



4. WATER SUPPLY AND WASTEWATER TREATMENT



WATER SUPPLY AND WASTEWATER TREATMENT

Water Supply

The availability of a clean and abundant water supply was critical in the early development of Morris County, and this resource continues as an increasing issue of concern within the region. Not only does the availability of water provide a significant basis for development and commerce in Morris County, it is also one of the county's primary exports. In 1994, it was reported that over 50 million gallons of water were exported from Morris County reservoirs daily and sent eastward to support major urban areas, including Jersey City, Newark and their environs.¹ This role as "water provider" continues, and the importance of the region as a supplier of water has resulted in new regulatory actions for Morris County and the six surrounding counties with lands encompassing the "New Jersey Highlands Region," the physiographic province recently redefined by the 2004 Highlands Water Protection and Planning Act. As a result, water supply issues will continue to be a major factor in determining the future of Morris County.

Morris County's government officially began addressing water availability issues in 1956 due to concern about available water supplies and the impact of outside control of these resources.² At that time, Jersey City and Newark had sole control of the major surface water supplies of the Rockaway and Pequannock Rivers watersheds in Morris County. Today, surface water resources are still largely controlled by out-of-county water purveyors. As a result, about 95% of county public water supplies and all

residential self-supplied water provided for Morris County residents is drawn from aquifers.³

Morris County MUA

The Morris County Board of Chosen Freeholders created the Morris County Municipal Utilities Authority (MCMUA) in 1958 as part of the effort to address water supply issues.⁴ The MCMUA was created for the primary purpose of developing and distributing an adequate supply of water for the use of the county's inhabitants. To this end, the MCMUA obtained control of various lands and developed a well system enabling them to supply bulk water to the many water supply systems existing throughout the county. At present, the MCMUA maintains wells with a production capacity of about 10.2 million gallons of water per day. This water is provided to ten municipal and commercial water purveyors.⁵ The MCMUA uses a system of pumps, booster stations, and pipelines to transmit water to the following purveyors:

Denville Township	Parsippany-Troy Hills Township
Jefferson Township	Randolph Township
Mine Hill Township	Roxbury Township
Mount Arlington Borough	Wharton Borough
N. J. American Water Company	Southeast Morris County MUA

¹ 1994 Morris County Master Plan Water Supply Element, Camp Dresser and McKee, Inc., pg. 1-17.

² Ibid, page. iii.

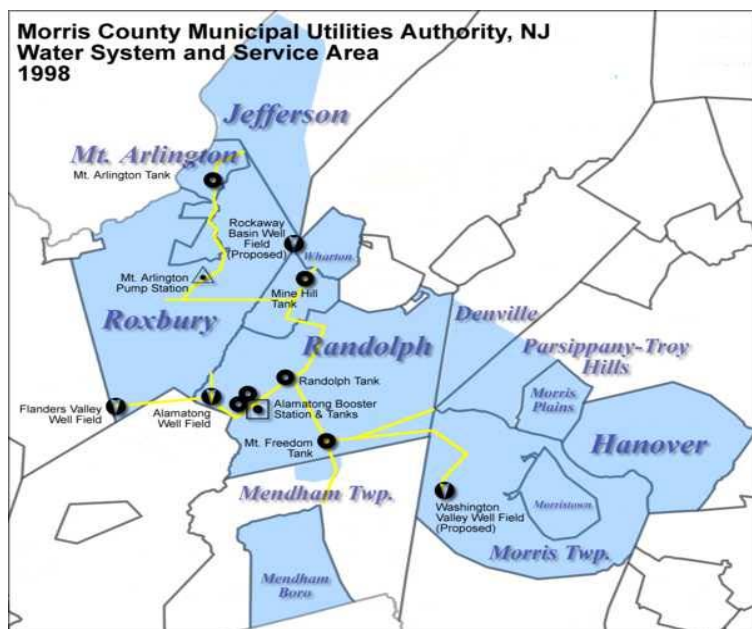
³ Ibid., pgs. 1-1, 5-2. An aquifer is a water bearing rock, rock formation or group of rock formations that contain water.

⁴ Ibid, pg. iv.

⁵ Morris County MUA website.



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Source: MCMUA website

County Water Supply Planning

While the county had developed earlier water supply studies,⁶ the Morris County Planning Board, working in conjunction with the MCMUA, adopted the first Morris County Water Supply Master Plan in 1971. The Plan proposed the development of four new surface water reservoirs, diversion of water resources from a reservoir located outside the county, and the development of one groundwater source.⁷ Only development of the Almatong Wellfield was completed. This wellfield, located in Randolph

Township and Chester Township, is the primary source of bulk water supplied by the MCMUA.

The following 1982 Water Supply Element reported that most water purveyors and communities in Morris County had sufficient groundwater sources for the immediate future provided these sources were properly managed.⁸ The 1982 Plan also recommended additional steps needed to assure long term water availability, including extending the existing regional water system and the development of additional well fields. In response, regional water supply interconnections were made with Mendham Borough, Denville Township, Roxbury Township, and the Southeast Morris County Municipal Utilities Authority. In addition, a new wellfield was developed, located on the Flanders Valley Golf Course in Mount Olive Township and Roxbury Township, creating a second source of groundwater for the MCMUA.⁹

The latest Morris County Water Supply Element was adopted in 1994 to address water distribution, water quality and the protection of water supplies. The 1994 Plan, using a 20 year time frame, estimated that water demand would increase from the 1994 demand of 56.7 MGD (million gallons per day) to a 2014 estimated demand of about 61.8 MGD. The Plan indicated that water supply would be sufficient to meet the needs of the anticipated population, which was projected as 446,000 persons by the year 2010. The Plan did not comment on the ability to meet demand post 2010.¹⁰

In actuality, the population of Morris County reached 470,212 by the year 2000¹¹ and total water demand for 1999 was estimated at 60.9

⁶ Report Upon Long Range Water Requirements for Morris County, Morris County Board of Freeholders, Elson T. Killam Associates, Inc. 1958.

⁷ 1971 Morris County Master Plan – Water Supply Element, Elson T. Killam Associates, Inc., pgs. 25-31.

⁸ 1982 Morris County Master Plan – Water Supply Element, Elson T. Killam Associates, Inc.

⁹ 1994 Morris County Master Plan Water Supply Element, pg. vi.

¹⁰ Ibid., pg. 5-3.

¹¹ 2000 Census, U.S. Census Bureau.



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MGD.¹² The 2005 estimated population of Morris County is 481,130, an increase of 2.3%.¹³ Assuming a corresponding percent increase in water use, current demand is estimated at about 62.3 MGD, slightly exceeding the demand estimated for 2014.

Water use figures derived from the 1971, 1982 and 1994 Morris County Water Supply Elements illustrate the steady rise in total water demand, which has increased in relation to population increases and the development of new commercial and other nonresidential uses.

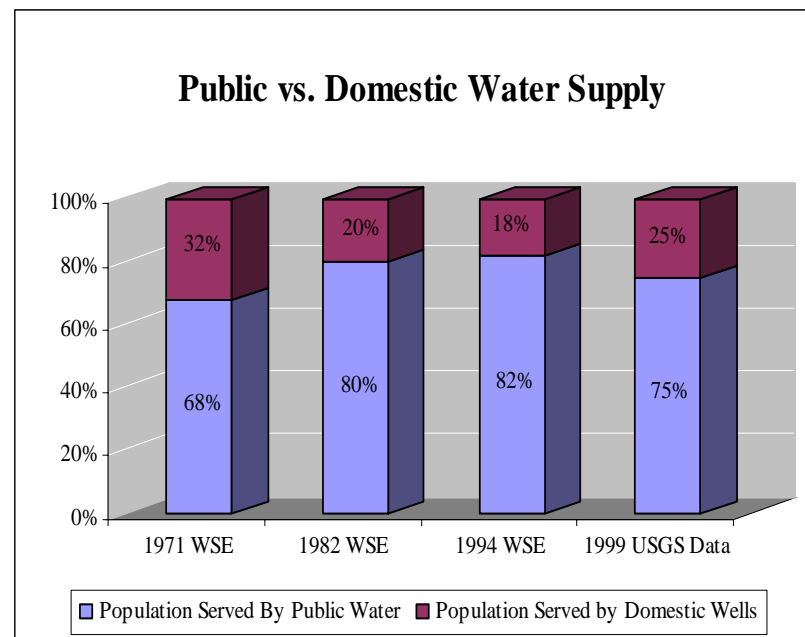
Year	Population	Total Estimated Demand (public and private sources) ¹⁴
1971	309,015	39.8 MGD
1982	407,630	48.0 MGD
1994	421,353	56.6 MGD
1999	470,212 ¹⁵	60.9 MGD

Estimates of water demand are available from the NJDEP, Division of Water Supply, which is the state agency responsible for managing water in New Jersey. Water purveyors must apply to NJDEP for consideration of water withdrawal permits. Data summarizing water withdrawals for Morris County as reported to NJDEP for the period (1990-1996) indicates annual average withdrawals of 42,027 Million Gallons per Year (MGY) in Morris County.¹⁶ Of this, about 53% is drawn from ground water sources and the remainder is from rivers and reservoirs. Of the total withdrawn, it is estimated that about 47% is exported,

leaving approximately 22,294 MGY to serve residential and nonresidential activities within Morris County. Exported water is primarily from surface water sources.

Public Water vs. Private Wells

In the early 1970s, about 68% of households in Morris County received their water from a public water supply provider. The remainder relied on individual onsite wells.¹⁷



Source: Morris County Master Plan – Water Supply Element(s) 1971, 1982, 1994, and the NJDEP.

¹² Last data available for NJDEP estimates of water demand is 1999.

¹³ July 2005, American Community Survey, US Census Bureau.

¹⁴ Public and nonpublic, community and non-community, residential and nonresidential.

¹⁵ 2000 Census

¹⁶ www.state.nj.us/dep/njgs/enviroed/infocirc/withdrawals.pdf

¹⁷ 1971 Morris County Master Plan – Water Supply Element, Elson T. Killam Associates, Inc. May 1969, May 1970, reprinted Oct. 1971, Table 1.



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Over the next two decades, the proportion of households serviced by domestic wells decreased as opportunities to connect to a public water supply system increased.

As illustrated, this trend recently reversed, as the percentage of households relying on individual wells has increased to levels not seen since before 1982. One reason may be that much of the development occurring over the last ten years has been in more rural areas of the county, often on larger lots, where onsite wells may be the only source for water.

Public Water Supply Systems

At present, the NJDEP identifies 59 separate public water systems serving the county's 39 municipalities.¹⁸ Morris County municipalities and their public water supply sources are identified in the following table.

Municipality	Major Water Systems ¹⁹
Boonton Town	Boonton WD
Boonton Twp.	Denville WD, Boonton WD, Boonton Twp. WD, Mt. Lakes WD
Butler Boro.	Butler WD
Chatham Boro.	Southeast Morris County MUA, Chatham Boro. WD
Chatham Twp.	NJ American Water Co. (Short Hills)
Chester Boro.	NJ American Water Co., Randolph WD
Chester Twp.	NJ American Water Co. (Short Hills.), Four Seasons at Chester
Denville Twp.	Denville WD, Mt. Lakes WD, Rockaway Boro. Water Utility
Dover Town	Dover WD, Rockaway Water Utility
East Hanover Twp.	E. Hanover WD
Florham Park Boro.	NJ American Water Co. (Short Hills.) Florham Park WD
Hanover Twp.	Southeast Morris County MUA
Harding Twp.	Southeast Morris County MUA, NJ American Water Co. (Short Hills), Lake Shore Water Co.

Jefferson Township	Mt. Shore WD, Jefferson WD, Jefferson Twp. Water Utility (Lake Hopatcong, Milton & Padere), Sun Valley
Kinnelon Boro.	Kinnelon WD, Butler WD, Fayson Lakes Water Co.
Lincoln Park Boro.	Lincoln Park WD, Lincoln Park Jacksonville System, Pequannock WD (Main and Cedar Crest)
Madison Boro.	Madison WD
Mendham Boro.	NJ American Water Co. (Short Hills), Randolph WD, Sisters of Christian Charity
Mendham Twp.	Southeast Morris County MUA, NJ American Water Co. (Short Hills)
Mine Hill Twp.	Mine Hill WD, Wharton WD, Dover WD
Montville Twp.	Montville MUA, Boonton WD, United Water Jersey City, Plausha Park Water Co.
Morris Twp.	Southeast Morris County MUA, Sisters of Charity South Elizabeth
Morris Plains Boro.	Southeast Morris County MUA
Morristown Town	Southeast Morris County MUA
Mt. Lakes Boro.	Mt. Lakes WD, Denville WD, Parsippany-Troy Hills WD
Mt. Arlington Boro.	Mt. Arlington WD (Kadel & Main System) Roxbury WD (Shore Hills), United Water (Arlington Hills)
Mount Olive Twp.	Mt. Olive WD (Goldmine, Sand Shore, Pinecrest, Lyn, Jucket, Tinc Farm, Carlton Hill, Village Green and Main Systems), AWM Country Oaks, Mt. Olive Villages WD, NJ American Water Co. West Jersey, Short Hills and ITC) NJ Vasa Home Water, Hackettstown MUA
Netcong Boro.	Netcong WD
Parsippany Troy Hills	Parsippany Troy Hills WD, Denville WD, Mt. Lakes WD,
Long Hill Twp.	NJ American Water Co. (Shore Hills.)
Pequannock Twp.	Pequannock WD (Main and Cedar Crest)
Randolph Twp.	Randolph WD, Denville WD, Morris County MUA, Dover WD
Riverdale Boro.	Riverdale WD
Rockaway Boro.	Dover WD, Rockaway Water Utility
Rockaway Twp.	Rockaway WD, Denville WD, Wharton WD, Picatinny Arsenal –ARDEC, Hoffman Homes
Roxbury Twp.	Roxbury WD (Evergreen, Lookout Mountain, Say View, Shore Hills) Kenvil Works Site, Netcong WD, Roxbury Water Co.
Victory Gardens Boro.	Dover WD
Washington Twp.	Washington MUA (Hager, Schooleys Mountain), Hackettstown MUA, Sherwood Village, Cliffside Park Assoc. Inc.
Wharton Boro.	Dover WD, Wharton WD

¹⁸ Mobile home parks excluded.

¹⁹ NJDEP Source Water Assessment Program and NJDEP Division of Water Supply.



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Major Water Supply Activities

Morris County Water Balance Modeling

While some data exists concerning water demand characteristics, the actual or potential amount of water available for county use or for export poses an extremely difficult question which has, to date, not been adequately addressed due to the complexity of the many factors that must be considered. Morris County is currently engaged in an effort to develop a comprehensive water balance model that can be used to estimate the current amount and quality of ground and surface water supplies in Morris County. The model will help determine the long term sustainability of water supply sources in the county and will address watersheds, aquifers, stream flow, water quality, groundwater levels, geology, rainfall, aquatic biology, riparian ecosystems and discharges to waterways. Water supply sources will be determined on the basis of each of the six major watersheds located in the county (Rockaway, Upper Passaic, Raritan, Whippany, Musconetcong and Pequannock). The model is anticipated for completion by the end of 2007. Its use will help guide decisions regarding future development, the ability to meet near term and long term water supply needs in the county, and the ability to transfer water out of the county.

Scrub Oaks Mine Storage Concept Plan

The Morris County Municipal Utilities Authority is pursuing supplemental water sources in an effort to augment the current ground water inventory supplied from the Raritan River Basin and to comply with the State Water Supply Policy of reducing

dependency on Inter-Basin Transfers.²⁰ One alternative proposes to utilize an abandoned mine as a water storage reservoir. The proposed site, Scrub Oaks Mine in Mine Hill Township, could be utilized to store as much as 1.8 billion gallons of water from ground water sources and surface water diverted from the Musconetcong River, Lake Hopatcong and the Rockaway River during high water periods. The county is undertaking a feasibility study for this project, which is expected to be concluded in 2007.

Wastewater Treatment

The availability of potable water is a necessity for residential and nonresidential development. Equally critical is the ability to adequately treat and dispose of wastewater. Higher density residential and higher intensity nonresidential developments are particularly dependent on advance wastewater treatment capabilities.

Wastewater treatment is generally accomplished by one of three main systems; municipal/regional systems, non-municipal systems (package plants) and on-site systems (septic systems). The limits of treatment and disposal are governed by the NJDEP permitting criteria, by wastewater treatment technologies and by the capacity of land and waterways to assimilate treated waste within parameters necessary to maintain public health and natural ecosystems.

Municipal Regional Systems

Municipal/regional systems include the sanitary sewer conveyance system, i.e., the pipelines that run under the streets, and the sewage treatment plants where sewage is treated and later discharged. A "sewer service area" includes areas that have sewer infrastructure,

²⁰ The MCMUA's main supply of water is from the Raritan River Basin; however, most of its service area is in the Passaic and Delaware River Basins.



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and/or have an NJDEP approved Wastewater Management Plan, allowing for the extension of sewer infrastructure.

During the late 1960's and early 1970's, Morris County was served by 15 major municipal/regional sanitary sewer facilities, providing approximately 25 million gallons of wastewater treatment per day.²¹ These major municipal/regional systems served about 20% of the land area of the county.²² In addition, the county contained many smaller "package" plants that served individual industries, schools and medical institutions and residential developments.

The 1971 Morris County Sanitary Sewerage Facilities Element supported the replacement of many of the smaller, privately owned package plants with larger regional sewerage collection and disposal systems. Subsequently, the Federal Water Pollution Act of 1972 provided both the financial and the regulatory support for the expansion and upgrade of many public sewer treatment facilities and the expansion of sewer treatment areas. Following passage of this Act and subsequent amendments, on-going facility upgrade and expansion provided service to previously un-served areas. These changes allowed the elimination of many small package treatment plants as the users of these systems began connecting to the new or expanded municipal and regional sewage treatment systems.

During the last 20 years, the capacity of sewage treatment facilities in the county has been limited by the NJDEP and the courts. Even so, permitted expansions since the 1970's have significantly increased the aggregate capacity of these facilities and the amount of land area served by public sewer systems in the county. At present, 19 public sewer service facilities serve Morris

County and approximately 43% of Morris County is within an approved sewer service area.²³

The 19 current sewage facilities have an estimated treatment capacity of about 67 million gallons per day (MGD).²⁴ Much of this capacity is; however, already being used and/or is committed or otherwise restricted by NJDEP requirements. Adjusting for existing flows, committed but unused capacity and NJDEP operating requirements, the remaining available "hypothetical" capacity to serve new development is estimated to be about 11.6 MGD or about 17% of the total capacity.²⁵ This composite figure can be characterized as "hypothetical" since its use is limited by individual facility situations. Some facilities have little or no remaining capacity, while others have capacity but may be unable to utilize it due to physical, contractual or regulatory limitations.

Wastewater Management Planning Agencies

There are 24 Wastewater Management Planning Agencies in Morris County that oversee local sewer service planning and associated wastewater treatment facilities.²⁶ These agencies are currently responsible for the preparation of Wastewater Management Plans (WMP), which must be consistent with the overall Statewide Water Quality Management Plan and State Water Quality Management

²³Based on NJDEP GIS data found at www.nj.gov/dep/gis/newdata.htm This information is currently being reviewed by the county as part of an effort to confirm NJDEP sewer service information.

²⁴ NJDEP – (<http://datamine.state.nj.us/dep/DEP-OPRA/Index2>). Some plants located outside of Morris County. Not all capacity available to serve Morris County. Excludes Skyview in Roxbury as no longer active. MCDPDT analysis. Includes NJDEP permitted capacity less unused but dedicated flow.

²⁵ MCDPDT analysis of NJDEP Sewerage Treatment Permits. Includes NJDEP permitted capacity less unused but dedicated flow.

²⁶ NJDEP Division of Watershed Management website 5/06 (www.nj.us/dep/watershedmgmt/docs/wmpagencylist.pdf)

²¹ 1971 Morris County Master Plan – Sanitary Sewerage Facilities Element, Table 1.

²² 1971 Ibid., pg. 3.

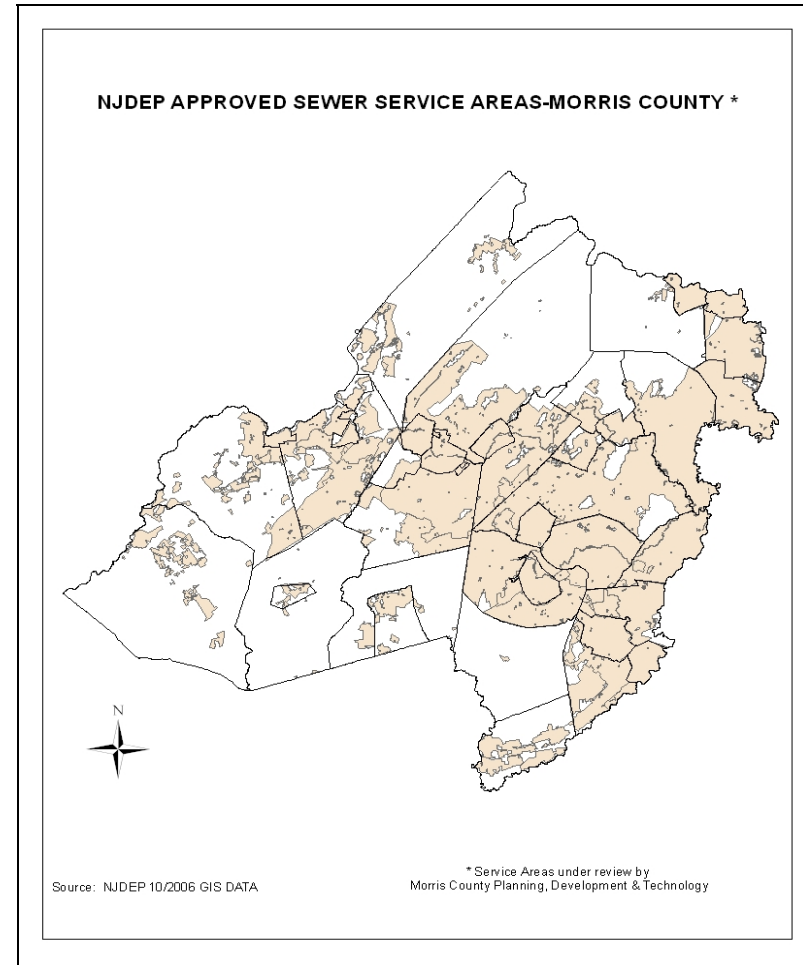


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Plan Rules (N.J.A.C.7:15) overseen by the NJDEP. The location of sewer service areas, treatment facilities, expansion of facilities and levels of treatment must be consistent with the Statewide Wastewater Quality Management Plan and associated rules.

In most cases, these agencies own and manage treatment facilities, but in other cases, they contract with outside treatment facilities to provide service. It should be noted that treatment plants are not necessarily located in the municipality they serve, and one treatment agency may be associated with wastewater treatment in several municipalities. There are also instances where a treatment facility serving a portion of Morris County is located outside of the county.

The wastewater treatment agencies and facilities are often within the direct control of the municipalities through their local department of public works. In other cases, a regional authority has been established to provide sewerage treatment services to multiple municipalities. Municipalities often address their treatment needs by using a combination of their own treatment facilities and that of a regional authority.



*Municipal Regional and Non-Municipal Systems as Defined by the NJDEP
NJDEP Adopted Sewer Service Area Mapping 10/2006*



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Wastewater Management Planning Agency	Municipalities Served by Agency
Chatham Township	Chatham Township
Chester Borough	Chester Borough
Chester Township	Chester Township
Florham Park Sewerage Authority	East Hanover Township, Florham Park Borough, Hanover Township, Morris Township
Hanover Township Sewerage Authority	Hanover Township
Harding Township	Harding Township
Jefferson Township	Jefferson Township
Long Hill Township	Long Hill Township
Madison-Chatham Joint Meeting	Chatham Borough, Madison Borough
Mendham Borough	Mendham Borough
Mendham Township	Mendham Township
Mine Hill Township	Mine Hill Township
Morristown Town	Morris Township, Morristown Town
Morris Plains Borough	Morris Plains Borough
Mount Olive Township	Mount Olive Township
Mount Arlington Borough	Mount Arlington Borough
Musconetcong Sewerage Authority	Jefferson Township, Mount Arlington Borough, Mount Olive Township, Netcong Borough, Roxbury Township
Parsippany-Troy Hills Township	Mountain Lakes Borough, Parsippany-Troy Hills
Pequannock River Basin Regional Sewerage Authority	Butler Borough, Kinnelon Borough, Riverdale Borough
Pequannock, Lincoln Park and Fairfield Sewerage Authority	Butler Borough, Kinnelon Borough, Lincoln Park Borough, Montville Township, Pequannock Township, Riverdale Borough,
Rockaway Valley Regional Sewerage Authority	Boonton Town, Boonton Township, Denville Township, Dover Town, Mine Hill Township, Parsippany Troy Hills, Rockaway Borough, Rockaway Township, Victory Gardens Borough, Wharton Borough
Roxbury Township	Roxbury Township
Somerset County	Chester Township
Washington Township Municipal Utilities Authority	Washington Township

Non-Municipal Systems

Non-municipal systems provide treatment for individual or small groups of uses. These are small dedicated treatment systems designed to accommodate the needs of a specific user. Typically identified as “package plants,” these systems can be constructed and operated at a relatively low cost.

The 1971 Sanitary Sewerage Facilities Element of the Morris County Master Plan reported that there were about 70 package treatment plants operating in the county, serving individual users such as an industries, schools or shopping centers.²⁷ With the expansion of municipal/regional sewage treatment plants in the 1970’s, many of these non-municipal systems were eliminated. About 35 are still in operation, all located outside areas currently served by public sewer.

On-Site Disposal – Septic Systems

Uses not served by municipal-regional or non-municipal systems are served by individual on-site wastewater disposal systems. These systems are most commonly septic systems, which are usually employed outside of existing sewer service areas. Septic systems are absorption systems that transport wastewater effluent to groundwater by means of subsurface percolation, filtration and bacterial degradation. Typically used for individual residences, these systems include a settling tank and disposal field. In the settling tank, bacteria decompose organic matter, leaving a sludge which must periodically be removed. Wastewater flows through drains over a subsurface area where it drains into the ground. Septic system design, construction, and operation are governed by New Jersey Standards for Individual Sewage Disposal Systems.²⁸

²⁷ 1971 Morris County Master Plan – Sewerage Facilities Element, Elson T. Killam Associates, Inc. pg. 3.

²⁸ N.J.A.C.7:9A.



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The use of these systems is largely dictated by the types of soils over which they are placed and their underlying geology. These natural factors, along with the septic infrastructure, determine the effectiveness of the septic system. In the use of septic systems, protection of underlying groundwater quality from nitrate pollution is a major concern. Soils, geology and groundwater conditions determine the number of septic systems that may be installed in a given area while still maintaining groundwater quality. The allowable density of septic systems often serves as the basis for minimum lot size requirements associated with subdivisions and new construction.

Highlands Act Impact on Wastewater Facilities

The future use of sewers and septic systems in portions of Morris County will be substantially restricted due to the passage of the Highlands Water Protection and Planning Act. As described in the Land Use section of this document, the Act requires the creation of a Highlands Regional Master Plan for 88 municipalities in the region, 32 of which are in Morris County. Of these 32 municipalities, 13 contain lands in what the Highlands Act has designated as “Preservation Area.” The remainder contains lands that are located in what the Act designates as the “Planning Area.” The basis for the Highlands Act is the protection of the region’s water resources, which supply water to nearly half of New Jersey’s population, most of whom live outside the Highlands Region and outside of Morris County.²⁹

With knowledge that development of the Highlands Regional Master Plan would take at least 18 months to prepare, the NJDEP adopted a set of preemptive rules significantly reducing development potential in the Preservation Area of the Highlands

Region.³⁰ The rules eliminate all approved future sewer service areas in the Preservation Area and prohibit the extension of sewers into the Preservation Area to serve new development. The rules also impose severe restrictions with regard to the minimum area required for installing septic systems in the Preservation Area. Essentially, these rules attempt to protect water quality by severely limiting the development of any undisturbed land in the region. New subdivisions using septic systems will require lot sizes of between 25 and 88 acres each; specific minimum size will depend on calculations related to the environmental characteristics of the land in question. Recommended septic system densities and recommended modifications to sewer service areas in the Highlands Planning Area will also be proposed as part of the Highlands Regional Master Plan. Presently, compliance with these recommendations by Planning Area municipalities is voluntary; however, the NJDEP will consider the Highlands Regional Master Plan in making decisions throughout the Highlands region.

Consequently, the restrictive standards for septic systems in the Preservation Area of the Highlands severely limit new development in Morris County municipalities within the Preservation Area. The full impact on communities with land in the Planning Area will depend on the final recommendations of the Highlands Regional Master Plan, the willingness of Planning Area communities to conform to the Regional Master Plan standards (which are voluntary in the Planning Area) and potential changes to NJDEP policies as a result of the findings of the Highlands Regional Master Plan.

²⁹ Highlands Act, P.L. 2004, c 120, pg. 1.

³⁰ N.J.A.C. 7:38, May 9, 2005, amended December 19, 2005.



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Trends / Issues

Water Supply

- ◆ As the population of the county increases, existing water supply and distribution systems will face increasing demands for adequate water supply. Water purveyors will need to ensure that the infrastructure and supply is adequate to serve the existing and future demands of industrial and commercial development, as well as the demands of residential users. Without a dependable supply of potable water, existing development can not be sustained and future development will not be possible.
- ◆ Recognizing the importance of water supply to the future of the county, the issue of water availability and use is currently undergoing intense scrutiny by state, regional and local governments. At this time, both Morris County and the Highlands Council are studying the issue of water supply. The findings of these studies can be controversial, as different stakeholders often hold conflicting views on water supply conditions and their implications for both the county and the region. The availability of potable water will be a central component of land use and environmental debate for the foreseeable future.
- ◆ *New Jersey Water Supply Master Plan* - The New Jersey Statewide Water Supply Master Plan was adopted in 1982 and it was the first comprehensive statewide plan to examine all aspects of water supply management. The Plan recommended projects and programs for the satisfaction of the state's water supply needs; provided a framework for the future planning, evaluation, and implementation of specific projects to meet those needs;

and provided a mechanism for update and revision. Last updated over 10 years ago, the plan predicted that the state would run out of water by the year 2040, based on a projected population of 8.25 million. Since the state's population is currently estimated at about 8.5 million, it is clear that an update to this plan is needed.³¹

Unfortunately, no formal date has been set for the much anticipated release of a comprehensive update. The information found in the updated Statewide Water Supply Master Plan will be important in planning for future growth and development throughout the state, and will be of particular concern in Morris County, a key provider of water for millions of out-of-county residents. This fact is currently having repercussions that will impact Morris County for years to come, most notably manifest in the recently adopted Highlands Water Protection and Planning Act.

- ◆ Highlands Water Protection and Planning Act and Highlands Regional Master Plan – In instances where there are supply or contamination problems, those that rely on private wells are often required to connect to public water sources. The ability of the county to provide water for its citizens and to expand public water availability to those currently relying on private wells is restricted by the Highlands Act. Along with prohibition of sewer service in the Preservation Area, the act also limits the construction of new public water systems or the extension of existing public water systems to serve development in the Highlands Preservation Area, except in the case of a demonstrated need to protect public health and safety.

³¹ US Census, American Community Survey, 2005.



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The Highlands Council has prepared a Draft Highlands Regional Master Plan that includes an examination of water supply conditions throughout the Highlands Region, which includes 32 Morris County municipalities. The current Draft Plan identifies the majority of that portion of Morris County in the Highlands Region as within a “Current Water Deficit Area.” The remainder of the county is identified as an “Existing Constrained Area.”

A “Current Water Deficit Area” is defined as an area where existing water uses exceed available water resources and where there is a high risk to water supplies, the integrity of Highlands waters and the aquatic ecosystems that depend on these resources. In these areas, it is the intent of the Highlands Plan to reduce water use, primarily through capacity and environmentally-based restrictions on the intensity and placement of new development, while at the same time promoting increased water recycling and best management practices. “Existing Constrained Areas” are areas located upstream from the existing “Water Deficit Areas” where further reduction of flows would exacerbate the downstream deficit situation. There is currently much debate and controversy over these findings with regard to water availability. As the plan is developed, various questions regarding the methodologies used and the data employed for the study will need to be addressed.

The implementation of the development restrictions and the environmental performance standards found in the Draft Highlands Regional Master Plan will severely limit additional water diversions within Morris County and the Highlands Region. Those portions of the county within

the Preservation Area will be compelled to adhere to the water withdrawal and protection standards contained in the plan. These standards are still evolving, but they will most certainly limit the extension of public water facilities and impact the ability to drill new wells and/or draw additional water from surface water supplies. The number of municipalities in the Planning Area that voluntarily decide to conform to the Highlands Regional Master Plan will also impact the manner in which water is used in region. The impacts of these proposed standards are not yet known.

- ◆ Morris County Water Balance Model - The “Morris County Water Balance Model” project is anticipated for completion by the end of 2007 and will provide valuable information to help guide decisions regarding future development. This effort was begun by Morris County prior to the Highlands Council’s review of water supply conditions. The model being developed will follow a more definitive methodology than that being used by the Highlands Council to identify the ability of Morris County to meet near and long term water supply needs. The model will also address the issue of water transfer out of the county and its future implications. As a county-based, rather than regionally-based analysis, the information generated will be directly pertinent to the state of *local* water supply issues. When completed, this model will be available to the Highlands Council and to other state agencies to help refine water supply findings for the county.
- ◆ As the amount of water demand in the county attributed to local or regional use continues to grow, real or perceived water deficit issues can also be addressed through the more efficient use of groundwater recharge techniques and conservation efforts. The use of engineering, site and building design techniques that place more water back into



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the ground and prevent its runoff to rivers and streams can increase water supplies in the county, while accommodating new development or redevelopment projects. The supply of water in the county could be significantly improved by the use of increased recharge of groundwater. This could increase local water supplies, as well as the supply available for out-of-county transfer.

- ◆ Clearly equal to the issue of water supply is the reality of water demand and the careful management of water as a resource. This management extends significantly to the end users of the supply and their ability to conserve water and avoid waste. Water scarcities may be reduced or mitigated by reducing waste all along the water distribution system. This is particularly important in Morris County since so much of the water supply from local rivers and reservoirs makes its way to more urbanized areas to the east where aging infrastructure may be responsible for significant water loss. Improvements to the infrastructure located in these urban areas would drastically reduce water requirements and help eliminate potential water deficits.
- ◆ Increased water conservation will require that end users of Morris County and “Highlands” water be made at least partially responsible for contributing to the preservation of the lands that generate the water supply. The issue of a reasonable water fee or water tax to be paid by the out-of-region users of Highlands Region water is one that must be seriously considered. Such a fee, spread over the millions of beneficiaries of Highlands Region water, would help compensate property owners in the Highlands Preservation Area for the severe restrictions being imposed on them in the name of state-wide water

protection. A water use fee would also motivate Highlands water consumers to conserve water due to increased costs.

- ◆ Statewide Stormwater Management Rules – Recently, new Statewide Stormwater Management Rules were adopted that will reduce water quality degradation attributed to nonpoint sources of pollution from new development and redevelopment projects.³² As required by the Municipal Land Use Law and state stormwater regulations,³³ municipalities are required to prepare stormwater management plans and to implement these plans through related stormwater control ordinances.³⁴ These new rules set forth the required components of regional and municipal stormwater management plans, and establish stormwater management design and performance standards for new development.³⁵ Generally, these plans address groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards on major new development projects. Most municipalities in the county have completed these plans and are in the process of completing and adopting stormwater control ordinances, which must be approved by Morris County.
- ◆ Most pollution was once attributed primarily to industrial activities and other “point” sources. The majority of local pollution is now from “nonpoint” sources such as fertilizers, herbicides, pesticides, petroleum residues, paints and other wastes, that enter the water supply as stormwater runoff. NJDEP studies indicate that, while most streams and lakes

³² N.J.A.C. 7:8.

³³ N.J.A.C.7:14A-25.

³⁴ Municipal Land Use Law, L. 1975, c. 291 C: 40:55D-93.

³⁵ NJDEP regulations adopted on February 2, 2004.



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are healthy enough to support drinking water supplies, there continues to be waters that fail to meet NJDEP standards for aquatic life, fish consumption and recreational use.³⁶ Recent changes to statewide stormwater management rules will provide increased protection against nonpoint pollution from new development and redevelopment. However, more education is needed to support greater environmental stewardship from each resident so that the amount of such materials that enter the waste stream and runoff from each local property is substantially reduced.

- ◆ Increased pressures to preserve lands for groundwater recharge and water supply protection may have long term impacts on local open space land preservation efforts. Both Morris County and local governments have long provided funding for the preservation of land for watershed and water supply protection. In the future; however, this could become an even more significant factor in the prioritization of preservation funding and of targeting specific sites for acquisition.

Wastewater Treatment

- ◆ Many public sewer facilities are at or approaching their maximum regulatory limits. Substantial growth within the county will be limited by the remaining capacities of these systems, their potential for expansion and NJDEP connection requirements. Recent NJDEP rulemaking will severely limit any future expansion of sewage treatment capacity. The use of septic systems has also been subjected to additional regulation and restriction by the

NJDEP in the Highlands Preservation Area. The use of septic systems throughout the state will also be subject to additional regulation and restrictions in the recently released draft NJDEP Wastewater Management Rules. Other state actions impacting these issues include the following:

- NJDEP rules require that sewer service treatment facilities operate in conformance with an approved Wastewater Management Plan.³⁷ These rules require that these plans be adopted and renewed every six years in connection with continued sewer service approvals. Treatment plants throughout the state are operating under previously approved plans that have expired. In many instances, applications have been made for renewal of plant approval but these have not been acted upon by the NJDEP for various reasons.
- In the fall of 2005, the NJDEP issued several public notices in the New Jersey Register proposing amendments to Area-wide Water Quality Management Plans that would revoke all future sewer service areas in State Plan Planning Areas 3, 4, and 5 that were not included in a Wastewater Management Plan (WMP) currently approved and adopted in accordance with NJDEP rules. If adopted, these amendments would have revoked almost all WMPs in Morris County. After much public controversy concerning this proposed action, the NJDEP withdrew the amendments. The NJDEP has drafted new Wastewater Management Rules, which are currently under review.

³⁶ New Jersey Integrated Water Quality Monitoring and Assessment Report, NJDEP, December 2006, pg. 7.

³⁷ New Jersey Register October 17, 2005. Wastewater Management Plan rules established at N.J.A.C. 7:15-5.23.



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- In the summer of 2005, the NJDEP proposed establishing new pollution limits as part of their proposed Water Quality Management Planning Rules. These limits are expressed in terms Total Maximum Daily Loads (TMDL) with emphasis on controlling phosphorous loading into the Passaic River Basin.³⁸ The TMDL mechanism is used to identify all the contributors to surface water quality impacts and the TMDLs identified provide a measure for setting goals for load reductions for specific pollutants as necessary to meet surface water quality standards.

Compliance with new TMDL standards will limit the ability of some wastewater treatment facilities to make maximum use of their design capacity, effectively reducing their existing treatment capacity and possibly eliminating plans for future treatment facility expansion. If facilities are required to upgrade to meet the new TMDL standards, this cost will ultimately be passed on to treatment plant customers.

- As part of the proposed Water Quality Management Rules, new nitrate dilution standards are anticipated that may require more land to facilitate septic systems, thereby increasing minimum lot sizes in areas that rely on

septic system wastewater disposal. These standards will apply throughout New Jersey.

- The newly proposed Water Quality Management Rules may reduce the number of Wastewater Management Planning Agencies by assigning this task to each of New Jersey's 21 county governments. If adopted, counties would become responsible for approving municipal wastewater management plans in accordance with NJDEP requirements. In effect, the county would act on behalf of the NJDEP in overseeing development of plans and directing municipalities to amend their development regulations accordingly. Under current enabling legislation, counties have no authority to require municipalities to amend their development regulations; therefore, the enactment of such a proposal is at this time unclear. If such a rule is adopted, it would mean that counties would be required to undertake a substantial new role in the planning and implementation of sewer service facilities and local planning.
- As previously noted, the adoption of the Highlands Water Protection and Planning Act prohibits the extension of new public wastewater facilities into any part of the Preservation Area, even where these facilities are part of a previously approved sewer service area.³⁹ Previously approved sewer service areas in the Preservation Area were revoked by the Act. These limitations will severely limit new

³⁸ Total Maximum Daily Loads (TMDLs) represent the assimilative or carrying capacity of the receiving water taking into consideration point and nonpoint sources of pollution, natural background, and surface water withdrawals.

³⁹ Highlands Water Protection and Planning Act, P.L. 2004, c.120 at C.58:11A-7.1. Extensions may be permitted where found necessary by the NJDEP to address public health or safety issues.



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development and will also impact existing customers of the effected sewer system. Facilities that were built or expanded with the expectation of spreading costs to future users in the area now designated as “Preservation” are now limited to the existing customer base that will bear the full costs of the improvements.