

## Executive Summary

Scott County is at the beginning of an important period in the development of the County. Growth is beginning to occur in areas close to the Tri-Cities and new industry is moving into the Duffield Industrial Park. As the economic “boom” in the Country continues, the County must also be in condition to move forward economically. One key to the success of any economic development program is a strong infrastructure system. Adequate water and sewer systems are also important to the standard of living of any county’s residents.

For these reasons, the County Board of Supervisors has commissioned this study and report. The purpose of this water and sewer study is to develop a comprehensive planning document to be used for the continued development of water and sewer facilities within the County. The Study concentrates on the “broad-brush” aspects of this effort realizing that detailed Preliminary Engineering Reports are necessary to the planning process. Therefore, the recommendations contained herein also concentrate more heavily on “procedural” issues and proposed solutions to impediments which may exist as a result of deficiencies in organizations.

The major impediment to efficient development of water and sewer systems within the County is the lack of unified efforts on the part of the local government agencies toward this development. Study after study conducted on this issue have revealed that regional solutions provide savings for the end user. Therefore, aggressive leadership is needed to begin to bring these local governments together to find ways to more effectively serve the citizens of Scott County. There are several residents within the County needing public water and sewer service. At the present time, no single entity has taken responsibility for the provision of these services.

There are seven local government agencies within the County who serve potable water and five who provide public wastewater collection and treatment. In addition, the Scott County School Board operates and maintains several small water and sewer systems serving schools where public facilities do not exist. The major public water suppliers are:

- The Scott County Water and Sewer Authority
- The Town of Gate City
- The Town of Nickelsville
- The Town of Dungannon
- The Town of Clinchport
- The Moccasin Gap Sanitation District Commission
- The Duffield Development Authority

Agencies providing public sewer service are:

The Scott County Water and Sewer Authority  
The Gate City Sanitation Authority  
The Town of Nickelsville  
The Town of Dungannon  
The Duffield Development Authority

General recommendations made within the study for these agencies are as follows:

1. Scott County should adopt a water and sewer availability ordinance which would make it possible for the Scott County Water and Sewer Authority to collect an availability charge from residents who choose not to hook on to a water and sewer system if it is constructed close to their home. This will allow the development of systems in areas where there is a need for service but where some residents have adequate individual systems at the present time.
2. The Scott County Board of Supervisors should direct and empower the Scott County Water and Sewer Authority to develop public water and sewer service in areas where needs exist. The Scott County Water and Sewer Authority should aggressively pursue water and sewer system development throughout the county where service is needed and should construct new systems and expand existing systems as feasible.
3. Existing system efficiency must be maximized. Water leaks and sewer system infiltration and inflow (I/I) must be corrected in systems where problems exist and on-going programs must be implemented to keep accountability in acceptable ranges. It is almost always more economical to correct leaks and eliminate I/I than to expand systems.
4. The Town of Gate City and the Scott County Water and Sewer Authority should develop an inter-municipal agreement and negotiate reasonable rates for water service to areas of the County adjacent to the Town.
5. The Town of Gate City and the Moccasin Gap Sanitation District Commission should interconnect their water systems and negotiate water sales agreements.
6. The Scott County Water and Sewer Authority and the Gate City Sanitation Authority should finalize negotiations and enter into a regional wastewater agreement to provide wastewater collection and treatment to the Town of Gate City and surrounding areas of the County.

7. The Moccasin Gap Sanitation District Commission and the Scott County Water and Sewer Authority should negotiate reasonable rates for the long-term sale of water from the District to the Authority. If such an agreement cannot be reached, the Authority should move toward the development of a long-term water source for the area of the County around Gate City. This source should consist of a plant on the North Fork of the Holston River or the Gate City Quarry. (A Preliminary Engineering Report is currently being prepared by Thompson + Litton, Inc.)
8. The Scott County Water and Sewer Authority should continue negotiations with the Duffield Development Authority concerning the purchase of the Duffield Development Authority water and wastewater systems. Both of these systems are in excellent condition and could be used by the County to provide water service and wastewater collection and treatment in the Duffield area of the County.
9. The Towns of Nickelsville and Dungannon should begin meetings with the intent of finding ways to eliminate duplication of effort within their respective water and sewer systems and thereby reducing costs to their customers. Feasible water and wastewater extensions should be made by each Town with the long-range goal of tying the two systems together. Operation and maintenance agreements should be developed between the two Towns and the Scott County Water and Sewer Authority.
10. The Town of Clinchport and the Scott County Water and Sewer Authority should enter into an operation and maintenance agreements with the long term goal of having the County totally operate and maintain the system.
11. The Scott County Water and Sewer Authority should consider taking over operations of the small water and sewer systems currently operated by the Scott County School Board. Consideration should be given to the expansion of these systems to serve the communities surrounding the schools.

Funding of the necessary improvements will be challenging, however several options exist. With the passage and enforcement of the availability ordinance, additional funding opportunities will develop. The United States Department of Agriculture-Rural Development (formerly Farmers Home Administration) historically has played a major role in funding of the County's systems and should be expected to continue to do so. The LENOWISCO Planning District Commission should be utilized by the County and its local government agencies for assistance in funding development. Again, it is extremely important to aggressively pursue system financing. Those systems ready to move forward when funding is available consistently receive the highest funding priority.

The authors of this report hope that this document is used as a “road map” for development of water and sewer systems in the years to come. In order to provide continued emphasis on the implementation of the recommendations and to provide “third-party” assistance in the development of inter-municipal agreements, we recommend that the advisory committee assembled during the preparation of the study continue to meet periodically. The initial and interim chair of this committee should be the Director of the LENOWISCO Planning District Commission.

As stated at the beginning of this section, the County is entering an important era in its development. The provision of adequate and affordable water and sewer service is essential to the County reaching its goals.

## Section 1

### INTRODUCTION

#### 1.1 Purpose and Funding Source

The purpose of the Scott County Water and Sewer Study is to develop a comprehensive planning document for the development of water and sewer systems in Scott County, Virginia over the next twenty years. This will be accomplished by conducting an overview of the County, designating study areas, identifying their specific water and sewer needs, and evaluating alternatives for meeting these needs. The effort will also evaluate the ways in which the various water and sewer systems are operated and will make recommendations for improvements. The Water and Sewer Study will provide a plan of action to improve service to existing systems and to expand service to unserved areas.

Interim findings of the Study will be presented to an advisory committee established to evaluate the implementation of certain alternatives. Representatives from each Public Water Supply and Public Sewer System will be invited to participate in the work effort. The committee will be instrumental in the Study Development. Individuals requested to meet with the study team were:

Mr. Roger Burke	Town of Nickelsville
Mr. Phil Osborne	Town of Dungannon
Mr. John Strutner	Scott County Administrator
Mr. Ron Flanary	LENOWISCO PDC
Mr. Jack Bush	Scott County Water and Sewer Authority
Mr. Bruce Robinette	Duffield Development Authority
Mr. Jack Francisco	Moccasin Gap Sanitation District
Mr. Tucker Barker	Gate City Sanitation Authority
Mr. Charles Daugherty	Town of Gate City
Mr. Billie Page	Town of Clinchport
Mr. Danny Meade	Scott County School Board
Ms. Ginger Helms	Scott County Industrial Development Authority

Funding for this project has been provided by the Scott County Board of Supervisors and Southeast Rural Community Assistance Project, Inc. (SER-CAP).

#### 1.2 Statement of Problem

A number of citizens in Scott County are provided water and sewer service through the surrounding towns and other local government agencies. Water service is provided through the Towns of Gate City, Clinchport, Dungannon,

Nickelsville; the Scott County Water and Sewer Authority (SCW&SA), Duffield Development Authority (DDA), and the Moccasin Gap Sanitation District Commission (MGSDC). The wastewater systems of the County are operated by the Gate City Sanitation Authority (GCSA), Scott County Water and Sewer Authority, Duffield Development Authority, the Town of Dungannon, and the Town of Nickelsville. The Scott County School Board also provides public water and sewer service to schools located in areas of the County where public service is not available. These government agencies provide service in the most densely populated areas of the County, however, there are several areas of growth occurring in the County where service is not available. The systems currently operate independently with a few interconnects. The demand for water and sewer service is increasing in certain areas of Scott County.

Water and sewer related needs are becoming some of the most critical problems faced by localities in Virginia and other states. Most localities' water and sewer needs far exceed their financial means to implement solutions. Economic development can be enhanced by the presence of public water and sewer facilities. However, the lack of such facilities may impede economic development. The presence or absence of adequate infrastructure can also dramatically affect housing development.

Scott County must develop an effective water and sewer plan that can prioritize needs to maximize benefits to the public.

### **1.3 Objective, Concerns, and Issues**

#### **1. Objectives**

The basic objectives of the Scott County Water and Sewer Study are to

- a. evaluate current systems both technically and administratively,
- b. develop future projections of water and sewer needs of Scott County,
- c. identify alternatives for providing services,
- d. identify and eliminate organizational and procedural impediments, and
- e. provide feasible recommendations.

#### **2. Concerns**

- a. Water loss through leaks must be decreased.
- b. Sewer System Infiltration and Inflow (I/I) must be managed.
- c. Duplication of effort must be reduced.
- d. An organized, unified approach must be developed to address expansion.
- e. A basic funding strategy must be developed.

#### **3. Issues**

- a. There is no one agency taking responsibility for providing services.
- b. System expansion is sometimes impossible due to monetary concerns.
- c. Cooperation between water and sewer service providers is limited.
- d. Resources are not wisely used.

#### **1.4 Study Area Identification**

After a review of current systems, locations, areas of concentrated population, physical/geographic boundaries, and the potential for future needs, three specific study areas were selected. Since growth trends can change, and since public health needs may arise, the study should be re-evaluated periodically to make adjustments in development patterns. The three study areas are:

1. The Nickelsville / Dungannon Area.
2. The Duffield / Clinchport Area.
3. The Gate City / Tri-Cities Area.

The boundaries of these areas are shown in Figure 1, located at the end of this section.

#### **1.5 Previous Reports and Studies Performed**

Documents were reviewed to provide background and current information for demographic, economic, water, and wastewater data. The documents used include:

1. Virginia Coalfields Regional Water Study for Cumberland Plateau Planning District and Lenowisco Planning District, Thompson + Litton, 1998.
2. Preliminary Engineering Report for the Town of Dungannon Water System Improvements Project, Dewberry & Davis, 1996.
3. Preliminary Engineering Report Water System Improvements Town of Clinchport, Virginia, Anderson & Associates, Inc. 1993.
4. Jasper Community Water System Improvements Preliminary Engineering Report, Lane Engineering, Inc. 1999.
5. Preliminary Engineering Report for the Hiltons Water Source Project, Thompson + Litton. 1998.
6. Preliminary Engineering Report Water Distribution System Development for the Dry Creek Community, Scott County, Virginia, Thompson + Litton. 1995.
7. Preliminary Engineering Report Water Distribution System Development for

- the Sunbright Community, Scott County, Virginia, Thompson + Litton. 1996.
8. Preliminary Engineering Report Manville Water Line, Gate City, Virginia, Olver Incorporated. 1995.
  9. Preliminary Engineering Report for the Town of Dungannon Water System Improvements Project, Dewberry & Davis. 1997.
  10. Preliminary Engineering Report Water System Improvements Town of Clinchport, Clinchport, Virginia, Anderson & Associates. 1993.
  11. Preliminary Engineering Evaluation of the Proposed Wastewater Collection System for the Yuma Area of Scott County, Virginia, Olver Incorporated. 1998.
  12. Preliminary Engineering Report Duffield, Virginia Route 871 Sewer Line Extension, Lane Engineering. 1998.
  13. Preliminary Engineering Report Daniel Boone Water System, Thompson + Litton. 1999.
  14. Preliminary Engineering Report Kermit Water Line Extension, Danko & Associates and Lane Engineering, Inc. 1999.

## **1.6 USGS Quadrangle Maps**

Maps showing main lines of existing systems and the general layout of the proposed system extensions are included in Appendix B of this report.

## Section 2

### EXISTING CONDITIONS

#### 2.1 General Description

Scott County is located in southwestern Virginia and covers 539 square miles. The County consists of five incorporated towns and several unincorporated communities, including the Towns of Gate City, Weber City, Nickelsville, Dungannon, and Clinchport. The County is bound by Wise County to the north, Lee County to the West, the State of Tennessee to the South, and Washington and Russell counties to the East.

U.S. Route 23, running north and south, and U.S. Route 421 / 58, running east and west, intersect the County. Both Routes 23 and 58 are part of the Daniel Boone Heritage Trail. Both roads have bypasses around most of the Towns in the County.

The North Fork of the Holston River flows through Scott County. This river has many tributaries within the County and provides water withdrawal for several of the communities within the County.

Elevations within the County range from 1200 to 2600 feet above mean sea level. The average annual temperature is 55.9°C, with an average of 42.0°C in January and an average of 74.9°C in July. Average rainfall within the County is 41.24" per year, with an average snowfall of 27.9".

The Scott County school system is comprised of five elementary schools, two primary schools, two intermediate schools, one middle school, and three high schools. It also operates a Vocational -Technical school.

Numerous parks and attractions are situated in Scott County, including the 850-acre Natural Tunnel State Park. Scott County is home to numerous small businesses and has two major industrial parks, which are located in Duffield and Dungannon. Two railroad systems, Norfolk Southern and CSX-Family Lines, utilize railways in the County.

With its location adjacent to the Tri-Cities Area, Scott County is in a prime position to experience future growth. Parts of the County, in particular the Gate City-Weber City Area, should see significant growth while the rest of the County is expected to show a modest growth pattern.

Water and sewer facilities must be able to support industrial growth and the resulting residential growth which occurs.

## **2.2 Population**

The 1990 census reported the population of Scott County to be 23,304. Studies conducted in 1997 by the University of Virginia for Public Service estimated a population of 23,100, indicating an overall stable population for the County. The population of Scott County is expected to increase 1% over the next 20 years.

In June of 1999, 9,647 Scott County residents were eligible for the labor force. Of this number, 8,896 persons were employed, giving an unemployment rate of 7.8%. This rate compares favorably with surrounding area rates, i.e., City of Norton at 9.1%; Lee County at 11.7%; and Wise County at 11.9%. The overall unemployment rate for the Commonwealth of Virginia in June 1999 was 3.2%.

According to information obtained from the LENOWISCO Planning District Commission, Scott County has an average of 2.63 persons per household.

## **2.3 Description of Individual Study Areas**

The Town of Clinchport is located 10 miles northwest of Gate City, along U.S. Route 58 and State Route 65 at the confluence of Stock Creek and the Clinch River. Topography within the area varies from bottom land along the Clinch River to steep slopes on each side of the river. Elevations range from 1220 to 2068 feet above mean sea level. The population of the Town of Clinchport is 64 persons.

The Town of Duffield is situated along U.S. Routes 23 and 58. Elevations range from 1400 to 1460 feet above mean sea level. The Town of Duffield has a population of 54 persons.

The Town of Dungannon is located along Route 65, northeast of Gate City. Elevations around the Town range from 1300 to 1400 feet above mean sea level. The population of the Town is 250 persons.

The Town of Gate City is approximately five miles west of the City of Kingsport, Tennessee along Route 23. The Town's population is 2,214 persons. Elevations within the Town range from 1350 to 1520 feet above mean sea level.

The Town of Nickelsville is located northeast of Gate City, along Route 71. Elevations within the Town range from 1920 to 2010 feet above mean sea level. The population is approximately 411 persons within the corporate limits.

## **2.4 Existing Water Systems**

There are nine permitted waterworks in Scott County classified by the Virginia Department of Health as a community water system. The Waterworks Regulations define a community waterworks as "...a waterworks which serves at least 15 service connections used by year-round resident or regularly serves at least 25 year-round residents". The following are permitted waterworks within the County and a description of the water systems:

### **Town of Clinchport**

The Town of Clinchport operates a relatively new water system. The Clinchport system provides service throughout the Town and consists of 6-inch and smaller line.

*Water Supply* – The system obtains water from two municipal drilled wells.

*Storage Tanks* – The Town has one 20,000 gallon water storage tank and one 5,000 pneumatic tank.

*Current Operation* - The system has a capacity of 0.04 MGD and is currently operating with a demand of 0.022 MGD (55% capacity). Accountability within the system is approximately 67 percent.

### **Town of Dungannon**

The Town of Dungannon owns and operates a water system with a capacity of 0.07 MGD. A new microfiltration water treatment plant was constructed recently and is currently in operation. The Town of Dungannon provides water to the Town's limits and to an industrial park outside of Dungannon, near the old Louisiana Pacific Building.

*Water Supply* – Water is supplied by two wells located north of the Town.

*Storage Tanks* – The Town has a single 250,000 gallon steel water storage tank.

*Current Operation* - The demand, 0.07MGD, is running the Dungannon system at full capacity. Water loss needs to be addressed, which will bring the system below its design capacity.

### **Duffield Development Authority**

The Duffield Development Authority (Duffield Development) operates a water treatment plant with a capacity of 0.5 MGD and serves the Duffield Industrial Park, Thomas Village, and the County's Duffield Water System. Duffield Development's water system consists of 10-inch and smaller water line.

*Water Supply* – Water is taken from the North Fork of the Powell River.

*Storage Tanks* – The Duffield Development System includes two 0.5 million gallon storage tanks and one 1.0 million gallon water tank.

*Current Operation* - With a demand of only 0.14 MGD, the plant is operating at 28% capacity. Accountability in this system exceeds 90%. The water system is well operated and maintained.

### **Town of Gate City**

The Town of Gate City owns and operates a 0.5 MGD water treatment plant, which was built in 1951. The system provides service throughout the Town and beyond the corporation limits on the eastern and western ends of Gate City. The original water system consisted of approximately 48,500 linear feet of line consisting of 5,250 linear feet of 12-inch line, 4,195 linear feet of 8-inch line, and 39,023 linear feet of 6-inch line. Gate City's water system and water treatment plant were upgraded in 1984 and 1985 to meet the Town's needs and to comply with the Virginia Waterworks Regulations. The system was expanded into Williams Mill in the mid-1990s by the addition of 1,455 linear feet of 8-inch line, 9,245 linear feet of 6-inch line, and 525 linear feet of 4-inch line.

Water for the system is treated by a conventional water treatment plant located on the east end of Town.

*Water Supply* – Water for the system is supplied by Big Moccasin Creek.

*Storage Tanks* – The system utilizes four water storage tanks with a capacity of 710,000 gallons. The original system consisted of three storage tanks: a 0.05 million gallon tank, a 0.10 million gallon storage tank, and a 0.474 million-gallon. Included in the Williams Mill expansion was the addition of a 0.086 million-gallon storage tank.

*Pump Stations* – One booster pump station is used to supply water for the high pressure zone of the system.

*Current Operation* - The plant produces an average daily flow of 0.41 MGD, or approximately 82% of capacity. This high capacity prohibits expansion of this system. Accountability of the system is approximately 50 percent. Water loss within the system must be addressed.

### **Moccasin Gap Sanitation District Commission**

The Moccasin Gap Sanitation District Commission (District) was created by the General Assembly and board members are appointed by legislative action with concurrence by the Scott County Board of Supervisors.

The District owns and operates a 0.75-MGD water treatment plant, which was constructed in the 1950's and was later expanded in 1967. The distribution system provides service throughout the Town of Weber City and consists of approximately 80,000 linear feet of 8-inch and smaller line.

An upgrade performed in 1994 upgrade included improvements from Poplar Street along U.S. Route 23 South. Another upgrade in 1997 involved replacing a 4-inch water system serving the Yuma Community with approximately 23,000 linear feet of 8-inch water line.

Water is treated by conventional methods at a water treatment plant located on the east end of Weber City on Big Moccasin Creek.

*Water Supply* - Big Moccasin Creek serves as the source of water for this system. The intake is located along State Route 619 across from the treatment plant. Water flows by gravity through a 10-inch water line to the intake pumps where it is pumped through an 8-inch line to the treatment plant.

*Storage Tanks* – The system has four active water storage tanks with a combined capacity of 900,000 gallons. The original system included a 0.2 million-gallon storage tank with an overflow elevation of 1,482 feet. The 1994 upgrade included dividing the system into a low pressure and high-pressure system. Included in the upgrade was the addition of a 0.25 million-gallon water storage tank with a base elevation of 1600 feet and an overflow elevation of 1624 feet. The most recent upgrade in 1997 included the addition of a 0.25 million-gallon water storage tank.

*Pump Stations* - A booster pump station was added by the District in the 1997 upgrade.

*Current Operation* - The system is operating at 48% capacity with a current demand at 0.36 MGD. Much of the water distribution system is at least 40 years old, however, accountability within the Moccasin Gap system is approximately 75 percent.

### **Town of Nickelsville**

The Town of Nickelsville operates a water distribution system consisting of 6-inch and smaller water line.

*Water Supply* – Water for this system is provided by three drilled wells. Dry weather recently exhausted one of the three wells. Another well has been drilled and is currently being tested to determine its adequacy.

*Storage Tanks* – The system includes a 0.20 million-gallon water storage tank.

Current Operation - The Nickelsville system is rated with a capacity of 0.10 MGD and is currently realizing a demand of 0.075 MGD (75% capacity).

### **Scott County Water and Sewer Authority**

The Scott County Water and Sewer Authority (Scott County Water) has operated several water systems throughout Scott County since the early 1970's. These include the Duffield Water System, the Hiltons Water System, and the East Carters Valley Water System.

### **Duffield Water System**

The Duffield Water System, owned by the County, has been in service since 1974 and serves customers in the Duffield area along U.S. Route 58, Pattonsville, Fraleytown, and areas along State Routes 604, 638, and 871. The water system consists of approximately 500 linear feet of 8-inch line, 20,155 linear feet of 6-inch line, 16,264 linear feet of 4-inch line, and 8,790 linear feet of 2-inch line.

*Water Supply* – Water is purchased from the Duffield Development Authority in bulk for the Duffield Water System.

*Current Operations* – Average daily flow through the system is 0.04 MGD and accountability within the system is 74 percent.

Limited fire protection is being provided in the Duffield Water System. It does not appear that the Duffield Water System is adequate to meet current and projected demands within this area. The reader should note that the Duffield Development Authority provides water and sewer service to the Duffield Industrial Park, which is the main demand center for this part of the County.

### **East Carters Valley Water System**

The East Carters Valley Water System is also operated by the Scott County Water and Sewer Authority. This system was constructed in 1989 and consists of approximately 15,800 linear feet of 8-inch line, 6,200 linear feet of 6-inch line, and 520 linear feet of 4-inch line.

The East Carters Valley System was extended along Route 724 to the North Fork of the Holston River Bridge around 1992.

*Water Supply* - The East Carters Valley Water System is provided with water by a well located in the Lynn Mar Subdivision and a connection with the Bloomingdale Utility District in Kingsport, Tennessee.

*Storage Tanks* – The system includes one 0.12 million-gallon glass-coated water storage tank.

*Pump Stations* – This system includes one booster pump station.

### **Hiltons Water System**

The Scott County Water and Sewer Authority also operate the Hiltons Water System. This system was constructed in the mid 1980's and consists of approximately 54,000 linear feet of 8-inch line, 3,500 linear feet of 6-inch line, and over 8,000 linear feet of 4-inch and smaller water line.

*Water Supply* - Scott County Water obtains water for the Hiltons Water System from the Moccasin Gap Sanitation District (District). Water is purchased in bulk from the District.

The cost of raw water sold to Scott County from Moccasin Gap has been a point of controversy for several years. Scott County Water believes that water rates are excessive while the Board of Directors of Moccasin Gap believes the rates to be too low. This issue has resulted in Scott County looking for other sources of water.

*Storage Tanks* – The system includes one 0.25 million-gallon glass-coated water storage tank.

*Pump Stations* – The system includes one booster pump station.

*Current Operations* – Average daily flow through the system is 0.03 MGD and the accountability is approximately 85 percent.

Table 1 summarizes the capacity, demand, and surplus or deficit for each system.

**Table 1. Scott County Public Water Systems**

<b>System</b>	<b>Services</b>	<b>Capacity</b>	<b>Demand</b>	<b>Surplus/Deficit*</b>
Clinchport	Clinchport	0.04 MGD	0.022 MGD	0.10 MGD
DDA	Industrial Park Thomas Village and SCW&SA	0.50 MGD	0.14 MGD	0.36 MGD
Duffield	Duffield	(See DDA)	0.04 MGD	N/A
Dungannon	Dungannon	0.07 MGD	0.07 MGD	0.00 MGD
East Carters Valley	ECV	N/A	N/A	N/A
Gate City	Town and Adjacent Area	0.50 MGD	0.41 MGD**	0.00 MGD
Hiltons	Hiltons	(See MGSD)	0.03 MGD	N/A
MGSDC	Weber City	0.75 MGD	0.36 MGD	0.24 MGD
Nickelsville	Nickelsville	0.10 MGD	0.075 MGD	0.01 MGD
<b>TOTAL</b>		<b>2.32 MGD</b>	<b>1.345 MGD</b>	<b>0.71 MGD*</b>

\*Based upon 80% capacity

\*\*50% accountability

## 2.5 Existing Wastewater Systems

There are two types of sanitary sewer systems used to collect, treat, and return wastewater to the environment in Scott County, municipal and privately owned systems. Sanitary sewer collection systems are regulated by The Virginia Department of Environmental Quality under the Virginia Pollutant Discharge Elimination System (VPDES). The alternative for residents not served by municipal sewer is privately owned septic tank systems which are regulated by the Virginia Department of Health.

A major problem experienced by many sanitary sewer collection systems is infiltration and inflow. Infiltration is the unintentional flow of water into the sewer pipe through bad joints, failed seals, and cracked pipes. A certain degree of infiltration is expected, however, excessive amounts may lead to accelerated wear to equipment, increased treatment costs, and violations by the treatment facility. Inflow occurs when stormwater runoff enters the sanitary sewer system. Stormwater may enter from numerous sources such as roof drains, storm sewer connections, etc. This additional wastewater in the system leads to insufficient treatment and increased costs.

The following is a list of wastewater providers and a general description of their operations:

### **Duffield Development Authority**

The Duffield Development Authority operates a 0.4 MGD wastewater treatment plant and serves the Duffield Industrial Park and Thomas Village. The sewer system consists of 8-inch gravity sewer and force main.

*Pump Stations* – The sewer system consists of two wastewater lift stations.

*Current Operation* - The system is well operated and maintained, operating with flows of 0.15 MGD or at approximately 40% of design capacity. Infiltration/Inflow within the system is virtually nonexistent. The plant has a hydraulic capacity of 0.5 MGD. The permit could be increased from 0.4 to 0.5 MGD with little difficulty.

### **Town of Dungannon**

The Town of Dungannon operates a wastewater treatment facility with a capacity of 0.04 MGD. The system consists of 8-inch and smaller lines.

*Current Operation* - The system has experienced Infiltration/Inflow in the past but the I/I problems appear to be under control since flow to the system now averages 0.022 MGD, or 55% of design capacity.

## **Gate City Sanitation Authority**

The Gate City Sanitation Authority provides wastewater collection and treatment for the Town of Gate City and adjacent areas. The treatment plant is located along State Route 619, along U.S. Route 23, adjacent to Big Moccasin Creek. The original collection system consists of approximately 1,710 linear feet of 16-inch line, 4,816 linear feet of 15-inch line, 8,933 linear feet of 12-inch line, 1,325 linear feet of 10-inch line, and 52,321 linear feet of 8-inch gravity sewer.

Recent expansions of the Gate City sewer system included a sewer system extension into the Burnt Cabin Branch and Old Nickelsville Road areas. This extension consisted of 5,245 linear feet of 8-inch gravity sewer, a sewer lift station and 300 linear feet of 2-inch force main. Service was also recently extended into Helen and Ruth Heights Subdivision. This expansion included approximately 4,160 linear feet of 8-inch gravity sewer line. A third recent expansion of the Gate City Sewer System consisted of approximately 2,200 linear feet of 8-inch gravity sewer line to Quillen Heights. In the early 1990's, the Authority extended sewer service to the Davidson Subdivision and along Oak Street and Red Hill Road. This extension consisted of 12,150 linear feet of 8-inch gravity sewer.

*Treatment* - The wastewater treatment plant consists of a single-train Imhoff Tank and Trickling Filter wastewater treatment.

*Current Operation* – The 0.500 MGD plant is currently operating at full capacity. The Gate City Sanitation Authority system has been plagued for several years with excessive inflow/infiltration (I/I). Recently, the Authority has taken several steps toward a reduction in the amount of I/I into the system.

## **Holston Regional Sewer System**

Scott County Water and Sewer Authority provides wastewater treatment to Weber City and the Oakwood Area and operates a 0.3 MGD wastewater treatment plant located on the North Fork of the Holston River, near the Yuma Community. The Holston Regional Sewer System (Holston System) was placed in operation in 1985 and serves Weber City. A recent expansion across the Johnson Bridge south of Weber City has recently been completed and is referred to as the “Oakwood Sewer Line Extension.”

The original Holston System consisted of approximately 5,600 linear feet of 24-inch line, 12,700 linear feet of 18-inch line, 69,000 linear feet of 8-inch line, 12,728 linear feet of 6-inch line. It also consists of a sewer lift station and 2,732 linear feet of 6-inch force main. The Oakwood Sewer Line Extension recently completed consists of approximately 3,900 linear feet of 12-inch line, 16,000 linear feet of 8-inch sewer line, a sewer lift station and approximately 2,200 linear feet of 4-inch force main. The Holston System (collection and transport portion)

was designed to serve the Town of Gate City. However, due to the Town of Gate City's unwillingness to join the regional effort at the time of construction, the plant was not constructed to treat these flows.

*Treatment* – The plant is an oxidation ditch type plant and has been converted from its original chemical disinfection system to an ultraviolet disinfection system.

*Pump Stations* – The system consists of two sewer lift stations.

*Current Operation* – The 0.300 MGD wastewater treatment plant is operating at 57% capacity.

### **Town of Nickelsville**

The Town of Nickelsville operates a 0.07-MGD wastewater treatment plant.

*Treatment* – The plant is an extended air activated sludge plant.

*Pump Stations* – There are four small pump stations which deliver flow from low lying areas to the plant.

*Current Operation* – The 0.070-MGD capacity plant currently receives average daily flows of 0.030 MGD. It is operating at 43% of design capacity.

Table 2 illustrates system capacities, current flows, and remaining capacities for the County's sewer systems.

**Table 2. Scott County Central Wastewater Systems**

<b>System</b>	<b>Services</b>	<b>Capacity</b>	<b>Flow</b>	<b>Surplus/Deficit*</b>
DDA	Industrial Park Thomas Village	0.40 MGD	0.15 MGD	0.17 MGD
Dungannon	Dungannon	0.04 MGD	0.022 MGD	0.01 MGD
Gate City Sanitation Auth.	Gate City and Adjacent Areas	0.50 MGD	0.50 MGD	0.00 MGD
Holston Regional	Weber City Oakwood Area	0.30 MGD	0.17 MGD	0.07 MGD
Nickelsville	Nickelsville	0.07 MGD	0.03 MGD	0.026 MGD
<b>TOTAL</b>		<b>1.31 MGD</b>	<b>1.07 MGD</b>	<b>0.276 MGD*</b>

\*Based upon 80% capacity.

## 2.6 Existing Agreements

Currently the following agreements exist:

**Moccasin Gap/Scott County Water and Sewer Authority:** A water sales agreement between the MGSDC and the SCW&SA for water to the Hiltons area of the County. The agreement provides that water can be purchased at a rate of \$3.25 per 1000 gallons.

**Bloomingtondale Utility District/Scott County Water and Sewer Authority:** A water sales agreement which provides for the sale of water from Bloomingtondale to Scott County for the East Carters Valley area of the County. The agreement stipulates that water may be purchased at a rate of \$2.50 per 1000 gallons.

**Duffield Development Authority/Scott County Water and Sewer Authority:** A water sales agreement which provides for the Scott County Water and Sewer Authority to purchase water from the DDA for the Town of Duffield and surrounding area at \$3.60 per 1000 gallons.

## 2.7 Existing Water Needs

There are some areas of Scott County with immediate needs for new or improved water service. This section addresses improvements to the existing system and extensions of water service into unserved areas of Scott County.

### Accountability

As the cost of water treatment continues to increase, it is becoming more necessary to improve water accountability. A well-run system should be able to account for 85 to 90% of its water. Causes of poor accountability include leaks, unauthorized use, unmetered connections, improper readings, etc.

One way to increase accountability is through leak detection. Each system should undergo a thorough leak detection program to identify and correct existing problem areas, which will assist in returning the system to an acceptable accountability level. Leak detection service by an outside firm costs approximately \$400/mile assuming that the utility assists with line identification and valve operation.

As the existing problems are corrected, monitoring and record keeping should be implemented as part of daily maintenance operations to identify future problems. In addition, periodic routine checks of the system specifically for leaks should help maintain accountability at an acceptable level.

## **Elimination of Duplication of Effort**

The water purveyors within the Study Area must continue to look for ways to reduce expense by eliminating duplication of effort. Discussions should be held between the Town of Clinchport and the SCW&SA pertaining to operation and maintenance agreements. Similar discussions between the DDA and the SCW&SA and between the Towns of Nickelsville and Dungannon are recommended.

## **Extension of Water Service**

### Jasper

The Jasper area extends from the Lee/Scott County line to the Town of Duffield. A map of the area is included in Appendix B. The Lee County Public Service Authority currently has submitted an application to USDA-Rural Development to serve the Lee County Portion of the Jasper Community. This application calls for water to be purchased from the Town of Big Stone Gap at the Lee County Line by the Lee County PSA. Water would be purchased at the Scott County line by Scott County. An inter-municipal Agreement between the two Counties will be needed for this project. There are approximately seventy residential connections in the Scott County Portion of the Jasper area.

### Duffield

As described in earlier sections of this report, Scott County Water purchases water from the Duffield Development Authority and re-sells water to residents of the Town of Duffield and surrounding areas. Scott County has, in the past, held discussions with DDA in reference to additional water sales. The mission of the DDA is to provide water and sewer services to the Duffield Industrial Park. It has been difficult for the DDA to provide extensive services outside the Industrial Park and Thomas Village in the past. At the present time, however, the Park is nearing “build-out” and it appears that sufficient capacity remains to allow the system to be used for service to additional areas of the County. Growth in the Duffield area has made expanded service feasible. The Scott County Water and Sewer Authority should begin extensive negotiations with the Duffield Development Authority concerning the purchase of the Duffield water and sewer system.

### Rye Cove

The community of Rye Cove is located to the northeast of the Town of Clinchport. The community was served by a spring owned and operated by the Scott County School Board. Due to the spring being classified as “surface water influenced”, the School Board developed and is currently using a drilled well. The well is not large enough to serve the community and as a result the

community is currently not served by a municipal water source. Several residents have no water supply and others are served by individual and sometimes inadequate well or spring sources. A source of adequate potable water is needed for this community. The population of the community is approximately 700 persons. This area is shown on a map included in Appendix B.

### Daniel Boone

The community of Daniel Boone is located to the west of the Town of Gate City and is currently not served by a municipal water source. The population of this community is approximately 600 persons. Water is provided to the residents by individual wells, springs or small community systems. Many of these systems do not meet the requirements of the Virginia Department of Health. Surface runoff causing source contamination is a major problem. The lack of storage, small line sizes and cross connections are also troublesome issues. The Scott County Health Department has documented that several new wells developed in the area are contaminated. This area is in dire need of a safe adequate drinking water supply. Thompson + Litton has completed a Preliminary Engineering Report (PER) for the area. Maps are included in Appendix B.

### Manville Community

This area is located at the northwest boundary of the Town of Gate City corporate limits, where Moccasin Avenue becomes Route 665. Residents of this community have petitioned the Town for water service. The need is based on the inability to provide quality water in adequate quantity to meet safe drinking water standards. A PER completed by Olver, Inc. addressed this area. Maps are included in Appendix B.

### Cowan Gap/Kermit Community

The Kermit Community is bordered on the North by the Clinch Mountain and on the South by Pine Ridge. The Community is primarily residential with one industry. Residents in this area have long experienced problems with the quality and quantity of water needed to maintain a healthy environment. Due to unseasonably dry conditions, ground water levels are at record low conditions causing individual springs and wells to go dry. The residents of the area have requested assistance from the Scott County Board of Supervisors and the Scott County Water and Sewer Authority. The only existing public water supply in the area is owed and operated by the Moccasin Gap Sanitation Authority. The MGSA is currently providing water to the Cowan Branch community adjacent to the Kermit Community but they do not own and operate the Cowan Gap distribution System. Both the Cowan Gap and Kermit Communities are in need of a safe, adequate and reliable source of potable water.

### Sunbright Community

The Sunbright Community is located approximately 2 miles northeast of Duffield along State Route 653. Currently there are no public water supplies in the area and residents are wholly dependent upon private unregulated wells and springs. The area has been studied by Thompson + Litton, Inc. In this study, T&L proposes to extend service from the Duffield system. There are 43 connections in the Sunbright Community.

### Dry Creek Community

The Dry Creek Community is located in northwestern Scott County, west of Pattonsville along Route 604 extending 4.6 miles. The area is comprised primarily of residential older homes currently using wells and springs as sources of supply. Dry conditions during past seasons have depleted the ground water making public water supply a necessity. There are 82 potential connections in the Dry Creek area.

### Areas adjacent to Nickelsville and Dungannon

Both the Towns have some additional water capacity remaining. As areas adjacent to the Towns develop, water service will be needed. The Town systems may be extended as feasible with the idea of connection of the two systems at some time in the future. Fort Blackmore is a community that is showing some relatively rapid growth. Although this area was not mentioned as an area needing immediate water service, the need will likely develop during the study period. Depending on the condition of the Nickelsville and Dungannon Systems, service may be extended from one of these two systems or a well system can be developed.

## **2.8 Existing Sewer Needs**

There are several areas of Scott County with immediate needs for new or improved sanitary sewer collection and wastewater treatment facilities. This section addresses improvements to the existing systems and extension of sewer service into the unserved areas of Scott County.

### **On-going Infiltration/Inflow Correction**

Infiltration and inflow (I/I) problems exist within some of the existing systems. Gate City, Holston Regional, and Dungannon report some problems while Nickelsville and the Duffield Development Authority appear to have I/I under control. Since it is the oldest system, occurrences of I/I are the most severe in the Gate City Sanitation system. The Authority has recently developed an aggressive approach to I/I correction and this approach is paying off. Smoke

testing and internal TV inspection has led to the discovery and elimination of several I/I sources. The Gate City Sanitation Authority and all other operators of wastewater collection systems must continue to actively locate and correct sources of I/I. Costs associated with treatment of I/I, especially in light of more stringent effluent limits, will only increase and as with water systems, it is almost always cheaper to correct I/I than to expand.

### **Elimination of Service Duplication**

Due to the proximity of the systems to each other, much potential for elimination of duplicated effort exists. It is important for the system owners to continue to investigate ways to reduce costs. The Scott County Water and Sewer Authority and the Gate City Sanitation Authority have begun negotiations concerning the combining of forces to provide sewer service to the Town and surrounding areas of Scott County. Both of these Authorities should be commended for this effort. Additional discussions in these areas should occur between the Towns of Nickelsville and Dungannon and between the SCW&SA and the DDA.

### **Extension of Sewer Service**

Extension of sewer service into several areas of the County needs to be considered.

#### **Valley View / Route 708**

This portion of the county is in dire need of sewer service. The area is shown on maps in Appendix B and is scheduled to receive sewer funded with monies left over from the Oakwood sewer project.

#### **Yuma**

The Yuma area was identified by the County as an area needing wastewater collection and treatment, especially the school. Soils conditions are such that the area will not support septic tank/drain field installations. This area was studied by Olver, Incorporated. Approximately 400 homes and the school were potential connections. Although an effort was made to obtain user agreements, and a large majority of the residents were in favor of the system, the project did not appear feasible. If the County passes an availability ordinance, the Yuma area would almost certainly be a feasible area for a sewer extension,

#### **East Carters Valley and Route 724**

The East Carters Valley/Route 724 area has been identified by County officials as a growth area and as such will need wastewater collection and treatment. This area and the Valley View area, when provided with sewer service, will open

up the area referred to as “Wadlow Gap” for development. Since this area is adjacent to the Tri-Cities area, the growth potential is high.

### Hiltons

The Hiltons area was provided with water service several years ago. As the area continues to develop, sewer service becomes more important. As in other areas of the County, soils do not percolate and are unsuitable for the installation of septic tank drain fields.

### Areas adjacent to Dungannon and Nickelsville

Both the Towns of Nickelsville and Dungannon have remaining capacity in their wastewater treatment plants. As areas adjacent to both Towns develop, sewer service will be needed and can be extended.

### Route 871 near Duffield

This area was studied in June of 1998 by Lane Engineering. The area is located near the intersection of Route 871 and U.S. Route 23 adjacent to the Town of Duffield. The project area consists of approximately eighty-five single family dwellings and two small businesses. Septic tank drain field systems do not function properly and need frequent repair and expansion. The completed Preliminary Engineering Report recommends extension of the existing Duffield Development Authority System into this area.

## Section 3

### FUTURE CONDITIONS

#### 3.1 Population Trends and Flow Projections

##### Population Trends

In 1990, the U.S. Census Bureau reported the population of Scott County to be 23,304. Studies conducted in 1997 by the University of Virginia for Public Service estimated a population of 23,100, indicating an overall stable population for the County. According to information obtained from the LENOWISCO Planning District Commission, Scott County has an average of 2.63 persons per household.

The following information is based on 1990 U.S. Census Bureau data obtained from the LENOWISCO Planning District Commission. Specific populations are of the incorporated limits of the Towns only. Projected populations were calculated assuming a 1% increase for the Nickelsville / Dungannon area, a 1.5% increase for the Duffield / Clinchport area, and a 2% increase for the Gate City area.

**Table 3**

#### **Projected Population of the Study Areas**

<b>Town</b>	<b>1990 Population</b>	<b>30-Year Trend</b>	<b>2020 Population</b>
Clinchport	67	1.5% increase	96
Duffield	54	1.5% increase	77
Dungannon	250	1.0% increase	317
Gate City	2,214	2.0% increase	3,561
Nickelsville	411	1.0% increase	522
Remaining Scott County	20,308	1.0% increase	24,534
<b>TOTAL</b>	<b>23,304</b>		<b>29,107</b>

## Flow Projections

The following tables provide an estimate of the future water and wastewater demands as based upon the estimated increase in population. Growth average daily flow (ADF) has been scaled using the same percentage increase as population data for the planning areas.

**Table 4  
Water Demand Projections**

<b>Provider</b>	<b>Current ADF (MGD)</b>	<b>Growth ADF (MGD)</b>	<b>2020 ADF (MGD)</b>	<b>Plant Capacity (MGD)</b>
Clinchport	0.022	0.015	0.029	0.04
Duffield Dev. Auth.	0.14	0.015	0.19	0.50
Dungannon	0.07	0.01	0.085	0.07
Gate City	0.41	0.02	0.59	0.50
MGSDC	0.36	0.02	0.52	0.75
Nickelsville	0.075	0.01	0.091	0.10
<b>TOTAL</b>	<b>1.275</b>		<b>1.505</b>	<b>2.32</b>

The above table indicates that a maximum daily flow of 1.505 MGD will be required for the planning areas in 2020. Current plant capacities are 2.32 MGD, however, the Dungannon and Gate City water treatment plants are currently operating at or near capacity. The projected capacity for the Dungannon treatment plant (0.085 MGD) exceeds the plant's capacity of 0.07 MGD. The projected capacity of the Gate City treatment plant (0.59 MGD) also exceeds its current capacity of 0.50 MGD. If both localities address water loss and bring it to an acceptable level, the plants should be able to supply demand throughout the study period.

**Table 5**

**Wastewater Demand Projections**

<b>Provider</b>	<b>Current ADF (MGD)</b>	<b>Growth ADF (MGD)</b>	<b>2020 ADF (MGD)</b>	<b>WWTF Capacity</b>
DDA	0.15	0.015	0.20	0.40
Dungannon	0.022	0.01	0.027	0.04
Gate City	0.50	0.02	0.73	0.50
Holston Regional	0.17	0.02	0.25	0.30
Nickelsville	0.03	0.01	0.036	0.07
<b>TOTAL</b>	<b>0.872</b>		<b>1.243</b>	<b>1.31</b>

The above table indicates that a total average daily flow of 1.243 MGD will be received in 2020. The current capacity of the wastewater treatment plants in the planning areas is 1.31 MGD. The Virginia Department of Health requires expansions of WWTFs when average daily flow reaches 90% capacity. The 2020 projected flows to the Gate City wastewater treatment plant will exceed the current capacity of 0.5 MGD.

**3.2 Policies, Regulations, and Agreements**

Policies

The most important policy which the Scott County Board of Supervisors can pass to aid in the implementation of the improvements recommended in this Study is an Availability Ordinance. This Availability Ordinance would allow the Scott County Water and Sewer Authority to charge for the availability of water and sewer. Several times in the past, systems have not been feasible because of the fact that although 80% of residents in an area want and need service, 20% of the people will not agree to utilize the service. An availability ordinance would require these 20% to pay for the availability of the utility. Since the availability of public water and sewer greatly enhance property value, this policy is considered reasonable and fair and should be adopted as soon as possible by the Board of Supervisors.

The Virginia Department of Health Regulations state that “at such time as water production of a community waterworks reaches 80% of the rated capacity of the waterworks for any consecutive three-month period, the Owner shall cause Plans and Specifications to be developed for expansion of the waterworks to include a schedule for construction; however, if it can be shown by the Owner that growth within the service area is limited and will not exceed the rated capacity of the waterworks or if unusual transient conditions caused production to reach the 80% level, preparation of Plans and Specifications for expansion will no longer be required.” Waterworks owners and operators should be aware that when the 80% capacity is approached, expansion should be immediately planned.

### Regulations

In addition to local and state policies, there are several regulations which will have a potential impact on the future of water and wastewater service in Scott County over the next twenty (20) years.

#### **Surface Water Treatment Rule**

The Surface Water Treatment Rule requires that all utilities served by surface water and/or groundwater under the direct influence of surface water must comply with the requirements of the Rule. The Rule establishes criteria which provides optimum protection from contamination due to microbial invasion. Once a source is considered surface water influence, the waterworks has eighteen (18) months to either provide filtration for the water supply or abandon the water supply.

#### **1996 Safe Drinking Water Act (SDWA) Amendments**

The 1996 SDWA Amendments addressed a number of issues including funding source water protection, capacity development and operator certification in regulatory changes. This regulation resulted in the funding of the Department of Health Revolving Loan Fund.

#### **Total Coliform Rule**

Maximum contaminant levels for total coliform bacteria was created in December of 1990. Both surface water and groundwater must be monitored with sampling requirements being based on the population served.

#### **Disinfectant / Disinfection by Product Rule**

This rule was proposed in July 1994 and contains a two-stage provision. Maximum contaminant levels (MCLs) must be met when using either chlorination or microfiltration systems. Systems with poor raw water quality must begin sampling for *Giardia* and *Cryptosporidium*. Log removal levels will then be

determined by using this data. Stage 1 of the two-stage provision established maximum contaminant levels for total organic carbon, total trihalomethanes and total haloacetic acids. Stage 2 of the two-stage provision will be based on research that will determine the most cost-effective methods to reduce total contamination and by-products associated with disinfection.

### **Phase II and Phase V Rules**

The Phase II and V Rules established maximum levels for seventy-six contaminants including synthetic organic chemicals (SOCS), volatile organic chemicals (VOCS) and inorganic chemicals. This regulation requires that the water system be tested for inorganic contaminants once per year for surface waters and once for every three years for groundwaters, and requires that the water system be monitored quarterly for three years for organic chemicals.

### **Wastewater Chlorine Ban**

Use of chlorine for disinfection has been banned by the Department of Environmental Quality for the Clinch River, Powell River and any of their tributaries. Disinfection of wastewater effluent must therefore be performed using UV light disinfection process or some other non-chlorine method.

### **Agreements**

Future agreements between localities and Scott County which would impact water and wastewater service would include the following:

1. Agreements between Gate City and Scott County Water and Sewer Authority.
2. Agreements between Gate City Sanitation Authority and Scott County Water and Sewer Authority.
3. Agreements between the Moccasin Gap Sanitation District Commission and the Scott County Water and Sewer Authority.
4. Agreements between Duffield Development Authority and Scott County Water and Sewer Authority.
5. Agreements between the Towns of Dungannon and Nickelsville.
6. Agreements between the Town of Clinchport and Scott County Water and Sewer Authority.

## Section 4

### WATER SYSTEM ALTERNATIVES

#### 4.1 Water Source and Supply Alternatives

As discussed in previous sections of this report, the current capacity of water supplies and sources within Scott County is 2.32 million gallons per day (MGD). The unused capacity of these systems is 0.71 MGD. Most of this unused capacity rests with the Moccasin Gap and the Duffield Development Authority Systems. Based upon accountability calculations, this excess would increase if Gate City was successful in correcting water leaks. If reasonable intermunicipal agreements can be reached between all parties, the expense of developing new water sources may be avoided. It will be extremely difficult to negotiate such agreements, for example, Scott County Water and Sewer Authority obtains water for the Hiltons Water System from the Moccasin Gap Sanitation District (Moccasin Gap). The cost of water sold to the Scott County Water and Sewer Authority from Moccasin Gap has been a point of controversy for several years. Scott County Water believes that water rates are excessive, while the Board of Directors of Moccasin Gap believes the rates to be too low. This issue has resulted in Scott County looking for other sources of water. The purchase agreement also limits the amount of water that may be purchased, thereby limiting the growth potential for the Hiltons Community.

Thompson + Litton, Inc. completed a preliminary engineering report in 1998 that examines additional sources of water for the Hiltons Area. Scott County Water received a \$200,000 grant/loan from the Virginia Department of Health Office of Water Programs to help with the study and with the development of a potential water treatment plant. The recommendation of the PER was that the most viable solution, presenting the least overall cost, is the drilling of a well at Eddington Gap. The success of this alternative is dependent on a well that produces a water source of good quality and quantity. Therefore another alternative was presented involving the withdrawal and treatment of water from the North Fork of the Holston River. Both of these alternatives are considered more cost effective than the continued purchase of water from the Moccasin Gap Sanitation District Commission.

Also, the Virginia Coalfields Water Study recommends a new water treatment plant along the Clinch River at the Town of Clinchport. The water treatment plant would serve Clinchport, Rye Cove, Daniel Boone and Duffield. However this area could be served from the existing Duffield Development Authority Plant.

Since maximization of the use of existing supplies is normally the least expensive alternative, this report recommends this alternative as the most cost effective.

The reader must understand that political constraints may make successful negotiations impossible and additional supplies may be the only alternative. If agreements cannot be reached, alternative supplies include drilled wells, the abandoned quarry at Gate City, and stream withdrawals from the Clinch and Holston Rivers.

## **4.2 Distribution System Alternatives**

### Emergency Interconnections

The Moccasin Gap Sanitation District Plant and the Town of Gate City's water treatment plant are in very close proximity to each other. In order to provide backup water for both, it is recommended that a connection be made between the Town of Gate City and the Moccasin Gap Sanitation District. The connection would consist of approximately 2,800 linear feet of water line and is estimated to cost approximately \$194,000.

### Distribution Line Planning

A majority of the extensions discussed herein have been the discussed in Preliminary Engineering Reports. No attempt will be made within this study to verify distribution line sizes or layouts. Cost estimates derived within these reports will be used for planning purposes.

### Regional Connections

Interconnections would improve reliability to existing systems by the addition of a secondary source. Interconnections involve the existing water providers hooking together to provide service to previously unserved areas. A result of the connections is that water is allowed to flow from one system to the other in times of water shortage.

Regional Authority is an option that was addressed in the Virginia Coalfields Regional Water Study. This study's suggestions include establishing a Regional Authority which could cross any political boundaries such as public service authority, county, town, city, or planning district. Under an Authority, each of the owners of existing water systems would give up their systems to form a regional authority which would own and operate all of the existing and new facilities and serve all customers within the service area. Each of the original system owners would have a seat on the new Authority and each newly served area would have representation on the Authority.

There are several advantages to a regionalized system. Each existing system would be able to get out of the water supply business and allow the authority to deal with the issues that may arise. All debts of the existing owners would be

assumed by the Authority. Rates could be uniformly set across the service area. A Regional Authority would also eliminate the duplication of operations and maintenance staff.

There are also several disadvantages to a regionalized system, such as the existing owner would no longer have exclusive control of the water system and the owner would no longer be able to set rates.

### **4.3 Management / Operation Alternatives**

Clinchport has a limited operation and maintenance budget and limited operation and maintenance personnel. For this reason, the Town of Clinchport and the Scott County Water and Sewer Authority should immediately begin discussions concerning the operation and maintenance of the Clinchport system by the Scott Water and Sewer Authority.

The Scott County Water and Sewer Authority should conduct negotiations with the Duffield Development Authority with the goal of negotiating a reasonable purchase of the DDA water system. The DDA system can then be utilized to serve the areas within the Duffield – Clinchport Study Area.

It is strongly recommended that the Scott County Board of Supervisors consider the adoption of an ordinance that would make it possible for the Scott County Water and Sewer Authority to collect an availability charge from residents who choose not to hook onto the sewer system. Although such an ordinance is unpopular, we believe that expansion of water service into areas of Scott County without the ordinance in place will be difficult if not impossible.

## Section 5

### WASTEWATER SYSTEM ALTERNATIVES

#### 5.1 Wastewater Treatment Alternatives

Wastewater treatment is provided in each of the three study areas. As with the water systems, it appears that capacity exists within the existing systems to serve the County through the Planning Period. We do not propose new wastewater treatment plants but would recommend an expansion of the Holston Regional Plant if negotiations are successful between the SCW&SA and the Gate City Sanitation Authority.

#### 5.2 Collection Systems

Infiltration and inflow correction is the most pressing issue facing the existing systems. It appears that if I/I is successfully addressed, line sizes are sufficient to handle expected flows.

#### 5.3 Future Service Areas

There has been some discussion concerning the expansion of the Holston Regional Sewer System into the Yuma Area of Scott County. There is reportedly a significant need for wastewater treatment in the Yuma Area especially at the school and surrounding area.

Residents in the East Carters Valley and Route 724 (Wadlow Gap Road) Areas have contacted Scott County Water requesting sewer extensions. Residents of the areas of Hiltons, along Route 58 to Bristol, and Route 614 to Mendota have also petitioned Scott County Water requesting consideration of extensions.

#### 5.4 Management / Operation Alternatives

The Gate City Sanitation Authority is presently in violation of the Department of Environmental Quality Discharge Requirements at the wastewater treatment plant. The Gate City Sanitation Authority, in conjunction with the Scott County Water and Sewer Authority, has recently commissioned Thompson + Litton to prepare a preliminary engineering report to address the feasibility of connecting the Gate City Sanitation Authority Plant and the Scott County Holston Regional Wastewater Treatment Plant. This report has been prepared and submitted to the Department of Environmental Quality for their review and comment. Negotiations between the Gate City Sanitation Authority and the Scott County

Water And Sewer Authority are progressing at the time of this report. It is hoped that the two systems can be joined together in a regional approach to solve these problems.

The Scott County Water and Sewer Authority should conduct negotiations with the Duffield Development Authority with the goal of negotiating a reasonable purchase of the DDA system.

It is strongly recommended that the Scott County Board of Supervisors consider the adoption of an ordinance that would make it possible for the Scott County Water and Sewer Authority to collect an availability charge from residents who choose not to hook onto the sewer system. Although such an ordinance is unpopular, we believe that expansion of sewer service into these areas of Scott County without the ordinance in place will be difficult if not impossible.

## Section 6

### PROPOSED IMPROVEMENTS

#### 6.1 Water System Improvements

The following improvements and/or extensions are proposed in terms of priority :

Improvement	Cost
Interconnect Gate City and Moccasin Gap Plants	\$194,000
Purchase DDA System	\$625,000
Correct Water Leaks in Gate City	\$ 300,000
Provide Water to Kermit Community	\$1,746,200
Provide Water to Dry Creek and Jasper	\$1,700,000
Provide Water to Daniel Boone*	\$4,300,000
Provide Water to Wadlow Gap Road	\$1,500,000
Provide Water to Rye Cove	\$2,000,000
Provide Water to Sunbright	\$650,000
Provide Water to Areas adjacent to Nickelsville and Dungannon	\$500,000
<b>TOTAL</b>	<b>\$13,515,200</b>

\*Includes a plant which would not be required if Gate City and Moccasin Gap are utilized.

#### ~~Interconnect the Gate City and Moccasin Gap Sanitation District Plants~~

The Town of Gate City's and Moccasin Gap's water treatment plants are in very close proximity to each other. In order to provide emergency water for both systems, it is recommended that the two systems be interconnected. The interconnection would consist of approximately 2,800 L.F. of water line and would provide increased capacity, which may be utilized to serve the surrounding communities. The estimated total project cost is \$194,000.

### ☞☞Purchase the Duffield Development Authority System

It is recommended that the Scott County Water and Sewer Authority purchase the DDA System. This sale would be beneficial to both organizations. The DDA system is in excellent condition and could be used to provide water service within the Duffield / Clinchport Study Area. Negotiations between the two Authorities should be conducted. The proposed price of the DDA system is approximately \$625,000.

### ☞☞Correct Water Leaks within the Gate City System

Existing system efficiency must be maximized. The Gate City treatment plant is operating at 82% of capacity. However, accountability within the system is approximately 50%. Water leaks must be corrected and on-going programs must be implemented to keep accountability within acceptable ranges. It is more economical to correct leaks than to expand systems.

### ☞☞Provide Water to the Kermit Community

According to a PER performed by Danko & Associates and Lane Engineering, Inc., the most feasible approach to providing potable water to the residents of Kermit is to connect to an existing 4" water line owned by MGSDC. The MGSDC has stated that they are not in a position to assume debt associated with the proposed extension. The proposed water extension would consist of approximately 45,400 L.F. of 6" water line, 1,500 L.F. of 2" water line, and 2,940 L.F. of 1" and ¾" water line. The proposed line would be connected to an existing 4" line in Cowan Branch. A 100,000 gallon water storage tank and a booster pump station would also be constructed. The proposed project would serve approximately 130 residential customers.

This project is dependent on an agreement being reached between the MGSDC and the Scott County Water and Sewer Authority. The two providers are currently discussing various aspects of the Kermit project. The total estimated project cost is \$1,746,200.

### ☞☞Provide Water to the Dry Creek Community

The Dry Creek Community Water Distribution System Development PER performed by Thompson + Litton, proposed the extension of water service from Pattonville, Virginia along State Route 604. Water would be provided by the Scott County Water and Sewer Authority, who purchases water from the Duffield Development Authority for this distribution system.

This project would add approximately 42 connections and add an additional demand of approximately 11,050 gpd. This alternative would involve

connecting 9,450 L.F. of 6" line to an existing 4" line from Fraleytown to Pattonsville and the construction of approximately 12,540 L.F. of 6" water line from Pattonsville to approximately 4.8 miles west of Pattonsville. A new booster pump station and a 20,000 gallon water storage tank would also be required. The estimated total project cost is \$620,040.

#### Provide Water to the Jasper Community

Lane Engineering, Inc. performed a PER for the proposed project, which would involve extending the Big Stone Gap system through Lee and Scott Counties and connecting to the DDA system. The project was divided into two phases with Phase II connecting at the Lee / Scott County line and extending through Scott County into the Town of Duffield. The Scott County Water and Sewer Authority would own and operate the distribution system. The total estimated project cost is \$1,100,000.

#### Provide Water to the Daniel Boone Community

Thompson + Litton has performed a PER investigating the possibilities for providing water to the Daniel Boone area of Scott County. The proposed project would consist of approximately 98,000 L.F. of 4", 6", and 8" water line, one 200,000 water storage tank, and a 150,000 gallon per day membrane filtration water treatment plant. The old quarry pond located within the Town of Gate City and adjacent to the service area would serve as the raw water source. The estimated total project cost is \$4,350,790. The proposed water treatment plant would not be necessary if the Gate City and Moccasin Gap plants are interconnected and utilized for this area. The utilization of existing treatment plants would cut the project cost to approximately \$3,390,000.

#### Provide Water to Residents along Wadlow Gap Road

Due the proximity of this area to the Tri-Cities area, the Wadlow Gap area has a high potential for growth. As the community grows, the need for potable water increases

#### Provide Water to the Rye Cove Community

The community of Rye Cove was served by a spring owned and operated by the Scott County School Board. Due to the spring being classified as "surface water influenced", the School Board developed and is currently using a drilled well. However, the well is not large enough to serve the community. Several residents have no water supply and others are served by individual and sometimes inadequate well or spring sources. A source of adequate water is needed for this community of approximately 700 persons. The estimated project cost for supplying potable water to the Rye Cove Community is \$2,000,000.

☞ Provide Water to the Sunbright Community

A PER, performed by Thompson + Litton suggested that the Scott County Water and Sewer Authority system should be upgraded to provide water to 43 homes in the Sunbright Community. The project would consist of upgrading the existing hydro-pneumatic tank station to incorporate two 57 gpm booster pumps, construction of a 20,000 gallon water storage tank, and construction of approximately 18,390 L.F. of 6" water line. The estimated total project cost is \$651,440.

☞ Provide Water to areas adjacent to the Towns of Nickelsville and Dungannon.

Both the Towns have additional capacity remaining. As areas adjacent to the Towns develop, water service will be needed. Fort Blackmore is a community that is showing some relatively rapid growth. The need for water will likely develop during the study period.

## 6.2 Wastewater System Improvements

The following improvements and/or extensions are proposed in terms of priority:

Improvement	Cost
Correct I/I in Gate City and Holston Regional Systems	\$250,000
Provide Sewer Service to Valley View	Funded
Purchase DDA System	\$625,000
Combine Holston Regional and Gate City, Expand Sewer Plant to 1.0 MGD and Extend Service to Yuma	\$8,000,000
Provide Sewer Service Route 724	\$2,000,000
Provide Sewer Service to Hiltons	\$4,000,000
Provide Sewer Service to Areas adjacent to Nickelsville and Dungannon	1,000,000
<b>TOTAL</b>	<b>\$15,875,000</b>

☞ Correct I/I within the Gate City Sanitation Authority and Holston Regional Systems

Due to the ages of the systems, occurrences within these systems are most severe. The Gate City system is operating at full capacity and has been plagued for several years by excessive inflow and infiltration. The Holston Regional WWTF has limited additional capacity. The cost of treating I/I in light of more stringent effluent limits will only increase. It is almost always less expensive to correct I/I than to expand. The correction of I/I would cost approximately \$250,000.

#### Provide Sewer Service to Valley View

The Valley View area has been identified by County officials as a growth area and is in dire need of sewer service. When provided with sewer service, the area will open up the area referred to as Wadlow Gap for development. Since this area is adjacent to the Tri-Cities area, the growth potential is high. Funding for this project has been secured.

#### Purchase of the DDA System

The DDA system is in excellent condition and could be used by the County to provide wastewater collection and treatment in the Duffield area. Negotiations between the Scott County Water and Sewer Authority and the DDA should continue. The proposed price of the DDA System is \$625,000 for the water and wastewater treatment plants.

#### Combine the Holston Regional and Gate City Sanitation Authority Systems. Expand the Gate City Plant to 1.0 MGD. Extend Service to the Yuma Community.

Due to the proximity of the systems to each other, combining the Holston Regional and Gate City WWTFs would eliminate duplication of services. It is important for the Scott County Water and Sewer Authority and the Gate City Sanitation Authority to continue to investigate ways to reduce costs. As the Gate City plant is currently operating at full capacity, it is recommended that this plant be expanded to 1.0 MGD capacity. This expansion along with the added capacity of the Holston Regional plant would provide the capacity to serve more of the surrounding communities. The estimated cost of this project is \$3,969,700.

The Yuma Community has been identified by the County as an area in need of wastewater collection and treatment and has been studied by Olver, Inc. According to the PER performed by Olver, Inc., the proposed project would consist of the construction of 50,800 L.F. of gravity sewer line and a sewage lift station. The probable project cost is \$4,140,300. Based on user agreements, a large majority of the residents were in favor of the system. However, the project did not appear feasible. If the County passes an

availability ordinance, the Yuma area would almost certainly be a feasible area for a sewer extension.

#### Provide Sewer Service to Route 724

The Route 724 area has been identified by County officials as a growth area and as such will need wastewater collection and treatment. This area and the Valley View area, when provided with sewer service, will open up the area referred to as Wadlow Gap for development. Since this area is adjacent to the Tri-Cities area, the growth potential is high. The estimated project cost is \$2,000,000.

#### Provide Sewer Service to Hiltons

The Hiltons area was provided with water service years ago. As the area continues to develop, sewer service becomes more important. As in other areas of the County, soils do not percolate and are unsuitable for the installation of septic tank drain fields. The estimated project cost to provide service to the Hiltons area is \$4,000,000.

#### Provide Sewer Service to Areas adjacent to Dungannon and Nickelsville

Both the Towns of Nickelsville and Dungannon have remaining capacity in their wastewater treatment plants. As areas adjacent to both Towns develop, sewer service will be needed and can be extended. The cost of providing sewer service outside of the Towns is approximately \$1,000,000.

### **6.3 Septage and Sludge Disposal Improvements**

It is recommended that septage handlers in the Gate City / Tri-Cities study area transport their waste to the Holston Regional WWTP due to capacity constraints at the Gate City WWTP. The Holston Regional WWTP is operating at 57% capacity. Septage collected in the Duffield / Clinchport area should be transported to the Duffield Development Authority WWTP, which is operating at only 40% capacity. Septage collected from the Nickelsville / Dungannon area can be disposed of at either the Nickelsville WWTP, operating at 43%, or at the Dungannon WWTP, which is operating at 55%.

## Section 7

### PROJECT FINANCING

#### 7.1 Rate Structure and Impact

##### Water and Sewer Rate Structure

Rate structure is one of the most important aspect of water and sewer operations. A rate structure must be developed and utilized to assure the water and / or sewer provider that sufficient funds will be generated to operate the system, pay debt retirement, and set aside capital improvements funds. In Scott County, the rates vary with each provider. The following are the residential rates now in effect in Scott County. The rates are for a typical usage of 5,000 gallons per month:

<u>Provider</u>	<u>In-Town Water</u>	<u>Out-of-Town Water</u>	<u>In-Town Sewer</u>	<u>Out-of-Town Sewer</u>
Clinchport	\$23.00	N/A	N/A	N/A
Duffield Dev. Auth.	\$36.00	N/A	\$36.00	N/A
Duffield	\$30.63	N/A	N/A	N/A
Dungannon	\$16.00	\$17.00	\$21.50	\$22.50
East Carters Valley	\$35.75	N/A	N/A	N/A
Gate City	\$28.00	\$35.00	\$28.00	\$35.00
Hiltons	\$35.75	N/A	N/A	N/A
Holston Regional	N/A	N/A	\$37.00	N/A
MGSDC	\$30.00	N/A	N/A	N/A
Nickelsville	\$11.00	\$13.00	\$27.75	N/A

The rates in Scott County compare favorably with the rates in the surrounding rural counties in southwest Virginia. The in-town rates in Scott County range from \$11.00 to \$36.00 per month for water. Out-of-town rates range from \$13 to \$35 per month for water. In-town sewer rates range from \$21.50 to \$37.00 per month. Out-of-town sewer rates range from \$22.50 to \$35.00.

## **7.2 Funding Sources**

One of the most challenging aspects of constructing water and sewer improvements is to obtain favorable financing for the work. Since the revenue from the water and sewer systems is the only source of income, rates must be low enough to be affordable for all different income levels. Water and sewer system financing is available from numerous sources. The major sources presently used or that could be used to produce funds are classified into four (4) different categories. These categories are as follows:

1. Federal Grants and Loans including Appropriations
2. State Grants and Loans including Appropriations
3. Local Funding Sources
4. Privatization

In the past, federal construction grants have been plentiful, however these grants are now a decreasing source of funding. It is therefore necessary for projects to be funded utilizing several different sources of funding. These combination loan and grant programs are still available for southwestern Virginia and are obtainable if innovation is used and effective funding strategy is developed.

### **1. Federal Grants and Loans including Appropriations**

#### **United States Department of Agriculture – Rural Development (RD)**

Rural Development (formerly Farmers Home Administration) has historically been the major source of loan and grant funds for projects in Scott County in particular and southwestern Virginia in general. Both water and wastewater projects may be funded utilizing RD funds. The median household income of the Project Planning Area determines the percentage of loan and the loan interest rate. If a community qualifies as financially needy, it may receive up to 75% of the eligible project cost as a grant with the remaining 25% in the form of a low interest loan. The RD loan programs are backed by bonds purchased by RD with the life of forty (40) years. The bonds may be general obligation bonds, revenue bonds or a combination of the two. RD loan rates are dependent upon median household income and are normally in the area of 5%.

#### **Appalachian Regional Commission (ARC)**

The Appalachian Regional Commission provides federal grant funding for areas in the Appalachian Region, of which Scott County is located. Grant funds are available up to \$500,000 and can be utilized for water and wastewater projects.

The main focus of the ARC program is to fund projects that will create or retain jobs. Designated “distressed counties” can apply for ARC funds for projects that are not job related. In general, ARC considers projects based on the same guidelines as Rural Development, and the funds are usually tied into and administered by other funding sources such as RD.

### **Abandoned Mined Lands (AML)**

In 1990, Congress amended the Surface Mining Control and Reclamation Act (SMCRA) to allow funding for water projects involving protection, repair, replacement construction or enhancement of facilities related to water supply or distribution in AML affected areas. Although AML grants cannot be completely ruled out for Scott County, it would be necessary to find an area that had been adversely affected by abandoned mined land activities.

### **Appropriations**

The federal government has recently approved the expenditure of up to \$20,000,000 by the United States Army Corps of Engineers. In addition, the federal government assigned a water supply mission to the Corps of Engineers. This procedure was a first step toward identifying the United States Army Corps of Engineers as a funding source for water and wastewater projects. Although there is no appropriation of federal dollars to fund the authorization, it is hoped that funds will be forthcoming. Since a portion of the proposed Scott County Improvements are included in the Virginia Coalfields Water Study, it is assumed that these would be fundable with the Corps of Engineers appropriation.

### **Economic Development Administration (EDA)**

EDA provides a 50/50 matching grant up to a maximum of \$750,000 primarily to promote economic activity in areas of high unemployment. The program is tied closely with unemployment and overall economic development and projects are ranked based on their potential for creating new jobs, saving existing jobs and stimulating new economic development within the project area. To be eligible for grants under this program, the County must first develop an Overall Economic Development Program (OEDP). This Plan is usually developed with the assistance of the local planning district, (LENOWISCO) and would identify potential projects which will enhance the overall economic structure of the County. This grant source is especially appropriate for areas of Scott County in or adjacent to industrial parks such as the Duffield Area.

## **2. State Grants and Loans**

### **Virginia Department of Housing and Community Development (DHCD)**

DHCD administers a block grant program sponsored by the United States Department of Housing and Urban Development (HUD), which provides grants for projects that may include water and sewer service extension. CDBG applications are taken in March of each year. Competitive grants of up to \$700,000 for water and wastewater projects are available through DHCD. Communities may apply for up to two grants provided that each grant is for a separate project, however, the combined total of the grants cannot exceed \$1,000,000. CDBG are generally targeted to low and moderate income areas and leverage funds (monies from other sources) are important in obtaining the highest level of funding.

### **Virginia Resources Authority (VRA)**

VRA will issue bonds in large amounts (\$1,000,000) and lend the proceeds to state localities for water and sewer projects. With the bonds backed by the Commonwealth of Virginia, interest rates can be very favorable. Although a VRA loan is technically the same as a locality placing a private bond issue, there are advantages to financing projects through the VRA. Compared to a private placement, issue costs and bond discounts are less. The major advantage to a VRA loan is a waiver of debt service reserve.

### **Virginia Department of Environmental Quality Revolving Loan Fund (VRLF)**

The VRLF administers a program sponsored by the Environmental Protection Agency (EPA) which provides funds for the revolving loan program. The EPA funds may be supplemented by state appropriations to finance wastewater projects. Interest rate is based upon the median household income in the project planning area and can range from 0% to just below market rates. Areas designated as “health hazards” by the Virginia Department of Health will receive high priority for eligibility however, “health hazards” do not receive preferential treatment in the setting of interest rates. The application is long and can take a considerable amount of the time with the applicant required to comply with federal requirements such as wage determinations, environmental statements, etc.

### **Virginia Water Supply Revolving Loan Funds Administered by the Virginia Department of Health (VDH)**

The Virginia Department of Health administers the Virginia Water Supply Revolving Loan Fund which was enacted by the Virginia General Assembly in 1997. The annual appropriation to this fund is almost \$30,000,000 with loans being used to alleviate problems related to drinking water. Priorities are given to those supplies with serious health risks. Interest rates for loans range from 0% to 3% and some money is available for grants. Eligibility is determined by the Virginia Department of Health.

### **Southeast Rural Community Assistance Project, Inc. (S/ER-CAP)**

S/ER-CAP (formerly Virginia Water Projects, Inc.) receives funds from Rural Development. Grant funding is available for up to \$400 per connection in a project planning area meeting this income criteria. S/ER-CAP is most widely used to fund the preparation of Preliminary Engineering Reports for water and/or wastewater systems.

### **State Appropriations**

For the past several years, a considerable effort has been made to fully develop and extend water service throughout the Coalfields Region of Virginia. State representatives have made strong arguments for an investment of State General Fund Dollars in the development of strategic linkages and emergency interconnections. It is expected that this initiative will be advanced this year, providing potential funding to projects that are ready to go to construction.

## **3. Local Funding Sources**

### **Coalfield Water Development Fund, Inc. (CWDF)**

The CWDF is a non-profit 501C-3 charitable organization providing grant assistance for water system construction in the counties of Lee, Scott, Wise, Dickenson, Russell, Tazewell, Buchanan and the City of Norton. The seed funding for the CWDF was provided through a federal grant and will be supplemented with private contributions. The endowment income will be used to make construction grants in the coal-producing counties of southwestern Virginia. The CWDF is known as “gap financing” whereby applications are leveraged utilizing funding from traditional financing sources with CWDF filling gaps in funding needs. Typically, only a small amount of funds are available from this funding agency.

## **4. Privatization**

Several privately owned groups are interested in the privatization of publicly owned water and sewer systems. Privatization would offer the possibility through franchising the operations and customer base on outright sale of systems to recover this equity. Proceeds from equity could then be leveraged by other state and/or federal programs to fund water and wastewater programs. Private utility companies are available who specialize in potable water supply and wastewater treatment.

## Section 8

### Conclusions and Recommendations

**The Scott County Board of Supervisors has commissioned this study and report due to the growth of the County and the need to provide adequate and strong infrastructure. The purpose of this water and sewer study is to develop a comprehensive planning document to be used for the continued development of water and sewer facilities within the County. The study concentrates on “broad-brush” aspects of this effort, realizing that detailed Preliminary Engineering Reports are necessary to the planning process. Therefore, the recommendations contained herein concentrate more heavily on “procedural” issues and proposed solutions to impediments which may exist as a result of deficiencies in organizations.**

Several residents within the County are in need of public water and sewer service. At the present time, no single entity has taken responsibility for the provision of these services. The major impediment to efficient development of water and sewer systems is the lack of unified efforts on the part of the local government towards this development. Therefore, aggressive leadership is needed to begin to bring local governments together to find ways to more effectively serve the citizens of Scott County.

General recommendations are as follows:

1. Scott County should adopt a water and sewer availability ordinance which would make it possible for the Scott County Water and Sewer Authority to collect an availability charge from residents who choose not to hook on to a water and sewer system if it is constructed close to their house. This will allow the development of systems in areas where there is a need for service but where some residents have adequate individual systems at the present time.
2. The Scott County Board of Supervisors should direct and empower the Scott County Water and Sewer Authority to develop public water and sewer service in areas where needs exist. The Scott County Water and Sewer Authority should aggressively pursue water and sewer system development throughout the county where service is needed and should expand existing systems as feasible.
3. Existing system efficiency must be maximized. Water leaks and sewer system infiltration and inflow (I/I) must be corrected in systems where problems exist and on-going programs must be implemented to keep accountability in acceptable ranges. It is almost always more economical to correct leaks and eliminate I/I than to expand systems.

4. The Town of Gate City and the Scott County Water and Sewer Authority should develop an inter-municipal agreement and negotiate reasonable rates for water service to areas of the County adjacent to the Town.
5. The Town of Gate City and the Moccasin Gap Sanitation District Commission should interconnect their water systems and negotiate water sales agreements.
6. The Scott County Water and Sewer Authority and the Gate City Sanitation Authority should finalize negotiations and enter into a regional wastewater agreement to provide wastewater collection and treatment to the Town of Gate City and surrounding areas of the County.
7. The Moccasin Gap Sanitation District Commission and the Scott County Water and Sewer Authority should negotiate reasonable rates for the long-term sale of water from the District to the Authority. If such an agreement cannot be reached, the Authority should move toward the development of a long-term water source for the area of the County around Gate City. This source should consist of a plant on the North Fork of the Holston River or the Gate City Quarry. (Preliminary Engineering Report currently being prepared by Thompson and Litton, Inc.)
8. The Scott County Water and Sewer Authority should continue negotiations with the Duffield Development Authority concerning the purchase of the Duffield Development Authority water and wastewater systems. Both of these systems are in excellent condition and could be used by the County to provide water service and wastewater collection and treatment in the Duffield area of the County.
9. The Towns of Nickelsville and Dungannon should begin meetings with the intent of finding ways to eliminate duplication of effort within their respective water and sewer systems and thereby reducing costs to their customers. Feasible water and wastewater extensions should be made by each Town with the long-range goal of tying the two systems together. Operation and maintenance agreements should be developed between the two Towns and the Scott County Water and Sewer Authority.
10. The Town of Clinchport and the Scott County Water and Sewer Authority should enter into an operation and maintenance agreements with the long term goal of having the County totally operate and maintain the system.
11. The Scott County Water and Sewer Authority should take over operations of the small water and sewer systems currently operated by the Scott County School Board. Consideration should be given to the expansion of these systems to serve the communities surrounding the school plants.

**12.** The advisory committee, consisting of those individuals who assisted in the review of this Study, should be seated by the County for the purpose of monitoring progress toward implementation of these recommendations. We recommend that the Executive Director of the LENOWISCO Planning District Commission be appointed as interim chair. Funding of the necessary improvements will be challenging, however several options exist. With the passage and enforcement of the availability ordinance, and the introduction of state and federal initiatives, additional funding opportunities will develop. LENOWISCO and the Committee should be utilized by the County for assistance in developing funding strategy. Again, it is extremely important to aggressively pursue system financing. Those systems ready to move forward when funding is available consistently receive the highest funding priority.