SECTION 3
Public Utilities

PREFACE

The County's Department of Public Utilities owns, operates, and maintains public water and wastewater systems in the Suburban Service Area. The Suburban Service Area is the crescent-shaped area north of the Chickahominy River, generally between Route 1 and Creighton Road, including Ashland, the Doswell area, the Route 33 area near the Henrico County border, and the Hanover Courthouse area. Outside of the Suburban Service Area are five rural, residential subdivisions served by separate Public Utilities water systems (included collectively, as part of the "System").

As of June 30, 2006, the County provides water services to approximately 19,292 customers and wastewater services to approximately 17,384 customers. This includes approximately 1,500 commercial and industrial accounts. One private water utility provider serves approximately 2,500 customers. The balance of County residents and businesses are served by private wells and septic systems.

The County operates the System as a self-supporting enterprise fund, whereby the operations and capital expenditures are funded with revenues generated from user fees and one-time fees paid for capacity at the time of connection to the System. County general fund tax dollars are not used to finance the operating or capital expenses of the System. The Utility enterprise fund reimburses the County's general fund for services provided to support Public Utilities. The Board of Supervisors establishes and revises water and wastewater fees and adopts an annual operating budget and capital improvements budget.

Customers are billed for water and wastewater services based upon metered water consumption. A small number of wastewater-only customers is billed a flat rate for wastewater service.

As of June 30, 2006, the Department of Public Utilities had 93 full-time positions.

THE PRESENT

The System - Water Facilities

A. Public Water System

The County provides water service from 11 wells and 2 surface water treatment plants. In addition, the County provides water service via the purchase of water from the City of Richmond and the County of Henrico.

In Doswell, the County owns the 4.0 million gallon per day (MGD) Doswell Water Treatment Plant, which utilizes the North Anna River as its source. The plant serves the Doswell area, including three major water users: Bear Island Paper Company, Paramount's Kings Dominion, and the Doswell Limited Partnership Cogeneration Power Plant. The Doswell Water Treatment Plant is interconnected with the Suburban Service Area, which enhances cost effectiveness and operating reliability, efficiency, and flexibility.

In the Ashland area, the County owns the 2.0 MGD South Anna Water Treatment Plant, which has the South Anna River as its source. The plant is currently not in service and would require substantial upgrades to return it to service.

In the Route 33 area, the County provides water service to Tyson Foods and a limited number of residential and commercial customers via a water purchase agreement with Henrico County. (The County also has a connection to the Henrico County system along Route 1, which is not routinely utilized).

In the Route 301 corridor, the Suburban Service Area utilizes the Richmond waterline as its source through a water purchase agreement with the City of Richmond. The County's current available capacity from Richmond is 15 MGD.

In the Mechanicsville area, the County owns the 0.17 MGD Harris Court well facility and the 0.65 MGD Garthright well facility. The Garthright well facility is currently not in service.

In the Hanover Courthouse area, the County owns 3 wells with a capacity of 0.16 MGD. The Courthouse system primarily serves the County's government complex, the Pamunkey Regional Jail, and a small number of residential and commercial customers.

Scattered throughout the County are five independent subdivision water systems: Strawhorn, Dianne Ridge, Sinclair Manor, Georgetown, and Oak Hill Estates. These systems are served by a total of 6 wells with a combined capacity of 0.12 MGD.

B. Private Water Systems

Some businesses and residential subdivisions are served by private central water systems. The largest private water purveyor, Aqua Virginia, Inc., owns and operates systems that serve an estimated twenty-three residential subdivisions. In addition, Hanover Public Schools owns individual water systems that serve the County's South Anna, Rural Point and Beaverdam Elementary Schools.

Water Supply Contracts

A. Henrico Water Agreement

The County has purchased potable water from Henrico County since 1974. On April 10, 1995, the County renegotiated an agreement with Henrico County (the "Henrico Water Contract") to purchase up to 0.775 MGD of water.

The term of the Henrico Water Contract extends through June 30, 2014, and continues thereafter until terminated by either the County Manager of Henrico or the County Administrator of Hanover, by giving ten years written notice.

b. Richmond Water Agreement

On July 1, 1994, the County entered into a contract with the City of Richmond (the "Richmond Water Contract") for the County to purchase water. The ultimate capacity available to the County is 20 MGD, which is purchased in 5 MGD increments. The County's current available capacity from Richmond is 15 MGD. The fourth and final 5 MGD incremental capacity purchase will occur in 2010.

The term of the Richmond Water Contract extends through June 30, 2035, and continues thereafter until terminated by either the City Manager of Richmond, by giving fifteen years written notice, or the County Administrator of Hanover, by giving ten years notice, unless a shorter time for notice is mutually agreed upon.

The System - Wastewater Facilities

A. Public Wastewater System

The County provides wastewater service via 4 wastewater treatment facilities and a contractual agreement with Henrico County. The County's wastewater treatment facilities are located in Doswell, Ashland, Mechanicsville and Hanover Courthouse.

In the Doswell area, the County owns the 1.0 MGD Doswell Wastewater Treatment Plant, which discharges to the North Anna River. The facility primarily treats domestic wastewater from Bear Island Paper Company, Paramount's Kings Dominion, and the Doswell Limited Partnership Cogeneration Power Plant.

In the Ashland area, the County owns the 2.0 MGD Ashland Wastewater Treatment Plant, which discharges to the South Anna River. The plant serves residences and businesses in and around the Town.

In the Hanover Courthouse area, the County owns the 0.08 MGD Courthouse Wastewater Treatment Plant, which discharges to the Pamunkey River. The facility serves the County's government complex, the Pamunkey Regional Jail, and a small number of residential and commercial customers.

In the Mechanicsville area, the County owns the 5.0 MGD Totopotomoy Wastewater Treatment Plant, which discharges to the Pamunkey River. The plant currently serves residences and businesses east of Lee-Davis Road along the Route 360 corridor. The service area will expand to include areas west of Mechanicsville as additional trunk sewers are installed in accordance with the Department of Public Utilities Water and Wastewater Facilities Master Plan and the County's Capital Improvement Program.

Also in the Mechanicsville area, the County owns the 13.5 MGD Beaverdam Creek Wastewater Pump Station. It is the collection point for all wastewater conveyed to Henrico County for treatment. Wastewater from the Beaverdam Creek Pump Station is pumped to Henrico's Strawberry Hill Pump Station in route to Henrico's Wastewater Treatment Plant for treatment and discharge to the James River.

B. Private Wastewater Systems

Bear Island Paper Company owns an on-site wastewater treatment plant which treats industrial wastewater prior to combining its discharge with the discharge from the Doswell Wastewater Treatment Plant. In addition, Tyson Foods operates a 1.0 MGD wastewater treatment facility at its processing plant on Route 33. Other private facilities are

located at the Hanover Learning Center, Barrett Learning Center, the Missionary Training Center, and Kosmo Village Trailer Park.

Wastewater Treatment Contracts

A. Henrico Wastewater Agreement

The County has purchased wastewater treatment service from Henrico County since 1979. On April 10, 1995, the County renegotiated a wastewater agreement with Henrico County (the "Henrico Wastewater Contract"). In accordance with the Henrico Wastewater Contract, Henrico will accept up to 5.4 MGD, based upon a ninety-day rolling average.

The term of the Henrico Wastewater Contract extends through June 30, 2014, and continues thereafter until terminated by the mutual agreement of the parties.

THE GOALS

Goal 1: To provide public water and wastewater services to meet the diverse and changing needs of County residents.

Objective 1: Support existing economic development by providing adequate water and wastewater capacity.

Objective 2: Develop and promote planned development areas to attract firms best suited for the local labor force.

Goal 2: To accommodate future growth within existing suburban service areas and guide development into more compact patterns.

Objective 1: Investigate the impact of any major land development on utility systems.

Objective 2: Locate new facilities to support orderly and efficient development of suburban land use.

Goal 3: To protect those features of the natural and manmade environment which are essential to maintaining a clean, unpolluted, natural environment and the cultural heritage of the County.

Objective 1: Minimize environmental impacts while providing services and operating infrastructure and facilities.

Goal 4: To develop water supply sources to meet future County demands.

Objective 1: Evaluate future water availability in terms of the safe yield concept, which recognizes water as a finite resource.

THE MEANS

To manage and direct suburban style development into a small portion of the County, allow for economic development opportunities within the County, and preserve the rural character of a majority of the County, Hanover has designated a Suburban Service Area. The existing and planned limits of the Suburban Service Area are shown on the *Conservation and Phased Suburban Development Plan* map. The Suburban Service Area is the area of the County in which it is planned to make public water and sewer service available which allows higher density development to occur. The Suburban Service Area consists of "existing" areas in which public water and sewer service is already available. It also consists of planned expansions where water and sewer service is to be made available in the future. Currently two expansions to the Suburban Service Area are planned and shown on the Conservation and Phased Suburban Development Plan. Expansions of the Suburban Service Area take effect on July 1, 2007 and July 1, 2017.

Phased Suburban Development

The Conservation and Phased Suburban Development Plan and Land Use Plan should be considered together. These two plans represent the County's plan for the type and timing of future development. In support of these plans, the Department of Public Utilities plans and implements improvements to make water and wastewater treatment capacity available to support development of the expansion areas. The Department invests in water and wastewater treatment capacity and major regional pump stations, trunk sewers and water transmission mains as provided for in the Department's Capital Improvement Program. The Department may also work with Community Development Authorities, special service districts or in partnership with private developers to help extend utilities to the expansion areas. The County does not make water and wastewater service available to every parcel in an area when an area is in phase. The intent of the plan is that the Department makes water and wastewater treatment capacity available so that every lot within the Suburban Service Area can be served with public water and sanitary sewer if a property owner desires to extend public water and/or sanitary sewer to a property. Other public facilities, such as stormwater drainage, are also anticipated when an area comes into phase.

Existing Suburban Service Area. The existing Suburban Service Area is shown on the Conservation and Phased Suburban Development Plan and is the area in which public water and sewer service is currently allowed to be provided.

Expansion of the Suburban Service Area. As previously stated, two expansions to the Suburban Service Area are planned and are shown on the Conservation and Phased Suburban Development Plan. The two expansions of the Suburban Service Area are planned to take effect on July 1, 2007 (2007 – 2017 Expansion), July 1, 2017 (2017 – 2027 Expansion)

A. Purpose of the Suburban Service Area Expansion Process. The County desires that development occur in a logical, compact and contiguous manner so that the rural character of the County is maintained while providing housing, business, and employment opportunities for its citizens. Based on projected growth and anticipated needs, public water and sewer facilities are planned to be made available in Expansion Areas which are compact and contiguous to the existing Suburban Service Area. Thus the size of the Suburban Service Area is expanded in a logical manner, and the County can plan for the logical expansion of the public water and sewer system.

B. Changes. Changes in the scheduled Conservation and Phased Suburban Development Plan and/or expansion of the boundaries of the Suburban Service Area could be considered if any one of the following conditions exist: (1) for economic development purposes where a private applicant is willing to fund public improvements in advance of an area coming into phase, (2) where the County has determined the change is consistent with the Comprehensive Plan, and (3) where the County has determined there is a demonstrated risk to the public health, safety, and welfare as a result of failing water or wastewater facilities necessary to serve an identified community; and for Hanover County public sites and facilities.

Except as stated above, there is no provision for public water and sewer to be provided outside of the Suburban Service Area or outside the areas presently served by public utilities in the Doswell area, the Route 33 area, the Hanover Courthouse area and the five rural subdivisions presently served with public water.

Provision of public utilities is conceptually described in the Department of Public Utilities Water and Wastewater Facilities Master Plan. The current Facilities Master Plan was developed following the adoption of the Vision 2022 Comprehensive Plan. It shows conceptual projects through which water and wastewater service could be provided to areas within the Suburban Service Area in support of the Comprehensive Plan, and other projects necessary to support natural growth. The Department of Public Utilities plans to prepare an update to the Water and Wastewater Facilities Master Plan after the County adopts the update to its Comprehensive Plan for the planning period 2007 - 2027.

THE FUTURE

Water Supplies. The need for additional future water supplies has been recognized since the 1970's. The findings of numerous studies agree that the groundwater resources of Hanover County are restricted by quantity and quality and are not viable for meeting the County's long-term water resource requirements.

Based upon future water supply needs, as reviewed by the then Board-appointed Water Alternatives Citizens Committee, a cross-stream impoundment creating the Little River Reservoir and Crump and Pollard Creeks Reservoir were two alternatives evaluated by the County in the 1980's. These alternatives would allow a reduction in groundwater withdrawal and provide a dependable storage of substantial safe yield to meet the County's water demand. Following detailed evaluations of safe yield, environmental impacts, and water demand, the County proposed to construct a cross-stream impoundment of Crump Creek, downstream of the Pollard Creek confluence, with a river skimming intake facility on the Pamunkey River, as a means of providing the Suburban Service Area with an adequate water supply. The County submitted an application to the U.S. Army Corps of Engineers for review in 1992.

The proposed Crump Creek Reservoir would be located on Crump and Pollard Creeks in Hanover County. The site appears suitable for impoundment and the construction of an earth fill dam. The Crump Creek watershed covers about 14.8 square miles. The reservoir would hold approximately 10 billion gallons of water. The raw water supply to the reservoir would be provided by a river skimming intake facility and pumping station located on the Pamunkey River and by runoff from the Crump Creek watershed. Water was estimated to be pumped from the Pamunkey River at a rate of 25 MGD. Before the water from the proposed Crump Creek Reservoir was distributed, it would be treated at a water treatment plant.

When the Crump Creek application was made, the EPA and other environmental agencies took strong exception to projects which eliminate wetlands. The proposed Crump Creek project had wetland impacts therefore the County pursued an alternative connection with the City of Richmond for utilization of Richmond's excess capacity, which resulted in the Richmond Water Contract that was entered into on July 1, 1994. Through its contract with the City of Richmond, the County will have 20 MGD of water available to it in 2010. Currently 15 MGD of water is available from Richmond. It is estimated that the 20 MGD capacity of this contract, when combined with other supply sources available to the County, will meet the County's average and peak day demands to sometime during period 2020-2025, depending on growth within the Suburban Service Area.

In addition to the interconnection with the City of Richmond, the County has recently evaluated more cost effective and environmentally compatible alternatives to the Crump Creek Reservoir Project. In 2001, the County initiated a "Long-

Range Water Resources Planning Study" to identify sources of water available to the County for meeting projected water demands after 2020-2025.

The Long-Range Water Resources Planning Study included the following:

- Documented the water supply capabilities of existing sources.
- Projected water demands and assessing the ability of the County's existing water supply sources and facilities to reliably meet those needs.
- Documented work from previous studies with a particular focus on work conducted in support of new water supply sources.
- Developed and evaluated water supply alternatives capable of meeting projected needs after 2020.
- Developed an implementation schedule that documents when actions are needed for the recommended alternative(s).

A total of seven alternatives were evaluated:

Alternative 1: Verdon Quarry with treatment at Doswell Water Treatment Plant (WTP)
Alternative 2: Verdon Quarry with WTP at Verdon Quarry
Alternative 3: Verdon Quarry with WTP in Suburban Service Area
Alternative 4: Verdon Quarry with WTP near Route 301 at Hanover Learning Center
Alternative 5: Off-stream storage and WTP near Route 301
Alternative 6: Run-of-river withdrawal
Alternative 7: Groundwater

The study recommended that the County retain the following two alternatives for incorporation into the Comprehensive Plan.

<u>Alternative 2: Verdon Quarry with WTP at Verdon Quarry</u>

This alternative involves use of raw water storage in the Verdon Quarry and treatment at a plant adjacent to the quarry. This alternative includes:

- 28 MGD (estimated) water treatment plant adjacent to the Verdon Quarry
- 50 MGD (estimated) river intake and raw water pump station at Little River

- 30 MGD (estimated) river intake and raw water pump station at North Anna River
- 28 MGD (estimated) reservoir intake and raw water pumping station at Verdon Quarry
- 28 MGD (estimated) finished water pump station at water treatment plant
- 42-inch (estimated) raw water main from Little River to Verdon Quarry (approximately 400')
- 42-inch (estimated) raw water main from Verdon Quarry to North Anna River (approximately 6,000')
- 36-inch (estimated) finished water main from water plant to the Suburban Service Area (approximately 62,000')

Alternative 3: Verdon Quarry with WTP in Suburban Service Area

This alternative involves use of raw water storage in the Verdon Quarry and treatment at a plant in the southern central portion of the County. This alternative includes:

- 28 MGD (estimated) water treatment plant in the southern central portion of the County
- 50 MGD (estimated) river intake and raw water pump station at Little River
- 50 MGD (estimated) river intake and 78 MGD raw water pump station at South Anna River
- 28 MGD (estimated) reservoir intake and raw water pump station at Verdon Quarry
- 28 MGD (estimated) finished water pump station at water treatment plant
- 42-inch (estimated) raw water main from Little River to Verdon Quarry (approximately 400')
- 42-inch (estimated) raw water main from Verdon Quarry to South Anna River (approximately 39,000')
- 42-inch (estimated) raw water main from South Anna River to water treatment plant (approximately 30,000')
- 36-inch finished water main from water plant to the Suburban Service Area (approximately 12,000')

In 2010, it is recommended that the County initiate implementation of the water supply project by selecting a consultant to conduct further studies of the water supply facilities.

Wastewater Systems. Hanover County's projected growth, proposed Suburban Service Area and General Land Use Plan, have and will necessitate expansion of the wastewater collection, transmission, treatment, and discharge facilities.

In 2004 the County placed its newest wastewater treatment plant, the Totopotomoy Wastewater Treatment Plant, in service. Based on current wastewater flow projections, construction of this plant along with other infrastructure improvements will allow Hanover to remain within its 5.4 MGD contractual capacity with Henrico County. This will be accomplished by diverting flow currently being sent to Henrico to the new plant and wastewater flow from new development within the current and future phase areas will be directed to the new plant as well. The Totopotomoy

Wastewater Treatment Plant has a capacity of 5 MGD with a tiered Commonwealth of Virginia discharge permit that allows for up to a 10 MGD discharge. The tiered permit was obtained because much of the plant has been sized and constructed to handle the higher flows and the remaining processes can be economically expanded as necessary to meet future demands. The Conditional Use Permit for the Totopotomoy plant, approved by the Hanover County Board of Supervisors in 1997, allows for expansions up to 15 MGD.

The Totopotomoy plant discharges to the Pamunkey River and will provide additional treatment capacity for the portion of the Suburban Service Area now served by the Henrico Wastewater Contract. The County's plan is to continue to utilize the wastewater treatment capacity it has purchased from Henrico County. Flow will be off-loaded from Henrico as necessary to remain within the 5.4 MGD contract limit. The areas served by the Henrico contract (via wastewater conveyed from Hanover's Beaverdam Creek Wastewater Pump Station to Henrico's Strawberry Hill Wastewater Pump Station) and the Totopotomoy plant will vary as growth occurs.