REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
ORANGE COUNTY, NEW YORK

Prepared for

Orange County Water Authority

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Highland Mills, New York

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REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
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INTRODUCTION

The Town of Warwick's municipal water systems include The Village of Warwick Water District, The Village of Florida Water District, the Village of Greenwood Lake Water District and a system of four formerly private community water systems, acquired by the Town. The four districts now owned and operated by the Town are: Eurich Heights Water District, Bellvale Park Water District, Wickham Village Water District and Westside Greenwood Lake Water District. In addition there are several private community water supplies developed within the Town.

EXISTING SURFACE-WATER SUPPLY

The Village of Warwick obtains its water supply from both surface water and ground-water sources. The Village of Florida obtains its water supply from a surface water source only.

Village of Warwick

The Village of Warwick currently operates the Mistucki Brook reservoir system. Water is supplied to the system under normal conditions from 3 reservoirs and stored in one of three storage tanks with the following capacities.

TANK 1 - Highland Avenue
100,000 gal.

TANK 2 - Valley View
500,000 gal.

TANK 3 - Robert Avenue Extension
133,570 gal.

The combined storage capacity of the reservoirs is 66 million gallons. Raw water from the reservoirs is pre-chlorinated and then filtered through two filters capable of supplying 0.864 mgd, combined yield. This is the maximum treatment capacity of the water treatment facility. (Orange County Health Department)

Village of Florida

The Village of Florida withdraws water from Glenmere Lake. Most of the land around Glenmere Lake is owned by Orange County. Watershed rules and regulations enacted in 1986 are applicable to the Glenmere Lake watershed. The storage capacity of the distribution system is 301,700 gallons. Construction of a treatment system that will increase storage capacity of finished water by 100,000 gallons is scheduled to begin in 1994, according to Mr. Jerry McDonald, the Village engineer. Most of the Village water customers are unmetered; however the system is capable of pumping 0.5 mgd. The planned treatment capacity is 0.5 mgd. The treatment processes will include filtration and disinfection. The water supply has been adequate for the service population. (Orange County Health Department)

EXISTING GROUND-WATER SUPPLY
WARWICK TOWN WATER SUPPLY SYSTEMS

The Town of Warwick owns and operates four water districts, which were developed as private community water supplies. These districts service their own areas and are not interconnected for distribution. The four districts are Eurich Heights, Bellvale Park, Wickham Village and Westside Greenwood Lake.

Eurich Heights Water District

In 1962 an independent water district was created to service the newly developed Eurich Heights subdivision. The district was supplied by two drilled wells and a storage tank. In July 1991, following two and a half months of above average usage and below average precipitation, this system could not meet the daily usage demands. The Town took emergency action and installed a new supply well to enhance the total yield capacity of the system. The newly installed Well 3 has remained the primary production well since 1991.

Well Supply In Service

Well 3 (Groundwater Inventory Map ["GIM"], Well WT-14) is the primary producer with an average yield capacity of 15 gpm (0.009 mgd) and a maximum yield capacity of 15 gpm (0.011 mgd). Well 1 (GIM, Well WT-12) has an average yield capacity of 15 gpm

(0.009 mgd). Well 1 is used during peak demand only. Both wells are completed in bedrock. Well data are presented in Tables 1 and 2C.

Well Supply Not in Service

Well 2 (GIM, Well WT-13) was abandoned due to total lack of recovery and interference with Well 1 (Tectonic, 1992).

Bellvale Park Water District

Prior to the Town of Warwick acquiring the Bellvale Park water district, the district operated one well. On acquisition, the Town upgraded the existing well and constructed a second well with a capacity not to exceed 50 gpm. Both are sand and gravel wells. The town owns the property for a 200 foot radius around Wells 1 and 2. The Bellvale Water District does not have adequate storage capacity for fire protection.

Well Supply in Service

Well 1 (GIM, Well WT-15) has an average yield capacity of 20 gpm (0.007 mgd) and a maximum yield capacity of 20 gpm (0.029 mgd). Well 2 (GIM, Well WT-16) has an average yield capacity of 20 gpm (0.007 mgd) and a maximum yield capacity of 20 gpm (0.029 mgd).(Batz, 1993) Well data are presented in Tables 1 and 2D.

Well Supply Not in Service

There are no additional wells either abandoned or not in service. (Hudson, 1985)

Wickham Village Water District

The Wickham Village Water District was developed in the Town of Warwick in the 1950's. Four wells were drilled for a water supply system (GIM, Wells WT-17, WT-18, WT-19, WT-20). All four wells are located within a 100 foot radius. The Wickham Village Water District experienced water shortages in recent years prompting an investigation into a supplemental water supply. A well site was selected, and a test well was constructed 2500 feet away from the original well field. There were no water-level interference effects between TW-1 and the wells in the original well field. The Wickham test well, TW-1 (GIM, Well WT-21) constructed in 1989 is 444 feet deep and finished in bedrock. (Tectonic, 1989)

Well Supply in Service

There is one main supply well, Well TW-1/PW-5 and three supplemental wells (Wells PW-1, PW-2 and PW-3). Well TW-1 (GIM, Well WT-21), constructed in 1989, acts as the primary supply well and has a maximum yield capacity of 70 gpm (0.100 mgd). Well PW-2 (GIM, Well WT-18) has a maximum yield capacity of 10 gpm (0.006 mgd). Well PW-1 (GIM, Well WT-17) has a maximum yield capacity of 70 gpm (0.039 mgd). Wells PW-1, PW-2 and PW-3 are used as standby wells for Well TW-1. Well PW-3 (GIM, Well WT-19) has a maximum yield capacity of 10 gpm (0.006 mgd). Well data are presented in Tables 1 and 2E.

Well Supply Not In Service

Well PW-4 (GIM, Well WT-20) constructed in 1958-60 and finished in bedrock at 265 feet has been abandoned. (Hudson, 1985).

Westside Greenwood Lake

This system consists of an infiltration gallery, two ground-water supply wells and a low level standpipe and two high level standpipes. During winter months the high level tanks are drained and removed from service. The two gravel pack wells appear to be hydraulically connected with Greenwood Lake as indicated by the corresponding decreases in the infiltration rate to the gallery as the lake level is drawn down.

Well Supply in Service

The Westside Greenwood Lake has two wells in service. Well 1 (GIM, Well WT-22) has a maximum yield capacity of 90 gpm (0.129 mgd). Well 2 (GIM, Well WT-23) has a maximum yield capacity of 30 gpm (0.043 mgd). Both wells run simultaneously with a combined maximum yield of 115 gpm (0.166 mgd). Detailed well data are presented on Tables 1 and 2F.

Well Supply Not in Service

There are no additional wells either abandoned or inactive. (Hudson, 1985)

Village of Warwick

The Village of Warwick under normal conditions

obtains its supply from three reservoirs. During occasional peak demands one supply well is put into service.

There are three Village wells (GIM, Wells WT-1, WT-2 and WT-3). The present supply capacities and available well data are presented on Tables 1 and 2A.

Well Supply in Service

Well 2 (GIM, Well WT-2) is a caisson well drilled in the sand and gravel aquifer. During drought periods this well supplements the reservoir system. The maximum yield capacity of Well 2 is 800 gpm (1.15 mgd).

Well Supply Not in Service

Well 1 and Well 3 have been abandoned. Well 1 (GIM, Well WT-1) has mutual interference with Well 2 (GIM, Well WT-2). Well 3 (GIM, Well WT-3) was abandoned due to possible surface water influence. This well is approximately 75 feet from a swamp. (Orange County Health Department).

Village of Greenwood Lake

There are six existing ground-water supply wells in the Village of Greenwood Lake. Mayor Gilbert Shapiro reported there is one production well and a back-up supply well in operation.

Well Supply in Service

Production Well E (GIM, Well WT-10) is the principal supply source. This well was developed in 1992 in the sand and gravel aquifer, and it has a maximum yield capacity of 320 gpm (0.461 mgd). Well 5 (GIM, Well WT-5) is a stand-by well utilized in emergencies and during peak summer demand. This well has a maximum yield capacity of 230 gpm (0.331 mgd).

Well Supply Not in Service

Test wells A, B and C (GIM, Wells WT-7, WT-8, WT-9) have been abandoned. Well 1 (GIM, Well WT-4) was abandoned due to possible surface water influence. (OCHD) Well EW-1 (GIM, Well WT-6) had a decrease in production capabilities. According to the Village Engineer, Mr. Jerry Fine, Well EW-1 will be redeveloped and put back in service in the future.

Proposed Sources

Production Well D (GIM, Well WT-11) is a test well. Available well data are presented on Tables 1 and 2B. This well was also developed in 1992. (Mr. Jerry Fine, with Hudson Engineering verified Well D will be in service in the near future).

EXISTING GROUND-WATER SUPPLY PRIVATE COMMUNITY WATER SYSTEMS

The following are existing community water supply systems in the Town of Warwick.

Blue Lake

Blue Lake is a surface water supply for residential and industrial/commercial use. Blue Lake Reservoir (Sterling Forest Lake) treatment facility has a capacity of 500,000 gallons. (Orange County Health Department) There are three pumps. One pump is used to satisfy the average daily requirements. This has a maximum yield capacity of 375 gpm (0.180 mgd). Two additional pumps capable of 200 gpm each (0.192 mgd) are available but rarely needed (Riley, 1994).

Kings Estates

Kings Estates is a multi-phased development project with a private water system. Phase I construction, which is complete, is 120 units or 30% of maximum capacity.

Well Supply in Service

There are three active wells (Wells TW-1, TW-2 and TW-3). These wells run sequentially but can be run simultaneously. Well TW 1 (GIM, Well WT-24) has a maximum yield capacity of 20 gpm (0.006 mgd). Well TW2 (GIM, Well WT-25) has a maximum yield capacity of 50 gpm (0.015 mgd). Well TW3 (GIM, Well WT-26) has a maximum yield capacity of 40 gpm (0.012 mgd). Well data may be found on Tables 1 and 2G.

Well Supply Not in Service

Well TW7 (GIM, Well WT-27) has a maximum yield capacity of 65 gpm (0.020) The total maximum yield capacity of this system is 175 gpm (0.052 mgd). Well TW7 is a back-up supply well which can be run in conjunction with Wells 1, 2 and 3 without interference (Batz, 1993). Well TW8 (GIM, Well WT-28) has been abandoned. The well data are

presented on Table 1.

Proposed Well Supply Not in Service

Preliminary ground-water investigations on the westerly lands of Kings Estate indicate that wells with a minimum safe yield of 70 gpm may be expected. Three wells to the west with yields of 70, 70 and 25 gpm are planned. An approximate completion date is unknown. (Lawler, Matusky & Skelly, 1987).

Pine Island Water Company

The Pine Island Water Company is a private system. The consumption and production are unmetered. There is a storage capacity of 1,665 gallons. Consumption is estimated at 0.006 mgd.

Well Supply in Service

There are four wells in service. Well 6 (GIM, Well WT-35) is the primary producer. Well 1 (GIM, Well WT-30) and Well 4 (GIM, Well WT-33) and Well 5 (GIM, Well WT-34) are for standby use. All of the wells were drilled in a sand and gravel aquifer. The depth of the wells range from 32 to 66 feet. Available well data are presented on Tables 1 and 2H (Orange County Health Department). No yield capacity information is available.

Well Supply Not in Service

Well 2 (GIM, Well WT-31) and Well 3 (GIM, Well WT-32) have been abandoned (Orange County Health Department).

Mid-Orange Correctional Facility

Mid-Orange Correctional Facility has five existing wells in its water supply system. Maximum daily usage is estimated at 161,000 gallons per day (0.161 mgd). The total maximum yield is 229,800 gallons per day (0.230 mgd).

Well Supply in Service

There are five equipped wells. Caisson Well 1 (GIM, Well WT-34) is the primary supplier. This is a 5 foot diameter caisson well in a sand and gravel bed. It has a maximum yield capacity of 140 gpm (0.101 mgd). Well 5 (GIM, Well WT-39) is utilized during peak summer demand. It has a maximum yield capacity of 250 gpm (0.075 mgd). Wells 1, 2 and 3 have a combined yield of approximately 0.054 mgd. (Nye, 1993). Based on operator information all wells can be pumped simultaneously. Well data are presented on Tables 1 and 2I.

Well Supply Not in Service

There are no additional wells either abandoned or inactive (Nye, 1993).

PROPOSED COMMUNITY WATER SUPPLY SYSTEMS

Centennial Hill Project

The Centennial Hill project is located along Sanfordville and Pelton Roads abutting the Village of Warwick at its western boundary. The owner of Kuperus Farms, which is the proposed development site, has evaluated the water demands and water supplies for the project. The firm of Lawler, Matusky & Skelly, Engineers (LMS) performed an investigative study to evaluate potential ground-water sources on the Kuperus Farm. Based on the results of their study, LMS reported that the water system will be capable of providing an additional 200 gpm of safe yield after the Kuperus Farm developments' own requirements are met. Drilling and pump tests indicate a ground-water supply on the order of 270 gpm (0.39 mgd) is available from the existing wells (LMS, 1988). Both wells are completed in the bedrock aquifer. Well PW1 (GIM, Well WT-40) and Well PW3 (GIM, Well WT-41) are equipped for production. Well data are presented on Table 1 and Table 2J.

The design requirements for the Kuperus Farm development are an average daily requirement of 140 gpm (150 gal/bedroom for a maximum of 1,356 bedrooms) and a maximum daily requirement of 200-280 gpm. A total safe yield from wells developed on the property of 270 gpm should meet the project demands. (LMS, 1988).

Cascade Lake Country Club Estates

This is a proposed single family home development. There has been no evaluation of the ground-water sources on this site. Historic water supply information is not available. (Gross, 1993)

There are currently no additional proposed projects in the Town of Warwick. (Winglovitz, 1993)

WATER SUPPLY DEMAND

Eurich Heights Water District

The present water supply meets the average daily demand of 6,000 gallons per day (0.006 mgd) and the maximum demand of 11,000 gallons per day (0.011 mgd).

The maximum yield capacity of the two supply wells (Well 1, Well 3) is 30 gpm (0.022 mgd). To satisfy the NYSDOH guidelines Eurich Heights water district must be capable of yielding twice the average daily demand with the best well out of service. With Well 3 (best well) out of service the safe yield is 15 gpm (0.011 mgd). It should be noted that this system does not meet NYSDOH guidelines. Data are summarized on Table 3A.

Bellvale Park Water District

The present water supply meets the average daily demand of 5,000 gallons per day (0.006 mgd) and maximum daily demand of 15,000 gallons per day (0.015 mgd) (peak summer water demand). The maximum yield capacity of the two Bellvale Park bedrock wells is 20 gpm or 28,800 gallons per day (0.029 mgd).

To satisfy NYSDOH guidelines Bellvale Park must provide 10,000 gallons per day with the best well out of service. The secondary well (well 2) is capable of 28,800 gallons per day, a more than adequate supply. Both wells cannot operate simultaneously. Data are summarized on Table 3A.

Wickham Village Water District

The present water supply meets the average daily demand of 60,000 gallons per day (0.060 mgd) and the maximum daily demand (peak summer usage) of 133,000 gallons per day (0.133 mgd).

The primary well TW-1 has a maximum yield capacity of 70 gpm (0.100 mgd). Additional supply is provided on demand from Wells PW-1, PW-2 and PW-3. The combined maximum yield capacity is 160 gpm (0.149 mgd).

To satisfy NYSDOH guidelines, Wickham Village must provide 120,000 gallons per day (0.120 mgd) with the best well out of service. With Well TW-1 out of service, the maximum yield capacity is 49,800 gallons (0.049 mgd). Therefore the present supply is not sufficient to meet NYSDOH guidelines. Data are summarized on Table 3A.

Westside Greenwood Lake Water District

The present water supply meets the average daily demand of 90,000 gallons per day (0.090 mgd) but cannot meet the maximum daily demand (summer usage) of 247,000 gallons per day (0.247 mgd).

Both sand and gravel wells run simultaneously with a combined yield of 115 gpm (0.156 mgd). An infiltration gallery is capable of contributing 0.011 mgd. The total maximum yield capacity for the system is 0.167 mgd. Additional standpipe storage capacity helps meet peak summer demands.

To satisfy the NYSDOH guidelines the Westside Greenwood Lake Water District safe yield must be 180,000 gallons per day (0.180 mgd). The present supply is inadequate by 0.137 mgd to meet NYSDOH guidelines. Data are summarized on Table 3A.

Village of Warwick

The present water supply meets the average daily demand of 436,000 gallons per day (0.436 mgd) and the maximum daily demand of 1,310,000 gallons per day (1.31 mgd). The supply source is a predominately surface water. The Village has one supply well which is a back up to the reservoir system. The treatment facility has 864,000 gallons per day capacity. Maximum yield capacity of Well 2 is 800 gpm (1.15 mgd). The combined maximum yield capacity is 2,010,000 gallons per day (2.01 mgd). (Orange County Health Department). Data is summarized on Table 3B.

Village of Greenwood Lake

The present water supply system is adequate to meet current average daily demand of 332,000 gallons per day (0.332 mgd) and maximum daily demand of 422,000 gallons per day (0.422 mgd).

The maximum yield capacity of the Village water system is 540 gpm (0.792 mgd). To satisfy NYSDOH guidelines the Village water district must yield 664,000 gallons per day (0.664 mgd) with the best well out of service. The capacity of the secondary well is inadequate by 0.333 mgd to satisfy NYSDOH guidelines. Data are summarized on Table 3D. Well D, currently inactive, is proposed to be brought into production. With this well on line the total safe yield will be 0.792 mgd which is adequate to satisfy

NYSDOH guidelines. There is storage capacity of 1,300,000 gallons in 3 standpipes.

Village of Florida

The present water supply meets the average estimated demand of 0.325 mgd. Since the Village does not meter their usage, the demand was estimated by the Village engineer (MacDonald, 1993). The safe yield of the Village water source, Glenmere Lake, is 0.500 mgd. Current maximum daily demand is 0.455 mgd. Data are on Table 3C.

Kings Estates

The present water supply meets the average daily demand of 20,000 gallons per day (0.020 mgd) and the maximum daily demand of 30,000 gallons per day (0.030 mgd).

The maximum yield capacity for Kings Estates is 175 gpm (0.053 mgd). This is a combined yield of four active wells. To satisfy the NYSDOH guidelines the yield capacity with the best well out of service must be 40,000 gallons per day (0.040 mgd). With Well TW-7 (best well) out of service the safe yield is 33,000 gallons per day (0.033 mgd), an inadequate supply by 0.007 mgd. Data are summarized on Table 3A.

Pine Island Water Company

Data on yields for Pine Island Water Co. was not available. Based on the population in the service area a water demand of 4.2 gpm (0.006 mgd) was calculated using 75 gallons per capita per day.

Mid-Orange Correctional Facility

The present water supply system is adequate for the average daily demand of 98,000 gallons per day (0.098 mgd) and the maximum daily demand of 161,000 gallons per day (0.161 mgd). The maximum yield capacity for the five active wells is 229,800 gallons per day (0.229 mgd) (Nye, 1993).

To satisfy NYSDOH guidelines the supply capacity with the best well out of service must be 136 gpm (0.196 mgd). With Well 5 (best well) out of service, the secondary wells yield capacity is 154,800 gallons per day (0.155 mgd). The supply is 0.041 mgd inadequate to satisfy DOH requirements. Data are on Table 3A.

Wickham Knolls

Data on yields for Wickham Knolls' wells was not available. Based on the service area population, the average daily water demand was estimated to be 11.8 gpm (0.017 mgd). The estimated maximum daily demand is 17.7 gpm (0.026 mgd). Data are on Table 3A.

Blue Lake

The Blue Lake Reservoir System meets the average daily demand of 119,000 gallons per day (0.119 mgd) and the maximum daily demand of 188,000 gallons per day (0.188 mgd). The treatment facility has a storage capacity of 500,000 gallons (Orange County Health Department).

One pump is capable of yielding 375 gpm, has an average yield capacity of 0.113 mgd and a maximum yield capacity of 0.180 mgd. Two pumps capable of yielding 200 gpm with a maximum yield capacity of 0.192 mgd are available on demand (Riley, 1993).

Projected Water Demands

Table 4A indicates that the existing Town of Warwick water districts have an estimated maximum yield capacity of 0.366 mgd. The estimated maximum water demand for these Town water districts to the year 2020 is about 0.315 mgd. Therefore, there will likely be a water supply surplus of 0.051 mgd.

The maximum yield capacity for the Village of Warwick is 2.01 mgd. The estimated maximum water demand to the year 2020 is 0.49 mgd. The Village of Warwick has the capacity in its sewage treatment plant to treat an additional 100,000 gallons per day. This information was used to estimate the population projections to 2020. The available water supplies for the Village of Warwick would be sufficient for this size population increase. Data are on Table 4B.

The Village of Greenwood Lake proposes three additional supply wells. The estimated maximum yield capacity would increase from 0.79 mgd to 1.51 mgd. The estimated maximum daily demand to 2020 is .474 mgd. Therefore, there will likely be a water supply surplus of 1.04 mgd with the proposed wells contributing. Data are on Table 4D.

The Village of Florida proposes an increased storage capacity to the water supply system. The

maximum yield capacity of the system is 0.500 mgd based on available treatment capacity. The estimated average water demand to 2020 is 0.350 mgd. Therefore the Village has a projected water supply excess of 0.150 mgd to meet future demands. Data are on Table 4C.

INVENTORY OF GROUND-WATER CONTAMINATION PROBLEMS

Existing Ground-Water Contamination Problems

Tectonic Engineering Consultants, P.C. reviewed the following sources to determine if any environmental incidents concerning ground-water have been reported within the Town of Warwick:

- The New York State Department of Environmental Conservation (NYSDEC) inactive hazardous waste sites;
- The New York State Spill Prevention and Response (SPILLS);
- The Resource Conservation and Recovery Information System (RCRA) report containing information pertaining to facilities that generate, dispose or handle hazardous waste; and
- Solid Waste Facilities, a listing of permitted solid waste facilities currently operating.

This information was provided by Lawler, Matusky and Skelly Engineers (LMS, 1993) and gathered from a Freedom of Information Law (FOIL) request from the New York State Department of Environmental Protection.

The FOIL report did not inventory any reported ground-water contamination problems within the Town of Warwick. As well as could be determined, all public and community water supply systems routinely meet NYSDOH drinking water standards. Those wells which have suspected surface water influence have been taken out of service; Village of Warwick Well 3 and Village of Greenwood Lake Well 1.

Potential Ground-Water Contamination Problems

Information about potential ground-water contamination sites was obtained from:

- FOIL request to NYSDEC (LMS, 1993); and
- Land use data from the Orange County, New York Real Property Tax Assessment data base (Space Track, 1993).

Tectonic reviewed the same documents listed in the previous section in an effort to determine the potential of listed facilities or incidents to environmentally degrade ground-water supplies in the Town of Warwick. With regard to the review of the spills list, there does not appear to be any major threat from those incidents reported to date. There is no indication of the nature of the spills or conditions of the property associated with the spills in this report. However, the information provided indicated none of the reported spills have resulted in the installation of recovery systems. In addition, a list of possible ground-water contamination sites has been developed by Tectonic using an available Environmental Risk Database.

Registered Inactive Hazardous Waste Remediation Sites in the Town of Warwick include:

Warwick Landfill (Penaluna Landfill)

This was a Federal Superfund site. This is an inactive hazardous waste site with Classification 2 - a significant threat to the public health or to the environment. This site is on Penaluna Road in Greenwood Lake (Environmental Risk Database).

Georgia Pacific Corporation

This is an inactive hazardous waste site with Classification 2A - adequate information is unavailable to classify this site as a significant threat to the public health or the environment. This facility is on 17 Forester Avenue (Environmental Risk Database).

Cascade Road

No specific information was available on this site (FOIL).

Four Corners Road

No specific information was available on this site (FOIL).

The sites listed below are registered as hazardous waste manifestors. There is no implication that these facilities are not in full compliance with the law.

Cumberland Farms Store

This facility is a small quantity generator of hazardous waste. The listed waste type is benzene. This facility is in full compliance. This facility is located on Windmere and Walnut Street in Greenwood

Lake (Environmental Risk Database).

Pendine Electronics

This facility is a small quantity generator of hazardous waste. Information on the nature of waste was unavailable. This facility is located at 10 Jersey Avenue in Greenwood Lake (Environmental Risk Database).

The sites listed below are potential ground-water contamination sites:

Town Salt Storage

Warwick Town salt storage is at the Department of Public Works Garage on Kings Highway southwest of Ackerman Road. The storage facility has a roof and three sides.

Warwick Sanitary Landfill

The Warwick Sanitary Landfill became the Penaluna Landfill, and is listed above.

Greenwood Lake Transfer Station

This is a permitted solid waste facility, listed in the FOIL report. This facility is located at the DPW complex on Elm Street.

Carletta

This is a construction and demolition landfill, listed in the FOIL report. There was no information on the location of this facility.

Sanford

This is a construction and demolition landfill, listed in the FOIL report. This facility is not in use. The exact location on Sanfordville Road is not known.

Warwick Conference Center

This is a construction and demolition landfill, listed in the FOIL report.

Warwick Park Golf Course Site

This is a construction and demolition landfill, listed in the FOIL report.

Each property in Orange County has a land use code number. Properties with land use code numbers associated with potential contamination of ground water were identified through analysis of the Real Property Tax Assessment data base by Space Track, Inc. The types of land uses in the potential contamination category include:

- industrial facilities;
- gas stations;
- dry cleaners, and
- auto repair facilities.

Where possible, approximate locations of these sites are shown as triangles on the GIM.

Petroleum Bulk Storage Facilities

There are an excess of fifty registered petroleum bulk storage facilities throughout the Town of Warwick. A significant spill or leak at any facility may ultimately affect a down gradient water supply. Every effort should be made to maintain these facilities according to required standards. In addition, early leak detection and rapid remediation should be performed. The petroleum bulk storage facilities are presented on Table 5.

The above sites are listed as potential ground-water contaminant sites. Further investigations would be required to determine if contamination exists at the respective locations.

TABLE 1

TOWN OF WARWICK

Summary of Available Well Data

Well ------ Water District	Tax Map Municipality ----- Section -- Block -- Lot	Map Location ------- I.D. #	Well Status	Reported Yield (gpm) Original ------ Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) ------ Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 1 ---------- Village of Warwick	V/O Warwick 54 -- 1 -- 3.1	Warwick ----- WT-1	Abandoned --------	NA ----- 200	75	18	NA	NA	Gravel	NA	Interference with well #2.
Well 2 ---------- Village of Warwick	V/O Warwick 54 -- 1 -- 3.1	Warwick -------- WT-2	In service -------- active	NA ----- 800	47	72	NA	NA	Sand & Gravel	NA	Back-up for surface supply. Aquifer feeds wells 1 & 2.
Well 3 -------- Village of Warwick	V/O Warwick 54 -- 1 -- 3.1	Warwick -------- WT-3	Abandoned	NA -- 300	46	72	NA	NA	NA	NA	
Well 3 -------- V/O ofGreenwood Lake	V/O Greenwood Lake 312 -- 3 -- 1.2	Warwick -------- WT-4	Abandoned --------	250 ----- 200	87	10	77	NA -----	Sand & Gravel	1963	

TOWN OF WARWICK

Summary of Available Well Data

Well **------** **Water District**	**Tax Map** **Municipality** **-----** **Section** **--** **Block** **--** **Lot**	**Map Location** **-------** **I.D. #**	**Well Status**	**Reported Yield (gpm)** **Original** **------** **Present**	**Depth of Well (feet)**	**Well Diameter (inches)**	**Length of Casing (feet)**	**Well Screen Length (feet)** **------** **Setting Interval (feet)**	**Aquifer**	**Date Drilled**	**Comments**
Well 5 ---------- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 3 -- 5.4	Warwick -------- WT-5	In service -------- standby	590 ----- 225	40.5	100	38	2.5	Sand & Gravel	1966	Caisson Well.
Well EW-1 ---------- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 3 -- 5.4	Warwick -------- WT-6	Inactive --------	300 ----- 200	87	8	74	 ----- 	Sand & Gravel	NA	Inactive.
Well A ---------- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 3 -- 1.2	Warwick -------- WT-7	Abandoned --------	NA ----- NA	101	6	100	5 ----- 91-96	Sand & Gravel	NA	Test well

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality --- Section -- Block -- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well B --- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 7 -- 1.2	Warwick --- WT-8	Abandoned ---	NA --- NA	100	6	80	NA	Sand	NA	Test well.
Well C --- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 7 -- 1.2	Warwick --- WT-9	Abandoned ---	NA --- NA	52	6	52	NA ---	Sand & Gravel	NA	Test well.
Well E --- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 7 -- 5.4	Warwick --- WT-10	In service --- active	500 --- 320	90	8	80	10 --- 80 - 90	Sand & Gravel	1992	Principal source.

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality --- Section -- Block -- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well D --- Village of Greenwood Lake	V/O Greenwood Lake 312 -- 7 -- 5.4	Warwick --- WT-11	Inactive ---	500 --- 500	62	8	52	10 --- 52-62	Sand & Gravel	NA	Test well. Proposed new source.
Well 1 --- Eurich Heights	Warwick 32 -- 6 -- 1	Warwick --- WT-12	In service --- standby	15 --- 15	750	6	150	--- On	Bedrock	1987	Standby; interference with well 2.
Well 2 --- Eurich Heights	Warwick 32 -- 6 -- 1	Warwick --- WT-13	Abandoned	3	550	6	NA	--- On	Bedrock	1962	Abandoned no recharge.
Well 3 --- Eurich Heights	Warwick 32 -- 6 -- 1	Warwick --- WT-14	In service --- active	15 --- 15	720	6	150	--- On	Bedrock	1991	Primary producer.

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality --- Section -- Block -- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 1 --- Bellvale Park	Warwick 56 -- 6 -- 1.2	Warwick --- WT-15	In service --- active	100 --- 20	265	6	NA	-----	Bedrock mu	1958	
Well 2 --- Bellvale Park	Warwick 56 -- 6 -- 1.2	Warwick --- WT-16	In service --- active	75 --- 20	237	6	47	-----	Bedrock OEw	1987	
Well PW1 --- Wickham Village	Warwick 36 -- 4 -- 21	Warwick --- WT-17	In service --- standby	85 --- 70	163	6	NA		Bedrock On	1958	For emergency use only.

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality --- Section -- Block -- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well PW2 --- Wickham Village	Warwick 36 -- 4 -- 21	Warwick --- WT-18	In service --- standby	20 --- 10	295	6	NA	-----	Bedrock On	1958-60	For emergency use only.
Well PW3 --- Wickham Village	Warwick 35 -- 1 -- 21	Warwick --- WT-19	In service --- standby	36 --- 10	45	8	NA	NA --- -----	Sand & Gravel	1958-1960	For emergency use only.
Well PW4 --- Wickham Village	Warwick 36 -- 4 -- 21	Warwick --- WT-20	Abandoned ---	30 --- 0	265	6	NA	-----	Bedrock On	1958-1960	
Well TW1/PW5 --- Wickham Village	Warwick 36 -- 4 -- 21	Warwick --- WT-21	In service --- active	70 --- 70	444	6	40	-----	Bedrock On	1989	Primary Supply

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well ------ Water District	TAX MAP MUNICIPALITY ----- SECTION -- BLOCK -- LOT	Map Location -------- I.D. #	Well Status	Reported Yield (gpm) Original ------ Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) ------ Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 1 ---------- Westside Greenwood Lake	Warwick 73 -- 8 -- ?	Warwick -------- WT-22	In service -------- active	100 ----- 90	40	8	15	10 ----- NA	Gravel	1956	
Well 2 ---------- Westside Greenwood Lake	Warwick 73 -- 8 -- ?	Warwick -------- WT-23	In service -------- active	150 ----- 30	40	8	NA	10 ----- NA	Gravel	1988	
Well TW1 ---------- Kings Estates	Warwick 35 -- 1 -- 16	Warwick -------- WT-24	In service -------- active	20 ----- 20	910	8	NA	----- On	Bedrock	NA	No interference with other wells.
Well TW2 ---------- Kings Estates	Warwick 35 -- 1 -- 16	Warwick -------- WT-25	In service -------- active	50 ----- 50	805	8	50	----- On	Bedrock	1985	Mutual interference with well TW3.

TOWN OF WARWICK

Summary of Available Well Data

Well ------ Water District	Tax Map Municipality ----- Section -- Block -- Lot	Map Location -------- I.D. #	Well Status	Reported Yield (gpm) Original ------ Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) ------ Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well TW3 ---------- Kings Estates	Warwick 35 -- 1 -- 16	Warwick -------- WT-26	In service -------- active	40 ----- 40	625	6	NA	-----	Bedrock On	1985	Mutual interference with well TW2.
Well TW7 ---------- Kings Estates	Warwick 35 -- 1 -- 16	Warwick -------- WT-27	In service -------- standby	65 ----- 65	850	8	40	-----	Bedrock On	1985	Backup to well TW2.
Well TW8 ---------- Kings Estates	Warwick 35 -- 1 -- 16	Warwick -------- WT-28	Abandoned --------	17 ----- NA	650	NA	NA	----	Bedrock On	1986	Abandoned due to low yield.
Well 1 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick -------- WT-29	In service -------- standby	NA ----- NA	32	8	NA	NA	Sand & Gravel	NA	Limited data available for the entire system.

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well ------ Water District	Tax Map Municipality ----- Section -- Block -- Lot	Map Location -------- I.D. #	Well Status	Reported Yield (gpm) Original ------ Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) ------ Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 2 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick ----- WT-30	Abandoned --------	NA ----- NA	32	8	NA	NA	Sand & Gravel	NA	
Well 3 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick -------- WT-31	Abandoned --------	NA -----	32	8	NA	NA	Sand & Gravel	NA	
Well 4 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick -------- WT-32	In service -------- standby	NA ----- NA	32	8	NA	NA	Sand & Gravel	NA	
Well 5 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick -------- WT-33	In service -------- standby	NA ----- NA	32	8	NA	NA	Sand & Gravel	NA	

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well ------ Water District	Tax Map Municipality ----- Section -- Block -- Lot	Map Location ------- I.D. #	Well Status	Reported Yield (gpm) Original ------ Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) ------ Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 6 ---------- Pine Island	Warwick 14 -- 4 -- 2.25	Warwick ----- WT-34	In service -------- active	NA ----- NA	66	8	28	NA	Sand & Gravel	NA	Principal supply source.
Well 1 ---------- Mid- Orange Corrections	Warwick 46 -- 1 -- ?	Warwick ----- WT-35	In service -------- active	20 ----- 20	41	6	NA	NA	Sand & Gravel	NA	95 ft. from Wickham Lake
Caisson Well 1 ---------- Mid-Orange Corrections	Warwick 46 -- 1 -- ?	Warwick -------- WT-36	In service -------- active	140 ----- 140	27	60	NA	NA	Sand & Gravel	1930's	In pump house #1; hand dug well.
Well 2 ---------- Mid-Orange Corrections	Warwick 46 -- 1 -- ?	Warwick -------- WT-37	In service -------- active	NA ----- 30	42	6	NA	----- OEw	Bedrock	NA	

TABLE 1
(continued)

TOWN OF WARWICK

Summary of Available Well Data

Well --- Water District	Tax Map Municipality --- Section -- Block -- Lot	Map Location --- I.D. #	Well Status	Reported Yield (gpm) Original --- Present	Depth of Well (feet)	Well Diameter (inches)	Length of Casing (feet)	Well Screen Length (feet) --- Setting Interval (feet)	Aquifer	Date Drilled	Comments
Well 3 --- Mid-Orange Corrections	Warwick 46 -- 1 -- ?	Warwick --- WT-38	In service --- active	25 --- 25	39	6	NA	NA	Sand & Gravel	NA	
Well 5 --- Mid-Orange Corrections	Warwick 46 -- 1 -- ?	Warwick --- WT-39	In service --- active	300 --- 250	55	6	NA	NA	Sand & Gravel	1983	
Well PW1 --- Centennial Hill	Warwick 42 -- 1 -- 104	Warwick --- WT-40	In service --- standby	270 --- 270	245	8	61	--- OEw	Bedrock	1986	Proposed Subdivision.
Well PW3 --- Centennial Hill	Warwick 43 -- 1 -- 209	Warwick --- WT-41	In service --- standby	150 --- 150	430	NA	NA	--- OEw	Bedrock	1986	Proposed Subdivision.

wttbl1/orange

TABLE 2A

REGIONAL GROUND-WATER STUDY
VILLAGE OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Village of Warwick Water District

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well 1 ---------- Village of Warwick	1455 -------- 200	200 -------- 0	 ------- 	Abandoned
Well 2 ---------- Village of Warwick	2076 -------- 800	236 --------- 340,000	800 -------- 1,152,000	Standby to reservoir system.
Well 3 ---------- Village of Warwick	3079 -------- 300	300 -------- 0	 --------- 	Abandoned
TOTALS	**(Total Permitted Yield)** **1300**	**(Total Yield Capacity)** **236** **--------** **340,000**	**(Total Maximum Yield Capacity)** **800** **--------** **1,152,000**	

gpm- Gallons per minute WSA No.- Water Supply Application Number
gpd- Gallons per day

COMMENTS

! Well 2 is used to back up surface system during peak demand and draught periods. When in use the well is pumped 24 hrs per day.

WARWICK\TABLE2A.WVL

TABLE 2B

REGIONAL GROUND-WATER STUDY
VILLAGE OF GREENWOOD LAKE
WARWICK, NEW YORK

Summary of Well Yield Capacities
Village of Greenwood Lake Water District

Well **Water District**	**WSA No.** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **(gpd)**	**Maximum Yield Capacity (gpm)** **(gpd)**	**Comments**
Well 5 Village of Greenwood Lake	8815 590	230 331,200	230 331,200	Standby well.
Well E Village of Greenwood Lake	8815 500	320 460,800	320 460,800	Principal source.
Well D Village of Greenwood Lake	8815 500	500 0	500 0	Proposed new principal source.
TOTALS	**(Total Permitted Yield)** **1090**	**(Total Yield Capacity)** **320** **460,800**	**(Total Maximum Yield Capacity)** **550** **792,000**	

gpm- Gallons per minute WSA No. - Water Supply Application Number.
gpd- gallons per day

COMMENTS:

- Well E is pumped for 24 hrs a day.
- Well 5 is utilized during peak summer demand. Well E and Well 5 can be pumped simultaneously with no interference based on operation information.
- Well D is proposed, the pump study indicates a safe yield of 500 GPM (0.720 mgd). No interference with either of the two existing wells was noticed during the pump study.
- Wells A,B,C and 1 have been abandoned. Well Ew-1 is inactive.

WARWICK\TABLE2B.GLV

TABLE 2C

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Eurich Heights Water District

Well **Water District**	**WSA No.** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **(gpd)**	**Maximum Yield Capacity (gpm)** **(gpd)**	**Comments**
Well 1 Eurich Heights	5652 15	15 9000	15 10,800	Standby, used during peak demand.
Well 3 Eurich Heights	8837 15	15 9000	15 10,800	Primary producer, drilled in 1991.
TOTALS	**(Total Permitted Yield)** **30**	**(Total Yield Capacity)** **15** **9000**	**(Total Maximum Yield Capacity)** **30** **21,600**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS

- Primary Well 3 is pumped at 12-15 GPM on an average of 8-10 hrs per day, according to the operator.
- Wells 1 & 3 are run simultaneously during peak demand. Each is run at 15 GPM for 10-12 hrs per day. The system is capable of sustained pumping.
- Well 2 has been abandoned.

WARWICK\TABLE2C.EUR

TABLE 2D

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Bellvale Park Water District

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well 1 ---------- Bellvale Park	6291 ------- 100	20 -------- 7,200	20 ------- 28,800	Active
Well 2 ---------- Bellvale Park	8394 -------- 50	20 --------- 7,200	20 -------- 28,800	Active
TOTALS	**(Total Permitted Yield)** **150**	**(Total Yield Capacity)** **2.0** **--------** **7,200**	**(Total Maximum Yield Capacity)** **20** **--------** **28,800**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS

! Based on operators information wells cannot be run simultaneously. Well use is alternated every two weeks.

! Each well has an output of approximately 20 GPM and pumps 5-6 hours per day, on average. Pump rates are similar for max days with approximately 8 hrs of pumping.

! Sustained 24 hr pumping is possible in either well.

WARWICK:TABLE2d.BL

TABLE 2E

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Wickham Village Water District

Well **Water District**	**WSA No.** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **(gpd)**	**Maximum Yield Capacity (gpm)** **(gpd)**	**Comments**
Well PW1 Wickham Village	3441 110	70 0	70 38,800	Standby
Well PW2 Wickham Village	3441 15	10 0	10 5,500	Standby
Well PW-3 Wickham Village	3441 15	10 0	10 5,500	Standby
Well TW1/PW-5 Wickham Village	8461 70	70 63,000	70 100,000	Primary producer. Drilled 1989
TOTALS	**(Total Permitted Yield)** **195**	**(Total Yield Capacity)** **70** **63,000**	**(Total Maximum Yield Capacity)** **160** **150,000**	

gpm - Gallons per minute.
gpd - Gallons per day.
WSA No. - Water Supply Application Number.

COMMENTS

! Well TW-1/PW-5 is the primary well pumping at 60-70 GPM for 12-15 hrs per day. Maximum demand is met with same rate and additional hrs of pumping. Sustained pumping is feasible on TW-1.
! Wells 1,2 & 3 are standby wells pumped simultaneously in emergency situations only with no appreciable sustained yield. Maximum yield capacity is approximately 50,000 GPD for auxillary wells.

TABLE 2F

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Westside Greenwood Lake

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well 1 ---------- Westside Greenwood Lake	7870 ------- 100	90 -------- 75,600	90 -------- 129,600	Active, primary well.
Well 2 ---------- Westside Greenwood Lake	7870 -------- 150	30 -------- 25,200	30 -------- 43,200	Active.
TOTALS	**(Total Permitted Yield)** **250**	**(Total Yield Capacity)** **115** **--------** **96,600**	**(Total Maximum Yield Capacity)** **115** **--------** **165,600**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS

- Both wells run simultaneously at a combined yield of 110-115 GPM, an average of 12-14 hrs per day, based on operator information.
- An infiltration gallery is used in rare events for 2-3 hrs per day at 60 GPM.
- Sustained pumping of both wells is feasible.
- 350,000 gallon storage capacity helps meet maximum summer demands.

WARWICK\TABLE2F.WGL

TABLE 2G

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Kings Estates Water District

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well TW1 ---------- Kings Estates	7879 -------- 20	20 -------- 3,600	20 -------- 6,000	Active
Well TW2 ---------- Kings Estates	7564 ------- 50	50 -------- 9,000	50 ------- 15,000	Active
Well TW3 ---------- Kings Estates	7564 -------- 40	40 -------- 7,200	40 ------- 12,000	Active
Well TW7 ---------- Kings Estates	7879 -------- 65	65 -------- 11,700	65 ------- 19,500	Standby
TOTALS	**(Total Permitted Yield)** **175**	**(Total Yield Capacity)** **175** **--------** **31,500**	**(Total Maximum Yield Capacity)** **175** **--------** **52,500**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS

- Wells 1,2 & 3 run sequentially for 2-3 hrs per day each. However, they can be run simultaneously with limited interference.
- Well 7 can be run in conjunction with wells 1,2 & 3 if necessary.
- Well 8 has been abandoned.
- Wells 12 & 13 will be submitted for approval as warranted by development with an estimated combined yield of 120 GPM (at 6 hrs per day = .043 MGD)

TABLE2G.KG

TABLE 2H

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Pine Island Water District

Well **Water District**	**WSA No.** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **(gpd)**	**Maximum Yield Capacity (gpm)** **(gpd)**	**Comments**
Well 6 Pine Island	3464			Principal source.
Well 1 Pine Island	3464			Active, standby.
Well 4 Pine Island	3464			Active, standby.
Well 5 Pine Island	3464			Active, standby.
TOTALS	**(Total Permitted Yield)**	**(Total Yield Capacity)**	**(Total Maximum Yield Capacity)**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS:

- Pine Island Water District does not meter their usage. According to the Orange County Health Department no records on well capacities are available.
- Repeated attempts to make personal contact with the owner of the Pine Island Water Company were unsuccessful.
- Wells 2 and 3 have been abandoned according to Orange County Health Department records.

TABLE2H.PI

TABLE 2I

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Mid-Orange Correctional Water District

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well 1 ---------- Mid-Orange Corrections	NA -------- 20	20 -------- 14,400	20 -------- 14,400	Active, standby.
Caisson Well 1 ---------- Mid-Orange Corrections	NA ------- 140	140 -------- 100,800	140 ------- 100,800	Active, primary supply well.
Well 2 ---------- Mid-Orange Corrections	NA -------- 30	30 -------- 21,600	30 ------- 21,600	Active, standby.
Well 3 ---------- Mid-Orange Corrections	NA -------- 25	25 -------- 18,000	25 -------- 18,000	Active, standby.
Well 5 ---------- Mid-Orange Corrections	NA -------- 250	0 -------- 0	250 ------- 75,000	Active, used only during peak demand, 4-5 hrs per day.
TOTALS	**(Total Permitted Yield)** **465**	**(Total Yield Capacity)** **140** **--------** **100,800**	**(Total Maximum Yield Capacity)** **465** **--------** **229,800**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS :

! Caisson Well 1 pumped at 140 GPM for 10 - 12 hrs per day to meet average demand. Well #5 runs 4-5 hrs per day in summer.

! Based on operator information all wells can be pumped simultaneously without significant interference.

TABLE2I.MO

TABLE 2J

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Well Yield Capacities
Proposed Centennial Hill Water District

Well **-----** **Water District**	**WSA No.** **-----** **Permitted Yield (gpm)**	**Average Yield Capacity (gpm)** **-----** **(gpd)**	**Maximum Yield Capacity (gpm)** **-----** **(gpd)**	**Comments**
Well PW1 ---------- Centennial Hill	NA ------- 270	270 -------- 194,000	270 ------- 388,800	Proposed primary.
Well PW3 ---------- Centennial Hill	NA ------- 150	270 -------- 194,000	150 -------- 216,000	Standby
TOTALS	**(Total Permitted Yield)** **NA**	**(Total Yield Capacity)** **270** **--------** **194,000**	**(Total Maximum Yield Capacity)** **270** **--------** **388,800**	

gpm - Gallons per minute. WSA No. - Water Supply Application Number.
gpd - Gallons per day.

COMMENTS:

! Permitted yield obtained from pump test report obtained from project EIS.

! Well #2 left undeveloped due to relatively low yield.

! Due to significant interference pump study recommends pumping only one well at any time.

! Average yield capacity based on twelve hour pumping cycle. Max capacity based on 24 hr cycle.

TABLE2J.CT

TABLE 3A
REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Water Supply Source

The Town of Warwick owns and operates four community water systems. They are: Westside Greenwood Lake, Eurich Heights, Wickham Village and Bellvale Park. Westside Greenwood Lake wells are effected when Greenwood Lake is severely drawn down. Eurich Heights has one primary supply well and a back-up supply well. Bellvale Park has two active wells. In addition there are four private community water districts in the town.

	Water District	Ground Water (mgd)
Current Average Daily Water Demand	Westside Greenwood Lake	.090
	Eurich Heights	.006
	Wickham Village	.060
	Bellvale Park	.005
	Kings Estates	.020
	Pine Island Water	NA
	Mid-Orange Corrections	.098
	Wickham Knolls	NA
Current Maximum Daily Water Demand	Westside Greenwood Lake	.247
	Eurich Heights	.011
	Wickham Village	.133
	Bellvale Park	.015
	Kings Estates	.030
	Pine Island Water	NA
	Mid-Orange Corrections	.161
	Wickham Knolls	NA
Maximum Yield Capacity	Westside Greenwood Lake	.166
	Eurich Heights	.022
	Wickham Village	.149
	Bellvale Park	.029
	Kings Estates	.053
	Pine Island Water	NA
	Mid-Orange Corrections	.230
	Wickham Knolls	NA
Average Yield Capacity	Westside Greenwood Lake	.097
	Eurich Heights	.009
	Wickham Village	.063
	Bellvale Park	.007
	Kings Estates	.032
	Pine Island water	NA
	Mid-Orange Corrections	.101
	Wickham Knolls	NA
Proposed Sources (Average Day)	Centennial Hills	.194
TOTAL MAXIMUM YIELD CAPACITY (MGD) =		**.649**
----------		**-------**
CURRENT MAXIMUM DAILY USE (MGD) =		**.597**

COMMENTS: The total max day use does not include those districts whose yield capacity is unknown.

TABLE 3B

REGIONAL GROUND-WATER STUDY
VILLAGE OF WARWICK
WARWICK, NEW YORK

Summary of Water Supply Source

This is primarily a surface supply system with a maximum treatment capacity of 0.864 MGD. The Mistucki Brook reservoir system can meet demand under normal conditions, while during peak demand a standby well is put into service.

Existing Source

	Surface Water (mgd)	**Ground Water (mgd)**
Current Average Daily Water Demand	0.436	
Current Maximum Daily Water Demand	0.768	0.547
Maximum Yield Capacity	0.864	1.15
Average Yield Capacity	0.642	0.340
Proposed Sources (Average Day)		
***TOTAL MAXIMUM YIELD CAPACITY (MGD) =** **----------** ***CURRENT MAXIMUM DAILY USE (MGD) =**		**.864*** **-------** **1.31***

mgd - Million gallons per day.
* Combine surface water and ground-water sources.
** The Village of Warwick wells are a standby to the reservoir system.

COMMENTS

- Water is drawn from the reservoir first and backed up as needed by ground water supply. The reservoir system is adequate except during extrene draught conditions.
- Source of information: Environmental Health Water Program Inventory, Orange County Health Department.
- Available total maximum yield capacity of 2.01 MGD is limited by treatment capacity to 0.864 MGD.

WARWICK\TABLE3B.WRV

TABLE 3C

REGIONAL GROUND-WATER STUDY
VILLAGE OF FLORIDA
WARWICK, NEW YORK

Summary of Water-Supply Sources

The Village water supply is from Glenmere Lake. Watershed Regulations limiting land use protect this water supply. The maximum treatment capacity of the system is 500,000 gallons per day. This supply is adequate for the service area.

Existing Source

	Surface Water (mgd)	**Ground Water (mgd)**
Current Average Daily Water Demand	.325	
Current Maximum Daily Water Demand	.455	
Maximum Yield Capacity	.500	
Average Yield Capacity	.300	
Proposed Sources (Average Day)		
***TOTAL MAXIMUM YIELD CAPACITY (MGD) =** **----------** ***CURRENT MAXIMUM DAILY USE (MGD) =**		**.500** **---** **.455**

mgd - Million gallons per day.
* Combine surface water and ground-water sources.

COMMENTS

- **!** The Village does not meter their water usage, however they have never had a problem with their distribution storage supply.
- **!** An additional storage capacity of 100,000 gallons is proposed at the filtration plant , to begin construction in 1994.
- **!** Maximum treatment capacity of the system is 500,000 gallons per day, limiting maximum yield capacity.

TABLE 3D

REGIONAL GROUND-WATER STUDY
VILLAGE OF GREENWOOD LAKE
WARWICK, NEW YORK

Summary of Water Supply Sources

The Village of Greenwood Lake currently operates one well. During peak demand, two wells are pumped simultaneously. If either of the wells is out of service the system is not capable of meeting demand during peak times.

Existing Source

	Water District	**Ground Water (mgd)**
Current Average Daily Water Demand	Village of Greenwood Lake	.332
Current Maximum Daily Water Demand	Village of Greenwood Lake	.422
Maximum Yield Capacity	Village of Greenwood Lake	0.792
Average Yield Capacity	Village of Greenwood Lake	0.461
Proposed Sources (Average Day)		0.720
TOTAL MAXIMUM YIELD CAPACITY (MGD) = **----------** **CURRENT MAXIMUM DAILY USE (MGD) =**		**0.792** **--------** **.422**

mgd - Million gallons per day.

COMMENTS

- **!** Proposed Well D has a safe yield of 500 GPM (0.720 mgd) according to the operator.
- **!** There are two additional wells proposed. It is expected that wells in the sand and gravel aquifer could yield 300-400 gpm.

WARWICK\TABLE3D.GLV

TABLE 3E

REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Summary of Water-Supply Source
Blue Lake

Blue Lake Reservoir (Sterling Forest Lake) is a surface water source for a residential and industrial/ commercial population.

Existing Source

	Surface Water (mgd)	**Ground Water (mgd)**
Current Average Daily Water Demand	.119	.00
Current Maximum Daily Water Demand	.188	.00
Maximum Yield Capacity	.500	.00
Average Yield Capacity	.119	.00
Proposed Sources (Average Day)		
***TOTAL MAXIMUM YIELD CAPACITY (MGD) = ---------- *CURRENT MAXIMUM DAILY USE (MGD) =**		**.500 --------- .188**

mgd - Million gallons per day.
* Combine surface water and ground-water sources.

COMMENTS

- **!** Blue Lake has distribution storage of 500,000 gallons.
- **!** Water is treated at a plant and pumped at a rate of 450 gpm. The rated capacity of the treatment plant is 650,000 gpd.
- **!** The distribution system serves IBM, Blue Lake sewage treatment plant, former INCO building, and the Woodlands Development.

TABLE 4A
REGIONAL GROUND-WATER STUDY
TOWN OF WARWICK
WARWICK, NEW YORK

Projected Water Demand
1993 - 2020
(mgd)

Water District	Current Maximum Yield Capacity (mgd)	Current and Proposed* Maximum Yield Capacity (mgd)	1993 Projected Water Demand ----- Water-Supply Adequacy	2000 Projected Water Demand ----- Water-Supply Adequacy	2010 Projected Water Demand ----- Water-Supply Adequacy	2020 Projected Water Demand ----- Water-Supply Adequacy
Eurich Heights	.022	.022	.006 -------- + .016**	.007 -------- + .015**	.011 -------- + .011**	.016 -------- + .006**
Bellvale Park	.029	.029	.005 -------- + .024**	.006 -------- + .023**	.009 -------- + .020**	.013 -------- + .016**
Wickham Village	.149	.149	.060 -------- + .089**	.068 -------- + .081**	.100 -------- .049**	.144 -------- + .005**
Greenwood Lake Westside	.166	.166	.090 -------- + .076**	.102 -------- + .064**	.120 -------- + .046	.142 -------- + .024**
Blue Lake	.500	.500	.199 -------- + .381**	.135 -------- + .365**	.159 -------- + .341**	.187 -------- + .313**
Kings Estates	.053	.096	.020 -------- + .033**	.089 -------- + .007***	.089 -------- + .007***	.089 -------- + .007***
Mid-Orange Correc-tional Facility	.230	.230	.098 -------- + .132**	.111 -------- + .119**	.131 -------- + .099**	.155 -------- + .075**
TOTAL	**1.149**	**1.192**	**.398** **----------** **+ 0.751****	**.518** **----------** **+ 0.674****	**.619** **--------** **+ 0.573****	**.689** **----------** **+ 0.446****

\+ Surplus water supply, mgd. - Water supply deficiency

* Combined yield capacity of both current and proposed water supply(s).

** Calculated by current maximum yield capacity minus projected water demands.

*** Calculated by current and proposed maximum yield capacity minus projected water demands.

COMMENTS: **!** Population projections estimated using calculations published in CH2M Hill Report on Orange County Water Demand.

! Based on the present rate of development, it is anticipated that Kings Estates will be at full build out by the year 2000. Proposed wells 12 & 13 will yield a combined 0.043 MGD at similar pump cycles.

TABLE 4B

REGIONAL GROUND-WATER STUDY
VILLAGE OF WARWICK
WARWICK, NEW YORK

Projected Water Demand
1993 - 2020
(mgd)

Water District	Current Maximum Yield Capacity (mgd)	Current and Proposed* Maximum Yield Capacity (mgd)	1993 Projected Water Demand ----- Water-Supply Adequacy	2000 Projected Water Demand ----- Water-Supply Adequacy	2010 Projected Water Demand ----- Water-Supply Adequacy	2020 Projected Water Demand ----- Water-Supply Adequacy
Village of Warwick	0.864	0.864*	0.436 ---------- +0.428**	0.484 -------- +0.380**	0.493 ------- +0.371**	0.493 --------- +0.371**
TOTAL	**0.864**	**0.864***	**0.436** **----------** **+0.428****	**0.484** **----------** **+0.380****	**0.493** **--------** **+0.371****	**0.493** **----------** **+0.371****

\+ Surplus water supply, mgd. - Water supply deficiency
* Combined yield capacity of both current and proposed water supply(s).
** Calculated by current maximum yield capacity minus projected water demands.

COMMENTS: **!** Maximum yield capacity of Village system is limited by present treatment capacity (0.864 mgd).

WARWICK\TABLE4B.WRK

TABLE 4C

REGIONAL GROUND-WATER STUDY
VILLAGE OF FLORIDA
WARWICK, NEW YORK

Projected Water Demand
1993 - 2020
(mgd)

Water District	Current Maximum Yield Capacity (mgd)	Current and Proposed* Maximum Yield Capacity (mgd)	1993 Projected Water Demand ----- Water-Supply Adequacy	2000 Projected Water Demand ----- Water-Supply Adequacy	2010 Projected Water Demand ----- Water-Supply Adequacy	2020 Projected Water Demand ----- Water-Supply Adequacy
Village of Florida	.500	.500	.325 --- +.175**	.350 --- +.150**	.350 --- +.150**	.350 --- +.150**
TOTAL	**.500**	**.500**	**.325** **---** **+.175****	**.350** **---** **+.150****	**.350** **---** **+.150****	**.350** **---** **+.150****

\+ Surplus water supply, mgd. - Water supply deficiency
* Combined yield capacity of both current and proposed water supply(s).
** Calculated by current maximum yield capacity minus projected water demands.

COMMENTS:

! A growth capacity of 100 dwellings was assumed maximum potential for the Village in a recent study by MacDonald Engineering. To estimate future projected water demand, 250 gallons per day per dwelling were added to the 1993 water demand.

! Maximum treatment capacity of the system is 0.5 MGD, which is the limiting factor for maximum yield capacity.

WARWICK\TABLE4C.FLV

TABLE 4D

REGIONAL GROUND-WATER STUDY
VILLAGE OF GREENWOOD LAKE
WARWICK, NEW YORK

Projected Water Demand
1993 - 2020
(mgd)

Water District	Current Maximum Yield Capacity (mgd)	Current and Proposed* Maximum Yield Capacity (mgd)	1993 Projected Water Demand ----- Water-Supply Adequacy	2000 Projected Water Demand ----- Water-Supply Adequacy	2010 Projected Water Demand ----- Water-Supply Adequacy	2020 Projected Water Demand ----- Water-Supply Adequacy** or ***
Village of Greenwood Lake	0.792	1.51*	.332 --- + .460**	.399 --- + 1.11***	.474 --- + 1.04***	.474 --- + 1.04***
TOTAL	**0.792**	**1.51***	**.332** **---** **+ .460****	**.539** **---** **+ 1.11*****	**474** **---** **+ 1.04*****	**.474** **---** **+ 1.04*****

\+ Surplus water supply, mgd. - Water supply deficiency
* Combined yield capacity of both current and proposed water supply(s).
** Calculated by current maximum yield capacity minus projected water demands.
*** Calculated by current and proposed maximum yield capacity minus projected water demands.

TABLE 5

TOWN OF WARWICK
ORANGE COUNTY, NEW YORK

Petroleum Bulk Storage Facilities
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FACILITY NAME	LOCATION	MUNICIPALITY
Warwick Garage	County Road 1	Edenville
DTI Gasoline Station	133 N. Main Street	Florida
Empire Southern Tier Equipment Corp.	Route 94, P.O. Box 547	Florida
G & G Bus Service, Inc.	15 Industrial Drive	Florida
G & G Bus Service, Inc.	8 Fairres Avenue	Florida
Golden Hill Elementary Building	Round Hill Road	Florida
Leos Corner American	1 South Main Street	Florida
Mortorano Transport Systems	P.O. Box 517, Rt. 94	Florida
S S Seward Institute	53 N. Main Street	Florida
Straub & Sons Exc., Inc.	Rt. 94, Box 455	Florida
Carpenter & Smith, Inc.	Windermere Ave. & Walnut Streets	Greenwood Lake
Cumberland Farms	Windermere Ave. & Walnut Streets	Greenwood Lake
Dairy Mart	Windermere Ave. & Walnut Streets	Greenwood Lake
Greenwood Lake School District	Waterstone Road	Greenwood Lake
Greenwood Lake School District/Middle	Lakes Road	Greenwood Lake

TABLE 5 (Page 2)

TOWN OF WARWICK
ORANGE COUNTY, NEW YORK

Petroleum Bulk Storage Facilities
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FACILITY NAME	LOCATION	MUNICIPALITY
Inc. Village of Greenwood Lake	Church Street	Greenwood Lake
Long Pond Marina	Box 1470, Jersey Avenue	Greenwood Lake
Triangle Service Station	Route 17A	Greenwood Lake
Willow Point Marine	RR4, Box 657	Greenwood Lake
American Waste Control of N.Y., Inc.	P.O. Box 176	Pine Island
DeBuck's Sod Farm	Box 142, Mission Land Rd.	Pine Island
Panco Equipment Corp.	Pine Island Turnpike	Pine Island
Ray's Service #8053	Four Corners Street	Pine Island
Ray's Service Center	Corner of Pulaski Hwy. & PI Tpk.	Pine Island
Saint Stanislaus Church	Pulaski Highway	Pine Island
Warwick Valley Central School	Drawer E School House Road	Pine Island
B & K Fuel, Inc.	11 Maple Avenue	Warwick
Georgia-Pacific Corp.	17 Forester Avenue	Warwick

Reference:

Freedom Of Information Law (FOIL) request by Lawler, Matusky & Skelly Engineers, October 15, 1993