

## **4. Sewerage**

### **4.1. General Information**

This chapter inventories existing shared wastewater treatment facilities and shared facilities along with any authorized systems under development. Problem areas are discussed with alternative solutions and recommendations.

In 2008, it was estimated that approximately one half of the Kent County's population depends on on-site disposal systems (OSDSs). It is estimated that there are approximately 4,850 OSDSs within Kent County. The remaining population is served by either a municipal, county, private shared facility.

Most of the larger problem areas occur in subdivisions approved prior to regulations controlling OSDSs. Some of these areas are not targeted for growth by the Kent County Comprehensive Plan; and correction of the sewerage problems without promoting growth is a difficult task. Older settlements, not involving hundreds of undeveloped lots of record, present a different challenge as there are not a sufficient number of users to bear the cost of sewerage correction. Most problem areas in the County must be investigated on an area-by-area basis. Resolutions to each of these problems will be derived from a balance of planning, engineering and economics.

### **4.2. Point Source Strategy**

Maryland's Point Source Strategy for the Chesapeake Bay is based on a two-part plan to:

- (1) Upgrade Maryland's wastewater treatment plants to state-of-the-art Enhanced Nutrient Removal (ENR) technology to meet concentrations of 4.0 mg/l or less total nitrogen and 0.3 mg/l or less total phosphorus, and;
- (2) Maintain nutrient loading caps as follows:
  - a. Significant wastewater treatment plants are those with design capacity of 500,000 gpd or greater. These plants will be required to achieve ENR, and meet established nutrient loading limits based on ENR, as soon as possible.
  - b. Non-significant wastewater treatment plants are those with design capacity of less than 500,000 gpd. Annual nutrient loads are based on flows established by the MDE and concentration of 18 mg/l total nitrogen and 3 mg/l total phosphorus. Expanding non-significant facilities cannot exceed 6,100 lbs/year in nitrogen and 457 lbs/year in phosphorus.
  - c. Significant industrial wastewater treatment plants are those with a minimum total nitrogen discharge of 75 pounds per day or a minimum total phosphorus discharge of 10 pounds per day, which are equivalent to loading limits for significant municipal wastewater treatment plants.

The Point Source Strategy summarized above compelled a reorganization of Kent County's 2009 Water & Sewerage Plan. Sewerage service areas are ordered based on the wastewater treatment plant to which they flow rather than the 2005 Plan's organization based on municipal, county or private system. Information relating to the Point Source Strategy is included for each wastewater treatment plant: discharge water body, designations and protected uses of discharge water body, watershed, nutrient limits, permits and connected sewer service areas.

Chapter 4 of the Water & Sewerage Plan shall serve as an inventory of wastewater systems for planning. Details of the Point Source Analysis are included in Chapters 2 and 5 of this Plan because they are required for the Water Resources Element (WRE), but not required as part of the triennial update of the Water & Sewerage Plan. All elements included in Chapter 4 shall be updated on a triennial basis and amended as required.

### **4.3. Future Demand Projections**

Existing sewerage demands reported in this Plan were provided by the operating agency (county or municipality), based on records as of September 2008.

Subsequent Comprehensive Water & Sewerage Plans may reference Wastewater Capacity Management Plans (WWCMPs). These plans will be prepared as part of the development of the basis of design for future infrastructure capital projects and will be used as the basis for amendments to this plan. WWCMPs review the operational records of wastewater systems for three years to determine:

- Sewerage demand per capita and connection;
- Capacity of the wastewater system taking limiting factors into account;
- An estimation of extraneous flow or inflow and infiltration (I&I) should be calculated by comparing flows during drought periods and wettest years on record;
- An estimation of the potential additional wastewater demand from approved but undeveloped subdivisions and building permits;
- An estimation of the excess wastewater system capacity available for allocation to new growth;
- One process to track and control the allocation of new connections to the sewerage system.

The 7-page Worksheets and Capacity Forms with reference tables, that may be used to develop WWCMPs for any water supply system, are included in Appendix 4-A of this Water & Sewerage Plan. Refer to MDE's Guidance Document on WWCMPs to complete these worksheets for a wastewater system.

Kent County uses Sewage Flow Capacity Reports to track existing demand and account for potential demand generated by the approval of record plats and building permits. This tracking system may be compared to the one outlined in the WWCMP Guidance.

Future demand projections for a wastewater system in Kent County calculated by any means shall be included in Appendix 4-B of this Water & Sewerage Plan.

The 2009 Water & Sewerage Plan includes future demand projections for 2030, as required for the Water Resources Element of the County Comprehensive Plan, based on a simple ratio of the existing service area and population to the projected population for 2030. The 2030 projections are included in Chapter 2 of this Water & Sewerage Plan, which discusses Planning in relation to the Water Resources Element. These projections shall be refined as more comprehensive methods to estimate future demand for each wastewater system are employed.

### **4.4. Sludge Disposal & Septage Management**

#### **4.4.1. Sludge Disposal**

Sewage sludge is one of the final products of the treatment of sewage at wastewater treatment plants. The U.S. Environmental Protection Agency has long promoted the beneficial use of sewage sludge. MDE,

which governs the application of sewage sludge, reports that approximately 50 per cent of the sewage sludge in Maryland is applied to agricultural land for beneficial use.

The enacted House Bill 1058, which becomes effective October 1, 2009, addresses the local notice for Sewage Sludge Utilization Permits. When MDE receives an application for permit to use sewage sludge at a site, the department is responsible for mailing a copy of the permit application to the legislative body and any elected executive of a county and to the elected executive of any municipal corporation where the sewage sludge utilization site is to be located as well as to the legislative body and elected executive of any other county within 1 mile of the sewage sludge utilization site.

Where the permit is for the application of sewage sludge on marginal land or to construct a permanent facility designed primarily to utilize sewage sludge, MDE has additional local notification of officials as well as publication of notice in a local newspaper. The executive or legislative body of the county or the legislative body of the municipal corporation may request that MDE hold a public hearing. Marginal land means land where the soil characteristics do not support normal vegetative growth over time. Marginal land includes, but is not limited to, land abandoned from mineral extraction, strip mine areas, areas where topsoil has been removed, fill areas with poor soil characteristics, and completed landfills with poor topsoil.

Where the permit is for the application of sewage sludge on land other than marginal land, MDE has specific local notification requirements for local officials. The executive or legislative body of the county or the legislative body of the municipal corporation may request that MDE conduct a public information meeting.

MDE is required to provide each county and municipal corporation that receives a copy of any sludge utilization permit with an opportunity to consult with the Department about the decision to issue, deny, or place restrictions on such permit.

Current Disposal of Sludge is managed through private contractors as follows:

- Chestertown - \_\_\_\_\_
- Rock Hall – Managed by Synagro Technologies, Inc. Mid-Atlantic
- Galena – Managed by Synagro Technologies, Inc. Mid-Atlantic (2004)
- Betterton – Managed by Marcor Remediation, Inc. (hailed to Tri-County Landfill)
- Millington – Managed by BFI and Waste Management
- Kennedyville – Managed by BFI
- Worton / Butlertown – Managed by BFI
- Tolchester – Managed by BFI

#### **4.4.2. Septage Management**

The Kent County Commissioners are implementing regulations for septage disposal. All septage, including marine pump-out wastes, generated in Kent County is disposed of at the Worton/Butlertown Wastewater Treatment Facility. In 1998, the County upgraded the septage receiving cell at the treatment facility. Improvements included the installation of mechanical aeration, grit removal and electronically controlled access. Haulers are charged an annual permit fee and a per gallon disposal fee.

## 4.5. Sewerage Systems

The following pages describe the various sewerage systems in Kent County.

Where municipal sewerage systems provide wastewater treatment for sewer service areas owned and operated by the Kent County Department of Water & Wastewater Services, intermunicipal agreements between towns and the County exist for the treatment of wastewater from the county service areas. Intermunicipal agreements are included in Appendix 1-E of this document.

The table below lists Kent County's wastewater treatment plants.

**Table 4-1. Kent County Wastewater Treatment Plants**

Wastewater Treatment Plant	Average Daily Flow (gpd)	
	Permitted	Actual
Chestertown	900,000	706,000
Rock Hall	485,000	220,000
Galena	60,000	50,000
Betterton	200,000	12,000
Millington	140,000	140,000 <sup>1</sup>
Kennedyville	60,000	20,000
Worton-Butlertown	150,000	99,700 <sup>2</sup>
Tolchester	265,000	94,000

1. Permitted flow increased per February 4, 2009, letter from the Mayor of Millington to Kent County. Actual flow estimated at permitted flow for nutrient load calculations.
2. Actual average flow for 2005-2007. Half of this flow is used in nutrient load calculations based on spray irrigation used half of each calendar year.

### 4.5.1. Chestertown

The incorporated Town of Chestertown owns and operates a wastewater treatment facility. The Chestertown Wastewater Treatment Plant serves Chestertown, areas outside town limits along Md. Rtes 291 and 289, and the Quaker Neck service area. Areas outside the town limits and the Quaker Neck service area are owned and operated by the County (Appendix 1-E contains intermunicipal agreements). A map of the service areas is included at the end of this chapter.

Table 4.5.1 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility is permitted for a flow of 900,000 gpd. The flow for 2007 and the average flow for 2005-2007 were 684,000 gpd and 706,000 gpd respectively.

The Chestertown wastewater treatment plant discharges to the Chester River, which is protected for shellfish harvesting. It is located within the Middle Chester Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 18,273 lb/year and 1,371 lb/year respectively.

The Chestertown sewerage service area (within the town limits) includes approximately 2,300 connections (EDUs) and approximately 5000 persons.

***System History and Upgrades:***

In summer 2008, the ENR upgrades to the Chestertown wastewater treatment plant were completed. Upgrades included construction of two (2) oxidation wave aeration systems, screening, grit removal clarifiers, de-nitrification filters, sludge pumping, chemical feed systems, liquid chlorination and de-chlorination systems, control building, raw sewage pump station modifications, instrumentation, and control systems. The cost of the upgrades was \$9.8 million.

In 1997, Chestertown revised the Town Charter to its original language prohibiting out of town sewer extensions without annexation.

In 1990, the facility was upgraded with an outfall line discharging into the Chester River and construction of a new aeration system.

**4.5.1.1. Quaker Neck**

The Kent County Department of Water & Wastewater Services owns and operates the Quaker Neck sewer service area, which is provided sewage treatment by the Chestertown wastewater treatment plant (Appendix 1-E contains intermunicipal agreements).

The Quaker Neck sewer service area includes 190 connections (EDUs) and approximately 479 persons.

***System History and Upgrades:***

In 2006, a design to upgrade the pumping station located on John Hason Road was completed. Construction of this project was completed in 2008. This pumping station upgrade is required to comply with MDE requirements as part of Chestertown's 2008 ENR upgrade to their wastewater treatment facility.

Treatment capacity at Chestertown's wastewater treatment plant provided relief to many residents in the Quaker Neck area, but not all residents experiencing septic problems have been served as of 2008 and there is continuing demand for growth.

In 2007, discussions with the Town of Chestertown permitted the County to proceed with a feasibility study to serve failing septic systems along Lover's Lane and also a proposed small residential project on Lover's Lane by expanding the Quaker Neck service area.

In 2009 the Quaker Neck service area was amended to serve a maximum of 12 lots in the Prestwick Woods subdivision. The amendment and revised service area map are shown in Appendix 4-G.

**4.5.2. Rock Hall**

The incorporated Town of Rock Hall owns and operates a wastewater treatment facility. The Rock Hall Wastewater Treatment Plant serves Rock Hall, two (2) marinas outside the town limits (maintained by the town), and the following county service areas: Green Lane, Spring Cove, Allen's Lane, Piney Neck / Skinner's Neck / Wesley Chapel corridor, and Edesville. (Appendix 1-E contains intermunicipal agreements). Maps of the service areas are included at the end of this chapter.

Table 4.5.2 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility was

permitted for a flow of 505,000 gpd; the facility permit was revised by MDE for a flow of 485,000 gpd. The plant is currently considered a minor WWTP. The average flow calculated from 2008 Daily Monitoring Reports (DMRs) is 220,000 gpd.

The Rock Hall wastewater treatment plant discharges effluent to a new (1996) discharge point in Gray's Inn Creek, which is designated Use II waters protected for shellfish harvesting. It is located within the Lower Chester Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 6,152 lb/year and 461 lb/year respectively.

The Rock Hall sewerage service area (within the town limits) includes approximately 1,100 connections (EDUs) and approximately 2,700 persons.

***System History and Upgrades:***

The following list summarizes the chronology in which county sewer service areas were connected to the Town of Rock Hall wastewater treatment plant:

In 2007, Edesville was connected to Rock Hall via a force main along Rte. 20.

In 2006, Allen's Lane was connected to Rock Hall.

In 2006, Green Lane and Spring Cove were connected to Rock Hall.

In 1996, the Piney Neck / Skinner's Neck / Wesley Chapel corridor was connected to Rock Hall.

In December 1995, an upgrade to the Rock Hall wastewater treatment plant by the Kent County Sanitary District (now Kent County Department of Water & Wastewater Services) was completed. The new plant (1995) is located adjacent to the town's abandoned lagoon.

**4.5.2.1. Green Lane / Spring Cove**

The Kent County Department of Water & Wastewater Services owns and operates the Green Lane/Spring Cove sewer service area (1996), which is provided sewage treatment by the Rock Hall wastewater treatment plant (Appendix 1-E contains intermunicipal agreements).

The Green Lane/Spring Cove sewer service area includes 132 connections (EDUs) and approximately 330 persons.

Green Lane and Spring Cove are located adjacent to the Town of Rock Hall.

**4.5.2.2. Allen's Lane**

The Kent County Department of Water & Wastewater Services will own and operate the planned Allen's Lane sewer service area (2006), which will be provided sewage treatment by the Rock Hall wastewater treatment plant (Appendix 1-E contains intermunicipal agreements).

The Allen's Lane sewer service area will include 40 connections (EDUs) and approximately 100 persons.

Allen's Lane is located south of the Town of Rock Hall.

***System History and Upgrades:***

In 2008, the County is in the process of developing engineering plans for the connection.



In 2006, the County received approval from MDE and MDP to proceed with the design of the Allen's Lane sewerage system project (MDE Project # WQ04-342-151), subject to the following conditions: "The proposed force main shall be designated 'restrictive access;' Existing residential lots with failing septic systems as identified and documented by the Kent County Environmental Health Department shall be allowed to connect to the new sewer system; Unimproved lots of record existing as of September 2006 that could meet the requirements for private well and septic systems shall be allowed to connect to the new sewer system; and No further subdivision of any lots in the service area shall be allowed."

In 2004, a preliminary engineering report was completed.

#### **4.5.2.3. Piney Neck / Skinner's Neck / Wesley Chapel**

The Kent County Department of Water & Wastewater Services owns and operates the Piney Neck / Skinner's Neck / Wesley Chapel (PN/SN/WC) sewer service area (1996), which is provided sewage treatment by the Rock Hall wastewater treatment plant (Appendix 1-E contains the intermunicipal agreements).

The PN/SN/WC sewer service area includes 400 connections (EDUs) and approximately 1,000 persons.

##### ***System History and Upgrades:***

In 1996, the Kent County Sanitary District installed the PN/SN/WC collection system. The system consists of 61,000 feet of low pressure force main; 16,000 feet of force main; 3 main pump stations; and over 350 individual grinder pumps.

In 1995, the Kent County Sanitary District funded an expansion of the Rock Hall WWTP through an intermunicipal agreement with the Town of Rock Hall (Appendix 1-E contains the intermunicipal agreement). The expansion was designed to accommodate flow to the Rock Hall WWTP prior to the PN/SN/WC connection, additional flow from the PN/SN/WC connection, and the anticipated flow for the next 20 years.

#### **4.5.2.4. Edesville**

The Kent County Department of Water & Wastewater Services owns and operates the Edesville sewer service area, which is provided sewage treatment by the Rock Hall wastewater treatment plant since 2007. (Appendix 1-E contains intermunicipal agreements).

The Edesville sewer service area includes 98 connections (EDUs) and approximately 245 persons.

##### ***System History and Upgrades:***

In December 2007, the Kent County Department of Water & Wastewater Services, in agreement with the Town of Rock Hall, decided to extend the service area approximately 0.5 miles along Lover's Lane to correct an area of failing septic systems. In 2007, the Kent County Commissioners approved proceeding with the design and construction of the extension of the sewer system to include these failing septic systems along Lover's Lane. The revised Edesville map with relevant parcel numbers can be seen in Appendix 4-F.

The County Commissioners own a wastewater treatment facility that once served approximately 225 users in the Edesville area and a small affordable income housing project, Edesville East. The Kent County Department of Water & Wastewater Services operated the facility.

The old Edesville system consisted of a small diameter gravity collection system with pump stations and a land treatment system. Septic tanks were installed at each connection and served as primary treatment. Clarified sewage effluent was collected and directed to a two cell lagoon for natural aeration. The effluent was chlorinated and discharged to a ridge and furrow land treatment area where the effluent was treated through continuous aeration, absorption, evapotranspiration and evaporation. Furrows and ridges consisted of grass and trees. The system had a design capacity of 21,000 gpd.

The system's lagoons were leaking and, an intermunicipal agreement was signed with the Town of Rock Hall to connect the system to the town system.

In 2007, the connection was designed and construction was completed.

In 2008, plans are underway to abandon the lagoons at the treatment facility.

#### **4.5.3. Galena**

The incorporated Town of Galena owns and operates a wastewater treatment system that serves the town and a small area outside town limits. A map of the service area is included at the end of this chapter.

Table 4.5.3 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility is permitted for a flow of 60,000 gpd. The average flow calculated from 2008 Daily Monitoring Reports (DMRs) is 50,000 gpd.

The Galena wastewater treatment plant discharges to the Dyer Creek, which is designated Use I waters protected for water contact recreation and aquatic life. It is located within the Sassafras Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 1,538 lb/year and 256 lb/year respectively.

The Galena sewerage service area includes 306 connections (EDUs) and approximately 550 persons.

#### ***System History and Upgrades: (Amended August 2010)***

The Maryland Department of the Environment recently inspected the WWTP and reported operational deficiencies. The Sassafras River Association has contacted the town and has offered its involvement in the discharge permit process so that it can be beneficial to the Sassafras River and its surrounding areas. On May 20, 2009, the Smart Growth Coordinating Committee granted an exception to the Priority Funding Area law for the site of the existing WWTP which lies just outside of the municipal limits of the town.

The selected alternative is to upgrade treatment for 80,000 GPD and remove a portion of the lagoon – this would include a new system on the existing site with removal of 75% of the existing lagoon capable of Enhanced Nutrient Removal (ENR) which would meet all limitations on a new discharge permit and would all but guarantee that the WWTP and lagoon would be in compliance to future permit limitations for approximately 25 years. This project was considered as the best alternative because it uses the latest



technology, reduces impervious surfaces, eliminates seasonal effects and uses the existing site of the lagoon.

A schematic of the proposed treatment process is shown in Table 4.5.3 in Appendix 4-C.

#### **4.5.4. Betterton**

The incorporated Town of Betterton owns and operates a wastewater treatment system that serves the town. A map of the service area is included at the end of this chapter.

Table 4.5.4 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility is permitted for a flow of 200,000 gpd. The average flow calculated from Daily Monitoring Reports (DMRs) from July 2007 to December 2008 is 12,000 gpd.

The Betterton wastewater treatment plant discharges to the Sassafras River, which is Designated as Use II (shellfish harvesting) waters- protected as actual or potential areas for the harvesting of oysters, softshell clams, hardshell clams, and brackish water clams. It is located within the Sassafras Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 1,224 lb/year and 204 lb/year respectively.

The Betterton sewerage service area includes 329 connections (EDUs) and approximately 300 persons.

#### ***System History and Upgrades: (Amended December 2010)***

The 5 pump stations in the collection system have required constant maintenance and need rehabilitation.

In 2010, due to more stringent effluent requirements in the discharge permit, the town authorized an engineering study to consider alternatives to meet the new discharge requirements. As a result of the preliminary engineering report, the Town of Betterton proposes to replace the existing treatment facility in its entirety with an oxidation ditch method of treatment. The new facilities will include a new head-works facility, a new aeration tank, two new clarifiers, chemical storage facilities, a new filter, a new ultra-violet disinfection facility, a post aeration facility, automated controls, a modernized alarm system, a new electrical system and improvements to the sludge drying beds.

#### **4.5.5. Millington**

The incorporated Town of Millington owns a wastewater treatment system. The Millington wastewater treatment plant serves Millington, West Millington, Sandfield, Millington Elementary School, the former Howard Johnson's Restaurant located on U.S. Rte. 301, and the development at Rte. 291 / 301 including Food Lion, River's Edge, and Stoltzfus. An extension of service has been authorized by MDE to the Chesterville Forest development to address failing septic systems. Please see section 4.7.7 for more details. The amendment can be seen in Appendix 4-I.

The collection system in areas outside the town limits is owned and operated by the County (Appendix 1-E contains intermunicipal agreements). A map of the service areas is included at the end of this chapter.

Table 4.5.5 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility was permitted for a flow of 105,000 gpd. Millington has requested a permit revision from MDE which would

allow flow up to 140,000 gpd. The flow for year 2007 and the average flow for 2005-2007 were 55,000 gpd and 55,000 gpd respectively.

The Millington wastewater treatment plant discharges to the Chester River, which is which is designated as Use I water and is protected for water contact recreation and aquatic life. It is located within the Upper Chester Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 3,342 lb/year and 457 lb/year respectively.

The Millington sewerage service area includes 385 connections (EDUs) and approximately 920 persons.

***System History and Upgrades:***

In 2009, upgrades and service area extensions are being planned for the Millington service area. The map of the service area included at the end of this chapter includes proposed service area extensions.

In 2004, the flood-proofed Biolac treatment facility was completed. This facility has a treatment capacity of 145,000 gpd. Maintenance of the plan is performed by contracting services.

The new plant provides service to properties that previously were not served by the force main that runs from U.S. Rte. 301 to the town boundary along Md. Rte. 291. Service was extended to the homes in the River Run subdivision both east and west of U.S. Rte. 301 and also to the homes just north of Millington along Chesterville Road and Md. Rte. 313. The old treatment plant was a 70,000 gpd activated sludge facility with contact stabilization. Treatment included chlorination, aeration and dechlorination prior to discharge into the Chester River. It was owned and operated by the incorporated Town of Millington.

**4.5.6. Kennedyville**

The Kent County Department of Water & Wastewater Services owns and operates the Kennedyville wastewater treatment system. A map of the service area is included at the end of this chapter.

Table 4.5.6 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The treatment facility is permitted for a flow of 30,000 gpd. The flow for year 2007 and the average flow for 2005-2007 were 23,000 gpd and 20,000 gpd respectively.

The Kennedyville wastewater treatment plant discharges to Morgan Creek, which is Use I water and protected for water contact recreation and aquatic life. It is located within the Middle Chester Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 1,425 lb/year and 237 lb/year respectively.

The Kennedyville sewerage service area includes 120 connections (EDUs) and approximately 300 persons.

***System History and Upgrades:***

The system is comprised of a two cell stabilization lagoon facility with chlorination and dechlorination prior to discharge into Morgan Creek. The system currently treats approximately 14,000 gpd. The plants design capacity is currently 50,000 gpd with a permitted daily flow of 30,000 gpd. The county had a feasibility study completed in late 2002 that indicated under the present zoning within the service area, there could be approximately 60,000 gpd flow needed to serve potential new growth.

Due to leakage of the lagoons, the county entered into a Consent Order with MDE to construct a new wastewater treatment facility and upgrade the pumping stations. A new 60,000 gpd Sequencing Batch Reactor (SBR) WWTP was completed in September 2006 and is currently operational.

A new residential development, The Village at Kennedyville, is proposed for Kennedyville. The project will be constructed in phases. The existing treatment facility will accommodate both phases of the project. Phase I is currently under construction. The final phase will not be constructed until completion of the wastewater treatment plant.

#### **4.5.7. Worton / Butlertown**

The Kent County Department of Water & Wastewater Services operates the Worton/Butlertown wastewater treatment system. Service includes two schools in addition to several commercial and industrial users and residential connections. A map of the service area is included at the end of this chapter.

Table 4.5.7 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The existing treatment facility is permitted for a flow of 150,000 gpd. The flow for year 2007 and the average flow for 2005-2007 were 103,000 gpd and 99,700 gpd respectively.

The Worton/Butlertown wastewater treatment plant discharges to Morgan Creek (restricted to November 1st through April 30th) and Groundwater of the State (spray irrigation). Morgan Creek is designated as Use-I water and is protected for water contact recreation and aquatic life. It is located within the Middle Chester Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 3,631 lb/year and 605 lb/year respectively.

The Worton/Butlertown sewerage service area includes 385 connections (EDUs) and approximately 1,065 persons.

#### ***System History and Upgrades:***

In 2009, the County is planning on constructing a new treatment facility that will include new mechanical treatment using membrane treatment technology to meet Maryland's enhanced nutrient removal requirements. The upgraded plant's discharge rate will increase from 150,000 gpd 6 months per year to 250,000 gpd 12 months per year. During the months of April through October, the effluent will be discharged via spray irrigation on agricultural fields located near Worton. The new wastewater plant will be constructed adjacent to the old treatment lagoon. The old treatment lagoon will be converted to a storage facility to accommodate the spray irrigation application period requirements. The upgrades will accommodate proposed growth in the area (outlined below) and a new county business park.

In 2009, upgrades to the sewer force mains, pump stations, and gravity mains are anticipated. These upgrades will be constructed in phases as proposed residential development projects are approved. Upgrades to the infrastructure will be paid pro-rata by each developer in accordance with the project's impact on the system. Details of the upgrades can be seen in Appendix 4-D.

#### **4.5.8. Tolchester**

The Kent County Department of Water & Wastewater Services owns and operates the Tolchester wastewater treatment system (1996). The Tolchester Wastewater Treatment Plant serves Tolchester Estates, Fairlee/Georgetown and Delta Heights Condominiums. A map of the service areas is included at the end of this chapter.

Table 4.5.8 in Appendix 4-C summarizes the wastewater treatment system technology, treatment process, service area, design and production flows and basic discharge information. The Tolchester treatment facility is a sequencing batch reactor (SBR) plant with ultraviolet disinfection, post aeration and aerobic sludge digester. The treatment facility is permitted for a flow of 265,000 gpd. The system serves the Tolchester collection system (85,000 gpd) and the Fairlee/Georgetown collection system (180,000 gpd). The flow for year 2007 and the average flow for 2005-2007 were 92,000 gpd and 94,000 gpd respectively. The collection system consists of approximately 41,000 feet of low pressure force main, 24,000 feet of force main, 12,000 feet of outfall pipeline, 2 main pumps stations and over 200 individual grinder pumps.

The Tolchester wastewater treatment plant discharges to the Chesapeake Bay, which is designated Use II waters protected for the support of estuarine and marine aquatic life, and shellfish harvesting. It is located within the Chesapeake Bay Watershed. Tributary Strategy nutrient limits for nitrogen and phosphorus are 5,584 lb/year and 931 lb/year respectively.

The Tolchester sewerage service area includes a total of 742 connections (EDUs) and approximately 1850 persons.

#### ***System History and Upgrades:***

In 1996, construction of a new wastewater treatment facility (Tolchester WWTP) and collection system was completed. Previously, the growth allocation for the Tolchester WWTP was 50 EDUs.

In response to requests from residents in the Tolchester service area for sewer allocations, a hydraulic study of the collection system was conducted by McCrone, Inc. and it was determined that additional allocation is allowable subject to certain criteria. In March of 2008, the County, with the concurrence of MDE, Determined that additional sewer allocations may be granted provided that (1) the owner (s) of the property seeking such allocation establishes through the McCrone study, or through another accepted study, that the county's sewer lines will not need to be extended; and no upgrades to the county's sewer system, including but not limited to the sewer lines, will be needed or necessary; and (2) the property shall otherwise meet all applicable laws, regulations and criteria including being located within and /or contiguous to the designated growth area shown on the Tolchester delineated development area map shown in Appendix 4-E.

#### **4.5.8.1. Fairlee/Georgetown**

The Kent County Department of Water & Wastewater Services owns and operates the Fairlee/Georgetown wastewater collection system / sewer service area, which is provided sewage treatment by the Tolchester wastewater treatment plant. A map of the service area is included at the end of this chapter.

The Fairlee/Georgetown sewer service area includes 308 connections (EDUs) and approximately 1050 persons.

#### ***System History and Upgrades:***

The original Fairlee/Georgetown treatment facility was a three-cell stabilization lagoon system. After construction of the Tolchester wastewater treatment plant in 1996, the lagoons were abandoned and a new force main was installed to carry all wastewater from Fairlee and Georgetown to the new Tolchester plant.

A section of the old primary lagoon was reconstructed to serve as a 24-hour emergency holding lagoon for flow from Fairlee/Georgetown.

#### **4.5.8.2. Delta Heights**

The Kent County Department of Water & Wastewater Services owns and operates the wastewater collection system serving Delta Heights Condominiums. It is included as part of the Tolchester service area.

##### ***System History and Upgrades:***

C & D Enterprises previously owned and operated a wastewater treatment facility that served the Delta Heights Condominium Project. After construction of the Tolchester wastewater treatment plant in 1996, the system was abandoned and it was connected to the Tolchester wastewater collection system and treatment facility in 1996.

#### **4.5.9. Chestertown Foods**

The Chestertown Foods, formally Campbell Soup Company, owned and operated a wastewater treatment facility for treatment of process wastewater. The plant closed down in 1995 and reopened in the fall of 1996. The facility closed again in 2008.

The system consisted of a spray irrigation and/or overland flow system with an average daily flow of 500,000 gpd. Overland flow was in the Middle Chester Watershed and eventually discharges into Morgan Creek. Treatment included settling, screening, grease flotation and chlorination prior to discharge.

#### **4.5.10. Genovique Specialties Corp. (formerly Velsicol)**

The Tenneco Chemicals, Inc. facility (1957), owned by Genovique, is located on MD Route 297 north of Chestertown. The wastewater treatment facility treats chemical process wastewater (since the late 1960s). The plant discharges treated wastewater effluent and stormwater in accordance with its NPDES Discharge Permit MD0000345 issued by the MDE. All sanitary flows are discharged to the Worton WWTP.

The system includes three lagoons with a storage capacity of 300,000 gallons. The system treats an average flow of 125,000 gpd. Treatment consists of API separators, aqueous decant/surge, a primary clarifier, an aqueous surge tank, equalization, a bioreactor, and a secondary clarifier to plant discharge. Treated effluent is discharged to Morgan Creek.

##### ***Site History:***

In 2008, Genovique signed a consent decree agreeing to clean up contaminated soil and groundwater at its Worton plant as part of Baseline RCRA Corrective Action. In July 2008, Genovique developed a Phosphorus Evaluation and Reduction Plan for the Chestertown facility to document a plan and schedule

to evaluate the presence of phosphorus in the Wastewater Treatment System (WWTS) of the facility, and to develop a plan for the reduction of phosphorus in Outfall 001. Upon approval by the MDE, this Plan will be implemented by Genovique. The consent order also requires Genovique to provide the public with sampling data and that status of its remediation plans on a Web site.

In 1999, the Kent County Sanitary District asked MDE's Water Management Administration, Water Supply Program, for information on groundwater contamination at the Genovique property. MDE reviewed the data and concluded the site did not present a risk to the Worton Water System.

In 1989, a closure plan for impoundment 314 was submitted to MDE's Groundwater / Underground Injection Control Permits Division. MDE approved the plan subject to a sludge-removal schedule, bioremediation installation schedule, and groundwater monitoring requirements.

In May 1984, the Maryland Department of Health and Mental Hygiene (DHMH) collected groundwater and soil samples (Site Inspection of Tenneco Chemicals, Incorporated, 1986). The site was owned by Nu-Dex at the time. The sample results revealed the presence of heavy metals in on-site monitoring wells. The report concluded that source(s) of contamination had not been identified.

#### **4.5.11. Great Oak Resort Club**

Mears, Inc. owns and operates the wastewater treatment facility that serves the Great Oak Resort Club. The Club includes a restaurant, motel and marina.

The system is a one acre stabilization lagoon with chlorination prior to discharge into Fairlee Creek in the Stillpond-Fairlee Watershed. The facility treats an average flow of 6,000 gpd and has a design capacity of 14,000 gpd.

#### **4.5.12. Drayton Manor**

Drayton Manor is a retreat center with an onsite wastewater disposal system and a private well. It is in the Stillpond-Fairlee Watershed.

The new owner of Drayton Manor has proposed to expand the facility into Drayton Retreat, Spa and Conference Center. The developer proposed to supply the site with a new 345-ft deep well into a deeper aquifer than the local residential wells. The yield of the new well has not been identified. In 2008, MDE approved a 29,800 gpd drip irrigation system for wastewater disposal at this site.

### **4.6. Shared Septic Systems**

#### **4.6.1. Rudnick**

The Kent County Department of Water & Wastewater Services operates and maintains the Rudnick sewerage system. It is a shared septic system that serves nine (9) single family homes. The septic system has multiple fields that are routinely alternated. A map of the service area is included at the end of this chapter.

#### **4.6.2. Little Neck**



The Kent County Department of Water & Wastewater Services operates and maintains the Little Neck sewerage system. It is a shared septic system designed to serve sixteen (16) existing single family homes and a future community area. Each home has a septic tank, which drains to an effluent pump and chamber connected to a small diameter force main, which flows to the shared septic system. A map of the service area is included at the end of this chapter.

#### **4.7. Sewerage Problem Areas**

Several areas in Kent County have failing septic systems. The primary reason for bacterial contamination of groundwater is failing septic systems. This issue is discussed in both chapters 3 and 4 because it is both a water and a sewer issue. Areas vary greatly in size and consist of:

- Villages
- Large subdivisions, consisting of small lots, recorded prior to the adoption of effective sewage regulations.
- Mixtures of cross road settlements and scattered individual homes.

Many of these areas cannot financially support a typical shared system for sewage disposal, which would improve the quality of the surrounding ground water used for domestic consumption.

These areas include the communities of:

- Quaker Neck
- Lover's Lane (near Edesville)
- Lover's Lane / Quaker Neck / Wilkins Lane (near Chestertown)
- Chesapeake Landing
- Still Pond / Coleman
- Golts
- Chesterville Forest

The following sections describe proposed solutions for those areas investigated thus far. Some areas have not been addressed yet due to technical or financial limitations.

##### **4.7.1. Quaker Neck**

Quaker Neck is a large, older residential area with failing septic systems.

The Kent County Department of Water & Wastewater Services owns and operates the Quaker Neck sewer service area, which is provided sewage treatment by the Chestertown wastewater treatment plant. The Quaker Neck sewer service area includes 190 connections (EDUs) and approximately 475 persons.

Treatment capacity at Chestertown's wastewater treatment plant provided relief to many residents in the Quaker Neck area, but not all residents experiencing septic problems have been served and there is continuing demand for growth.

In 2006, discussions with the Town of Chestertown permitted the County to proceed with a feasibility study to serve failing septic systems along Lover's Lane and also a proposed small residential project on Lover's Lane by expanding the Quaker Neck service area. On 5-1-09 the Maryland Department of the Environment approved the extension of sewer service from the Town of Chestertown via a denied access

sewer line in Lover's Lane to the Quaker Neck area to serve 15 existing homes with failing septic systems and 12 undeveloped lots in the Prestwick Woods subdivision.

#### **4.7.2 Lover's Lane (near Edesville)**

The Lover's Lane area (near Edesville) is a street with failing septic systems. It contains approximately 11 failing septic systems.

To address the failing septic systems, in November 2008, the Kent County Commissioners approved a proposed extension of water and sewer lines from the end of the existing service area on Lover's Lane to serve 11 properties with failing septic systems with a denied access line. As of 2009, the sewer connection is complete.

#### **4.7.3. Lover's Lane / Quaker Neck / Wilkins Lane (near Chestertown)**

The Lover's Lane / Quaker Neck / Wilkins Lane area (near Chestertown) is a residential area with approximately 15 failing septic systems. To correct the sewer problem, Lover's Lane and Quaker Neck areas have been connected to the Chestertown sewer system.

#### **4.7.4. Chesapeake Landing**

Chesapeake Landing is a large, older subdivision with small lots, poor soils and failing septic systems. It contains approximately 210 private residences.

In 2005, the Kent County Department of Water & Wastewater Services proceeded with a study to determine the feasibility of providing water and sewerage to this area. The feasibility study was outlined to assess at least three alternatives: connection to the Tolchester wastewater treatment facility, connection to the Worton wastewater treatment facility, on-site systems. There are no plans to move forward with the project at this time.

#### **4.7.5. Still Pond/Coleman (Amended September 2010)**

The Still Pond/Coleman area is a rural village with failing septic systems. It contains 184 parcels, 142 are developed.

A sanitary survey conducted by the Health Department in July 2010 determined there were no immediate health issues but there is a strong possibility of failing septic systems in the near future due to the age of existing systems and soil conditions. Furthermore, due to the lack of available recovery areas the County Commissioners may consider a feasibility study to investigate possible connection to the Town Of Betterton's water and sewer treatment facilities and/or shared facilities to serve this area should system failures occur.

#### **4.7.6. Golts**

The Golts area is a rural village with failing septic systems. It contains 95 parcels, 41 are developed. There is no water or sewer service planned for the Golts area at this time.

#### **4.7.7. Chesterville Forest**

The Chesterville Forest area is a rural village with failing septic systems. This is a priority funding area. In 2007, residents along Chesterville Road approached the Kent County Commissioners seeking help with their failing septic systems. The Kent County Health Department performed a sanitary survey in the Chesterville Forest Area.

In 2009, due to the inability to locate a site for the treatment facilities, the County developed a new study to convey the wastewater to Millington via the Edge Road Pump Station and the Kent County Health Department conducted a sanitary survey in the River Road area. Based on the results of the study and sanitary survey, the County is planning on connecting Chesterville Forest development to the Millington wastewater treatment plant, by use of a low pressure grinder pump force main system traversing along MD 291 and intersecting with an existing force main at Edge Road. The connecting sewer main to the Millington Service area is a “denied access” sewer main. Service is limited to the existing lots within the rural village PFA and those single connections indicated in the MDE amendment.

#### **4.7.8 Fox Hole, Shorewood Estates, Gregg Neck, Georgetown, and Kentmore Park**

The Kent County Commissioners have requested that the Kent County Health Department perform an investigation and evaluation of these areas. These are older subdivisions which have very small lots containing both wells and OSDSs. This situation warrants the Health Department to look at both the drinking water quality issues and potential failing OSDSs.