The results are listed on the following pages of the analyses performed on the water samples from the Parkside and Puchack Plants obtained by ROSSNAGEL & ASSOCIATES on Apr. 10, 1986.

If you have any questions, please do not hesitate to contact us.

John M. Rissel
Lab Manager
ROSSNAGEL & ASSOCIATES

JMR/klw
cc: WBR

Notes: 1) All procedures used may be found in "Standard Methods for the Examination of Water and Wastewater," 14th Edition.

2) The liability of ROSSNAGEL & ASSOCIATES and its divisions, with respect to the services charged for herein, shall in no event exceed the amount of the invoice.

RECEIVED
MAY 30 1986
N.J. State Dept. of Environmental Protection
BUREAU OF POTABLE WATER

Form #RA-898

ATTACHMENT DDA

16

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: CITY OF CAMDEN - PARKSIDE PLANT — SW ID NO.

LAB NAME: ROSSNAGEL & ASSOC

T (1)	NJPDES NO. NJ (2–8)	WELL PERMIT NO. (9–16)	SAMPLE DATE YR. MO. DAY (17–22)	NJ LAB CERT. NO. (23–27)	WQM USE (28)
			8 6 0 4 1 0	0 3 1 1 7	

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 0486 (MO. YR.) TO 0486 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
			X									Acrylonitrile	UG/L	34215	50.	K
			X									Benzene	UG/L	34030	1.0	K
			X									Bromoform	UG/L	32104	1.0	K
			X									Carbon Tetrachloride	UG/L	32102	1.0	K
			X									Chlorobenzene	UG/L	34301	1.0	K
			X									Chlorodibromoethane	UG/L	34306	1.0	K
			X									Chloroform	UG/L	32106	1.0	K
			X									1, 1 - Dichloroethane	UG/L	34496	1.0	
			X									1, 2 - Dichloroethane	UG/L	34531	5.0	
			X									1, 1 - Dichloroethylene	UG/L	34501	1.0	K
			X									1, 2 - Dichloropropane	UG/L	34541	1.0	K
			X									Ethylbenzene	UG/L	34371	1.0	K
			X									Methylene Chloride	UG/L	34423	6.0	K
			X									1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
			X									Tetrachloroethylene	UG/L	34475	1.0	K
			X									Toluene	UG/L	34012	1.0	K
			X									1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
			X									1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
			X									Trichloroethylene	UG/L	39180	5.0	
			X									Vinyl Chloride	UG/L	39175	2.0	K
			X									Acrolein	UG/L	34210	50	K
			X									Chloroethane	UG/L	34311	2.0	K
			X									2 - Chloroethylvinyl Ether	UG/L	34576	2.0	K
			X									Dichlorobromomethane	UG/L	32105	1.0	K
			X									1, 3 - Dichloropropylene	UG/L	34699	1.0	K
			X									Methyl Bromide	UG/L	34413	2.0	K
			X									Methyl Chloride	UG/L	34418	1.0	K
			X									1, 2 - trans - Dichloroethylene	UG/L	34546	1.0	K
												1, 2 Dichlorobenzene	UG/L	34536		
												1, 3 Dichlorobenzene	UG/L	34566		
												1, 4 Dichlorobenzene	UG/L	34571		

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 42 55 68 — 33 34 46 47 59 60 72 73 — 40 41 53 54 66 67 79 80

RECEIVED
MAY 30 1996
N.J. State Dept. of Environmental Protection
BUREAU OF POTABLE WATER

ATTACHMENT DD3

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: CITY OF CAMDEN – PUCHACK PLANT SW ID NO.

LAB NAME: ROSSNAGEL + ASSOC

T (1)	NJPDES NO. (2–8)	WELL PERMIT NO. (9–16)	SAMPLE DATE YR. MO. DAY (17–22)	NJ LAB CERT. NO. (23–27)	WQM USE (28)
	NJ		86 04 10	03117	

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 0486 (MO. YR.) TO 0486 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

SAMPLING MONTHS

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
			X									Acrylonitrile	UG/L	34215	50	K
			X									Benzene	UG/L	34030	1.0	K
			X									Bromoform	UG/L	32104	1.0	K
			X									Carbon Tetrachloride	UG/L	32102	1.0	K
			X									Chlorobenzene	UG/L	34301	1.0	K
			X									Chlorodibromoethane	UG/L	34306	1.0	K
			X									Chloroform	UG/L	32106	1.0	K
			X									1, 1 - Dichloroethane	UG/L	34496	1.0	K
			X									1, 2 - Dichloroethane	UG/L	34531	1.0	K
			X									1, 1 - Dichloroethylene	UG/L	34501	1.0	K
			X									1, 2 - Dichloropropane	UG/L	34541	1.0	K
			X									Ethylbenzene	UG/L	34371	1.0	K
			X									Methylene Chloride	UG/L	34423	4.0	K
			X									1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
			X									Tetrachloroethylene	UG/L	34475	1.0	K
			X									Toluene	UG/L	34012	1.0	K
			X									1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
			X									1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
			X									Trichloroethylene	UG/L	39180	2.0	
			X									Vinyl Chloride	UG/L	39175	2.0	K
			X									Acrolein	UG/L	34210	50	K
			X									Chloroethane	UG/L	34311	2.0	K
			X									2 - Chloroethylvinyl Ether	UG/L	34576	2.0	K
			X									Dichlorobromomethane	UG/L	32105	1.0	K
			X									1, 3 - Dichloropropylene	UG/L	34699	1.0	K
			X									Methyl Bromide	UG/L	34413	2.0	K
			X									Methyl Chloride	UG/L	34418	1.0	K
			X									1, 2 - trans - Dichloroethylene	UG/L	34546	1.0	K
												1, 2 Dichlorobenzene	UG/L	34536		
												1, 3 Dichlorobenzene	UG/L	34566		
												1, 4 Dichlorobenzene	UG/L	34571		

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 33 34 40 41
42 46 47 53 54
55 59 60 66 67
68 72 73 79 80

ATTACHMENT DD4

BSDW

ENTERED

MAY 27 1986

NJ DEP Bureau of Potable Water

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

May 5, 1986

Bureau of Safe Drinking Water
Division of Water Resources
NJDEP
CN 029
Trenton, NJ 08625

Gentlemen,

Here are the lab results for the March volatile organic scans for the Parkside and Puchack plants. These are submitted as per your letter of January 7.

Note that where a "K" appears in the "remarks" column, the substance listed was not detected.

This table summarizes the results of the March 26 sampling:

Concentration (PPB) of Listed Substances,
Sample of 3-26-86

	Parkside	Puchack	Level III
1,2 Dichloroethane	8.0	ND	7<C<70
Tetrachloroethylene	12.0	1.0	6.6<C<66
Trichloroethylene	14.0	6.0	30<C<309
1,2-trans-Dichloroethylene	3.0	2.0	148<C<270

The original lab report is available at Rossnagel & Associates. If you have any questions concerning these results, contact them or me.

Sincerely,

Frank Al-Greene
Administrative Analyst

RECEIVED
MAY 09 1986
N.J. State Dept. of Health
BUREAU OF POTABLE WATER

ATTACHMENT DD5

N. C. Associate Firm
Analytical Testing Consultants
506 Broad Street
Kannapolis, N. C. 28081
(704) 932-3193

ROSSNAGEL & ASSOCIATES INC.

Engineering & Testing Consultants
234 RT. 70
MEDFORD, N. J. 08055
(609) 654-1441

R.C.R.A. - RESOURCE CONSERVATION & RECOVERY ACT

E.C.R.A. - ENVIRONMENTAL CLEANUP RESPONSIBILITY ACT

AIR - WATER - ENERGY - INDUSTRIAL HYGIENE - NOISE - WASTE

- STACK & EXHAUST TESTING
- DESIGN OF AIR/WATER/NOISE POLLUTION CONTROL SYSTEMS
- BACTERIA / MOLD / FUNGUS / SPORES
- SPECIFICATIONS / DRAWINGS
- WATER / WASTEWATER / SLUDGE
- CHEMICAL ANALYSES
- GAS CHROMATOGRAPHY, I.R. & A.A.
- ENVIRONMENTAL IMPACT STUDIES

TEST REPORT # 24,093 April 30, 1986

Lab Report # 20,960

City of Camden
Department of Utilities
City Hall, Room 419A
Sixth & Market Streets
Camden, NJ 08101

Attention: Mr. Frank Al-Greene

The results are listed on the following pages of the analyses performed on the water samples from the Parkside and Puchack Plants obtained by ROSSNAGEL & ASSOCIATES on March 26, 1986.

If you have any questions, please do not hesitate to contact us.

John M. Rissel
Lab Manager
ROSSNAGEL & ASSOCIATES

JMR/mb
cc: WBR

Notes: 1) All procedures used may be found in "Standard Methods for the Examination of Water and Wastewater," 14th Edition.

2) The liability of ROSSNAGEL & ASSOCIATES and its divisions, with respect to the services charged for herein, shall in no event exceed the amount of the invoice.

RECEIVED
MAY 09 1986
N.J. State Dept. of Environmental Protection
Bureau of Potable Water

Form #RA-898

ATTACHMENT DD6

rm VWX-016
33

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

LEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME Parkside Plant - City of Camden N.J. SW ID NO.

LAB NAME Rossnagel + Assoc.

T	NJPDES NO.	WELL PERMIT NO.	SAMPLE DATE YR. MO. DAY	NJ LAB CERT. NO.	WQM USE
1	NJ 2–8	9–16	86 03 26 (17–22)	03117 (23–27)	28

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 0386 (MO. YR.) TO 0386 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

ND:K

SAMPLING MONTHS

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
		X										Acrylonitrile	UG/L	34215	50	K
		X										Benzene	UG/L	34030	1	K
		X										Bromoform	UG/L	32104	1	K
		X										Carbon Tetrachloride	UG/L	32102	1	K
		X										Chlorobenzene	UG/L	34301	1	K
		X										Chlorodibromoethane	UG/L	34306	1	K
		X										Chloroform	UG/L	32106	1	K
		X										1, 1 - Dichloroethane	UG/L	34496	1	K
		X										1, 2 - Dichloroethane	UG/L	34531	8.0	
		X										1, 1 - Dichloroethylene	UG/L	34501	1	K
		X										1, 2 - Dichloropropane	UG/L	34541	1	K
		X										Ethylbenzene	UG/L	34371	1	K
		X										Methylene Chloride	UG/L	34423	1	K
		X										1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1	K
		X										Tetrachloroethylene	UG/L	34475	12	
		X										Toluene	UG/L	34012	1	K
		X										1, 1, 1 - Trichloroethane	UG/L	34506	1	K
		X										1, 1, 2 - Trichloroethane	UG/L	34511	1	K
		X										Trichloroethylene	UG/L	39180	14	
		X										Vinyl Chloride	UG/L	39175	2	K
		X										Acrolein	UG/L	34210	50	K
		X										Chloroethane	UG/L	34311	2	K
		X										2 - Chloroethylvinyl Ether	UG/L	34576	2	K
		X										Dichlorobromomethane	UG/L	32105	1	K
		X										1, 3 - Dichloropropylene	UG/L	34699	1	K
		X										Methyl Bromide	UG/L	34413	2	K
		X										Methyl Chloride	UG/L	34418	2	K
		X										1, 2 - trans - Dichloroethylene	UG/L	34546	3.0	
		X										1, 2 Dichlorobenzene	UG/L	34536	1	K
		X										1, 3 Dichlorobenzene	UG/L	34566	1	K
		X										1, 4 Dichlorobenzene	UG/L	34571	1	K

VALUE CODING RULES AND
REMARK CODES ON REVERSE

29 33 34 40 41
42 46 47 53 54
55 59 60 66 67
68 72 73 79 80

ATTACHMENT DD7

rm VWX-016
83

DSDW

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: City of Camden Purchase Plant

SW ID NO.:

LAB NAME: Rosenazel & Assoc

T (1)	NJPDES NO. NJ (2–8)	WELL PERMIT NO. (9–16)	SAMPLE DATE YR. MO. DAY (17–22)	NJ LAB CERT. NO. (23–27)	WQM USE (28)
			8 6 0 3 2 6	0 3 1 1 7	

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 0 3 8 6 (MO. YR.) TO 0 3 8 6 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

ND-K

SAMPLING MONTHS: Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
	X										Acrylonitrile	UG/L	34215	50	K
	X										Benzene	UG/L	34030	1	K
	X										Bromoform	UG/L	32104	1	K
	X										Carbon Tetrachloride	UG/L	32102	1	K
	X										Chlorobenzene	UG/L	34301	1	K
	X										Chlorodibromoethane	UG/L	34306	1	K
	X										Chloroform	UG/L	32106	1	K
	X										1, 1 - Dichloroethane	UG/L	34496	1	K
	X										1, 2 - Dichloroethane	UG/L	34531	1	K
	X										1, 1 - Dichloroethylene	UG/L	34501	1	K
	X										1, 2 - Dichloropropane	UG/L	34541	1	K
	X										Ethylbenzene	UG/L	34371	1	K
	X										Methylene Chloride	UG/L	34423	1	K
	X										1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1	K
	X										Tetrachloroethylene	UG/L	34475	1.0	
	X										Toluene	UG/L	34012	1	K
	X										1, 1, 1 - Trichloroethane	UG/L	34506	1	K
	X										1, 1, 2 - Trichloroethane	UG/L	34511	1	K
	X										Trichloroethylene	UG/L	39180	6.0	
	X										Vinyl Chloride	UG/L	39175	2	K
	X										Acrolein	UG/L	34210	50	K
	X										Chloroethane	UG/L	34311	2	K
	X										2 - Chloroethylvinyl Ether	UG/L	34576	2	K
	X										Dichlorobromomethane	UG/L	32105	1	K
	X										1, 3 - Dichloropropylene	UG/L	34699	1	K
	X										Methyl Bromide	UG/L	34413	2	K
	X										Methyl Chloride	UG/L	34418	2	K
	X										1, 2 - trans - Dichloroethylene	UG/L	34546	2.0	
	X										1, 2 Dichlorobenzene	UG/L	34536	1	K
	X										1, 3 Dichlorobenzene	UG/L	34566	1	K
	X										1, 4 Dichlorobenzene	UG/L	34571	1	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 42 55 68 | 33 34 46 47 59 60 72 73 | 40 41 53 54 66 67 79 80

ATTACHMENT DD

Mr Khan

Jeff Zelikson, Acting Director
Division of Water Resources
John Wilford, Assistant Director
Division of Water Resources

July 14, 1978

Update on Organic Sampling Investigations of the City of Camden Water Dept.

Our recent sampling investigations conducted on 4/20, 4/24, 5/4 and 5/26/78 for the City of Camden ground water sources and distribution system for volatile organics have indicated average levels of trichloroethylene in ppb as follows:

POINTS OF COLLECTION	RAW WATER		1st CONSUMER'S TAP	
	State Lab.	Rutgers Lab.	State Lab.	Rutgers Lab.
Well #5	91.6	66.5	32.5	36.2
Well #11	15	36.2	20	1.2
Well #13	16.5	23.8	5	14.0
Well #16	297	144	80	54.5
Well #17	31.7	29.3	5	14.0
Well #18	27.0	11.8	5	14.0
Puchack Station	7.5	2.4	--	--
Morris Station	5.0	1.0	--	--

The above results indicate comparatively-high levels of trichloroethylene in the raw water from Wells #5 and #16 and at the taps of first consumers of water from these wells, though the latter were considerably lower than the levels in the raw water, presumably as a result of dilution in the mains with water from other wells. All of these results, however, are well below the initial determinations by Rutgers' laboratory showing 1900 ppb and 198 ppb trichloroethylene in Wells #16 and #18 respectively.

There are no established standards that we are aware of for volatile organics, so do not know what should be considered as the safe upper limit, though the proposed M.C.L. of 100 ppb for trihalomethanes in the recent EPA proposed Regulations could, perhaps, be used as a guide.

Camden is not well-endowed with prime source capacity, so the loss of Well #5 and #16 would significantly impair their ability to meet their normal water demands. Because of the mixture of the water from these wells with other waters and the high summer demands that are presently occurring, we are hesitant to order their removal from service at this time. If the present levels of trichloroethylene continue on the basis of additional samples to be collected, we should consider the removal of at least well #16 from service, or permit its use only for meeting peak or emergency demands.

In a letter dated June 23, 1978, Camden has been asked to monitor wells #5, #16, #17 and #18 for selected organics once a week. They are also being monitored twice monthly by the Bureau of Potable Water. These samples will provide information on the tread, to determine whether the presence of

ATTACHMENT EE

trichloroethylene is constant, occasional, or increasing or declining. There is a growing suspicion that trichloroethylene may be ubiquitous in many of the groundwaters of the State which, if correct, would make it impossible to undertake wholesale removal of affected wells from service. Accordingly, a number of selected water supplies throughout the State are being sampled for 8 significant volatile organics, and we are awaiting receipt of these results for comparison with those obtained from Camden before we make a definite decision.

John Wilford, P.E.
Assistant Director
Division of Water Resources

ATTACHMENT EE2

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Parkside #8092906 ppb	
EPA Method 601/602: (ug/l)		
Chlorobenzene (601/602)	<1.0	
Carbon tetrachloride (601)	<1.0	
Chloroform (601)	<1.0	
1,1-Dichloroethylene (601)	<1.0	
1,2-Dichlorobenzene (602)	<1.0	
Toluene (602)	<1.0	
Dibromochloromethane (601)	<1.0	
Bromodichloromethane (601)	<1.0	
Bromoform (601)	<1.0	
1,1,2,2-Tetrachloroethane (601)	<1.0	
1,3-Dichlorobenzene (602)	<1.0	
Benzene (602)	<1.0	
1,1,1-Trichloroethane (601)	<1.0	
Methylene chloride (601) (Dichloromethane)	<1.0	
trans-1,2-Dichloroethylene (601)	3.7	MM
1,4-Dichlorobenzene (602)	<1.0	
Tetrachloroethylene (601)	1.1	BB
Ethylbenzene (602)	<1.0	
Trichloroethylene (601)	4.6	AA
1,2-Dichloroethane (601)	6.3	EE
1,1,2-Trichloroethane (601)	<1.0	

Date: Nov. 3 1988

Signed: HBuff Jr
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF1

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Puchack #8092905 ppb
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	2.3 BB
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	1.6 AA
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: [signature]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF2

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #810280772A
December 1, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.
Morris-Delair Water Treatment Plt.
8900 Zimmerman Avenue
Pennsauken, NJ 08110

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent
City Hall
Camden, NJ 08101

P.O. #1747

Copy to: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

Sample Designation: Sampling Date - 10/28/88
#8102803 - Water/Parkside
#8102804 - Water/Puchack
#8102805 - Water/Well #13 Morris-Delair

Parameter	Parkside #8102803	Puchak #8102804	Well #13 #8102805
	ppb		
EPA Method 601/602: (ug/l)			
Chlorobenzene	<1.0	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0	<1.0
Chloroform	19 RR	31 RR	<1.0
1,1-Dichloroethylene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
Benzene	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<1.0	<1.0
Methylene chloride (Dichloromethane)	<1.0	<1.0	<1.0
trans-1,2-Dichloroethylene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0
Tetrachloroethylene	16 BB	5.8 BB	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
Trichloroethylene	66 AA	27 AA	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0

JAN 3 1989

Date December 1, 1988 Signed: Sherree A Baker
Laboratory Director/Manager

ATTACHMENT FF3

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Tr.Pl.Eff. #8092903
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: H Bi[illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF4

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #13 #8092904
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: HBurg
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF5

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771
August 8, 1988

CITY OF CAMDEN 0408001
Dept. of Utilities
Attn.: Edward Papale, Supt.
Morris-Delair Water Treatment Plt.
8900 Zimmerman Avenue
Pennsauken, NJ 08110

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent
City Hall
Camden, NJ 08101

P.O. #1747

Copy to: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

Sample Designation: Sampling Date - 7/18/88
#8071801 - Water/Well #13
#8071802 - Water/Parkside
#8071803 - Water/Puchack

Parameter	Well #13 #8071801
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1

Date: Aug 8 1988

Signed: [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF6

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent Sample Date: 7/18/88
CITY OF CAMDEN, Dept. of Utilities

Inv. & Copy to: Frank Al-Greene

Parameter	Well #13 #8071801
EPA Method 601/602 cont.: (ug/l)	
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	<1
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	<1
Ethylbenzene (602)	<1
Trichloroethylene (601)	<1
1,2-Dichloroethane (601)	<1
1,1,2-Trichloroethane (601)	<1

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1

Date: Aug 8 1988

Signed: [signature]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF7

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	ppb
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	9.4 MM
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	5.2 BB
Ethylbenzene (602)	<1

Date: Aug 8 1988

Signed: HR, SAPC
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF1

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent Sample Date: 7/18/88
CITY OF CAMDEN, Dept. of Utilities

Inv. & Copy to: Frank Al-Greene

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	ppb
Trichloroethylene (601)	23 AA
1,2-Dichloroethane (601)	6.9 EE
1,1,2-Trichloroethane (601)	<1

Parameter	Puchack #8071803
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1

Date: Aug 8 1988 Signed: H Bissey
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF-9

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Puchack #8071803
EPA Method 601/602: (ug/l)	ppb
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	<1
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	<1
Ethylbenzene (602)	<1
Trichloroethylene (601)	<1
1,2-Dichloroethane (601)	<1
1,1,2-Trichloroethane (601)	<1

Date: Aug 8 1988

Signed: H B [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF16

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

Camden City (W)
C4030-1

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.
Morris-Delair Water Treatment Plt.
8900 Zimmerman Avenue
Pennsauken, NJ 08110

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent
City Hall
Camden, NJ 08101

P.O. #1747

Copy to: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

Sample Designation: Water/Sampling Date - 8/26/88

#8082615 - Well #6	#8082622 - Well #1 at Puchak
#8082616 - Well #7	#8082623 - Well #3 at Northfield
#8082617 - Well #8	#8082624 - Well #2 at Delair
#8082618 - Well #10	#8082625 - Well #3 at Delair
#8082619 - Well #11	#8082626 - Well #17 at Parkside
#8082620 - Well #12	#8082627 - Well #18 at Parkside
#8082621 - Well #13	#8082628 - Well #13 at Parkside

Parameter	Well #6 #8082615
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: HB [illegible]
Laboratory Director/Manager

ATTACHMENT FF11

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #7 #8082616
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF12

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #8 #8082617
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF-3

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #10 #8082618
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept 15 1988

Signed: [illegible]
Laboratory Director/Manager

ATTACHMENT FF14

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #11 #8082619
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept 15 1988

Signed: [illegible]
Laboratory Director/Manager

ATTACHMENT FF15

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #12 #8082620
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF16

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #13 #8082621 ppb
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	3.3 JC
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF 17

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #13 at Puchak #8082622
EPA Method 601/602, ug/l:	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	SS 1.8 THM
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	GG 2.4
trans-1,2-Dichloroethylene (601)	MM 3.1
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	AA 3.1
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF.18

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #3 at Northfield #8082623
EPA Method 601/602, ug/l:	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	11.0 JB
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	4.8 JC
Tetrachloroethylene (601)	5.9 BB
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FFA

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #2 at Delair #8082624
EPA Method 601/602, ug;l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept 15 1988 Signed: [illegible]

ATTACHMENT FF20

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #3 at Delair #8082625
EPA Method 601/602, ug/l:	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	2.4
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: [signature]
Laboratory Director/Manager

ATTACHMENT FF21

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #17 at Parkside #8082626
EPA Method 601/602, ug/l:	ppb
Chlorobenzene (601/602)	II 52.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	23.0 HB
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	SS 23.0 THM
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	2.5 GG
trans-1,2-Dichloroethylene (601)	5.9 MM
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	17.0 AA
1,2-Dichloroethane (601)	6.7 EE
1,1,2-Trichloroethane (601)	<1.0

JAN 3 1989

Date: Sept. 15 1988

Signed: HB Bishop
Laboratory Director/Manager

ATTACHMENT FF 22

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #18 at Parkside #8082627	
EPA Method 601/602, ug/l:		
Chlorobenzene (601/602)	<1.0	
Carbon tetrachloride (601)	<1.0	
Chloroform (601)	<1.0	
1,1-Dichloroethylene (601)	<1.0	
1,2-Dichlorobenzene (602)	<1.0	
Toluene (602)	34.0	FB
Dibromochloromethane (601)	<1.0	
Bromodichloromethane (601)	<1.0	
Bromoform (601)	6.2	SS THM
1,1,2,2-Tetrachloroethane (601)	<1.0	
1,3-Dichlorobenzene (602)	<1.0	
Benzene (602)	<1.0	
1,1,1-Trichloroethane (601)	<1.0	
Methylene chloride (601) (Dichloromethane)	<1.0	
trans-1,2-Dichloroethylene (601)	4.8	MM
1,4-Dichlorobenzene (602)	<1.0	
Tetrachloroethylene (601)	<1.0	
Ethylbenzene (602)	<1.0	
Trichloroethylene (601)	19.0	AA
1,2-Dichloroethane (601)	5.9	FE
1,1,2-Trichloroethane (601)	<1.0	

JAN 3 1989

Date: Sept. 15 1988

Signed: HB
Laboratory Director/Manager

ATTACHMENT FF23

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #808260775A
September 15, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #13 at Parkside #8082628	
EPA Method 601/602, ug/l:		
Chlorobenzene (601/602)	<1.0	
Carbon tetrachloride (601)	<1.0	
Chloroform (601)	2.8	RR
1,1-Dichloroethylene (601)	<1.0	
1,2-Dichlorobenzene (602)	<1.0	
Toluene (602)	230.0	HB
Dibromochloromethane (601)	<1.0	
Bromodichloromethane (601)	<1.0	
Bromoform (601)	7.8	SS THM
1,1,2,2-Tetrachloroethane (601)	<1.0	
1,3-Dichlorobenzene (602)	<1.0	
Benzene (602)	14.0	HH
1,1,1-Trichloroethane (601)	<1.0	
Methylene chloride (601) (Dichloromethane)	<1.0	
trans-1,2-Dichloroethylene (601)	26.0	MM
1,4-Dichlorobenzene (602)	<1.0	
Tetrachloroethylene (601)	<1.0	
Ethylbenzene (602)	<1.0	
Trichloroethylene (601)	130.0	AA
1,2-Dichloroethane (601)	8.3	EE
1,1,2-Trichloroethane (601)	<1.0	

JAN 3 1989

Date: Sept. 15 1988

Signed: HB
Laboratory Director/Manager

ATTACHMENT FF24

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771
August 8, 1988

CITY OF CAMDEN 0408001
Dept. of Utilities
Attn.: Edward Papale, Supt.
Morris-Delair Water Treatment Plt.
8900 Zimmerman Avenue
Pennsauken, NJ 08110

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent
City Hall
Camden, NJ 08101

P.O. #1747

Copy to: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

Sample Designation: Sampling Date - 7/18/88
#8071801 - Water/Well #13
#8071802 - Water/Parkside
#8071803 - Water/Puchack

Parameter	Well #13 #8071801
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1

Date: Aug 8 1988

Signed: [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF25

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Well #13 #8071801
EPA Method 601/602 cont.: (ug/l)	
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	<1
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	<1
Ethylbenzene (602)	<1
Trichloroethylene (601)	<1
1,2-Dichloroethane (601)	<1
1,1,2-Trichloroethane (601)	<1

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1

Date: Aug 8 1988

Signed: [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF26

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	ppb
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	9.4 MM
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	5.2 BB
Ethylbenzene (602)	<1

Date: Aug 8 1988

Signed: HR, SAC
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF27

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Parkside #8071802
EPA Method 601/602: (ug/l)	ppb
Trichloroethylene (601)	23 AA
1,2-Dichloroethane (601)	6.9 EE
1,1,2-Trichloroethane (601)	<1

Parameter	Puchack #8071803
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1
Carbon tetrachloride (601)	<1
Chloroform (601)	<1
1,1-Dichloroethylene (601)	<1
1,2-Dichlorobenzene (602)	<1
Toluene (602)	<1
Dibromochloromethane (601)	<1
Bromodichloromethane (601)	<1
Bromoform (601)	<1
1,1,2,2-Tetrachloroethane (601)	<1

Date: Aug 8 1988

Signed: [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF28

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #807180771A
August 8, 1988

Edward Papale, Superintendent
CITY OF CAMDEN, Dept. of Utilities

Sample Date: 7/18/88

Inv. & Copy to: Frank Al-Greene

Parameter	Puchack #8071803
EPA Method 601/602: (ug/l)	ppb
1,3-Dichlorobenzene (602)	<1
Benzene (602)	<1
1,1,1-Trichloroethane (601)	<1
Methylene chloride (601) (Dichloromethane)	<1
trans-1,2-Dichloroethylene (601)	<1
1,4-Dichlorobenzene (602)	<1
Tetrachloroethylene (601)	<1
Ethylbenzene (602)	<1
Trichloroethylene (601)	<1
1,2-Dichloroethane (601)	<1
1,1,2-Trichloroethane (601)	<1

Date: Aug 8 1988

Signed: HB, Ph.D.
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF29

SE 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Tr.Pl.Eff. #8092903
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: [signature]
Laboratory Director/Manager

IN 3: 1989

ATTACHMENT FF30

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Tr.Pl.Eff. #8092903
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: H Bi[illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF31

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Parkside #8092906 ppb	
EPA Method 601/602: (ug/l)		
Chlorobenzene (601/602)	<1.0	
Carbon tetrachloride (601)	<1.0	
Chloroform (601)	<1.0	
1,1-Dichloroethylene (601)	<1.0	
1,2-Dichlorobenzene (602)	<1.0	
Toluene (602)	<1.0	
Dibromochloromethane (601)	<1.0	
Bromodichloromethane (601)	<1.0	
Bromoform (601)	<1.0	
1,1,2,2-Tetrachloroethane (601)	<1.0	
1,3-Dichlorobenzene (602)	<1.0	
Benzene (602)	<1.0	
1,1,1-Trichloroethane (601)	<1.0	
Methylene chloride (601) (Dichloromethane)	<1.0	
trans-1,2-Dichloroethylene (601)	3.7	MM
1,4-Dichlorobenzene (602)	<1.0	
Tetrachloroethylene (601)	1.1	BB
Ethylbenzene (602)	<1.0	
Trichloroethylene (601)	4.6	AA
1,2-Dichloroethane (601)	6.3	EE
1,1,2-Trichloroethane (601)	<1.0	

Date: Nov. 3 1988

Signed: [signature]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF32

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Puchack #8092905 ppb
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	2.3 BB
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	1.6 AA
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: [signature]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF33

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #810280772A
December 1, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.
Morris-Delair Water Treatment Plt.
8900 Zimmerman Avenue
Pennsauken, NJ 08110

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent
City Hall
Camden, NJ 08101

P.O. #1747

Copy to: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

Sample Designation: Sampling Date - 10/28/88
#8102803 - Water/Parkside
#8102804 - Water/Puchack
#8102805 - Water/Well #13 Morris-Delair

Parameter	Parkside #8102803	Puchak #8102804	Well #13 #8102805
	ppb		
EPA Method 601/602: (ug/l)			
Chlorobenzene	<1.0	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0	<1.0
Chloroform	19 AA	31 AA	<1.0
1,1-Dichloroethylene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
Benzene	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<1.0	<1.0
Methylene chloride (Dichloromethane)	<1.0	<1.0	<1.0
trans-1,2-Dichloroethylene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0
Tetrachloroethylene	16 BB	5.8 BB	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
Trichloroethylene	66 AA	27 AA	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0

JAN 3 1989

Date December 1, 1988 Signed: Sherree A Baker
Laboratory Director/Manager

ATTACHMENT FF34

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Tr.Pl.Eff. #8092903
EPA Method 601/602: (ug/l)	ppb
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: H B [illegible]
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF35

SEPT 29 88

CHEMICAL SAMPLES & ANALYTICAL SVCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT (cont)
CSAS JOB #809290772A
November 3, 1988

CITY OF CAMDEN
Dept. of Utilities
Attn.: Edward Papale, Supt.

Bill to: CITY OF CAMDEN
Richard Felicione
Purchasing Agent

P.O. #1747

Copy to: Frank Al-Greene

Parameter	Well #13 #8092904
EPA Method 601/602: (ug/l)	
Chlorobenzene (601/602)	<1.0
Carbon tetrachloride (601)	<1.0
Chloroform (601)	<1.0
1,1-Dichloroethylene (601)	<1.0
1,2-Dichlorobenzene (602)	<1.0
Toluene (602)	<1.0
Dibromochloromethane (601)	<1.0
Bromodichloromethane (601)	<1.0
Bromoform (601)	<1.0
1,1,2,2-Tetrachloroethane (601)	<1.0
1,3-Dichlorobenzene (602)	<1.0
Benzene (602)	<1.0
1,1,1-Trichloroethane (601)	<1.0
Methylene chloride (601) (Dichloromethane)	<1.0
trans-1,2-Dichloroethylene (601)	<1.0
1,4-Dichlorobenzene (602)	<1.0
Tetrachloroethylene (601)	<1.0
Ethylbenzene (602)	<1.0
Trichloroethylene (601)	<1.0
1,2-Dichloroethane (601)	<1.0
1,1,2-Trichloroethane (601)	<1.0

Date: Nov. 3 1988

Signed: HBurg
Laboratory Director/Manager

JAN 3 1989

ATTACHMENT FF36

C MICAL SAMPLES & ANALYTICA VCS CO
POB 514
THOROFARE, NJ 08086
(609)848-7227
FAX 609-848-9591

LABORATORY ANALYSIS REPORT
CSAS JOB #901120772A
March 22, 1989

CITY OF CAMDEN
Attn.: Frank Al-Greene
Rm. 419A, City Hall
Camden, NJ 08101

P.O. #1741

Sample Designation: Water - Sample Date 1/12/89
#9011207 - Puchack
#9011208 - Parkside
#9011209 - Well #13 Morris-Delair

Parameter	Puchack #9011207	Parkside #9011208	Well #13 #9011209
Volatile Organic Compounds: (EPA Method 601/602), ug/l			
Chlorobenzene	<1.0	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.0	<1.0
1,1-Dichloroethylene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
Benzene	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<1.0	<1.0
Methylene chloride (Dichloromethane)	<1.0	<1.0	<1.0
trans-1,2-Dichloroethylene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0
Tetrachloroethylene	2.0	23.0	5.0
Ethylbenzene	<1.0	<1.0	<1.0
Trichloroethylene	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0

Date: March 22, 1989

Signed: [illegible]
Laboratory Director/Manager

ATTACHMENT FF37

BSDW

0408001

05-30-1986
Monthly Monitoring

RECEIVED
JUN 30 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

ENTERED
JUN 30 1986
NJ DEP Bureau of Potable Water

June 24, 1986

Bureau of Safe Drinking Water
Division of Water Resources
NJDEP
CN 029
Trenton, NJ 08625

Gentlemen,

Here are the lab results for the May volatile organic scans for our Prakside and Puchack plants. These are submitted as per your letter of January 7.

Note that where a "K" appears in the "remarks" column, the substance listed was not detected. Puchack shows all K's.

This table summarizes the results of the May 30 sampling:

Parkside
Concentration (PPB) of Listed Substances,
Sample of May 30, 1986

BB	Tetrachloroethylene	8.0	III	(Level III, 6.6<C<66 PPB)
AA	Trichloroethylene	14.0	II	(Level II, 3.1<C<30 PPB)

The original lab report is available at Northeastern Analytical Corporation. If you have any questions concerning these results, contact them or me.

Sincerely,

Frank Al-Greene
Administrative Analyst

ATTACHMENT 66

Form VWX-016
4/83

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

RECEIVED
JUN 30 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: CITY OF CAMDEN Parkside

SW ID NO.:

LAB NAME: NORTHEASTERN ANALYTICAL CORP

T (1)	NJPDES NO. NJ (2–8)	WELL PERMIT NO. (9–16)	SAMPLE DATE YR. MO. DAY (17–22)	NJ LAB CERT. NO. (23–27)	WQM USE (28)
			860530	03117	

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 0586 (MO. YR.) TO 0586 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
Acrylonitrile	UG/L	34215	50	K
Benzene	UG/L	34030	1.0	K
Bromoform	UG/L	32104	1.0	K
Carbon Tetrachloride	UG/L	32102	1.0	K
Chlorobenzene	UG/L	34301	1.0	K
Chlorodibromoethane	UG/L	34306	1.0	K
Chloroform	UG/L	32106	1.0	K
1, 1 - Dichloroethane	UG/L	34496	1.0	K
1, 2 - Dichloroethane	UG/L	34531	1.0	K
1, 1 - Dichloroethylene	UG/L	34501	1.0	K
1, 2 - Dichloropropane	UG/L	34541	1.0	K
Ethylbenzene	UG/L	34371	1.0	K
Methylene Chloride	UG/L	34423	1.0	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
Tetrachloroethylene	UG/L	34475	8.0	
Toluene	UG/L	34012	1.0	K
1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
Trichloroethylene	UG/L	39180	1.4	
Vinyl Chloride	UG/L	39175	2.0	K
Acrolein	UG/L	34210	50	K
Chloroethane	UG/L	34311	2.0	K
2 - Chloroethylvinyl Ether	UG/L	34576	2.0	K
Dichlorobromomethane	UG/L	32105	1.0	K
1, 3 - Dichloropropylene	UG/L	34699	1.0	K
Methyl Bromide	UG/L	34413	2.0	K
Methyl Chloride	UG/L	34418	2.0	K
1, 2 - trans - Dichloroethylene	UG/L	34546	1.0	K
1, 2 Dichlorobenzene	UG/L	34536	1.0	K
1, 3 Dichlorobenzene	UG/L	34566	1.0	K
1, 4 Dichlorobenzene	UG/L	34571	1.0	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 33 34 40 41
42 46 47 53 54
55 59 60 66 67
68 72 73 79 80

ATTACHMENT 662

orm VWX-016
/83

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

RECEIVED
JUN 30 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME CITY OF CAMDEN Puchack — SW ID NO.

LAB NAME NORTHEASTERN ANALYTICAL CORP

T (1)	NJPDES NO. NJ (2–8)	WELL PERMIT NO. (9–16)	SAMPLE DATE YR. MO. DAY (17–22)	NJ LAB CERT. NO. (23–27)	WQM USE (28)
			86 05 30	03117	

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 05 86 (MO. YR.) TO 05 86 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
Acrylonitrile	UG/L	34215	50	K
Benzene	UG/L	34030	1.0	K
Bromoform	UG/L	32104	1.0	K
Carbon Tetrachloride	UG/L	32102	1.0	K
Chlorobenzene	UG/L	34301	1.0	K
Chlorodibromoethane	UG/L	34306	1.0	K
Chloroform	UG/L	32106	1.0	K
1, 1 - Dichloroethane	UG/L	34496	1.0	K
1, 2 - Dichloroethane	UG/L	34531	1.0	K
1, 1 - Dichloroethylene	UG/L	34501	1.0	K
1, 2 - Dichloropropane	UG/L	34541	1.0	K
Ethylbenzene	UG/L	34371	1.0	K
Methylene Chloride	UG/L	34423	1.0	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
Tetrachloroethylene	UG/L	34475	1.0	K
Toluene	UG/L	34012	1.0	K
1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
Trichloroethylene	UG/L	39180	1.0	K
Vinyl Chloride	UG/L	39175	2.0	K
Acrolein	UG/L	34210	50	K
Chloroethane	UG/L	34311	2.0	K
2 - Chloroethylvinyl Ether	UG/L	34576	2.0	K
Dichlorobromomethane	UG/L	32105	1.0	K
1, 3 - Dichloropropylene	UG/L	34699	1.0	K
Methyl Bromide	UG/L	34413	2.0	K
Methyl Chloride	UG/L	34418	2.0	K
1, 2 - trans - Dichloroethylene	UG/L	34546	1.0	K
1, 2 Dichlorobenzene	UG/L	34536	1.0	K
1, 3 Dichlorobenzene	UG/L	34566	1.0	K
1, 4 Dichlorobenzene	UG/L	34571	1.0	K

29 42 55 68 — 33 34 46 47 59 60 72 73 — 40 41 53 54 66 67 79 80

VALUE CODING RULES AND REMARK CODES ON REVERSE

ATTACHMENT GG3

Entered 9/29/86 MO

A-250 MONTHLY

RECEIVED
SEP 5 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

CITY OF CAMDEN
DEPARTMENT OF UTILITIES
City Hall - Room 419A
Sixth and Market Streets
Camden, New Jersey 08101
609-757-7680

FREDERICK HUGH MARTIN, JR.
DIRECTOR

MELVIN R. PRIMAS, JR.
MAYOR

August 28, 1986

Bureau of Safe Drinking Water
Division of Water Resources
NJDEP
CN 029
Trenton, NJ 08625

Gentlemen,

Here are the lab results of the July and August volatile organic scans for our Parkside and Puchack plants. These are submitted as per your letter of January 7.

Note that where a "K" appears in the "remarks" column, the substance listed was not detected. Level II concentrations of the following chemicals were found at the locations and times listed below:

1,2 dichloroethane	Parkside (August)
tetrachloroethylene	Parkside, Puchack (August)
1,2 trans-dichloroethene	Parkside, Puchack (July, August)

The original lab reports are available at Northeastern Analystical. If you have any questions concerning these results, contact them or me.

Sincerely,

Frank Al-Greene

ATTACHMENT 66d

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: CITY OF CAMDEN PARKSIDE — SWID NO.

LAB NAME: NORTHEASTERN ANALYTICAL CORP.

T — NJPDES NO.: NJ — WELL PERMIT NO. — SAMPLE DATE YR. MO. DAY: 86 07 23 — NJ LAB CERT. NO.: 03117 — WQM USE

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 07 86 (MO. YR.) TO 07 86 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

RECEIVED
SEP 5 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS			REMARKS
Acrylonitrile	UG/L	34215	100	K
Benzene	UG/L	34030	10	K
Bromoform	UG/L	32104	10	K
Carbon Tetrachloride	UG/L	32102	10	K
Chlorobenzene	UG/L	34301	10	K
Chlorodibromoethane	UG/L	34306	10	K
Chloroform	UG/L	32106	10	K
1, 1 - Dichloroethane	UG/L	34496	10	K
1, 2 - Dichloroethane	UG/L	34531	10	K
1, 1 - Dichloroethylene	UG/L	34501	10	K
1, 2 - Dichloropropane	UG/L	34541	10	K
Ethylbenzene	UG/L	34371	10	K
Methylene Chloride	UG/L	34423	10	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	10	K
Tetrachloroethylene	UG/L	34475	10	K
Toluene	UG/L	34012	10	K
1, 1, 1 - Trichloroethane	UG/L	34506	10	K
1, 1, 2 - Trichloroethane	UG/L	34511	10	K
Trichloroethylene AA II	UG/L	39180	25	
Vinyl Chloride	UG/L	39175	10	K
Acrolein	UG/L	34210	100	K
Chloroethane	UG/L	34311	10	K
2 - Chloroethylvinyl Ether	UG/L	34576	10	K
Dichlorobromomethane	UG/L	32105	10	K
1, 3 - Dichloropropylene	UG/L	34699	10	K
Methyl Bromide	UG/L	34413	10	K
Methyl Chloride	UG/L	34418	10	K
1, 2 - trans - Dichloroethylene	UG/L	34546	10	K
1, 2 Dichlorobenzene	UG/L	34536	10	K
1, 3 Dichlorobenzene	UG/L	34566	10	K
1, 4 Dichlorobenzene	UG/L	34571	10	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 42 55 68 — 33 34 46 47 59 60 72 73 — 40 41 53 54 66 67 79 80

ATTACHMENT 665

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

RECEIVED
SEP 5 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: CITY OF CAMDEN PUCHACK

LAB NAME: NORTHEASTERN ANALYTICAL CORP

SW ID NO.

T	NJPDES NO.	WELL PERMIT NO.	SAMPLE DATE YR. MO. DAY	NJ LAB CERT. NO.	WQM USE
1	NJ 2–8	9–16	86 07 23 (17–22)	03117 (23–27)	28

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 05-86 (MO. YR.) TO (MO. YR.)

SUBMIT WITH SIGNED T-FWX-014

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
Acrylonitrile	UG/L	34215	100	K
Benzene	UG/L	34030	10	K
Bromoform	UG/L	32104	10	K
Carbon Tetrachloride	UG/L	32102	10	K
Chlorobenzene	UG/L	34301	10	K
Chlorodibromoethane	UG/L	34306	10	K
Chloroform	UG/L	32106	10	K
1, 1 - Dichloroethane	UG/L	34496	10	K
1, 2 - Dichloroethane	UG/L	34531	10	K
1, 1 - Dichloroethylene	UG/L	34501	10	K
1, 2 - Dichloropropane	UG/L	34541	10	K
Ethylbenzene	UG/L	34371	10	K
Methylene Chloride	UG/L	34223	10	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	10	K
Tetrachloroethylene	UG/L	34475	10	K
Toluene	UG/L	34012	10	K
1, 1, 1 - Trichloroethane	UG/L	34506	10	K
1, 1, 2 - Trichloroethane	UG/L	34511	10	K
Trichloroethylene AA II	UG/L	39180	10	
Vinyl Chloride	UG/L	39175	10	K
Acrolein	UG/L	34210	100	K
Chloroethane	UG/L	34311	10	K
2 - Chloroethylvinyl Ether	UG/L	34576	10	K
Dichlorobromomethane	UG/L	32105	10	K
1, 3 - Dichloropropylene	UG/L	34699	10	K
Methyl Bromide	UG/L	34413	10	K
Methyl Chloride	UG/L	34418	10	K
1, 2 - trans - Dichloroethylene	UG/L	34546	10	K
1, 2 Dichlorobenzene	UG/L	34536	10	K
1, 3 Dichlorobenzene	UG/L	34566	10	K
1, 4 Dichlorobenzene	UG/L	34571	10	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 42 55 68 | 33 34 46 47 59 60 72 73 | 40 41 53 54 66 67 79 80

ATTACHMENT 666

6

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

RECEIVED
SEP 5 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME: City of Camden Parkside Plant

SW ID NO.:

LAB NAME: Northeastern Analytical Corp

T	NJPDES NO.	WELL PERMIT NO.	SAMPLE DATE YR. MO. DAY	NJ LAB CERT. NO.	WQM USE
1	NJ 2–8	9–16	860813 (17–22)	03117 (23–27)	28

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 08/86 (MO. YR.) TO 08/86 (MO. YR.)

SUBMIT WITH SIGNED T-FWX-014

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
Acrylonitrile	UG/L	34215	100	K
Benzene	UG/L	34030	1.0	K
Bromoform	UG/L	32104	1.0	K
Carbon Tetrachloride	UG/L	32102	1.0	K
Chlorobenzene	UG/L	34301	1.0	K
Chlorodibromoethane	UG/L	34306	1.0	K
Chloroform	UG/L	32106	1.0	K
1, 1 - Dichloroethane	UG/L	34496	1.0	K
1, 2 - Dichloroethane EE II	UG/L	34531	4.3	
1, 1 - Dichloroethylene	UG/L	34501	1.0	K
1, 2 - Dichloropropane	UG/L	34541	1.0	K
Ethylbenzene	UG/L	34371	1.0	K
Methylene Chloride	UG/L	34423	1.0	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
Tetrachloroethylene BB II	UG/L	34475	5.7	
Toluene	UG/L	34012	1.0	K
1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
Trichloroethylene AA II	UG/L	39180	9.8	
Vinyl Chloride	UG/L	39175	1.0	K
Acrolein	UG/L	34210	100	K
Chloroethane	UG/L	34311	1.0	K
2 - Chloroethylvinyl Ether	UG/L	34576	1.0	K
Dichlorobromomethane	UG/L	32105	1.0	K
1, 3 - Dichloropropylene	UG/L	34699	1.0	K
Methyl Bromide	UG/L	34413	1.0	K
Methyl Chloride	UG/L	34418	1.0	K
1, 2 - trans - Dichloroethylene	UG/L	34546	1.0	K
1, 2 Dichlorobenzene	UG/L	34536	1.0	K
1, 3 Dichlorobenzene	UG/L	34566	1.0	K
1, 4 Dichlorobenzene	UG/L	34571	1.0	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 42 55 68 | 33 34 46 47 59 60 72 73 | 40 41 53 54 66 67 79 80

ATTACHMENT G-7

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
WATER QUALITY MANAGEMENT ELEMENT

RECEIVED
SEP 5 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

GROUND WATER ANALYSIS – VOLATILE ORGANICS REPORT

PLEASE TYPE OR PRINT WITH BALLPOINT PEN

FACILITY NAME City of Camden - Puchack Plant

SW ID NO.

LAB NAME Northeastern Analytical Corp

	NJPDES NO.	WELL PERMIT NO.	SAMPLE DATE YR. MO. DAY	NJ LAB CERT. NO.	WQM USE
T	NJ		86 08 13	03117	
1	2 3	9 10	17 22	23 27	28

THE SCHEDULE INDICATED BELOW IS TO BE OBSERVED FROM 08 86 (MO. YR.) TO 08 86 (MO. YR.)

SUBMIT WITH SIGNED T-VWX-014

SAMPLING MONTHS: Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

ANALYSIS	UNITS	PARAMETER	VALUE	REMARKS
Acrylonitrile	UG/L	34215	1.00	K
Benzene	UG/L	34030	1.0	K
Bromoform	UG/L	32104	1.0	K
Carbon Tetrachloride	UG/L	32102	1.0	K
Chlorobenzene	UG/L	34301	1.0	K
Chlorodibromoethane	UG/L	34306	1.0	K
Chloroform	UG/L	32106	1.0	K
1, 1 - Dichloroethane	UG/L	34496	1.0	K
1, 2 - Dichloroethane	UG/L	34531	1.0	K
1, 1 - Dichloroethylene	UG/L	34501	1.0	K
1, 2 - Dichloropropane	UG/L	34541	1.0	K
Ethylbenzene	UG/L	34371	1.0	K
Methylene Chloride	UG/L	34423	1.0	K
1, 1, 2, 2 - Tetrachloroethane	UG/L	34516	1.0	K
Tetrachloroethylene BB II	UG/L	34475	1.7	
Toluene	UG/L	34012	1.0	K
1, 1, 1 - Trichloroethane	UG/L	34506	1.0	K
1, 1, 2 - Trichloroethane	UG/L	34511	1.0	K
Trichloroethylene AA II	UG/L	39180	4.4	
Vinyl Chloride	UG/L	39175	1.0	K
Acrolein	UG/L	34210	1.00	K
Chloroethane	UG/L	34311	1.0	K
2 - Chloroethylvinyl Ether	UG/L	34576	1.0	K
Dichlorobromomethane	UG/L	32105	1.0	K
1, 3 - Dichloropropylene	UG/L	34699	1.0	K
Methyl Bromide	UG/L	34413	1.0	K
Methyl Chloride	UG/L	34418	1.0	K
1, 2 - trans - Dichloroethylene MMI	UG/L	34546	3.0	
1, 2 Dichlorobenzene	UG/L	34536	1.0	K
1, 3 Dichlorobenzene	UG/L	34566	1.0	K
1, 4 Dichlorobenzene	UG/L	34571	1.0	K

VALUE CODING RULES AND REMARK CODES ON REVERSE

29 33 34 40 41
42 46 47 53 54
55 59 60 66 67
68 72 73 79 80

ATTACHMENT 66B

DEP-016
9/88

#89-357

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15623

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWS ID #0408001

SAMPLING LOCATION: CAMDEN CITY - MORRIS WELLFIELD WELL #4

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
1803728	POTABLE	☐	10-23-89	12:15

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	A DeBonis	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A DeBonis	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS

ACCOUNT NO. ____-____-_____-__

ANALYSES TO BE PERFORMED

NOV 6 1989

I. Organics

- ☑ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☑ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify) MERCURY + CHROMIUM HEX

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
1	1 HP	1020 89	Metals
4	40mL	1011 89	524.2

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
L Brown	A DeBonis	10/23/89	9:30	Sat + 6 pickup
A DeBonis	Nick Tuttle	10/23/89	1635	Transfer to DEQAS
[illegible]	J E Duke	10/24/89	10:30	524.2
L Brown	[illegible]	10/27/89	800	

COPIES: Gold — Sample Receipt Pink — Lab Yellow — Client White — BEL

PAGE

ATTACHMENT HH1

PRIORITY

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15623
FIELD ID#: B03728
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	ND	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	ND	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH2

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15623
SAMPLE TYPE: EMERGENCY
FIELD ID# B03728 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 10/25/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.16	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	ND	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	0.69	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH3

BROMOFORM	ND	24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15623
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	81.60	60%-	140%	

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeC12 ABOVE MDL IN WATER BLANK

ATTACHMENT HH4

DEP-016
9/88

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB CONTROL NO. 15626

Use one form for each sample.

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWSID# 0408001

SAMPLING LOCATION: Camden City / Morris Wellfield - Well #6

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO. DAY YR.)	TIME
B03731	POTABLE	☐	10-23-89	1:15

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	A DeBonis.	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A DeBonis	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS:

ACCOUNT NO.

NOV 6 1989

ANALYSES TO BE PERFORMED

I. Organics

- ☐ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

Reject NSC
OK To Analyze
1 Vial Has Air

V. Other (Specify)
Chromium Hex
Mercury

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[signature]	A DeBonis	10/23/89	9:30	Bottle Pickup
A DeBonis	[signature]	10/23/89	1635	Transfer to DEQAS
[signature]	J E Durkes	10/24	1030	524-2
[signature]	[signature]	10/27	800	[illegible]

COPIES: Gold – Sample Receipt Pink – Lab Yellow – Client White – BEL

PAGE ___

ATTACHMENT HH5

PRIORITY

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15626
FIELD ID#: B03731
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	ND	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	ND	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH6

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15626
SAMPLE TYPE: EMERGENCY
FIELD ID# B03731 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: CB 10/25/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.82	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	0.36	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	0.46	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	BMDL	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	BMDL	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	0.84	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	0.83	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH7

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15626
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	88.20	60%-	140%	

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT HH6

DEP-016
9/88

Emergency Priority

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15746

SAMPLING LOCATION: Morris Well # 7

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO-DAY-YR)	TIME
67823	Potable Water	☒	11-13-89	1045

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
DWM SBRE	Cheryl Bohursik	609 346-8032

REPORT RESULTS TO	NAME & ADDRESS OF UNIT
Mr. Ross	SBRE 20 E Clementon Rd, Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS: Trip Blank # 67827

ACCOUNT NO.

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☒ ~~601, 602~~ B ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. 601 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome Hex

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Size of Container	Batch No. of Containers	DESCRIPTION OF SAMPLE	LAB USE ONLY PRICE LIST
4	40mL	102089	524.2	☐ A
1	Poly	110989	Cr-T Hg	☐ B
1	Poly	110989	Cr-Hex	☐ C
				☐ D
				☐ E
				☐ F
				☐ Other

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	C. Bohursik	11/13/89	1550	Bottle pickup
[illegible]	[illegible]	11/14/89	0920	Transfer to DEPA
[illegible]	[illegible]	11/15/89	[illegible]	[illegible]
[illegible]	[illegible]	11/16/89	1100	524.2

RECEIVED
DEC 07 1989
Dept. Environmental Protection
DWM Enforcement Southern Bureau

ATTACHMENT 4A9

COPIES: Yell. – Remote Receipt Pink – Lab Yellow – Client

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVSION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15746
FIELD ID#: 67823
SAMPLE TYPE: POTABLE

SPIKE LC#: 15436
DUPLICATE LC#: 15436

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH10

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15746
SAMPLE TYPE: EMERGENCY
FIELD ID# 67823 BOHARSIK
ANALYSIS DATE: 11-16,17-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 11/28/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.20	-	8.15
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	ND	0.44	ND
TRANS-1,2-DICHLOROETHENE	0.44	0.20	ND
1,1-DICHLOROETHANE	0.35	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	1.33	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	BMDL	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	0.39	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	0.97	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	0.53	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH11

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	BMDL	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15746
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	82.00	60%-	140%	

COMMENTS: SAMPLE WAS ANALYZED TWICE.

ATTACHMENT HH12

QUANT REPORT

Operator ID: DIERKES
Output File: ^1C746::QT
Data File: >1C746::D2
Name: LC# 15746 REPEAT #2
Misc: 11-17-89 EPA 524.2

Quant Rev: 6 Quant Time: 891117 14:43
Injected at: 891117 14:02
Dilution Factor: 1.00000

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*FLUOROBENZENE-IS		13.30	820	211518	10.00	PPB	97
4)	VINYL CHLORIDE	**A280	3.41	160	240	~~.10~~	~~PPB~~	93
10)	TRANS-1,2-DICHLOROETHENE	**A280	8.79	519	2244	.44	PPB	80
11)	1,1-DICHLOROETHANE		9.68	579	4704	.35	PPB	97
13)	CIS-1,2-DICHLOROETHENE	**A280	10.94	663	2981	1.33	PPB	94
16)	1,1,1-TRICHLOROETHANE	**A280	11.95	730	1410	~~.15~~	~~PPB~~ BMDL	89
21)	TRICHLOROETHENE	**A280	14.06	871	2737	.39	PPB	83
29)	TETRACHLOROETHENE	**A280	17.78	1119	6612	.97	PPB	92
33)	*p-BROMOFLUOROBENZENE-IS		22.15	1411	44475	10.00	PPB	89
34)	CHLOROBENZENE	**A280	19.58	1239	5260	.53	PPB	88
42)	1,2-DICHLOROBENZENE-d4		25.64	1644	32065	8.20	PPB	97
55)	1,4-DICHLOROBENZENE	**A280	24.85	1591	1570	~~.23~~	~~PPB~~ BMDL	97

* Compound is ISTD

assume peaks are real
Joseph E Dierkes
11/17/89
see also >1B746

ATTACHMENT 11H13

DEP-016
10/88

89-351

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15625

Use one form for each sample

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWS ID # 040800

SAMPLING LOCATION: CAMDEN CITY - MORRIS WEIFIELD - WELL # 8

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO. DAY YR.)	TIME
003730	POTABLE	☐	10-23-89	1:00

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
CCSDW	A. DeBonis	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A. DeBonis	401 E. STATE ST.

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS

ACCOUNT NO.

NOV 6 1989

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☒ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☒ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☒ G. Base Neutral/Acid Extractables
- ☒ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☒ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

III. Limited Chemistry

- ☐ A. Total Cyanide ☒ C. Oil and Grease
- ☐ B. Total Phenol ☒ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☒ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☒ D. Reactivity

V. Other (Specify) Chromium Hex, Mercury

No. of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE

LAB USE ONLY
PRICE LIST
☐ A
☐ B
☒ C
☐ D
☐ E
☐ F
☒ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	A. DeBonis	10/23/89	9:30	Bottle Pickup
A. DeBonis	[illegible]	10/23/89	1635	Transfer to DEQAS
[illegible]	[illegible]	10/24/89	1030	524.2
[illegible]	[illegible]	10/27/89	[illegible]	[illegible]

COPIES: Gold — Sample Receipt Pink — Lab Yellow — Client White — BEL

PAGE ___

ATTACHMENT H14

PRIORITY

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15625
FIELD ID#: B03730
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	ND	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	ND	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH15

*** VOLATILE SAMPLE ANALYSIS **

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15625
SAMPLE TYPE: EMERGENCY
FIELD ID# B03730 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 10/25/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	7.54	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	ND	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	0.48	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH16

BROMOFORM	ND	[illegible]4	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15625
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	75.40	60%-	140%	_____

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT HH17

DEP-016 9/88 #07-35.1

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15624

Use one form for each sample

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWS ID # 0408001

SAMPLING LOCATION: CAMDEN CITY ~~Bldg~~ MORRIS WELLFIELD - WELL #10

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
B03729	POTABLE	☐	10-23-89	12:45

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	A DeBonis	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A DeBonis	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS

ACCOUNT NO. ----.----.----

ANALYSES TO BE PERFORMED

NOV 6 1989

I. Organics

- ☐ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify) Chromium Hex & Mercury

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
1	1 liter	102089	Metals
4	40 ml	101789	VOC 524.2

LAB USE ONLY
PRICE LIST
- ☑ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
L Brown	A DeBonis	10/23/89	9:30	Bottles picking
A DeBonis	Nick Tuells	10/23/89	1635	Transfer to DEQAS
A Gingrich	S E Durkes	10/24/89	1030	524.2
L Brown	[illegible]	10/27/89	800	pip

COPIES: Gold – Sample Receipt Pink – Lab Yellow – Client White – BEL

ATTACHMENT HH 18

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

REPORT DATE: 10/31/89

SAMPLE LC#: 15624
FIELD ID#: B03729
SAMPLE TYPE: POTABLE

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	ND	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	ND	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH 19

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15624
SAMPLE TYPE: EMERGENCY
FIELD ID# B03729 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RCB 10/25/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.16	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	ND	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT 11H26

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15624
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	81.60	60%-	140%	_____

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT HH21

DEP-016
9/88

Emergency Priority

Use one form for each sample

N[illegible]ERSEY DEPARTMENT OF ENVIRONMENTAL PRO[illegible]ION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15747

SAMPLING LOCATION: Morris Well # 11

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
67827	Potable Water	☒	11-13-89	1100

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
DWR - SBRE	Cheryl Boharsik	609 346-8032

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
[illegible]	SBRE 20 E Clementon Rd Suite 3015, Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS: Trip Blank # 67827

ACCOUNT NO. ----------

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☒ 501,602 LB ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☒ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome Hex

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
4	40mL	102089	524.2
1	1 Gal	110989	Cr-Tr, Hg
1	1 Gal	110989	Cr-Hx

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	C Boharsik	11/9/89	1100	Bottle Pickup
C Boharsik	[illegible]	11/14/89	0920	Transfer to DEQAS
[illegible]	[illegible]	11/14/89	[illegible]	[illegible]
[illegible]	J E Durkes	11-14-89	1100	524.2

RECEIVED
DEC 07 1989
Dept. Environmental Protection
DWR-Enforcement Southern Bureau

COPIES: Gold – Sample Receipt Pink – Lab Yellow – Client

ATTACHMENT [illegible]

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVSION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15747
FIELD ID#: 67824
SAMPLE TYPE: POTABLE

SPIKE LC#: 15436
DUPLICATE LC#: 15436

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH23

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15747
SAMPLE TYPE: EMERGENCY
FIELD ID# 67824 BOHARSIK
ANALYSIS DATE: 11-14,16-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB
METHOD 524.2
11/28/89

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.23	-	8.80
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	ND
TRANS-1,2-DICHLOROETHENE	0.26	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	BMDL	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	BMDL	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH24

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15747
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	82.30	60%-	140%	_____

COMMENTS: SAMPLE WAS ANALYZED TWICE.
RESULT FOR cis 1,2-DICHLOROETHENE QUALIFIED: CAL CURVE USES SECOND DEGREE FIT RATHER THAN AVERAGE FACTOR.

ATTACHMENT HH25

QUANT REPORT

Operator ID: DIERKES
Output File: ^1B747::QT
Data File: >1B747::D2
Name: LC# 15747 REPEAT
Misc: 11-16-89 RECAL EPA 524.2

Quant Rev: 6
Quant Time: 891117 08:38
Injected at: 891116 19:09
Dilution Factor: 1.00000

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*FLUOROBENZENE-IS		13.31	821	193044	10.00	PPB	95
9)	METHYLENE CHLORIDE	**A280	8.18	479	1461	~~.19~~	~~PPB~~ BMDL	94
10)	TRANS-1,2-DICHLOROETHENE	**A280	8.78	519	1203	.26	PPB ✓	91
13)	CIS-1,2-DICHLOROETHENE	**A280	10.93	662	1119	1.08	PPB ✓ BMDL	71
21)	TRICHLOROETHENE	**A280	14.07	872	620	~~.10~~	~~PPB~~	84
29)	TETRACHLOROETHENE	**A280	17.80	1121	1165	~~.19~~	~~PPB~~ BMDL	92
33)	*p-BROMOFLUOROBENZENE-IS		22.16	1412	48170	10.00	PPB	94
42)	1,2-DICHLOROBENZENE-d4		25.67	1646	34856	8.23	PPB	98

* Compound is ISTD

Joseph E Dierkes
11/14/89

qualified c-12-2ClC_2 =
2nd degree curve
BMDL

ATTACHMENT HH26

DEP-016
9/88

Emergency Priority

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15748

SAMPLING LOCATION: Morris Well # 12

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
67825	Potable Water	☒	11-13-89	1140

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
DWR SBRE	Cheryl Boharsik	609-346-8032

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
[illegible]	SBRE 20 E. Clementon Rd, Suite 301S, Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS: Trip Blank #67827

ACCOUNT NO. ----------

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☒ ~~601,602~~ 28 ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome Hex

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☒ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
4	40 mL	102089	524.2
1	1 Gal	110989	Cr-T, Hg
1	1 Gal	110989	Cr-Hex

LAB USE ONLY
PRICE LIST
☐ A
☐ B
☐ C
☐ D
☐ E
☐ F
☐ Other (Hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	C. Boharsik	11/9/89	1150	Bo + He pickup
[illegible]	[illegible]	11/14/89	0940	Transfer to DEQ
[illegible]	[illegible]	11/14/89	1020	[illegible]
[illegible]	J. E. [illegible]	11-14-89	1100	524.2

RECEIVED
DEC 0 7 1989
Dept. Environmental Protection
DWR-Enforcement Southern Bureau

COPIES: Gold — Sample Receipt

ATTACHMENT HH27

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVSION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15748
FIELD ID#: 67825
SAMPLE TYPE: POTABLE

SPIKE LC#: 15436
DUPLICATE LC#: 15436

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH28

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15748
SAMPLE TYPE: EMERGENCY
FIELD ID# 67825 BOHARSIK
ANALYSIS DATE: 11-14,16-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB
METHOD 524.2
11/28/89

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	9.01	-	8.80
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	ND
TRANS-1,2-DICHLOROETHENE	BMDL	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	BMDL	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH29

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15748
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	90.10	60%-	140%	

COMMENTS: SAMPLE WAS ANALYZED TWICE.
RESULT FOR cis 1,2-DICHLOROETHENE QUALIFIED: CAL CURVE USES SECOND DEGREE FIT RATHER THAN AVERAGE FACTOR.

ATTACHMENT 11H30

QUANT REPORT

Operator ID: DIERKES Quant Rev: 6 Quant Time: 891117 08:41
Output File: ^1B748::QT Injected at: 891116 19:57
Data File: >1B748::D2 Dilution Factor: 1.00000
Name: LC# 15748 REPEAT
Misc: 11-16-89 RECAL EPA 524.2

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*FLUOROBENZENE-IS		13.31	821	210949	10.00	PPB	96
9)	METHYLENE CHLORIDE	**A280	8.18	479	1442	~~.17~~	PPB BMDL	97
10)	TRANS-1,2-DICHLOROETHENE	**A280	8.78	519	930	~~.18~~	PPB BMDL	89
13)	CIS-1,2-DICHLOROETHENE	**A280	10.96	664	779	~~1.81~~	PPB	93
33)	*p-BROMOFLUOROBENZENE-IS		22.16	1412	52053	10.00	PPB	92
42)	1,2-DICHLOROBENZENE-d4		25.67	1646	41252	9.01	PPB	98

* Compound is ISTD

Joseph E Dierkes
11/17/89

qualified peak # 13
2nd degree fit

ATTACHMENT HH31

DEP-016
9/88

Emergency Priority

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15749

SAMPLING LOCATION: Morris Well # 13

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
67826	Potable Water	☒	11-13-89	1120

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
DWR SBRE	Cheryl Boharsik	609 346-8032

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
[illegible]	SBRE 20 E. Clementon Rd, Suite 301S Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS	ACCOUNT NO.
Trip Blank # 67827	

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☒ ~~601,602~~ LB ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome Hex

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
4	40ml	102039	524.2
1	Liter	110989	Cr-T, Hg
1	Liter	110989	Cr-Hex

LAB USE ONLY
PRICE LIST
☐ A
☐ B
☐ C
☐ D
☐ E
☐ F
☐ Other (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	C Boharsik	11/9/89	1150	Bat Ho pickup
[illegible]	L Brown	11/14/89	0930	Transfer to DEQAS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	J E [illegible]	[illegible]	[illegible]	524.2

RECEIVED
DEC 07 1989
Dept. Environmental Protection
DWR-Enforcement Southern Bureau

ATTACHMENT 1/1-32

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVSION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15749
FIELD ID#: 67826
SAMPLE TYPE: POTABLE

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

SPIKE LC#: 15436
DUPLICATE LC#: 15436

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983
FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT HH33

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15749
SAMPLE TYPE: EMERGENCY
FIELD ID# 67826
ANALYSIS DATE: 11-14,16-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 11/28/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.48	-	8.80
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	ND
TRANS-1,2-DICHLOROETHENE	0.27	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	ND	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT HH.34

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15749
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	84.80	60%-	140%	

COMMENTS: SAMPLE WAS ANALYZED TWICE.

QUANT REPORT

Operator ID: DIERKES Quant Rev: 6 Quant Time: 891117 08:43
Output File: ^1B749::QT Injected at: 891116 20:44
Data File: >1B749::D2 Dilution Factor: 1.00000
Name: LC# 15749 REPEAT
Misc: 11-16-89 RECAL EPA 524.2

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*FLUOROBENZENE-IS		13.31	821	217139	10.00	PPB	95
9)	METHYLENE CHLORIDE	**A280	8.17	478	1860	~~.21~~ ~~PPB~~ BMDL		76
10)	TRANS-1,2-DICHLOROETHENE	**A280	8.78	519	1415	.27	PPB	95
33)	*p-BROMOFLUOROBENZENE-IS		22.15	1411	54549	10.00	PPB	88
42)	1,2-DICHLOROBENZENE-d4		25.67	1646	40692	8.48	PPB	98
44)	1,1,2,2-TETRACHLOROETHANE		22.59	1440	171	~~.07~~ ~~PPB~~		85

* Compound is ISTD

Joseph E Dierkes
11/17/89

ATTACHMENT HH36

DEP-016 Emergency Priority
9/88

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15745

SAMPLING LOCATION: Well # 1

SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
Potable Water	☒	11-13-89	1210

PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
Cheryl Boharsik	

NAME & ADDRESS OF UNIT: 20 E Clementon Rd, Suite 301S, Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

Trip Blank # 67827

ACCOUNT NO.

ANALYSES TO BE PERFORMED

I. Organics
- ☒ A. Volatiles (GC) ☒ 601,602 ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Oil/Gas ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics
- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome Hex

III. Limited Chemistry
- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA
- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Type of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
1	[illegible]	102089	524.2
1	[illegible]	110989	Cr-I, Hg
1	[illegible]	110989	Cr-Hex

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	[illegible] Boharsik	11/9/89	1130	Bottle pickup
[illegible]	[illegible]	11/10/89	0920	Transfer to DEQ AS
[illegible]	[illegible]	11/14/89	1020	[illegible]
[illegible]	[illegible]	11-14-89	1100	[illegible]

RECEIVED
DEC 07 1989
Dept. Environmental Protection
DWR-Enforcement Southern Bureau

ATTACHMENT II

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVSION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15745
FIELD ID#: 67822
SAMPLE TYPE: POTABLE

SPIKE LC#: 15436
DUPLICATE LC#: 15436

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT II2

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15745
SAMPLE TYPE: EMERGENCY
FIELD ID# 67822 BOHARSIK
ANALYSIS DATE: 11-14,16-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RCB 11/28/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	9.02	-	8.80
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	ND	0.44	ND
TRANS-1,2-DICHLOROETHENE	BMDL	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	ND	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT II3

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15745
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	90.20	60%-	140%	

COMMENTS: SAMPLE WAS ANALYZED TWICE.

ATTACHMENT II4

QUANT REPORT

Operator ID: DIERKES Quant Rev: 6 Quant Time: 891117 08:32
Output File: ^1B745::QT Injected at: 891116 17:34
Data File: >1B745::D2 Dilution Factor: 1.00000
Name: LC# 15745 REPEAT
Misc: 11-16-89 RECAL EPA 524.2

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*FLUOROBENZENE-IS	13.31	821	229613	10.00	PPB	97
10)	TRANS-1,2-DICHLOROETHENE**A280	8.80	520	1004	~~.18~~	~~PPB~~ BMDL	84
33)	*p-BROMOFLUOROBENZENE-IS	22.17	1412	57938	10.00	PPB	87
42)	1,2-DICHLOROBENZENE-d4	25.67	1646	45965	9.02	PPB	98

* Compound is ISTD

Joseph E Dirkes
11/17/89

ATTACHMENT II5

DEP-016 - Emergency Priority
9/88

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

LAB USE ONLY
LAB CONTROL NO. 15744

SAMPLING LOCATION: Delair #3 Well - Pennsauken Twp - Camden County

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
67827	Potable Water	☒	11-13-89	1220

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
DWR - SBRE	Cheryl Boharsik	(609) 346-8032

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
Ron Rossi	20 E. Clementon Rd Suite 3015, Gibbsboro NJ

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS: Trip Blank #67827

ACCOUNT NO.: ----------

ANALYSES TO BE PERFORMED

I. Organics

- ☒ A. Volatiles (GC) ☒ 601,602 LB ☐ 502.2
- ☐ B. Volatiles (GC/MS) ☐ 624 ☒ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☐ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☒ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☒ D. Metals, Water Pollution, specify: Chrome - Hex

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify)

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
4	40mL	102089	524.2
1	Liter	110989	Cr - T, Hg
1	Liter	110989	Cr - Hex

LAB USE ONLY
PRICE LIST
☐ A
☐ B
☐ C
☐ D
☐ E
☐ F
☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	C Boharsik	11/9/89	1150	Bottle Pickup
[illegible]	L B [illegible]	11/10/89	[illegible]	Transfer to DEQAS
[illegible]	[illegible]	11/14/89	[illegible]	[illegible]
[illegible]	J E Durkes	11-14-89	1100	524.2

RECEIVED
DEC 07 1989
Dept. Environmental Protection
DWR-Enforcement Southern Bureau

COPIES: Gold - Sample Receipt Pink - Lab Yellow - Client White - BEL

ATTACHMENT II 6
PAGE

**********METALS SAMPLE ANALYSES**********
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIROMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15744
FIELD ID#: 67821
SAMPLE TYPE: POTABLE

SPIKE LC#: 15436
DUPLICATE LC#: 15436

REPORT DATE: 11/17/89

ANALYSTS: THOMAS COSTANTINO
NICHOLAS TUMMILLO
DENISE COSTANTINO

SECTION SUPERVISOR

PARAMETER	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF	CONC. ADDED UG/ML	% SPIKE RECOVERY
HEXAVALEN CHROMIUM	ND	0.01	<0.01	ND	NA	1.0	91
TOTAL CHROMIUM	ND	0.05	<0.05	ND	NA	1.0	96
MERCURY	ND	0.001	<0.001	ND	NA	2.0UG/ML	98

METHODS REFENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT II 7

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15744
SAMPLE TYPE: EMERGENCY
FIELD ID# 67821 BOHARSIK
ANALYSIS DATE: 11-14,16-89
REPORT DATE: 11-17-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB
METHOD 524.2
11/28/89

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.71	-	8.80
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	ND	0.22	ND
METHYLENE CHLORIDE	ND	0.44	ND
TRANS-1,2-DICHLOROETHENE	BMDL	0.20	ND
1,1-DICHLOROETHANE	ND	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	BMDL	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	ND	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	ND	0.43	ND
TRICHLOROETHENE	ND	0.25	ND
1,2-DICHLOROPROPANE	ND	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT II 8

BROMOFORM	ND	0.24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15744
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	87.10	60%-	140%	

COMMENTS: SAMPLE WAS ANALYZED TWICE.
RESULT FOR cis 1,2-DICHLOROETHENE QUALIFIED: CAL CURVE USES SECOND DEGREE FIT RATHER THAN AVERAGE FACTOR.

ATTACHMENT IIa

QUANT REPORT

Operator ID: DIERKES
Output File: ^1B744::QT
Data File: >1B744::D2
Name: LC# 15744 REPEAT
Misc: 11-16-89 RECAL EPA 524.2

Quant Rev: 6
Quant Time: 891117 08:29
Injected at: 891116 16:47
Dilution Factor: 1.00000

ID File: ID_VOC::RP
Title: DEQ BOAS VO STANDARDS FOR 524.2 11-16-89 7 PT CURVE CA_ABU
Last Calibration: 891117 08:26

	Compound		R.T.	Scan#	Area	Conc	Units		q
1)	*FLUOROBENZENE-IS		13.32	822	229795	10.00	PPB		97
9)	METHYLENE CHLORIDE	**A280	8.18	479	856	~~.09~~ PPB		BMDL	82
13)	CIS-1,2-DICHLOROETHENE	**A280	10.97	665	890	1.02	PPB	BMDL	85
33)	*p-BROMOFLUOROBENZENE-IS		22.16	1412	55120	10.00	PPB		85
42)	1,2-DICHLOROBENZENE-d4		25.67	1646	42241	8.71	PPB		97

* Compound is ISTD

Joseph E Dirkes 11/17/89

qualified peak #13 BMDL

2nd degree curve

ATTACHMENT II 10

DEP 016
9/88

89-357

Use one form for each sample

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15620

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWSID #0408001

SAMPLING LOCATION: CAMDEN CITY - PUCHACK WELLFIELD - WELL #2

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO. DAY YR.)	TIME
003725	POTABLE	☐	10-23-89	11:15

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	ADEL BONIS	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A. DEL BONIS	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS: NOV 6 1989

ACCOUNT NO.

ANALYSES TO BE PERFORMED

I. Organics

- ☐ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify) MERCURY - CHROMIUM HEX.

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
1	1 LITER	102089	MUNIS
4	40ml	101189	524.2

LAB USE ONLY
PRICE LIST
☐ A
☐ B
☐ C
☐ D
☐ E
☐ F
☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[illegible]	[illegible]	10/23/89	9:30	Bottle Pickup
[illegible]	[illegible]	10/23/89	1635	Transfer to DEQAS
[illegible]	J.E. Durkes	10/24/89	1030	524.2
[illegible]	[illegible]	10/27/89	800	[illegible]

COPIES: Gold — Sample Receipt Pink — Lab Yellow — Client White — BEL

PAGE ___

ATTACHMENT III

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15620
FIELD ID#: B03725
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	BMDL	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	2.62	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT JJ2

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15620
SAMPLE TYPE: EMERGENCY
FIELD ID# B03725 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 10/25/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.27	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	6.92	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	0.81	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	0.78	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	21.21	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	0.74	0.43	ND
TRICHLOROETHENE	75.00	0.25	ND
1,2-DICHLOROPROPANE	0.74	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	BMDL	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	2.16	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	BMDL	0.36	ND
o-XYLENE	BMDL	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT JJ3

BROMOFORM	ND	24	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	0.27	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	BMDL	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15620
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	82.70	60%-	140%	

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT JJ4

DEP 016 9/88 — 4-89-357

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15621

Use one form for each sample

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWSID # 0408001

SAMPLING LOCATION: CAMDEN CITY - PUCHACK WELLFIELD - WELL #3

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
B03726	POTABLE	☐	10-23-89	11:30

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	A DEBONIS	292-5550

SEND RESULTS TO:	NAME & ADDRESS OF UNIT
A DEBONIS	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS

ACCOUNT NO. ____-___-_____-__

ANALYSES TO BE PERFORMED

NOV 6 1989

I. Organics

- ☐ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☐ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base-Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☐ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

V. Other (Specify) MERCURY - CHROMIUM HEX

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
[illegible]	[illegible]	102009	Metals
[illegible]	[illegible]	101189	524.2

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[signature]	[signature]	10/23/89	9:30	Bottle pickup
[signature]	Nick Tunell	10/23/89	1635	Transfer to DEQAS
[signature]	J E Dierkes	10/24/89	1030	524.2
[signature]	[signature]	10/27/89	500	[signature]

COPIES: Gold — Sample Receipt Pink — Lab Yellow — Client White — BEL

PAGE ____

ATTACHMENT J35

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15621
FIELD ID#: B03726
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	BMDL	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	4.18	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT JJ6

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15621
SAMPLE TYPE: EMERGENCY
FIELD ID# B03726 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: KB
METHOD 524.2 10/25/89

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.30	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	7.41	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	0.98	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	0.78	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	20.71	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	1.29	0.43	ND
TRICHLOROETHENE	58.00	0.25	ND
1,2-DICHLOROPROPANE	1.43	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	ND	0.30	ND
TETRACHLOROETHENE	ND	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT JJ7

ROMOFORM	ND	0.[illegible]	ND
ISOPROPYLBENZENE	ND	0.[illegible]	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15621
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	83.00	60%-	140%	_____

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT JJ8

#89-357

DEP-016
9/88

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEQ ANALYTICAL SERVICES
380 SCOTCH ROAD, TRENTON, N.J. 08628

LAB USE ONLY
LAB CONTROL NO. 15622

Use one form for each sample

REQUEST FOR ANALYSIS & CHAIN OF CUSTODY RECORD

PWS ID #0408001

SAMPLING LOCATION: Camden City Pochack Well Field - Well #7

FIELD SAMPLE NO.	SAMPLE TYPE	PRESERVED	COLLECTION DATE (MO DAY YR)	TIME
1503727	POTABLE	☐	10.23.89	11:45

RESPONSIBLE AGENCY	PERSON AUTHORIZED TO REQUEST ANALYSIS	PHONE NO.
BSDW	A DeBonis	542-5550

SEND RESULTS TO	NAME & ADDRESS OF UNIT
A DeBonis	401 E STATE ST

SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS NOTED BELOW.

REMARKS

ACCOUNT NO. ____-____-____-__

NOV 6 1989

ANALYSES TO BE PERFORMED

I. Organics

- ☑ A. Volatiles (GC) ☐ 601,602 ☐ 502.2
- ☑ B. Volatiles (GC/MS) ☐ 624 ☑ 524.2
- ☐ C. Trihalomethanes ☐ (GC)502.2 ☐ (GC/MS)524.2
- ☐ D. Pesticides/PCB's
- ☐ E. PCB's
- ☑ F. Bill 280 ☐ Volatiles ☐ Chlordane & PCB's
- ☐ G. Base Neutral/Acid Extractables
- ☐ H. Pesticides, Drinking Water
- ☐ I. Herbicides, Drinking Water

II. Inorganics

- ☑ A. Metals, Drinking Water ☐ Primary ☐ Secondary
- ☐ B. Metals, Priority Pollutant
- ☐ C. Metals Scan (ICP)
- ☐ D. Metals, Water Pollution, specify: _____

III. Limited Chemistry

- ☐ A. Total Cyanide ☐ C. Oil and Grease
- ☐ B. Total Phenol ☐ D. pH

IV. RCRA

- ☐ A. EP Toxicity ☐ Metals ☐ Pesticides ☐ Herbicides
- ☑ B. Ignitibility
- ☐ C. Corrosivity ☐ pH ☐ Coupon
- ☐ D. Reactivity

V. Other (Specify) Mercury - Chromium Hex

Number of Containers	Size of Containers	Batch No. of Containers	DESCRIPTION OF SAMPLE
2	1 ltr	10 20 M	Metals
4	40 ml	10 11 89	524.2

LAB USE ONLY
PRICE LIST
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ F
- ☐ Other _____ (hours)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
[signature]	A DeBonis	10/23/89	9:30	Bottle pickup
A DeBonis	Nick Tuell	10/23/89	1635	Transfer to DEQAS
[signature]	J E Duske	10/24/89	1030	524.2
L Brown	[signature]	10/27/89	1100	[illegible]

COPIES: Gold — Sample Receipt Pink — Lab Yellow — Client White — BEL

PAGE ____

ATTACHMENT JJg

Priority

****METAL SAMPLE ANALYSES*****

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION AND INORGANIC
ANALYTICAL SERVICES

SAMPLE LC#: 15622
FIELD ID#: B03727
SAMPLE TYPE: POTABLE

REPORT DATE: 10/31/89

ANALYSTS: TOM COSTANTINO
DENISE COSTANTINO
NICK TUMMILLO

SECTION SUPERVISOR:

SPIKE LC#: 15620
DUPLICATE LC#: 15620

PARAMETERS	SAMPLE CONC. UG/ML	MDL (BRIAS) UG/ML	REAGENT BLANK UG/ML	DUPLI-CATE UG/ML	DUPLI-CATE %DIFF.	CONC. ADDED UG/ML	% SPIKE RECOVERY
MERCURY	BMDL	0.001	<0.001	BMDL	NA	2.0UG/L	86
HEXAVALENT CHROMIUM	ND	0.01	<0.01	2.66	0.8	1.0	90

METHODS REFERENCE: EPA 600/4-79-020, REVISED MARCH, 1983 FOR WATER AND WASTEWATER.

EPA FR, OCTOBER 26, 1984 FOR ICP RESULTS.

METHOD DETECTION LIMITS: BRIAS ESTABLISHED AUGUST, 1988.

BMDL = BELOW MINIMUM DETECTABLE LIMIT
NA = NOT APPLICABLE
ND = NONE DETECTED

ATTACHMENT JJ10

*** VOLATILE SAMPLE ANALYSIS ***

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ORGANIC ANALYTICAL SERVICES

SAMPLE LC# 15622
SAMPLE TYPE: EMERGENCY
FIELD ID# B03727 DEBONIS
ANALYSIS DATE: 10-24-89
REPORT DATE: 10-24-89

ANALYST: JOSEPH E. DIERKES
DILUTION FACTOR: 1
REVIEWED BY: RB 11/1/89
METHOD 524.2

VOLATILE ANALYTES	SAMPLE CONC. UG/L	MDL UG/L	METHOD BLANK UG/L
1,2-DICHLOROBENZENE-d4 SUR	8.63	-	8.40
DICHLORODIFLUOROMETHANE	ND	0.40	ND
CHLOROMETHANE	ND	0.93	ND
VINYL CHLORIDE	ND	0.25	ND
BROMOMETHANE	ND	0.32	ND
CHLOROETHANE	ND	0.37	ND
TRICHLOROFLUOROMETHANE	ND	0.25	ND
1,1-DICHLOROETHENE	5.35	0.22	ND
METHYLENE CHLORIDE	BMDL	0.44	0.46
TRANS-1,2-DICHLOROETHENE	ND	0.20	ND
1,1-DICHLOROETHANE	0.52	0.31	ND
2,2-DICHLOROPROPANE	ND	0.34	ND
CIS-1,2-DICHLOROETHENE	1.17	0.39	ND
BROMOCHLOROMETHANE	ND	0.35	ND
CHLOROFORM	ND	0.20	ND
1,1,1-TRICHLOROETHANE	14.77	0.30	ND
CARBON TETRACHLORIDE	ND	0.20	ND
1,1-DICHLOROPROPENE	ND	1.01	ND
BENZENE	ND	0.25	ND
1,2-DICHLOROETHANE	1.33	0.43	ND
TRICHLOROETHENE	88.00	0.25	ND
1,2-DICHLOROPROPANE	0.84	0.34	ND
DIBROMOMETHANE	ND	0.35	ND
BROMODICHLOROMETHANE	ND	0.29	ND
CIS-1,3-DICHLOROPROPENE	ND	0.24	ND
TOLUENE	ND	0.18	ND
TRANS-1,3-DICHLOROPROPENE	ND	0.29	ND
1,1,2-TRICHLOROETHANE	BMDL	0.30	ND
TETRACHLOROETHENE	1.16	0.19	ND
1,3-DICHLOROPROPANE	ND	0.26	ND
DIBROMOCHLOROMETHANE	ND	0.27	ND
1,2-DIBROMOETHANE (EDB)	ND	0.27	ND
CHLOROBENZENE	ND	0.26	ND
1,1,1,2-TETRACHLOROETHANE	ND	0.23	ND
ETHYLBENZENE	ND	0.20	ND
TOTAL m,p-XYLENES	ND	0.36	ND
o-XYLENE	ND	0.22	ND
STYRENE	ND	0.19	ND

ATTACHMENT JJ

BROMOFORM	ND	0	ND
ISOPROPYLBENZENE	ND	0.20	ND
BROMOBENZENE	ND	0.23	ND
1,1,2,2-TETRACHLOROETHANE	ND	0.24	ND
1,2,3-TRICHLOROPROPANE	ND	0.31	ND
n-PROPYLBENZENE	ND	0.24	ND
2-CHLOROTOLUENE	ND	0.27	ND
4-CHLOROTOLUENE	ND	0.19	ND
1,3,5-TRIMETHYLBENZENE	ND	0.20	ND
tert-BUTYLBENZENE	ND	0.23	ND
1,2,4-TRIMETHYLBENZENE	ND	0.20	ND
sec-BUTYLBENZENE	ND	0.23	ND
1,3-DICHLOROBENZENE	ND	0.35	ND
p-ISOPROPYLTOLUENE	ND	0.22	ND
1,4-DICHLOROBENZENE	ND	0.28	ND
1,2-DICHLOROBENZENE	ND	0.31	ND
n-BUTYLBENZENE	ND	0.21	ND
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.74	ND
1,2,4-TRICHLOROBENZENE	ND	0.29	ND
HEXACHLOROBUTADIENE	ND	0.18	ND
NAPHTHALENE	ND	0.27	ND
1,2,3-TRICHLOROBENZENE	ND	0.25	ND

1. REFERENCE METHODS: EPA FEDERAL REGISTER VOL.49,NO.209

2. METHOD DETECTION LIMITS: CALCULATED JUL.89 BY METHOD 524.2

ND=NOT DETECTED
BMDL=CONFIRMED AND BELOW MDL

SAMPLE LC#15622
SURROGATE RECOVERY DATA

ANALYTE	CONC. ADDED UG.	%RECOVERY	CONTROL LIMITS LOWER	UPPER	QUALIFIED
1,2-DICHLOROBENZENE-d4	10.00	86.30	60%-	140%	

COMMENTS: RESULTS QUALIFIED: NO TRIP BLANK WITH SAMPLE SET.
MeCl2 ABOVE MDL IN WATER BLANK

ATTACHMENT JJ12

Pudrack #1

Purveyor: Camden City W.D.
Designated Source: Pudrack Well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
12-13-85	BEL	N.D											V.O. Chemicals
10-20-81	DOH	—											1 unidentified Peak

ATTACHMENT KK1

Purveyor: Camden City W.D.
Designated Source: Puchack Well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-87

Date	Lab	Contaminants (PPb) Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl chloride	1,2 Dichloropropane	Trans-1,2 Dichloroethylene	1,2-Dichloroethane	Chlorobenzene	Remarks
✓ 7-13-82	USGS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
✓ 2-27-87	NAC		2.8			2.5				1.2	1.70	1.20	

ATTACHMENT KK2

Purveyor: Camden City W.D.
Designated Source: Pitchack Well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/5/89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	Chromium Hexavalent										
7-13-82	USGS	< 10	< 1										
1-4-82			5										

ATTACHMENT KK-3

Purveyor: Camden City W.D.
Designated Source: Pulhack Well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	Cr^{+6}	Mercury									
10-2-84	DOH	10	N.D.	0.20									
1-19-82	DOH	N.D.	N.D	–									
1-4-82	DOH	N.D	N.D 5	–									
10-8-81	DOH	N.D.	N.D	–									
8-30-89	DEP	70	30	ND									
7-30-82	USGS	BMDL	BMDL	–									

ATTACHMENT KK-4

Puchack #2

Purveyor: Camden City W.D.
Designated Source: Puchack Well #2

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/5/87

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Dichloroethane	TCE	Toluene	Vinyl chloride	1,2 Dichloro-propane	1,1-Dichloroethane	Trans-1,2-Dichloroethylene	1,2-Dichloroethane	
✓ 9-15-82	USGS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
✓ 2-27-87	NAC		9.5	3.7		40		2.60		3.80	6.50	1.5	Benzene-1.6, chlorobenzene-1.80
✓ 7-21-87	NAC	2.60	9.0			18					3.60		Chlorobenzene-4.40
✓ 3-28-88	NAC	1.9	9.0			22					9.80		Chlorobenzene-3.40

ATTACHMENT KK-5

Purveyor: Camden City W.D.
Designated Source: Pulhack Well #2

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Chlorobenzene	Dichlorodifluoromethane	1,1-Dichloroethane	1,2-Dichloroethane	trans-1,2-Dichloroethylene	1,2-Dichloropropane	Methylene Chloride	PCE	1,1,1-Trichloroethane	TCE	Benzene	
✓ 12-13-85	BEL	3.40 (0.73)	6.67 (1.30)	5.54 (0.38)	1.75 (0.35)	10.8 (0.36)	0.91 (0.44)	1.09 (0.29)	6.68 (0.85)	0.64 (0.53)	21.1 (0.34)	1.31 (0.64)	
X 10-20-81	Dott.	—											1 unidentified Peak.

ATTACHMENT KK-6

Purveyor: Camden City W.D.
Designated Source: Pitchack Well #2

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	Cr^{+6}	Hg									
✓ 10-2-84	DOH	56	54	0.30									
X 1-19-82	DOH	26	interference	–									
✓ 1-4-82	DOH	26	N.D 5	–									
✓ 6-8-81	DOH	49	15	–									
✓ 10-23-89	DEP	–	2620	BMDL									
✓ 9-15-82	USGS	40	3	–									
X													
			L										

ATTACHMENT KK-7

Pulhack #3

Purveyor : Camden City W.D.
Designated Source : Pulhack Well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/87

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	Chromium +6	Hg									
✓ 10/2/84	DOH	155	169	0.80									
✓ 1-19-82	DOH	9	5										
✓ 1-4-82	DOH	14	14										
✓ 10-8-81	DOH	40	31										
10-23-89	DEP	—	4180	BMDL									
✓ 7-27-81	USGS	→	BMDL										

ATTACHMENT KK-8

Purveyor: Camden City W.D.
Designated Source: Puchack Well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Chlorobenzene	Dichloro-difluoromethane	1,1-Dichloro-ethane	1,2-Dichloro-ethane	1-1-Dichloro-ethylene	trans-1,2-Dichloroethylene	1-2-Dichloro-propane	Methylene Chloride	PCE	1,1,1-Trichloro-ethane	TCE	
12-13-85	BEL	1.2 (0.73)	6.67 (1.30)	6.46 (0.38)	2.29 (0.35)	3.75 (0.81)	25.3 (0.36)	0.73 (0.44)	1.01 (0.29)	12 (0.85)	14.8 (0.53)	111 (0.34)	Benzene - 2.79 (0.64)
10-20-81	DOH			10								6	13 unidentified peaks

ATTACHMENT KK-9

Purveyor: Camden City W.D.
Designated Source: Pulhock Well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/5/89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene Chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl Chloride	1,2 Dichloro-propane	trans-1,2-Dichloroethylene			
7-21-80	USGS	<1.0	<1.0	<1.0	—	14	<1.0	—	—				
7-27-81	USGS	<1.0	5	<1.0	—	11	<1.0	—	—				
3-28-88	NAC	1	9.50		16	63				16			

ATTACHMENT KK-10

Pudrick #5

Purveyor: Camden City W.D.
Designated Source: Pudrick Well #5

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr Total	Cr Hex										
1-19-82	DOH	621	594										
1-4-87	DOH	500	472										
10-8-89	DOH	897	757										

ATTACHMENT KK-11

norg

Purveyor: Camden City W.D.
Designated Source: Puchack Well #5

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		TCE											
10-20-81	DOH	56											2 unidentified peaks

ATTACHMENT KK-12

Puchack #7

Purveyor: Camden City W.D.
Designated Source: Puchack Well #7

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	+6 Chromium	Hg									
7-13-82	USGS	10	<1	–									
10-23-89	DEP	–	ND	BMDL									
7-10-75	Camden	–	ND	–									

ATTACHMENT KK-13

Purveyor : Camden City W.D.
Designated Source : Puchack well #7

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl chloride	1,2 Dichloro-propane				
7-13-82	USGS	<1.0	<1.0	<1.0	<1.0	64	<1.0	<1.0	<1.0				

ATTACHMENT KK-14

City Wells

Purveyor: Camden City W.D.
Designated Source: City well # 4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb) Cr^{+6}	Chromium Total											Remarks
✓ 11-4-81	DOH	30												
9-25-80	DOH	1037												
✓ 6-26-80	DOH	2230												
✓ 5-14-80	DOH	1412 1141.2												
— 7-7-77	DOH		N.D											
✓ 6-9-77	DOH	N.D												0 - min
✓ 6-9-77		N.D												10 - min
✓ 6-9-77		N.D												20 - min
✓ 6-9-77		N.D												30 - min
✓ 6-9-77		N.D												40 - min
~~[illegible]~~														
7-15-72			17.0											

ATTACHMENT KK-15

Purveyor: Camden City W.D.
Designated Source: City well #4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		1,2 dichloroethane	Carbon tetrachloride	Tetrachloroethylene PCE	TCE	1,1,2 trichloroethane	1,1,1 trichloroethane	Chloroform	Chlorodibromomethane				
11-4-81	DOH	–	–	60	12								
6-26-80	DOH	3.10		15.60	62.70	12.40	1.40	2.20					
4-3-80	TRI	21.04		6.70	31.41	[illegible]							
5-2-80	TRI	<1		5.86	31.88								
6-3-80	TRI			6.56	28.09			25.81	21.42				

ATTACHMENT KK-16

Purveyor: Camden City W.D.
Designated Source: Park side Well #4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}											
~~12-23-80~~	DOH	1648											

ATTACHMENT KK-17

Purveyor: Camden City W.D.
Designated Source: City Well # 5

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		1,2 dichloro-ethylene	1,1,1 Trichloroethane	Chloroform	PCE	TCE	1,2 dichloro-ethane	1,1 dichloro-ethane	1,1,2 Trichloroethane	Chloroform	Carbon-tetrachloride	Trichloro-benzene	
6-26-80	DoH	8.6	1.10	1.60	3.80	72.50	4.50	3.60					
7-5-79	DoH	N.D											
4-25-79	DoH				26				16				
3-16-79	DoH								37				
2-27-79	DoH								30				
1-31-79	DoH								8	10			
12-15-78	DoH	<10											
10-23-78	DoH				<10	30	<100				<10		
10-4-78	DoH		<10		<10	<10	<100				<10		
9-20-78	DoH		<10		<10	<10	<100				<10	<100	
9-12-78	DoH		<10		<10	<10	<100				<10		
8-21-78	DoH		<10		<10	<10	<100				<10		
12/27/79	TRI				1.01	15.8	2.62			.41			
1-31-90	TRI				1.33	54.8	3.73			ND			
2-29-90	TRI		L		<1	39.44	3.09			5.97			
11-03-90	TRI				2.50	44.66	2.47			5.23			
1-4-90	TRI				1.88	39.19	3.41			<1			

ATTACHMENT KK.16

Purveyor : Camden City W.D.
Designated Source : Parkside Well #5

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}											
12-23-80	DOH	16											

ATTACHMENT KK-19

Surveyor: Camden City W.D.
Designated Source: City Well #5

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE	Carbon tetra chloride	1,2 Dichloro ethane								
✓ 8-25-78	TR+I	21.25	<1	<1	5.66								
✓ 9-1-78	TR+I	21.2	<1	<1	6.6								
✓ 4-20-78	DOH	91.6											
✓ 4-20-78	Rutgers Lab	66.5											

ATTACHMENT KK-80

Purveyor: Camden City W.D.
Designated Source: City well # 10

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-21-87

Date	Lab	Contaminants (PPb)											Remarks
		Total Chromium											
9-26-78	DOH	10											

ATTACHMENT KK-21

Purveyor: Camden City W.D.
Designated Source: Parkside Well #11

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}											
12-23-89	DOH	N.D.											

ATTACHMENT KK-27

Surveyor: Camden City W.D.
Designated Source: City well #11

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-21-89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE	Carbon tetrachloride	1,2 Dichloroethane	1,1,1 trichloroethane	Benzene						
9-20-78	DOH	<10	<10	<10	<100	<10	<100						
4-24-78	DOH	<10											
4-20-78	DOH	15											
	Rutgers	36.2											

ATTACHMENT KK-23

Purveyor: Camden City W.D.
Designated Source: City Well 16

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr											
7-29-80		5											
7-25-80		5											

ATTACHMENT KK-24

Purveyor: Camden City W.D.
Designated Source: City well #16

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-8-89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	1,1,2 Trichloroethane	PCE	Carbon-Tetrachloride	1,2 Dichloro-ethane	1,1,1 Trichloro-ethane	Trichloro-benzene					
7-5-79	DoH	25											
4-25-79	DoH	N.D											
3-16-79	DoH		25										
2-27-79	DoH		40										
1-31-79	DoH		6										
11-30-78	DoH	210		<25	<25	<25	<25						
9-20-78	DoH	<10		<10	<10	<100	<10	<100					
~~9-20-78~~	~~DoH~~	~~45~~		~~<10~~	~~<10~~	~~<100~~	~~<10~~	~~<100~~					
9-12-78	DoH	286		<10	<10	<100	<10						
8-21-78	DoH	270		<10	<10	<100	<10						
8-4-78	DoH	190		<10	<10	<100	<10						
7-21-78	DoH	240		<10	<10	<100	<10						
4-24-78	DoH	500±100		15									
4-20-78	DoH	265		45									0 - minutes (running the well)
4-20-78	DoH	275		45									30 - minutes
4-20-78	DoH	290		41									60 - minutes

ATTACHMENT KK-25

Surveyor: Camden City W.D.
Designated Source: City well #17

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}											
11-4-81	DoH	N.D											

ATTACHMENT KK-26

Purveyor: Camden City W.D.
Designated Source: City well #17

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		1,2 dichloro-ethane	carbon tetra-chloride	PCE	TCE	1,1,1 trichloroethane	Trichloro-benzene						
*11-4-81	DoH	3	0.50	20	41								
9-20-78	DoH	<100	<10	<10	45	<10	<100						

ATTACHMENT KK-27

Parkside

Purveyor: Camden City W.D.
Designated Source: City well #13

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-21-89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE	Carbon-Tetrachloride	1,2 Dichloroethane	1,1,1 Trichloroethane	Trichlorobenzene	Chloroform	toluene				
10-4-78	DOH	<10	<10	<10	<100	<10							
9-20-78	DOH	<10	<10	<10	<100	<10	<100						
4-24-78	DOH	13											
12-26-79	TRI	21.5	3.88		14.2			4.27					
√1-31-80	TRI	39.5	5.55		18.7			4.20					
8-11-80	TRI	29.6	2.40	3.52	20.7			5.09					
√10-3-80	TRI	30.97	4.07	2.69	15.54			3.58					
11-5-81	TRI	32.76	4.92	2.85	16.01			3.56					
√8-26-88	CSAS	130.0	<1	<1	8.3	<1		2.8	230.0				
4-20-78	DOH	16.5											
4-20-78	Rutgers	23.6											

ATTACHMENT KK-28

Purveyor: Camden City W.D.
Designated Source: Parkside Well #13

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr_{Total}	Cr^{+6}										
12-23-80	DOH		N.D.										

ATTACHMENT K-29

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/30/89

Purveyor : Camden City W.D.
Designated Source : Parkside Well #11

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE	carbon tetrachloride	1,2 dichloroethane								
9-8-78	TRI	69.9	15.1	<1	3.1								
9-20-78	TRI	54.4	18.6	<1	1.9								

ATTACHMENT KK-30

Purveyor: Camden City W.D.
Designated Source: Parkside well #17

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-8-89

Date	Lab	Contaminants (PPb)											Remarks
		111 Trichloroethane	TCE	PCE	Carbon-Tetrachloride	1,2 Dichloro-ethane	1,1,2 Trichloroethane	chloroform	chlorobenzene	trans 1,2 Dichloro-ethylene	methylene chloride		
7-5-79	DOH		30	16									
4-25-79	DOH			11			22						
3-16-79	DOH						8						
2-27-79	DOH						6						
1-31-79	DOH	N.D											
12-15-78	DOH	<10											
11-30-78	DOH	<25	40	30	<25	<25							
10-23-78	DOH		45	220	<10	<100	<10						
10-4-78	DOH	<10	<10	<10	<10	<100							
9-12-78	DOH	<10	66	16	<10	<100							
8-21-78	DOH	<10	120	20	<10	<100							
4-24-78	DOH		40	20									
12-26-79	TRI		51.9	18.3		2.29		1.76					
1-30-80	TRI		61.7	27.8		2.39		<1					
2-29-80	TRI		15.22	4.44		1.53		<1					
4-03-80	TRI		41.3	79.17		2.25		—					
8-11-80	TRI		34.2	18.0		2.53		—					

ATTACHMENT KK.3

Purveyor: Camden City W.D.
Designated Source: Parkside Well #17

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		+6 Chromium											
12-23-80	DOH	N.D											
6-9-77	DOH	N.D											Running well for 10 mins

ATTACHMENT KK-32

Surveyor: Camden City W.D.
Designated Source: Parkside Well #1-8

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	Tetrachloroethylene PCE	1,2 dichloro-ethane	chloroform	Bromoform	Toluene	trans-1,2-Dichloro-ethylene					
12/26/79	TRI	6.33	21.30	3.29	7.70								
1/31/80	TRI	8.60	21.8	1.35	<1								
2-29-80	TRI	24.75	15.46	<1	<1								
5-2-80	TRI	11.92	16.33	2.01	<1								
6-3-80	TRI	15.02	17.81	2.33	<1								
11-5-80	TRI	9.12	22.70	2.12	ND								
8-26-88	CSAS	19.0	<1	5.9	<1	6.2	34.0	4.8					
7-26-76	TRI	22.2	22.9	1.2	-	-	-	-					
7-20-71	TRI	20.6	20.0	<1	-	-	-	-					

ATTACHMENT KK-33

Surveyor: Camden City W.D.
Designated Source: Park side well # 18

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-8-89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE	1,1,2 Trichloroethane	1,1,1 Trichloroethane	Carbon-Tetrachloride	1,2 Dichloroethane	Trichlorobenzene					
5-5-79	DoH	8	19										
4-25-79	DoH		10										
3-16-79	DoH			8									
2-27-79	DoH			5									
1-31-79	DoH				7								
12-15-78	DoH	<10											
11-30-78	DoH	<25	<25		<25	<25	<25						
10-23-78	DoH	N.D											
10-4-78	DoH	<10	<10		<10	<10	<100						
9-26-78	DoH	<10	<10		<10	<10	<100	<100					
9-12-78	DoH	<10	<10		<10	<10	<100						
8-21-78	DoH	<10	22		<10	<10	<100						
8-4-78	DoH	<10	<10		<10	<10	<100						
7-21-78	DoH	<10	<10		<10	<10	Broken						
4-24-78	DoH	13	17										
4-20-78	DoH	20	20										0 min - running
4-20-78	DoH	18	22										30 min —
													60 min —

ATTACHMENT KK-34

Purveyor: Camden City W.D.
Designated Source: Parkside Well #18

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}											
12-23-80	DOH	N.D.											
1-21-90		5											

ATTACHMENT KK-35

Surveyor: Camden City W.D.
Designated Source: Morris Well # 13

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	1,4 Dichlorobenzene					
7-27-81	USGS	<1.0	<1.0	<1.0	—	<1.0	<1.0						
2-27-87	NAC	N.D											
3-28-88	NAC	N.D											
4-27-89	NAC	N.D											<1.0
9-29-89	CS&AS Co.	N.D											
10-28-89	"	N.D											
11-30-88	"	N.D											
12-8-88	"	N.D											<1.0
1-12-89	"		5.0										
8-26-88	"	<1	<1	<1	<1	<1	<1	3.3					

ATTACHMENT XK-36

Purveyor: Camden City W.D.
Designated Source: Morris well #13

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		V.O.C	1,2 dichloro-propane										
2-4-81	DOH	—	8.30										

ATTACHMENT KK-37

Purveyor: Camden City W.D.
Designated Source: Morris Well # 12

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene Chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl Chloride	1,2 Dichloro propane				
7-27-81	USGS	<1.0	<1.0	<1.0	—	<1.0	<1.0	—	—				
7-13-82	USGS	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
3-28-89	NAC	N.D.											
8-26-88	CSAS	<1.0	—										

ATTACHMENT KK-38

Need Dates

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 11-29-89

urveyor : Camden City W.D.
esignated Source : Morris Well #12

ate	Lab	Contaminants (PPb)											Remarks
		Chromium Total	+6 Chromium										
7-27-81	USGS	1	<1										
7-13-82	USGS	<10	<1										
[illegible]			5										

ATTACHMENT KK-39

Purveyor: Camden City W.D.
Designated Source: Morris well #12

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/30/89

Date	Lab	Contaminants (PPb)											Remarks
		V.O.C											
2-4-81	DOH	N.D											V.O.C

ATTACHMENT KK-40

Purveyor: Camden City W.D.
Designated Source: Morgan well #11

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12.5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl chloride	1,2 Dichloro propane				
7-12-82	USGS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
3-28-88	NAC	N.D											
8-26-88	CSNS	<1											

ATTACHMENT KK-4

Purveyor: Camden City W.D.
Designated Source: Morris well # 11

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-29-87

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total											
7-12-82	USGS												
6-21-86	DOH	5											

ATTACHMENT KK42

Purveyor: Camden City W.D.
Designated Source: Morris well #10

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene Chloride	PCE	1,1,1 Trichloroethane	TCE	Toluene							
7-21-80	USGS	<1.0	<1.0	<1.0	<1.0	5							
7-27-81	USGS	<1.0	<1.0	<1.0	2	<1.0							
3-28-88	NAC	N.D											
5-26-88	CSAS	<1.0											

ATTACHMENT KK-43

Purveyor: Camden City W.D.
Designated Source: Morris Well #10

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-29-89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	+6 Chromium										
12-21-70	USGS	5	–										
8-[illegible]	CSAS	[illegible]											

ATTACHMENT KK-44

Purveyor: Camden City W.D.
Designated Source: Morris well # 9

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-6-87

Date	Lab	Contaminants (PPb)											Remarks
		1,2-Dichloroethane	PCE	Chlorobenzene									Method 601
2-27-87	NAC	1.20	1.80	1.50									
3-28-86	NAC		2.10										

ATTACHMENT KK-45

Purveyor: Camden City W.D.
Designated Source: Morris well # 8

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/6/89

Date	Lab	Contaminants (PPb)											Remarks
3-28-88	NAC	N.D											V.O. Scan
8-26-86	CSNS	<1											

ATTACHMENT KK-46

Surveyor : Camden City W.D.
Designated Source : Morris Well #8

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
12/13/85	BEL	N.D.											

ATTACHMENT KK-47

Purveyor: Camden City W.D.
Designated Source: Morris Well #7

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-6-89

Date	Lab	Contaminants (PPb)											Remarks
2-27-87	NAC	N.D											V.O. Scan
3-28-88	NAC	N.D											
8-26-91	CSAS	ND <1											

ATTACHMENT KK-4

Purveyor: Camden City W.D.
Designated Source: Morris well # 6

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	TCE	Toluene							
7-22-80	USGS	<1.0	<1.0	<1.0	<1.0	<1.0							
7-27-81	USGS	<1.0	<1.0	<1.0	<1.0	<1.0							
3-28-88	NAC	N.D											
8/26/88	CSAS	ND <1	<1	<1	<1	<1	all	[illegible]					

ATTACHMENT KK-49

Purveyor: Camden City W.D.
Designated Source: Morris Well # M-4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}	Hg.										
5-19-82	DOH	N.D.	0.15										

ATTACHMENT KK-50

Purveyor: Camden City W.D.
Designated Source: Morris well #4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-6-87

Date	Lab	Contaminants (PPb)											Remarks
2-27-87	NAC	N.D											V.O. Scan

ATTACHMENT KK-51

Purveyor : Camden City W.D.
Designated Source : Morris well # M-4

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
5-19-82	DOH	N.D.											V.O.C

ATTACHMENT KK-52

Purveyor: Camden City W.D.
Designated Source: Morris Well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 11-29-89

Date	Lab	Contaminants (PPb)											Remarks
		Chromium Total	+6 Chromium	Hg									
10-16-69	USGS	20	—	—									
7-12-82	"	<10	<1	—									
5-14-82	DOH	—	ND	ND									

ATTACHMENT KK-53

Purveyor: Camden City W.D.
Designated Source: Morris well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/6/89

Date	Lab	Contaminants (PPb)											Remarks
		Chlorobenzene											
8-27-87	NAC	8.2											

ATTACHMENT KK-54

Purveyor: Camden City W.D.
Designated Source: Morris well # 3A

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Benzene	Methylene Chloride	PCE	1,1,1 Trichloroethane	TCE	Toluene	1,1,2-Trichloroethane	Vinyl Chloride	1,2 Dichloro-propane			
✓ 7-22-80	USGS	2											
7-27-81	USGS		<1.0	<1.0	<1.0	3	<1.0						
7-12-82	USGS		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			

ATTACHMENT KK-55

Purveyor: Camden City W.D.
Designated Source: Morris well #M-3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		1,2 Dichloro-ethylene	TCE	Chlorobenzene									
5-19-82	D.O.H.	3.5	1.5	11									V.O.C.

ATTACHMENT VII-56

Purveyor : Camden City W.D.
Designated Source : Morris Well # M-1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr^{+6}	Hg.										
5-19-82	D011	N.D.	N.D										

ATTACHMENT KK-57

Purveyor: Camden City W.D.
Designated Source: Morris well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/6/89

Date	Lab	Contaminants (PPb)											Remarks
		TCE	PCE										
3-28-88	NAC	2.0	3.10										

ATTACHMENT KK-5B

Surveyor : Camden City W.D.
Designated Source : Morris well # M-1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		1,1,1 Trichloroethane											
5/19/82	DOH	1											V.O.C.

ATTACHMENT KK-59

Delair

Surveyor: Camden City W.D.
Designated Source: Delair well #1

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12-5-89

	Date	Lab	Contaminants (PPb)											Remarks
			Methylene chloride	PCE	1,1,1 Trichloroethane	TCE	Toluene	1,1,2-Trichloroethane	Vinyl chloride	1,2 Dichloro propane		Chromium Total	hex Chromium	
Delair Well # 1	7-22-80	USGS	<1.0	<1.0	<1.0	<1.0	<1.0							
	7-27-81	USGS	<1.0	<1.0	<1.0	<1.0	<1.0							
	9-15-82	USGS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<10	<1	
	8-06-86	ESAS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Delair well #2														

ATTACHMENT KK-60

Surveyor : Camden City W.D.
Designated Source : Delair well #2

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 12-5-89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	1,1,2 Trichloroethane	TCE	Toluene	Vinyl chloride	1,2 Dichloro propane		total chromium	hex chromium	
9-15-82	USGS	<1.0	3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		<10	<1	
2-27-87	NAC	N.D											
3-28-88	NAC	N.D											
3-26-89	CSBASCo.	<1											

ATTACHMENT KK-6

Purveyor: Camden City W.D.
Designated Source: Delair well #3

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/5/89

Date	Lab	Contaminants (PPb)											Remarks
		Methylene chloride	PCE	1,1,1 Trichloroethane	TCE	Toluene	1,1,2 Trichloroethane	Vinyl chloride	1,2 Dichloro propane		total chromium	hexavalent chromium	
7-21-80	USGS	<1.0	<1.0	<1.0	14	<1.0							
9-15-82	USGS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		10	<1	
2-27-87	NAC	N.D											
3-28-88	NAC	N.D											
8-26-88	CSRAS Co.	2.40											

ATTACHMENT KK-62

Purveyor: Camden City W.D.
Designated Source: Parkside T.P (Effluent)

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/26/89

Date	Lab	Contaminants (PPb)											Remarks
		Trans-1,2-Dichloroethylene	PCE	TCE	1,1-Dichloro-ethane	Benzene	1,2 Dichloro-ethane	1,1-Dichloro-ethylene	1,2 Dichloro-ethylene	Chlorobenzene	1,1,1 Trichloro-ethane	Chloroform	
5/20/87	D.O.H.	2.8 (2)	6.1 (2.0)	18 (2.0)									
3/6/86	DOH	4.5 (2)	5.2 (2)	22 (2)	3 (2)	2.1 (2.0)	8.9 (2.0)	2 (2)					wells 13 & 18
1-21-85	DOH		7.50	18.30			6.5		3.80				
4-11-85	DOH	N.D											unidentified Peaks - 1
6-26-80	DOH		9.70	26.50	4.0	0.7	7.20	2.2		4.2	1.20	2.4	Methylene chloride - 2.80 Trichloro fluoromethane - 1.8
12/26/79	TRI		6.47	16.0			4.46					0.87	
1-31-80	TRI		9.71	20.00			5.90					1.20	
2-27-80	TRI		8.29	11.26			<1					ND	
7-2-80	TRI		5.66	16.46			7.56					1.13	
3-26-86	R+A	3.0	12.0	14.0			8.0					—	
11-2-80	TRI		3.83	17.05			6.98					1.13	
10-28-86	CSAS	<1	16	66.00			<1					19	
7-16-86	CSAS	9.4	5.2	23.0			6.9						
4-3-85	Campbell Soup		6.45	26.7								8.06	
6-21-85	DOH		7.5	18.3			6.5		3.8				

ATTACHMENT KK-63

Puchack TP

Purveyor: Camden City W.D.
Designated Source: Puchack Run T.P. (Effluent)

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/26/89

Date	Lab	Contaminants (PPb)											Remarks
		Trans-1,2-Dichloroethylene	PCE	TCE	1,2 Dichloro-ethane	1,2 Dichloro-ethylene	1,2 dichloro-propane	ethyl Benzene	1,1,1 Trichloroethane	Chloroform	Methylene chloride	Carbon-tetrachloride	
5/20/89	D.O.H	4.7/2.0	3/2	17/2.0									
3/6/86	D.O.H	2.37/2.0		4.54/2.0									wells # 1,2,3
11/21/85	DOH			8.60	–	2.6							
✓ 6-26-80	DOH		3.10	25.70			1.90	1.50	1.20	1.10	3.20	/	
9-20-78	DOH		<10	<10	<100				<10			<10	Trichlorobenzene <10 u
4-24-78	DOH	N.D											
✓ 1-3-80	TRI		<1	16.20	<1								
– 7-2-10	TRI		1.09	11.92	<1								
4-3-85	Campbell Gang		2.81	20.1						3.56		–	

ATTACHMENT KK-64

Purveyor: Camden City W.D.
Designated Source: Pachack Run T.P (Effluent)

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/27/89

Date	Lab	Contaminants (PPb)											Remarks
		Cr_{Total}	Cr_{+6}	Hg									
2-8-82		18	18	—									
11-1-82		378	203	—									
11-4-82		185	185	—									
7-10-75 ~~[illegible]~~		—	N.D	—									
1-27-12		—	ND	—									

ATTACHMENT KK-65

one of 3

Purveyor: Camden City W.D.
Designated Source: Pennsauken T.P. Effluent

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/5/89

Date	Lab	Contaminants (PPb)											Remarks
		PCE	TCE	1,2-trans Dichloroethylene	trans-1,2-Dichloroethylene	1,1,2,2 Tetrachloro-2 ethylene	Chloroform	1,2-Dichloroethane					
3-26-86	N.A. Rossmael	1.0	6.0	2.0									V.O. Scan
4-10-86	"		2.0										
5-30-86	N.A.C	N.D.											
7-23-86	N.A.C		10										
8-13-86	NAC	1.70	4.40		3.0								
10-21-86	NAC		3.6		2.10	1.50							
10-31-86	NAC	N.D											
1-24-86	NAC						4.50						
12-19-86	NAC	0.54	1.10										
12-31-86	NAC		1.10										
01-22-87	NAC		1.60	1.30									
01-30-87	NAC		1.60		1.30	0.65 J							
2-27-87	NAC	1.1	3.60				1.0	1.60					
4-20-87	NAC		7.0		3.1								
4-30-87	NAC		5.30		13.0								
5-29-87	NAC	1.30	5.20		1.70			1.7					
6-30-87	NAC		6.20										

ATTACHMENT KK-66

Two of 3

Purveyor: Camden City W.D.
Designated Source: Puchack T.P Effluent

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 12/6/89

Date	Lab	Contaminants (PPb)											Remarks
		1,1, Dichloro-ethane	TCE	1,2-Dichloroethane	PCE	1,1,2-Trichloroethane	Dibromo-chloromethane	Methylene chloride	1,1,2,2-Tetrachloro-ethane				
7-31-87	NAC	1.80	4.70										
9-21-87	NAC		3.50										
9-21-87	NAC			2.20	1.70								
10-22-87	NAC		3.60										
10-30-87	NAC		3.6										
12-29-87	NAC		7.0										
1-25-88	NAC		13.0										
1-29-88	NAC		4.10										
3-28-88	NAC		3.70										
4-29-88	CS&ASCo.		<1	3.1		<1							
4-29-88	CS&ASCo.						5.2	2.20					
5-20-88	CS&ASCo		N.D.										
5-20-88	CS&ASCo			3.90									
5-20-89	CS&ASCo						4.7		1.40				
6-17-88	CS&ASCo				5.80								
6-17-88	CS&ASCo		28										
7-17-88	"	N.D											

ATTACHMENT KK-67

Three of Three

Purveyor: Camden City W.D.

Designated Source: Pudhock T. P effluent

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT

Date: 12/8/89

Date	Lab	Contaminants (PPb)											Remarks
		PCE	TCE	Chloroform	Dibromo-chloromethane	Bromo-di chloromethane	1,1,2,2-Tetrachloroethane	1,2-Dichloro-ethane	1,1,1 Trichloroethane				
9-24-88	CS&ASCO	2.30	1.60										
10-28-88	"	5.80	27	31									
11-30-88	"				3.7	4.0	1.40	1.30					
12-8-88	"	N.D											<1.0
1-12-89	"	2.0											
3-3-89	"	5.40	9.90					5.60					
4-11-89	"	N.D											<1.0
5-8-89	"								25				

ATTACHMENT KK-68

Purveyor : Camden City W.D.
Designated Source : Morris-Delair T.P

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 12/8/89

Date	Lab	Contaminants (PPb)											Remarks
1-29-88	CS&ASCo	N.D											V.O. Scan < 1.
			L										

Purveyor : Camden City W.D.
Designated Source : Morris - Delair T.P (Effluent)

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date : 10/27/87

Date	Lab	Contaminants (PPb)											Remarks
		Cr Total	Cr^{+6}										
1-19-82	DOH	N.D	N.D										

ATTACHMENT KK-70

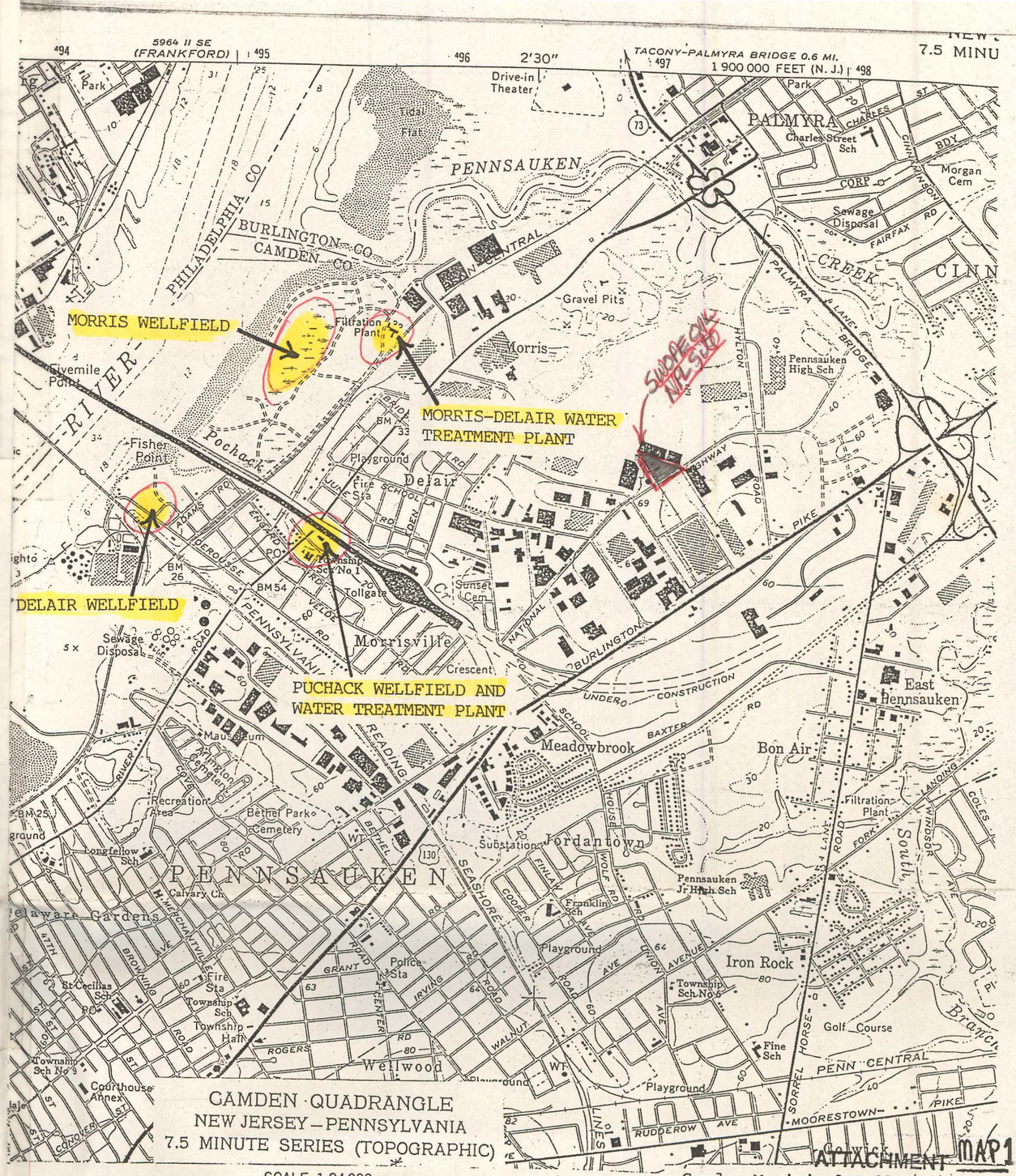
Purveyor: Camden City W.D.
Designated Source: Effluent Morris-Delair T.P.

New Jersey Dept. of Env. Protection
Bureau of Safe Drinking Water
Summary of Raw Water Sample

Prepared By: N. BUTT
Date: 10/28/89

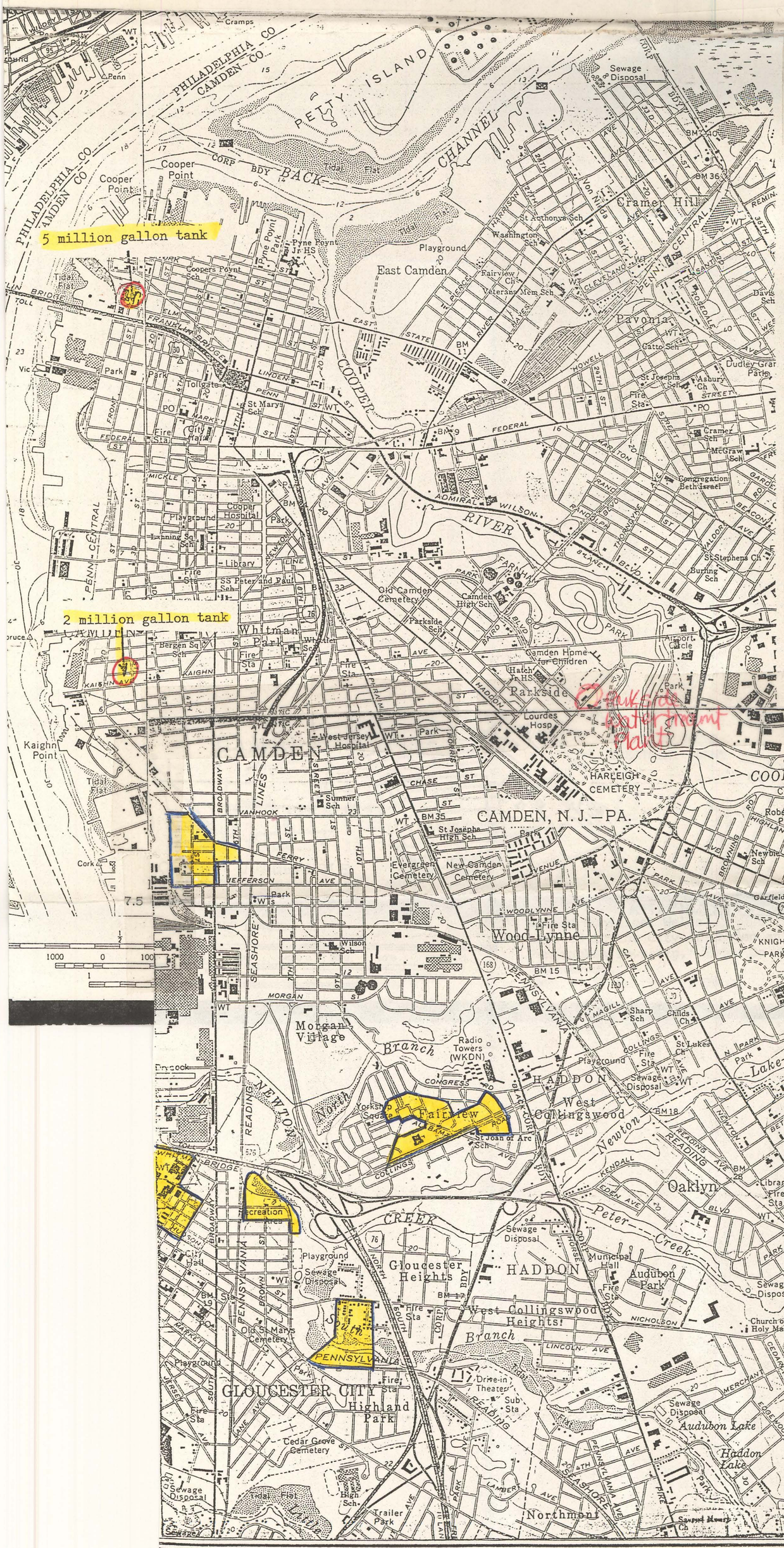
Date	Lab	Contaminants (PPb)											Remarks
		Chloroform	1,1,2-Trichloro-ethane	Chlorobenzene	1,2 dichloropropane	Chloroform	TCE	PCE	Carbon-tetrachloride	1,2 Dichloroethane	1,1,1 trichloroethane	Trichloro-benzene	
5-1-89	DOH	0.57/0.2	0.43/0.30	0.85/0.22									
5-20-87	DOH	3.7/2											
3-6-86	DOH	N.D/2											Wells #1,2,3,6,7,8,9,11,12,13
11-21-89	DOH	N.D.											
6-26-80					2.60	2.20	0.60						
9-20-78	DOH						<10	<10	<10	<100	<10	<100	
4-03-81	TRI	1.20					<1			<1			
7-2-80	TRI	1.60					<1						
6-26-85	DOH						<1	<1		<1			

ATTACHMENT KK-71



Camden Municipal Wells
Located in the City of Camden an
Pennsauken Township, Camden Co.,
New Jersey.
Lat.: 39 59 28 Lon: 75 03 00

ATTACHMENT MAP1



CAMDEN RADIATION SITES
CAMDEN & GLOUCESTER CITIES
USGS TOPOGRAPHIC MAP
MAP 1

Site to be made an alias to the 7 PRPS noted in reference "m". This site is only a "target" - rather than a source. The 7 sites in EPA's site assessment system, once addressed, should take care of this site.