

**INTRODUCTION**

The Utilities Service Plan Element reviews the current status and adequacy of sanitary sewerage treatment facilities, public water supply, solid waste disposal, and stormwater management facilities. The future utility needs are then analyzed based upon anticipated population use demands. This establishes parameters for monitoring the adequacy of these systems and recommends improvements as required to meet anticipated needs.

**STATUTORY AUTHORIZATION**

This section of the Master Plan was prepared in accordance with the Municipal Land Use Law, N.J.S.A. 40:55D-28b:

(5) A utility service plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment, solid waste disposal and provision for other related utilities, and including any storm water management plan required pursuant to the provisions of P.L.1981, c.32 (C.40:55D-93 et seq.);

**UTILITIES SERVICE GOALS AND OBJECTIVES**

1. To maintain the quality of municipal services and community facilities in order to assure a high quality of life for present and future Township residents.
2. To limit development within the designated sewer service area (SSA) so as not to exceed the capacity of the sewage treatment plant.
3. To consider allowing alternative and innovative on-site wastewater disposal systems outside the SSA's.
3. To limit centralized sewer infrastructure to existing SSA's. .
4. To limit development to densities and intensities that can be adequately served by existing and planned private and municipal capital facilities and the natural and built infrastructure, and not purchasing additional wastewater treatment capacity to permit collection line extensions.
5. To limit development to densities and intensities that will retain the remaining natural areas of the Township and protect sensitive environmental areas.
6. To encourage the use of design techniques that result in energy and water conservation and minimize the impact of development on the everyday environment.
7. To assure that public and private water supplies are adequately maintained to provide high quality water to meet the needs of Bernards residents and

businesses.

8. To provide realistic opportunities to meet the mandate of the Telecommunications Act of 1996 that minimize negative visual impacts and protect residential neighborhood character.
9. To assure ample, open, pervious land area is preserved on each lot in order to provide for infiltration and recharge to groundwater aquifers.
10. To encourage development of alternative energy sources in appropriate settings while also protecting desirable neighborhood character.

### **WASTEWATER TREATMENT**

The Bernards Township Sewerage Authority currently maintains a policy not to expand the Township's sewer districts and major sewer infrastructure beyond where sanitary sewer infrastructure improvements currently exist. Consistent with this policy, there will be no extension of sewer lines outside the existing sewer districts.

There are currently five sewer service areas within Bernards Township as shown on Figure IX-1. These five sewer service areas include the Bernards Township Sewerage Authority (The Authority), the Environmental Disposal Corporation (EDC), the Veterans Administration Hospital Complex Treatment Plant, and the Pingry School serviced by the Somerset/Raritan Valley Sewerage Authority Sewer System. Somerset County is presently preparing a Wastewater Management Plan for all Somerset County municipalities, including Bernards Township for approval by the New Jersey Department of Environmental Protection. This Plan provides an update to the Township sewer service areas based on projected Township demands at full build-out and environmental constraints.

The Bernards Township Sewerage Authority (The Authority) operates the Harrison Brook Treatment Plant, which serves most of the sewered area of the Township. The plant is situated on Martinsville Road at the southern part of the Township at the confluence of the Harrison Brook and the Dead River. The plant has a design capacity of 2.5 million gallons per day (MGD). The current Wastewater Management Plan provides for no expansion of the current Authority service area.

The EDC service area is within the Raritan River basin and a portion of the Dead River basin, and serves The Hills Development within both Bernards and Bedminster Townships. The EDC sewage treatment plan has a design flow capacity of 2.1 MGD and an average daily flow of 1.4337 MGD.

The Exxon Station on King George Road is sewered by the adjacent Warren Township sewage treatment plant.

The Veterans Administration Medical Center Complex off Valley Road has its own sewage treatment plant. The plant has a design capacity of 400,000 GPD and an average daily flow of 0.1183 MGD.

The fourth sewer service area only serves the Pingry School, located off Martinsville Road in the southern section of the Township. Through a special agreement, the Pingry School is connected to the Somerset/Raritan Valley Sewerage Authority Sewer System who has a design capacity of 21.3 MGD and an average daily flow of 19.64 MGD.

According to the current Wastewater Management Plan, all locations outside of the four existing sewer service areas must use individual on-site septic disposal. The Plan recognizes that certain areas will not be suitable for traditional on-site septic systems due to severe soil limitations. On-site disposal methods are the required means of wastewater treatment for those areas outside of the sewer service areas. These areas of the township were zoned for larger lots that can accommodate on-site disposal on lots with suitable soils.

### **Municipal Wastewater Treatment Issues**

#### **Harrison Brook Treatment Plant**

The capacity of the Harrison Brook sewage treatment plant (STP) is 2.5 MGD. The average monthly flow in 2008 was 1.672 MGD. However, the NJDEP uses the highest quarterly average as their guide. The highest quarterly average in 2008 was the first quarter in which the STP processed an average of 2.150 MGD. The future residential and commercial buildout, within the sewer service area, including the current vacant office space will generate an additional 0.225 MGD. Therefore the entire sewer district, based on existing and future development is expected to generate on average a minimum of 2.375 million gallons per day. The current and anticipated flows to the STP are precariously close to the capacity of the plant, and expansion of the SSA is strongly discouraged.

According to recent DEP requirements, when a sewer plant reaches 80 percent of its design capacity, the operator is required to submit documentation on how they intend to guard against over capacity. In early 90's, the Authority received an 80 percent notice from NJDEP and has submitted documentation to show how they intend to guard against exceeding capacity.

The Bernards Township Sewerage Authority should continue to allow connections to its sewer system from within its sewer service area. While the low flow months see flows of less than 1 MGD, during severe rain events the maximum daily (24 hour) flow can be as much as 6.061 MGD (December, 2008). One of the largest sources of inflow is the connections of sump pumps into the sanitary sewer system.

These illegal connections are being vigorously pursued by the use of in pipe video cameras during wet weather. The Authority is very much aware of this condition and has on-going maintenance projects and inspection programs to reduce the inflow and infiltration into the sanitary sewer lines.

The non-sewered areas of Bernards have previously been zoned for one unit per two or three acres. However, because of environmental constraints, and due to the lack of public sewer infrastructure throughout these Districts, the Land Use Plan recommends a reduction of density (increased lot sizes) that respects the carrying capacity limitations of the natural systems and protects groundwater qualities.

### **Community Septic Systems**

The current Wastewater Management Plan only provides for individual septic systems less than 2,000 gallons per day. However there is a current environmental movement to use common created wetlands and other alternate mechanisms to clean and process larger volumes of effluent. The Planning Board should be receptive to these types of waste water treatment only if it can be demonstrated that individual on-site disposal of waste water can be accomplished on each proposed lot, including an approvable primary and reserve septic system location. That is, all proposed lots shall meet all of the requirements for individual septic systems and have received Board of Health or NJDEP approval prior to Planning Board consideration of a common septic system. In this manner if there is a failure of the common system, each property owner will have the ability to construct an individual septic system on their own lot. In that regard, the locations of approved soil tests for the future septic systems on each lot should be covered with an easement for future septic system use. In addition, the use of a common septic system shall not increase the zone density or increase the lot yield. Nevertheless, there is always a concern that a homeowners association or other entity will fail to maintain the system. Therefore great care should be given in the review and approval of the entity established for the operation and maintenance of the common system.

### **Individual On-Site Wastewater Disposal Systems**

These systems, commonly called septic systems, are designed for use by one realty improvement, such as a home. As development continues to expand onto marginal lands outside the SSA, it is important to assure that a septic system can function properly and that adequate provisions are possible to repair or replace a failing system. This objective has been advanced by requiring that an approvable primary and reserve septic system location are available on each lot.

Nitrate dilution modeling has been increasingly used to measure the capacity of the natural environment to assimilate septic effluent, since nitrates are highly mobile in groundwater and pose significant health risks. In 2003, the Bernards Master Plan

relied on the nitrate dilution approach developed for the State Development and Redevelopment Plan, which led to the land use plan recommendations for lower residential densities in septic service areas. These proposed districts, CR-1 (7 acres/unit) and CR-2 (10 acres/unit), were designed to limit development to respect the natural carrying capacity in septic-served areas.

Bernards has not yet adopted the zoning changes outlined in the 2003 Land Use Plan, but in the interim, additional studies have also suggested the need to reduce permitted development densities in septic service areas. NJDEP has adopted a nitrate dilution model that will require *maximum* residential densities significantly lower than the current residential zoning. Additionally, a groundwater evaluation (Mulhall Study), commissioned by Bernards Township, recommended maximum residential densities far lower in some cases than even the NJDEP septic densities. These considerations are addressed in detail in the Conservation and Open Space Plan.

### **WATER SUPPLY**

As of January 1, 2009, Bernards Township had 27,850 residents living in 10,307 dwelling units. These data indicate a dwelling unit density of 2.7 persons per unit. Based on Bernards' population and the average daily demand of 75 gallons per person indicated in N.J.A.C. 7:10-12.6, Bernards Township residents currently consume approximately 2.09 million gallons per day, or 762 million gallons of water per year.

#### **Public Water Supply**

New Jersey American Water (NJAW) provides public water supply to most areas of Bernards Township. The Township is located in the western portion of the NJAW's Passaic Basin System service area and is served by a combination of interconnected sources of supply that provide for highly redundant and reliable water service. These sources of supply include groundwater from nearby rock wells and surface water from the Passaic and Raritan Rivers. Passaic River sources include NJAW's Canoe Brook Water Treatment Plant in Millburn and purchased water from the Passaic Valley Water Commission Treatment Plant in Totowa. The Raritan River sources include NJAW's Raritan-Millstone and Canal Road Water Treatment Plants in Bridgewater Township and Franklin Township. These sources are delivered through various pumping stations and interconnections to five separate pressure gradients to provide adequate pressure to all areas of the Township.

#### **Individual Water Supply (Wells)**

Within large portions of the township, the source of drinking water for residents is groundwater supplied from individual, on-lot wells in fractured bedrock aquifers.

The hydrogeologic characteristics of these aquifers are dependent on the type of bedrock and nature and interconnection of fractures and other openings. The type of bedrock limits groundwater storage and transmission, recharge rates, sustained yields, interference effects, quality, and contaminant removal/dilution rates. An April 2008 "Evaluation of Groundwater Resources of Bernards Township", prepared by M2 Associates Inc., has informed Bernards Master Plan efforts.

In areas of Bernards Township, with dense, hard, poorly weathered bedrock; few fractures; hilly terrains; and steep slopes; stream channels will start at high elevations. In these areas, the slopes provide sufficient gradient to induce surface-water runoff and the low permeability of the bedrock limits the infiltration capacity. As a result, groundwater in the underlying bedrock aquifer systems is not significantly recharged and the water quickly runs off the land surface or through flows immediately below the ground surface often along the top of bedrock to the nearest stream channel.

Based on soils mapping completed by USDA-NRCS, approximately 27 percent of the township has slopes less than 2 percent and much of these areas contain wetlands or can be flooded and therefore, are not significant groundwater recharge zones. Slopes beneath approximately 33 percent of the township are equal to or exceed 6 percent, which is sufficient to promote surface-water runoff in lieu of groundwater recharge. Furthermore, nearly 73 percent of the soils beneath Bernards Township are considered to have a hydrologic soil group code of C or D. These types of soils have very low infiltration rates and therefore, would have high rates of surface-water runoff. Soils and slopes beneath much of Bernards Township promote surface-water runoff in lieu of groundwater recharge.

Therefore ample, open, pervious land area must be preserved on each lot in order to provide sufficient land area for infiltration to recharge the groundwater aquifers.

### **SOLID WASTE**

In 1987, the municipal landfill off Pill Hill Road was closed. In accordance with strict NJDEP landfill closure requirements the Township capped the landfill in 1995. Solid waste is now picked up by private haulers and brought to the Bridgewater Transfer Station or other approved facilities for ultimate disposal in accordance with the Somerset County Solid Waste Management Plan.

The prior municipal landfill area (Pill Hill Recycling Center) is currently used as a recycling center for vegetative waste and source-separated Class B recyclables, electronics, paper & corrugated, carpet, tires, televisions, MRP (mixed recyclable plastics), textiles, and various metals are also accepted. Motor oil and fluorescent light bulbs are accepted at our DPW facility at 277 South Maple Ave. In addition, Township residents currently can drop off bulky items at the recycling area. At this time, the Township has roll-off truck chassis and roll-off containers to handle this operation, and has incorporated a wood mulching machine into the operations. This eliminates approximately 300 roll-off containers full of vegetative waste currently shipped to various locations throughout the State and allow us to make mulch which can be used locally.

In terms of curbside recycling, the Township is in compliance with the State Mandatory Recycling Law Provisions. The Township has adopted ordinances, which require the recycling of newspapers, cardboard, chipboard, junk mail, batteries, glass, plastics #1 & #2, steel, bimetal and aluminum cans. The Township also has a contract with Somerset County to pick up recyclable items. In addition, the Township's Land Use Ordinance has been revised to meet State-mandated recycling provisions to insure that new developments provide sufficient locations to handle recyclables. The Township continues to evolve in finding new ways to expand the recycling efforts to eliminate materials needlessly filling up landfills.

### **STORMWATER MANAGEMENT**

In 2005 a comprehensive stormwater management plan was prepared by the Bernards Township Engineer and approved by Somerset County. This study addressed stormwater-related conditions throughout the Township on a systematic basis, reflecting anticipated Township growth and the need to maintain a policy of zero increase in the rate of runoff after development. A policy of "over-detention" of stormwater runoff as required with the new NJDEP stormwater regulations was recommended as a means to compensate for pre-1980 development without detention facilities.

Policies established in the 2005 Stormwater Management Plan should be continued in concert with the new NJDEP stormwater management requirements. The Township should continue to provide "over-detention", as required by the new NJDEP stormwater regulations, on properties under development. On-site water quality, infiltration and detention features such as grass infiltration swales, rain gardens and dry wells should be encouraged.

In 2000, Najarian Associates prepared a comprehensive stormwater management report for the Harrison Brook watershed. This watershed has the highest levels of flooding occurrences in the Township, mainly along Newell Drive and Valley Road. The report focused on causes of the flooding and improvements that could be made to remedy the problems. All of the existing detention basins were studied for possible modifications to "over retain" the stormwater flows. Unfortunately, the results of the study found no meaningful improvements to the floodwater elevations after analyzing numerous improvement scenarios.

The report found that the older existing developments without stormwater detention were adding to the flooding problems, not the newer developments with stormwater management. The Township has received approval from FEMA for its Flood Mitigation Plan in hopes of receiving federal funds for flood proofing, elevating or buy-out of flood prone dwellings.

### **Stormwater Quality Issues**

In 2004 the NJDEP has mandated stormwater management regulations for all municipalities that “require minimum controls to compensate for the differences in the hydrologic response of the watershed from the undeveloped to the developed conditions.” The primary goal is to have a no net increase in non-point source pollution as well as volume of stormwater runoff. At present, the Planning Board abides by the New Jersey Residential Site Improvement Standards requirements for stormwater management for all residential developments. These regulations have adopted the new NJDEP stormwater regulations. The Township has also required all non-residential development to abide by these same regulations. The water quality component involves the In addition the Township has adopted an ordinance that requires stormwater management for any development that results in the creation of 1,000 square feet or more of new impervious area or one that disturbs more than 2,500 square feet of land area. In these cases, soil erosion and sediment control measures, seepage pits or other infiltration measures shall be provided by the use of non-structural methods of stormwater conveyance utilizing grass swales, infiltration, and filtration and bio-retention systems.

The Township has also adopted a riparian corridor ordinance that requires a 75 foot wide buffer to any waterway. In addition the NJDEP has recently passed regulations requiring a 300-foot wide buffer for Category 1 streams and their tributaries, a 150 foot wide buffer for streams with threatened or endangered species (exceptional resource value wetlands) and a 50 foot wide buffer on all other streams and waterways.

Bernards Township has prepared numerous Stormwater Management studies over the last 28 years. These studies have depicted the areas of the municipality that routinely experience flooding conditions. Bernards Township and Somerset County have worked diligently over the years to mitigate and improve these areas. Projects such as replacement bridges over the Dead River at Acken Road, Martinsville Road, Allen Road, Somerville Road and Meeker Road have already been reconstructed to provide safe passage from flood waters. The Mine Brook Road Bridge and Whitenack Road Bridge over the Dead River have also been completed by Somerset County. Bridge replacements over the Passaic River are in various forms of development. The bridge construction at Haas Road has been completed, and the bridge at Lord Stirling Road is under construction and new bridges at Hardscrabble Road and at Madisonville Road have already been completed. Numerous culverts and drainage improvements have also been accomplished in the last 20 years.

In regards to environmental improvements, the township has sponsored several stream bank stabilization protection projects, as well as detention basin retro-fits. The township has adopted numerous environmentally sensitive ordinances to improve water quality by protecting the stream buffers, steep slopes, wetlands and trees.

The quality of the streams in the township are very good at either non-impaired or at the high end of the range of moderately impaired. The habitat ratings are also very good at either optimal or at the high end of the range for sub-optimal.

All new development projects in the township must comply with the NJDEP Stormwater regulations, Best Management Practices and township ordinances to further improve the quality and control the quantity of stormwater runoff.

### **SOLAR ELECTRIC POWER**

Solar power from the installation of Solar Photovoltaic (PV) Panels can be a great choice for Bernards Township not only because it is a cost-effective way to meet energy needs, but because it makes a statement about conserving energy and often inspires residents to make independent conservation changes. The township is presently investigating opportunities for a solar PV installation at the Recycling Center on Pill Hill Road and at other municipal sites. The Bernards Township Sewerage Authority will be awarding a contract for a photovoltaic solar energy generating project at the Sewer Treatment Plant in the Spring of 2010. As this technology evolves, Bernards may need to develop guidelines and regulations to assure that these facilities can be assimilated without detriment to neighborhood character.

### **WIRELESS TELECOMMUNICATIONS TOWERS AND ANTENNAS**

Due to the growing use of wireless telecommunications services and the need to provide such services to the community effectively and efficiently, guidelines have been established for the siting of wireless communications towers and antennas, consistent with the Federal Telecommunications Act of 1996, which preserves local government authority to enforce zoning requirements that protect public safety, public and private property, and community aesthetics.

Towers and antennas should be located such that residential areas and land uses are protected from adverse impacts. Primary options for antenna locations should be on existing towers, buildings, or other existing structures. To the extent new towers are proven necessary, they should be encouraged in non-residential areas and designed to accommodate multiple wireless communications providers, thus minimizing the total number of towers throughout the community. In all cases, towers and antennas should be constructed and configured in a way that minimizes adverse visual impacts through careful design, siting, landscape screening, and innovative camouflaging techniques. Provisions for removal of outdated equipment and towers have been included in local regulations governing wireless telecommunications towers and equipment.