

**BOTETOURT COUNTY
SEWER FACILITIES STUDY**

Prepared by the staff of the Fifth Planning District Commission with assistance from the Botetourt County staff. Funding for this document was provided, in part, by a grant to the Fifth Planning District Commission from the Appalachian Regional Commission, under the Appalachian Regional Development Act of 1965, Section 302(A), As Amended.

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BOTETOURT COUNTY SEWER SERVICES STUDY

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CHAPTER I

INTRODUCTION AND BACKGROUND

Planning Background

This study is part of the Botetourt County Board of Supervisors' and Botetourt County Planning Commission's ongoing efforts to provide services to County residents in a timely and efficient manner. The Fifth Planning District Commission is grateful to the Botetourt County staff for its assistance in the preparation of this study.

Sewer services and facilities have become an increasingly important concern for Botetourt County's leaders during the past few decades. Botetourt County officials began planning public water and sewer facilities for the County in 1973 with the incorporation of the Botetourt County Service Authority (BCSA). At that time, the County Board of Supervisors provided the BCSA with \$400,000 to use as seed money for investigation of improvements to County water and sewer services and to retain an engineering firm for feasibility studies.

Several plans and studies regarding sewage disposal in Botetourt County have been completed in recent years. To name a few, they include: 1) the 1976 208 Areawide Plan by Moore, Gardner, and Associates, Inc. and the Fifth Planning District Commission; 2) the 1976 Botetourt County Groundwater--Present Conditions and Prospects by the Fifth Planning District Commission; 3) the 1980 and 1987 Botetourt County Comprehensive Plan by the Botetourt County Planning Commission, County Planning Department and Fifth Planning District Commission; 4) the 1987 Wastewater Facility Plan for the City of Roanoke by Malcolm Pirnie, and 5) the 1987 Hydrogeological Investigation and Evaluation of Susceptibility of Groundwater to Septic Field Contamination, Glade Creek Drainage Area by Geological Consulting Services, Inc.

In 1985, Botetourt County adopted its first Capital Improvements Plan (CIP). This Plan identified and prioritized major capital projects needed over a five-year period. It has been updated annually as part of the planning and budgeting process. In 1986, the County also established a Capital Needs and Bond Referendum Committee. The committee determined that it was advisable to hold a bond referendum to authorize bonds for much-needed capital projects. As a result of the Committee's recommendations, \$100,000 has been budgeted annually for water/sewer improvements that bolster economic development. In 1988, the County established a separately funded "Public Works Capital Reserve Fund" to provide the resources and flexibility to meet ongoing maintenance needs and take advantage of opportunities involving capital improvements.

Further reorganization in 1987 incorporated the BCSA into a County Department of Public Works and Recreation which reports to the Botetourt County Administrator. The Department now handles all functions related to sewer services and facilities.

Existing County Facilities and Service Contracts

Botetourt County has two major drainage basins, the James River Basin and Roanoke River Basin. Illustration 1 in Appendix I shows the divide between the two basins, which generally follows Tinker Mountain in the southwestern portion of the County. Within the County, Eagle Rock, Iron Gate, Fincastle, and Buchanan drain to the James River. Most of the area south of these communities drains to the Roanoke River.

In response to growth pressures, health need, and economic considerations, several public sewer projects have been initiated by the County during the past few years. The Tinker Creek Interceptor and the Glade Creek Interceptor (shown on Illustration 2) were developed by the County to accommodate existing and projected residential, commercial, and industrial growth patterns.

The Tinker Creek Interceptor runs from the general Daleville community around Lord Botetourt High School south on U.S. 220 to U.S. 11; it then runs southwest along Tinker Creek through Cloverdale to the Roanoke County line where it connects to Roanoke County's system. The Roanoke County system connects to joint-use interceptors in the City of Roanoke which flow into the Roanoke Regional Water Pollution Control Plant.

The Glade Creek Interceptor runs east along Alternate 220, then south along U.S. 460, connecting to a joint-use interceptor in Roanoke County which flows into a joint-use interceptor system in Roanoke City and into the Roanoke Regional Water Pollution Control Plant.

The sewage from the Tinker Creek and Glade Creek Interceptors is treated at the Roanoke Regional Water Pollution Control Plant. Botetourt County and Roanoke City have a 30-year sewage treatment contract that expires in 2002. In essence, Botetourt County "owns" approximately 5% of the plant's current treatment capacity through the contract period. The Regional Plant has allocated 1.9 million gallons per day (MGD) of its 30 MGD treatment capacity to Botetourt County. The remainder of its treatment capacity is allocated to the City of Roanoke, Town of Vinton, City of Salem, and Roanoke County. The plant has a tertiary treatment design flow of 35 MGD. The 1987 Wastewater Facility Plan by Malcolm Pirnie reports that the plant operated (at that time) at an average of 28 MGD, using primary and secondary treatment as well as the tertiary processes of

phosphorus removal, biological nitrification, flocculation, and coagulation, filtration and chlorination.

Botetourt County's treatment contract with the Regional Plant is under renegotiation and the County hopes to buy additional treatment capacity and establish perpetual ownership of that capacity. Botetourt will share the cost of plant expansions and upgrades that will create additional treatment capacity. The County's investment may reach \$1 million.

Other County-owned sewer facilities include sewer systems near Troutville and in several subdivisions in southern Botetourt (see Illustration 2). The County's system near Troutville services virtually the entire Town, the Camp 25 area, and the I-81/U.S. 220 intersection where it services many commercial uses.

In addition, Botetourt County is constructing a sewage treatment plant and collection system in Eagle Rock. Construction should begin in the spring of 1991. The County applied for and was awarded Community Development Block Grant funds to construct the system.

Fincastle, Buchanan, and Iron Gate's Sewer Facilities

There are three other existing public sewer systems in Botetourt County. The Town of Fincastle has a public sewage collection and treatment system with a capacity of 75,000 GPD. Fincastle is the County seat and a population and commerce center. The Town of Buchanan has a public sewage treatment plant and collection lines. Buchanan is currently constructing modifications to its sewage treatment plant (capacity will remain at 240,000 GPD). The Iron Gate community also has a public sewer system into which a County sewage collection system serving twenty-eight connections flows. Iron Gate has no treatment facilities of its own and contracts with Clifton Forge for treatment capacity of 150,000 GPD. Botetourt County contracts with the Town of Iron Gate for sewage treatment. Appendix II lists current sewer rates and fees charged by Fincastle, Buchanan, and Iron Gate.

Growth Patterns in Botetourt County

There are thousands of acres of National Forest in Botetourt County. Just over 80,000 acres of the County's approximately 350,720 acres of land area is controlled by the federal government in the Jefferson and George Washington National Forests. Almost 28% of the County's land mass was utilized for agricultural purposes in 1983 (see 1987 County Comprehensive Plan). Approximately 1.5% of the County's land mass was

developed for residential, commercial, and industrial uses at that time. The largest portion (approximately two-thirds) of that was in residential usage.

In 1991, the general division of land uses is the same as that of 1983. The major change in land use has been a gradual and slight decrease in forest and agricultural acreage as a result of gradual increases in residential, commercial, and industrial acreage.

The majority of all new development in Botetourt County is occurring in the southern portion of the County. Much of the growth in southern Botetourt is occurring along or near major corridors (e.g., Interstate 81, U.S. 220, U.S. 460, Alternate 220, and U.S. 11), Troutville, the Interstate 81/U.S. 220 interchange (Exit 44), and Alternate U.S. 220/Route 460 are where much of the commercial growth is occurring.

Industrial growth has primarily occurred in the southern part of the County. Growth has occurred in the Jack Smith Industrial Park developed jointly by Botetourt County and Roanoke County. There is a private industrial park called the Botetourt Industrial Park. In addition, Botetourt County is single-handedly developing another industrial park on Alternate U.S. 220, called EastPark Commerce Center. Botetourt County also has other areas with potential for industrial growth.

Table 1 shows population projections for Botetourt County by magisterial district for the years 1980-2050 (see Illustration 1 for magisterial boundaries). Only the Buchanan District is expected to decline in population from the years 1980 to 2050. During the same time period, Blue Ridge is expected to grow by 4,719 persons, or 67% of its 1980 population. The other Districts, Amsterdam, Fincastle and Valley, are expected to grow by 71%, 96%, and 110%, respectively, in the 70-year time period.

TABLE 1

**POPULATION PROJECTIONS FOR BOTETOURT COUNTY, VIRGINIA
BY MAGISTERIAL DISTRICT, 1980-2050**

Year	Magisterial Districts						Total Count
	Amsterdam	Blue Ridge	Buchanan ¹	Fincastle	Valley		
1980 (Census) Actual:	4,577 (19.7%)	7,021 (30.1%)	3,885 (16.7%)	4,028 (17.3%)	3,759 (16.2%)		23,270
1990 (Estimate) ² Assumed:	5,180 (20%)	7,770 (30%)	3,800 (15%)	4,575 (18%)	4,575 (18%)		25,900
2000 Assumed:	5,600 (20%)	8,400 (30%)	3,800 (14%)	5,100 (18%)	5,100 (18%)		28,000
2010 Assumed:	6,020 (20%)	9,030 (30%)	3,800 (13%)	5,625 (19%)	5,625 (19%)		30,100
2020 Assumed:	6,440 (20%)	9,660 (30%)	3,800 (12%)	6,150 (19%)	6,150 (19%)		32,200
2030 Assumed:	6,860 (20%)	10,290 (30%)	3,800 (11%)	6,675 (20%)	6,675 (20%)		34,300
2040 Assumed:	7,330 (20%)	10,980 (30%)	3,800 (10%)	7,260 (20%)	7,260 (20%)		36,630
2050 Assumed:	7,825 (20%)	11,740 (30%)	3,800 (10%)	7,880 (20%)	7,880 (20%)		39,125

NOTES: ¹Assumed stable population for Buchanan. An average growth rate of 0.6% is projected between 2030-2040.

²Detailed 1990 Census figures not available at date of publication.

SOURCES: 1980 Census; estimates for 1990-2030 for total County from Virginia Department of Planning and Budget, April 1990. Assumptions for distribution by Magisterial District and Projections for 2040 and 2050 by Botetourt County Public Works Department.

CHAPTER II

EXISTING SEWER POLICIES AND REGULATIONS

Board Policies on Sewer Development

According to data provided in the Virginia Water Project, Incorporated's 1988 report, Water For Tomorrow, only 811 or 9.6% of all year-round housing units in Botetourt County are served by public sewer. The vast majority of homes use private septic systems for sewage disposal.

Currently, the Botetourt County Board of Supervisors' policy on residential sewer development is that the developer is responsible for installation of public sewer collection systems. Each system must receive local and state approval prior to construction. The County requires a bond from the developer to cover the cost of the sewer system. This bond is returned following satisfactory completion of the system. Upon completion, the developer is required to dedicate the sewer collection system to the County which owns, operates, and maintains the system thereafter.

In approving residential sewer system funding, the Board's policy is to help those areas that have a certified health need as determined by the Health Department. Recent examples include Eagle Rock and Cloverdale. Recently, the County applied for Community Development Block Grant funding on behalf of the Eagle Rock community. This funding will be used to help construct a collection system and a 20,000 gallon per day treatment plant that will prevent the release of raw sewage into the James River.

With regard to sewer development in commercial and industrial areas, the Board takes a pro-active approach. In an effort to strengthen and diversify the County's economy, the Board may offer sewer and other utility facilities as an incentive to potential commercial and industrial developers. Recent examples of this policy in action include the County's installation of the sewer lines serving EastPark Commerce Center and the Jack Smith Industrial Park, where Tweeds is located in the Bonsack area. Most recently, there is the planned extension of a sewer line to the Simmons Industrial Park on U.S. 11 in Cloverdale. The extension is scheduled to be built in spring 1991 and is expected to generate industrial growth on this 80+ acre tract.

The Board's policy is to coordinate sewer improvements with road and water improvements. The Board reviews Federal, State, and local short-range and long-range land use projections and plans for public facilities improvements in order to ensure efficiency and maximize resources. An example of this policy in

action is the County's recent installation of utility casings in conjunction with the widening of Alternate 220 (as stated in the Virginia Department of Transportation's Six-Year Plan). This will allow sewer and water extensions to that area at a minimum cost in the future, (i.e., the County's forethought will prevent the widened road from being disturbed in order to add utilities later).

In other instances, the Board's pro-active approach to sewer development in commercial and industrial areas has led to the sizing of lines to accommodate future development and/or the waiving of sewer connection fees. For example, the County recently paid the difference in cost between the 8" line required of a developer (the City of Roanoke) and a 21" sewer line needed to accommodate future growth in the U.S. Route 460 Corridor. This 21" line will amply accommodate future growth that is anticipated.

Town Policies on Sewer Development

Although a sewer system serves Fincastle residents, as well as some nearby County residents, Town policy-makers have decided to reserve the remaining unused capacity (20% of the 75,000 GPD total capacity) for Town use. New developments outside the Town would require a plant expansion, at the developer's cost. All uses within Fincastle are required to connect to the public sewer (see Appendix II, Part 2, for fees).

In the Town of Buchanan, new buildings (including residences) are required to connect to the public sewer, i.e., septic tanks are no longer allowed. All new customers are required to pay the \$350 fee for connecting to the public sewer. An exception to this is a portion of the Town that was acquired in a recent boundary extension. Those homes were allowed to keep their septic systems.

Sewage from the Town of Iron Gate system is treated at Clifton Forge. This includes 228 connections from Alleghany County's Town of Iron Gate, 28 connections from the Botetourt County community of Iron Gate and 64 connections from adjacent sections of Alleghany County. The Town's contract with Clifton Forge lists its share of treatment capacity at 150,000 GPD. Although the Town often exceeds this contract capacity, it still adds new users as needed because of the inability of most lots to support septic systems. A \$300 connection fee applies to all new system users.

County Codes and State Regulations

The Botetourt County Code includes a chapter on water, sewers, and sewage disposal which is modeled on the Code of Virginia. The County's regulations include general requirements for permits, inspection, cross connection control, backflow prevention, line size, prohibited discharges, service charges, industrial discharge, etc. All sewer facilities in new subdivisions must be designed by a civil engineer and the plans and specifications approved by the State Department of Health and the County Department of Public Works prior to construction. The development of sewer construction standards is planned by the County.

The County's Code requires that discharges into public sewers meet general guidelines. For example, businesses and industries are required to trap grease and sand on-site before discharging into the public sewer. The County's Code also requires that all discharges meet federal categorical pretreatment standards and any State Water Control Board standards. Due to Environmental Protection Agency (EPA) regulations, Botetourt County is currently administering a pretreatment program that may require establishments to pretreat their discharge on-site before discharging to the public sewer system. Effluent testing and reporting is included for most industrial dischargers. The County's job is to ensure that those required to pretreat are in fact doing so and that their discharge meets certain standards.

CHAPTER III

PROJECTED NEED AND POTENTIAL IMPROVEMENTS

Demand Projections for Roanoke River Basin

The following sewer need projections were developed by Richard G. Lang, of Lang Engineering Company, and Bonnie L. Newlon, the Director of Public Works for Botetourt County, in conjunction with John B. Williamson, III, Botetourt County Administrator. Their projections include only the areas collected by the Tinker Creek Interceptor and the Glade Creek Interceptor (i.e., southern Botetourt - see Illustration 2). These areas drain into the Roanoke River Basin. The following projections were made in May, 1990.

- 1) Estimated Sewage Flows for Roanoke River Basin
Botetourt County, Virginia, 1990-2050 (in gallons per day)

<u>Year</u>	<u>Portion of Roanoke River Basin</u>		<u>Total</u>
	<u>Glade Creek</u>	<u>Tinker Creek</u>	
1990	75,000	525,000	600,000
2000	378,000	802,500	1,180,500
2010	541,800	1,048,050	1,589,850
2020	869,400	1,225,350	2,094,750
2030	1,080,450	1,318,350	2,398,800
2040	1,235,250	1,422,000	2,657,250
2050	1,320,750	1,531,650	2,852,400
Peak (MGD)			
30-40%:	1.72-1.85	1.99-2.14	3.71-3.99

- 2) Estimated Flows at Condition of Total Build-Out of Net Buildable Area in Roanoke River Basin, Botetourt County, Virginia

<u>Indicator</u>	<u>Portion of Basin</u>		<u>Total</u>
	<u>Glade Creek</u>	<u>Tinker Creek</u>	
Population	16,184	27,967	44,151
Sewage Flow (MGD)	2.4276	4.1951	6.6227
Peak Flow (MGD)	3.16-3.40	5.45-5.87	8.61-9.27

NOTE: Glade Creek sewer area will take 101.5 years beyond 2050 (to 2151) to reach total build-out (growing at an average annual growth rate of 0.6%). Tinker Creek sewer area will take 167.9 years (to 2218) to total build-out under similar conditions. The average for the basin is 140.4 years past 2050 to total build-out (one unit per acre of net buildable area), or around the year 2190.

The results of these calculations indicate that the total plant capacity needed for 2050 is 2.9 MGD as opposed to the 1.9 MGD "owned" by Botetourt County through agreement with the City of Roanoke. About 1.3 MGD is needed in the Glade Creek drainage area and 1.6 MGD in the Tinker Creek area. Botetourt County is considering purchasing increased capacity to accommodate the projected need, both in the plant and in the incoming Tinker Creek interceptor at the Roanoke Regional Water Pollution Control Plant.

Demand Projections for James River Basin

The following estimates refer only to the James River Basin section of the County (see Illustration 1 for division between Roanoke River Basin and James River Basin).

- 1) Estimated Sewer Flows for Botetourt County portion of James River Basin, 1990-2050 (in Gallons Per Day)

1990	375,000
2000	645,750
2010	829,800
2020	1,035,900
2030	1,314,000
2040	1,657,650
2050	1,989,300

Sources: Botetourt County Public Works Department and Roanoke County Departments of Development and Public Facilities average day projections. Note Roanoke County's projections to 2040 extrapolated by Botetourt County Department of Public Works to 2050 using an 0.7% per annum growth rate, representative of the growth seen in service population between the years 2030-2040.

- 2) Estimated Sewer Flows at Condition of Total Build-Out of Net Buildable Area in Botetourt County portion of James River Basin, 1990-2050

Population at Build-Out*	102,933
Sewage Flow (MGD)	15,439,950

* It would take 341,5 years of growth past the year 2050 for the Basin to reach total build-out if it grows at .06 per annum.

The above figures show a large disparity between the total capacity needed for the year 2050 (2 MGD) and the existing capacity of public sewer in the Botetourt County portion of the James River Basin (348,125 GPD). The existing capacity was computed by adding the capacities of Buchanan (240,000 GPD), Eagle Rock (20,000 GPD, under development in spring 1991), Fincastle (75,000 GPD), and Botetourt County's proportionate share of Iron Gate (13,125 GPD, or 8.75% of the total 150,000 GPD Iron Gate allocation).

Sewer System Improvements

The following is a brief listing of ongoing or recently completed sewer improvements. The location of improvements is shown on Illustrations 3A and 3B.

- o Eagle Rock treatment plant and collection lines have been designed and are being constructed by the County in mid-1991.
- o Buchanan's treatment plant is currently being updated (improvements will not change the capacity, which will remain 240,000 GPD).
- o Botetourt County has participated in construction of a force main at the Tarmac plant on Route 779, discharging to the public sewer at Daleville.
- o The County is designing collection lines for the "Old Cloverdale" area between U.S. 11 and the Norfolk-Southern railroad tracks.
- o The County has designed collection lines to the Simmons Industrial Site on U.S. 11 and will begin construction in spring 1991.
- o A developer is extending an interceptor line from Botetourt East subdivision on Alternate 220 to Steeplechase subdivision.
- o EastPark Commerce Center's water and sewer lines have been constructed by Botetourt County.
- o The County is helping finance improvements to upgrade the Regional Water Pollution Control Plant in Roanoke City (not shown on Illustrations 3A & 3B).

The designation and construction of potential improvements is dependent upon a number of factors. Among them are health need, funding availability, and potential for public benefit. These factors have and will continue to shape priorities in selecting sewer system improvements for County officials.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

For many years the Botetourt County Board of Supervisors and County Planning Commission have taken a planned approach in providing needed public sewer facilities for County residents, businesses and industry. The County has examined future growth and demand projections, and taken steps to meet future demand as funding allowed. Improvements have been constructed largely on a "pay-as-you-go" basis that has included some grants and loans from outside sources. As a result of its past actions the County has a public sewer system that is functioning well as a whole and that can grow to serve future generations once the structural improvements in progress or scheduled are completed.

Recommendations

The following sections review four recommendations that can further advance the County's public sewer system:

1) Strengthening Ongoing Maintenance Program & Development of Utility Services

Since beginning its public sewer system, the County has had an ongoing maintenance program which is intended to detect and correct minor problems before they become large problems causing service interruptions and wasted resources. Currently a large portion of the County's maintenance activity focuses on detecting and eliminating inflow and infiltration ("I and I") into the public sewer system. Today's sewer construction technology dictates that rainwater or stormwater be collected and treated by a separate system (storm sewers) than sewage which is collected and treated in a sanitary sewer system. Infiltration is defined as water that leaks into sanitary sewers from underground, while inflow is water that enters sanitary sewers from surface sources such as manholes, roof drains, or basement sump pumps connected to the sanitary sewer. The County's "I and I" work includes smoke testing for breaks in lines, checking for illegal connections to public sewer lines, and comparing water and sewer readings for specific users. (Sewer readings that regularly outpace water readings following a rainfall may indicate infiltration and inflow.)

Developing in-house utility maintenance operations as the utility department grows is a recommended goal. Currently, maintenance agreements with private contractors cover line maintenance repairs and monitoring outside the scope of County services.

Some federal and state funding for sewer facilities is contingent upon elimination/reduction of "I and I". In addition, any system with substantial "I and I" tends to place unnecessary demand upon its treatment plant and the plant's capacity is used more quickly than would be the case without the "I and I". Therefore, it is recommended that the County continue the funding for "I and I" detection and elimination. Implementation of this recommendation will result in financial savings for the County over the long-term.

2) Development of Sewer Construction Standards

As previously noted, the County does not have its own set of detailed sewer construction standards; it uses the State Health Department's specifications. The County plans to begin work on detailed sewer construction standards. It is recommended that the County use its staff or a consultant to complete the standards as soon as possible. When complete, these standards will make it easier for developers to know exactly what is required of them in regard to sewers. The standards will also help promote a unified public sewer system through compatible construction materials, sizing of lines, etc. These standards will be more specifically tailored to Botetourt County's topography, soils, and general environment. They will help produce a higher quality public sewer system over the long run.

3) Continue to Pursue Potential Sewer Funding Sources

Funding a public sewer collection or treatment facility is no small task. Funding for such projects generally originates from taxes, user fees, and public or private grants and loans. The following is a partial description of funding sources, some of which Botetourt County is currently utilizing and others that the County may choose to investigate further in regard to their future public sewer needs and plans.

- a) CDBG: In Virginia, the U.S. Department of Housing and Urban Development's Community Development Block Grant (CDBG) program is administered by the Virginia Department of Housing and Community Development. That department will fund a portion

of a community improvement project such as a public sewer facility. The maximum grant available is \$700,000. Municipal governments competing for funding must document how the project provides primary benefit to low and moderate income persons, aids in the prevention or elimination of slums and blight, or addresses an urgent community need.

- b) EPA: The Environmental Protection Agency (EPA) has loans available to help meet the water quality objectives of the Clean Water Act. The amount allocated for this purpose has, however, decreased steadily over the past few years. In Virginia, the State Water Control Board administers the loans through the Revolving Loan Fund. Systems in violation of water quality standards or needing expansion and conveyances to meet standards receive top priority when funding is awarded.
- c) FmHA: The U.S. Department of Agriculture's Farmers Home Administration (FmHA) has funds available primarily to low-moderate income rural communities. The program first provides a loan based on a percentage of total assessed real estate value and income in the area. The remainder of the project can be financed by FmHA grants. The proportion of grant funds can be as high as 75% of the eligible project costs depending upon the area's income level.
- d) EDA: The U.S. Department of Commerce's Economic Development Administration (EDA) has a small amount of funds available to support industrial development in areas with low per capita income. The critical selection factor in the awarding of these funds is the commitment by an industry to locate in an area if funding is awarded.
- e) Other Funding Sources: The Virginia Resource Authority provides political subdivisions with loans at or below the market rate. The Authority is a loan pool that is backed by the State. Bond closing costs are spread among its borrowers. Application materials include a current audit, an engineering report including costs and purposes of the proposed expenditures, and a statement of projected user revenues that will repay the loan.

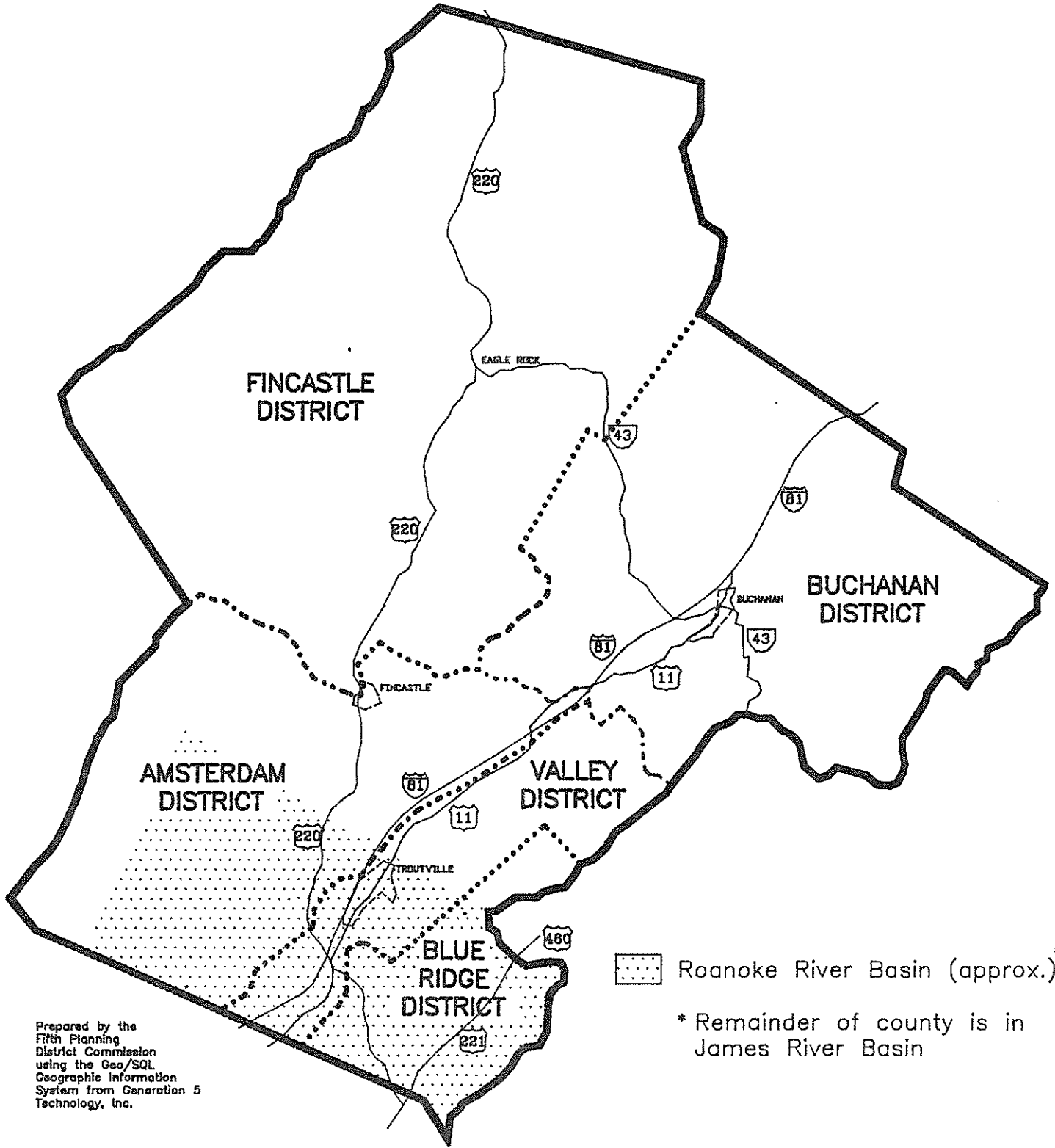
The Virginia Water Project, Inc. (VWP) is a non-profit organization that has been helping local agencies solve their water/wastewater problems for a number of years. It has grants and loans available to communities in the area. Often projects are funded as a planning project or as matching seed money that is often coupled with CDBG funds. The percentage of low-moderate income families in the proposed project area is usually a primary determinant of the percentage of project costs that can be funded by VWP funds.

4) Continue Coordination with Other Localities and Agencies


Coordination and cooperation with other localities and agencies has proven successful in Botetourt County. A major recent example is the joint construction of the Jack Smith Industrial Park with Roanoke County. The "Miss Utility Agreement" is another example of coordination between localities. It is important that nearby localities and Botetourt County continue to work together in planning for and understanding growth. It is also important that Botetourt County continue to work with outside agencies, such as its coordination with the Health Department in recognizing local needs.

APPENDIX I
ILLUSTRATIONS

ILLUSTRATION 1
MAGISTERIAL DISTRICTS
BOTETOURT COUNTY, VA



Prepared by the
Fifth Planning
District Commission
using the Geo/SQL
Geographic Information
System from Generation 5
Technology, Inc.

 Roanoke River Basin (approx.)
* Remainder of county is in James River Basin

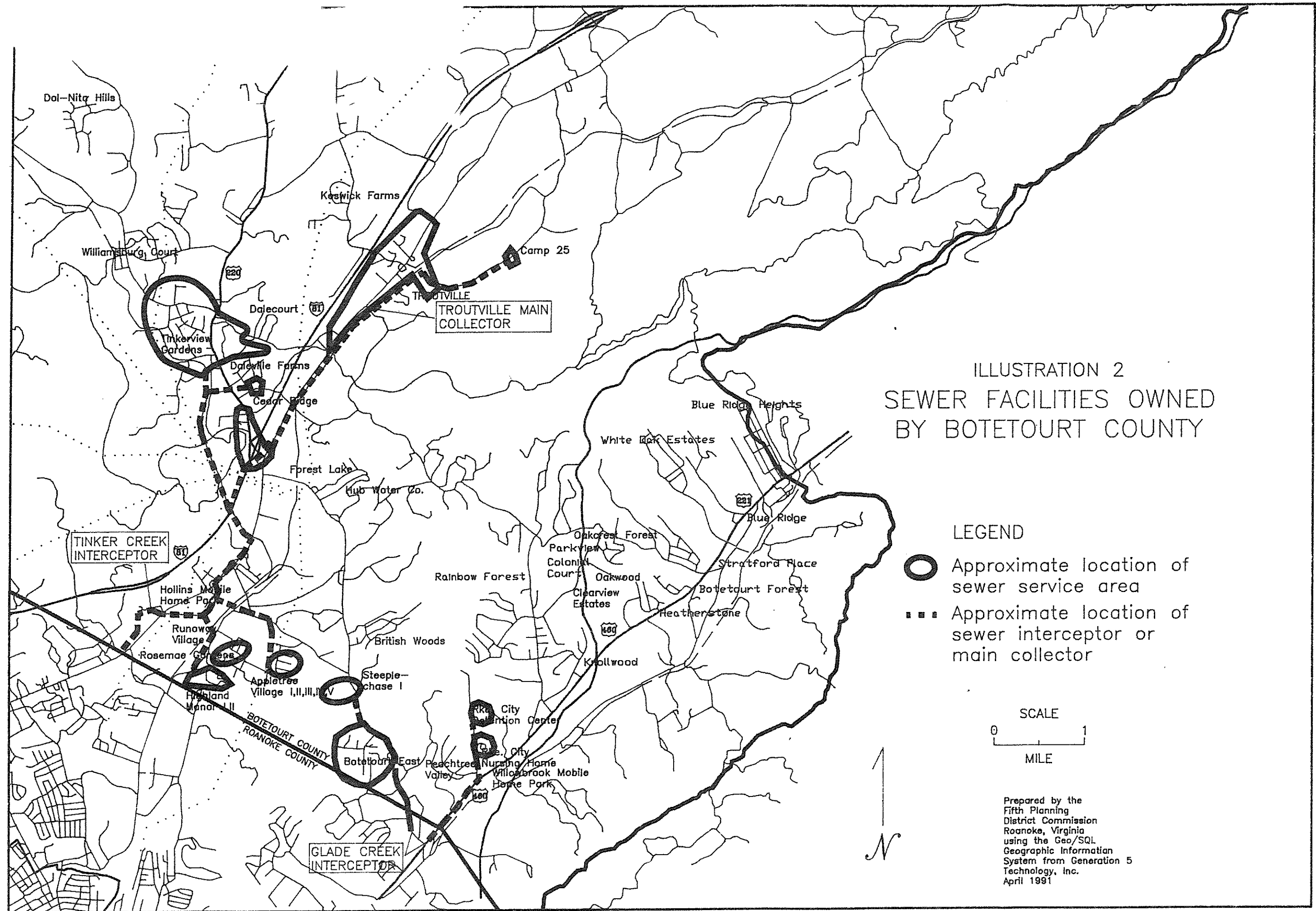
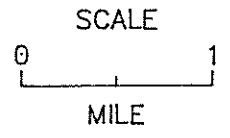


ILLUSTRATION 2
SEWER FACILITIES OWNED
BY BOTETOURT COUNTY

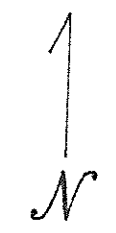
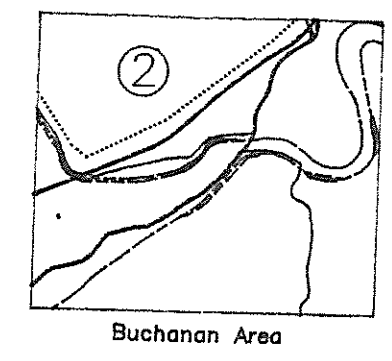
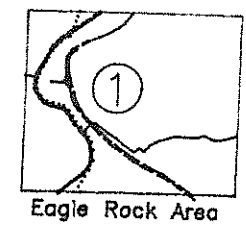
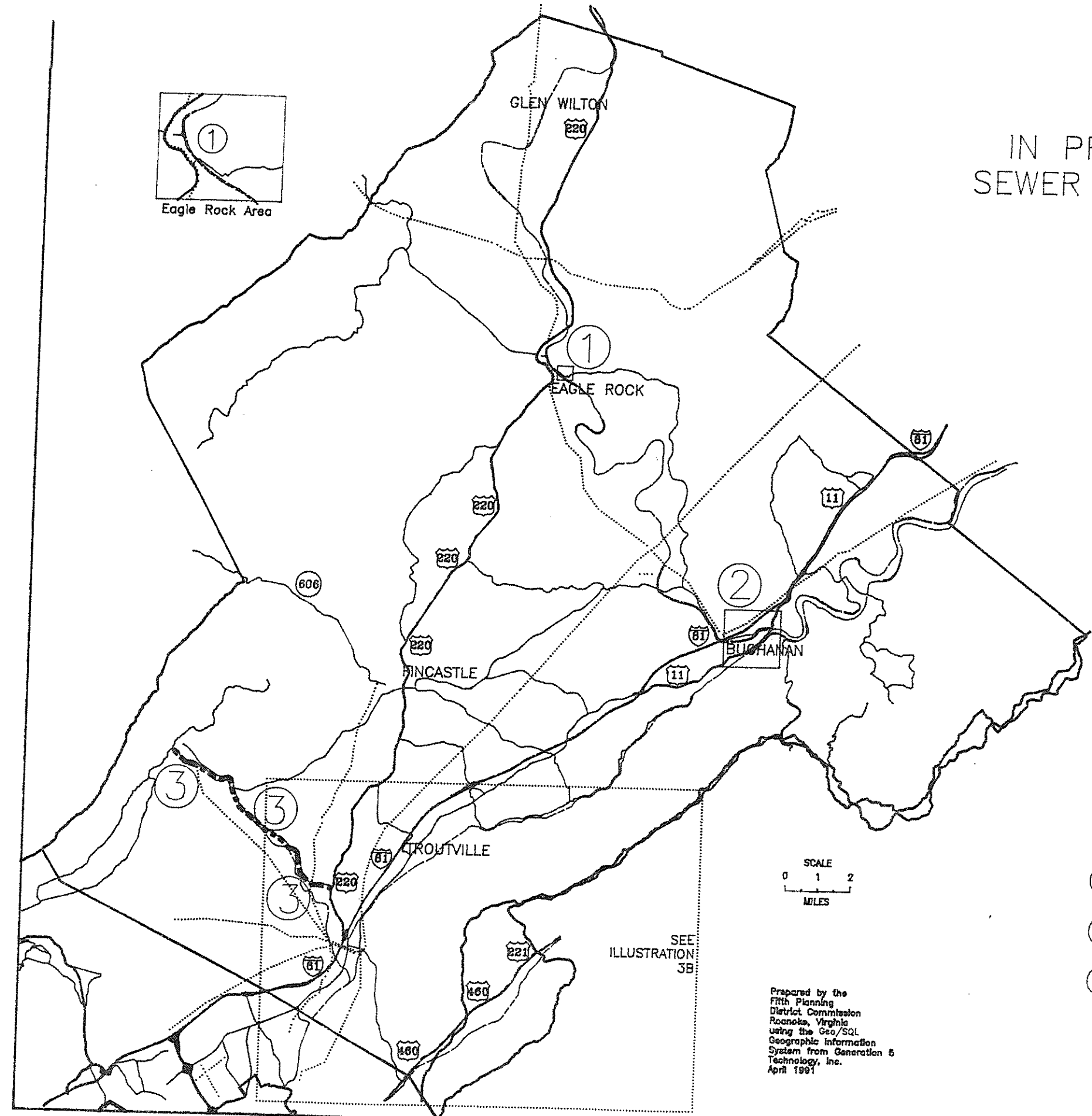
LEGEND

- Approximate location of sewer service area
- ■ ■ Approximate location of sewer interceptor or main collector



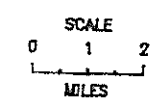
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April 1991

ILLUSTRATION 3A IN PROGRESS AND RECENT SEWER SERVICE IMPROVEMENTS



LEGEND

- ① Eagle Rock
- ② Buchanan
- ③ Tarmac plant



SEE
ILLUSTRATION
3B

Prepared by the
Fifth Planning
District Commission
Roanoke, Virginia
using the Geo/SQL
Geographic Information
System from Generation 5
Technology, Inc.
April 1991

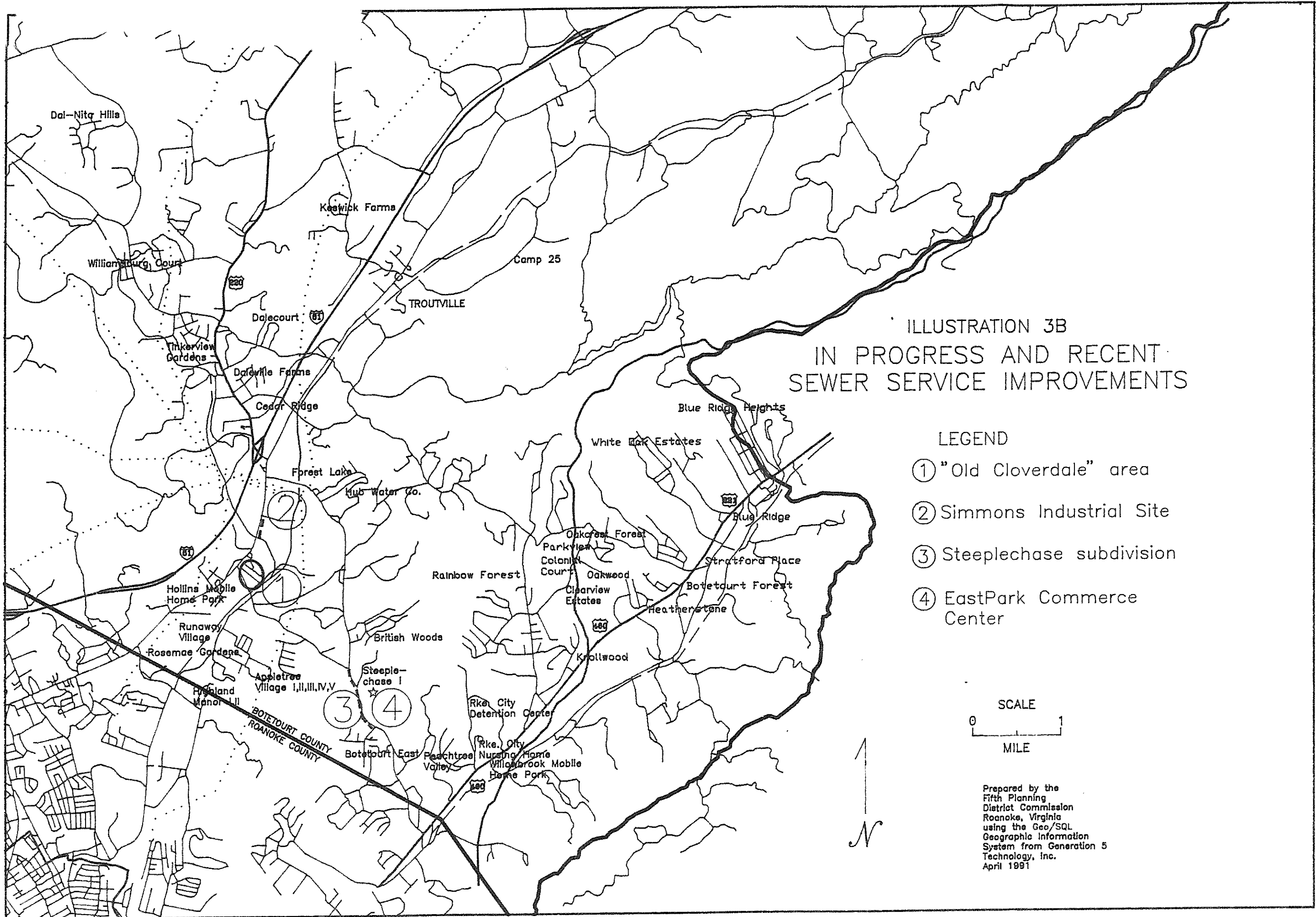


ILLUSTRATION 3B
 IN PROGRESS AND RECENT
 SEWER SERVICE IMPROVEMENTS

LEGEND

- ① "Old Cloverdale" area
- ② Simmons Industrial Site
- ③ Steeplechase subdivision
- ④ EastPark Commerce Center



Prepared by the
 Fifth Planning
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APPENDIX II
SEWER RATES AND FEES

APPENDIX II
PART 1

SEWER RATES AND FEES
BOTETOURT COUNTY

Monthly Usage Fees:

Residential monthly flat fee	\$18.50
Business minimum fee	\$27.00
Business usage fee	\$ 2.75 per 1000 gal. for all above 4,000 gallons

Connection Fees:

Residential-first 60 days availability	\$500
Residential-thereafter	\$600
Commercial for 4,500 gallon flow	\$800
Commercial for each additional residential equivalent	\$200

APPENDIX II
PART 2

SEWER RATES AND FEES
FINCASTLE

I. SEWER RATES:

RESIDENTIAL WASTEWATER SURCHARGE:

Minimum charge..... \$5.63/1500 gallons + \$5.27 surcharge

All over 1500 gallons..... \$3.75/1000 gallons

Minimum Residential Charge.....\$10.90 per month

COMMERCIAL WASTEWATER SURCHARGE:

Minimum charge.....\$5.63/1500 gallons +\$10.55 surcharge

All over 1500 gallons.....\$3.75/1000 gallons

Minimum Commercial Charge.....\$16.18 per month

II. SEWER CONNECTIONS FEES:

<u>TYPE OF SERVICE</u>	<u>BASIC INSTAL- LATION COST</u>	+	<u>AVAILABILITY FEE</u>
Single Family Resi- dential Dwelling Unit	(Cost + 10%)		\$1,200.00
Multi-Family Equivalent Dwelling Usage (E.D.U.)	N/A*		1,200.00/E.D.U.
Motel & Hotel/bed	N/A*		700.00/bed
Hospital/bed	N/A*		1,200.00/bed
Other Residential (including, but not limited to Nursing Homes and "bed and breakfast" homes)	N/A*		850.00/bed

All others will be based on size of water service or Equivalent Dwelling Usage.

* All uses other than single family dwelling units must have a private plumbing firm (rather than the Town of Fincastle) install their sewer connection. Thus, the cost for basic installation may vary for uses other than single family dwelling units.

<u>WATER METER SIZE</u>	<u>E.D.U.</u>	<u>AVAILABILITY FEE</u>
5/8" x 3/4" (Residential)	1	\$ 1,200.00
3/4"	1.44	1,728.00
1"	2.56	3,072.00
1-1/2"	5.76	6,912.00
2"	10.24	12,288.00
3"	23.04	27,648.00
4"	40.96	49,152.00
6"	92.16	110,592.00

APPENDIX II
PART 3

TOWN OF BUCHANAN SEWER RATES

I. SEWER RATES:

\$14.00 MINIMUM CHARGE FOR THE FIRST 4000 GALLONS USED.

- PLUS 22 CENTS FOR EACH ADDITIONAL 100 GALLONS FOR THE NEXT 3500 GALLONS USED.
- PLUS 16 CENTS FOR EACH ADDITIONAL 100 GALLONS FOR THE NEXT 6500 GALLONS USED.
- PLUS 9 CENTS FOR EACH ADDITIONAL 100 GALLONS FOR ABOVE 14,000 GALLONS USED.

<u>GALLONS</u>	<u>RATE</u>	<u>GALLONS</u>	<u>RATE</u>
4000	\$ 14.00	8100	\$ 22.66
4100	14.22	8200	22.82
4200	14.44	8300	22.98
4300	14.66	8400	23.14
4400	14.88	8500	23.30
4500	15.10	8600	23.46
4600	15.32	8700	23.62
4700	15.54	8800	23.78
4800	15.76	8900	23.94
4900	15.98	9000	24.10
5000	16.20	9100	24.26
5100	16.42	9200	24.42
5200	16.64	9300	24.58
5300	16.86	9400	24.74
5400	17.08	9500	24.90
5500	17.30	9600	25.06
5600	17.52	9700	25.22
5700	17.74	9800	25.38
5800	17.96	9900	25.54
5900	18.18	10000	25.70
6000	18.40	10100	25.86
6100	18.62	10200	26.02
6200	18.84	10300	26.18
6300	19.06	10400	26.34
6400	19.28	10500	26.50
6500	19.50	10600	26.66
6600	19.72	10700	26.82
6700	19.94	10800	26.98
6800	20.16	10900	27.14
6900	20.38	11000	27.30
7000	20.60	11100	27.46
7100	20.82	11200	27.62
7200	21.04	11300	27.78
7300	21.26	11400	27.94
7400	21.48	11500	28.10
7500	21.70	11600	28.26
7600	21.86	11700	28.42
7700	22.02	11800	28.58
7900	22.34	11900	28.74
8000	22.50	12000	28.90

TOWN OF BUCHANAN SEWER RATES

<u>GALLONS</u>	<u>RATE</u>	<u>GALLONS</u>	<u>RATE</u>
12100	\$ 29.06	17000	\$ 34.80
12200	29.22	17100	34.89
12300	29.38	17200	34.98
12400	29.54	17300	35.07
12500	29.70	17400	35.16
12600	29.86	17500	35.25
12700	30.02	17600	35.34
12800	30.18	17700	35.43
12900	30.34	17800	35.52
13000	30.50	17900	35.61
13100	30.66	18000	35.70
13200	30.82	18100	35.79
13300	30.98	18200	35.88
13400	31.14	18300	35.97
13500	31.30	18400	36.06
13600	31.46	18500	36.15
13700	31.62	18600	36.24
13800	31.78	18700	36.33
13900	31.94	18800	36.42
14000	32.10	18900	36.51
14100	32.19	19000	36.60
14200	32.28	19100	36.69
14300	32.37	19200	36.78
14400	32.46	19300	36.87
14500	32.55	19400	36.96
14600	32.64	19500	37.05
14700	32.73	19600	37.14
14800	32.82	19700	37.23
14900	32.91	19800	37.32
15000	33.00	19900	37.41
15100	33.09	20100	37.59
15200	33.18	20200	37.68
15300	33.27	20300	37.77
15400	33.36	20400	37.86
15500	33.45	20500	37.95
15600	33.54	20600	38.04
15700	33.63	20700	38.13
15800	33.72	20800	38.22
15900	33.81	20900	38.31
16000	33.90	21000	38.40
16100	33.99	21100	38.49
16200	34.08	21200	38.58
16300	34.17	21300	38.67
16400	34.26	21400	38.76
16500	34.35	21500	38.85
16600	34.44	21600	38.94
16700	34.53	21700	39.03
16800	34.62	21800	39.12
16900	34.71	21900	39.21
		22000	39.30

II. CONNECTION FEES:

\$350 Fee for sewer connection
\$200 Fee for water connection

APPENDIX II
PART 4

SEWER RATES AND FEES
IRON GATE

I. SEWER RATES:

Residential and Commercial:

\$20/month up to 4000 gallons

\$1/1000 gallons over first 4000

II. SEWER CONNECTION FEES:

Residential and Commercial:

\$300/each connection