

CHAPTER 4 – PUBLIC UTILITIES AND INFRASTRUCTURE

Introduction

Infrastructure is typically limited to those services found in an urban setting made available under finite conditions. These services include water, sewer, solid waste, electricity, communications, and other related utilities. Most of these services are regulated by the Public Service Commission for rates to the customer and by State Environmental Authorities for capacity limitations and expansion. This arrangement governs the regulated cost to the consumer as well as the physical impacts expansion of such services may have on the community and environment.

This chapter provides an overview of the historic methods of provision and regulation of these services, as well as the current trends experienced by each. It also outlines existing and projected deficiencies in order to establish goals for both corrective measures and adequate realistic projections to ensure that services are extended appropriately for the foreseeable future.

Water

A water system is defined by the West Virginia Department of Health as any water system or supply which regularly supplies or offers to supply, piped water to the public for human consumption, if serving at least an average of 25 individuals per day for at least 60 days per year, or which has at least 15 service connections. In Morgan County, there are three distinct methods by which water is provided. They include: public systems owned and operated by a government entity, community systems typically owned by an association of users and maintained by private contract, and private wells that are owned and operated to serve a limited number of customers or larger single user that still meets the above criteria.

Public Water Systems

The largest public water system in Morgan County is the Berkeley Springs Water Department (BSWD), located on the corner of Wilkes and Fairfax streets in the Town of Bath. This system, which draws its supply from mineral springs located at the base of Warm Springs Ridge on park property owned by the State Department of Natural Resources, serves more than 20% of the County's residents, including the Town of Bath and surrounding greater Berkeley Springs area.

The Town leases from the State the right to take water from the springs in Bath Square to a maximum amount of 750 gallons per minute. The State rated allocation for this system is one million gallons per day. It is operated by six full time employees and has experienced a significant increase in usage over the past five years from 606,000 gallons per day (gpd) in 2001 to 785,000 gpd in 2005. Due to increased usage the department has identified both operating and capital needs, which include additional staff and replacement of segments of the aged pipes to begin in 2006. However, these changes do not solve the greater need of this system which is to identify and develop a second source of water to meet the increased demand for hook-ups.

The Town acquired the system from the Mountain State Water Company in 1963. Since that time major improvements were made in 1980 to address storage, treatment, and pumping needs. This included the addition of a 500,000 gallon storage tank and treatment system which was required due to a determination by the West Virginia State Department of Health and Human Resources that the springs are “under the influence of surface water”.

Extension and improvements to the system to serve new development must be approved by the Bath Town Council, with the cost of such extensions borne by the developer. There are no written policies and procedures for new extensions which are subject to a predefined service area determined by the PSD. Growth on the system has increased from 190,000 gpd in 1980 to 785,000 gpd in 2005.

Second largest of the public water systems, the Paw Paw Municipal Water Works was reconstructed in 1981 at which time the Potomac River replaced a series of wells as the source of raw water. This water plant provides chlorination and sedimentation treatment.

The Paw Paw water system serves 524 residents, located within the Town limits. In addition, there are several commercial and industrial accounts. Daily metered water usage has averaged nearly 70,000 gpd over the past five years, slightly decreasing over time. This system, which is owned by the Town of Paw Paw, is operated under supervision of the Water Board and receives water through an appropriation from the Potomac River. As there is limited growth currently within this area, there are no immediate plans for expansion of personnel or facilities.

Community Water Systems

Due to a growing number of larger subdivisions and industrial business parks being located along the major transportation routes throughout the County, there has been a continued increase in this type of system within the County. These systems are much like public systems in serving more than 15 connections or 25 people. However, unlike public systems they are owned by the association of users rather than a government entity and are maintained through user fees and contracted services.

Community systems as they exist across the State have experienced some difficulty with long-term maintenance and operation. This has led to increased scrutiny of the continued proliferation of these systems, most recently by the State Legislature under Senate Bill 760.

Individual Wells

There are a total of 19 private individual wells located throughout the County that serve more than 25 people daily but less than 15 connections, thus meeting the State classification of a water system. Most of these wells serve mobile parks, recreational facilities, or commercial and industrial centers. Given that many of these systems are developed and approved where extension to additional users is limited, or the infrastructure is antiquated, there is little room for expansion to provide for additional growth on these systems in the areas in which they are located.

Table 4-1 Water Systems (million gpd)

Name	Type	Source	Pop Served	Yield	In Use	Available
Apple Orchard Acres	Community	2 wells	60	0.0570	0.0062	0.0508
Autumn Acres	Community	1 well	75	0.0400	0.0050	0.0350
Autumn Acres	Community	1 well	116	0.0350	0.0070	0.0280
Berkeley Springs Water Dept	Public	Springs	2,440	0.4688	0.7000	-0.2312
Bob's Big Beef	Private	1 well	0	0.0461	0.0002	0.0459
Bowlerama	Private	1 well	0	0.0288	0.0004	0.0284
Cacapon Bed and Breakfast	Private	1 well	0	N/A	N/A	N/A
Cacapon State Park	Private	3 wells	100	0.1380	0.0210	0.1170
Coolfont Mtn. Assoc.	Community	2 wells	0	0.0547	0.0170	0.0377
Coolfont Recreation	Private	2 wells	0	0.0734	0.0000	0.0734
Country Road Restaurant	Private	1 well	0	0.0022	N/A	N/A
Great Cacapon Elementary	Private	1 well	23	0.0259	0.0002	0.0257
Greenwood Elementary	Private	1 well	66	0.0432	0.0012	0.0420
Kat & Rosie Bar	Private	1 well	0	0.0864	N/A	N/A
Morgan Industrial Park	Private	1 well	0	0.0864	0.0000	0.0864
Morgan Village MHP	Community	2 wells	94	0.1771	0.0083	0.1688
Panorama Steak	Private	2 wells	0	0.0202	0.0004	0.0198
Paw Paw Water Works	Public	Potomac	524	0.0605	0.0380	0.0225
Pine Valley School	Private	1 well	0	0.0288	0.0000	0.0288
Pleasant View Elementary	Private	1 well	151	0.0864	0.0011	0.0853
Skyline Village MHP	Community	2 wells	120	0.0187	0.0071	0.0116
The Glens	Private	1 well	0	0.0288	N/A	N/A
Tom Seely	Private	1 well	160	0.0075	0.0008	0.0067
Tri-Lake Campground	Community	2 wells	178	0.1296	0.0085	0.1211
VFW Post	Private	1 well	0	0.0259	N/A	N/A
Waugh's MHP	Community	2 wells	144	0.0864	0.0110	0.0754
Wheel House Restaurant	Private	N/A	0	N/A	N/A	N/A
Total		33 wells	4,251	1.8558	0.8334	0.8791

Source: West Virginia Department of Environmental Protection

Morgan County Water Resource Study

The Morgan County Water Resource Study being developed along the same time frame as the Comprehensive Plan update by the Eastern Panhandle Conservation District will be used to recommend the most cost effective means of meeting future water demand through 2030. The study focuses on the priority population areas that would be served by public water sources.

The report, which was in draft form during this Plan update, breaks the County into three priority areas where development potential has increased, and includes approximately 8,000 people. Several assumptions made in the report are based on 75% of the low and high growth scenarios as outlined in Chapter 1 of this report, and that 75% of new growth would occur in the priority areas, with 50% of the ultimate priority area population being served by public water. The report provides further analysis of commercial and industrial water needs as well as water system loss that create an average daily demand of 1.86 million gpd and peak daily demands of more than 2.7 million gpd by 2030.

After identifying projected water demand, the Study evaluated four possible scenarios including impoundment, river intakes, groundwater and purchasing water from a nearby utility with the primary objective of recommending a course of action from one or more of these scenarios to meet future demand.

The study considered four possible alternatives to meet future demand with costs ranging from an estimated nearly 29 million to more than 31 million dollars, with groundwater resources for all three areas scoring the highest of the four scenarios being considered.

The Study also provides for evaluation of meeting future demand through development of groundwater supply. This would allow for independent systems to be located in each of the three identified priority areas. From this approach there were three necessary stages outlined to achieve implementation of this recommendation with the ultimate goal of utilizing six wells within various high yield aquifers. These stages would require identification, testing, and engineering of well resources.

Linking the analysis of the Water Resource Study with the USGS Report summarized later in this chapter provides an outline of what direction the County may need to proceed in. This will guide the County in efforts to develop future water sources to meet projected demand and in turn determine where and how those resources may be negatively impacted by activity in other aquifers.

Sewer

A sewer system is defined by the West Virginia State Department of Health as any sewage collection system with or without treatment facilities with a daily design flow exceeding one thousand (1,000) gpd with sub-surface discharge or exceeding six hundred (600) gpd with surface discharge serving one or more dwellings or establishments and owned and maintained by one entity. In Morgan County three types of systems fall under this definition. They include: public systems owned and operated by a government entity, community systems typically owned by an association of users and maintained by private contract, and individual systems typically serving a large commercial establishment. A fourth type of sewage treatment system, not typically regulated through monitoring as the three above, is one which serves only one lot and can include such common methods as a typical septic or, due to unique circumstances of a property, may utilize alternative methods such as sand mounds.

Public Sewer Systems

The largest public sewer system in Morgan County is the Warm Springs Public Service District (PSD). The District is governed by the Warm Springs Public Service District Board, which includes a three-member board appointed by the County Commissioners, covering many areas of the County, excluding the Town of Paw Paw.

The Warm Springs system in Berkeley Springs, serves more than 1,100 customers with an average annual flow of more than 680,000 gpd between 2001 and 2005. However, this plant

which opened in 1980 and received minor upgrades in 1989, 1990, 1994, and 2002, has for those same 5 years exceeded its State rated capacity of 400,000 gpd. It has continued during this time to discharge more than its rated capacity into the Warm Springs Run, and is currently under a State mandated moratorium on new connections except for single-family dwellings. This moratorium is expected to be relieved with the completion of the ongoing project to upgrade this facility to 1.7 million gpd. This will include further extension and improvements to inflow and infiltration in the system, and allow for approximately 1,000 additional customers.

A smaller sewer system that is also owned and operated by the Warm Springs PSD, is the Great Cacapon Waste Water Treatment Plant, located on Stinebaugh Lane, in Great Cacapon. This system opened in 1999, and serves approximately 145 customers within the unincorporated area of Great Cacapon. The Plant is rated for 60,000 gpd, but receives an annual average flow of 10,500 gpd. There are no current plans for expansion of this system, which has an available capacity of 45,000 gpd, or approximately 180 additional customers.

The Paw Paw Sewer System serves 524 residents located within the Town limits. In addition, there are numerous nonresidential accounts. Average daily flow over the past five years has increased from 29,000 gpd in 2001 to 37,500 gpd, with a spike in 2003 to more than 73,000 gpd and a five year average of nearly 42,000 gpd, slightly decreasing over time. This system, which is owned by the Town of Paw Paw opened in 1964 with upgrades to its lagoon in 1988, line extensions in 2000, and pump station upgrades in 2002. Two employees operate both plants. As there is limited growth currently within this area, there are no immediate plans for expansion of personnel or facilities.

Community Sewer Systems

With the proliferation of larger subdivisions throughout the County, and development of business parks along the major transportation routes, there has been a continued increase in this relatively new type of system. These systems are much like public systems in serving more than one dwelling and/or establishment. However, unlike public systems they are owned by an association of users rather than a government entity and have experienced some difficulty with long-term maintenance and operation. This has led to increased scrutiny of the continued development of these systems, most recently by the State Legislature under Senate Bill 760.

Individual Systems

There are a total of 4 individual private septic systems that meet the State classification of a sewer system. Most of these systems serve recreational facilities or commercial and industrial centers. Given that many of these systems are developed and approved where extension to additional users is limited, or the infrastructure is antiquated, there is little room for expansion to provide for additional growth on these systems in the areas in which they are located.

Septic & Alternative Methods

The most common form of sewage service for the more rural areas within the County is by means of individual septic systems. Although the County does allow for alternative methods in

certain circumstances, these types of systems have become more obsolete with regulatory measures, technological advances, and decrease in development in sensitive areas.

Table 4-2 Sewer Systems (million gpd)

Name	Type	Discharge Source	Capacity	In Use	Available
Cacapon East	Community	Indian Run	0.0100	0.0000	0.0100
Cacapon South	Community	Indian Run	0.0380	0.0043	0.0337
Cacapon State Park	Public	Indian Run	0.0500	0.0127	0.0373
Camp Harmison	Private	Sleepy Creek	0.0055	N/A	N/A
Coolfont Recreation	Private	Sir Johns Run	0.0560	0.0400	0.0160
Coolfont Mt. Assoc.	Community	Sir Johns Run	0.0195	0.0098	0.0097
Morgan Village MHP	Community	Cherry Run	0.0350	0.0079	0.0271
Paw Paw SS	Public	Potomac River	0.2000	0.0592	0.1408
Ridge View Inc	Community	Dry Run	0.0270	0.0010	0.0260
Skyline Village. MHP	Community	Dry Run	0.0110	0.0061	0.0049
Tri-Lake Campground	Community	Sleepy Creek	0.0300	0.0000	0.0300
Valley Dale Subdivision	Community	Sleepy Creek	0.0100	0.0045	0.0055
Valley View Nurse Home	Private	Sleepy Creek	0.0350	0.0136	0.0214
Warm Springs PSD	Public	Warm Springs Run	0.4000	0.6000	-0.2000
Waugh's Com Home Park	Community	Sleepy Creek	0.0147	0.0061	0.0086
Wayside LLC	Private	Sleepy Creek	0.0050	0.0014	0.0036
522 Industrial Park	Community	Sleepy Creek	0.0250	0.0000	0.0250
Total			0.9717	0.7666	0.1996

Source: West Virginia Department of Environmental Protection

Water and Sewer Plan Limitations

Septic Systems

In considering parameters for planning water and sewer facilities, it is informative to review pertinent physical features within the County. These key features, as outlined in Chapter 6, are slope and soils. As slope increases, care must be taken in land development to prevent soil erosion and improperly installed systems. Twenty-five percent slope is the generally accepted limit for structural development and is the regulatory limit in West Virginia for the installation of septic systems. Approximately 21% of Morgan County falls within a slope range of 15 to 25%. An additional 30% of land is between 8 and 15% slope. Only 5% of the County can be considered relatively flat at a slope of less than 8%. This means that nearly 45% of land within the County is greater than the 25% allowable limit under State law.

In addition to slope, soil suitability should be considered when evaluating sites for development. The soil material between depths of 18 inches and 6 feet is evaluated for septic drain field use by means of a Soil Survey. The soils properties considered are those that affect the absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table, and susceptibility to flooding. Slope is a property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and down-slope flow of effluent.

Limitations of the use of a particular soil for septic system use are expressed as slight, moderate, and severe. A rating of severe indicates the soil has serious limitations that are difficult, though not impossible to overcome. A review of available data for soils present in Morgan County indicates a severe limitation on the use of septic systems for all but less than 1% of the County's land area. When compared to available slope data, nearly the entire County is severely limited for septic systems. However each site is determined on a case-by-case basis by the Morgan County Health Department based on State review standards.

The number of housing units utilizing septic systems or cesspools has increased from 2,974 in 1980 to more than 4,000 in 2000. This represents a change from nearly 66% of year round housing in 1980 to nearly 70% currently. More significant, the number of units utilizing outhouses or listed as having no sewage disposal systems decreased from 410 units in 1980 to less than 100 in 2000. This represents a decrease in percentage of the overall housing stock for such units from nearly 10% in 1980 to less than 1% in 2000.

The lack of adequate sewage disposal systems is typically brought to the attention of the Morgan County Health Department through citizen complaints. The number of complaints received regarding structures with no disposal system has decreased from 30% in the early 1980's to consistent with the decrease in dwellings using these systems. The most frequent complaints of such failures, have occurred along US Rt. 522 south of Berkeley Springs. This is due in part to high water tables and poor percolation in these areas, or aging systems, all of which may be resolved through extension of service to these areas.

Surface Water Quality

Surface water quality in the West Virginia portion of the Potomac River Basin is generally good. Water quality parameters evaluated include dissolved oxygen, pH temperature, metals, and conductivity.

There have been occasional violations for fecal coliform bacteria which is indicative of either human or animal waste entering the streams from failing septic or agricultural activity. Also, the Potomac River is subject to inadequately treated and occasional raw sewage discharge from various public systems both north and south of the County. This includes plants within the County such as the Warm Springs Public Service District WWTP in Berkeley Springs which is currently under a consent order from the State DEP to correct recurring discharge violations due to high wet weather flows.

Water quality of the Cacapon River is considered excellent as reflected by available chemical data collected on a regular basis. Like many of the streams in the Eastern Panhandle that are unaffected by mine drainage, the Cacapon has an excellent pH value and has tested well for acidity, hardness, oxygen levels, and alkalinity. There have been few instances of fecal coliform standard violations, as well as few instances of metal readings exceeding State standards.

The Sleepy Creek watershed is also a major contributor to the Potomac River Basin. Sleepy Creek's source lies near the Hampshire County, West Virginia border at Good, north of Virginia State Highway 127 in Frederick County, Virginia. From Frederick County, Sleepy Creek flows

north through Morgan County and drains into the Potomac at Sleepy Creek on the old B & O Railroad mainline. It includes a wide drainage area made up of numerous tributaries including; Bear Garden Run, Hands Run, Breakneck Run, Indian Run, Rock Gap Run, Middle Fork Sleepy Creek, South Fork Sleepy Creek, Mountain Run, Yellow Spring Run, and Meadow Branch.

The potential exists in Morgan County for water quality problems due to sediment and nutrients loadings, which occur after heavy rains in areas of agricultural and construction activities. Sediment often includes organic and inorganic pollutants from fertilizers, pesticides, animal waste, and construction materials. Chemical pollutants may be toxic to fish, and may be retained in fish, which have eaten contaminated organisms. Over a period of time, sediment fills watercourses, covering bottom dwelling organisms and contributing to increased flooding potential. By increasing turbidity, or cloudiness of water, sediment and nutrients reduce light available for growth of aquatic plants and animals. For these reasons, it offers the potential to significantly reduce the health, scenic and recreational value of Morgan County streams.

Storm Water Management

The West Virginia Department of Environmental Protection's Storm Water Permit Team is responsible for administrative and technical review of applications and storm water pollution prevention plans submitted for coverage under storm water general regulations. There are three General Storm Water Permits.

- The Storm Water Construction permit covers all earth-disturbing construction activities that are one acre or greater.
- The Multi-Sector Storm Water permit covers storm water effluent from certain industrial activities.
- The Municipal Separate Storm Sewer Systems permit covers storm water discharges from certain municipalities and other public entities.

Groundwater

Precipitation is the chief source of water in Morgan County. Although precipitation is intermittent, water is continually moving from storage in the underground rock structure to streams and from streams back into the ground. In general, groundwater movement parallels the land surface, moving from ridges to the valleys, where it discharges to springs and streams.

Water is found in practically all rock formations of the Potomac River Basin, of which Morgan County is a part. However, the quantity of water largely depends on the kind, size, and degree of interconnection of the openings in the rock. The largest groundwater supplies are available from areas underlain by sandstone and limestone bedrock, which contain fractures and solutional cavities through which groundwater can move easily. The least water is available from shale, which contains very few openings of this type. Shale is more plastic than sandstone or limestone and at greater depths the weight of overlaying rock squeezes openings shut.

There are two strips of land along either side of Cacapon Mountain where groundwater availability can be reflected in well yields from 100 to 200 gallons per minute. The remaining

areas of the County report lower well yields of 0 to 70 gallons per minute due to geologic structure.

The most frequent groundwater quality problem in Morgan County is high mineral content. Groundwater beneath the ridges has a lower concentration of dissolved minerals than beneath valleys because the ridges are mainly recharge areas and the valleys are mainly discharge areas. A well on a ridge draws relatively pure groundwater near the beginning of its flow path. A well in a valley draws comparatively impure groundwater, which is near the end of its flow path, has been exposed to bedrock longer, and has picked up dissolved minerals along the way. Based on available data, the ridges along the west side of Cacapon Mountain have produced higher quality water than the Sleepy Creek Valley to the east. Further, areas east of the Cacapon ridge have experienced excessive iron content and hardness due primarily to the slow movement of water through areas underlain by shale.

There is a greater potential for groundwater contamination in limestone areas because of the presence of solutional cavities and sinkholes through which contaminated water can enter without being filtered through the soil mantle. This type of pollution is more frequently found in the Great Valley of which Berkeley and Jefferson counties form a part. Although such regions are not the only areas susceptible to contamination, the sparsely populated areas underlain by shale and sandstone in Morgan County have not produced any major problems.

Maintaining high quality groundwater is important to Morgan County as the number of residents who rely on groundwater for drinking and domestic use has doubled from nearly 7,500 in 1980 to more than 14,000 in 2000. It is also important for industry and particularly for those enterprises which rely on pure spring water such as the water bottling companies in Berkeley Springs, the Ridge State Fish Hatchery, and the baths of Berkeley Springs State Park.

West Virginia Conservation Agency USGS 2005 Report

The West Virginia Conservation Agency and Eastern Panhandle Conservation District worked with the US Department of the Interior and the Geological Survey to develop a report on groundwater resource information in 2005. This report was conducted to analyze the hydrogeologic, geochemical, and water-quality characteristics of aquifers and springs within the County.

The report provides a very technical and comprehensive analysis of 91 wells and 8 spring sites throughout the County, primarily located within Cacapon and Sleepy Creek mountain drainage areas. The study reviewed in part the relationship of geology and ground flow, aquifer properties, water levels, and chemical make up and influence. A major component of this report was the determination of the level of transmissivity occurring between the aquifers, or how each of the areas were interacting throughout the various aquifers within the watersheds.

Although the summary and conclusion to the report does not include definitive analysis of individual areas, it does provide an outline for how conceptually the results assume the various factors exist within the overall hydrogeologic system. This includes levels of transmissivity, and

thus, potential for influence within the system for water resources to be affected by different geochemical levels being spread throughout the groundwater system.

Chesapeake Bay Initiative

With a land-to-water ratio higher than any estuary in the world the shallow 4,000 square-mile Chesapeake Bay is a delicate natural system especially vulnerable to development and pollution. How the land in the watershed is treated and cared for profoundly affects the Bay's overall health.

The Chesapeake Bay is the largest of the 130 estuaries in the United States. It receives about half of its water volume from the Atlantic Ocean, with the Susquehanna River providing approximately 50 percent of its freshwater. The Chesapeake Bay watershed spans parts of six states (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the District of Columbia. There are about 150 major rivers and streams in the Chesapeake drainage basin, and the basin is home to roughly 16 million people most of which are clustered around the Bay and its tidal rivers. Over the next 30 years, the basin's population is expected to increase by 3.7 million people, or nearly 25 percent.

The Bay supports more than 3,600 species of plants, fish and animals, including 348 species of finfish, 173 species of shellfish, and over 2,700 plant species. In addition, the region is home to 29 species of waterfowl and is a major resting ground along the Atlantic Migratory Bird Flyway. Every year, one million waterfowl winter in the Bay watershed.

Current Restoration Plan

Restoration of the Chesapeake Bay involves a very strong sense of cooperation, with a dominant State role. Goals are set in voluntary agreements between the states through a series of directives and statements which serve as executive orders adopted by each State. Since 1910 there have been more than 100 actions or initiatives that have led to the establishment of a large-scale restoration program in the Chesapeake Bay watershed.

The Chesapeake 2000 Agreement provided goals and objectives for Chesapeake restoration through 2010 and is the current restoration vehicle for the ecosystem. The Agreement outlined over 80 specific objectives to be achieved to restore and protect the Bay's living resources, habitats, and water quality. Commitments focus on the topics of Living Resource Protection and Restoration; Vital Habitat Protection and Restoration; Water Quality Protection and Restoration; Sound Land Use; and Stewardship and Community Engagement. The agreement outlines these initiatives through several primary goals based on the following principles of implementation:

- Restore, enhance and protect the finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem.

- Preserve, protect and restore those habitats and natural areas that are vital to the survival and diversity of the living resources of the Bay and its rivers.
- Achieve and maintain the water quality necessary to support the aquatic living resources of the Bay and its tributaries and to protect human health.
- Develop, promote and achieve sound land use practices which protect and restore watershed resources and water quality, maintain reduced pollutant loadings for the Bay and its tributaries,
- Promote individual stewardship and assist individuals, community-based organizations, businesses, local governments and schools to undertake initiatives to achieve the goals and commitments of this agreement.

West Virginia's Role in the Chesapeake Bay

West Virginia's portion of the Chesapeake Bay watershed is the land that drains into the Potomac River and its tributaries and a small area that drains into the James River. Fourteen percent (14%) of West Virginia drains into the Potomac River and on to the Chesapeake Bay. The Chesapeake Bay drainage area in West Virginia includes Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral, Morgan, Pendleton, and small portions of Preston and Tucker counties. The headwaters of the James River is in Monroe County.

To better protect and restore local water quality in the Shenandoah and Potomac Rivers and the Chesapeake Bay, on June 18, 2002, West Virginia officially committed as a "headwater partner" in the Chesapeake Bay Program. This Memorandum of Understanding created a seven state partnership, and reaffirmed West Virginia's obligation to voluntarily maintain and protect the Potomac River watershed.

Since becoming a "headwaters partner," West Virginia has been an active participant in numerous Chesapeake Bay committees, subcommittees, and workgroups. These groups established water quality objectives for all seven jurisdictions involved in the Chesapeake Bay Program. West Virginia spent one year developing its tributary strategy and anticipates achievement of these objectives by 2010.

The addition of Nitrite, TKN, Total Suspended Solids, Suspended Sediment Concentration and occasional sand/fine splits allows West Virginia to comply with sampling protocols set forth by the Non Tidal Water Quality Workgroup. The new parameters, as well as the existing nutrient analysis, will be applied to samples collected from drains to the North Branch of the Potomac River, the mouth of the South Branch, the Potomac River main stem and its direct tributaries. These samples will be collected monthly through at least 2010.

Like all of the Bay States, West Virginia has been actively involved in pollution reduction programs for over twenty years. Bay program partners agreed to develop and carry out cooperative and voluntary Tributary Strategies to reduce the flow of nutrients and sediment loads to the Potomac River, and ultimately to the Chesapeake Bay. The goal is to improve water

quality by 2010 without placing undue hardships on community resources. Throughout West Virginia, communities are voluntarily improving wastewater treatment, upgrading storm water control systems and developing controlled growth plans.

The policies, goals and objectives of this Comprehensive Plan have been developed to meet this effort at the local level given the County's primary drainage pattern flows into the Potomac River, and ultimately the Chesapeake Bay.

Solid Waste

Solid waste services are provided to the residents and businesses of Morgan County through a variety of means. Although the County no longer provides a local landfill, it does have two solid waste haulers and a growing recycling program.

Morgan County Solid Waste Authority

The Morgan County Solid Waste Authority, established by State Legislation in 1988, completed a comprehensive Solid Waste and Litter Control Plan in 2003. This Plan outlined the adequacy of the provision of solid waste disposal services to the County, the separation of source solid waste and its impact on the LCS Waste Services Landfill in Berkeley County, the clean up of open dump sites and litter along roadways, and evaluation of the ongoing recycling program and its expansion needs. The Plan also provides goals and objectives, prioritization of monitoring of existing services, and development of funding strategies to carry out the plan.

A second study completed by the Morgan County Solid Waste Authority is the Commercial Solid Waste Facility Siting Plan Amendment. This Plan, through criteria established for review of possible acceptable locations for development of a new landfill within the County, determined that there is no present site within the County suitable for location of a land fill, and further that the current use of the LCS Landfill in Berkeley County was sufficient to serve the future projected needs of Morgan County through the Plan period.

A concern identified by the Solid Waste Authority Plans and the 1985 Comprehensive Plan was the proliferation of illegal dump sites. To address this issue the Authority partnered with the West Virginia Department of Environmental Protection and achieved clean up of more than 35 locations to date, reclaiming 49 acres of land and removing 749 tons of waste.

Landfill

Morgan County currently does not have a landfill located within its boundaries. Instead, both haulers and citizens transfer the waste to the landfill located in Berkeley County.

The landfill previously used in Morgan County is located on Milo School Road in Cacapon district. It discontinued operations in 1993 due to changing regulatory issues and State standards that the facility could not practically meet. There was adequate land still available at the time of closure to provide service to the County for the foreseeable future. Since that time, ownership of

the “used” portion of the land was transferred to the Morgan County Solid Waste Authority for use as a recycling transfer station, while the County retained the vacant remainder.

Hauling Service

Morgan County is served by two trash haulers both of which haul trash out of the County to the LCS landfill in Berkeley County. The Town of Bath provides trash pick-up within the municipal limits of the town and Morgan Sanitation serves all other areas within the County. Both services are headquartered in the Town of Bath. Unlike the municipal service provided by Bath, Morgan Sanitation is a privately owned company. Morgan Sanitation, being the larger provider, serves more than 3,700 accounts of which more than 100 are nonresidential. The Town of Bath serves nearly 500 accounts, with more than 100 being nonresidential. Based on the Solid Waste Authority report in 2003, the LCS landfill receives waste from US Silica and other haulers which accounts for nearly 20% of waste received from Morgan County under separate direct service contracts.

Table 4-3 Trash Hauling

Year	Population	Morgan San.	Bath	US Silica	Others	Total	Tons/Person
2000	14,943	N/A	652	N/A	N/A	8,512	0.57
2001	15,401	N/A	713	N/A	N/A	8,652	0.56
2002	15,858	6,065	733	10	2,388	9,196	0.58
2003	16,315	6,427	790	22	2,136	9,375	0.57
2004	16,772	6,667	809	29	2,389	9,894	0.59
2005	17,232	6,356	838	71	2,538	9,803	0.57

Source: Berkeley County LCS Landfill

Recycling

Over the past decade Morgan County has developed a successful recycling program. This program, which was initiated in 1994, is operated under the Morgan County Solid Waste Authority, located on Washington Street in Berkeley Springs. It continues to offer recycling sites and additional permanent containers for cardboard at schools and businesses. The Authority consists of one paid recycle coordinator, five volunteer directors, and nine volunteer assistants.

There are seven self-serve residential recycle drop-off sites for paper, cardboard, glass, metal, plastic and white goods. As the number of sites has increased to serve the increasing population, the program has increased its recycled tonnage from approximately 24 in 1995 to 1,118 in 2008. The highest total in one year occurred in 2003 when 1,245 tons were recycled.

The Authority is considering the addition of a permanent recycle center located near the Town of Bath to be opened four to five days per week, accepting items that are currently accepted at its drop off sites. This plan for expansion of service is expected to occur within the next five years.

In addition to the recycling program, there are two commercial providers of tire recycling within the County, following State legislation regarding this material passed in 2000, and the inception

of voluntary programs of these business entities, illegal disposal of tires has greatly diminished in Morgan County as well as elsewhere statewide. This program is further supported through the efforts of the State Roads department which periodically takes tires for recycling as well.

Table 4-4 Recycling Materials (thousand pounds)

Year	Paper	Cardboard	Steel	Aluminum	Glass	White Goods	Plastic	Comm. Service	Total
1995	33.3	N/A	2.3	1.1	8.7	1.5	N/A	N/A	47.1
2000	403	595.6	16.0	2.6	52.4	32.4	3	985	1,106.3
2005	673.3	335.3	18.8	2.3	82.5	0	6	0	1,118.4

Source: Morgan County Solid Waste Authority

West Virginia Solid Waste Management Board

Morgan County is included in Watershed E of the West Virginia Solid Waste Management Plan for 2005. Under this Plan, it is projected that the County’s population will increase by more than 17% between 2005 and 2025 for a total projected 20,265 residents. From these projections, the Plan estimates that the total monthly municipal tonnage for waste will increase from the current 947 tons per month to 1,126 tons per month.

There are several significant factors that do not appear to be included for consideration in the report, such as the efforts of the County to reduce waste through recycling efforts. It also does not address the issue of the LCS landfill in Berkeley County requiring a change in classification once it exceeds 10,000 tons per month, which from the current loads is projected to occur within the Plan period. However, possibly the most important factor in the Plan is its low population projection of only 17% growth. This projection fails to reach even the lowest growth projection outlined in the Growth Scenarios section of Chapter 1 of this Comprehensive Plan, and falls more than 9,000 residents short of the medium growth scenario for the same period.

Miscellaneous Utilities

Morgan County is served by Allegheny Power.

Morgan County residents receive phone service through the Verizon and Frontier networks.

Propane gas is provided to certain areas of the County by Blueflame, Inc. and Thompson Gas.

Goals and Objectives

Goals

The County’s goals concerning infrastructure are aimed at protecting critical water supplies, managing waste and matching growth to the resources available in the County by:

- Evolving reasonable approaches to ensure that patterns of future residential and commercial development are congruent with water and sewer capacity;
- Encouraging the placement of high density development in areas served by central water and sewer systems;
- Recognizing and protecting sensitive groundwater recharge areas and encouraging water conservation;
- Encouraging recycling and discouraging illegal waste disposal;
- Promoting stable, state-of-the-art communication and other technology infrastructure to provide efficient communication links for citizens and government and make the county an attractive business location; and
- Encourage the establishment of riparian buffers along rivers and streams within the County.

Objectives

The following objectives will serve to advance these goals.

- Evaluating on an ongoing basis, e.g. via a master plan, the quantity and quality of available water resources and sewer capacity;
- Encouraging expansion of public sewer systems into areas where the condition is not well suited to septic systems;
- Considering the impact of and limitations on commercial sales of water and the conditions under which this might be done;
- Promoting the development of a water and sewer master plan that would include (but not be limited to) components addressing inflow and infiltration flow (I&I) to maximize the efficiency of projected water and sewer capacities, the reservation of corridors for future water and sewer infrastructure, and the merits of merging existing public water and sewer districts;
- Supporting state initiatives to limit homeowners' associations (HOA) ownership and maintenance of community water and sewer facilities;
- Providing impetus for improved management of on-lot wastewater systems.
- Evaluating long term needs for a landfill;
- Supporting the Morgan County Solid Waste Authority Plan, and the Berkeley County plan that directs solid waste disposal in the landfill in that county; Evaluating and promoting methods to reduce littering, including optimum placement of litter receptacles in public areas and an 'adopt a highway' program;
- Investigating ways to increase recycling of solid waste; and
- Supporting development of high speed Internet access throughout the County.