



Final Environmental Impact Statement

Wastewater Treatment
Facilities for the
Town of Ashland and
Hanover County, Virginia



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III

6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

AUG 20 1981

TO ALL INTERESTED AGENCIES, PUBLIC GROUPS, AND CITIZENS:

Enclosed is a copy of the Final Environmental Impact Statement (EIS) prepared by the U.S. Environmental Protection Agency (EPA) in conjunction with wastewater treatment Facilities Plans for the Town of Ashland and the "Phase I Extended" area of Hanover County, Virginia. This Final EIS has been prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, the Clean Water Act of 1977, and the corresponding regulations promulgated by EPA (40 CFR Part 6, November 6, 1979; 40 CFR Part 35, September 27, 1978).

Please note that since a Draft EIS was issued in 1979 covering the Phase II area of Hanover County (which included Ashland), separate wastewater Plans have been prepared by Ashland and the County. This Final EIS addresses both Plans in accordance with NEPA requirements. It may be necessary for Hanover County or the City of Ashland to furnish additional information or for EPA to perform supplemental NEPA analyses prior to future Federal funding.

I wish to thank the local jurisdictions and participating government agencies for their assistance during this EIS process. In addition, I especially wish to recognize and commend the strong environmental knowledge, interest, and efforts of the area's citizenry. Their participation throughout the EIS process has had a profound influence on development of wastewater treatment solutions which are responsive to the needs of the area.

EPA will not take any administrative action pending a 30-day review period following public issuance of this FEIS. A public meeting on the Final EIS will be held on September 22, 1981 at 8:00 p.m. in the Wickham Building, Hanover, VA. The general public and representatives of organizations are invited to attend and express their opinions about the Final EIS. Any comments or inquiries concerning this EIS should be raised to the attention of Mr. Thomas Slenkamp of this Regional EPA office by September 28, 1981.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Alvin R. Morris", is written over the typed name.

Alvin R. Morris
Deputy Regional Administrator

Enclosure

FINAL
ENVIRONMENTAL IMPACT STATEMENT
WASTEWATER TREATMENT FACILITIES
FOR THE TOWN OF ASHLAND
AND
HANOVER COUNTY, VIRGINIA

August 1981

Prepared for
U. S. Environmental Protection Agency
Region III
Philadelphia, Pennsylvania

By
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PREFACE

Purpose of the Final EIS

This Final Environmental Impact Statement (EIS) has been prepared by the U.S. Environmental Protection Agency (EPA) in conjunction with wastewater treatment "Facilities Plans" for the Town of Ashland and Hanover County, Virginia.

The National Environmental Policy Act (NEPA) requires every Federal government agency to prepare an EIS before taking any major Federal action which could significantly affect the quality of the human environment. In this case, EPA initiated an EIS because of concerns over the proposed Federal funding for a wastewater treatment project, termed "8-I", serving an area designated as "Phase II" in Hanover County (including Ashland). A Draft EIS covering the Phase II area was issued by EPA in early 1979 and a public hearing held on April 4, 1979. Since that time, several events have occurred which have altered the basic circumstances and, therefore, assumptions involved in preparation of the Draft EIS. These include 1) efforts made by the Town of Ashland to complete a separate Facilities Plan from that of Hanover County, and 2) the County's revision of previous wastewater planning goals and objectives which has resulted in a reduced service area-"Phase I Extended" - for future sewerage facilities (See Figure 1).

The net effect of these changes has been to render as infeasible the previously recommended Phase II solution ("8-I") which had prompted EPA to initiate an EIS. While the separate Facilities Plans for Ashland and the County (Phase I Extended) would not necessarily require EIS's in and of themselves, EPA believes it is appropriate to provide guidance in this Final EIS concerning environmental considerations which should be used by both local jurisdictions when implementing wastewater treatment solutions. However, the Final EIS in this instance does not cover both Facilities Plans to a level of detail which would be expected in a single-Plan EIS, partly because many of the previous environmental concerns have been alleviated through development of the new Plans.

In issuing this Final EIS, EPA will discuss only in a general manner the rationale for selection of a Phase II alternative concept, and, within that context, the alternative plans now being considered for implementation by the separate jurisdictions. Somewhat more discussion is provided about the Ashland alternatives, since the Ashland Facilities Plan had progressed further at the time this Final EIS was started.

Although EPA is satisfied that the separate Facilities Plans represent substantial improvement and have incorporated many environmental concerns raised by the Draft EIS, this does not preclude EPA from requesting additional information concerning NEPA compliance from local jurisdictions in support of future requests for grant assistance. EPA reserves the right to modify conclusions and recommendations expressed herein, and could issue supplemental NEPA analyses on either Plan depending upon final solutions and methods of implementation selected by Ashland and Hanover County.

Following the close of the comment period on the Final EIS (thirty days after issuance), EPA will prepare a Record of Decision which will describe the conclusions of the EIS process, the decisions reached by EPA as to Federal funding of alternatives, and the actions to be undertaken by the grant applicants.

References

This Final EIS addresses all substantive comments received on the "Draft EIS - Wastewater Treatment Facilities Planning for Hanover County, Virginia: Phase II Area" including the testimony received at the public hearings on 4 April 1979 and 20 January 1981.

Rather than repeat the entire Draft EIS here in the Final EIS, the Draft EIS has been included by reference as Appendix A and appropriate changes and additions made in the Final EIS. All environmental setting information used to evaluate Phase II alternatives and sub-alternatives in this Final EIS was presented in the Draft EIS except where specially noted otherwise. Furthermore, detailed Facilities Planning information is drawn from existing Phase II, Phase I extended, and Ashland Facilities Plans. The reader is referred to the following sources to obtain this information:

- For information on the Environmental Setting and on Phase II Facilities Planning:

"Draft EIS Wastewater Treatment Facilities Planning for Hanover County, Virginia: Phase II Area"
(Draft EIS)
Engineering-Science and EPA, January 1979

- For information on the Phase II Facilities Planning:

"Hanover County Facilities Plan, Phase II, Volumes I and II (The Plan, Appendix)"
(1975 Facilities Plan)
Bremner, Youngblood & King, Inc., November 1975

"Preliminary Draft - Expanded Scope and Investigation of Additional Alternatives for Facilities Planning in Hanover County, Virginia"
(1978 Facilities Plan)
Bremner, Youngblood & King, Inc., August 1978

- For information on the Ashland Facilities Planning:

"Preliminary Draft: Town of Ashland Facilities Plan"
(Ashland Draft Facilities Plan)
Town of Ashland, February 1980)

- For information on "Phase I Extended" Facilities Planning:

"Draft Addendum - Water Pollution Control Facilities Plan - Phase I Extended, Hanover County, Virginia", April 1981, Patton, Harris, Rust, and Guy

LIST OF ACRONYMS
AND ABBREVIATIONS

BOD	Biochemical Oxygen Demand
BYK	Bremner, Youngblood & King, Inc.
CBOD ₅	5-day Carbonaceous Biochemical Oxygen Demand
cfs	cubic feet per second
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ERA	Economics Research Associates
gpcd	gallons per capita per day
gpd	gallons per day
I-95	Interstate-95
I/I	Infiltration and Inflow
mgd	million gallons per day
mg/l	milligrams per liter
MPN	Most Probable Number
NEPA	National Environmental Policy Act
O&M	Operation and Maintenance
PL	Public Law (of the United States)
RBC's	Rotating Biological Contactors
RPCCA	Rural Point Concerned Citizens Association
SAPU	Service Area Planning Unit
SWCB	Virginia State Water Control Board
TSS	Total Suspended Solids
30/30	30 mg/l for BOD and 30 mg/l for TSS

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This Final Environmental Impact Statement (FEIS) has been prepared by the U.S. Environmental Protection Agency. It generally addresses wastewater treatment Facilities Plans prepared for the Town of Ashland and the Phase I Extended area of Hanover County, VA.

Draft EIS

A Draft EIS was previously prepared covering the Phase II area of Hanover County, including the Town of Ashland. The Draft EIS analyzed wastewater treatment alternatives developed through Phase II Facilities Plans, and presented several others in addition for public consideration. The Draft EIS also outlined several preliminary recommendations, chief among them that the originally recommended Phase II areawide solution was associated with numerous adverse impacts which cast significant doubt on its feasibility. Other alternatives were suggested for more favorable consideration, including some involving a separate Ashland treatment facility.

Partly based on the Draft EIS recommendations, the Town of Ashland and Hanover County subsequently took steps to prepare separate Facilities Plans, the County's being for a reduced study area designated as "Phase I Extended". Although Ashland's independent Plan was completed considerably sooner than the County's, several questions remained preventing its immediate implementation, including those concerning the interrelationship of the two Plans. The County recently completed a Draft Facilities Plan for Phase I Extended, enabling EPA to complete this Final EIS generally covering both jurisdictions' Plans.

Public Input

EPA received many written comments on the Draft EIS during and after a formal public comment period from February 15, 1979 to April 15, 1979. In addition, oral testimony was received at a public hearing conducted by EPA on April 4, 1979. These and other public comments were instrumental in the local government decisions to prepare separate Ashland and County Facilities Plans and in forcing consideration of issues of concern to local residents, such as the environmental value of County streams, including Totopotomoy Creek and Chickahominy River, the need for balancing water supply and wastewater treatment needs, the effect growth will have on the County's predominantly rural way of life, and the ability of local residents to pay for improved wastewater treatment facilities.

During and after the separate Facilities Plans were prepared, additional public workshops, meetings, and hearings were held to solicit further public opinion. A public hearing was conducted by EPA on January 20, 1981 in conjunction with Ashland's Facilities Plan. The County held a public hearing on the Phase I Extended Plan on June 3, 1981. EPA will hold a public meeting on this Final EIS approximately 30 days after public issuance.

Alternatives Considered

The Final EIS addresses the alternatives developed through the separate Town and County Plans. Ashland's Plan compared six basic alternatives for improving the existing lagoon system, including two land treatment alternatives. The County Plan for Phase I Extended evaluated four primary alternatives, including land treatment and an alternative of improving existing systems without public sewerage. The level of detail presented in the Final EIS is generally less than in the Draft EIS since the separate Facilities Plans have alleviated many of the concerns raised by the Draft EIS.

Final EIS
Recommended
Alternative

EPA concurs with the recommended alternatives in the two Draft Facilities Plans, which call for Ashland to upgrade (by aeration) and expand its existing facility to 1.2 mgd, and for the County to pursue a sewerage interconnection to adjacent Henrico County's treatment system. EPA also strongly recommends that the County consider phased implementation of the proposed sewer network and that they apply stringent land use controls in conjunction with the wastewater treatment project. Oak Hill Estates is recommended to be connected into the Ashland system for treatment.

Recommendations and
Conclusions

The following recommendations and conclusions are presented based upon information developed and analyzed during Facilities Planning for Phase II, Ashland, and Phase I Extended, and throughout the EIS process. Local jurisdictions and the public are urged to take these into account in determining a final course of action. EPA will prepare a concise Record of Decision following the close of the comment period on this Final EIS, which will summarize the findings of the EIS process and set forth any measures necessary to make the recommended actions environmentally acceptable.

1. The most cost-effective alternative for the entire Phase II area is Alternative A-I: Separation of Ashland and Interconnection of the Industrial Corridor and the remaining County service area to Henrico County. This alternative minimizes adverse environmental impacts on the Totopotomoy Basin and allows the Town of Ashland to move immediately to upgrade their facility in order to end the moratorium on hookups imposed by the Virginia State Water Control Board.

2. The County, the Town, the SWCB, and EPA have taken preliminary, although not irreversible, steps to implement the A-I Alternative in concept. These steps include:

Approval by all parties of a separate Ashland facility;

- Preparation of a Draft Facilities Plan by the Town of Ashland;

Reservation by the County of 3.7 mgd of treatment capacity in the Henrico County facility;

Completion of a Draft Facilities Plan for the Phase I Extended area by the County; and

- Separation of the Phase II EPA grant funds for Step II (design) and Step III (construction) into Ashland funds and County funds on the State construction grant priority list.

3. The Town of Ashland's most feasible treatment alternative for upgrading and expanding its system consists of aerating the existing lagoon. This option, Alternative 1 in the Ashland Draft Facilities Plan, is the most cost-effective and least environmentally impacting alternative for the Town. It has a construction cost estimated at \$1,212,200.

4. Growth patterns in the County since issuance of the original Phase II Facilities Plans have not served to justify implementation of a maximum-growth treatment alternative. In response to these patterns, and to outspoken recommendations by the public, the County has minimized the area to receive improved wastewater treatment service. The resulting area, "Phase I Extended", is significantly smaller than the original Phase II Service Area. The County's Phase I Extended Draft Facilities Plan calls for interconnection to Henrico County as the most feasible alternative, based on most recent available cost estimates and an assumption that the planned Henrico system will be fully implemented. EPA endorses this recommended action as an acceptable long-term wastewater management solution for the needs of the Phase I Extended area. It has an estimated construction cost of \$2,729,400.

5. Because of initially high projected growth rates for the Phase I Extended area and financial uncertainties related to future Federal funding and costs for treatment in adjacent Henrico County, Hanover County should strongly consider implementation of its recommended action in phases, as future development occurs in a manner sufficient to justify construction of additional system components. This is especially relevant to construction of interceptor sewers.

6. To ensure that the recommended action will assist in directing future growth into the "urban" service areas outlined in the Facilities Plan, the County must complement the project with stringent application of land use controls and policies which are in concert with the same goal. This will help to avoid the in-fill problems experienced with the Phase I system.

7. As an additional wastewater project-related growth control, the County should consider construction of a forcemain vs. a gravity sewer where cost competitive.

8. Continued use of on-site systems, including upgrades where necessary to rectify existing problems, and provision of decentralized off-site systems (cluster systems) are acceptable solutions for areas which may not warrant initial sewer service. EPA's Construction Grants Program provides for 85% Federal funding of these systems where certain conditions are met.

9. Sewer service should be restricted from the Totopotomoy River Basin (with the possible exception of three existing subdivisions) in the near term because of unquantifiable but potentially adverse environmental impacts. Before service can be considered, a more comprehensive field survey should be performed to more precisely define the sensitivity of the Basin and its value as an environmental resource. EPA will arrange with the appropriate government agencies for this to be performed.

10. EPA recommends that the Oak Hill Estates pollution problem be addressed via interconnection with the Town of Ashland's wastewater treatment system. The Town should modify its Facilities Plan to incorporate this change.

To implement solutions to the area's wastewater management needs, it is recommended that the Town of Ashland and Hanover County finalize Facilities Planning efforts consistent with the above recommendations and submit formally adopted Plans to the State Water Control Board along with Step II grant applications as soon as possible.

SECTION I

Background

SECTION I: BACKGROUND

INTRODUCTION

Under the Clean Water Act of 1977, the U.S. Environmental Protection Agency (EPA) is authorized to administer several programs for controlling water pollution. Under the Section 201 program "Grants for Construction of Treatment Works", EPA may provide up to 75 percent of the costs for the planning (Step 1), design (Step 2), and construction (Step 3) of conventional publicly-owned treatment works and up to 85 percent of the costs of "innovative or alternative" facilities.

In addition, the National Environmental Policy Act (NEPA) requires each Federal agency to prepare an Environmental Impact Statement (EIS) on any of its actions which may significantly affect the quality of the human environment. EPA funding of large construction projects is, in some cases, considered such an action. The EIS process is designed to facilitate informed and responsible decision-making by all levels of government and by the public. The EIS process is specifically designed to ensure that environmental as well as economic factors are considered in decision-making and that the environmental consequences of the options examined are disclosed. The EIS process also encourages public input into the decisions made.

First a Draft EIS is prepared and circulated to all concerned parties. Then comments are accepted in writing and at a mandatory public hearing. Lastly a Final EIS is prepared which responds to comments on the Draft EIS and which presents and evaluates any changes in the proposed project which have occurred since the issuance of the Draft EIS.

HISTORY OF THE PROJECT

During the early and mid-1970's, Hanover County, Virginia, received Federal assistance from EPA for its plan to improve the wastewater treatment in the Mechanicsville area (Phase I). This plan was carried to fruition and facilities are now being constructed. Additional parts of the county north and northwest of Mechanicsville (designated as the Phase II area) were determined to be in need of improved wastewater treatment as well, but the problems in this area were not as severe and were thus postponed until after Phase I planning was complete.

In 1975, Hanover County applied to EPA for a Step I grant for Facilities Planning in the Phase II area. The grant was awarded, and a Facilities Plan was completed late in 1975. The Plan presented a regional treatment scheme that would cover all of the area identified as Phase II, but could not gain state or local approval. The Plan was not accepted because insufficient information about the proposed project was presented, and inadequate investigation had been done of additional alternatives.

To correct these deficiencies, the County requested additional Step I funds to study other treatment options. EPA granted these funds and initiated an EIS on the Phase II area planning because of the significant controversy over the project. The EIS was to be prepared concurrently ("piggyback") with the expanded Facilities Plan to expedite the Step I process.

A preliminary draft Facilities Plan was completed in 1978 and a Draft EIS was issued in 1979. Alternatives beyond the original options in the 1975 Plan were developed in the 1978 Plan and additional alternatives were presented in the Draft EIS. These alternatives included sub-regional treatment schemes and limited growth options; several options provided

for a separate facility for the Town of Ashland. A public hearing was held on the Draft EIS in April 1979.

In April 1979, the Virginia State Water Control Board (SWCB) issued a consent order to the Town of Ashland which stated that, because it was consistently operating its wastewater treatment system above design capacity, a moratorium on new sewer connections would be in effect until a plan to relieve this condition was approved. That same month the Ashland Town Council adopted a resolution requesting that EPA, the SWCB, and the Hanover County Board of Supervisors allow the town to proceed with development of its own Facilities Plan, separate from the County's Phase II efforts. The Town indicated that it felt that this approach would enable it to solve its wastewater problem most expeditiously. Later in 1979, the County, the SWCB, and EPA approved Ashland's request to initiate planning to assess overall Phase II alternatives with respect to the feasibility of Ashland separating from the County and to evaluate options for the Town's upgrading and expanding its existing treatment facility.

RECENT DEVELOPMENTS

In February 1980, the Town of Ashland completed a Sewer System Evaluation Survey and issued a Draft Facilities Plan which assessed the major Phase II alternatives and additional wastewater treatment alternatives for the Town only. At that time, the County expressed its intention to continue planning efforts for the remainder of the Phase II service area. However, as the County's planning has progressed, the portion of the Phase II area to be serviced has diminished to the extent that it now includes only an area northwest of the Phase I area that extends along the I-95 Industrial Corridor only about halfway to Ashland. This area has been termed "Phase I Extended". In January 1981, EPA and the Town jointly sponsored a public hearing to receive comments on the Ashland Draft Facilities Plan and to present updates on the County's planning and on the status of the EIS.

REASSESSMENT OF THE PLANNING AREA

Due to the changes in the Facilities Planning process described above, the planning area covered by the Facilities Plans has been altered and now consists of an Ashland Service area and a Phase I Extended area (which includes Oak Hill Estates). The original Phase II study area and the revised Facilities Planning areas are shown in Figure 1. Although plans for treating wastewater from the entire Phase II area as originally designated have been abandoned, this present report continues to assess the effects of the revised alternatives on the entire area. These revised study areas simply comprise a "limited-build" alternative as defined in the Draft EIS.

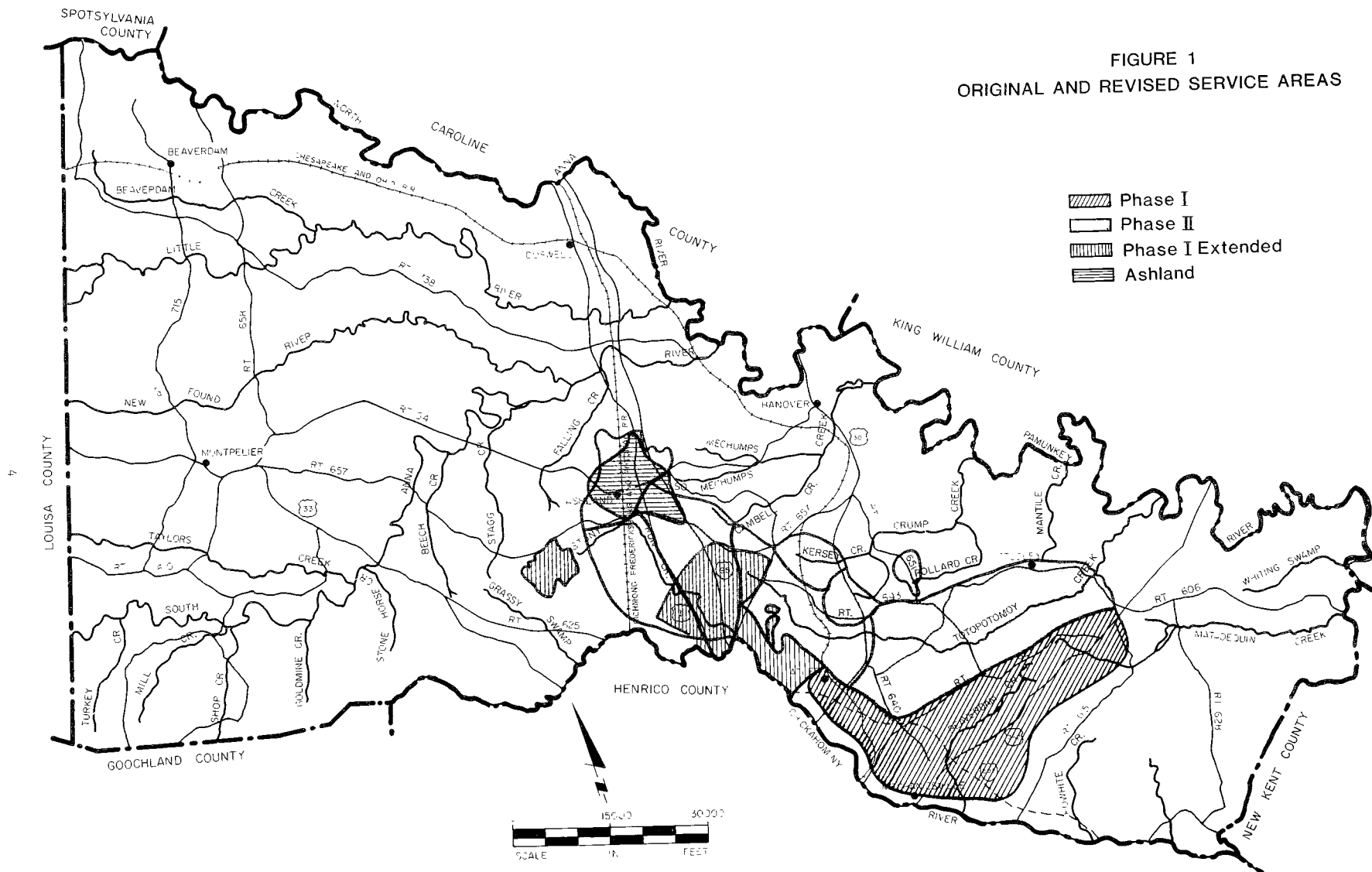
However, the division of the Phase II planning area between two planning authorities, and the diminution of the area to be serviced, render inapplicable the Service Area Planning Unit (SAPU) concept that was used in the 1978 Facilities Plan and in the Draft EIS. The seven SAPU's which were identified and discussed in those documents are therefore not used in this Final EIS. Instead, the Ashland Service Area and the Phase I Extended Service Areas are the sub-areas discussed.

ORGANIZATION OF THIS EIS

This Final EIS addresses comments received on the Draft EIS and presents information on the selected alternatives and on sub-alternatives which have been developed in detail since

the Draft EIS was prepared. The Final EIS concentrates on the Ashland Alternatives presented in the Town's 1980 Draft Facilities Plan.

Section II of this report summarizes comments received by EPA on the Draft EIS and responds to those comments in light of recent developments. Section III briefly presents and discusses the main alternatives recommended in the 1978 Facilities Plan and in the Draft EIS and the alternative now selected. Section IV develops the Ashland portion of the selected alternative in terms of the sub-alternatives presented in the 1980 Ashland Draft Facilities Plan. Section V describes in detail the selected Ashland sub-alternative and the environmental impacts of and mitigative measures for that alternative. Section VI discusses recent County progress in its Facilities Planning for the Phase I Extended Area including Oak Hill Estates. Section VII summarizes the previous Sections and makes recommendations to the local planning authorities.



SECTION II

Public Participation

SECTION II: PUBLIC PARTICIPATION

INTRODUCTION

Public involvement of the citizens of Hanover County and the Town of Ashland in the Phase II planning process has been extensive. The public has had a profound influence on many of the major decisions: the decision to develop alternatives in addition to the originally-recommended 8-I option; the decision to prepare an EIS on the Phase II Facilities Planning; the decision for Ashland to pursue Facilities Planning individually; and the selection of issues addressed in the Draft EIS and in this Final EIS. Public participation has taken the form of testimony at public hearings; attendance at public meetings; letters to the various local, state, and Federal governmental entities involved in the planning; and preparation of citizens' reports (e.g. "A Closer Look at Hanover County's Proposed Facilities Plan, Phase 2" by the Rural Point Concerned Citizens Association, and "A Comparative Analysis of Sewerage Program Alternatives for Hanover County, Virginia" prepared for the Public Facilities and Solid Waste Subcommittee of the Hanover County Citizens Advisory Committee by Patton, Harris, Rust and Guy). In this Section, public participation relating specifically to the Draft EIS and this Final EIS is identified and discussed.

CHRONOLOGY

As part of the extended Phase II Facilities Planning process, a series of public informational meetings and public hearings have been held in Hanover County over the past five years. Several of these meetings were held before the decision was made to prepare an Environmental Impact Statement on the Phase II project. Indeed, public comments received at some of the earlier meetings contributed to that decision. Since the initiation of the EIS process, two public hearings have been held to officially receive public comments on the EIS and on the status of Phase II Facilities Planning in the County. The first public hearing was held after distribution of the Draft EIS and the second was held after publication of the Ashland Draft Facilities Plan, just prior to issuance of this Final EIS. Written comment periods accompanied each public hearing. All public informational and comment meetings and hearings held prior to issuance of the Draft EIS are included with other major events in the Phase II Facilities Plan/EIS process chronology in the Draft EIS (pp. I-4 through I-7). Public meetings and other events since the issuance of the Draft EIS are listed below:

DATE	EVENT
February 1979	Distribution of Draft EIS.
March 1979	Public hearing held on Draft EIS.
April 1979	SWCB issued consent order to Town of Ashland stating that it was operating its wastewater treatment system above capacity and that a moratorium on new sewer connections would be in effect until a plan to relieve this condition was approved.
April 1979	Ashland Town Council adopted resolution requesting EPA, SWCB and County Board of Supervisors to allow the town to proceed with its own facilities plan separately from the County.

DATE	EVENT
May 1979	Hanover County Board of Supervisors adopted resolution approving Town of Ashland pursuing construction of its own wastewater treatment facility.
October 1979	Formal approval by SWCB and EPA of Ashland's planning to upgrade and expand its own wastewater treatment facility.
January 1980	Town of Ashland prepared a revised SSES for the Town only.
February 1980	Town of Ashland prepared a Draft Facilities Plan which included alternatives for the town only.
March 1980	SWCB revised FY '80 priority list. The list included separate sums for Hanover County and the Town of Ashland.
August 1980	EIS contract modification approved by EPA to accommodate facilities planning.
January 1981	Public hearing held on Ashland Draft Facilities Plan and on updates to Hanover County facilities planning process.

PUBLIC HEARINGS
Draft EIS Public
Hearing

To comply with EPA's regulations for public participation in EIS preparation, a public hearing was held on 4 April 1979 at the Hanover County Courthouse at Hanover, Virginia. Seventy-seven people signed the attendance list, and 28 people gave testimony. A transcript of the hearing is available from EPA, Region III. The following persons spoke at the public hearing:

- o Steven A. Torok - Chief, EIS Preparation Section, U.S. Environmental Agency, Region III
- o Pettis Miller - Vice-Mayor of the Town of Ashland
- o Tom Slenkamp - Project Monitor for Hanover County Phase II EIS, U.S. EPA, Region III
- o James Bruce - Hanover County Public Utility Director
- o Robert Bremner - Bremner, Youngblood & King, Inc.
- o Tim Rohrmoser - Bremner, Youngblood & King, Inc.
- o T. A. Clark
- o Anne Smith - Rural Point Concerned Citizens Association
- o Donald Wiber - Rural Point Concerned Citizens Association
- o Tom Evans - Virginia B.A.S.S. State Federation, Inc.
- o Robert Phillips - Hanover County Citizens Federation

- o Gail Enroughty - President, Rural Point Concerned Citizens Association
- o Nina K. Peace - Member of the Hanover County Board of Supervisors from the Ashland District
- o Lou L. Hanks - South Anna Citizens' Council
- o E.C.C Woods, Jr. - Member of the Hanover County Board of Supervisors from the Henry District
- o Margaret R. Miller - Citizens for Sensible Growth
- o Virginia Shaw English
- o Bruce V. English
- o Donald McDonald
- o John S. Graham - Hanover Properties, Inc.
- o Lois Wickham - Curator, Hanover Historical Society
- o Ron Jones
- o George Nester - Town Manager, Town of Ashland
- o John B. Steadman - Wiley & Wilson
- o Preston Wade - Wiley & Wilson
- o Bob Wilby - President Hickory Hill Farms
- o Bob Ostergren

The majority of comments at the hearing dealt with the question of whether or not a regional treatment system for the Phase II area was justified. A good number of people stated their support for dividing the service area and allowing Ashland to solve its treatment problems individually. Several persons also cited lack of public support in the County and inability or unwillingness to finance a regional project as reasons for abandoning the regional treatment concept. The growth-inducing effects of a regional facility were criticized; several people stated their desire to preserve the rural quality of life in the County. The justification of the project by failing septic systems was also questioned. Several people mentioned the need to preserve the quality of the Totopotomoy basin and the Pamunkey River. Some people suggested land application of treated effluent as one way to attain this objective. One industry representative spoke in support of the facilities planned to serve the Industrial Corridor. Finally, a few people criticized the lack of public participation in the planning process and the unavailability of the Facilities Plan.

EPA responses to the issues raised appear later in this Section.

Public Hearing on
Ashland Facilities
Plan

In response to the division of the Phase II study area for Facilities Planning purposes, and to elicit public reaction to the split and to updated Facilities Planning efforts by the Town

of Ashland and the County, EPA and the Town of Ashland jointly sponsored another public hearing prior to issuance of this Final EIS. The hearing was held on 20 January 1981 at the Town of Ashland Municipal Building. The attendance list was signed by 35 persons and nine of those presented testimony. A transcript of the hearing is available from EPA Region III. The following persons spoke at the public hearing:

- o Tom Slenkamp - Project Monitor for Hanover County Phase II EIS, U.S. Environmental Protection Agency, Region III
- o Douglas C. Cullinane - Town Engineer, Town of Ashland
- o John Hodges - Planner, Planning Office, Hanover County
- o T.A. Clark
- o Bruce V. English
- o Gail Enroughty - President, Rural Point Concerned Citizens Association
- o Margaret Miller
- o Virginia Shaw English
- o Nina K. Peace - Member of the Hanover County Board of Supervisors from the Ashland District

The issues addressed most extensively at this meeting dealt with the connection of Oak Hill Estates to the Town's treatment system and the effects of the current drought on the planning effort. Several Ashland residents expressed the opinion that wastewater management in Oak Hill Estates was not a problem that the town should be expected to assume (as proposed by Mr. Hodges at the meeting). Several citizens also expressed their concern that the present drought situation may be relieving some of the previously acute problems with Ashland's lagoon and that planning for water supply and wastewater management in the County should be undertaken to avoid shortages during dry periods. A couple of people supported the proposed Ashland project as a necessary cost-effective solution to a critical problem, but one person reiterated his previous support for a land application solution. One citizen expressed specific concern for the protection of the Upper Totopotomoy basin and criticized lack of public participation, also suggesting that an Addendum to the Draft EIS be prepared in order to address the newly-developed alternatives presented in the Ashland Draft Facilities Plan and the County's plans regarding the Phase I Extended Service Area.

EPA responses to the issues raised at this hearing also appear later in this Section.

WRITTEN COMMENTS

In addition to testimony given at the two public hearings, one individual and several government agencies submitted written comments to EPA regarding the Draft EIS. All comments received are reprinted in Appendix B of this document. Written comments were received from the following persons:

- o Donald Macdonald - Hanover Citizens Federation

- o Walter P. Pierson - Regional Director, Federal Insurance Administration, U. S. Department of Housing and Urban Development
- o William Patterson - Regional Environmental Officer, Northeast Region, U.S. Department of the Interior
- o D. N. Grimwood - State Conservationist (1979), Soil Conservation Service, U.S. Department of Agriculture
- o H. McDonald Rimple, M.D. - Regional Health Administrator, U.S. Department of Health, Education, and Welfare
- o Paul F. Chamberlain - Division Administrator, Federal Highway Administration, U.S. Department of Transportation
- o J.D. Ruehrmund - Director, Division of Operations and Procedures, Virginia State Air Pollution Control Board
- o R. L. Hundley - Environmental Quality Engineer, Virginia Department of Highways and Transportation
- o Leon E. App - Virginia Department of Conservation and Economic Development
- o Berkwood M. Farmer - Virginia Department of Agriculture and Consumer Services
- o Raymond E. Bowles, P.E. - Director, Bureau of Surveillance and Field Studies, Virginia State Water Control Board
- o Ron R. Blackmore - Director, Virginia Commission of Outdoor Recreation
- o J.B. Jackson, Jr. - Virginia Council on the Environment
- o Manly S. Wilder - State Conservationist (1981), Soil Conservation Service, U.S. Department of Agriculture

One commenter expressed support for a limited-growth option (upgrading the Ashland lagoon with land application of effluent if feasible) and questioned the need for a growth-inducing regional system for the Phase II area.

The other comments comprised factual correction of statements in the Draft EIS. These corrections appear later in this Section II are incorporated into later Sections of this Final EIS.

EPA RESPONSES TO
ISSUE-ORIENTED
PUBLIC COMMENTS
Separation of Ashland

Issue: Since the initiation of Phase II Facilities Planning, some citizens have opposed implementation of a regional solution and supported separation of the Phase II area with acceleration of Ashland planning and deceleration of the planning for the "lower priority" parts of the study area. With the issuance of the consent order to Ashland by the SWCB, the need for Ashland to separate and begin individual planning has been more widely and vehemently expressed.

Response: In response to the critical nature of the Town of Ashland's current wastewater treatment problem and to the significant support given the division of the service area by the public, the Town, the County, and the SWCB, EPA has approved

the separation of Ashland from the remainder of the Phase II study area. Subsequent to this approval, the Town of Ashland has pursued individual alternatives to correct its situation via its Draft Facilities Plan.

Growth in the Phase II Area

Issue: Throughout the planning process, many citizens have questioned the need for a regional solution for the Phase II area. The proposed regional solutions have been viewed as growth-inducing, and the desirability of a "maximum-growth" alternative for the study area has been questioned. Citizens have proposed that improved wastewater treatment be provided in certain priority areas (e.g. Ashland) and that other, currently sparsely developed or undeveloped areas in Phase II be left alone.

The concern regarding excess and unwanted growth in the County is manifested in corollary concerns as well. Interest in controlling growth in the County also appears as interest in preserving the rural quality of life in the County, preserving prime agricultural land, land use planning, and preserving historical and archaeological resources.

In the Draft EIS, several limited-growth alternatives for the Phase II area were developed and evaluated in conjunction with the regional proposals. A preliminary conclusion in the Draft EIS stated that the sub-regional alternatives appeared less environmentally damaging than several of the regional options.

Response: By approving the separation of Ashland from the rest of the Phase II area, EPA has encouraged the speedy solution of the major existing wastewater treatment problem in the study area. In addition, the planning for the remainder of the Phase II area has been scaled down to the Phase I Extended area now delineated by the County (Figure 1). The Phase I Extended area encompasses the I-95 Industrial Corridor from Mechanicsville to Ashland and several existing subdivisions along the way.

This focussed planning on the part of the County reflects a new, proposed growth-management policy which has been developed by the County Planning Department. This policy, "General Policies Plan - An Element of the Comprehensive Plan Update, March 1981", emphasizes differentiation of existing rural and urban areas. The policy, when adopted, will establish a general planning approach for the County: the County should channel future growth and development into existing urban areas such as Phase I and Phase I Extended, as defined by water and sewer service, and away from rural areas. The plan is designed to accommodate the inevitable growth for the County while minimizing adverse effects on the natural resources of the County.

Implementation of the proposed growth management policy, as represented by the revised Facilities Planning, will maximize preservation of the rural character of the County and minimize the losses of prime agricultural and forest land which would have occurred if the original Phase II area had been developed. Overall adverse environmental impacts related to growth will be minimized by improvement of the Ashland and Phase I Extended areas as currently planned.

Preservation of the
Totopotomoy Basin

Issue: Several citizens have opposed any treatment plant construction, wastewater discharge, additional residential development, or sewerage in the Totopotomoy Creek Basin. They have maintained that the Creek is an area of diverse and sensitive ecology and that disturbances of the natural balance by actions such as those listed above would irreversibly damage the Creek's natural character.

Response: The County's presently recommended Plan for Phase I Extended does not call for a treatment plant in the Totopotomoy Basin nor a discharge to the Creek (either upper or lower reach), although an alternative was evaluated which would discharge to the upper Creek above Route 301. Additionally, although three existing subdivisions located within the Totopotomoy Basin are proposed for initial service, the curtailment of the Phase II area significantly reduced the amount of land in the Basin which is planned for service. The County has formally recognized the concern for the Totopotomoy Basin by eliminating it from initial service consideration (except for the above three subdivisions) and by adopting goals and objectives for land use and wastewater facilities planning which restrain provision of near term service to the Totopotomoy Watershed population prior to fill-in of other priority "urban" service areas. Thus, the potential impacts associated with the "maximum build" alternatives developed in the Phase II Facilities Plan and evaluated in the Draft EIS have been substantially reduced.

Regarding the sensitivity of the Upper Totopotomoy, neither Virginia nor the Federal Government has officially designated any part of the Totopotomoy as a natural area or area of sensitive ecology. The designation in the Draft EIS of the Lower Totopotomoy (below Route 643) as such an area was a result of a field survey made by Bremner, Youngblood & King, Inc, as part of the Phase II planning process. To determine whether or not this classification should be extended above Route 643, another field survey would have to be undertaken. EPA estimates from aerial inventory analysis recently obtained from the U.S. Fish & Wildlife Service that a minimum of 150 acres of wetlands are in existence along the Upper Totopotomoy streambeds. It is recommended that a comprehensive ground survey be made before any significant actions are taken in the Upper Totopotomoy Basin. EPA will arrange with appropriate agencies for this to be accomplished.

Whether or not the Upper Basin is classified as an area of sensitive ecology, it is (see Figure 2) considered a Flood Hazard Area. The floodplain along the Creek, as delineated in the Draft EIS, stopped at U.S. Route 201. In the updated Flood Hazard map, the floodplain extends above U.S. Route 301. Furthermore, it is almost certain that point or non-point discharges to the Upper Totopotomoy would have some impact on the Lower as well. The extremely low flows characteristic of the Totopotomoy Creek (5.8 cfs average discharge, with a ten year minimum average seven consecutive day flow of 0.0 cfs) render it sensitive to relatively small changes in flow quantity or characteristics.

Effluent
Limitations

Issue: The effluent limitations set by the SWCB for an ashland discharge to the South Anna River and for a County discharge to the Pamunkey River at Nelson's Bridge have been uncertain throughout the majority of the duration of the Phase II planning.

Response: The SWCB has recently set new effluent limitations for a discharge at Nelson's Bridge. The new limitations are 21 mg/l BOD₅ and 1 mg/l ammonia. These have been relaxed from the previous limitations of 11 mg/l BOD₅ for a 3.0 mgd discharge. The new limitations are based on stream surveys conducted by the SWCB for the purpose of ascertaining whether or not the previous allocations were valid. It should be noted that this relaxation of effluent limitations does not affect the cost-effectiveness discussion in Section III of this Final EIS. In

Section III, it is determined that either sub-regional alternative (R-I or A-I) is more cost-effective than the 8-I regional alternative with the previous effluent limitations or with 30/30 requirements.

The SWCB has not yet finalized revised limitations for Ashland's South Anna River discharge. However, the SWCB has stated that the new limitations will be no more and possibly less stringent than the current ones (22 mg/l BOD for a 1.2 mgd discharge). Thus the Ashland alternatives' cost-effectiveness will not be undermined by the new limitations and may well be enhanced.

Public Participation

Issue: At various times during the Phase II planning and EIS process, several citizens have complained about the lack of public participation.

Response: As noted earlier in this Section, public participation in the Hanover County Phase II project has been intensive and has had a definite effect on several planning developments. Most of the major changes of direction in the planning have resulted, directly or indirectly, from public comment. These changes have included the assessment of sub-regional alternatives, the separation of Ashland, and the scale-down of the remaining Phase II study area.

EPA, through its requirements for public meetings, hearings, and distribution of documents, encourages such participation. EPA feels that the public involvement in this project has resulted and will result in the chosen treatment alternative being most responsive to public need. EPA recognizes that public support is mandatory for sewage and water projects to be implemented, since bond issues must be approved by the electorate. The construction grants public participation program helps the planning entities to develop projects which will be approved by the public and will be reflective of public need and preference.

Water Supply

Issue: Several citizens have expressed concern over the need to coordinate wastewater and water supply planning in the County.

Response: Although there does not appear to be any threat to the quality or quantity of water supply in the County at this time, it is well to consider the relationships between water supply and wastewater management. There are two basic water supply considerations to be included when making wastewater management decisions:

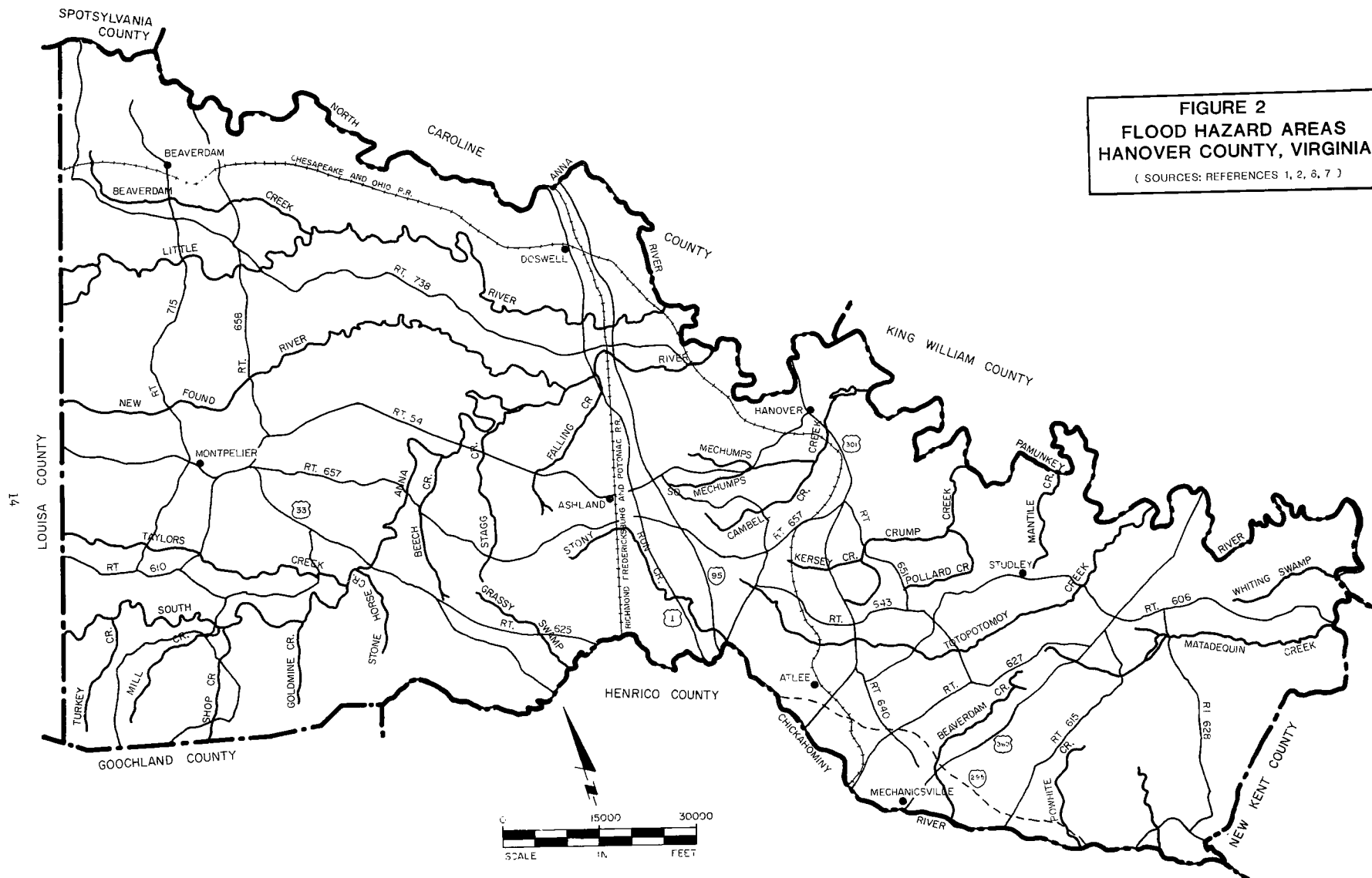
1. If wastewater treatment is inadequate, water supplies for the study area or for another area may be polluted and therefore threatened; and
2. If water supplies are limited and water conservation measures are implemented, the reduction in wastewater flow may render a previously-sized treatment facility over-designed. Conversely, concurrent planning of conservation and treatment design can effect economies in facility sizing.

Consideration of these two factors does not significantly alter the Facilities Planning accomplished either by the County or by Ashland.

ADDITIONAL AND
CORRECTED DATA

In response to specific comments received on the Draft EIS, the following errors have been noted and corrected:

<u>Page Reference in Draft EIS</u>	<u>Correction</u>
II-5	On Figure II-2, <u>Existing Land Use</u> , the last entry should read "Agricultural and Forest".
II-34	The last sentence on the page should read "The impoundment is required to discharge a minimum of 68 m ³ /minute (40 cfs) year-round.
II-50	Figure II-8, <u>Flood Hazard Areas</u> , should be replaced with Figure 2 of this Section.
II-58 & II-60	On Figure II-12, <u>Archaeological and Historical Sites in the Phase II area</u> , 7 (Rural Point) is located south rather than north of Route 606. In addition, The Totomoi historic site should be added as No. 11 to Table II-11, <u>Historic Sites and Structures in the Phase II Service Area</u> . The date is early 1800's and the listing is by the State. No. 11 (Totomoi) should be added to Figure II-12 (p. II-58) north of the Totopotomoy Creek, south of Route 643 and west of Route 640.
II-59	Paragraph 4 should read as follows: "...These are the 700-acre Hanover Wildlife and Recreation Area on the Pamunkey River just east of Hanover, an 80-acre park (Patrick Henry Park) west of Ashland, the 115-acre Little River Falls Park, and the 270-acre Park (Poor Farm Park) west of Ashland off Route 54". An additional sentence should be added to page II-59: "In addition, a transcontinental bike trail traverses Hanover County, although it is completely outside of the Phase II service area."
V-5	The last paragraph should be replaced with the following: "In Hanover County all streams have been classified by the SWCB as effluent limited; however, for streams that are water quality limited, implementation of the Virginia anti-degradation policy requires advanced waste treatment for all discharges that cannot meet anti-degradation standards with conventional treatment."
V-2 and V-3	Replace pages V-2 and V-3 with the following: "Pursuant to the requirements of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), the SWCB has established receiving water quality standards for the surface waters of Hanover County. In general, surface waters in the County fall into two major classifications: estuarine waters (Class II) or free flowing streams (Class III) (Ref. 28). Water quality stream standards for each of these classifications are given below.



WATER QUALITY STANDARDS FOR PRIMARY CLASSIFICATIONS
IN HANOVER COUNTY

Standard Parameter	Estuarine Class II	Free Flowing Streams Class III
Dissolved Oxygen		
Minimum	4.0	4.0
Daily Average	5.0	5.0
pH	6.0 - 8.5	6.0 - 8.5
Temperature (°F)		
Rise above natural	4.0 (Sept. - May) 1.5 (June - August)	5
Maximum	--	90
Maximum hourly change	2	2

An additional standard for fecal coliform for all surface waters, except those where leased private or public shellfish beds are present, requires that: "the fecal coliform bacteria shall not exceed a log mean (geometric mean) of 200 fecal coliform bacteria per 100 ml. Evaluation should be determined by either the multiple-tube fermentation for marine water or the membrane filter method for fresh water and should be based on not less than ten samples taken over not more than a 30-day period."

All surface waters in the County are assigned a major class (II or III) as described above. In addition, two stream segments are identified as sources of public water supply. These segments are:

- o The South Anna River from Ashland's raw water intake to a point 5 miles upstream; and
- o The North Anna River and its tributaries from Hanover County's raw water intake near Doswell (approximately 1/2 mile upstream from State Route 30) to a point 5 miles upstream.

The following standards apply to these segments:

<u>CONSTITUENT</u>	<u>CONCENTRATION (mg/l)</u>
Arsenic	0.05
Barium	1.0
Cadmium*	0.01
Chloride	250
Chromium (Total)	0.05
Copper*	1.0
Foaming agents (measured as methylene blue active substances)	0.5
Iron (soluble)	0.3
Lead	0.05
Manganese (soluble)	0.05
Mercury*	0.002
Nitrate (as N)	10
Phenols	0.001
Selenium*	0.01

CONSTITUENT	CONCENTRATION (mg/l)
Silver*	0.05
Sulfate	250
Total dissolved solids	500
Zinc*	5.0
Chlorinated Hydrocarbon Insecticides:	
Endrin*	0.0002
Lindane*	0.004
Methoxychlor*	0.1
Toxaphene*	0.005
Chlorophenoxy Herbicides:	
2,4-D	0.1
2,4,5-TP (Silvex)	0.01
Radioactivity:	Picocurie/liter
Combined radium-226 and radium-228	5
Gross Alpha particle activity (including radium-226 but excluding radon and uranium)	15

* The numeric standards for the chemicals listed above are designed to protect public water supplies for human consumption. The limits established for those chemicals marked with an asterisk (*) may not protect aquatic life. Therefore when a request to classify a stream as a public water supply is received, it will be determined if more stringent limits are needed for those chemicals in order to insure protection of aquatic life.

Furthermore, within Hanover County, the Chickahominy River and its tributaries, and the tidal Pamunkey River and tidal portions of its tributaries have also been assigned special standards by the SWCB. Effluents discharged to the Chickahominy River or its tributaries must meet the requirements given in Table V-2 [of the Draft EIS] Additional standards have been promulgated for the tidal portion of the Pamunkey River which has shellfish beds. For these areas, the following special bacterial standards take precedence over the general coliform standards:

Coliform Organisms - The median MPN shall not exceed 70/100 ml and not more than 10 percent of the samples ordinarily shall exceed a MPN of 230/100 ml for a 5-tube decimal dilution test (or 330/100 ml where a 3-tube decimal dilution is used) in those portions of the area most probably exposed to fecal contamination during the most unfavorable conditions.

SECTION III

Phase II Alternatives

SECTION III: PHASE II ALTERNATIVES

The purpose of this Section is to evaluate overall Phase II alternatives. The political feasibility of an Ashland split-off has already been demonstrated, and this feasibility is extremely important to consider in the planning process. Also of paramount importance, however, is the cost-effectiveness of this politically desirable option. In this Section, the cost-effectiveness of a separate Ashland facility within the context of the entire Phase II area planning is assessed.

Numerous alternatives and combinations of sub-alternatives for the Phase II area were assessed in the Draft EIS. To focus attention on the most feasible of these alternatives, only the two recommended alternatives from the 1978 Facilities Plan and the two from the Draft EIS are discussed in this Final EIS. All costs presented in this Section are distributed over the entire Phase II Service Area as originally delineated.

ALTERNATIVES RECOMMENDED IN 1978 FACILITIES PLAN Alternative 8-I

Two basic alternatives were recommended in the 1978 Facilities Plan. The first consisted of a single treatment plant to serve the entire Phase II area. This option was the recommended alternative in the original 1975 Facilities Plan for Phase II and was known as Alternative 8-I. The treatment plant was to be located in the Rural Point area and would discharge treated effluent to the Pamunkey River near Nelson's Bridge. The plant would be designed to accommodate an average flow of 3.0 mgd using a conventional activated sludge process followed by physical-chemical flocculation. A detailed description of this alternative may be found in Section 5 of the 1978 Facilities Plan or in Section III of the Draft EIS.

Alternative R-I

The second alternative recommended in the 1978 Facilities Plan called for a separate Ashland treatment facility, a treatment plant in the Totopotomoy Basin to serve that Basin, and interconnection of the Industrial Corridor to Henrico County.

This alternative was later identified as "R-I" in the Draft EIS. Under this option, an Ashland treatment facility would serve the Town of Ashland and those nearby areas which could readily be served by extending existing lines. These areas included Oak Hill Estates and Hanover Academy. Two treatment processes were proposed as feasible for the Ashland facility: oxidation ditches with discharge to the South Anna River and spray irrigation of pretreated effluent. Both alternatives would be designed for a flow of 0.8 mgd.

The Totopotomoy treatment plant would serve areas in both the Upper and Lower Totopotomoy drainage basins. The facility would be located near the confluence of the Totopotomoy and Strawhorn Creeks and would be a larger version of the proposed oxidation ditch at the Ashland facility (design flow - 1.5 mgd). The effluent would be chlorinated and discharged to the Totopotomoy Creek.

The Industrial Corridor, under this scenario, would be interconnected to the Henrico County system. Treatment of sewage from this area at either the Ashland or Totopotomoy facility was not considered feasible due to the relative impracticality of pumping to the Totopotomoy Basin, and the lack of capacity at the Ashland plant. Instead, an interceptor sewer would transmit the 1.29 mgd from this area along I-95 to Henrico County. Again, a more detailed description of this

alternative may be found in Section 5 of the 1978 Facilities Plan or in Section III of the Draft EIS.

ALTERNATIVES
PRESENTED IN THE
DRAFT EIS

The Draft EIS identified two environmentally and institutionally desirable treatment option alternatives. These alternatives were very similar; both incorporated the concept of a separate Ashland facility and the interconnection of the Industrial Corridor to Henrico County. However, one called for construction of a Totopotomoy treatment facility to serve the Totopotomoy basin service area and the other called for interconnection of the Totopotomoy service area to Henrico County along with the Industrial Corridor.

The Draft EIS concluded that Alternative 8-I would be associated with numerous adverse environmental impacts relative to the sensitive ecology of Totopotomoy Creek, the use of prime agricultural land in the County, and the opportunity for undirected growth that was presented by the proposed regional system. Alternative 8-I was not recommended for further consideration in the EIS because of the above impacts and because of Ashland's expressed and increasing desire to continue operation of their existing facility.

Alternative R-I

The first of these alternatives, providing for a separate Totopotomoy treatment facility, was also recommended in the 1978 Facilities Plan and was described previously.

Alternative A-I

The second alternative recommended by the Draft EIS again included a separate Ashland facility. However, under A-I, the Totopotomoy basin and the Industrial Corridor would interconnect with Henrico County. The Industrial Corridor interceptor would run along I-95 as in Alternative R-I. In addition, a trunk line serving the Upper Totopotomoy would run along Totopotomoy Creek and then down alongside U.S. Route 301 into Henrico County. A third sewer would follow the lower Totopotomoy Creek and Strawhorn Creek and then be diverted south to Henrico County just west of State Route 643. Each of these sewers would pass into Henrico County at a different point. A more detailed description of this alternative may be found in Section III of the Draft EIS.

ALTERNATIVES
EVALUATED IN 1980
ASHLAND FACILITIES
PLAN

The 1980 Ashland Draft Facilities Plan evaluated three basic Phase II alternatives: 8-I, R-I, and A-I. These are labelled Alternatives A, C, and D in the Ashland Plan and were chosen because they had been recommended in either the 1978 Facilities Plan or in the Draft EIS as discussed above. Under the 8-I alternative, two sub-alternatives were evaluated - one under which current SWCB effluent limitations at Nelson's Bridge would continue to apply (Alternative A), and one assuming that these limitations would be relaxed to 30/30 for BOD and TSS (Alternative B). In this EIS it is assumed that the SWCB limitations would be met.

The evaluation of these three Phase II alternatives was aimed at assessing the cost-effectiveness and environmental impacts of a separate Ashland facility as compared to the proposed regional facility. For this evaluation, the most costeffective option for an individual Ashland facility was assumed (see Section IV).

PHASE II
ALTERNATIVES

For this Final EIS the comparison of the three Phase II alternatives in the 1980 Ashland Facilities Plan has been reviewed. A summary of the findings from that review appear in this Section.

Alternative 8-I
Description

Alternative A in the Ashland Draft Facilities Plan is essentially the same as the previously identified Alternative 8-I: construction of a regional treatment plant to service the entire Phase II area. This alternative was recommended in the original 1975 Phase II Facilities Plan and in the 1978 Facilities Plan as well. It was not recommended in the Draft EIS.

The treatment system to be used at the Rural Point Plant is described fully in the 1975 Facilities Plan. In the Ashland plan, two changes have been made. First, the design flow has been increased to 4.0 mgd to accommodate increased projected flow from Ashland. Second, carbon adsorption columns have been added to the effluent treatment. The Ashland Facilities Planner determined that tertiary treatment would be required to meet stringent SWCB limitations on discharge to the Pamunkey River. Carbon adsorption columns were not included in the original 8-I cost estimates or treatment system, and it can be argued that the original 8-I could not have met SWCB limitations. The recent relaxation in SWCB limitations means that, although the additional processes described in the Ashland Facilities Plan may not be required, some treatment beyond secondary would be necessary.

Costs

The costs of this alternative were calculated as the sum of an amortized construction cost and a yearly operation and maintenance (O&M) expense. For ease in comparison, these two costs are combined and reported as single treatment expense. This is then given as the unit cost per 1000 gallons of wastewater treated and also as a total equivalent uniform annual cost. Figures are presented in October 1979 dollars.

The unit cost for Alternative 8-I (with treatment facilities capable of meeting stringent SWCB limitations) is \$2.14 per 1000 gallons of wastewater treated, which is an equivalent uniform annual cost of \$3,122,964.

Alternative R-I
Description

Alternative R-I was included as a recommended alternative in both the 1978 Facilities Plan and in the Draft EIS. This alternative provides for continued operation of a separate Ashland treatment plant, construction of a plant to service the Totopotomoy basin, and interconnection of the Industrial Corridor with Hanover County facilities.

The proposed Ashland plant incorporated into this alternative in the Ashland Facilities Plan is the selected most feasible Ashland sub-alternative in that Plan. This sub-alternative consists of upgrading the existing lagoon with aeration, a detailed description of which is included in Section V. The design flow for the Ashland Service Area has been increased from the 0.77 MGD used in the 1978 Facilities Plan and the Draft EIS to 1.2 MGD for reasons discussed in Section IV.

Two different treatment plants are proposed for the Totopotomoy Basin under Alternative C - both with discharges to Totopotomoy Creek. The first is similar to the plants previously proposed in the Phase II planning: a 1.5 mgd conventional

conventional activated sludge process with effluent disinfection. The sludge process train would include mechanical sludge dewatering, anaerobic digestion, sludge drying beds, and land-filling of the stabilized residue. The other proposed Totopotomoy plant is a physical/chemical facility. The proposed flow diagram would include screening, an aerated flow equalization, flocculation, clarification, multimedia filtration, and carbon adsorption. Carbon regeneration facilities are included in the alternative. The effluent would be disinfected by chlorination and discharged. Sludge handling facilities for the physical/chemical plant would consist of aerobic digestion followed by centrifuges. The dewatered stabilized sludge would be landfilled.

The interconnection of the Industrial Corridor with Henrico County facilities has been discussed previously in this Section. The costs of this alternative were merely updated in the Ashland Plan.

Costs

The unit cost for Alternative R-I is \$1.77 per 1000 gallons, and the equivalent uniform annual cost is \$2,580,209.

Alternative A-I Description

The final alternative included in the Ashland Facilities Plan was developed in the Draft EIS. Under this alternative the Town of Ashland would continue to treat its wastewater, and the rest of the Phase II Area would be interconnected to the Henrico County system. The proposed Ashland plant was again the most feasible sub-alternative of the Ashland Facilities Plan.

Interconnection of the Upper and Lower Totopotomoy basins and of the Industrial Corridor to Henrico County were assumed to be as developed in the Phase II planning efforts. Only the costs were updated.

Costs

The costs of construction and operation of an Ashland facility along with construction and maintenance of transmission lines to Henrico and treatment fees for the Totopotomoy basin and Industrial Corridor would result in a unit cost for the Phase II area of \$1.63 per 1000 gallons of wastewater. This equals an equivalent uniform annual cost of \$2,386,198.

Summary

Each of the three Phase II alternatives evaluated in the 1980 Ashland Facilities Plan would serve all of the Phase II area. However, a regional treatment system is specified in only one alternative; an independent Ashland treatment facility is specified in the other two options. The details of these latter alternatives follow closely the details presented in the County's earlier Phase II planning. However, the author of the Ashland Facilities Plan has evaluated these details and altered them where deemed appropriate. The alterations discussed in Section IV appear reasonable, especially in connection with the Ashland plant, where more accurate information was used than in the previous Phase II plans.

The costs of each alternative are summarized in Table 1. This table demonstrates that either R-I or A-I (the options providing for a separate Ashland facility) is more cost-effective than 8-I (in which Ashland is combined with the County). Specifically, Alternative A-I appears to be the most cost-effective.

TABLE 1
PHASE II ALTERNATIVES
COST COMPARISON

ALTERNATIVE	TOTAL PRESENT WORTH	TOTAL COST PER 1000 GAL	EQUIVALENT UNIFORM ANNUAL COST	COST RATING
8-I - Phase II Regional Plant with Discharge at Nelson's Bridge	\$33,408,604	\$2.14	\$3,122,964	3
R-I - Ashland Facility,* Totopotomoy Facility, Industrial Corridor Interconnect to Henrico County	\$27,602,362	\$1.77	\$2,580,209	2
A-I - Ashland Facility*, Rest of Phase II Interconnect to Henrico County	\$25,526,886	\$1.63	\$2,386,198	1

* Assuming Ashland Alternative #1 - Aerating existing lagoon

ENVIRONMENTAL
IMPACTS OF PHASE II
ALTERNATIVES

The environmental impacts of each of the three Phase II alternatives are summarized in this sub-section. These summaries are drawn from the Draft EIS and updated substantially only where significant comments were received on the Draft EIS and subsequent changes made (see Section II of this Final EIS.

Alternative 8-I:
Socioeconomic

The construction of a single treatment plant and sewer for the entire Phase II area is identified as a project that will allow high growth for Hanover County. Residential and commercial development in areas currently inaccessible to wastewater treatment would result.

Water Quality

Construction of a regional treatment plant would be associated with both beneficial and potentially adverse impacts. The most valuable beneficial impact would be seen in the improvement to Falling Creek and its small unnamed tributary to which the Ashland facility currently discharges. The Ashland lagoon has been cited as the cause of degradation of these streams. Elimination of the discharge would allow them to return to their natural condition. Another beneficiary of the elimination of the currently inconsistent Ashland discharge would be the South Anna River. A general improvement in water quality could be expected. A further benefit to surface waters would come from the elimination of failing septic tank systems. Currently failing systems allow unstabilized leachate to enter and degrade small streams in the service area. In addition, these failing systems have caused seepage into basements and pose a threat to local groundwater quality. Connection to the proposed sewer system would eliminate these private systems.

The adverse impacts of the project on surface water quality could include both potential serious permanent impacts and temporary construction effects. Possibly the worst potential impact involves the effect of the proposed discharge on the Pamunkey River. This, as included under Environmentally Sensitive Areas is both a scenic river and a sensitive ecology. Therefore degradation of water quality would be critical. Other potential adverse impacts on the Pamunkey include raising BOD and nitrate levels during low river flow periods and chlorine toxicity problems from the disinfected effluent.

Temporary adverse construction impacts would be associated with the sewer routing along the stream beds. Sedimentation from the construction could be expected in Stony Run, Lickinghole, Kersey, and Totopotomoy Creeks in addition to the Chickahominy River.

Biology

Beneficial impacts on aquatic biota are expected especially in Falling Creek and its small tributary to which the effluent from the Ashland facility is discharged. Beneficial impacts could also occur in the small streams in the area degraded by the failing septic tank systems. Communities in the watershed of the South Anna River would also benefit from the general improvement in water quality.

The potential for serious damage to the sensitive ecology of the Pamunkey bottomland is again a serious adverse impact. In addition, temporary adverse impacts on aquatic organisms could be expected from the construction of sewers in stream

beds. As before, this would involve Stony Run, Lickinghole, Kersey, and Totopotomoy Creeks and the Chickahominy River.

Terrestrial wildlife living along Falling Creek and its small tributary to which effluent from the Ashland lagoon is currently discharged would benefit from the cleaner stream. Adverse impacts to terrestrial biota would include animal migration from the Rural Point site and temporary disruption of animals by gravity sewer and force main construction. Animals driven off by the transmission line construction could be expected to return.

Environmentally Sensitive Areas

Construction of a regional treatment plant poses a serious potential threat to a sensitive ecology, the Pamunkey bottomlands. A shock pollutant loading, normal discharge during low flow, or over-chlorination of effluent could result in permanent damage to this area.

The proposed Rural Point plant would be located in another area of sensitive ecology, the Totopotomoy bottomlands. Construction would require clearing of some of this area and substantial sedimentation from site grading could be expected. Temporary sedimentation from sewer construction could also be expected in the Chickahominy wetlands.

The Pamunkey is also a scenic river and the potential degradation posed by Alternative 8-I should be avoided. However, this alternative would have beneficial impacts on the South Anna, also classified as a scenic river.

Stony Run, Lickinghole, Kersey and Totopotomoy Creeks and the Chickahominy River are all listed as flood hazard areas by the National Flood Insurance Program (see Figure 2). Foundation material under the sewer could be eroded by turbulent flood flows without proper design precautions. This could lead to unsupported pipes which are susceptible to failure.

No impacts are expected on groundwater recharge areas from any of the alternatives. Primary impacts on prime agricultural land from construction of sewer and force main traversing prime land would be adverse. In addition, an adverse secondary impact would be development of the Phase II area, much of which is prime agricultural land.

Implementation of Alternative 8-I would not be expected to have any significant impact on historically or archaeologically valuable lands. The proposed sewer routing does pass near seven identified historical sites (identified in the Draft EIS).

Summary

The potential damage to the sensitive ecology of the Pamunkey bottomlands and the construction of the plant in the Totopotomoy bottomlands are serious adverse environmental impacts. Additional adverse secondary impacts associated with the high growth potential of the alternative would include loss of prime agricultural land, some degradation in air quality, and potential socioeconomic stress on human services.

Significant beneficial impacts would include removing a potential public health problem by eliminating failing septic tank systems and a dramatic improvement in the quality of Falling Creek and its small tributary.

disrupt use of prime agricultural land. In addition, the actual Totopotomoy plant would be built on prime agricultural land causing its loss of use. The secondary impact of loss of prime agricultural land due to growth would be lessened but not substantially.

Impacts on groundwater recharge areas and historically or archaeologically valuable lands would be expected to be minimal. As under Alternative 8-I, sewers would pass close to seven identified historical sites.

Summary

Alternative R-I, like the previous alternative, includes a discharge into a sensitive ecology. Potential damage to the Totopotomoy bottomlands is a serious danger that must be taken into account in alternative evaluation. Secondary adverse impacts would be much as those identified for 8-I, although slightly smaller in magnitude.

The beneficial effects are the same as under Alternative 8-I, the major impacts being water quality improvement in Falling Creek and the removal of a potential public health problem by elimination of failing septic tank systems.

Alternative A-I Socioeconomic

The construction of a separate Ashland facility has already been noted as one of the alternatives leading to a moderate growth scenario.

Water Quality

Surface waters and groundwater in the county would benefit from this alternative as from 8-I and R-I.

The South Anna River would be the only stream in the County receiving effluent under this alternative. The Ashland discharge would be directly to the South Anna as under Alternative R-I. General water quality in the County would improve as discussed previously.

Biology

Impacts to biota, both aquatic and terrestrial, can be expected to be the same as listed under Alternative R-I. The biota of the South Anna is subject to the possible adverse impacts of discharging to that stream.

Environmentally Sensitive Areas

The greatest difference in environmental impacts of the three alternatives concerns sensitive ecologies. Alternative A-I does not have a potential adverse impact on a sensitive ecology. Under both Alternatives 8-I and R-I, a discharge to a critical bottomland was planned - the Pamunkey and Totopotomoy respectively. The discharge from the Ashland facility would be to the South Anna, well upstream of any sensitive ecology. In addition, this alternative is the only one of the three that would not include plant construction in the Totopotomoy bottomlands. Alternative A-I would include sewer routing in the Totopotomoy and Chickahominy bottomlands as under the previous two alternatives.

Impacts to the South Anna, a scenic river, would be the same as listed under Alternative R-I.

Sewer lines would again traverse prime agricultural land and adverse secondary impacts to prime agricultural land and to air quality would be the same as those from Alternative R-I.

TABLE 2
PHASE II ALTERNATIVES
ENVIRONMENTAL IMPACT COMPARISON

IMPACTS	8-I	R-I	A-I	NO ACTION
Surface Water Quality	+	+	++	-
Groundwater Quality	++	++	++	--
Aquatic Biology	+	+	++	-
Terrestrial Biology	-	-	0	0
Scenic Rivers	-	0	0	0
Flood Hazard Areas	0	-	0	0
Groundwater Recharge Areas	0	+	+	-
Prime Agricultural Land	-	--	-	0
Areas of Sensitive Ecology	--	--	0	0
Historical/Archaeological Sites	0	-	0	0
Construction Impacts	--	--	-	0
Land Requirements	--	--	-	0
Land Use	0	0	0	0
Population Growth	++	++	+	--
Implementability	--	--	++	--

KEY: ++ = Very beneficial impact
+ = Beneficial impact
0 = Not impacted by the alternative/equal adverse and
beneficial impacts
- = Adverse impact
-- = Very adverse impact

NOTE: These impacts have not been weighted in importance.
Thus no quantitative evaluation is presented.

Alternative A-I would not have any major impacts on groundwater recharge areas and/or historically or archaeologically valuable land. The proposed sewer routing does come near eight identified historical sites.

Summary

The greatest difference in the environmental impacts of the A-I Alternative concerns areas of sensitive ecology. Of the three, only Alternative A-I does not have a potential major adverse impact on a sensitive ecology associated with it. This should be given serious consideration in alternative evaluation. The other adverse and beneficial impacts for this alternative are very similar to those of Alternatives 8-I and R-I.

SUMMARY OF ENVIRONMENTAL IMPACTS

The individual descriptions above of each Phase II alternative's environmental impacts are summarized in Table 2. Each environmental factor is listed separately and the effects of each alternative on that environmental quality summarized are as very beneficial (++), beneficial (+), no impact/equally adverse and beneficial (0), adverse (-), and very adverse (--). No weighting of these factors has been established due to the difficulty of prioritizing them. Thus no quantitative evaluation or summing of all the ratings for each alternative is possible. However, it is possible to compare the alternatives on a more qualitative basis.

Table 2 and the more detailed descriptions above indicate that Alternative A-I has fewer adverse impacts than Alternatives 8-I and R-I. It appears that Alternative A-I would allow Ashland and other portions of the Phase II area to correct existing wastewater treatment problems while preserving to a large extent the rural character of the county and its pristine areas. Alternative A-I would have fewer and less extensive direct impacts on environmentally sensitive areas and would also direct and control growth in the county. Finally, A-I is the most implementable and least controversial solution: it allows Ashland to resolve its needs separately; it does not include a treatment plant in the County; and it takes advantage of arrangements that have already been made with Henrico County.

MOST FEASIBLE PHASE II ALTERNATIVES

Of the assessed Phase II Alternatives, Alternative A-I, involving the separation of Ashland and interconnection of the rest of the Phase II area to Henrico County, has been shown to be the most feasible Phase II alternative from economic and environmental viewpoints. This feasibility assumes availability of adequate capacity at the Henrico County facility and continuing relative proportions of the costs of the various option components. Although A-I appears most feasible, the evaluations do show that R-I is also more feasible than the regional 8-I alternative. Thus it is clear that separation of Ashland, with various options for the remainder of the Phase II area, is feasible and cost-effective.

The A-I Alternative concept has been tentatively pursued by both the Town of Ashland and by Hanover County, although no irrevocable commitments have been made. Ashland has developed specific alternatives to solve its problems independent of the County's post-Phase II planning efforts. The Town has prepared its own Draft Facilities Plan to assess Ashland alternatives. Concurrently the County has reserved capacity in the planned Henrico County facility. In addition, however, the County has initiated assessment of further options for a scaled down service area extending from Phase I in a northwesterly direction towards Ashland (Phase I Extended)

Both the Town's and County's recent actions are consistent with the A-I concept recommended by this EIS for the original Phase II planning area.

SECTION IV

Ashland Alternatives

SECTION IV: ASHLAND ALTERNATIVES

SEPARATION OF ASHLAND

As discussed in Section III of this Final EIS, the Town of Ashland has been separated from the rest of the Phase II study area as part of the selection of the A-I Alternative. Pursuant to this, the Town has prepared its own updated Sewer System Evaluation Survey and Draft Facilities Plan in order to determine which of several options is best environmentally and economically to solve the Town's current acute problem with its wastewater treatment plant. This Section discusses and presents information on each of the alternatives developed by the Town. All costs in this section apply to the Ashland Service Area only.

DEFINITION OF SERVICE AREA

The Town of Ashland is approximately eleven miles north of Richmond adjacent to Interstate 95. The Town limits encompass an estimated 4.5 square miles.

The Ashland treatment facility is planned to service all areas within the Town limits and nearby areas already served by Ashland's water system and/or most readily accessible to connections during the planning period. These areas are shown on Figure 3 and include:

- 1) The area adjoining U.S. Route 1 from the North Town limits to the junction of U.S. Route 1 and the R.F.&P. Railroad;
- 2) The area surrounding Hanover Academy and the State Route 54-Interstate 95 interchange;
- 3) The area adjacent to Ashcake Road (State Route 657) from the eastern Town limits to the western Town limits; and
- 4) The residential development west of Stony Run (western Town limits) near Woodland Cemetery.

POPULATION PROJECTIONS

Population projections prepared for the Ashland Service area by the Commonwealth of Virginia Department of Housing and Community Development and by Bremner, Youngblood and King, Inc./Economics Research Associates were used in the Ashland Draft Facilities Plan. As shown in Table 3, a comparison of these two projections revealed almost identical projection figures. These thus appeared to be reasonable projections, and indicated an average 2% annual growth rate for the Ashland Service Area over the planning period. Ashland's Draft Facilities Plan used the Department of Housing and Community Development projections to estimate wastewater flows and required treatment capacity.

Since the preparation of the Ashland Draft Facilities Plan, however, new population figures have been issued - the preliminary 1980 Census counts. As shown in Table 3, the preliminary Census figures for the Town of Ashland Service Area indicate a significantly lower population than previously estimated, about 1000 less people in 1980 and about 2003 less in 2003 (assuming the same growth rate as that assumed for the earlier figures). This population figure, although preliminary, has not been contested by the Town, so is probably close to the actual number. Thus the population projections used in the Ashland Draft Facilities Plan appear to be about 20% higher than they should be.

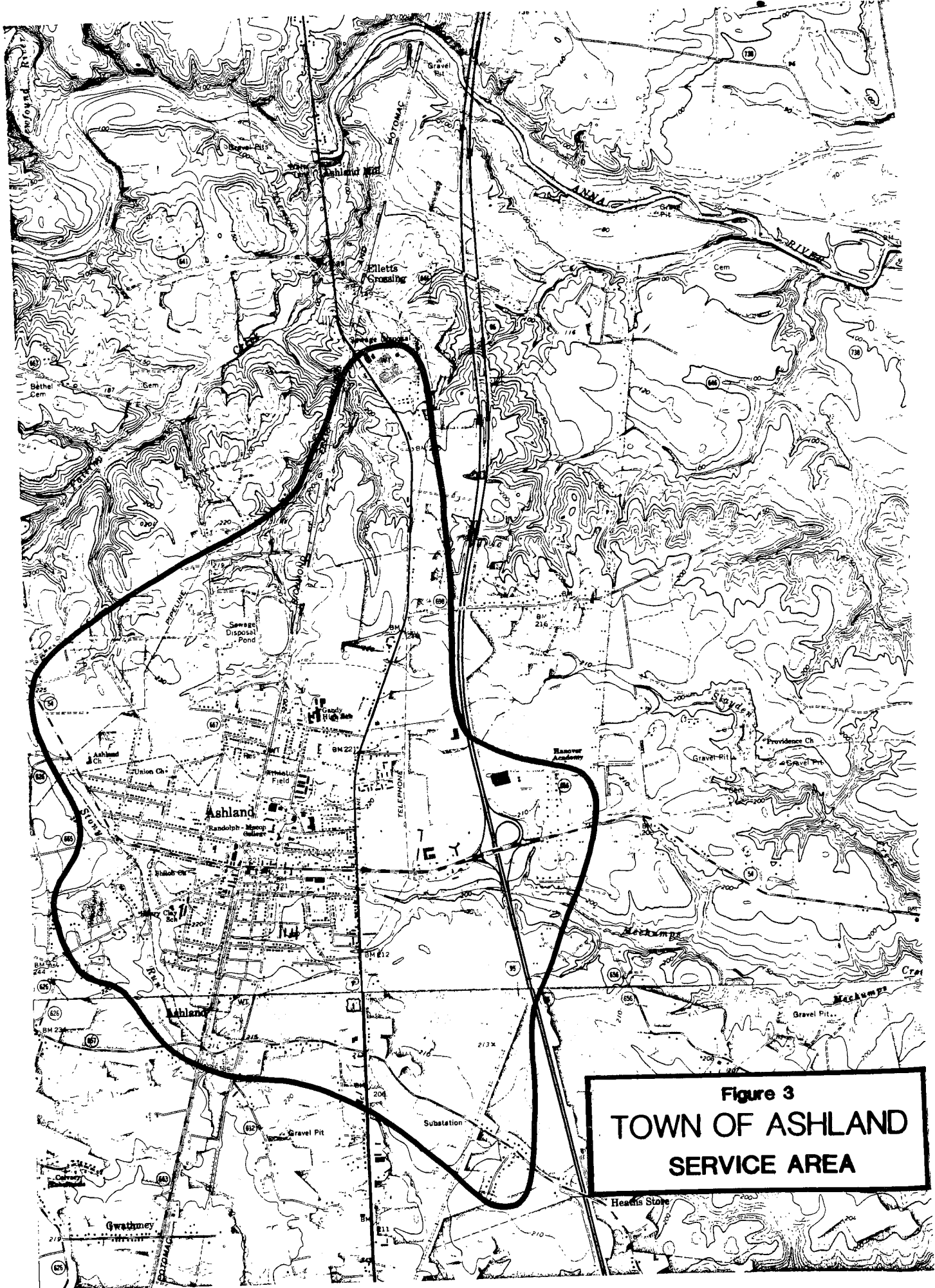


Figure 3
TOWN OF ASHLAND
SERVICE AREA

TABLE 3

ASHLAND SERVICE AREA
POPULATION PROJECTIONS

	<u>TOTAL POPULATION¹</u>	<u>TOTAL POPULATION²</u>	<u>TOTAL POPULATION³</u>
1980	6,331	6,038	4,982
1985	7,112	6,780	5,566
1990	7,893	7,617	6,151
1995	8,549	8,383	6,643
2000	9,222	9,097	7,142
2003	9,647	9,512	7,461

¹ Commonwealth of Virginia, Department of Housing and Community Development.
² Bremner, Youngblood & King, Inc., Economics Research Associates.
³ Developed by Economics Research Associates from preliminary 1980 U. S. Census population figure for the Town of Ashland

WASTEWATER FLOW
PROJECTIONS

The per capita water consumption rate used in the Ashland Draft Facilities Plan deviates significantly from previous estimates. In the Ashland Draft Facilities Plan, the Town of Ashland reports a 1979 water consumption of 137.3 gallons per capita per day (gpcd). However, the Draft EIS reported an average 1976 per capita water consumption of 105 gpcd and Bremner, Youngblood and King, Inc. reported a per capita water consumption of 110 gpcd for 1976 (Draft EIS, Section III). As discussed below, there are primarily two reasons for these deviations.

The two low figures, 105 gpcd and 110 gpcd, were obtained from the water use records of the Town of Ashland. However, according to the Director of Public Works for the Town of Ashland, there exists a significant amount of unmetered water consumption within the Service Area of the Town of Ashland. The amount of unmetered water consumed daily is estimated to be 15.2 percent of the total water produced or an average of 112,660 gpd. The two low consumption figures do not take this factor into account.

Another factor contributing to the variance in per capita water consumption rates is time. Again, the two low consumption figures were calculated from 1976 records, whereas the Town of Ashland's figure of 137.3 gpcd was calculated in 1979. As noted by Bremner, Youngblood and King, Inc., the average per capita water consumption rate increased by approximately 5 gpcd from 1974 to 1976, showing that variances occur from year to year.

To obtain total wastewater flow estimates, the per capita water consumption rate was multiplied by 80 percent to estimate the actual wastewater generated from water consumption. Finally,

an allowance for infiltration and inflow was added in accordance with EPA I/I regulations. This procedure provided an estimated design flow amount of 1.22 mgd.

The sewers within the corporate limits of the Town of Ashland exhibit excessive inflow and infiltration. All proposed Ashland alternatives would include an extensive sewer rehabilitation program, which is detailed in the report entitled Addendum: Sewer System Evaluation Survey, Town of Ashland, January 1980. Although current wastewater flows contain an excess of I/I, it is assumed that the rehabilitation program would reduce I/I to allowable levels. Such levels amount to 552.8 gpd per inch-mile of pipe and have been used to estimate future wastewater flows.

Although the methodology used to estimate future wastewater flows appears basically sound, one further step should be added. Because the future industrial flows were estimated apart from domestic and commercial flows, it seems logical that current commercial and industrial flows should not have been included in the total flow used to calculate per capita flows. Six hotels (over 200 rooms each) and one truck stop currently are served by the Ashland water system, using approximately 89,500 gallons of water per day. The flow to these facilities will be constant over the planning period and should be separated in order not to bias current per capita water consumption estimates. With the exclusion of this flow from the domestic water consumption, per capita flows will change. True domestic flows may then be calculated for the remainder of the planning period, based on the population projections.

Preliminary calculations indicate that incorporation of the revised population projections based on the 1980 Census figures into a revised methodology allowing for calculation of exclusively domestic flows gives a revised design flow estimate of 1.27 mgd for the year 2003. Thus, although the Town will need to reassess its design flow in light of the changes discussed above, it appears that the 1.22 mgd design flow used in the Ashland Draft Facilities Plan will be acceptable with no significant changes.

EXISTING WATER QUALITY PROBLEMS

The current Ashland situation exhibits an acute need for immediate action to upgrade wastewater treatment. The Town of Ashland, as previously discussed, was issued a notice by the State Water Control Board (SWCB) on 3 April 1979 to terminate the issuance of building permits until such time as the critical condition of overloading at the treatment plant was corrected. The consent order was issued because the influent flow exceeded 95 percent of the plant's design capacity for three months in violation of the SWCB's Policy for Sewage Treatment Plant Loadings. The consent order has slowed both commercial and residential growth in Ashland.

Aside from this regulatory constriction, the Ashland plant has caused real water quality problems. Effluent from the Ashland lagoon has been cited by the SWCB as the cause of degradation in the small unnamed tributary of Falling Creek. The lagoon, although overloaded, usually meets the secondary effluent limitations, but the flows in the small tributary and in Falling Creek are at times so low that the BOD load in the effluent cannot be assimilated. This fact is reflected in the stringent limitations now placed on effluent discharged

to Falling Creek (approximately 5 mg/l BOD and TSS). In addition, the Ashland facility has had a number of bypasses of untreated wastewater.

Although groundwater contamination has not been reported, failing septic tank systems pose a potential serious public health problem. The Ashland area has been identified as a poor soil area (Corville-Duplin-Marlboro) for septic tank systems and a number of failures leading to leachate seeping into drainage ditches and basements have been reported. Increasing use of septic tank systems with corresponding failures can be expected under an extended sewer connection moratorium. The potential of groundwater contamination and seepage of polluted water into basements is a serious public health problem. Such failures could eventually affect private water wells in the Ashland area and potentially some surface waters as well. Elimination of the failing systems by connection to the Ashland facility is desirable.

ASHLAND ALTERNATIVES

Six alternatives for upgrading and expanding the Ashland Treatment Plant were studied in the Draft Facilities Plan. The six alternatives include four conventional treatment processes and two land application systems. The six alternatives are:

- Alternative 1: Aeration of Existing Lagoon
- Alternative 2: Activated Sludge
- Alternative 3: Rotating Biological Contactors
- Alternative 4: Oxidation Ditch
- Alternative 5: Land Application-Overland Flow
- Alternative 6: Land Application-Spray Irrigation

Each preliminary design used for cost estimating and assessment of environmental impacts makes the maximum possible use of existing facilities, but some alternatives were able to employ more of the existing plant than others.

The Town of Ashland requested the Virginia State Water Quality Control Board to set effluent limitations for a range of flows (volumes) that a separate Ashland facility might produce. Those temporary limitations comprise the design criteria for the six alternatives. The SWCB limit for a design flow of 1.22 mgd is a CBOD₅ of 22.0 mg/l (220 lbs/day). These SWCB limitations which will be finalized soon will not be more stringent and may be relaxed somewhat.

Along with selection of one of these six alternatives, the Ashland Facilities Plan cites the immediate need to initiate a sewer system rehabilitation program. The rehabilitation is detailed in the Addendum: Sewer System Evaluation Survey, Town of Ashland, January, 1980.

Following is a brief description of each of the six treatment alternatives with probable environmental impacts included. Since almost identical environmental impacts are associated with Alternatives 1-4 (the four conventional treatment processes), they are discussed together.

A combined cost comparison and a chart comparing environmental impacts of all the alternatives is included in the Summary of this Section.

Alternative 1:
Aerating Existing
Lagoon

Description

Ashland's Alternative 1 consists of upgrading the existing lagoon. The upgrading would involve enlarging the lagoon to allow a detention time of 31 days, dividing the lagoon into two cells, and installing an aeration system. These modifications would increase the capacity of the facility to the required design flow of 1.22 mgd and would improve the quality of the effluent from the plant, as required to meet the effluent limitations.

The changes to the lagoon would require construction of a earthen dike to divide it into a two cell reactor. The existing embankment would be raised two feet to increase the volume and therefore the detention time. The aeration system would require the installation of blowers and air piping. The rest of the plant would be upgraded as well; major improvements would include upgrading the pump station, changing the influent pipe, constructing an Administration and Laboratory Building and increasing the capacity of the existing chlorination facility. For this alternative, as for each of the six alternatives, it is assumed that the existing screening facility would be adequate with only minor modifications. Alternative 1 would require the purchase of no additional land. Sludge from the treatment would remain in the lagoon without substantial build-up; thus no sludge handling facilities would be required.

Alternative 1 (and all others except Alternative 6-Spray Irrigation) would require construction of an effluent pipe with discharge to the South Anna River. A gravity flow pipe would run from the facility to the discharge point at the confluence of the South Anna River and Falling Creek, just downstream from the U.S. Route 1 bridge crossing.

Costs

The costs of each Ashland alternative are calculated as a capital cost and as a yearly operation and maintenance (O&M) expense. For ease in comparison, these are combined and presented in terms of total present worth, unit cost per 1000 gallons of wastewater treated, and as a single equivalent uniform annual cost. All costs are in October 1979 dollars.

For Alternative 1 (Aerating Existing Lagoon), the unit cost is \$0.45 per 1000 gallon of wastewater treated or an equivalent annual cost of \$201,580.

Alternative 2:
Activated Sludge

Description

A conventional activated sludge system is commonly used for facilities the size of or larger than that proposed for Ashland. An activated sludge system provides a biomass of organisms and the oxygen required by the organisms to consume the organics in the wastewater. The biomass, unlike the organic material, will settle out of the water, and can be recycled and reused in the process.

Alternative 2 consists of this type of process. As proposed, the existing lagoon would be abandoned and new treatment facilities constructed. The activated sludge plant would incorporate the existing bar racks and comminutors. After screening, the waste stream would pass through primary clarifiers and into an aeration basin. From here the water would flow to secondary clarifiers from which the settled biomass would be recycled back to the aeration basin. The water would then go to the chlorine contact basins and be discharged to the South Anna River. In addition to the wastewater treatment process, a sludge handling system would be required. The sludge from

the clarifiers would undergo aerobic digestion followed by sludge drying beds. The stabilized dewatered sludge would be hauled to landfills.

The physical facilities required for this alternative would include primary and secondary clarifier tanks with sludge removal equipment, an aeration basin with the necessary compressors, piping, injectors and related equipment. The sludge handling system would include the aerobic digester tank with mechanical surface aerators and the sludge drying beds. Alternative 2 also would incorporate the existing headworks and, an upgraded pump station, and would require enlargement of the existing chlorination facilities. An Administration and Laboratory Building which would also house the compressors is included in the cost estimate.

Construction of the activated sludge plant would necessitate the purchase of an additional 36 acres of land, an abandoned quarry north of the present site. The discharge pipe for this alternative to the South Anna would be identical to the one previously discussed under Alternative 1.

Costs

The unit costs estimated for construction and operation of this activated sludge plant are \$1.12 per 1000 gallons of wastewater treated, or an equivalent annual cost of \$497,567.

Alternative 3: Rotating Biological Contactors

Description

Using Rotating Biological Contactors (RBC's) as the treatment process is the third alternative proposed in the Ashland Facilities Plan. RBC's, also called biodiscs, are composed of a series of closely spaced plastic discs to which biological growth can attach. The cylinders formed by the stacked discs are placed horizontally in a channel, partially submerged in the wastewater. As the wastewater slowly flows through the wafered cylinder, the discs rotate continuously, exposing the attached biomass to the waste stream and then to the atmosphere. The organisms aerobically consume the organics in the wastewater; adsorbing oxygen as they contact the atmosphere.

The existing lagoon would be abandoned in this alternative. The influent would pass through the existing headworks and then into a primary clarifier. From here it would flow slowly through the RBC units and into a secondary clarifier. The final step would again be chlorination followed by discharge to the South Anna. The sludge handling system prepared for the RBC alternative is the same as that for Alternative 2; namely aerobic digestion followed by sludge drying beds with the residue being hauled to landfills.

The proposed construction under this alternative would include primary and secondary settling tanks with sludge collection equipment. Also similar to the activated sludge alternative would be expanded chlorine contact tanks and sludge handling system. The rotating biological contactors would consist of concrete channels with the RBC units mounted in them. The RBC units would also require the equipment necessary to drive them. The estimate prepared for this alternative includes an Administration and Laboratory Building and upgrading of the influent pump station.

Construction of this alternative would require the purchase of 15 additional acres of land north of the present site. The

type of construction required for the effluent pipe would be the same as for Alternatives 1 and 2.

Costs

For Alternative 2 (Rotating Biological Contactors), the unit cost is \$0.74 per 1000 gallons of wastewater. The equivalent uniform annual cost is \$328,297.

Alternative 4:
Oxidation Ditch

Description

The fourth alternative proposed in the Ashland Facilities Plan is an oxidation ditch to provide the secondary treatment at the Ashland facility. The oxidation ditch is an extended aeration type of activated sludge process, which consists of a ring-shaped ditch with aeration rotors placed to circulate and aerate the wastewater.

Use of the oxidation ditch would eliminate the need for primary clarification tanks. The wastewater would flow directly from the existing screening facilities to the oxidation ditch. From the oxidation ditch the water would flow into the secondary clarifiers, then chlorinated and discharged to the South Anna River. The oxidation ditch alternative would have a sludge handling system similar to those for the activated sludge and RBC alternatives.

The facilities required for this alternative would include the oxidation ditch channel with two rotors, including the driver and motors. The secondary clarifiers would be concrete tanks with sludge collection mechanisms. Once again, the chlorine contact facility would be enlarged to accommodate the 1.2 mgd design flow. Sludge handling facilities would be the same: an aerobic digester with mechanical surface aerators followed by sludge drying beds.

The additional land required by this alternative would be 15 acres, located to the north of the site. The effluent conduit to the South Anna River would be identical to that proposed in the three previous alternatives.

Costs

The unit cost for Alternative 4 (Oxidation Ditch) is \$0.72 per 1000 gallon of wastewater. The corresponding equivalent uniform annual cost is \$318,743.

Alternatives 1-4
Environmental
Impacts

Land Use

Implementation of any of the six alternatives is not expected to change the general trend in land use for the Town of Ashland. Growth would be stimulated temporarily by rescinding the sewer connection moratorium. Since all construction for Alternative 1 would be on the present treatment site, the relocation of residents or dedication of additional land for sewage treatment purposes would not be required. Alternatives 2, 3, and 4 would require land in addition to that already used for sewage treatment (36 acres for Alternative 2 and 15 acres for Alternatives 3 and 4). However, this land is an abandoned quarry with no current use and no relocation of residents would be necessary.

Water Quality

As discussed previously in this Section, elimination of septic tank systems by connection to the Ashland facility under any of the six alternatives would remove the potential serious threat of surface or groundwater contamination from failing septic systems.

In addition, all of the alternatives would cause significant improvement in the water quality of Falling Creek and

especially the small tributary to the creek to which the effluent from the Ashland facility is presently discharged. The small stream is presently overloaded, especially during periods of low flow or when untreated wastewater is bypassed. Because of the proposed discharge location all the alternatives would eliminate any discharge to Falling Creek; Alternatives 1-4 call for a discharge directly to the South Anna River.

The South Anna River would also benefit from implementation of an upgrading of the Ashland facility by any of Alternatives 1 to 4. A potential adverse impact to the South Anna River would be minor degradation of water quality at the discharge point by BOD and nitrates in the effluent during low river flow periods. The South Anna River experiences a wide variation in flow with a recorded ten year minimum average seven consecutive day flow of only 14.1 cfs. (Its average flow is 362 cfs.) At low flow, the river may not be able to assimilate even the secondary effluent and minor temporary water quality degradation at the discharge point would be possible. During construction of the discharge pipe, temporary sedimentation could be expected in the South Anna. These adverse impacts are associated with all alternatives requiring the construction of a discharge pipe (Alternatives 1-4).

Biology.

No permanent adverse impact on terrestrial wildlife would be expected from implementation of Alternatives 1-4. Alternative 1 would require no additional land and the extra land for Alternatives 2, 3, and 4 has already been cleared. The construction of the discharge pipe would temporarily drive animals from the immediate area. However, these would be expected to return once the work is finished and vegetative cover is re-established. Wildlife communities along Falling Creek would benefit from the improved water in the stream.

The improvement to Falling Creek would benefit the biota of the creek. The communities in the South Anna watershed, especially near the confluence with Falling Creek, would also benefit from implementation of any of the alternatives. Chlorination of the final effluent must be carefully monitored to avoid any problems with chlorine toxicity.

Environmentally Sensitive Areas

The South Anna is classified as a scenic river. As discussed above, implementation of any the six alternatives is expected to improve the general conditions of the South Anna River.

A strip of land along the South Anna is designated as a 100-year flood plain by the U.S. Department of Housing and Urban Development's National Flood Insurance Program (see Figure 2). Additional flow from an Ashland discharge would minimally augment flood waters.

The land involved in the conventional treatment alternatives is not classified as a groundwater (artesian aquifer) recharge area. Therefore no impact would be expected.

Since all construction for Alternative 1 would be on the existing site, no prime agricultural land would be affected, nor would the discharge pipe be routed across prime agricultural land. The additional land required for Alternatives 2, 3, and 4 is not prime agricultural land (nor sensitive in any other way). Furthermore, no secondary adverse impacts on prime

agricultural land would be initiated by any of the six alternatives, because growth would be accommodated only inside the Ashland service area, which includes no prime agricultural land.

None of the alternatives would have an adverse impact on an area of sensitive ecology. The bottomlands along the Pamunkey River located downstream of the discharge point, are classified as sensitive. A shock load passing through the plant could conceivably reach this area, but with considerable dilution. Because the wastewater is domestic in nature, the chance of such entering the plant is minimal and such a loading would be unlikely to cause permanent damage.

None of the six alternatives involve land that is considered historically or archaeologically valuable. Therefore no impact of this nature is expected.

Summary

Beneficial impacts are expected from implementation of the conventional treatment options: Alternatives 1 through 4. Improvement to Falling Creek and its small tributary would be of major importance. The elimination of the potential public health problems associated with failing septic tank systems contaminating both groundwater and small surface streams would also be expected from upgrading the Ashland facility. Expected adverse impacts would be minor and of temporary duration only (e.g. construction impacts). Alternatives 2, 3, and 4 would require additional land aside from that already dedicated to sewage treatment, but that land is not environmentally sensitive nor would it interfere with existing land use.

The major difference between the first four Ashland alternatives appears to be cost. Alternative 1 is significantly the least expensive; Alternative 2 is significantly the most expensive; Alternatives 3 and 4 are in the middle.

Alternative 5: Land Application - Overland Flow

Description

The final two alternatives examined in the Ashland Draft Facilities Plan are both land application processes. The first, overland flow, is considered as Alternative 5.

In an overland flow treatment system, the pretreated wastewater is distributed along the top of a sloped area of relatively impermeable soil covered with vegetation. The wastewater flows in a very thin layer down the slope through the vegetation. The pollutants in the water are removed by physical, chemical and biological means. The purified water is collected at the bottom, disinfected and then discharged.

The Ashland overland flow site was selected from a list of eight potential areas. Two possible sites were then selected on the basis of amount of land available and soil conditions. The proposed site is adjacent to the existing treatment site to the north and east.

In this alternative the existing lagoon would be used for pretreatment. Influent wastewater would flow through the existing screening facilities and into the lagoon. Lagoon effluent would then be chlorinated and stored in a reservoir. From the reservoir it would be pumped to the application site and distributed over the top of the slope. After flowing down the slope the water would be collected, chlorinated a second time, and discharged to the South Anna River.

The overland flow alternative would require construction of an asphalt-lined earth basin for storage of pretreated effluent and a pump station for the distribution system. The laboratory facilities for this alternative would be located in the pump house. Additional new construction would be required for expanded chlorination tankage, which would have to be larger than for the four previous alternatives because the flow must be chlorinated twice in separate basins of the tankage. The influent pump station would also be upgraded, but the existing screening facilities are assumed to be adequate.

At the application site the land would be levelled, graded, and seeded with reed canary grass. This grass would be harvested and the profit used to offset operating costs. The distribution piping installed at the site would be another major cost item. The runoff from the slope would be captured in a series of ditches excavated at the bottom of the slope, chlorinated, and discharged to the South Anna River via a pipe similar to that in the previous alternatives.

The land required for the overland flow alternative would be an additional 277 acres. A final requirement for this alternative would be construction of a series of groundwater monitoring wells around the land application site.

A second overland flow system, Alternative 5A, is included in the Ashland Facilities Plan. This is the same as Alternative 5 except for the application rate used in the design. Alternative 5A uses a lower application rate resulting in additional land being required for application and storage. With additional land, the total area required for 5A is 350 acres.

Costs

The unit treatment cost for Alternative 5 is \$0.90 per 1000 gallons of wastewater. The equivalent uniform annual cost is \$400,860. (The unit treatment cost for Alternative 5A is \$0.96 per 1000 gallons of wastewater and the equivalent uniform annual cost is \$427,584.) As a land treatment alternative, this option would be eligible for 85% Federal funding of the capital costs under EPA's innovative and alternative technology program.

Land Use

Alternatives 5 and 5A would require a commitment to limit some land use along Route 1, adjacent to the land application site, because of the proximity of this land to the site. Also, some existing farmland would be lost and relocation of several residents would be necessary. However, the overall growth trends and land use in Ashland would not be affected.

Water Quality

Impacts from implementation of the overland flow alternative would be similar to those listed under Alternatives 1-4 for both surface and groundwater. Additional impacts associated with this alternative would include temporary sedimentation in Falling Creek from the levelling and grading of the application site. Some percolation of pollutants to the groundwater could result from improper operation of the land application site. However, monitoring wells would be required to ensure that such percolation would not occur.

Biology

The impacts on aquatic organisms could be expected to be as listed under Alternatives 1-4. Impacts to terrestrial wildlife would also be similar to those of the previous alternatives but considerably more extensive because some of the additional

277 acres required for Alternative 5 have not been previously cleared. Some wildlife migration would likely result from implementation of this alternative.

Environmentally
Sensitive Areas

Potential impacts on prime agricultural land, scenic rivers, sensitive ecologies and historically or archaeologically valuable lands would be as listed under Alternatives 1-4.

The overland flow site lies at the edge of the flood plain along Falling Creek (see Figure 2). In the event of a flood, the vegetation and equipment at the site could be damaged by the high water and a shock load of pollutants could be swept into the creek.

A groundwater recharge area could be affected by this alternative. The application site borders the recharge area of the Pamunkey Group of the Aquia Formation. There would be minimal risk of a badly overloaded system allowing excessive percolation to contaminate this groundwater.

Summary

The environmental impacts expected from the overload flow system are similar to those for the previously discussed alternatives. There are however some additional adverse or potentially adverse impacts, involving the proximity of the site to a flood plain and a groundwater recharge area.

Alternative 5A mentioned in the review would have similar impacts, although the additional land required would exacerbate the adverse impacts mentioned above. Alternative 5 is more expensive than any of the previous alternatives except Alternative 2. Alternative 5A is slightly more expensive than Alternative 5.

Alternative 6:
Land Application -
Spray Irrigation

Description

The second land application alternative identified in the Ashland Draft Facilities Plan is spray irrigation. The major advantage of a spray irrigation system is that no effluent discharge is required. Pretreated wastewater is distributed over a vegetated area at a rate low enough to allow all the water to be accounted for by plant uptake, evaporation and percolation to the soil. Since the treatment includes planned percolation into the soil, an extensive groundwater monitoring program is an integral part of any spray irrigation system.

The land application site selection was made on the basis of land availability and suitable soil conditions. The selected area is located south of the South Anna River, just east of its confluence with the North Anna. This is a flood hazard area, so construction would have to include flood protection.

As with overland flow, the spray irrigation alternative would use the existing lagoon for pretreatment. The influent would pass through the existing screens and comminutors and into the lagoon. Effluent from the lagoon would be chlorinated and stored in a lined basin. Effluent would be drawn from this basin, chlorinated again and then pumped to the irrigation site. The water would be distributed over the site with spray irrigators. Any runoff would be caught in a series of collection ditches, recycled to the distribution system, and spray irrigated again. The area would be planted with reed canary grass, the harvest of which would be used to offset operating expenses.

The new facilities required by this alternative would include the lined storage reservoir, an Administration and Laboratory Building and enlarged chlorine contact tanks. A pump station and approximately 19,000 feet of 14 inch force main would be necessary to pump the wastewater to the irrigation site.

The irrigation site would be leveled and graded and a flood protective dike constructed. Runoff collection ditches and a small pump station to recycle the runoff to the main stream are also included in the estimate. The total additional land required for this alternative would be approximately 543 acres.

Costs

The unit cost for Alternative 6 is an estimated \$1.63 per 1000 gallons of wastewater. This converts to an equivalent uniform annual cost of \$726,042. As with alternative 5, this option would be eligible for 85% Federal funding of the capital costs under EPA's innovative and alternative technology program.

Land Use

The land use trends for the Town of Ashland are not expected to change with this alternative. However, the use of the selected land application site would require relocation of several residents.

Water Quality

Improvements in Falling Creek and the elimination of potential groundwater contamination would result. The South Anna River would benefit more from this alternative than the previous five since there would be no discharge from the system.

There are, however, adverse or potentially adverse impacts to water quality associated with the spray irrigation alternative. Aerosols generated by the spray system would require a buffer zone for containment. There may be a rise in the nitrate level in the South Anna and Pamunkey river during periods of slow nitrogen uptake by plants. A third potential adverse impact on surface waters would be the danger of high concentrations of pollutants from the spray irrigation site being washed into the South Anna by heavy rains before percolation could occur. Finally, the extensive site grading necessary for preparation of the irrigation field would cause temporary heavy sedimentation in the South Anna.

Excessive percolation of the wastewater into the soil could possibly contaminate the groundwater, the application rate would have to be carefully controlled to prevent this. As previously mentioned, a system of water quality monitoring wells would be included to check for any groundwater contamination.

Biology

The biological communities in the South Anna and Falling Creek watersheds would benefit from the elimination of discharges. Potential adverse impacts to the aquatic biota would center on the potential for runoff entering surface waters.

Construction of the spray irrigation system would benefit wildlife living along Falling Creek as would the previous alternatives. Negative impacts to terrestrial wildlife would include loss of animal habitat at the irrigation site and temporary migration along the force main route from the treatment plant to the application site.

Environmentally Sensitive Areas

Alternative 6 would affect environmentally sensitive areas more significantly than would the previous five. However no historically or archaeologically valuable lands or sensitive ecologies would be impacted by this alternative.

The irrigation site has been classified as a flood plain by the National Flood Insurance Program (see Figure 2). A major flood could seriously damage or destroy equipment and the vegetation necessary for the system to work. A flood would also interrupt operation of the treatment plant. High water or heavy rains could also sweep untreated wastes into the South Anna and Pamunkey Rivers. Both of these are considered scenic rivers. Construction (levelling and grading) at the site would cause temporary sedimentation in the South Anna.

The proposed irrigation site lies in a groundwater recharge area known as the Pamunkey Group of the Aquia Formation. As noted above, overloading the site could lead to excessive percolation and contamination of the groundwater. Since this is a recharge area, serious public health problems could result.

Finally, the proposed route of the transmission line from the present Ashland facility to the application site would cross prime agricultural land. Use of this land would be temporarily disrupted during construction.

Summary

The elimination of any discharge by means of spray irrigation would seem to make Alternative 6 superior to the other alternatives. However, there would be several offsetting adverse and potentially adverse impacts associated with this alternative. Prime among these are the irrigation site being located in a flood hazard area and on a groundwater recharge area. Furthermore, this alternative is substantially more costly than any of the previous five.

SELECTION OF THE MOST FEASIBLE ALTERNATIVE

The selection of the most feasible Ashland alternative takes into account economic, environmental and social impacts. The selected plan represents the best alternative for meeting these criteria. Tables 4 and 5 summarize and compare the costs and environmental impacts of the six alternatives identified in the Ashland Facilities Plan.

TABLE 4

ASHLAND ALTERNATIVES - COST COMPARISON

ALTERNATIVE	TOTAL PRESENT WORTH	UNIT COST PER 1000 GAL	EQUIVALENT UNIFORM ANNUAL COST	COST RATING
#1-Aerated Lagoon	\$2,156,447	\$0.45	\$201,580	1
#2-Activated Sludge	\$5,332,834	\$1.12	\$497,567	5
#3-Biological Contactors	\$3,512,030	\$0.74	\$328,297	3
#4-Oxidation Ditch	\$3,409,824	\$0.72	\$318,743	2
#5-Overland Flow	\$4,525,554	\$0.90	\$400,860	4
#6-Spray Irrigation	\$7,766,996	\$1.63	\$726,042	6

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KEY: ++ = Very beneficial impact 0 = Not impacted by the alternative/
+ = Beneficial impact equal adverse and beneficial impacts - = Adverse impact
-- = Very adverse impact

NOTE: These impacts have not been weighted in importance. Thus no quantitative evaluation is presented.

The selected plan is Alternative 1: Aerating Existing Lagoon. Alternative 1 has significantly lower costs than any of the other alternatives due to the limited construction required. It should be noted that although Alternatives 5 and 6 would be eligible for increased Federal funding of the capital cost of the treatment facilities, overall they are not cost-effective compared to the other alternatives. Furthermore, from a local viewpoint, even with increased Federal funding for Alternatives 5 and 6, Alternative 1 is still most economical.

The only new facilities required under Alternative 1 would be the effluent pipe and the Administration and Laboratory Building. The rest of the construction would consist of upgrading existing facilities. No additional land would be required. Another factor reflected in the cost is the simplicity of operation, with the result that Alternative 1 has the lowest unit cost.

The comparison of environmental impacts for the six Ashland alternatives shows that the first four treatment alternatives have almost identical impacts. This is expected, since all are conventional treatment processes with the final product being an effluent of equal quality to be discharged at the same point. The only difference is in the land required and implementability. Implementability encompasses factors such as time until completion and ease of approval of the plan. Since Alternative 1 requires the least construction, no additional land acquisition, or relocation of residents and is a widely used, easily operated system, it is more implementable than the others.

The considerably lower unit cost and the slight advantage in environmental impacts make Alternative 1 the most feasible alternative. A detailed description of this alternative, its probable environmental impacts, and potential mitigation measures appear in the next Section.

SECTION V

Recommended Ashland Alternative

SECTION V: RECOMMENDED ASHLAND ALTERNATIVE

DESCRIPTION

The most feasible alternative identified in the Ashland Facilities Plan is Alternative 1, which combines the lowest unit cost with slightly better cumulative environmental impacts to outrank the other alternatives.

Under Alternative 1, the existing lagoon would be divided into a two-cell reactor, the volume increased by raising the existing embankments, and aeration equipment installed. Increasing the volume would increase the detention time to approximately 31 days; dividing the lagoon into a two-cell reactor would provide the operational control needed to produce a cleaner effluent on a reliable basis.

The major improvement in the treatment process would be afforded by addition of aeration to the lagoon system. A lagoon is essentially a large reactor vessel in which the organic material (BOD) is consumed by organisms (biomass) in the water. These organisms need substantial amounts of oxygen to convert the organic material into food. In an unaerated lagoon, the process is similar to natural purification in rivers and lakes, and sufficient volume must be provided to avoid overloading of the lagoon. When the loading rate to the lagoon increases beyond the natural reoxygenation capacity of the water, the result is depletion of the dissolved oxygen in the water. The growth and activity of the biomass are limited and the BOD oxidation stagnates. By aerating the lagoon, oxygen is re-supplied by mechanical means, and the load-limiting factor is shifted. Besides supplying the necessary oxygen for the process, aeration mixes the wastewater in the lagoon, ensuring that the biomass will contact the organic matter present in the water and also that the flow will be distributed throughout the lagoon so that short-circuiting of the intended flow pattern will not occur.

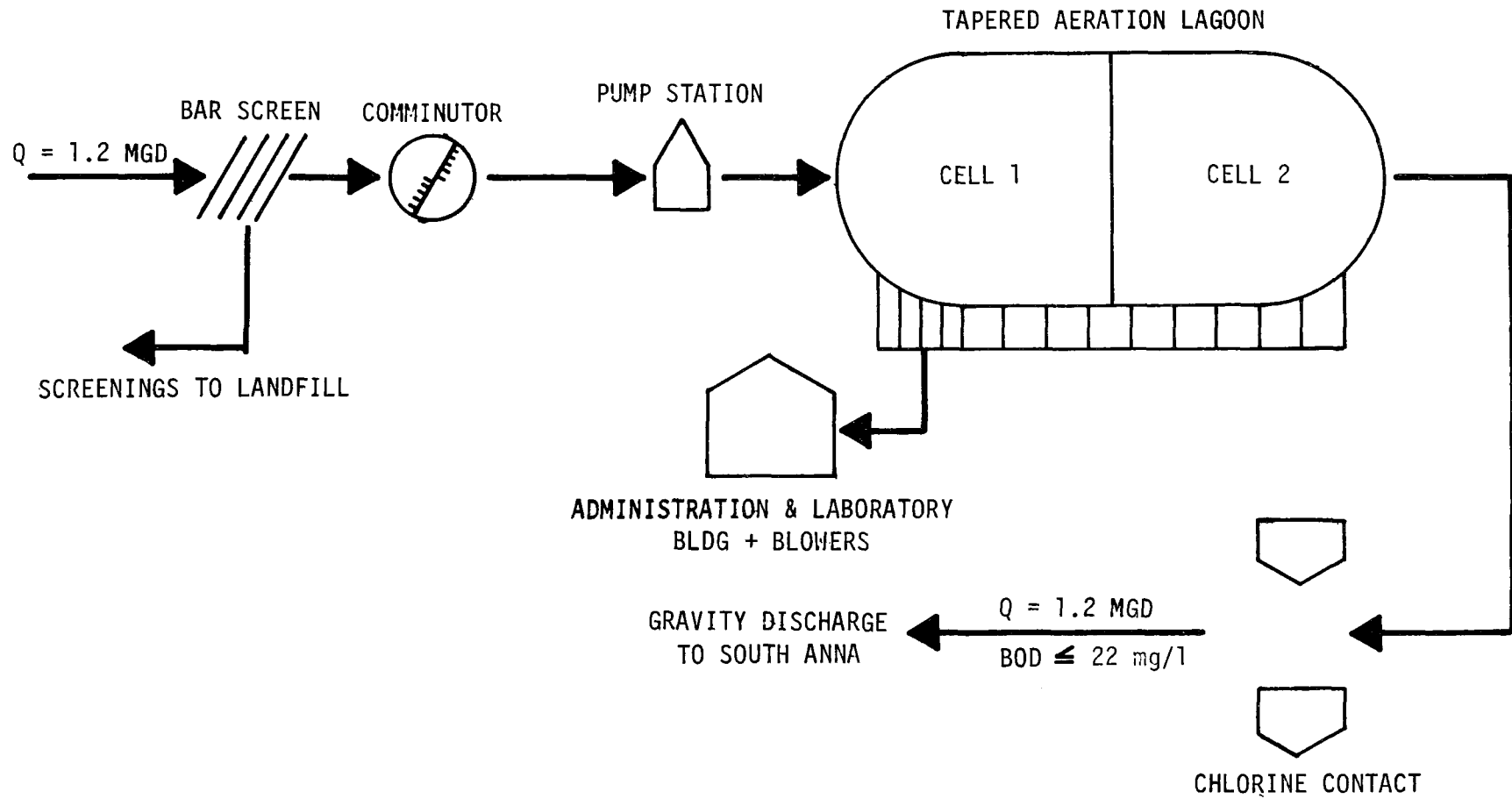
The proposed aeration method for the lagoon is known as "tapered aeration." Tapered aeration involves the injection of greater quantities of air at the inlet of the lagoon and diminishing quantities as one moves toward the outlet. The rationale behind tapered aeration is that the greatest demand for oxygen is at the inlet area where the BOD is highest. As the BOD is removed, the oxygen demand lessens. The objective of tapered aeration is to match the quantity of air injected to the oxygen demand profile, with a resulting savings in aeration cost. Another benefit of tapered aeration is that the biomass in the system will settle as the mixing effect of the aeration decreases with the tapering off of air injection.

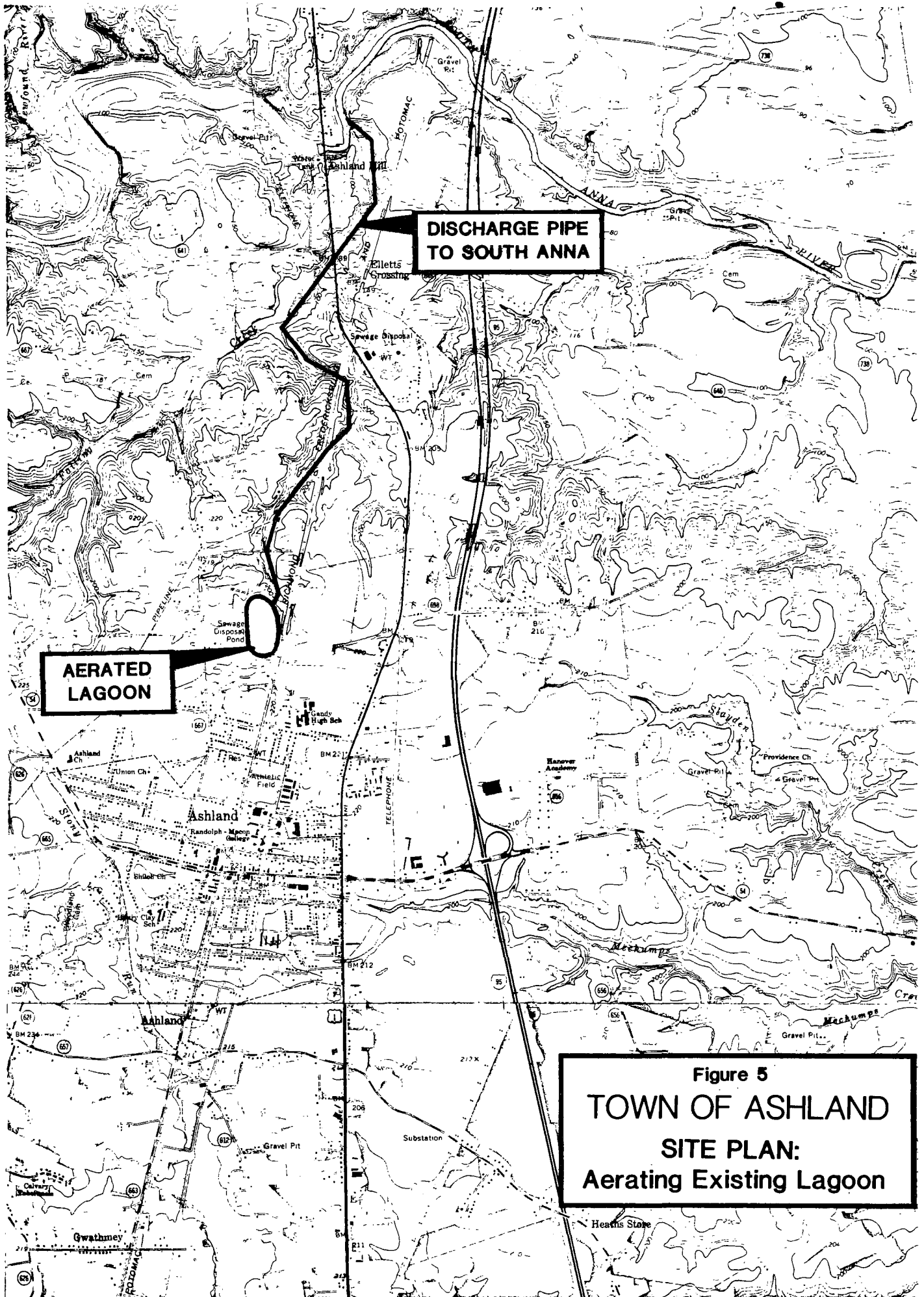
A flow chart of this alternative appears in Figure 4. The influent wastewater is screened with the existing facilities and then pumped to the south end of the modified lagoon through a new influent pipeline. Effluent from the lagoon flows into the upgraded chlorine contact tanks. After chlorination, the effluent is discharged to the South Anna River through a new gravity flow discharge line. The discharge point is at the confluence of the South Anna and Falling Creek, just downstream from the U.S. Route 1 bridge crossing. A plan view of the proposed facility and the route of the discharge pipe is shown in Figure 5.

Of the six alternatives, Alternative 1 would require the least construction. Existing facilities would be used with upgrading or addition. Following is a list of the major items required for construction of this alternative:

Figure 4

FLOW CHART OF ALTERNATIVE 1





- Influent pump station upgrading
- Influent pipe and structure modification
- Earthen dike for lagoon
- Intercell piping
- Raising of existing embankment
- Blower, air piping and associated equipment
- Effluent structure
- Administrative and laboratory building (will also house blower)
- Additional chlorine contact tank and chlorination equipment
- Discharge pipe to South Anna

Of the above items, the discharge pipe is by far the most expensive. The pipe and discharge represent approximately 40% of the total estimated construction cost. All of the alternatives, except spray irrigation, require construction of this component. As mentioned in Section IV, effluent from the Ashland facility can no longer be discharged to Falling Creek, making the long effluent line to the South Anna a necessity.

The preliminary design assumes that the existing facilities can be used with modification or upgrading and can be operated during construction. The headworks (for screens and comminutors) are assumed to be adequate with only minor modification. The existing pump station would be used with new pumps and auxiliary power equipment installed. The capacity of the chlorination facilities would be increased to the design flow of 1.2 mgd.

Besides upgrading the treatment plant, the Ashland Facilities Plan identifies as a second part of the wastewater treatment plan a sewer rehabilitation program. The Ashland collection system suffers from excessive inflow and infiltration which must be reduced in order to be within required EPA levels. The rehabilitation program is detailed in the Addendum: Sewer System Evaluation, Town of Ashland, January 1980.

The combination of eliminating the excessive I/I and upgrading the treatment plant will enable the Town of Ashland to meet the BOD effluent limitation of 22 mg/l set by the SWCB. In meeting this limitation cost-effectively and environmentally for the design flow, Alternative 1 appears to be the most feasible course of action for the Town of Ashland.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The environmental impacts associated with Alternative 1 are almost identical to those for the other three conventional treatment alternatives, as discussed in Section IV. The majority of the impacts are beneficial, especially with respect to water quality and aquatic biota. There are, however, some temporary or potentially adverse impacts inherent in this project. Probable or potential environmental impacts from and suggested mitigation measures for Alternative 1 are described below.

Socioeconomic

The unit cost of Alternative 1 is \$0.45 per 1000 gallons of wastewater or an equivalent annual cost of \$201,580. Federal funding is available for 75% of the construction cost of wastewater treatment plants. The operation expenses must be borne solely by the user of the facility. The total construction cost for this alternative is \$1,212,200. The Federal share (assuming maximum possible funding) would be \$909,150,

and the local share \$303,050. The yearly O&M cost, borne solely by the local residents, is estimated at \$88,266. On a unit cost basis, these costs amount to \$0.19 Federal share and \$0.26 local share per 1000 gallons of wastewater treated. These figures yield equivalent annual costs of \$84,986 for the Federal Government and \$116,595 for the local residents.

To acquire the funds necessary to support the local share of the facility, two basic types of financing are possible: the floating of revenue bonds and/or the creation of special assessment districts. Essentially, revenue bonds are secured by the revenues received from the operation of the facility. Rates for water usage would be established and users would be billed according to their consumption. A special assessment district would vary from the aforementioned financing alternative in that a geographic boundary would be drawn which includes only the beneficiaries of the project, and these residents and businesses would be taxed at a rate which produces enough revenue to pay the debt and operating costs of the facility.

In the Ashland Draft Facilities Plan, the user charges necessary to cover operation and maintenance costs and to service the revenue bonds have been estimated. The Facilities Plan recommended a \$600.00 connection charge and an initial bimonthly service charge of \$7.00, with increases to \$8.50 by the year 2000. These user charges would apply only to those serviced by the Ashland facility.

Land Use

The availability of wastewater treatment is not expected to change land use trends for the Town of Ashland. Removing the sewer moratorium will allow temporarily restricted residential and commercial growth to resume. Construction of the upgraded facility will not require acquisition of any more land, and no residents will be forced to relocate.

Water Quality

The most significant improvement in surface water quality will be to the small, unnamed tributary of Falling Creek to which the effluent from the lagoon is discharged. The SWCB has cited the Ashland facility as the cause of degradation of water quality in this small stream. Once the discharge to the creek is stopped, the natural process of purification can begin. Significant improvement will also occur in Falling Creek. The present facility has also overloaded this creek, especially during periods of bypasses and of low stream flows. With implementation of the alternative, the presence of effluent in Falling Creek will be eliminated.

The South Anna River will also benefit from the construction of the aerated lagoon. Although the discharge will be directly to the river, the effluent will be consistently cleaner than the water that has been coming from Falling Creek, especially when facility bypasses have occurred. Temporary water quality degradation near the discharge point may occur during times of low river flow. The South Anna is subject to wide flow variations with a reported ten-year minimum average seven consecutive day flow of 14.1 cfs. (The average flow is 362 cfs.) At extremely low flows the river may not be capable of immediately assimilating the secondary effluent from the facility. Minor water quality degradation from BOD and nitrates may occur during these periods. Another potential adverse impact to the South Anna involves effluent chlorination before discharge. The chlorine dosage rates must be closely monitored

to prevent any chlorine toxicity problems. Temporary sedimentation at the discharge point can be expected from construction of the effluent pipeline.

Elimination of failing septic tank systems will benefit the small streams in the area. The leachate from these septic tanks often enters and degrades these streams via drainage ditches. Connection of these sources to the upgraded collection system will eliminate this problem.

An even greater benefit derived from the elimination of failing septic tank systems will occur with respect to the quality of local groundwater. Although contamination of the groundwater has not been reported, the possibility poses a difficult to correct problem once incurred.

The potential adverse impacts above should be minimized by implementation of the following mitigation measures:

- o Close monitoring of chlorine dosage rates;
- o Careful operation of the facility, especially during periods of low flow;
- o Use of sediment and erosion controls during stream corridor construction;
- o Buffer zones between sewer lines and stream beds incorporating riparian vegetation when available; and
- o Berms or filtering devices such as hay bales between routes and streams.

Biology

The terrestrial wildlife indigenous to Falling Creek would benefit from the improved water quality. No permanent adverse impact is expected on terrestrial wildlife. Construction of the pipeline will temporarily drive off animals. After construction they can be expected to return once vegetative cover is reestablished. The construction at the plant is on the present site. Therefore no permanent animal migration from construction of the facility is anticipated.

Aquatic biota would benefit from construction of the aerated lagoon. The major beneficiaries would be the flora and fauna in Falling Creek and the small unnamed tributary to which the lagoon currently discharges. The communities in the South Anna would also benefit from the general improvement in water quality. Again, the final chlorination of the effluent would have to be closely monitored to prevent any chlorine toxicity problem.

Mitigating measures recommended to alleviate impacts on biota are as follows:

- o Stream erosion controls previously mentioned under water quality - siltation dams, buffer zones, filtering devices
- o Revegetation of all cleared areas;
- o Construction of stream crossings during periods of minimal biological activity (winter months).

Environmentally Sensitive Areas

The South Anna is classified as a scenic river. The implementation of Alternative 1 will improve the water quality of the river. A detailed description of probable impacts is contained in the previous section.

Land along the South Anna River is designated as a 100-year flood hazard area by the National Flood Insurance Program (see Figure 2). The additional flow from the Ashland facility will minimally augment the average flow of 362 cfs, not to mention the flows expected at flood stage.

The land involved in this alternative is not considered a groundwater recharge area. Therefore no impacts are expected.

Since all construction for this alternative is on the existing site, no prime agricultural land is involved. The proposed route of the effluent pipe does not cross any prime agricultural land, nor is any growth on prime agricultural land expected to occur as a result of this project.

Alternative 1 should not affect any areas classified as ecologically sensitive. Well downstream of the discharge point, the bottomlands of the Pamunkey River are considered ecologically sensitive.

The land involved with this alternative is not considered historically or archaeologically valuable.

Since no environmentally sensitive areas will be affected by Alternative 1, no mitigation measures are required.

Summary

The net results of the Alternative 1 environmental impacts are beneficial. Surface water quality would improve dramatically in Falling Creek and the small tributary into which the lagoon now discharges, improving conditions for both aquatic and terrestrial biota. Equally important is removing the potential public health danger of failing septic tank systems.

No permanent adverse impacts are anticipated from implementation of the proposed project. Mitigation measures for temporary construction impacts on water quality and aquatic and terrestrial biota could be managed as outlined above. Additional mitigation measures to minimize adverse noise and air quality impacts during construction and operation could include:

- o Muffling devices on pumps and other treatment plant equipment;
- o Appropriate design as well as O&M procedures to control odors; and
- o Fugitive dust controls at construction sites.

The results of the total project, including treatment plant improvements as well as the sewer rehabilitation program, will benefit the area and solve the Town of Ashland's sewage treatment problem in the most cost-effective and environmentally sound manner possible.

SECTION VI

Phase I Extended Alternatives

SECTION VI: PHASE I EXTENDED ALTERNATIVES

INTRODUCTION

With the separation of the Town of Ashland from the Phase II planning area, Hanover County was faced with a question of how to best address existing and expected needs within the remainder of Phase II in a manner which would take into account the economic and environmental concerns raised during the Phase II Facilities Planning effort. After months of local study and debate, the County arranged for an environmental consulting firm (Patton, Harris, Rust, and Guy, Inc.) to complete Facilities Planning for a reduced study area designated as "Phase I Extended". (See Figure 1).

Concurrent with this Facilities Planning, the County embarked on a new growth management program to ensure that future development will proceed in an orderly, planned manner. New goals and objectives were adopted by the County for land use management and provision of services, which specified that development in the next twenty years should be concentrated in four "urban" service areas: Mechanicsville, Ashland, Hanover Courthouse, and Doswell. Once development has materialized in those areas, other County areas would then be serviced, including the upper Totopotomoy River Basin above Route 643 and an expanded Doswell service area. Public utilities goals and objectives were also outlined, consistent with the above land use planning goals and objectives, from which Phase I Extended Facilities Planning assumptions were derived.

PLANNING AREA

As directed by the Board of Supervisors, the Phase I Extended planning area represents a significant reduction in size from the previous Phase II area (even without Ashland). The revised planning area reflects a desire of the County government to solve existing needs, to encourage future growth in a more compact area that is readily manageable, and to allow for more financially feasible alternatives to be developed. A major change from Phase II has been the elimination of the Totopotomoy River Basin (with the exception of two existing developments) from the planning area due to environmental concerns.

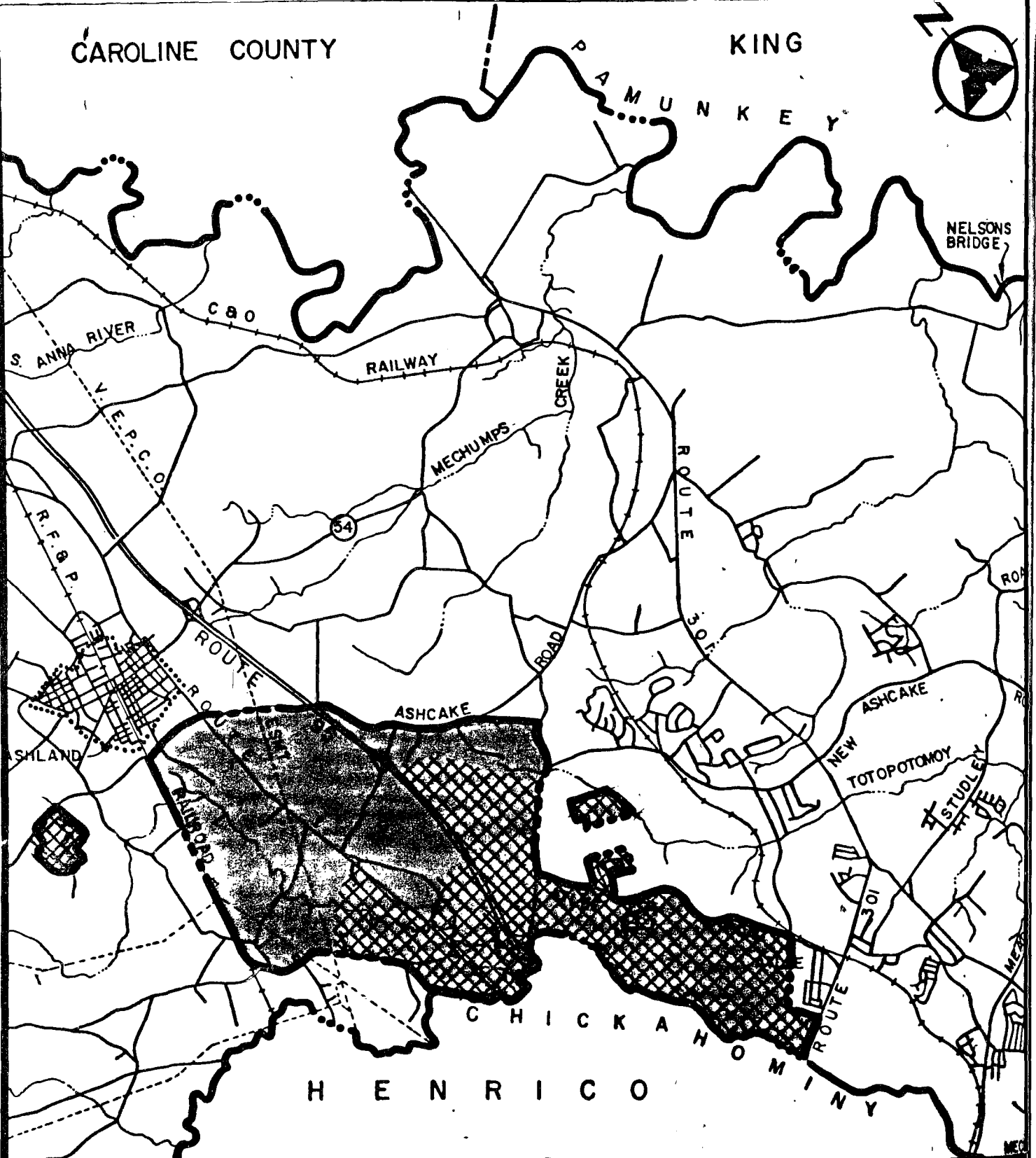
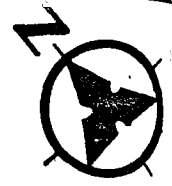
The heart of Phase I Extended lies along the Route 1 - Interstate 95 corridor south of the Town of Ashland, encompassing land as far west as the RF&P railroad, and includes the wedge of land east of I-95 bordered by Routes 656 and 657. Additionally, Phase I Extended includes a "connection" area northwest of Phase I along the Chickahominy River between Routes 656 and 301, and south of Route 637. The connection area includes the subdivisions of Totopotomoy and Kingswood Court. Oak Hill Estates, located directly southwest of Ashland, was included for study but addressed separately because of its isolation from the above areas.

EXISTING NEEDS

As described in the Draft Addendum Facilities Plan for Phase I Extended, there are presently eleven wastewater treatment systems in the planning area, operating under a State Water Control Board, Consent Order requiring these systems to upgrade their level of treatment. Table 6 lists these facilities. Additionally, there are numerous instances of septic tank failures scattered throughout the planning area, as described in the Draft EIS. Although alternative wastewater treatment solutions are geared towards improving or eliminating the major discharges, some or all of the on-lot system failures may be rectified via the alternative solutions described later. If not, they must be dealt with on a case-by-case basis by local and State health authorities.

CAROLINE COUNTY

KING





-  DENOTES STUDY AREA
-  DENOTES INITIAL SERVICE AREA

FIGURE 6
STUDY AREA & INITIAL SERVICE AREA

HANOVER COUNTY, VIRGINIA

4000 8000 12000

SCALE IN FEET

PATTON, HARRIS, RUST AND GUY — P.C.
CONSULTING ENGINEERING — LAND SURVEYING — PLANNING
FAIRFAX, VIRGINIA

TABLE 6

Name	Existing Sewage Treatment Facilities Type of Treatment	Est'd. Flows	Comments
1. Chickahominy River Basin			
A. Kosmos Village	Single cell stabilization lagoon, chlorination, discharge to Stony Run.	0.033 mgd	111 trailer lots plus 18 campsites.
B. Oak Hill Estates	Two single-cell stabilization lagoons, chlorination, discharge to Stony Run.	0.04 mgd	120 hook-ups
C. Hanover House Restaurant & Motel	Two single-cell stabilization lagoons, chlorination, discharge to Stony Run.	0.025 mgd	Receives pumped effluent from Fleming's Truck Plaza
D. Colonial Estates	Single-cell stabilization lagoon, chlorination, discharge to Chickahominy River.	0.033 mgd	122 trailer lots.
E. Stony Run Subd.	Individual septic tanks and drainfields for each lot.	0.003 mgd	27 lots.
F. Lakeridge Ind'l. Pk.	Individual septic tanks with a central drainfield.	0.02 mgd	Light industrial area.
G. Mobil	Individual septic tanks and drainfields.	0.003 mgd	
H. Hanover Air Ind'l. Park	Three single-cell stabilization lagoons followed by land application sprinkler system.	0.03 mgd	
I. Beechwood Farms	Two single-cell stabilization lagoons, chlorination, discharge to Chickahominy River.	0.055 mgd	212 lots.
II. Totopotomoy Creek Basin			
A. Kingswood Court	Single-cell stabilization lagoon, chlorination, discharge to Totopotomoy Creek.	0.02 mgd	67 hook-ups.
B. Totopotomoy Subd.	Single-cell aerated lagoon followed by clarification and sludge holding tanks, chlorination, discharge to Totopotomoy Creek.	0.05 mgd	205 hook-ups.
C. Blue Star Estates	Single-cell stabilization lagoon, chlorination, Totopotomoy discharge.	0.015 mgd	60 homes.
III. Campbell River Basin			
A. Speed and Briscoe Truck Plaza	Two single-cell stabilization lagoons, chlorination, discharge to Campbells Creek.	0.011 mgd	

POPULATION
PROJECTIONS

As part of updating the County Comprehensive Plan, the County Planning Department has projected future population and land use for the Phase I Extended planning area. The projection methodology uses preliminary 1980 census figures and data developed by the State Department of Planning and Budget. Table 7 summarizes the population projections used by the County.

TABLE 7

Population Projections 1980-2002

Hanover County, VA
January 1981

HANOVER COUNTY		
<u>YEAR</u>	<u>POPULATION</u>	<u>GROWTH RATE</u>
1980	50,219 (1)	
1982	53,000 (2)	2.8%
1987	60,500 (2)	2.4%
1992	67,300 (2)	1.8%
1997	73,400 (2)	1.7%
2002	79,900 (2)	1.7%

PHASE I SERVICE AREA		
<u>YEAR</u>	<u>POPULATION</u>	<u>GROWTH RATE</u>
1980	11,890 (3)	
1982	13,772 (4)	7.2%
1987	16,972 (4)	4.3%
1992	20,251 (4)	3.6%
1997	23,164 (4)	2.7%
2002	26,277 (4)	2.6%

PHASE I (EX) AREA		
<u>YEAR</u>	<u>POPULATION</u>	<u>GROWTH RATE</u>
1980	3,578 (3)	
1982	3,804 (4)	3.1%
1987	6,084 (4)	9.8%
1992	7,703 (4)	4.8%
1997	9,109 (4)	3.4%
2002	10,617 (4)	3.1%

As can be seen, roughly a tripling of growth within Phase I Extended (from 3578 to 10,617) is expected within the next 20 years. Although this may appear to be a high rate it is consistent with the County's desire to channel growth into the "urban" service areas, and represents a far lower number of total people to be accommodated than under the Phase II plan without Ashland (10,617 vs. approximately 20,000). However, because of the relatively high growth rate, it appears that phasing of any new wastewater treatment facilities will have greater than usual potential and should be seriously considered.

WASTEWATER FLOW
PROJECTION

The wastewater flow generated by existing and future growth was calculated by the County based on the above population projection and water consumption records from Phase I and Phase I Extended customers. The following methodology is taken from the County's April 1981 Draft Facilities Plan and would be used as a design flow for alternatives involving sewerage.

The residential/commercial use of water as reviewed was equal to 226 gallons per connection per day, or approximately 78 gallons per capita per day (gpcd) at current household densities. Assuming that only 80% of the water consumed is returned as wastewater, the estimated per capita wastewater flow is: 0.08 x 78 gpcd = 6.24 gpcd.

It is estimated that infiltration from new sewer line construction will be held to the required (by Virginia State Water Control Board) 200 gpd/inch-mile, and that future "non-excessive I/I" will be held at approximately this value through a strict maintenance program and the benefits derived from improved sewer construction materials. At the present time, the Phase I sewage collection system consists of 930.42 inch-miles of sewer pipe which is presently serving approximately 5,000 people, but is available to service the existing area population of 11,980. It is reasonable to assume that the density of development and related sewer lines in Phase I is representative of future densities to be expected in the total area within Phase I and Phase I Extended. The ratio of interceptor collector sewers to available population is $930.42/11,980 = 0.078$ inch-miles per capita. Use of this value with the "non-excessive I/I" value of 200 gpd/inch-mile will result in a per capita non-excessive I/I allowance of 0.078 inch miles/capita x 200 gpd/inch mile = 15.6 gpcd.

Current industrial development in the Study Area is relatively light, but the County expects this to increase significantly with sewer availability in Phase I Extended. To provide capacity for this expansion, EPA allows a per-capita allowance for future nonspecified industrial wastewater flows of 10% of the total design flow or 25% of the total industrial flow, whichever is greater.

The above projected per-capita wastewater flow rates and volumes result in the following values:

Residential/Commercial	62.4 gpcd
Industrial Allowance	6.0 gpcd
Non-excessive I/I	<u>15.6 gpcd</u>
Total:	84.0 gpcd

Future wastewater flows (2003)

Phase I	26,277 persons x 84 gpcd = 2,207,268 gpd
Phase I Extended	<u>10,617 persons x 84 gpcd = 891,828 gpd</u>
Total:	36,894 persons x 84 gpcd = 3,099,096 gpd

Say 3.1 MGD

Both the per capita flow figures used and the overall projection methodology appear to be sound and have taken into account suggestions made in the Draft EIS. The estimated Phase I Extended flow of approximately 900,000 gpd is less than half of the previously estimated Phase II flow (minus Ashland). Assuming that the base population projections used are supportable, EPA will accept as reasonable the above flow projections.

EVALUATION OF PHASE I EXTENDED ALTERNATIVES

Combining the foregoing information regarding updated conditions with previous Facilities Planning reports and suggestions made in the Draft EIS and by interested citizens, the County was able to focus on four possible strategies for wastewater management for the Phase I Extended area:

- (1) Upgrade/optimum operation of existing facilities with no centralized sewerage
- (2) Collection and treatment (at a) within-County AWT plant, with discharge to either the Totopotomoy or Pamunkey River
- (3) Collection and treatment at a within County land treatment facility
- (4) Collection and transport to Henrico County for treatment

(Treatment options for Oak Hill Estates are discussed separately in a later section of this report.)

Service Area

The initial service area is seen as the "panhandle" area from Phase I to I-95 along the Chickahominy and below Route 637, and the Stony Run and Lickinghole Creek basins as far northwest and north as Kosmos Village and the Industrial Air Park, respectively. Also included is limited service to the subdivisions of Totopotomoy and Kingswood Court for ultimate development of each subdivision only, not beyond.

The initial service area would provide wastewater collection and treatment for ultimate flows to the following existing wastewater treatment systems, judged to be currently inadequate to meet the levels of treatment required for discharge to the Chickahominy River Basin.

Kosmos Village	0.033 mgd
Colonial Estates	0.033 mgd
Flemings Truck Plaza	0.010 mgd
Hanover House	0.015 mgd
Lakeridge Industrial Park	0.020 mgd
Industrial Air Park	0.030 mgd
Totopotomoy Subdivision	0.076 mgd
Kingswood Court Subdivision	0.020 mgd
Beechwood Farms Subdivision	0.055 mgd

With the exception of the Totopotomoy and Kingswood Court subdivisions, no service is initially anticipated within the Totopotomoy River Basin; however, pressures do exist for including additional Totopotomoy development, as evidenced by a recent request from Blue Star Estates to be considered within the Phase I Extended solution.

The nature of the Phase I Extended area is such that service could be phased in as needs materialize, provided that the current "problem" systems are improved immediately.

It should be emphasized that these most recent alternatives were studied in the context of the Board of Supervisor's desire for a reduced scope service area, recognizing the separation of Ashland as a fait accompli. The solution for Phase I Extended may still, however, be considered "regional" in the sense that it will address several existing problems occurring within a broad area, and be flexible enough to accommodate anticipated needs over the next twenty years.

The following descriptions are taken from the April 1981 Draft Facilities Plan for Phase I Extended. Further reference should be made to that report for more details. Environmental considerations are discussed separately for Alternative 1, then collectively for Alternatives 2-4, as the latter three essentially share a common sewer network and differ only in their method of treatment.

Alternative 1 -
"Limited Build"

Alternative 1 consists of upgrading existing treatment systems within the service area so that they will comply with applicable effluent limitations. It is the only of the four alternatives which does not involve a centralized sewer network. However, it is not in EPA's view, a "no-action" alternative, as it would provide improved service to a number of currently inadequate wastewater treatment systems. It is also not a "no-growth" alternative; future growth would occur without the provision of public sewerage through the continued use of package treatment systems for individual developments or by individual on-lot treatment systems, primarily septic tanks.

Costs for this alternative were estimated by assuming an advanced level of treatment would be applied to each of the systems requiring an upgrade. The construction cost estimate of \$3,108,500 is competitive with the other alternatives; however, operation and maintenance costs are the highest of any alternative since no economy of scale can be realized, making the total cost over the entire planning period relatively unattractive. (See Table 8).

TABLE 8
ESTIMATED COSTS - LIMITED BUILD ALTERNATIVE ONE

Treatment System	Total Construction Cost*	Amortized Cost \$/1,000 gals.	O & M Cost \$/1,000 gals.	Total Cost \$/1,000 gals.
Kosmos Village	\$390,500	3.03	4.21	7.24
Colonial Estates	390,500	3.03	4.21	7.24
Hanover House	345,000	3.53	4.75	8.28
Lakeridge Ind'l. Park	330,000	4.23	5.57	9.80
Hanover Ind'l. Air Park	365,000	3.12	4.21	7.33
Totopotomoy	501,500	1.69	2.18	3.87
Kingswood Court	330,000	4.23	5.57	9.80
Beechwood Farms	456,000	2.12	2.78	4.90
Total:	\$3,108,500	-	-	-
Average Cost \$/1,000 gals	-	2.73	3.64	6.37

* No allowance made for non-construction costs -- land acquisition, site work, electricial, engineering, legal and contingencies.

Source: Draft Addendum - Facilities Plan - Phase I Extended, Patton, Harris Rust & Guy
- April 1981.

This alternative was determined not to be an acceptable solution by the Facilities Planning consultants because of high costs and the lack of growth control it provides.

Environmental Considerations

A number of impact categories may be affected by implementation of this alternative. The discussion will focus on those key areas which involve the most profound effects and which should be given primary consideration in deciding which solution to pursue.

Primary, or direct, impacts occurring from actual construction of the facilities' improvements will be minimal and acceptable, assuming that most of the upgrades will be accomplished on or adjacent to existing treatment sites. No construction of collector or interceptor sewers is anticipated, thus avoiding any direct disturbance of resources beyond the treatment plant sites.

The water quality of the Stony Run, Lickinghole Creek, Totopotomoy, and Chickahominy Rivers will be enhanced by improving the quality of effluent now discharged into those water courses. However, there will continue to be numerous effluent discharges into the above streams, as existing and future growth will be accommodated by a number of separate systems. Additionally, malfunctioning or marginally operating individual septic systems will not be collectively addressed under this alternative, but handled on a case-by-case basis as the need arises. This will mean a slower rectification of those problems with a corresponding strain on local government resources, and possibly on surface or groundwater quality in the short-term. However, this does not imply that properly installed and operated on-site systems cannot be relied upon as a longer-term solution in areas with proper soil conditions.

Indirect growth-related impacts under this alternative appear on the surface to be negligible, as the facilities improvements do not provide capacity for future growth. However, by forcing future development to be accommodated via on-site or package treatment systems, the limited build alternative will cause the pattern of development to be more widely dispersed and less manageable from a local governmental viewpoint. Location of future development will be more dependent on suitable soils, possible effluent discharge points, and local growth controls (e.g. zoning, subdivision ordinances) than on location of interceptor sewers.

Assuming similar growth attractiveness and pressure in the Phase I Extended area with or without the provision of central sewerage, this alternative will cause more land area to be developed than the others because population density will be less than under a sewered alternative. While quantifying indirect impacts under this alternative is difficult, it is reasonable to assume that the total amount of land disturbed, or altered from its present use, will be at least as much as under the sewered alternatives. Although termed "limited build", this alternative could conceivably cause the loss of significant amounts of prime agricultural land, woodlands, and wildlife habitat. Again, this conclusion is based on an assumption of equal growth pressure with or without provision of public sewers. The County could diffuse these negative effects with an aggressive program of land use management and control.

Impacts from the limited build alternative on the sensitive ecologies of streams in the planning area, particularly the Chickahominy and Totopotomoy, will depend on the control exercised by local governments concerning location of new development. Some direct impact on the streams will occur, although water quality will be improved, as effluent discharges continue into these streams. The increased wastewater load generated by a projected 7,000 additional people in Phase I Extended area by the year 2002 can be absorbed without detriment to these streams provided that the systems sewage treatment are properly operated and maintained.

A more subtle but significant effect is likely to occur from non-point source runoff generated by the roads, driveways, roofs, parking and other impervious areas associated with new development. As noted in the Draft EIS, regardless of the alternative selected, non-point runoff will have a great effect on water quality of County streams. The SWCB estimates that 97% of the phosphorus load on the Chickahominy River comes from non-point sources. The assimilative capacity of the streams and filtering action of wetland areas can buffer some of this runoff pollution; however, it is recommended that the County strictly enforce strict sediment and erosion control ordinances, or like measures to ensure that the carrying capacity of these streams is not unduly overburdened. A non-point source control program should also be established through local-State cooperation to protect especially sensitive watersheds, such as the Chickahominy and Totopotomoy. The rationale for such a program was outlined in a SWCB memorandum in December, 1980.

Alternative 2
Hanover County
AWT Plant

Alternative 2 consists of collection of all wastewater flows and treatment by Hanover County in an advanced wastewater treatment plant with effluent discharge to either the Totopotomoy or the Pamunkey Rivers.

The base system serving the Stony Run and Lickinghole Creek drainage basins in Phase I Extended is shown in Figure . This system is presented here because it is an element of the total wastewater collection system common to other alternatives to be considered. It consists of the following sewer lines: approximately 1,400 feet of 8" diameter, 7,000 feet of 10" diameter, 3,700 feet of 12" diameter, and 12,900 feet of 15" diameter; one minor pumping station serving Colonial Estates and a larger pumping station serving the entire drainage basin located at the base of Sliding Hill. Sewer line sizing is approximate only, and is a function of either the projected 20-year flows within the drainage area, or the degree to which limited slopes exist in areas where sewer will be provided. Pumping stations are sized for costing purposes to handle year 2002 flows, although initial design may provide for lower initial flows to facilitate proper operation.

This base system provides service to six (6) of the existing wastewater treatment systems and additional land for initial growth in residential, commercial and industrial development. Either the Lakeridge or Air Park interceptors would be designed to allow interceptor extensions up Lickinghole Creek with final determination of the most effective approach being dependent on actual on-site surveys.

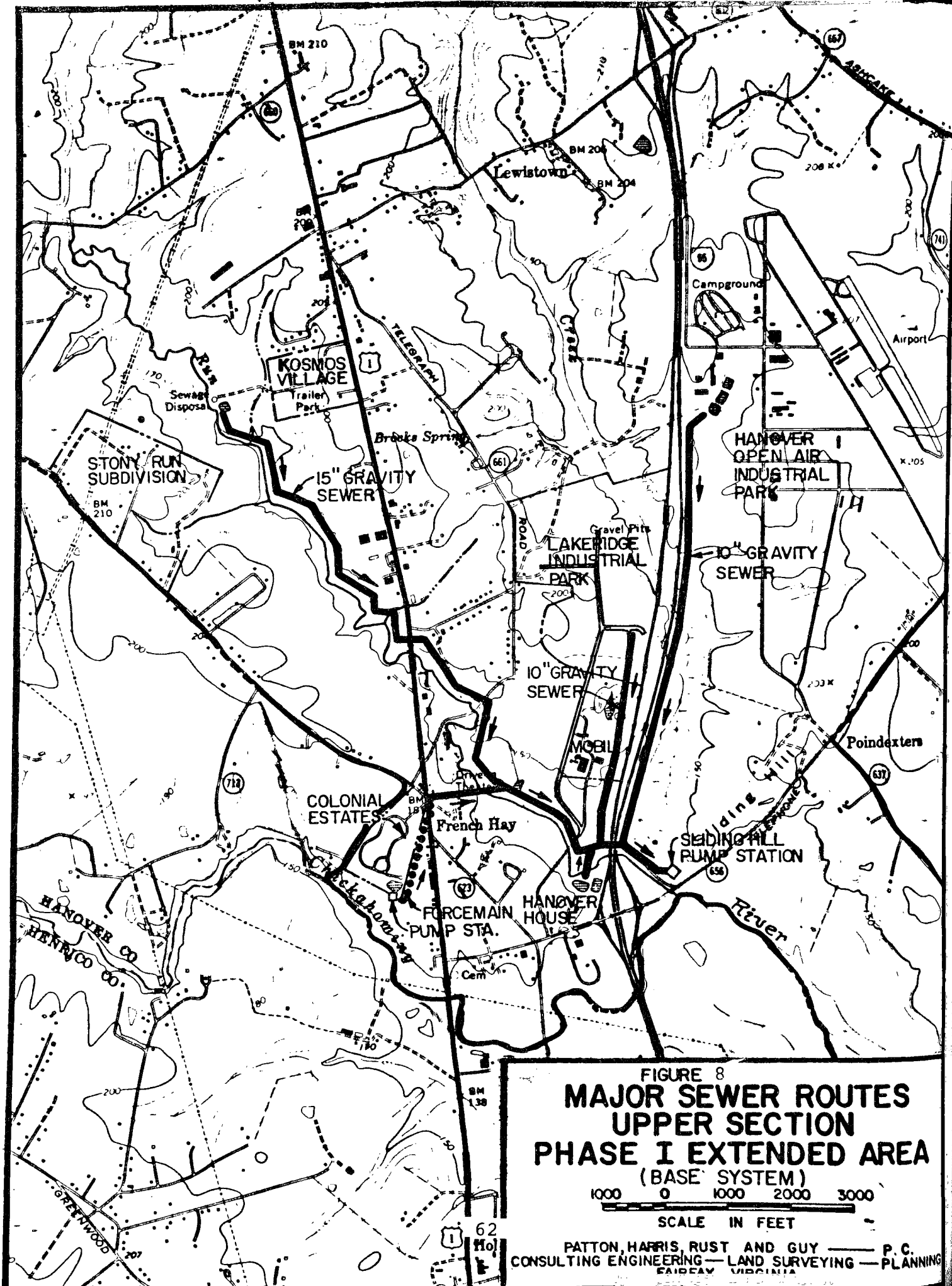


FIGURE 8
**MAJOR SEWER ROUTES
UPPER SECTION
PHASE I EXTENDED AREA**
(BASE SYSTEM)

1000 0 1000 2000 3000
SCALE IN FEET

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Regardless of discharge point, the level of treatment required under Alternative 2 will be advanced and relatively expensive. The State Water Control Board has determined allowable discharge limitations, (wasteload allocations) for potential discharge points on the Totopotomoy and Pamunkey Rivers. These are presented in Table 9. The relatively expensive consideration of pumping the effluent to Nelsons Bridge on the Pamunkey (61,600 ft.) would have to be evaluated against the unquantifiable impact of discharge to the Totopotomoy and its critical, environmentally-sensitive areas. For purposes of initial cost comparison, discharge has been assumed to be to the Totopotomoy.

Table 9

Effluent Limits

Pamunkey River near Nelson's Bridge
Effluent Discharge = 3.0 mgd

<u>DO (mg/l)</u>	<u>CBOD5 (mg/l)</u>	<u>TKN (mg/l)</u>
6.73	21.0	1.0
6.73	18.0	2.0
6.73	15.0	3.0
6.73	8.0	5.0

Totopotomoy Creek above Route 643

<u>Effluent Discharge (mgd)</u>	<u>DO (mg/l)</u>	<u>CBOD5 (mg/l)</u>	<u>TKN (mg/l)</u>
0.5	6.0	16.0	20
1.5	6.0	11.0	20
2.1	6.0	9.0	20
2.7	6.0	7.0	20
3.5	6.0	6.0	20

Source: Virginia State Water Control Board

The treatment plant itself is shown to be located within the Chickahominy River basin and the County Board-delineated service area, although many valid arguments do exist for placement within the Upper Totopotomoy drainage basin (above Route 643). It is recognized that many problem spots and areas of marginal suitability for septic systems are not covered by this more-limited service area. Nonetheless, it is the Board of Supervisor's and County Staff's determination that solution of these smaller problem areas with a wastewater collection system at this time will have its initial benefits significantly overshadowed by the adverse environmental impact of presently-unwanted residential and commercial development. Initial limitations to the service area were also deemed necessary to allow development of a solution solving the areas worst problems, while remaining affordable to the ultimate users.

Estimates of cost for this alternative, including the costs of the "base system" are presented in Table 10, and will be compared with other alternative costs in a subsequent section.

Environmental considerations are discussed collectively for Alternatives 2-4.

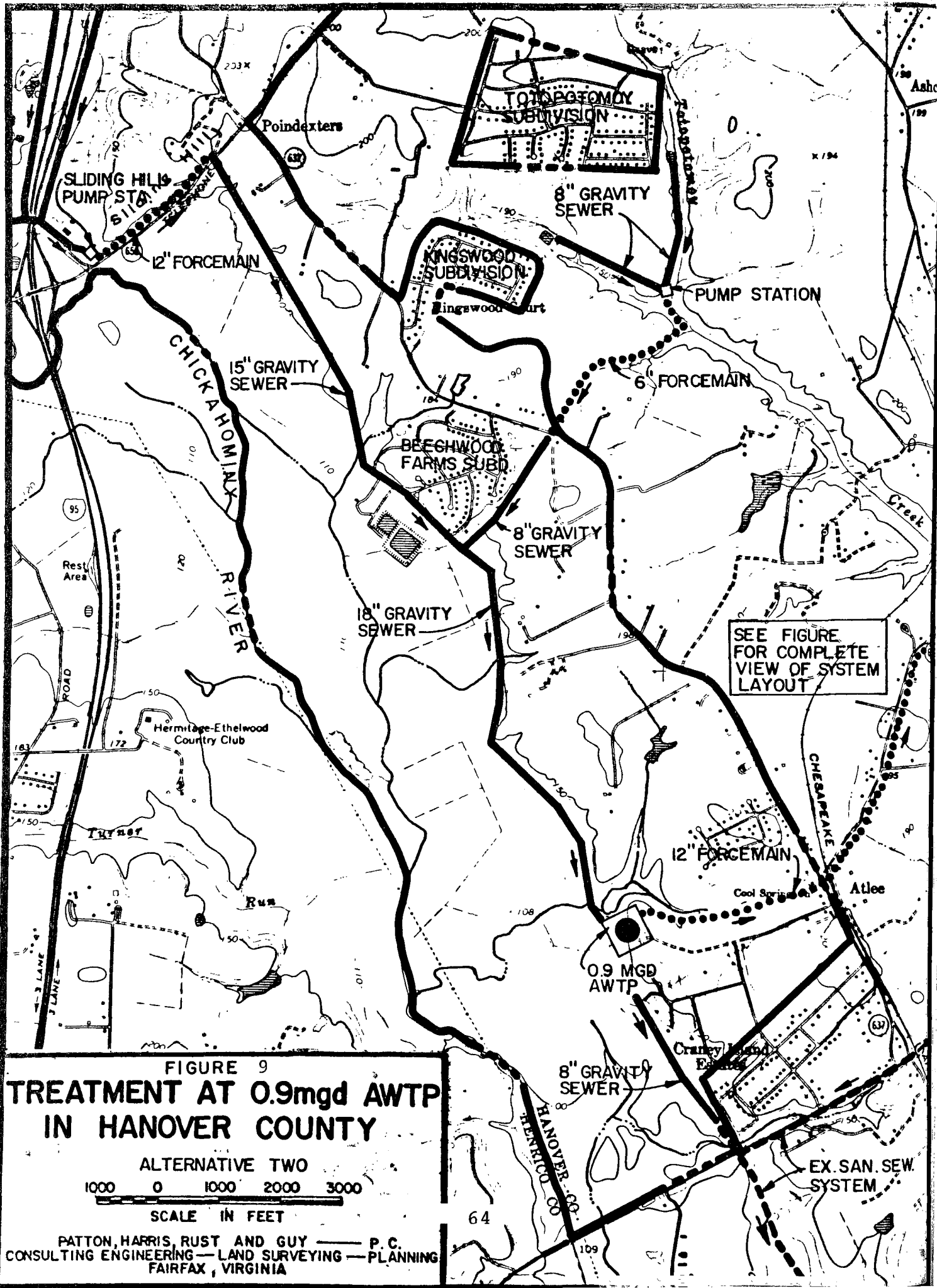


TABLE 10
ALTERNATIVE TWO

ESTIMATED COSTS - HANOVER COUNTY 0.9 MGD TREATMENT PLANT

Item	Construction Cost	O & M Cost
Base Sytems:		
1,800 LF 4" forcemain	\$ 21,600	\$ 70
1,700 LF - 8" san. sewer	43,400	160
7,300 LF - 10" san. sewer	227,200	810
3,800 LF - 12" san. sewer	136,500	410
12,850 LF - 15" san. sewer	539,700	1,920
300 LF Tunnel under Rte. 95	120,000	-
Colonial Estates Pumping Station	64,800	7,080
Sliding Hill Pumping Station	351,400	12,530
Subtotal:	\$1,504,600	\$22,980/year
3,500 LF 6" forcemain	\$ 52,500	\$ 150
2,500 LF - 12" forcemain	62,500	160
8,400 LF 8" san. sewer	235,200	920
5,700 LF - 15" san. sewer	239,400	930
9,700 LF - 18" san. sewer	455,900	1,850
Totopotomoy Pumping Station	103,600	8,180
Subtotal	\$1,224,800	\$12,430/year
Pamunkey discharge:		
0.9 MGD	\$1,166,420	\$130,860
Effluent Pumping Station	334,500	23,920
61,600 LF 12" forcemain	1,540,000	3,970
Total Cost:	\$5,694,620	\$193,920/year
	= 532,320/year	
	= \$1.62/1,000 gals	\$0.59/1,000gals.
Total:	2.21/1,000 gals.	
Totopotomoy Discharge:		
0.9 MGD AWTP	\$1,827,200	\$208,520
Effluent Pumping Station	200,000	15,040
9,500 LF 8" Forcemain	171,000	630
	\$4,851,900	
	435,545/yr.	259,360/year
	= \$1.38/1,000 gals.	\$0.79/1,000 gals.
Total:	\$2.17/1,000 gals.	

Alternative 3
Land Treatment

Alternative 3 involves use of the "base" collection system defined earlier. All wastewater flows from this area would be collected and pumped to the land application site via the Sliding Hill Pump Station. The panhandle of Phase I Extended and Totopotomoy and Kingswood Court subdivisions would be served by an interceptor extended along the Chickahominy from Phase I (Craney Island).

The treatment system would include primary treatment by aerated lagoons, chlorination, minimum 60-day storage capability, pumping to distribution, spray irrigation and collection and recycle for zero discharge. Overland flow and infiltration/percolation methods of land application were rejected in favor of irrigation based on effluent quality, land requirements, soils limitations with respect to depth and percolation rate, and potential impact on groundwater quality.

The land application alternative was reviewed extensively in the Preliminary Draft Facilities Plan, the Expanded Scope Facilities Plan, the Draft EIS and the Ashland Facilities Plan. Design criteria used herein is similar, including applicable requirements of the State Water Control Board. Application sites, as developed and screened in these documents, were evaluated as potential sites. The use of separate sites was ruled out due to the expense of duplicate facilities. Site #2 has been used in this report as a potential site and serves as the basis for cost calculations.

Site #2 is the one closer to Sliding Hill Pump Station and is characterized by cleared farmland, thus avoiding some of the environmental and cost impacts from additional clearing and grading. The possibility that most sites investigated are in a critical groundwater recharge area may require added protection by the installation of an underdrain collection system. Total area requirements are approximately 280 acres, including the required 400-ft. buffer zone on all sides. Crossing of the site by public roads would possibly require additional land for buffer zone requirements.

If land application becomes the selected alternative, a first step in the overall design procedure would be the verification of site suitability for land treatment, including analysis of floodplain limits, soil composition and depth, and groundwater level, flow rate and direction of movement.

The costs for this alternative are shown on Table 11. Costs for transmission from Sliding Hill Pumping Station to the treatment site have been kept separate to allow analysis of costs for land application at other potential sites.

TABLE 11
ESTIMATED COSTS FOR LAND TREATMENT
ALTERNATIVE THREE

Item	Capital Costs	O & M Costs
I. Base System	\$1,504,600	\$22,980
II. Land Treatment Components		
A. Pre-Application	83,700	22,000
B. Pumping	188,400	7,340
C. Storage	429,700	2,600
D. Field Preparation	49,500	-
E. Distribution (Center Pivot Spray)	163,700	29,370
F. Recovery	255,500	9,900
G. Administration & Lab	96,300	14,130
H. Monitoring Wells	7,300	4,000
I. Roads and Fencing	131,000	3,420
J. Chlorination	62,800	5,570
K. Plant/Cultivate/Harvest		
L. Land	843,000	
M. Transmission to Site 2	1,518,000	12,350
III. Sewering Lower Phase I Extended Area	935,200	52,070*
Totals:	\$6,168,700	
	576,636/year	260,930/year
	1.76/1,000 year	0.80/1,000 gals.
Total Cost:	\$ 2.56/1,000 gals.	

* Includes costs for treatment in Henrico County.

Alternative 4
Hanover Collection,
Henrico Treatment

Alternative 4 consists of the collection and transport of all wastewater flows in Phase I Extended to Henrico County for treatment. Use would be made of the existing Phase I system Beaverdam Pumping Station and Chickahominy interceptor. The general alternative considered involves the "base" collection system reviewed earlier, the Sliding Hill Pumping Station, a pumping station serving the Totopotomoy and Kingswood Court subdivisions, and approximately 18,500 lineal feet of interceptor sewer along the Chickahominy River to a connection with Phase I at Craney Island Estates. See Figure . Minor variations to this flow routing have also been considered in an attempt to arrive at the minimal cost approach.

This alternative would not require any upgrading or expansion to the existing Phase I system during the entire 20-year study period. A review of capacity available in the existing Phase I sewerage system, compared to existing and projected wastewater flows in both Phase I and Phase I Extended, indicates that adequate capacity exists in the Chickahominy (Phase I) interceptor for year 2002 flows from Phase I Extended and for Phase I at an ultimate capacity of 10 persons to the acre (original designs planned for an ultimate density of only 8 persons per acre). As reviewed earlier, the projected wastewater flows from both Phase I and Phase I Extended have been estimated at 3.1 mgd. Hanover County currently has a contract with Henrico County for treatment capacity of 3.0 mgd in their existing sewage treatment plant. Henrico County, through the EPA grants process, has initiated construction on a system of new interceptors, pump stations and a 30 MGD sewage treatment plant (year 2005). Because of funding uncertainties, no fixed date has been given for project completion, although 1988 has been cited as a possible completion time. The design for these facilities has included 3.7 MGD capacity for Hanover County for year 2005 wastewater flows. The plant will be expandable and has indicated potential Hanover County wastewater flows to it of 5.4 MGD.

Thus, under the current planning assumptions and resultant year 2002 flows of 3.1 MGD, it is not expected that any modifications will be necessary to the existing and proposed Hanover facilities or to the Henrico County Facilities, until after the 20-year planning period.

It is unrealistic to predict future populations and their exact locations beyond this initial planning period, although it appears that a significant amount of capacity will still be available in both County systems at this time. Availability of capacity and ease of expansion are two positive elements of this alternative. It is also apparent that this alternative provides additional flexibility to Hanover County. If at some point in time Hanover requires capacity beyond what Henrico County can provide, or if Henrico treatment costs become too expensive to justify contracting for additional capacity, Hanover will still have their backbone system of interceptors and pumping stations, and would be able to consider construction of their own sewage treatment plant to handle part or all of their wastewater flows. The existence of a larger service population at this point in time would also serve to reinforce the feasibility of this consideration. The County of Henrico Wastewater Facilities Planning Study, January 1977, with update costs in October 1977, estimated charges to Hanover County of approximately \$0.50 per thousand gallons for transportation and treatment of its wastewater. Delays in construction funding, however, have pushed back the project completion time from 1982 to, at the earliest, 1988. The many uncertainties involved in financing this project unknown grant money availability, different project

construction times, separate bond programs and related interest requirements all combine to make it extremely difficult to estimate what this final cost will be. The Henrico Facilities Plan (Appendix 15) in its detailed financial analysis, indicated project O & M costs (with inflation allowance) to be at least 50% of the total cost per thousand gallons. Even if the final construction cost is twice the October 1977 estimate, they would only increase the total cost per thousand gallons by 50% ($2 \times 50\% + 50\%$), or to approximately $150\% \times \$0.50 = \$0.75/1,000$ gallons. Current estimates of total construction costs for Henrico County are now estimated at \$151 million, a 98.7% increase from the original estimate. To be on the conservative side, it has been assumed that the costs to Hanover County will be approximately \$0.75/thousand gallons. This value has been combined with the costs for the Phase I Extended facilities to provide a total cost per thousand gallons for service to Phase I Extended - See Table 12.

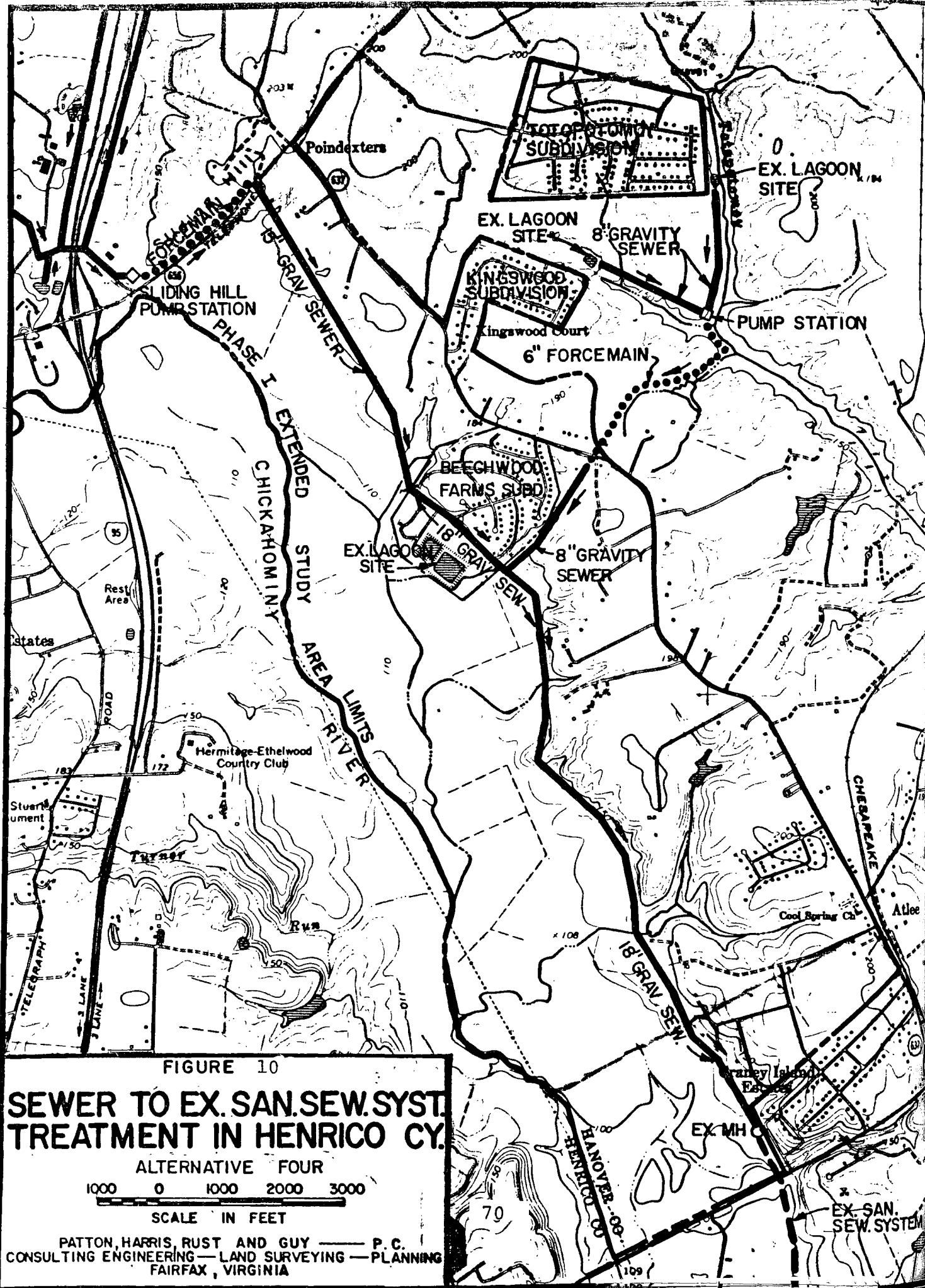


FIGURE 10

SEWER TO EX. SAN. SEW. SYST. TREATMENT IN HENRICO CY.

ALTERNATIVE FOUR

1000 0 1000 2000 3000

SCALE IN FEET

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FAIRFAX, VIRGINIA

TABLE 12.
ESTIMATED COSTS - TREATMENT BY HENRICO COUNTY

ALTERNATIVE FOUR		
Item	Construction Costs	O & M Costs
Basic System:		
1,800 LF - 7" forcemain	\$21,600	\$70
1,450 LF - 8" san. sewer	43,400	160
7,300 LF - 12" san. sewer	227,200	810
3,800 LF - 12" san. sewer	136,500	410
12,850 LF - 15" san. sewer	539,700	1920
300 LF tunnel under Rte. 95	120,000	-
Colonial Estates Pumping Station	64,770	7,080
Sliding Hill Pumping Station	351,400	12,530
Subtotal:	\$1,504,600	\$22,980/year
3,500 LF - 6" forcemain	52,500	150
2,500 LF - 12" forcemain	62,500	160
5,900 LF - 8" san. sewer	162,200	600
5,700 LF - 15" san. sewer	239,400	930
12,800 LF - 18" san. sewer	103,600	8,180
Subtotal:	\$1,224,800	\$12,430/year
Total:	\$2,729,400	\$35,410/year
	0.78/1,000 gal.	0.11/1,000 gal.

Treatment Costs at Henrico County = \$0.75/1,000 gallons

Total Cost: \$1.64/1,000 gallons

However, uncertainty exists as to the applicability of this rate to Hanover County exists with respect to the use of sewer wholesale rates and the method used for offsetting Henrico's capital costs. Thus, for purposes of this initial comparison, use of the value of \$0.75 per thousand gallons appears to be reasonable.

As a variation to this alternative, consideration was given to two alternatives 4A and 4B which allow for transport of most of Phase I Extended wastewater flows to Henrico County at the Interstate 95 crossing of the Chickahominy River in lieu of using the Phase I Facilities. (Figures and). While comparable in total cost to Alternative 4, it should be noted that: 1) these alternatives do not allow service to the entire panhandle of Phase I Extended; 2) they limit somewhat the County's flexibility to provide their own treatment plant in the future; and, 3) Hanover rejected the option of utilizing Henrico's Turner Run interceptor before it started construction and would now have to negotiate with them for an allocation of a portion of Henrico's future capacity needs.

Based on this, the Facilities Plan rated Alternative 4 as preferable to 4A or 4B, and utilized this in the cost comparison with other alternatives.

Environmental
Considerations -
Alternatives 2, 3,
and 4

Alternatives 2, 3, and 4 all share the common feature of a sewer network, which with minor variations, serves the same areas of Phase I Extended, follows similar routing patterns, and will cause similar environmental effects.

Primary Impacts

Primary effects from construction of collector or interceptor sewers along or across stream beds include increased erosion and sedimentation deposits. The proposed sewer network avoids, where possible, placement of sewer lines directly within streambeds; however, the significant cost savings realized from use of gravity sewers vs. forced flow sewers dictates that many lines follow the general contour of stream valleys. The temporary adverse impacts expected from these sewer placements can be minimized through the use of standard engineering practices for sedimentation and erosion control. The adverse impacts associated with stream crossings are potentially significant and should be addressed carefully prior to construction. In some cases, the effects can be minimized by jacking the sewer pipe beneath the stream bottom itself. In others, installation via cofferdams may be appropriate. Consultation should occur with local or State soil and water conservation agencies to ensure that proper techniques are employed.

Many of the sewer lines will lie within or near floodplain areas, as delineated in Figure 2. While this will not necessarily cause any direct adverse effects, care must be taken during design and construction to 1) avoid location in floodplain areas where possible and 2) to ensure sound construction techniques are utilized to minimize any potential damage should flooding occur. Alternative 3 is the most susceptible to direct flood damage as the land application sites themselves lie within a floodplain. The Federal Emergency Management Agency (FEMA) now has responsibility for the National Flood Insurance Program and Executive Order No. 11988 on Floodplain Management. They should be consulted regarding specific mitigative measures for construction of wastewater facilities within a floodplain.

Other primary impacts which can be expected from Alternatives 2, 3, and 4 are similar to those discussed in the Draft EIS, but to a lesser extent since the service area has been considerably reduced in scale. Indeed, the direct impacts related to construction in the Totopotomoy River Basin will be all but eliminated since this area was removed from consideration (with minor exceptions) for service during the 20 year planning period.

Secondary Impacts

The most significant potential impacts from the three sewered alternatives are those secondary effects which could result from the development accommodated by the central wastewater treatment facilities. Depending on its location, this development could adversely effect such environmental resources as prime agricultural lands, wetlands, wildlife habitats, and terrestrial and aquatic biota. Hanover County has instituted a new General Policies Plan (GPP) through a Growth Management Program which provides the basic framework necessary to control growth and the detrimental environmental effects which can accompany uncontrolled growth. The effectiveness of this program will depend on the degree to which the County is willing to strictly adhere to the planning goals embodied in the Plan.

Alternatives 2-4 represent potentially both promising and pessimistic future scenarios for the County. A sewered alternative will greatly assist the County in accomplishing the goal of locating future growth in the "urban" service areas, provided that other aspects (of the GPP) are also implemented. However, provision of a sewer network for Phase I Extended without a strong County commitment to sound land use management could result in significant negative consequences.

Among the issues of greatest public concern are those potential growth impacts on the Totopotomoy Creek Basin wetlands, future water supplies (due to interbasin transfer) and water/wastewater relationships, impacts on prime agricultural land, and on the general rural character of the area. There will be some effect on these characteristics with or without a sewered alternative. Under the sewered alternatives (2, 3, and 4), the environmental effects will be generally less severe than if the same amount of growth were handled with on-site or package systems, primarily because less total land area would be disturbed. One potential negative effect of the sewered alternatives is the increased pressure to connect existing and future systems, and subdivisions, lying outside the Phase I Extended area but within the Totopotomoy River Basin. This pressure will be strong along Route 301 North, and eastward along Routes 643 and 606. Connection of existing subdivisions would eliminate some scattered pollution problems, but the presence of an interceptor sewer would tend to direct growth into this area prematurely. This action could strain the carrying capacity of the Totopotomoy Creek, potentially creating an even larger environmental problem. Measures to minimize this effect include strict County application of available growth controls, and careful routing, sizing, or phasing of sewer lines.

Introduction of public sewers into the Phase I Extended area will tend to accelerate growth there initially, but long term demand depends on many other growth attractiveness features, such as roads, schools, taxes, and aesthetic appeal. That is, sewer, per se, do not create a demand for growth; rather they can serve as a catalyst, or a tool for growth control.

In the longer term, it is probable that equal growth pressures will occur with or without public sewers, on a County-wide basis. Therefore, a key question becomes whether it is best, all factors considered, to address pollution problems and expected growth in the Phase I Extended area via continued use of on-site and private package treatment systems, a central sewer system, on a combination of the two, where sewers are phased-in as growth materializes sufficiently to enable citizens to afford them?

Treatment Method

Under the sewerred Alternatives, three treatment options are available: advanced wastewater treatment at a within-County facility with stream discharge (Alternative 2), land treatment within County without a point discharge (Alternative 3), or transport to Henrico County for treatment (Alternative 4). Environmentally, Alternative 4 is preferable as it would address needs while preserving and enhancing water quality in Hanover County more effectively than the other two alternatives. One negative environmental effect of Alternative 4 is that up to 1.0 mgd of water will be diverted from the Chickahominy (and minimally the Totopotomoy) to the James River Basin. This is not expected to jeopardize future water supplies of the County or the Town of Ashland, based on projected safe yields of the South Anna and Pamunkey Rivers. However, the County must take care to ensure that adequate water supplies are available in conjunction with any improvements made for wastewater treatment facilities.

A Hanover County AWT plant (Alternative 2) is technically feasible, but less environmentally desirable and a more costly option. The VA SWCB has issued effluent limitations for discharge into either the Totopotomoy or Pamunkey Rivers. The impacts from either discharge option could be significant in several categories, given present environmental conditions. This is not a recommended alternative now, but could become more attractive later during the planning period depending on how growth occurs, and how treatment costs compare relative to Henrico County's treatment costs.

The land treatment option (Alternative 3) is desirable from the standpoint of requiring no stream discharge, and because of its feature of recycling and reuse of nutrients and other resources, is encouraged by the Federal Clean Water Act. Its two main drawbacks here are high initial construction costs and the large amount of land required for transportation, treatment, and buffer zones. Additionally, the two potential treatment sites lie within groundwater recharge areas, requiring special precautionary measures and monitoring. The land treatment option should not be ruled out totally, however. It could be employed for a portion of the Phase I Extended area or for individual subdivision or commercial treatment. Land treatment remains a technology which is supported by EPA and would be an environmentally acceptable alternative for Hanover County.

Costs

Perhaps the most determinative factor as to which wastewater treatment solution is chosen will be the ability of the County government and residents to afford the local share associated with each system. The existing Phase I system has been beset with financial problems requiring supplemental assistance from the County's general revenue fund. Many County residents have voiced concern over embarking on a new financial program for a Phase I Extended wastewater system when the existing Phase I financial situation has not resolved. In addition, the future of EPA's Construction Grants Program is uncertain due to funding cutbacks and policy changes. Although the Phase I Extended area is on the State priority list as an EPA fundable project, there is some doubt as to whether Federal money will be available, even at a reduced percentage rate, when the County is ready to proceed.

To assess this situation, the County recently contracted for the preparation of a report entitled "Financing Alternatives for the Hanover County Phase I Extended Wastewater System Project". This report analyzes various financial options for the Phase I Extended alternative, assuming that no Federal (EPA) funds will be available. The report concluded that the least cost, least risk method of financing is to:

- o Fund the residential area east of I-95 (Segment 1) with Farmers Home Administration low-interest, long-term loans.
- o Fund the commercial area east of I-95 (Segment 2) with conventional financing of lease/purchase financing or developer pro rata share financing.
- o Fund costs attributable to trailer parks in the area west of I-95 (Segment 1) with Housing and Urban Development Community Block Grants.
- o Fund the balance with conventional or lease/purchase financing.

The report also recommends that either the areas east of I-95 (Segments 1 and 2) be funded together or the entire Phase I Extended area be funded.

A wide range of user charges could be applied depending on the method of financing chosen, and whether Phase I and Phase I Extended customers are combined into one payment system. The Draft Facilities Plan projects that with a new connection fee of \$1500 and no EPA funding, a typical Phase I Extended system user could expect to pay roughly between \$52-65 every two months, or an annual charge of \$312-\$390. EPA guidelines suggest that user charges should not exceed 2.5% of median household income. In the case of Hanover County, this amounts to roughly \$400/year.

If EPA funding is available and is sought by the County, a detailed user charge system must be developed and approved by EPA prior to award of Federal funds for construction (Step 3).

Summary of Phase I Extended Alternatives

Selection of an alternative to serve the needs of the Phase I Extended area must take into account a variety of cost, environmental, and social factors. Tables 13 and 14 summarize and compare the costs and environmental impacts of the four alternatives discussed in the Phase I Extended Draft Facilities Plan.

Using a set of evaluative criteria, including costs and environmental effects, the Draft Facilities Plan presented a preliminary ranking of the four alternatives, recognizing that public hearing testimony and other public and local government opinions would also contribute to the selection process. The ranking listed Alternative 4 as the "best" alternative, followed by Alternatives 2, 3, and 1 in that order. While the evaluative criteria were not individually weighted per se, they were averaged to derive a final numerical ranking, which in effect assigned an equal weight to each criteria. And while EPA does not disagree with the preliminary identification of Alternative 4 as the most cost-effective alternative, the public and local decisionmakers should be aware that if different weightings were assigned and public opinion factored in, the final averages as well as ranking order beyond the first choice could possibly change. Alternative 1 would tend to be elevated in rank to a point where it could compete with Alternatives 2 and 3 as a viable alternative.

TABLE 13
PHASE I EXTENDED
ENVIRONMENTAL IMPACTS COMPARISON

Impact Area	Alternative			
	(1) Limited Build	(2) Hanover AWT Plant	(3) Hanover Land Treatment	(4) Henrico Interconnect
Surface Water Quality	+	+	+	++
Groundwater Quality	+	++	+	++
Water Supply	o	o	-	o
Aquatic Biology	+	+	++	++
Terrestrial Biology	o	-		-
Population Growth	o	+	+	+
Land Use	-	+	+	+
Land Requirements		-	--	
Construction Impacts	o	-	-	-
Flood Hazard Areas	o	-	--	-
Scenic Rivers	o	o	o	o
Prime Agricultural land		-	--	-
Historical/Archeological Sites	o	o	o	o
Groundwater Recharge Areas	o	o		o
Wetlands	o			o
Implementation	o	+	-	+

Key: ++ = Very beneficial impact
+ = Beneficial impact
o = Not impacted by the alternative/equal adverse and beneficial impacts
- = Adverse impact
-- = Very adverse impact

NOTE: These impact categories have not been weighted in importance. Thus, no quantitative totals appear.

TABLE 14
PHASE I EXTENDED
ALTERNATIVE TREATMENT COSTS

Alternative	Const. Cost \$	Amortized Const. Cost \$/Year	Cost. Cost \$/1,000 gals.	Annual O&M Cost \$/Year	O&M Costs \$/1,000 gals.	Total Cost 0% Grant	\$/1,000 gals. 50% Grant	75% Grant
1. Limited Upgrade	\$3,108,500	\$290,575	\$2.73	\$388,600	\$3.64	\$6.37	\$5.01	\$4.32
2. AWT Plant								
a. Totopotomoy Discharge	4,851,900	453,545	1.38	259,360	0.79	2.17	1.48	1.14
b. Pamunkey Discharge	5,694,620	532,320	1.62	193,920	0.59	2.21	1.40	1.00
3. Land Treatment	6,168,700	576,636	1.76	257,850	0.80	2.56	1.68	1.18
4. Treatment in Henrico	2,729,400	255,14	0.78	281,790	0.86*	1.64	1.25	1.06

*Includes estimated treatment costs in Henrico County system.

Because of the projected initially high growth rate, the Federal funding uncertainties, and possible fluctuation in Henrico County's cost, phasing or combinations of the four alternatives are also possible choices. For example, the County may elect to initially construct a sewer system from Phase I as far west as I-95 with treatment in Henrico County (a portion of Alternative 4), while applying the limited build solution to areas west of I-95.

However, of the four main alternatives, EPA concurs with identification of Alternative 4 as most cost-effective and, with appropriate preventive measures applied to control construction impacts and growth related secondary effects, believes it can be an environmentally acceptable solution.

OAK HILL ESTATES

Alternatives for Oak Hill Estates (located directly southwest of the Town of Ashland) were examined separately in the Phase I Extended Draft Facilities Plan because the subdivision is located away from the Phase I Extended initial service area and because of public controversy.

The following four options were evaluated for Oak Hill Estates:

1. Interceptor sewer construction for connection into the Phase I Extended system (assumed to include a sewer network)
2. An advanced waste treatment plant on-site, with discharge to Stony Run or Falling Creek
3. Connection to the Ashland system via pump station and force main
4. An individual land treatment system.

Table 15 taken from the Draft Facilities Plan presents a cost comparison of these four options. The table indicates that connection into the Ashland system (Alternative 3) is clearly the least costly option.

From an environmental perspective, Alternative 1 is associated with the most numerous adverse impacts due to lengthy interceptor construction and corresponding growth impacts which are inconsistent with County planning goals. For this reason, it is not an acceptable solution. Alternatives 2, 3, and 4 present insignificant and roughly equal overall environmental impacts. Alternatives 2 and 4 do not involve construction of major sewer lines outside the general boundaries of Oak Hill Estates and thus avoid impacts associated with interceptor construction. However, Alternative 2 would require construction of an effluent discharge line to either Stony Run or Falling Creek, while Alternative 4 would require pumping of treated wastewater to a site outside of the subdivision. Alternative 3 involves construction of a force main to the existing Ashland sewerage system. Some temporary adverse impacts can be expected from this alternative, including at least one stream crossing. But the potential for induced growth is not expected to be strong because the force main would technically and economically restrict additional connections and Ashland could limit through agreement the amount of flow it would receive.

It is recognized that many residents, and the Ashland Town Council object to resolution of a "County problem" by Ashland. However, given the overwhelming cost advantage of the Ashland interconnect option, along with minimal environmental impact, it is difficult to argue on a cost-effective basis that any but this alternative should be implemented. Therefore, unless a cost competitive technical alternative can be found for an on-site upgrade, EPA must support the Ashland interconnect alternative and recommends that the Town modify its plans accordingly.

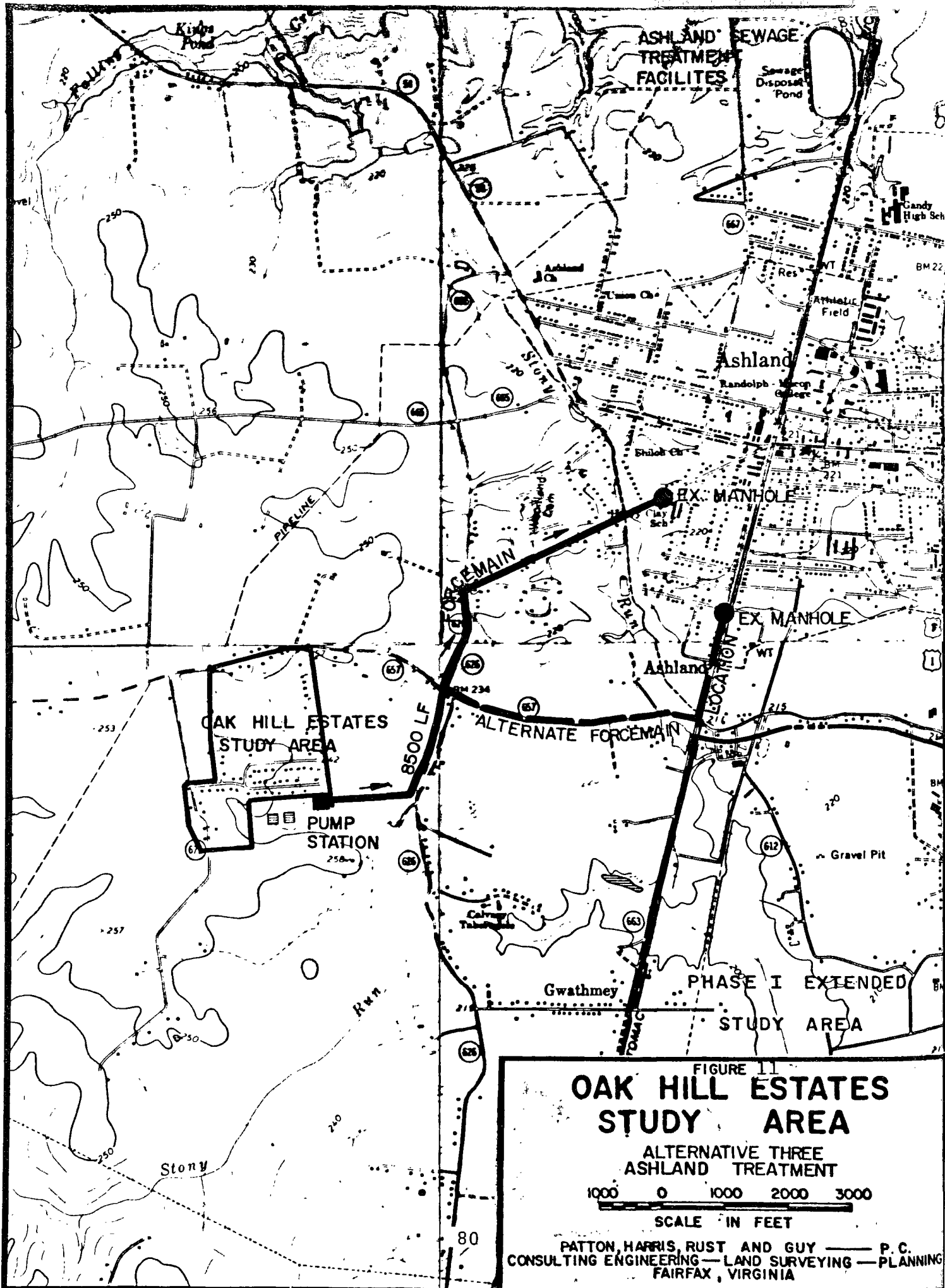


FIGURE 11
OAK HILL ESTATES STUDY AREA
ALTERNATIVE THREE
ASHLAND TREATMENT

1000 0 1000 2000 3000
SCALE IN FEET

PATTON, HARRIS, RUST AND GUY — P. C.
CONSULTING ENGINEERING — LAND SURVEYING — PLANNING
FAIRFAX, VIRGINIA

TABLE 15
OAK HILL ESTATES
ALTERNATIVE TREATMENT COSTS

Alternative	Const. Cost \$	Amortized Const. Cost \$/Year	Cost. Cost \$/1,000 gals.	Annual O&M Cost \$/Year	O&M Costs \$/1,000 gals.	Total Cost \$/1,000 gals. 0% Grant	50% Grant	75% Grant
1. Interceptor Extension Henrico Treatment	\$672,000	\$62,817	\$4.30	\$ 1,287	\$0.84*	\$5.14	\$2.99	\$1.91
2a. AWT Plant - To Stony Run	423,200	39560	2.71	51,560	3.53	6.99	4.89	4.21
2b. AWT Plant - To Falling Creek	360,720	33,720	2.31	42,970	2.94	6.00	4.10	3.52
3. Pump Station to Ashland System	177,910	16,630	1.14	7,942	1.02*	2.16	2.73	1.30
4. Land Treatment	407,660	38,107	2.61	21,520	1.47	4.09	2.78	1.86

*Include treatment costs of Henrico @ \$0.75/1,000 gallons and Ashland @ \$0.48/1,000 gallons.

HANOVER EIS MAILING LIST

FEDERAL AGENCIES

Council on Environmental Quality
U.S. Army Corps of Engineers, Norfolk District
Office of Economic Opportunity
U.S. Department of Agriculture
 Soil Conservation Service
U.S. Department of the Treasury
U.S. Department of Transportation
 Marine Environmental Protection Division
U.S. Department of Defense
U.S. Department of Health and Human Services
U.S. Department of the Interior
 Bureau of Outdoor Recreation
 Fish and Wildlife Services
 National Water Resource Analysis Group/Eastern
 Energy Land Use Team
 National Park Service
 Geological Survey
U.S. Department of Commerce
Advisory Council on Historic Preservation
Water Resources Council
U.S. Department of Housing and Urban Development
U.S. Department of Energy
 Office of the Secretary for the Environment
U.S. General Services Administration
National Agricultural Lands Study
U.S. Bureau of Prisons
Federal Emergency Management Agency

VIRGINIA STATE
AGENCIES

State Water Control Board
 Piedmont Regional Office
 Bureau of Enforcement
 Bureau of Water Control Management
State Health Department
 Bureau of Sanitary Engineering
 Bureau of Shellfish Sanitation
 Bureau of Occupational Health
 Bureau of Solid Waste and Vector Control
 Bureau of Environmental Health
Department of Highways and Transportation
Department of Housing
Commission of Game and Inland Fisheries
Council on the Environment
Air Pollution Control Board
Commission of Outdoor Recreation
Historic Landmarks Commission
Department of Agriculture and Commerce
State Energy Office
Department of Commerce and Resources
 Coastal Zone Management Program
Department of Intergovernmental Affairs
Marine Resources Commission
Virginia Park Authority
Office of the Governor
Soil and Water Conservation Commission
Department of Conservation and Economic Development

LOCAL AGENCIES

Richmond Regional Planning District Commission
Richmond National Battlefield Park
Hanover County
 Department of Public Utilities
 Planning Office
 Utilities Engineer

LOCAL AGENCIES
(cont)

Henrico County
Department of Public Utilities
Town of Ashland
Water and Sewer Council
Town Council

ELECTED OFFICIALS

Honorable John N. Dalton
Governor of Virginia
Honorable Harry F. Byrd, Jr.
United States Senator
Honorable John Warner
United States Senator
Honorable J. Kenneth Robinson
United States House of Representatives
Honorable Tom Bliley
United States House of Representatives

Honorable Elmo G. Cross, Jr.
Honorable James T. Edmunds
Honorable William E. Fears
Honorable E. T. Gray
Honorable J. Harry Michael, Jr.
Honorable William F. Parkerson, Jr.
Honorable Lawrence D. Wilder
Honorable Edward E. Willey

Honorable George E. Allen, Jr.
Honorable Ralph Axselle, Jr.
Honorable Richard M. Bagley
Honorable Robert B. Ball, Sr.
Honorable Gerald L. Baliles
Honorable James S. Christian, Jr.
Honorable John Warren Cooke
Honorable Alan A. Diamonstein
Honorable V. Earl Dickinson
Honorable Walter H. Emrock
Honorable Lewis P. Fickett, Jr.
Honorable John D. Gray
Honorable George W. Grayson
Honorable Franklin P. Hall
Honorable Robison B. James
Honorable George W. Jones
Honorable Benjamin J. Lambert, III
Honorable C. Hardaway Marks
Honorable Alexander B. McMurtrie, Jr.
Honorable Theodore V. Morrison, Jr.
Honorable D. Wayne O'Bryan
Honorable Robert C. Scott
Honorable S. Wallace Stuffle

CITIZEN GROUPS

Virginia Farm Bureau Federation, Richmond, VA
Virginia Association of Counties, Charlottesville, VA
Izaak Walton League, Arlington, VA
Mechanicsville Civic Association, Mechanicsville, VA
Virginia Society of Ornithology, Richmond, VA
Virginia Research Center for Archaeology,
Williamsburg, VA
Audubon Naturalist Society of the Central Atlantic
States, Inc., Washington, D.C.
Virginia Wildlife Federation, Inc., Alexandria, VA
Virginia Historical Society, Richmond, VA

CITIZEN GROUPS
(cont)

The Natural Conservancy - Virginia Division,
Richmond, VA
Conservation Council of Virginia, Inc., Richmond, VA
Chesapeake Bay Foundation for Environmental Studies,
Washington, D.C.
Sierra Club - Old Dominion Chapter, Midlothian, VA
League of Women Voters
Bon Air, VA
Waynesboro, VA
Richmond, VA
Rural Point Concerned Citizens Association, Mechanicsville, VA
Citizens for Sensible Growth, Ashland, VA
National Wildlife Federation, Washington, D.C.
Richmond Audubon Society, Glen Allen, VA
Virginia Bass State Federation, Roanoke, VA
Zero Population Growth, Richmond, VA
American Land Trust, Arlington, VA
Virginia Forests, Inc., Richmond, VA
Virginia Anglers Club, Richmond, VA
Reclaim-the-James, Richmond, VA
Natural Resources Defense Council, Washington, D.C.
American the Beautiful Fund, Washington, D.C.
Keep Virginia Beautiful, Richmond, VA
Environmental Policy Center, Washington, D.C.
National Parks and Conservation Association, Washington, D.C.
Rachel Carson Trust for the Living, Washington, D.C.
Water Pollution Control Association, Washington, D.C.
Wilderness Society, Washington, D.C.
Piedmont Environmental Council, Warrenton, VA
The Wildlife Society, Washington, D.C.
Environmental Defense Fund, Washington, D.C.
Virginia Agribusiness Council, Richmond, VA
Hanover County Citizens Federation, Mechanicsville, VA
Virginia Environmental Endowment, Richmond, VA

LIBRARIES

Ashland Branch Library
Mechanicsville Branch Library
Virginia State Library
Richmond Branch Library
Bon Air Branch Library
Henrico County Library

CITIZENS

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D. Tilghman Broadbush
William Chamberlain
R. W. Darnell
Bruce V. English, Ph.D.
Lewis C. Gilbert, M.D.
Lynwood E. Hancock, Mrs.
Dale Hanks, Mrs.
Roscoe Hughes, Ph.D.
John A. Hugo, Mrs.
Sam Ketner
Donald MacDonald
W. Wallace Martin, Ph.D.
James W. Midyette, Jr.
Stuart B. Monroe, Mrs.

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L. G. Cox
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Clyde L. Coff
Joseph C. Douhe
Paul Mealow

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(cont)

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Ronald G. Jones
Barrett S. Hopkins
E. A. Beck
E. Contarlimt
William C. Wirkliar, Jr.
F. J. Brown
J. S. McClurkue, Jr.

OTHER

Virginia Institute of Marine Science
Allen Transport
University of Pittsburgh
R. Stuart Royer & Associates
Patton, Harris, Rust & Guy
Little River Leisure Enterprises
Engineering-Science
Leadbottom Construction Co.
Bremner, Youngblood & King, Inc.
Clinton Bogert Association
Wiley & Wilson, Inc.
Mobil Chemical Co.
Hanover Properties, Inc.
Leadbetter Inc.

MEDIA
Newspapers

Times-Dispatch
News Leader
Gazette of Goochland-Powhatan
Herald-Progress

Television

WCVE, Richmond, VA
WCVW, Richmond, VA
WTVR, Richmond, VA
WWTB, Richmond, VA
WXEX, Richmond, VA
WVIR, Charlottesville, VA
WHSV, Harrisonburg, VA
WAVY, Portsmouth, VA
WHRO, Norfolk, VA
WTAR, Norfolk, VA
WVEC, Norfolk, VA

Radio

WHAP-AM, Hopewell, VA
WBBL-AM, Richmond, VA
WANT-AM, Richmond, VA
WENZ-AM, Richmond, VA
WGOE-AM, Richmond, VA
WIKI-AM, Richmond, VA
WKDH-AM, Ashland, VA
WLEE-AM, Richmond, VA
WRFK-AM, Richmond, VA
WKIE-AM, Richmond, VA
WRNL-AM, Richmond, VA
WRVA-AM, Richmond, VA
WRVQ-FM, Richmond, VA
WTVR-AM, Richmond, VA
WXGI-AM, Richmond, VA
WTUR-FM, Richmond, VA

APPENDIX A

Draft EIS Included by
Reference

APPENDIX B

Comment Letters

DRAFT EIS COMMENT LETTERS

Rt. 1
Doswell, Va. 23047
Mar. 30, 1979

Tel: (804) 227-3323

EPA Region III Preparation Section
6th and Walnut Streets
Philadelphia, Penn. 19106

EPA EIS Summary- Wastewater Treatment Facilities Planning
For Hanover County, Virginia Phase II Area

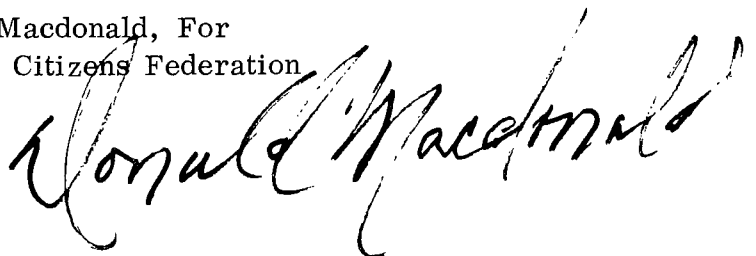
We have three areas of specific comment:

1. We favor continued but limited growth, but want it controlled and phased.
2. Waste Treatment facilities are growing too expensive, even with federal aid, to make them generally acceptable for many citizens. Therefore we look for the lesser package where possible, such as, upgrading existing facilities. Ashland Lagoon would be an example. The EIS outline of a proposed improvement, deepening, aeration etc., with possible land application looks to us as a good solution and a reasonable cost/benefit ratio.
3. We generally approve Land Application for two reasons:
 - a. It is less expensive
 - b. It should not pollute the rivers if managed properly.

In a general comment, we approve your recognition of the importance of preservation of our natural and cultural resources, historic sites, pre-historic sites, prime farm land (very important), purity of the aquifer recharge and ground water, and the guarding of citizen health.

In III - 15 EIS states: "Due to the increasing number of failing septic systems and package facilities, and overall growth in Hanover County, adequate sewerage service must be provided to the Phase II Service Area." We have doubt about the urgency of the need of Phase II at this time. There is question about the seriousness of the "failing systems" and their numbers and the reasons for failure. The "growth" referred to will only be small unless Phase II is put into effect.

Donald Macdonald, For
Hanover Citizens Federation





COMMONWEALTH of VIRGINIA

Council on the Environment

J. B. JACKSON, JR.
ADMINISTRATOR

903 NINTH STREET OFFICE BUILDING
RICHMOND, VA 23119
(804) 786-4100

April 16, 1979

RECEIVED

APR 19 1979

EPA, R3, WATER DIVISION
VIRGINIA SECTION

Mr. Jack J. Schramm, Regional Administrator
U. S. Environmental Protection Agency
Region III
6th and Walnut Streets
Philadelphia, Pennsylvania 19106

SUBJECT: Wastewater Treatment Facilities Planning for Hanover County,
Virginia: Phase II Area

Dear Mr. Schramm:

Thank you for the opportunity to review the subject Draft Environmental Impact Statement. It is a responsibility of the Council on the Environment to coordinate the State's review of Federal environmental impact statements and to respond to the responsible federal official on behalf of the State. The State agencies which participated in the review of the subject document are listed below:

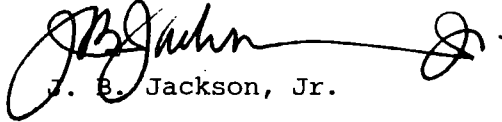
- Commission of Outdoor Recreation
- Department of Agriculture and Consumer Services
- Department of Conservation and Economic Development
- Department of Highways and Transportation
- State Air Pollution Control Board
- State Water Control Board
- Virginia Soil and Water Conservation Commission
- Virginia Research Center for Archaeology

At this point the Commonwealth is not opposed to any of the alternatives addressed in the document. Without the information normally contained in a facility plan a comprehensive analysis of the environmental impacts cannot be made.

Mr. Jack J. Schramm
Page Two
April 16, 1979

The enclosed comments of State agencies should be addressed in the Final document. If there are any questions, please do not hesitate to contact me.

Sincerely,



J. B. Jackson, Jr.

JB Jr/gcj

cc: The Honorable Maurice B. Rowe, Secretary of Commerce and Resources
Mr. Rob Blackmore, Commission of Outdoor Recreation
Dr. Berkwood Farmer, Department of Agriculture and Consumer Services
Mr. Leon App, Department of Conservation and Economic Development
Mr. R. L. Hundley, Department of Highways and Transportation
Mr. James Ruehrmund, State Air Pollution Control Board
Mr. Raymond Bowles, State Water Control Board



COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD

2111 Hamilton Street

R. V. Davis
Executive Secretary

Post Office Box 11143
Richmond, Virginia 23230
(804) 257-0066

April 3, 1979

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Kenneth B. Rollins

William L. Tate

R. Alton Wright

Mr. Reginald F. Wallace
Environmental Impact Statement Coordinator
Governor's Council on the Environment
Ninth Street Office Building
Richmond, Virginia 23219



Dear Reggie:

RE: DEIS - Hanover County Wastewater Treatment Facilities Planning

The preface to the DEIS states that the DEIS should be reviewed concurrently with the 201 Facilities Plan. However, information normally contained in a 201 Facilities Plan was not included in the DEIS, therefore, a comprehensive analysis of the environmental impacts of the project cannot be made.

We will assume that the Final EIS will contain the information contained in a facility plan or will be accompanied by the facility's plan. Upon receipt of the FEIS with other necessary information, we will provide comprehensive comments.

Our staff has reviewed the DEIS in the context of the above, and we have the following comments:

1. The DEIS makes several references to data included in the facility plan which cannot be substantiated without a copy of the facility plan. It should be noted that at the present time there is still some question as to the waste load allocation for the Nelson's Bridge Regional Plant site, which will have a major effect on the results of the cost-effective analyses in the facility plan. At the present time it is anticipated that an intensive stream survey will be undertaken to determine the actual effluent limitations to be imposed on both the Ashland Sewage Treatment Plant and the proposed treatment plant at the Nelson's Bridge site. Such a survey could add an additional year to the planning process, and would also require some changes in the EIS.
2. The information concerning current flow levels at the Ashland Treatment Plant, on pages 2-20 and 21, are inaccurate in light of information gathered as a result of recent enforcement actions. Flow monitoring, currently at the Ashland Plant, indicates that average flows may be as high as 1.2 MGD or double the flow levels included in the EIS.

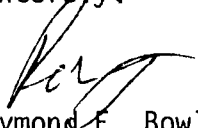
Continued. . .

3. On page 2-23, the statement is made that there is approximately 600,000 gallons/day of additional capacity existing at the Doswell facility. It should be noted that while flows resulting from industrial activities at the Bear Island Paper Company plant will not be going through the Doswell Treatment Plant itself, sanitary sewage will, which will further utilize the existing capacity. The currently rated discharge flow levels from the Doswell Treatment Plant (including Bear Island) will range up to 2.5 MGD depending on stream flow in the North Anna.
4. On page 2-34, the statement is made that VEPCO is required to discharge a minimum of 40 cfs during the winter months and 120 cfs during the summer months from the Lake Anna Reservoir. Our investigations, during the processing of the Doswell permit, indicates that there is a minimum discharge requirement of 40 cfs year around.
5. Page V-3 needs to be updated to match current water quality standards.
6. The statement about anti-degradation in the last paragraph of page V-5 is incorrect. The anti-degradation policy holds true for plants of all sizes and not just those above 1 MGD. If a plant can meet this criteria without advanced treatment, then such treatment would not be mandatory.

7. ~~In respect to the statement about anti-degradation on page V-12, the statement is incorrect. The anti-degradation policy holds true for plants of all sizes and not just those above 1 MGD. If a plant can meet this criteria without advanced treatment, then such treatment would not be mandatory.~~

Thank you for the opportunity to comment on this DEIS. If you have any questions concerning our comments, please do not hesitate to contact me.

Sincerely,


Raymond E. Bowles, P.E.
Director
Bureau of Surveillance
and Field Studies

/scc

cc: John J. Cibulka-PRO
Joyce Hoyle-PRO
Sam Waldo-BAT
Dale Wright-BSFS



COMMONWEALTH of VIRGINIA

S. MASON CARBAUGH
COMMISSIONER

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES Planning and Development

P. O. Box 1163, Richmond, Virginia 23209

March 28, 1979

BERKWOOD M. FARMER, Ph.D.
DIRECTOR AND
CHIEF ECONOMIST

Mr. Reginald F. Wallace
Environmental Impact Statement Coordinator
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219



Re: DEIS - Wastewater Treatment Facilities Planning for
Hanover County, Virginia - Phase II Area

Dear Reggie:

Sewerage collection and treatment facilities, per se, are not solely responsible for stimulating growth; however, their size and location influence the pattern and rate of growth within the county. Based on history, there is usually a direct relationship between the location of sewer lines and the pattern of development.

It appears that the planned location of the sewer lines and wastewater treatment facilities coincides with the location of prime agricultural land in the southeastern half of the county. Local decision makers and citizens should be knowledgeable of the possible effects on removing prime agricultural lands.

This agency also has responsibility in the application of sludge and effluent to land. Before a decision to go with land application of either effluent or sludge is made, a detailed plan of application and monitoring program will have to be prepared and submitted to the appropriate state agencies.

Sincerely,

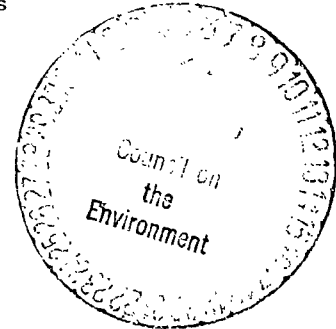

Berkwood M. Farmer

8. REVIEW INSTRUCTIONS:

- A) Please review the document carefully. If the proposal has been reviewed earlier (e.g., if the current document is a FINAL EIS), please consider previous comments.
- B) Prepare your agency's comments in a form which would be acceptable for responding directly to a project sponsoring agency.
- C) Use the space below for your comments. If additional space is needed, please attach extra sheets.

Return your comments to:

Reginald F. Wallace,
Environmental Impact Statement Coordinator
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219



COMMENTS

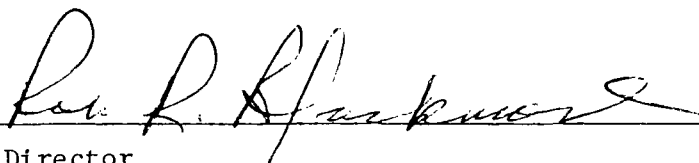
In several places (pp II-54, II-59, Figure II-10, pp. IV-31), the draft EIS refers to the North Anna, South Anna, Pamunkey and Chickahominy Rivers as scenic rivers or scenic river areas. Although these rivers have been identified in the Virginia Outdoors Plan as potential components of the Virginia Scenic Rivers System and are in fact significant natural and scenic resources, they have not been legislatively designated as components of the System.

Because of their proximity to the Richmond area, all four of the rivers are frequently utilized by canoeists and fishermen. As residential development increases in Hanover and Henrico Counties, and as canoeing continues to gain in popularity recreational boating use of area streams should continue to increase. Alternatives for wastewater collection and treatment which would result in numerous pipeline crossings, substantial streamside structures, decreased water quality or other activities which would significantly impact on these rivers would be unacceptable.

If facilities should be constructed in the vicinity of such valuable river resources, mitigation methods will be necessary to maintain the scenic character of these streams.

Site planning should include wide, vegetated buffer zones. Effluent discharges should be minimized in order to maintain high water quality, and stream crossings should be avoided. Where such crossings are necessary, the stream banks should be revegetated, and all structures left above the ground should be set back from the stream and painted in a manner to blend with their surroundings.

(SIGNED)



(TITLE)

Director

(AGENCY)

Commission of Outdoor Recreation

FRED W. WALKER
Director
JERALD F. MOORE
Deputy Director



COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT


1100 STATE OFFICE BUILDING
RICHMOND, VIRGINIA 23219
(804) 786-2121

DIVISIONS
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MINED LAND RECLAMATION
MINERAL RESOURCES
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GEORGE P. SHAFRAN, Arlington
NICHOLAS D. STREET, Grundy
SHERMAN WALLACE, Cleveland
E. FLOYD YATES, Powhatan

April 4, 1979

MEMORANDUM

TO: Mr. Reginald F. Wallace
FROM: Leon E. App 



This is in reference to the EPA Draft Environmental Impact Statement for the Hanover County, Virginia, Phase II Area, Wastewater Treatment Facilities Plan.

This report has been reviewed by our Division of Forestry and their comments are attached.

In general, Hanover County is one of the State's leading forest product counties and forest management has been practiced by hundreds of Hanover landowners. This fact has been ignored throughout the presentation, and is especially obvious in the Biology section on "Terrestrial/Ecosystems--Flora" on pages II-43 and 44. There are certainly more than five vegetational types in Hanover County. Those "types" described in the text are actually physiographic classes, not vegetational types. Under "Disturbed Areas" on page II-44 there is no indication that much of the forested disturbed area is a result of management practices which include planting over one million tree seedlings each year by Hanoverians.

Further information on Hanover's forest resources is available in the report, Hanover County Agricultural Development Subcommittee, A Report to the Hanover County Citizens Advisory Board, 1978, published by Hanover County. We feel these comments are important since historically the right-of-way for wastewater lines are impacted upon the forest resource.

If we can be of further assistance, please let us know

ec

Attachments

cc: Mr. Wallace F. Custard

B-8

COMMONWEALTH of VIRGINIA

Department of Conservation and Economic Development

Division of Forestry

502 F. Nite Mile Road

P. O. Box 678 Sandston, Va. 22080

Telephone 257-6611

GENE W. AUGSBURGER, District Forester

March 29, 1979



PLANS AND PROGRAMS

Environmental Impact Statement
Environmental Protection Agency

To: Mr. L. E. App

From: M. J. Simons, Forester-Planner

Stanley J. Simons

Subject: Hanover County Wastewater Treatment Facilities-Draft
Environmental Impact Statement

Gene Augsburger, District Forester, and I have reviewed the Draft Environmental Impact Statement for the Hanover County Wastewater Treatment Facilities and have inspected particular sites of environmental importance in the county. We wish to make the following comments and recommendations concerning this report:

Figure II-2: This map of existing land use generalizes that all land that is not shaded in is considered agricultural. This is misleading to the public in that over 60% of Hanover County's total acreage is in commercial forest land. This is stated in the text of the Impact Statement (II-55) and is supported by data from the current U.S. Forest Service Survey of Hanover County.

Section II-C-6: The major flaw in this discussion of the various physiographic classes is that you assume, judging by your narratives of each, that these classes are in their climax successional stage. In other words, you have assumed that each class of land described here is totally forested with climax tree species. You have not taken into account that forest management has been practiced in Hanover County for many years, and that much climax forest type acreage has been cut and reforested with sub-climax species, such as loblolly pine. These cutover areas, as well as old fields which have

PLANS AND PROGRAMS
Environmental Impact Statement
Environmental Protection Agency

-2-

been planted to pine, amount to a great deal of land, certainly enough to have them included in the discussion of physiographic classes. By including pine acreages in your discussion of disturbed areas, you have implied that these acreages are random occurrences, a part of natural succession; not, as is the case, an intentional, thoughtful process of managing forest lands for wood products and economic benefit.

Section II-D-3: After inspection of several areas along the Crump and Pollard Creeks, it was decided that few areas in each creek's bottomlands are undisturbed, rather than most areas, as was stated in the text (II-53, last paragraph). These areas have been logged at one time or another, but have regenerated back to mature, bottomland hardwood species.

Section II-D-7,8: As in Figure II-2, forest lands have once again been glossed over, either unintentionally or because the importance of forest management has been taken for granted. In the Prime Agricultural Lands category, directly beneath Forest and Woodlands, the text goes into great detail as to where prime agricultural lands are located in the county and what the major crops are. There is also a map delineating these prime agricultural areas (Figure II-11). Why then are the forest lands, which produce over five (5) million board feet of wood per year, not given the same consideration? A map delineating prime forest lands (meaning those which have the greatest potential for producing wood fiber and those which are currently being managed; eg.-tree farms, forest industry land) should be essential to the decision-making process. Location of wastewater treatment facilities in or around prime forest lands will bring residential, commercial, or industrial development to these areas, and result in the irretrievable loss of this forest resource.

Section II-D-II: There is one county park which is not mentioned in this text, and that is Poor Farm Park. Containing two hundred seventy (270) acres, this park is located west of Ashland off Route 54, and will be used for passive recreation.

In conclusion, there is little consideration given to the importance of Hanover County's forest lands in this text. The Environmental and Economic benefits of the forest resource have been glossed over. The absence of accurate data, locations, and description of the forest resource in Hanover County can only lead to improper decision-making and poor location of wastewater treatment facilities; an error all environmental impact statements are designed to avoid.

cc: Mr. Wallace F. Custard

B-10

HAROLD C. KING, COMMISSIONER

LEONARD R. HALL, BRISTOL, *BRISTOL DISTRICT*

HORACE G. FRALIN, ROANOKE, *SALEM DISTRICT*

THOMAS R. GLASS, LYNCHBURG, *LYNCHBURG DISTRICT*

MORRILL M. CROWE, RICHMOND, *RICHMOND DISTRICT*

WILLIAM T. ROOS, YORKTOWN, *SUFFOLK DISTRICT*

WILLIAM T. ROBINSON, WEST POINT, *FREDERICKSBURG DISTRICT*

WILLIAM B. WRENCH, SPRINGFIELD, *CULPEPER DISTRICT*

ROBERT S. LANDES, STAUNTON, *STAUNTON DISTRICT*

T. RAY HASSELL, III, CHESAPEAKE, *AT LARGE-URBAN*

CHARLES S. HOOPER, JR., CREWE, *AT LARGE-RURAL*



COMMONWEALTH of VIRGINIA

DEPARTMENT OF HIGHWAYS & TRANSPORTATION

1221 EAST BROAD STREET
RICHMOND, 23219

March 29, 1979

LEO E. BUSSEY, III
DEPUTY COMMISSIONER & CHIEF ENGINEER

T. ASHBY NEWBY
DIRECTOR OF ADMINISTRATION

J. M. WRAY, JR.
DIRECTOR OF OPERATIONS

H. R. PERKINSON, JR.
DIRECTOR OF PROGRAM MANAGEMENT

W. L. BRITTLE, JR.
DIRECTOR OF ENGINEERING

OSCAR K. MABRY
DIRECTOR OF PLANNING

IN REPLY PLEASE REFER TO

Wastewater Treatment Facilities
Planning for Hanover County:
Phase II Area
(1) Draft EIS
(2) Summary Draft EIS
Environmental Protection Agency

Mr. Reginald F. Wallace
EIS Coordinator
Council on the Environment
Ninth Street Office Building
Richmond, Virginia 23219

Dear Mr. Wallace:

Thank you for providing the Virginia Department of Highways and Transportation with an opportunity to review the above noted proposal.

After decisions on facility locations are made, any proposed crossing of roadways by sewer lines should be coordinated with the appropriate highway resident engineer with emphasis in minimizing disruption to traffic flow and roadway continuity.

If we can be of any further assistance, please advise.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. L. Hundley".
R. L. Hundley
Environmental Quality Engineer

B-11



AXEL T. MATTSON, CHAIRMAN
YORKTOWN

E. FOLGER TAYLOR, VICE CHAIRMAN
STAUNTON

EDGAR B. BOYNTON
RICHMOND

ELIZABETH H. HASKELL
MARTINSVILLE

CARL C. REDINGER
ALEXANDRIA

COMMONWEALTH of VIRGINIA

State Air Pollution Control Board

ROOM 1106, NINTH STREET OFFICE BUILDING
RICHMOND, VIRGINIA 23219
TELEPHONE: (804) 786-2378

W. R. MEYER
EXECUTIVE DIRECTOR

April 3, 1979



Mr. Reginald F. Wallace
Council on the Environment
903 Ninth Street Office Building
Richmond, Virginia 23219

Dear Mr. Wallace:

Since the proposed Hanover Wastewater Treatment Facility, does not plan to incinerate its waste there should be no direct effect on air quality.

However, there is most certainly an adverse impact on air quality as a result of the growth that the facility will encourage. Thus the county should be forewarned of this indirect effect. The county must be on guard to protect its air quality from unwanted growth and preserve it for the community's future use.

Sincerely,

J. C. Ruehrmund
Director
Division of Operations and Procedures

JCR/WPP/pjg

13-12



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION III
3535 MARKET STREET
PHILADELPHIA, PENNSYLVANIA

PUBLIC HEALTH SERVICE

April 3, 1979

MAILING ADDRESS
P O BOX 13716
PHILADELPHIA,
PENNSYLVANIA 19101

Mr. Jack J. Schramm
Regional Administrator
U. S. Environmental Protection
Agency
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Attn: Environmental Impact Branch
EIS Preparation Section

Re: Draft EIS, Hanover County, VA
Phase II Area,
Wastewater Treatment Plan

Dear Mr. Schramm:

Thank you for the opportunity to review the draft EIS for the referenced project. I have already forwarded a copy to the Regional Office for Facilities Engineering Construction (ROFEC) for a technical review based on their expertise in the field of engineering. If they decide to comment, they will write directly to you.

Your review of the several alternatives (14) is thorough. Unfortunately, the lack of information in several instances, as acknowledged, leaves the reader in a vacuum.

With the phasing out of the use of ground water to supply future water demands in Hanover County, it is necessary to expedite the resolution of the sewage treatment problems. We hope that once you receive the pending data, you will complete your assessment and recommendations. At this point in time, we have no further comments to make.

Sincerely yours,

H. McDonald Rimple, M.D.
Assistant Surgeon General
Regional Health Administrator

B-13

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

P.O. Box 10026 - Richmond, Virginia 23240

April 13, 1979

Mr. Jack J. Schramm
Regional Administrator
U.S. Environmental Protection Agency
Region III
6th and Walnut Streets
Philadelphia, Pennsylvania 19106

Dear Mr. Schramm:

Re: EV - Comments - Draft EIS - Wastewater Treatment Facilities
Planning for Hanover County, Virginia:
Phase II Area (EPA) and Summary

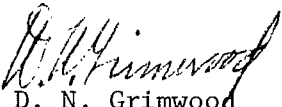
In comparing Figure I-2, "Service Area Planning Units," and Figure II-11, "Prime Agricultural Land, Hanover County, Virginia", we find considerable overlap. The EIS does not quantify the amount of prime farmland that will be lost due to project proposals.

Neither does the draft address the unique farmland found near Studley, Virginia, along Routes 606 and 627.

No provisions are provided in the draft for conserving, stockpiling, or proper disposition of topsoil. This should be addressed since a considerable amount of land-disturbing activities will occur when facilities are installed.

Thank you for the opportunity to comment.

Sincerely,



D. N. Grimwood
State Conservationist

cc: Office of Federal Activities, EPA, Washington, D.C. (5 copies)
Administrator, SCS, Washington, D.C.
Director, NETSC, SCS, Broomall, Pa.
Area Conservationist, SCS, Culpeper, Va.
District Conservationist, SCS, Ashland, Va.

13-14





DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION
CURTIS BUILDING, SIXTH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

April 4, 1979

REGION III

IN REPLY REFER TO:
3I
FLO-1

Mr. Thomas Slenkamp
U.S. Environmental Protection
Agency, Region III
EIS Preparation Section
6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Dear Mr. Slenkamp:

We have recently reviewed the Draft EIS on Wastewater Treatment Facilities planning on Hanover County, Virginia: Phase II area. In our review, we have focused on compliance with the National Flood Insurance Program (NFIP), and Executive Order 11988, Floodplain Management dated May 24, 1977. Over the past year, the FIA has been especially active in the implementation of Executive Order 11988. The FIA has a key role in its implementation. FIA's maps are its foundation and its regulations provide the Order's minimum standards for Federal construction. FIA's shared consultation role (pursuant to Section 2(d) of the Order) is the basis for a major inter-agency effort. FIA has participated in the preparation of over thirty agencies' procedures for implementing the Order. A major thrust of this activity has been clarifying the manner in which the Order applies to specific agency actions.

Executive Order 11988 distinguishes between primary and secondary impacts on floodplains. A primary impact would be one resulting directly from the siting of an action in a floodplain. In the present case, examples of actions with primary impacts would be the placing of treatment plants, collector systems or land application sites in floodplains. A secondary impact would be one flowing from an action that was made possible by another action located either in or out of a floodplain. An example, in this case, of an action with secondary impact would be the providing of infrastructure, i.e. central sewerage facilities, that can help stimulate growth in floodplains. The DEIS summary recognizes the potential influence of this type of infrastructure on environmentally sensitive areas (pp 8,9).

The DEIS addresses, at least preliminarily, the potential for adverse primary impacts of various alternatives. Avoidance procedures (relocation of sites and mitigating measures (floodproofing in plant design) are discussed (II-49 and IV-28).

13-15

The potential for adverse secondary impacts of various alternatives does not seem to have been addressed in sufficient detail. Many of the proposed sewer lines follow watercourses, e.g. Stony Run, Lickinghole Creek, the Chickahominy River, Totopotomy Creek. Without contrary evidence, it would seem that floodplain areas, being adjacent to sewer lines, would thereby be made more developable.

A more detailed picture of existing and potential land use within the limits of one hundred (100) year floodplains would facilitate an assessment of probable impacts of the planning alternatives. Figure II-3, the "General Land Use Plan of Hanover County," is not of a large enough scale to support such an assessment.

The floodplain information that is the basis for figure II-8, "Flood Hazard Areas of Hanover County," has been superseded by a more recent Corps of Engineers study. Flood Hazard area maps accompanying the Flood Insurance Study being prepared by the Corps of Engineers are now in draft form. We will be able to provide your office with access to these maps, which are more detailed than those previously available.

In the event that further analysis indicates that floodplain development would be supported by the various planning alternatives, strategies for avoidance of these impacts should be discussed. These strategies might include implementation of the zoning classifications such as those suggested in the growth management plan for Eastern Hanover County (reference p. II-10).

In summary, it is evident that the level of analysis of impacts relating to NFIP regulations and E.O. 11988 has been in keeping with the preliminary status of the DEIS. However, subsequent documents should include sufficiently detailed data to address the key requirements of the Executive Order: the identification of practicable alternatives that avoid floodplain impacts or support floodplain development. If it is found that there are no practicable alternatives to primary impacts, the documents should fully address the Order's provisions for minimization of harm to, or within, the floodplain and restoration and preservation of floodplain values. If secondary impacts are inevitable, or probable, without intervention, strategies for avoidance or minimization should be developed.

We are enclosing a copy of the U.S. Water Resources Council's Floodplain Management Guidelines for Implementing Executive Order 11988, as well as a summary, in the form of an eight-step process, of the Order's requirements (attachment #1). In considering indirect impacts on floodplains, steps 3, 4, and 5 are especially germane.

B-16

Please contact Joseph Gavin of our office for any necessary clarifications of our position. We would be pleased to provide any possible assistance in addressing the requirements of the National Flood Insurance Program or the Executive Order.

Sincerely,

Frederick G. Schumaker, III

for Walter P. Pierson
Regional Director
Federal Insurance Administration

Enclosure

cc: Regional Director, CPD
Asst. Sec., CPD

B-17



United States Department of the Interior

OFFICE OF THE SECRETARY

Northeast Region

15 State Street

Boston, Massachusetts 02109

ER79/207

April 27, 1979

Mr. Jack Schramm
Regional Administrator, Region III
Environmental Protection Agency
Sixth & Walnut Streets
Philadelphia, PA 19106

Dear Mr. Schramm:

The Department of the Interior has completed its review of the draft environmental impact statement for Wastewater Treatment Facilities Planning for Hanover County, Virginia: Phase II area. Our comments are listed below by our areas of jurisdiction and special expertise.

General Comments

The proposed Phase II water treatment facilities for the Hanover County is part of the larger, more inclusive Greater Richmond Metropolitan Area Water Quality Management Plan. The Phase III plan in conjunction with Phase I (which provides waste management facilities for the Mechanicsville-Beaverdam Creek drainage area of the county), is intended to copy with waste management needs throughout the entire county. The draft document, however, falls short in adequately reviewing the full range and scope of potential environmental impacts anticipated from this plan.

Hanover County is drained by two major stream basins, the Chickshominy and the Pamunkey. Both streams, particularly in the eastern portions of the county, are associated with high quality fish and wildlife resources. Extensive wetlands in the form of fresh water marshes and wooded swamps are present and critical spawning grounds for striped bass and other commercially and recreationally important fish species are located there. The proposed project plans, particularly those associated with aquatic habitat, could result in extensive and permanent losses to fish and wildlife resources in the area. The draft environmental impact statement should provide a more thorough assessment of these impacts.

Fish and Wildlife Resources

The statement is made in paragraph 3, page II-36, that due to low flows during certain periods of the summer, the only flow in some streams will be treated effluent. On page IV-21, it is further stated in paragraph 1 that under certain conditions the entire Totopotomoy Creek flow may consist

B-18

of secondarily treated effluent. Several alternative plans call for this condition and it is indicated that significant adverse water quality impacts can be expected. The nature and degree of these impacts, however, are not discussed. Considering the potential significance of this condition, a more thorough investigation is needed. A determination should be made of what pollutants would be present, in what quantity and their ultimate impact on the ecosystem.

One of the more important impacts associated with high percentage effluent flow in a stream is the toxic effect of chlorine residues left over from waste treatment. Chlorine can have detrimental effects on fish and benthic populations. A thorough investigation of potential impacts resulting from this condition should also be conducted. A very brief but inadequate, discussion on this topic appears on page IV-25.

On page IV-21, a discussion of "construction impacts" is provided. The draft document states that "...construction of gravity sewers, interceptors, and force mains along stream beds will result in short term increased erosion and sedimentation." Depending on the specific alternative, several miles of stream bed could be significantly impacted as a result of streambed construction. These impacts will not only be short-term but long-term and permanent as well. Loss of vegetation, alteration of streambed substrate and contour, and loss of channel stabilization are potential permanent impacts. Erosion and sedimentation, although temporary, can have long-term impacts in terms of losses of aquatic invertebrate populations.

On page IV-26, paragraph 1, it is stated that construction activities within the lower Totopotomoy Creek Basin would result in severe impacts on the varied marsh ecosystem. If this is the case, and based on plan summaries it appears certain it would be, a more detailed analysis of impacts to the ecosystem should be done. This type of analysis should include a habitat survey with aquatic and terrestrial resources inventories and a delineation of project associated losses.

In the same paragraph referenced above the statement is made that physical stream conditions altered by construction activities "...would be restored by the natural scouring and restoration effects of spring flows or seasonal upstream flow increases." This natural restoration process occurs only on a limited scale. It is highly doubtful that the type of streambed alteration that is anticipated from installation of sewer lines would be repaired by natural processes. Alteration of stream substrate composition, pool and riffle areas, and streambed contours cannot be repaired by natural scouring and upstream flow increases.

Based on figures provided in the draft statement, extensive streambed areas will be impacted by project construction. Because of the quality and quantity of habitat that could be impacted, alternative pipeline routes should be proposed and investigated. A route can parallel a stream, but

should maintain a minimum of 150 feet offset from the center-line of the stream. The buffer between the pipeline and the stream allows the stream and its riparian vegetation to remain intact. Pipeline routes which traverse wetland habitat should also be avoided. Pipeline installation through marshes can result in loss of vegetation and alteration of water circulation and drainage patterns.

The statement on page IV-5, paragraph 2, that full implementation of the proposed sewer project would serve to reduce the current indiscriminate scattering of various kinds of development is probably not an accurate statement without the support of proper zoning laws, an adequate facilities law, or the equivalent.

Outdoor Recreation

Units of the National Park System within the county are identified and briefly described on page II-59 under the heading of Public Outdoor Recreational Areas. These units are of historic significance and, thus, we suggest in the final statement that they be described under the Historic Sites heading (page II-56). These sites can be further identified by location on Figure II-12.

It is apparent that the Environmental Protection Agency (EPA) recognizes its responsibility under the National Historic Preservation Act and 36 CFR 800 to have intensive archeological survey work done to identify National Register and eligible properties in the area of potential impact. However, we do not agree that this should be done "once the final locations of sewer lines, pumping stations, and land application sites have been established" (page IV-32). A staged plan of survey work and other investigations should be implemented, so that results of archeological and historic site identification studies can be used to narrow project alternatives and make better decisions on facilities. For example, archeological survey investigations could begin first at proposed treatment plant alternate sites. As information becomes available on the relative acceptability of these sites, survey work could be expanded to help analyse best locations of gravity sewers, force mains, pumping stations, and other facilities. In consultation with the Virginia SHPO, (Tucker H. Hill, Virginia Historic Landmarks Commission, 221 Governor St., Richmond, VA 23219) data should be assembled to help predict the most likely archeological site locations from existing information. Treatment facilities and further survey work should be planned accordingly.

The final statement should include a full discussion of the methods and results of survey work, as well as an assessment of expected impacts from the various alternatives. The views and recommendations of the Virginia SHPO should be included, as well as evaluations of historic and archeological resources for possible inclusion in the National Register of Historic Places.

B-20

The Chickahominy River from the James River to U.S. Route 360 and the Pamunkey River from Herrick Creek to Liberty Hall are included in the final list of rivers or stream segments that have been identified in the Wild and Scenic Rivers System Study conducted by the Heritage Conservation and Recreation Service, Northeast Regional Office. This study is an inventory and evaluation of rivers in the northeast region and will be used as one factor in determining suitability for further study and/or potential inclusion into the National Wild and Scenic Rivers System.

This list, which is part of the results of a 3-year effort, is a refinement of the Preliminary Draft List which was issued in February 1978 and the Second Preliminary Draft List which was issued in September 1978. The Final List is the result of a detailed resource evaluation which included site reconnaissance. Rivers on the list have passed the final system study evaluation phase. They are generally 25 miles or more in length (there are numerous exceptions) and are in a relatively undeveloped or natural condition. To be eligible under Public Law 90-542 the rivers must meet the following criteria:

1. Be a free-flowing river or stream
2. Be free of certain types of alterations (i.e., impoundments, rip-rapping, channelization, etc.)
3. Be largely undeveloped (rivers or sections of rivers with shorelines or watersheds essentially primitive or largely undeveloped)
4. Be adjacent to or within a related land area that possesses an outstanding remarkable geologic, ecologic, cultural, historic, scenic, botanical, recreational or other similar value. (Interpreted to mean an area of multi-state or national significance.)

This phase of the System Study is essentially the natural or wild component. Rivers of urban, recreation and cultural value will be examined at a later time.

It is important to note that the System Study is a survey of rivers and should not be confused with the more detailed Congressionally mandated studies under the National Wild and Scenic Rivers Act which are conducted by the National Park Service. The purpose of the System Study is to:

1. Identify a balanced representation, in terms of physiographic provinces and sections, of the most significant river segments in the nation.
2. Identify for the President and Congress the parameters of a basic National Wild and Scenic Rivers System.

3. Identify those rivers which may be considered under the provisions of Section 5(d) of P.L. 90-542, as amended.

This most recent list, although final, does not preclude the addition or deletion of rivers or river segments at a later time.

The Virginia State Comprehensive Outdoors Recreation Plan (SCORP) prepared by the Commission of Outdoor Recreation (Revised Draft, August 1978) also lists the Chickahominy River in Charles City, New Kent, Henrico, and Hanover Counties (in addition to those scenic river areas included in the draft environmental statement) as having potential for study and possible inclusion in the Virginia Scenic Rivers System.

The Virginia Commission of Outdoor Recreation, in coordination with the Department of Highways and Transportation, established the Virginia segment of the Trans-Continental Bike Route which traverses Hanover County. No mention is made of the Hanover portion of this bicycle trail in the draft environmental statement.

The final environmental statement should evaluate the impact of the proposed project on these identified river and trail segments.

Water Resources

Land application sites 1 and 2 proposed under alternatives A2, B2, and A1 are located within ground water recharge areas. On page IV-29, it is stated that potential long-term impacts on artesian aquifers located in the area may result from contamination by nitrates, heavy metals, phosphorous, and total dissolved solids. Under measures designed to protect ground-water recharge areas and aquifers, a ground water monitoring system should be proposed.

Mineral Resources

Bureau of Mines data lists mineral production of stone, aplite, and sand and gravel in Hanover County, Virginia. However, according to the Bureau of Mines Mineral Industry Location System (MILS), current mineral production does not occur in the immediate area of the proposed project.

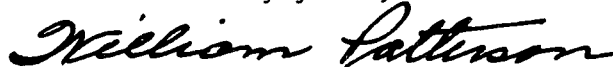
In order for this draft environmental impact statement to be considered an adequate assessment, mention should be made of the mineral resources in the project area and the amount of those resources which will be foregone (preempted) if the plan is implemented, along with the commitment of mineral resources for construction purposes.

Summary

The effort by Hanover County to upgrade and improve existing wastewater treatment facilities in the area is heartily supported by the Department of the Interior. It is apparent, however, that several aspects of this facility plan require further study to assess more fully the impacts that may result from implementation. Also, other, loss impacting alternatives must be developed that will protect fish and wildlife, recreational and cultural resources in the area.

The Department, under the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U. S. C. 661 et seq.) will review and comment on all work requiring Department of the Army authorization. Several components of the facilities plan, such as activities impacting streams and wetlands, will require permitting. Based on the information available to us at this time, our most probable position on the issuance of permits needed for the construction of several of these alternative plans would be one of opposition. It is recommended that further coordination with the U.S. Fish and Wildlife Service, Annapolis, be initiated on this aspect of the project.

Sincerely yours,

A handwritten signature in cursive script that reads "William Patterson".

William Patterson
Regional Environmental Officer

B-23



U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

REGION THREE
Post Office Box 10045
Richmond, Virginia 23240

April 5, 1979

IN REPLY REFER TO:

Subject: Wastewater Treatment Facilities Planning
Hanover County, VA
Phase II Area
Draft Environmental Impact Statement

United States Environmental Protection Agency
Region III
6th & Walnut Streets
Philadelphia, PA 19106

Attention: EIS Preparation Section

Dear Mr. Schramm:

We have reviewed the Draft EIS for the subject project and would like to thank you for the opportunity to comment on the proposed action. Following are our comments which have been arranged by subject area depending on priorities which our agency uses in its overall functions.

Summary Comments

We fully agree with the statement that the EIS should be used as a "decision making tool" (pg. 1-3). However, we doubt that this document gives the decision maker all the information needed to objectively make the correct decision on this important Hanover County issue. We base our contention of this on statements contained in the Draft EIS such as: (Underlining added for emphasis).

Page x

"Certain information normally contained in a wastewater facility plan has not been provided to the environmental consultant for incorporation into this EIS, therefore, comprehensive environmental impact analyses cannot be undertaken at this time. The following items must be received from BYK in order to complete the Environmental Impact Statement:

- Comprehensive discussion of the alternatives screening process from local to subregional to regional alternatives including costs;
- Consideration of phasing of sewerage facilities and details of Federal state/local financing consideration;

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- Energy requirements for proposed facilities discussed in the recommended plan;
- Facility Plan design flows by contributing component (i.e., residential, commercial, etc.) current and ten year incremental increases;
- Sludge management considerations for feasible alternatives.";

on Page I-16

"The issue of potential impacts of wastewater treatment alternatives (both primary and growth-induced) on environmentally sensitive areas unsuitable for development is recognized as being necessary to address in the EIS. Hopefully, the joint EIS/Facilities Planning process will develop strategies to ensure that maximum protection will be given to areas identified as important. This evaluation will include identifying impacts on historic sites."

on Page III-11

"Sites 1, 2, 15 and 16 were chosen for further study." without maps or an adequate discussion of sites 15 & 16 being presented equal to that presented on Sites 1 and 2.

on Page IV-18

"Complete cost data for all alternatives has not yet been provided by the facility planning engineer."

and

"Data concerning phasing of treatment facilities has also not been provided by BYK, and consequently, specific phasing possibilities and bond requirements cannot be discussed in this EIS."

on Page IV-23 Relative to Stream Crossings

"No data available on Alternative 8-I" which was the recommended alternative in the '75 Facilities Plan

Therefore it is our recommendation, that when all the information has been developed to adequately address all impacts and alternatives, a supplemental draft environmental impact statement be prepared. We understand that many delays have previously occurred in the preparation of the DEIS, but we believe that the DEIS should not be sacrificed as a result of these delays especially since one of the two "most significant delays" which you identified is the result of your other consultant (BYK) on this project not supplying the necessary alternative data in a timely manner.

In addition to the deficiencies which you yourself have noted in the DEIS, we feel the following areas need more information or clarification.

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LAND USE

On page I-4 the DEIS states that:

"Phase II of the Hanover County wastewater management program, which is the subject of this joint Facilities Plan/EIS effort, is concerned with providing some form of sewage service to the remaining portions of the County where some type of non-rural, high density development currently exists and/or is planned to continue or occur."

However, when we compared the proposed Facilities Plan with the Hanover County General Land Use Plan (Figure II-3), we noticed that large amounts of land to the north of Mechanicsville, east of State Rte. 615, and west of Ashland zoned low and low-medium density residential and some industrial land has not been included in either the Phase I or Phase II Plan. Since we are in total agreement with your inference that construction of the proposed sewerage facilities could serve as an important vehicle for implementing the Comprehensive Land Use Plan, we feel that this document should address all of the county that is planned to have a non-rural type of development.

On page IV-7 the DEIS states that because prime agricultural land is ideally suited for septic systems, the risk of losing valuable agricultural land to residential development is greatly enhanced. Although we agree entirely with this statement, we cannot believe that the potential for residential development is as great on the agricultural land as it would be if Phase II was constructed especially in the area known as the Lower Totopotomoy Basin (Planning Unit 5), where approximately 60% of the area planned for sewers is zoned Agricultural, Forest, Widely Scattered Residences, or Vacant Land in the County's Land Use Plan.

TRANSPORTATION

We realize that your document recognizes that there is an interrelationship between transportation, land use, and sewerage facilities. However, we feel that the DEIS should place more emphasis on the impacts on the transportation system, which will result from this project.

We believe that your document should address the additional vehicle trips which will occur as a result of the more intense development, and assign these trips to various highway facilities in the study area. Once this data has been developed, it will be easy to compare this data to the carrying capacity of individual facilities thereby identifying serious bottlenecks and areas where unacceptable levels of service will result.

WATER QUALITY

As you stated both land application sites (1 & 2) are located in special flood hazard areas. One possible mitigation measure to impacting the floodplain at either of these two sites would be to use either of the other two land application sites (site 15 or 16) which are both mentioned as sites that are still open for further study.

In addition to the major wetlands mentioned in your DEIS, there are several other areas where wetlands are impacted by various alternatives, such as, the Southern Corridor Interconnection (Figure III-6). In the area east of I-95 and north of State Rte. 656, the proposed gravity sewer is located in a wetland as identified on the USC&GS map.

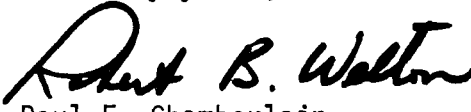
GENERAL COMMENTS

Although the DEIS mentions a need for some additional public services (schools, parks and retail services), it fails to discuss the need for additional emergency services (fire, police, ambulance) as well as the possibility of the county needing to construct some medical facilities (hospital) rather than rely on the City of Richmond and Henrico County for these services.

Probably the need for these services can be rationalized as being a necessity anyway relative to the projected population growth but as the DEIS states "In absence of the proposed sewer facilities, current projections for the area's 2003 population would have to be revised downward.", and thereby population projections could be classified as overly optimistic.

We hope that this review will assist you in processing the Environmental Impact Statement.

Sincerely yours,


Paul F. Chamberlain
Division Administrator

PUBLIC HEARING TESTIMONY

APRIL 4, 1979

(Incorporated by Reference)

1 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

2 REGION III

3 Philadelphia, Pennsylvania

4
5 HANOVER COUNTY PUBLIC HEARING

6 April 4, 1979

7
8 8:00 p.m.

9
10 Hanover County Courthouse,
11 Hanover, Virginia

12
13 IN RE:

14
15
16
17 HEARING FOR THE PURPOSES OF RECEIVING
18 INPUT FOR THE FACILITIES PLAN AND
19 EPA'S FINAL REGULATIONS FOR ENVIRONMENTAL
20 IMPACT STATEMENT

21
22
23
24
25 B-29

APPEARANCES:

STEVEN A. TOROK, Chief of the Environmental Impact Statement
Preparation Section, U. S. Environmental
Protection Agency, Region III, Philadelphia,
Pa., Hearing Officer

TOM SLENKAMP, Project Monitor representing the EIS Preparation
Section of the Environmental Protection Agency,
Region III, Philadlephia, Pa.

ROSEMARIE BALDINO, EPA, Region III, Philadelphia, Pa.

PAGE NUCKOLS, Chairman of Hanover County Board of Supervisors,

PETTIS MILLER, Vice Mayor, Town of Ashland, Virginia

JOHN B. STEADMAN, Mayor of Ashland, Virginia

PERSONS GIVING TESTIMONY

Steven A. Torok, Chairman
Mrs. Pettis Miller
Mr. Tom Slenkamp
Mr. James Bruce
Mr. Robert Bremner
Mr. Tim Rohrmoser
Mr. T. A. Clark
Mrs. Anne Smith
Mr. Donald Wiber
Mr. Tom Evans
Mr. Robert Phillips
Gail Enroughty
Nina Peace
Mrs. Lou L. Hanks
Mr. E. C. C. Woods
Mrs. Margaret R. Miller
Mrs. Bruce V. English
Mr. Bruce V. English
Donald McDonald
John S. Graham
Lois Wickham
Ron Jones
Pettis Miller
George Nester
John B. Steadman
Preston Wade
Bob Wilby
Bob Ostergren

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APPEARANCES:

1 L. Clark, Route 5, Box 150, RPCCA
2 Barrett S. Hopkins, Route 5, Box 300, Glen Allen, Virginia,
3 Green Top Sporting Goods
4 John Cibulka, P. O. Box 6616, Richmond, Water Control Board
5 E. A. Beck, 1103 Ridgeriver Road
6 E. F. Cartulin, Route 2, Box 263, Mechanicsville, Virginia,
7 RPCCA
8 Mike Bagby, State Health Department, Richmond, Virginia,
9 Kevin McCarthy, 333 G. Grace Street, Richmond, Virginia,
10 Richmond News Leader
11 T. O. Leadbetter, 405-A Air Park Road, Ashland, Virginia,
12 Leadbetter Construction,
13 Peggy N. Allen, 2940 Atlee Road, Mechanicsville, Virginia,
14 Allen Transport
15 A. G. Allan, Jr. 2940 Atlee Road, Mechanicsville, Virginia,
16 Allen Transport
17 L. P. Wade, 2310 Langhorn Road, Lynchburg, Virginia, Wiley &
18 Wilson
19 Anne N. Smith, Route 5, Mechanicsville, Virginia, Rural
20 Point Concerned Citizens Association
21 Lois Wickham, Route 4, Ashland, Virginia, land owner,
22 Jerry Moore, P. O. Box 231, Ashland, Virginia, Herald-
23 Progress
24 William C. Wickham, Jr., Route 4, Box 182, Hickory Hill
25 Farms,
Thomas W. Evans, 1402 Pump House Drive, Richmond, Virginia,
Virginia Bass State Federation, Inc.
S. N. Enroughty, Route 7, Box 21, Mechanicsville, Virginia,
RPCCA
Gail Enroughty, Route 7, Box 21, Mechanicsville, Virginia,
RPCCA
Greg Swanson, 5710 Midlothian Turnpike, Channel 12, WWBT-TV
W. K. Henberg, Jr., Ashland, Va., town council
E. Taylor, Mechanicsville, Virginia, citizen
Howard Dickenson, WWBT-TV
George Nester, P. O. 271, Ashland, Town of Ashland,
J. S. Graham, III, 1200 Ross Building, Richmond, Virginia,
Hanover Properties, Inc.
Mitam Gandhi, 1301 Roseneath Road, Richmond, Virginia, State
Health Department
Randy Morrisette, 1301 Roseneath Road, Richmond, Virginia,
State Health Department

APPEARANCES: (Continued)

Robert M. Ostergree, P. O. Box 211, Mechanicsville, Virginia
T. A. Cole, Jr., Route 6, Box 31, Mechanicsville, Virginia,
landowner

T. A. Cole, Sr. Henrico, Virginia, landowner

Nancy Cole, Route 6, Box 37, landowner

Ronald S. Jones, 2110 Avondale Dr, citizen

T. A. Clark, Route 5, Box 150, Mechanicsville, Va., RPCCA

Pete P. Tubee, 6434 Penrith Drive, Mechanicsville, Virginia
County of Hanover

Robert Phillips, Jr., 6410 Studley Road, Mechanicsville,
Virginia, homeowner

Robert N. Pethlan, III, Route 1, Box 219, Doswell, Virginia
homeowner

K. C. Das, 4010 W. Broad Street, Richmond, Virginia,
State Water Control Board

B. P. Gayle, 4010 W. Broad Street, Richmond, Virginia,
State Water Control Board

L. G. Cox, 6824 Wheeling Road, Mechanicsville, Virginia,
business and home owner

Mrs. E. Casterlion, Box 263, Route 2, Mechanicsville, Va.
home owner

Mr. E. Caterlion, Box 263, Route 2, Mechanicsville, Va.,
homw owner

Clyde L. Goff, 6001 Lakeside Avenue, Richmond, Va.
Beechwood Development Corporation

Joseph C. Dowhe, 6400 Croftwood Dr., Mech., Va. Mech. Civic
Association

Pauline Meadow, 1110 Atlee Road, Mech., Va. Mech. Civic
Association

C. Fred Swats, Pembroke Six, Suite 208, Virginia Beach,
Virginia, Wiley & Wilson, Inc.

Bruce V. English, P. O. Box 267, Ashland, Va. land owner

Virginia English, P. O. Box 267, Ashland, Va. citizen

Lou L. Hanks, P. O. Box 1031, Glen Allen, Virginia, South
Anna Citizens Council

Joyce L. Hoyle, 6316 Morningside Dr., Richmond, Virginia,
SWCB

R. D. Weber, Sr., Route 5, Box 152, Mech, Va., RPCCA

Nina K. Peace, Route 1, Box 281, Ashland, Virginia, Board of
Supervisors

CRANE - SNEAD & ASSOCIATES, INC.

COURT REPORTERS
1108 EAST MAIN STREET
RICHMOND, VIRGINIA
PHONE 648 - 2801

6.

APPEARANCES: (Continued)

Colin Williamson, Route 6, Box 671, Mech., Virginia
John W. Fauborn, 307 Arlington St., Apt. 56, Ashland,
Virginia, Hanover County
Tom O'Kelly, Sr. 6201 Delkin Circle, Mech., Va., Hanover
County
York Phillips, Planning Office, Hanover, Virginia, Hanover
County
Mrs. W. W. Bradley, Route 4, Box 184, Ashland, landowner
Bill Gullede, McLean, Virginia, Engineering Science
Frederick Kennedy, McLean, Virginia, Electronic Research
Associates
Ron C. Lyons, Mobil Chemical Co, Richmond, Virginia
Louis L. Guy, 10523 Main St., Fairfax, Virginia, Patton,
Harris, Rust & Guy
Elaine G. Fenne, Route 2, Box 359, Mech., Virginia
Utilities and Solid Waste
Hank Lowry, 605 Maple St., Ashland, Virginia, Town Council
Rosemary O'Kelly, 6201 Delkin Circle, Mech., Virginia,
resident
Helen M. Lachman, 1203 Boxlake, Mech., Virginia
Ray E. Martin, 115 Henry Clay Road, Ashland, Virginia
D. G. MacDonald, Route 1, Doswell, Virginia
John Steadman, 2215 Falcon Hill Place, Lynchburg, Virginia
Wiley & Wilson
Diane Slusarski, P. O. Box 231, Ashland, Virginia,
Herald-Progress
Shirley S. Mayer, Route 2, Box 143-E, Ruther Glen, Virginia
Leadbetter Const. Co.
Warfield Smith, Route 5, Box 165, Mech., Va.
M. J. Whittaker, 2905 Waynedale Dr., Mech., Va.
Margaret R. Miller, P. O. Box 202, Ashland, Va. Citizens for
Sensible Growth
M. M. Bordley, Jr., Box 182, Route 4, Ashland, Va.
K. T. Specer, 635 Mt. Herman Road, Ashland, Va.
Mrs. John Maples, Route 1, Box 382, Mech., Va.
E. C. C. Woods, Jr., Route 2, Box 8, Hanover, Virginia,
Board of Supervisors,
Mr. and Mrs. William A. Bruce, 1207 Arnoka Road, Mech.,
Virginia, land owner
W. R. Phillips, Jr., 1203 Barette Avenue, Mech., Va.,

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EXHIBITS

Flood Plain Information Totopotomoy Creek Book, Hanover County

A closer Look at Hanover County's Proposed Facilities Plan, Phase II

Exhibit No. 1 - A letter from Mr. Robert G. Bremner, Jr. to Mr. Tom Slenkamp dated April 3, 1979

Exhibit No. 2 - The Confidential Survey of Hanover County Residents

Exhibit No. 3 - A group of correspondence submitted into the record by Mr. E. C. C. Woods

Exhibit No. 4 - A statement from Mr. Tom Slenkamp, Project Manager representing the EIS PREPARATION SECTION of the EPA

Exhibit No. 5 - A statement from Thomas W. Evans of the Virginia B.A.S.S. State Federation, Inc.

Exhibit No. 6 - A statement from Gail Enroughty, President of Rural Point Concerned Citizens Association, Inc.

Exhibit No. 7 - A statement presented by Lou L. Hanks regarding the Draft Environmental Impact Statement for the Hanover County Phase II Area and the Corresponding Facilities Plan.

Exhibit No. 8 - A statement presented by Margaret R. Miller, Co-Chairman, Citizens for Sensible Growth

Exhibit No. 9 - A statement from Mrs. Bruce V. English dated April 4, 1979

Exhibit No. 10 - A statement from Mr. Bruce V. English on Hanover County Phase II Facilities Planning.

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PUBLIC HEARING TESTIMONY

JANUARY 20, 1981

(Incorporated by Reference)

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
and
TOWN OF ASHLAND
HANOVER COUNTY, VIRGINIA

- - - - -X
In the Matter of: :

WASTEWATER TREATMENT ALTERNATIVES :
FOR THE TOWN OF ASHLAND AND HANOVER :
COUNTY(Phase II area) :

JOINT HEARING

and :

TOWN OF ASHLAND "201" FACILITY PLAN, :
PRELIMINARY DRAFT. :

- - - - -X
Ashland Municipal Building
Council Chambers
Hanover Avenue and Thompson Street
Ashland, Virginia 23005

January 20, 1981
8:03 o'clock, p.m.

B e f o r e :

THOMAS SLENKAMP, Project Monitor
Environmental Impact Branch
EIS Preparation Section

and

RICHARD S. GILLIS, JR., Mayor
PETTIS FRAZIER MILLER, Vice Mayor
BRUCE W. HAYNES, Councilman
LINWOOD HENDERSON, JR., Councilman
DONALD P. ROBERTSON, Councilman

- - -
Daniel J. Siegel
Court Reporter



C.R.I. ASSOCIATES
Court & Conference Reporters
905 World Building
Silver Spring, Maryland 20910
(301) 587-6647

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1 ALSO PRESENT:

2 DAVID REYNAL, Town Manager
 3 DOUGLAS CULLINANE, Director of Public Works
 ELIZABETH C. KENNON, Township Clerk

4 JOHN HODGES, Hanover County Planning Department
 5 JERRY P. OWEN, Chairman, Hanover County Board of Supervisors
 NINA K. PEACE, Supervisor, Ashland District

6 ROSEMARIE BALDINO, Environmental Protection Agency,
 and others.

7 - - - - -
 8 I N D E X

9 <u>Speakers</u>	<u>Page</u>
10 Richard S. Gillis, Jr., Mayor	3
11 Thomas Slenkamp	4
12 Douglas Cullinane	9, 66
13 John Hodges	23, 51, 64
14 Bruce English	36, 66
15 Gail Enroughty	45
16 Margaret Miller	53
17 Mr. T. A. Clark	63
18 Mrs. Bruce English	64
19 Nina K. Peace	69

20 - - - - -
 21 ATTACHMENTS

22 Letter read into record by Mr. Hodges, from J. W. Fairburn,
 Interim County Administrator, dated January 20, 1981.

23 201 Facilities Planning Projections, Hanover County, Va.,
 24 January, 1981, and attached memoranda.

25 EIS NEWS, December 1980 Hanover County/Ashland, VA Wastewater
 Treatment Planning.

PUBLIC HEARING TESTIMONY

JUNE 3, 1981

(Incorporated by Reference)

PUBLIC HEARING - PAHSE I EXTENDED - WATER POLLUTION CONTROL
FACILITIES PLAN 4/81

Jim Popek - Chickahominy District

1. Has the area beyond Interstate 95 enough density to support the cost of extending the pipe in that area.
2. Concern as to the cost the extension of Phase I area will create in other services required.

T. A. Clark - Henry District

NO QUESTIONS

Nicholas A. Spinella - Henry District - Attorney for Avondale Corp.

1. Would welcome opportunity to have a meeting with County representatives in order to work out a pro rata cost of the extension so that the developers of property would be paying their fair share of any extension.

Supports the situation which must be corrected for the residents of Blue Star Estates.

Shirley Creasy - Chickahominy District - Blue Star Civic Association

NO QUESTIONS

Stated residents of Blue Star Estates would like the County to take over the utilities in Blue Star Estates at no cost whatsoever to the residents.

Charles M. Johnson, Manager of Public Affairs, RF&P Railroad

1. Would like to see Phase I Extended extend line to land already zoned industrial up to the RF&P
2. Need to obtain additional facts from the County as to what the cost factors would be

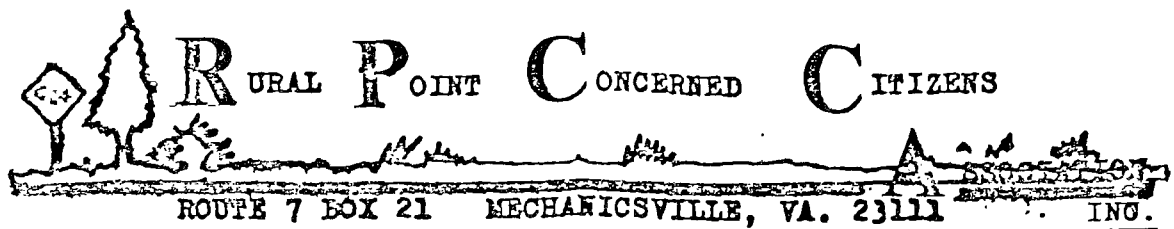
Ann Spain - Chickahominy District

1. Ask that Board seriously consider including Blue Star Estates in Phase I Extended

Margaret Miller - Beaverdam District - Citizens for Sensitive Growth

1. Cost for sewage treatment for Ashland
2. Why land treatment for Phase I Extended is so much less expensive than land treatment for Oak Hill Estates.
3. Would like to know whether innovated procedures beyond land treatment were considered
4. Would increasing the number of lagoons have any application in any of these cases and have they been considered.

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PUBLIC HEARING STATEMENT OF JUNE 3, 1981

For the record my name is Gail Enroughty, and I am represent Rural Point Concerned Citizens Association, Inc. As many of you are aware Rural Point has been following the Phase II, now Phase I Extension for a number of years with great interest and has had representation at the public hearings. Our initial concern was and is the Totopotomoy Creek and possible discharge to this creek, ^{environmental damage and development of the watershed} and the Pamunkey River discharge. We still have not seen answers to questions raised during the May, 1976 hearing and answers to the list submitted by the Town of Ashland and others many years ago. If my memory serves me correctly, there were almost 100 questions submitted.

Please refer to the hearings held May, 1976; April, 1979 and January, 1981 in reference to the concerns and questions expressed by Rural Point. Also, I followed up on the statement given during the January, 1981 hearing with a letter to Mr. Thomas Slenkamp dated March 6, 1981, and as of this date still have not received a reply.

[I submit a copy of that letter for the record.] So again we ask: What evaluation has been done on the upper portion of the creek and what is the outcome? What portions were found to be environmentally sensitive if not the whole ^{upper portion of the creek} creek, and has the floodplain information been corrected?) In my opinion there is absolutely no excuse for our questions pertaining to the sensitivity of the creek not being officially answered before now. Is this an example of the bureaucracy fulfilling the requirements by having a public hearing and not responding to the concerns of citizens? Also how many ^{meetings} ~~hearings~~ have been held without notification of those of us who requested to be notified? The

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Totopotomoy Creek is a vital portion of the overall plans for some and we would appreciate an answer tonight.

(The following are some of our other concerns which we at least want included in this record and hopefully will be addressed very soon. First we have previously questioned the issue of interbasin transfer. With the inclusion of Blue Star Estates and the ~~XXXXXX~~ Totopotomoy Creek we are dealing with two watersheds. Will this be allowed?

Next the County recently contracted with an engineering firm at a cost of approximately \$10,000. to study funding of alternatives. How can a final EIS ^{and the preliminary EIS} be prepared without the public having this information available for comment tonight? So again we are having a public hearing for public comment without all the information being available. And speaking of funding, the information sent out by the County dated April, 1981 on page 3 states "it is estimated that this system will actually allow a reduction in the Phase I user costs." The propaganda dated July, 1977 made available by the VPI Extension Service in cooperation with the Hanover Board of Supervisors for the purpose of trying to get the August, 1977 bond referendum passed was in the form of questions and answers. # 14 states: "Is there any possibility of reductions in the proposed sewer user rate schedule? Yes. There is the potential for a large industry to connect to the County's utility system that would have a substantial impact on user rates. The industry proposed, a newsprint mill (BATO), is equivalent to 1715 homes. If this industry comes to the County it will help support the utilities program." # 4 states: "Does this mean that every taxpayer will help pay for the sewer facilities? No. It is anticipated, but not guaranteed, that the residential and commercial users of the sewer facilities will pay the full cost of the system." And # 15 states: "What affect will the passing

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of the bond referendum have on an individual's taxes in Hanover County? The intent is to make the County's utility program self-supporting through the connection fees and bimonthly sewer rate. It is projected that those who use the system will pay and therefore an individual's taxes should not be affected." The Herald-Progress recently reported that the deficit for the 81-82 budget year will be \$830,000; so these statements are history and today we are facing the reality and will do so in future years. We predict that the deficit will continue to be larger, user rates will have to be increased and all County taxpayers will have to pay through increased taxes unless money is received from the potential users up front. Throwing good money after bad is not the solution. It is interesting to note that on page 4, section 9 of the addendum dated March, 1981 prepared by Patton, Harris, Rust and Guy under user charges and connections the following statement is made: "Federal regulations require that sewerage systems being built with Federal grant money be self supporting." Along this same line, section 6, page 18, Table 6-1 of the addendum, the limited build alternative gives costs for upgrading. First question, are these figures based on a sliding scale without considering portions of the existing systems being used? Has each system been individually evaluated? Has the SWCB developed allocations for each of these discharges? Were costs based on degree of treatment required? Kingswood Court and Totopotomoy Estates are the only two County owned systems on this table. The Cost given to upgrade these two is \$831,500. Again, is this figure accurate? The others are privately owned commercial, residential and industrial systems. Are these owners willing to pay up front the costs associated with this proposal for their systems? According to this table, if these systems were individually upgraded the dollar amount to do so would be \$2,277,000. Section 1, page 3 states: "The combined cost for Oak Hill Estates and Phase I Extended is as follows: Construction Cost _

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\$2,907, 310.." If the previous dollar amount of \$2,277,000 was collected from the private system owners and subtracted from the estimated construction costs, this would leave a maximum total of \$630,310 without grant money for the County to finance. ^{Perhaps this could be obtained from developing the} Of course, grant money ^{either} at 50% or 75% would substantially reduce the cost to the owners of the private system and to the County.

The next concern is in reference to the planning area, what is the amount of area being studied and being considered for sewer service in square miles. At one time it appeared that the 8-I plan was being scaled down considerably, but it now appears that the area is being increased back to the 8-I plan size.)

During the April 4, 1979 hearing Mr. E. C. C. Woods, Jr. entered a number of letters into the record. On page 74 at line 17 of the transcript Mr. Woods stated: "And to this date an audit has not been performed or started that I am aware of." Has EPA completed or started an audit? Also, since Phase I rates will be included in the rates for the Phase I extension, has an audit been completed on Phase I by EPA as was my understanding would be done. If so, where can a copy of the addit be obtained?

(In closing I would like to point out that numerous hearings have been held for the Phase II/Phase I extension. The citizens have raised many, many questions and points of concern. Also citizens have written letters to EPA. Will the issues be addressed in the Final EIS or will the citizen participation for the most part end up being ignored. When can we expect answers?)

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RESPONSE TO PUBLIC HEARING QUESTIONS JUNE 3, 1981
Draft Addendum Water Pollution Control Facilities Plan
Phase I Extended, Hanover County, Virginia

The following is a list of questions raised by citizens at the required public hearing held on the Draft Addendum, Water Pollution Control Facilities Plan, Phase I Extended, April, 1981 (prepared by Patton, Harris, Rust & Guy) held by the Hanover County Board of Supervisors during their June 3, 1981 meeting in the Henry Taylor Wickham Building, Hanover Virginia. The questions are followed by the best response the County can make at this time to these questions as prepared by the Hanover County Department of Planning.

1. Gail Enroughty, Rural Point Concerned Citizens Association, Inc. (presented prepared statement, questions summarized below).

- a. Question: "We still have not seen answers to questions raised during the May, 1976 hearing and answers to the list submitted by the Town of Ashland and others many years ago".

Response: Attached (Appendix B) is a September, 1976 list of 105 questions primarily concerned with land application of wastewater developed by citizens and staff following the May, 1976 public hearing on Phase II. The responses to most of the questions raised are included in the following documents used in the preparation of the Draft Addendum for Phase I Extended:

REFERENCES:

1. Expanded Scope and Investigation of Additional Alternatives for Facilities Planning - Hanover County Virginia, preliminary draft, August 1978, Bremner, Youngblood and King, Inc. (Sections 4.6 - 4.8);
2. Draft Environmental Impact Statement - Wastewater Treatment Facilities Planning for Hanover County, Virginia: Phase II Area, January 1979, Engineering Science (Section III.c and IV);
3. Preliminary Draft: Town of Ashland Facilities Plan, February 1980, Douglas Cullinane, Town Engineer (Section VI); and
4. Draft Addendum, Water Pollution Control Facilities Plan, Phase I Extended, April, 1981, Patton, Harris, Rust and Guy (Sections 6,7,8 and 10).
5. In addition, a review of information regarding "Land Treatment of Wastewater in Hanover County" is included in a Memorandum to the Board of Supervisors from the Growth Management Program Manager (March 19, 1981).

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After reviewing the questions, it is the feeling of the County Staff that the basic questions asked in the September, 1976 list have either been answered (through the documentation indicated above) or have been rendered obsolete by the subsequent significant revision and scaling down of the May 1976 Phase II proposals prepared by Bremner, Youngblood and Sharp, Inc. (As represented by the June 3, 1981 Phase I Extended proposal).

- b. Question: "What evaluation has been done on the upper portion of the (Totopotomoy) Creek and what is the outcome? What portions were found to be environmentally sensitive if not the whole upper portion of the Creek, and has the flood plain information been corrected?"

Response: These questions were directed to Mr. Thomas Slenkamp, EIS Preparation Section, Environmental Protection Agency. Mr. Slenkamp has received a copy of your comments from the June 3, 1981 public hearing and he has indicated that your concerns will be addressed in the Final EIS. Completion and publication of the Final EIS has been delayed by Federal staff and budgetary cut-backs. It is anticipated that the Final EIS will be available by the end of July.

- c. Question: "How many meetings have been held without notification of those of use who requested to be notified?"

Response: It is assumed that this question is also directed to Mr. Slenkamp as the County has provided adequate notice, as required for meetings in which the public is invited.

- d. Question: "First we have previously questioned the issue of interbasin transfer. With the inclusion of Blue Star Estates and the Totopotomoy Creek we are dealing with two watersheds. Will this be allowed?"

Response: It is our understanding of the State law which prevents interbasin transfers of water from one watershed to the other (such as from the York to the James River Basin) does not prevent transfer of water taken from deep wells (which represents water in unconsolidated sediments not related to surface water basins). Therefore, including Blue Star Estates, which is in the York River Basin, in the Phase I Extended System which discharges wastewater into the James River Basin would not be prohibited because Blue Star Utility users get their water from deep wells.

- e. Question: "How can a final EIS and a final 201 Plan be prepared without the public having this information?" (Report on financing alternatives for Phase I Extended to be presented by Peat, Marwick, Mitchell and Company June 24, 1981).

Response: The engineering consultants report (Patton, Harris, Rust and Guy) presented at the June 3, 1981 public hearing fulfils the Environmental Protection Agency's requirements for comparison of Alternate Wastewater disposal systems within environmental, social and cost constraints. However, because the County has been advised by the State Water Control Board that Federal funding of any Alternative is highly uncertain at this time and in the near future, the County has hired a financial consultant (Peat, Marwick, Mitchell and Co.) to assess the likelihood of building the system with local financial resources. The financing report will not change the alternatives reviewed in the engineering report, only help the Board determine the most feasible way to finance the recommended alternative. This may alter the timing but not the environmental, social or cost constraints which were discussed in the engineering report. Copies of the financial consultant's report have been available since the Board's June 24, 1981 meeting for review by the public. Since the financing report is advisory only and does not affect the Environmental Protection Agency's (EPA) requirements, the County Staff does not think a public hearing is necessary. Should the Board wish to pursue a particular financing alternative other than EPA grants, then the Board may elect to solicit public comments on the financing techniques.

- f. Question: "...the limited build alternative gives costs for upgrading. First question, are these figures based on a sliding scale without considering portions of the existing systems being used?"

Response: The County's engineering consultant for Phase I Extended advises that their cost estimates did not allow for using individual elements of the existing treatment plants other than for flow equalization of influent or as polishing ponds for the effluent.

- g. Question: "Has each (existing) system been individually evaluated?"

Response: The engineering consultant for Phase I Extended says that "yes" the systems have been individually evaluated but not beyond the general level considered appropriate to a 201 Facilities Plan.

- h. Question: "Were costs based on degree of treatment required? Kingswood Court and Totopotomoy Estates are only two County owned systems in this table. The cost given to upgrade these two is \$831,500. Again is this figure accurate?"

Response: The engineering consultant for Phase I Extended advises that, "yes", costs were based on expected advanced waste treatment requirements. Regarding Kingswood Court and Totopotomoy Estates, the consultant advises that costs were based on "typical" costs from EPA publications and are considered adequate for planning purposes. Further, the cost of Totopotomoy subdivision is greater than the others because its size is also greater than all the other treatment systems.

- i. Question: "...privately owned, commercial, residential, and industrial systems. Are these owners willing to pay up front cost associated with this proposal for their systems?"

Response: The firm of Peat, Marwick, Mitchell and Company recently reported on the financing alternatives for Phase I Extended (June, 1981). This report included a survey of major property owners and developers in the Phase I Extended study Area. The survey indicated an interest in participating in prepaid connections or the sale of revenue bonds. A similar but independent survey conducted by the Hanover Association of Business found, however, that only 30% of the property owners in the proposed Phase I Extended Service Area would be interested in contributing to the construction of the Phase I Extended System. The Board of Supervisors will consider this information in making its final decision on financing for Phase I Extended.

- j. Question: "What is the amount of area being studied and being considered for sewer service in square miles?"

Response: The Phase I Extended "initial service area" is approximately 8 square miles which is 55% of the total Phase I Extended "study area" (14.5 square miles).

- k. Question: "Has EPA completed or started an audit?" Also ...has an audit been completed on Phase I by EPA...If so where can a copy of the audit be obtained?

Response: Mr. Slenkamp of EPA advises that an audit of EPA funds will not be conducted until all Federal funds have been expended. As of this date, all EPA funds due the Phase I system have not been received. The Corps of Engineers will conduct a preliminary review of the County's files prior to release of final payment (the date has not yet been set for this review). This review will be followed within three years by an audit by EPA. (We have been advised that an EPA audit is not a requirement and may not be conducted).

- l. Question: "numerous hearings have been held ...When can we expect answers?"

Response: Attached (Appendices C and D), is an extract of Ms. Enroughty's comments from the two public hearings held subsequent to the May 1976 meeting mentioned at the beginning of her prepared statement. Responses are as follows:

- 1) Public Hearing, April 4, 1979, Hanover Courthouse. Comments are addressed to the preparation of the Final EIS which has not been completed as of this date and is the responsibility of the U. S. Environmental Protection Agency. Other comments raised concerned the Bremner, Youngblood and King presentation of a County facilities plan for Phase II which has not been adopted by the County and has been made obsolete by the Patton, Harris, Rust and Guy report on Phase I Extended. (April, 1981).
- 2) Public Hearing, January 20, 1981 Ashland Municipal Building. Comments are again addressed to the Environmental Protection Agency and the Draft EIS.

In regards to Ms. Enroughty's concern about pipe sizing, it should be pointed out that the Patton, Harris, Rust and Guy report projected design flows based on a twenty year planning period 1982-2002. Hanover County does not anticipate requesting a larger pipe size corresponding to a longer staging period such as 40 years. While not contradicting the statement quoted from Mr. Cibulka's letter of March 5, 1980, the State Water Control Board, by letter, reaffirmed the regulations quoted by Ms. Enroughty in her statement.

2. Thomas Tuohy, Vice President, Mechanicsville Civic Association (presented prepared statement, questions summarized below).

- a. Question: "Supposedly this plan will provide the sewer rate relief for the present Phase I Users that has been promised by members of the Board of Supervisors for many months. But does it? If we are reading the table (Table 9-3, page 9-9, Patton Harris, Rust and Guy, April, 1981) correctly this represents an 81.5% increase in present user costs."

Response: Table 9-3 was prepared in April and presents existing Phase I rates if they were totally supported by user charges. This is not currently the case. The table shows hypothetically how the addition of Phase I Extended would benefit a total Mechanicsville Water system by lowering average user costs.

Realizing the limitations of this type of financial analysis, although sufficient for Federal Grant purposes, the County hired the firm of Peat, Marwick, Mitchell and Company to conduct a detailed financial analysis of the impact of constructing Phase I Extended. This report has been presented to the Board in draft form. It shows that under certain financing conditions, the cost of construction to the users of the Phase I Extended system would be less than the current user costs of the Phase I system. Therefore, this preliminary report supports the concept that if the Phase I and Phase I Extended systems were combined and all users paid the same user fee, then the users of the Phase I Extended system could help offset the costs of the Phase I user.

- b. Question: "Page 4-10 of the Draft Addendum lists different numbers than Mr. Bruce's memo (December 22, 1980), as follows: ...paid connection fee, Bruce 2241 (74.4%), Addendum 2709 (90%); Actually connected, Bruce 1313 (43.6%, Addendum 1815 (60.2%))"

Response: The figures used by the consultant in the Draft Addendum were provided by Mr. Bruce, Director of Public Utilities, in an updated memorandum of April 13, 1981. Specifically, as of April 1981 there were 1815 physical connections to Phase I with 894 users having paid the connection fee but remaining unconnected.

- c. Question: "Page 9-5 of the addendum states that existing users would not be assessed for connection... Can someone explain either now or in the near future the dissimilarity between the Phase I and Phase I Extended users?"

Response: The Draft Addendum as prepared by the consultant looks at the Phase I Extended Area separately from Phase I. Therefore the discussion of "existing collections systems" is meant to cover only the Phase I Extended area. The information presented in financial analysis of the Draft Addendum is used solely for illustrative purposes. Connection fees and charges for the Phase I Extended area as opposed to the Phase I area are a policy decisions which have not been made by the Board of Supervisors.

- d. Question: "The subdivision (Blue Star Estates) is 15 years old. Will an engineering survey be made of existing underground lines to determine condition and adequacy to protect against future costs to the County?"

Response: This point is well taken. Hidden costs could exist from collection systems pump stations and lagoons in a poor state of repair. This level of analysis is beyond the scope of the 201 Facilities Plan. These hidden costs would apply to all alternatives considered so they would not influence the final recommended alternative.

3. Jim Popek, Chickahominy District (no written statement submitted).

- a. Question: Has the area beyond Interstate I-95 enough density to support the cost of extending the pipe in that area.

Response: The Draft Addendum report prepared by Patton, Harris, Rust and Guy did not address the financial self-sufficiency of the Phase I Extended system. This has been addressed by the preliminary report of Peat, Marwick, Mitchell and Company. This report indicates that the segments of Phase I Extended west of I-95 are not likely to be self-sufficient in the next five years.

- b. Question: Concern as to the other costs the extension of Phase I area will create in other service areas.

Response: The Draft Addendum presents an analysis of the costs associated with different wastewater treatment solutions as compared to each other. The impact of Countywide finances has been reviewed by the firm of Peat, Marwick, Mitchell and Company (preliminary report, June, 1981). The planning impacts will be discussed in the Comprehensive Plan Update for Phase I Extended which is being developed by the Planning Department at this time.

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4. T. A. Clark - comment, no questions.
5. Nicholas A. Spinella, Henry District, Attorney for Avondale Corp. (no written statement).

- a. Question: Would welcome an opportunity to have a meeting with County representatives in order to work out a pro rata cost of the extension (to Blue Star Estates) so that the developers of property would be paying their fair share of any extension.

Response: The firm of Peat, Marwick, Mitchell and Company has reviewed the impact of pro rata share contributions to the Phase I Extended system which included comments from developers regarding pro rata share. The County would contact you if additional information is needed by the Board before making a final decision on the utility program in your area.

6. Shirley Creasy - comment, no questions.
7. Charles M. Johnson, Manager of Public Affairs, R.F. & P Railroad (no written comments).

Question: Would like to see Phase I Extended extend line to land area already zoned industrial up to the R.F. and P. Need to obtain additional facts from the County as to what the cost factors would be.

Response: The County has hired the firm of Peat, Marwick, Mitchell and Company to review the financial alternatives for Phase I Extended. The preliminary report questions the extension of a line to the R.F. & P. property in the next five years. The final report with supporting documentation is expected to be available in July, 1981. When completed we would be glad to send you this information.

8. Ann Spain - (comment, no questions).
9. Margaret Miller, Beaverdam District, Citizens for Sensible Growth.

- a. Question: Cost for sewage treatment for Ashland.

Response: Hanover's Draft Addendum 201 Plan uses costs used by the Town of Ashland in its own 201 Facilities Plan for areas not in the Town.

- b. Question: Why is land treatment for Phase I Extended so much less expensive than land treatment for Oak Hill Estates?

Response: The lower costs are associated with the different economies of scale. The Phase I Extended area would serve approximately 1060 existing connections and an estimated 125 new connections each year. The Oak Hill system would serve only about 100 existing homes and would be designed to serve a limited number of new connections. Because of the larger scale, the Phase I Extended system can be designed to be more efficient than Oak Hill.

- c. Question: Would like to know whether innovative procedures beyond land treatment were considered?

Response: Innovative alternatives for wastewater treatment were considered but were not considered reasonable or practical for formal presentation in the report.

- d. Question: Would increasing the number of lagoons have any application in any of these cases and have they been considered?

Response: Increasing the number of lagoons was considered but were not seen as feasible. As in the case of Oak Hill, increasing the number of lagoons would not be sufficient to meet the Chickahominy River discharge standards.

10. Raphael Oeters, President, Blue Star Utility.

- a. Question: Please accept Blue Star Utility into Phase I.

Response: The County staff has recommended the inclusion of Blue Star Utility into Phase I Extended if the costs were borne by the utility users. The County's financing consultant has advised that if the County pays the construction costs, these additional costs would not be completely offset by the increase in the number of users in the Phase I Extended system (See Draft Report, Peat, Marwick Mitchell and Company, June 1981 page C-1). The treatment of a private utility in the Totopotomoy Watershed represents a planning precedent which the Board of Supervisors and Planning Commission will consider in the Comprehensive Plan Update for the Mechanicsville/Chickahominy Urban Area.

11. Blue Star Civics Association, comment on household survey (Appendix H), no question.
12. Doran Woodson, letter submitted prior to the public hearing.

Question: If the price is right, I will be willing to pay my share.

Response: The County is preparing a financial analysis which would indicate what the pro rata costs for developing properties would be in the Phase I Extended Area. If you would like a copy of the report please contact the Growth Management Planning Office.

13. Christopher J. Cullen, Executive Director, Hanover Association of Businesses letter submitted June 8, 1981.

Question: Wish to include results of a survey of the Phase I Extended.

Response: The results of the survey have been provided the County's Consultant Peat, Marwick, Mitchell and Company, with the survey results for inclusion in their report on financing alternatives for Phase I Extended.

14. W. Page Morris, Project Engineer, Johnson and Anderson of Virginia, Inc. representing Mr. Davide Mayers, Sr. letter submitted June 17, 1981.

Question: Request an expansion of the Phase I Initial Service Area to include approximately 351 Acres of Mr. Mayer's property which lies generally between and is contiguous to the subdivisions of Totopotomoy and Kingswood Court.

Response: Your request and the planning issues you raise will be considered and addressed by the staff in the Comprehensive Plan Update for the Mechanicsville/Chickahominy Urban Area. The Planning Commission and the Board of Supervisors are anticipated to take action on the planning proposals in September, 1981.

15. Gordon H. Lawhorn, correspondence received June 1, 1981.

Question: Is there a consideration of a water and sewer connection by the County of Hanover to Laurel Grove and north on U. S. 301? I would be interested to know more about the cost etc. and date of completion.

Response: Hanover County is considering extending a sewer line north along U. S. Route 301 from Atlee Square to the Blue Star Estates Subdivision. The cost to the County or Blue Star Estates would be approximately \$120,000. The County is considering several separate financing alternatives as well as the planning implications of extending a sewer interceptor into a primarily undeveloped watershed (Totopotomoy Creek). The County staff is working on a planning and financing recommendation which will be presented to the Board and Planning Commission in September, 1981.

16. David Mayers, correspondence received June 1, 1981.

Question: The County has proposed sewer on property which he intends to develop.

Response: The planning implications of allowing Mr. Mayers property to be connected to Phase I Extended is being studied by the staff and will be reviewed by the Planning Commission and Board in September, 1981.

17. R. P. Oeters, Jr., President, Sons, Inc., correspondence received June 1, 1981, No question asked, indicates interest in paying their share of cost to serve Blue Star Utility.

18. Nicholas A. Spinella, Attorney-at-Law, representing Avondale Corporation, correspondence received May 21, 1981.

Question: Requests a meeting to discuss how Avondale Corporation and property owners adjoining Blue Star Utility would share in the pro rata cost of extending sewer service to Blue Star Utility.

Response: Correspondence previously responded to by County Staff. Mr. Spinella presented comments to Board at June 3, 1981 Public Hearing. Providing sewer service to Blue Star and adjoining properties has planning implications which are being addressed by the Planning Department in a report that will be reviewed by the Board and Planning Commission in September, 1981.

19. W. S. Heindl, Jr., President, Heindl-Evans, Inc. correspondence received May 26, 1981.

Question: Requests to be informed when sewer service will be provided to certain properties owned by Heindl-Evans, Inc. and Hanover Investments.

Response: The County staff is preparing a report on the financing and planning implications of extending the Phase I system. This report is expected to be reviewed by the Planning Commission and Board in September, 1981. The timing and service area of any sewer extension will be addressed at that time.

20. Cecil R. Hopkins, correspondence received May 1, 1981.

Question: Requests his property adjacent to Hanover Airpark be included in the proposed Phase I Extended service area.

Response: At this time the subject property is included in the proposed initial service area. The Board and Planning Commission are expected to take action on the Phase I Extended proposals in September, 1981.

Doran Woodson
701 Brookhill Road
Richmond, VA 23227
May 22, 1981



John Hodges, AICP
Growth Management Steering Committee
Hanover, Virginia 23069

Dear Sir:

For the past 16 years, I have owned approximately five acres facing Shannon Road. Please include this in Phase I Extended.

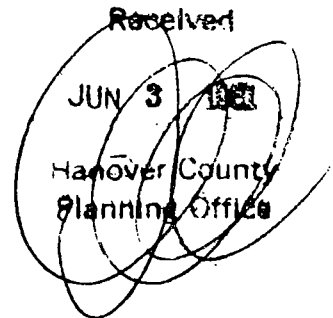
If the price is right, I will be willing to pay my share.

Sincerely,

Doran Woodson

DW/gr

cc: Jerry P. Owen
William C. Frazier
Terry Cook
Joseph H. Norman, Jr.
A. Page Nuckols
Mina K. Peace
E.C.C. Woods, Jr.
Peter L. Tribble



June 5, 1981

Mr. Allan T. Williams
County Administrator
Hanover Courthouse
Hanover, Virginia 23069

Dear Mr. Williams:

The Hanover Association of Businesses just completed a survey of the attitudes of selected users in the proposed Phase I Extended Area, entitled:

FUTURE USER/BENEFICIARY STUDY OF
PHASE I EXTENDED SEWERAGE
HANOVER COUNTY, VIRGINIA
MAY 1981

The Board of Directors of the Hanover Association of Businesses reviewed this plan at their regular monthly meeting held June 2, 1981 and unanimously voted to forward it to the County for inclusion in the record of the public hearing held on June 3, 1981 on the 201 Facilities Plan. Please find a copy of the survey enclosed.

I will be happy to discuss this survey and it's findings with the Board and/or staff. I am advising John Hodges, as well as the Board of Supervisors of this matter by forwarding to them a copy of this letter and study.

Should you have any questions or comments, please feel free to call me at any time.

Sincerely,

Christopher J. Cullen
Executive Director

CJC:mc
Enclosure

cc: John Hodges
Hanover County Board of Supervisors

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JUN 08 1981

GMP - Planning Department
Hanover County

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Johnson & Anderson of Virginia, Inc.

Consulting Engineers

Ashland-Hanover Office Bldg.
201 N. Washington Hwy
P.O. Box 568
Ashland, Virginia 23005
Telephone: 804-798-1618

RECEIVED

JUN 17 1981

GMP - Planning Department
Hanover County

June 12, 1981

County of Hanover
Hanover Courthouse
Hanover, Virginia 23069

ATTN: Mr. Allan T. Williams, County Administrator

RE: Wastewater Treatment Facilities Planning
for Hanover County, Phase I - Extended

Dear Mr. Williams:

I hereby request that this letter, in its entirety, be entered into the minutes of the Public Hearing held June 3, 1981 by the Hanover County Board of Supervisors. I have been advised by Mr. John Hodges of the Hanover County Planning Staff that the above mentioned minutes have been held open to accept additional comments until June 19, 1981. I am writing to you on behalf of Mr. David Mayers, Sr. to request an expansion of the Phase I Initial Service Area to include approximately 351 acres of Mr. Mayers' property which lies generally between and is contiguous to the subdivisions of Totopotomoy and Kingswood Court.

While the existing zoning of this property is agricultural, there are many factors suggesting that there is a more appropriate use for the land (i.e. residential development). To begin with, as noted above, it is bordered to the north and south by existing residential subdivisions which, it should be noted, are included in the Phase I Initial Service Area. Located in the immediate proximity of the property are Hanover Industrial Air Park and Beechwood Farms Subdivision, both of which are also included in the Phase I Initial Service Area.

These factors coupled with the fact that the property is readily accessible by State-maintained roads to Interstate 95 would appear to make this acreage a prime candidate for development in the near future.

The inclusion of this property in the Phase I Initial Service Area, and its subsequent development, would complement the existing, as well as the proposed, utility systems in the area. Proper location of central wells and appropriate design of distribution systems could offer some relief to the beleaguered water systems of the surrounding subdivisions. The proposed sewerage facilities to accommodate Totopotomoy and Kingswood Court are already shown on preliminary maps as located on and traversing

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Mr. Allan T. Williams, County Administrator
Page 2 of 2
June 12, 1981

across the Mayers' tract. Mr. Mayers has indicated a willingness to participate financially in the project to the extent that the facilities' design must be upgraded to accommodate future development of his property. In addition, such development would greatly enhance the County's tax base and would add needed connections toward the support of County operated utility systems.

The above noted factors combine to provide a formidable case in support of our request. Development patterns of the surrounding geographical area would seem to indicate that the development of this land is not only imminent but also consistent with the principles of sound land planning. The opportunity to achieve integration of utility systems in the area through advance planning is uniquely consistent with the long-range goals of Hanover County and sound economic policy.

Thank you for your consideration of this request. If I may be of any assistance in the furtherance of this matter please don't hesitate to contact me.

Sincerely yours,

JOHNSON & ANDERSON
of Virginia, Inc.



W. PAGE MORRIS
Project Engineer

WPM/pws

cc: Mr. A. Page Nuckols
Ms. Nina K. Peace
Mr. Jerry P. Owen, Chairman
Mr. E. C. C. Wood, Jr.
Mr. Terry L. Cook
Mr. William C. Frazier
Mr. Joseph H. Norman, Jr.

Mr. York L. Phillips
Mr. Peter L. Tribble
Mr. Randy D. Guill
Mr. James T. Bruce
Mr. John W. Fairburn
✓ Mr. John Hodges

Mr. Richard F. E. Shirey
Mr. Arthur P. Flippo
Mr. Robert S. Cosby
Mr. Fred E. Doggett
Mr. James Winters
Mrs. Barbara D. Jones
Mr. James Brannan

13-59

May 28, 1981

Mr. Hodges
Water & Sewer Dept.
Hanover County
Hanover, VA 23069

Dear Sir:

Is there a consideration of a water and sewer connection by the County of Hanover to Laurel Grove and north on US 301? I would be interested to know more about the cost, etc, and date of completion.

Sincerely,

Gordon H. Lawhorn
Gordon H. Lawhorn

45325 CHAMBERLAYNE ROAD
MECHANICSVILLE, VA 23111

Mr. Hodges
Water & Sewer Dept.
Hanover County
Hanover, VA 23069

A Sophisticated Business Selling Foreign Used Car Parts

LAWHORN INC.

B-60

Ornamental Iron Products Co.

P. O. BOX 9155

PHONE 730-9714

RICHMOND, VIRGINIA 23227

May 28, 1981

John Hodges
Program Manager
Hanover Court House
Hanover, Virginia 23069

Re: Sewer to Ex. San. Sew. System, Treatment
in Henrico County., Alternative Four.

Dear Mr. Hodges:

On receipt of your program paper "Future
Issues & Policies" I notice the sewer will
go thru the center of my property located
between Totopotomoy Subdivision and Kingswood
Court Subdivision.

It is my intention to develop this property
and hook up to the sewer as soon as practicable.

I submit this letter for input to your study.

Thank you.

Sincerely,

David Mayers

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JUN 01 1981

**GMP - Planning Department
Hanover County**

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Sons, Inc.
3010 W. Cary Street
Richmond, VA 23221
May 22, 1981

John E. Hodges, AICP
Growth Management Steering Committee
Hanover, Virginia 23069

Dear Sir:

Sons Inc. owns land adjoining Blue Star Utility Corp.
We would like to be included in Phase I Extended.

Sons Inc. will be willing to participate in paying
their share of the cost if the price is not too high.

Sincerely,



R.P. Oeters, Jr.
President

RPO/gr

cc: Jerry P. Owen
William C. Frazier
Terry Cook
Joseph H. Norman, Jr.
A. Page Nuckols
Nina K. Peace
E.C.C. Woods, Jr.
Peter L. Tribble

RECEIVED

JUN 01 1981

GMP - Planning Dept. - Hanover County

B-62

LAW OFFICES
SPINELLA, OWINGS, JACKSON & STEVERSON
A PROFESSIONAL CORPORATION
RICHMOND, VIRGINIA

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED
DATE 11/11/01 BY 60322

NICHOLAS A. SPINELLA
MERED L. OWINGS
GREGORY JACKSON, JR.
J. NEIL STEVERSON
JOHN C. MIZELL, JR.
THOMAS E. FURANK

May 20, 1981

WEST BROAD PARK
2720 ENTERPRISE PARKWAY
SUITE 101
RICHMOND, VIRGINIA 23229
TELEPHONE (804) 747-0920

RECEIVED

MAY 21 1981

GMP - Planning Department
Hanover County

Mr. John H. Hodges
Program Manager
Growth Management Program
Hanover Courthouse
Hanover, VA 23069

Re: Proposed Plan for Extending Mechanicsville
Waste Water System

Dear Mr. Hodges:


I write on behalf of my client, Avondale Corporation, to request that consideration be given in the proposed plan for extending the Mechanicsville Waste Water System to include neighboring property such as the 42.94 acres owned by Avondale Corporation at the northeast quadrant of the intersection of U.S. Route 301 and State Route 640.

We would welcome the opportunity to have a meeting with you as well as members of the Board of Supervisors regarding the details of how Avondale Corporation -- and perhaps other neighboring landowners as well -- might share in the pro rata cost of extending the Mechanicsville Waste Water System to Blue Star estates and the area in the vicinity of the intersection of U.S. Route 301 and State Route 640.

We would appreciate a response to this initiative, and we will contact you again in the very near future to try to arrange a meeting.

Please advise if you have any questions.

Yours truly,


Nicholas A. Spinella

NAS/vjs

cc: Honorable Jerry P. Owen
Honorable William C. Frazier
Honorable Nina K. Peace
Honorable E.C.C. Woods, Jr.

Honorable Page Nuckols
Honorable Terry L. Cook
Honorable Joseph H. Norman, Jr.
Mr. Peter L. Tribble

cc: Mr. G.R. Balducci

B-63

Heindl-Evans, Inc.

GENERAL CONTRACTORS
60 CHAMBERLAYNE ROAD
MECHANICSVILLE, VIRGINIA 23111
TELEPHONE 746-7851

RECEIVED

MAY 26 1981

GMP - Planning Department
Hanover County

May 21, 1981

Mr. John Hodges
Hanover Courthouse
Hanover, Virginia 23069

Re: Heindl-Evans, Inc. & Hanover Investments Properties
in Hanover County needing sewage.

Dear Mr. Hodges:

I would like to express our company's extreme need for
sewers at the below listed locations that either Heindl-
Evans, Inc. or Hanover Investments, both a Virginia
corporation located in Hanover County owns. Would you
please inform me at your earliest convenience as to when
sewerage will be extended to these locations:

Owned by Heindl-Evans, Inc.: *

See attached copies of plats.

Owned By Hanover Investments:

See attached copies of plats. (No Plat attached for 4.55 acres, NE
OF ATRER, HANOVER CO. DON + JANET CARTER

If you have any questions, please contact me. TO HANOVER INVESTMENTS

Thank you for your consideration.

Very truly yours,

W. S. Heindl, Jr.
W. S. Heindl, Jr.
President

wshjr/ah

B-64

April 29, 1981

Mr. John H. Hodges, Program Manager
Growth Management Office
Hanover Court House
Hanover, Virginia 23069

RE: Parcel of Land #72 B (1),
48.907 acres, Lots 5,6,7 & 8

Dear Mr. Hodges:

To confirm our phone conversation of April 27, 1981 concerning the above plot of land situated on the south end of the Hanover Industrial Air Park and the north side of Route 656.

I wish to submit the following facts:

1. This land has a state road No. 813 which is known as Air Park road running through approximately the center of it.
2. I donated this 60 ft. right of way to the County when this road was built with the anticipation that the land would be used commercially whenever sewer becomes available.

The Board of Supervisors passed a resolution stating the county would provide water and sewer lines under this road at two locations plus some other conditions as you will see in the attached copy of the resolution dated September 9, 1970.

REC'D

MAY 01 1981

GMP Planning Dept
Hanover County

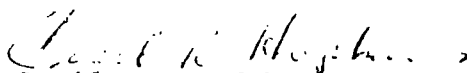
B-65

I furthermore have an agreement with Mr. Troy Leadbetter, developer of the Hanover Industrial Air Park, that whenever his capacity of water and sewer become available that I may attach on to his system. You may verify this by contacting Mr. Leadbetter.

In consideration of the land location and the above pertinent data, I feel that this land should definitely be placed in the urban growth area rather than the study area as I suspect it is now.

The reason I have made no effort to rezone or use this property has been due to the lack of sewerage in this area.

Respectfully yours,


Cecil R. Hopkins

Rt. 5, Box 300
Glen Allen, Va. 23060

CC: Jerry Owens

Troy Leadbetter

B-66