

**FINAL**

**ENVIRONMENTAL ASSESSMENT (EA)  
AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)  
FOR WASTEWATER IMPROVEMENTS IN  
ORANGEBURG COUNTY ALONG  
U.S. HWY 301, WEBER FARM ROAD, AND  
BIG BUCK BOULEVARD  
ORANGEBURG COUNTY, SOUTH CAROLINA**

**U. S. Army Corps of Engineers  
Charleston District**

**November 2004**

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**ORANGEBURG COUNTY, SOUTH CAROLINA**

**1.0 INTRODUCTION**

**1.1 Project Purpose and Authority.** The purpose of the proposed project is to provide wastewater collection service to areas within eastern Orangeburg County near the intersection of U.S. Highway 301 and Interstate 26 (see Figure 1). Without the wastewater improvements, residential, commercial, and industrial developments would be required to rely upon septic tanks or other such means for wastewater treatment and disposal. This Environmental Assessment (EA) addresses the environmental impacts due to the wastewater improvement project in Orangeburg County, South Carolina.

The U.S. Army Corps of Engineers (USACE) was authorized by the Water Resources Development Act (WRDA) of 1992 (Public Law 102-580), as amended, to provide assistance to non-Federal interests for carrying out water-related environmental infrastructure and resources protection and development projects.

**1.2 Project Location and Description.** Orangeburg County is located in the south central portion of South Carolina and encompasses approximately 1,100 square miles with 91,582 residents according to the 2000 U.S. Census.

The proposed project is a localized wastewater collection system that will accommodate wastewater flow from planned industrial sites as well as other residential, commercial, and industrial developments that may utilize the wastewater systems in the future. The proposed wastewater collection system is along U.S. Highway 301, Webber Farm Road, and Big Buck Boulevard. The proposed system consists of approximately 8,400 linear feet of eight inch gravity line, a 200-gpm pump station, and approximately 7,100 linear feet of six inch force main. Wastewater collected through this system will be pumped through the force main to the southwest along a tributary of Middlepen Swamp to an existing pump station and force main owned and operated by Orangeburg Department of Public Utilities (DPU) located in the City/County Industrial Park at the intersection of U.S. Highway 301 and Interstate 26 (see Figures 1 and 1A).

## 2.0 ALTERNATIVES (INCLUDING THE PROPOSED ACTION)

- 2.1 Proposed Action.** This alternative would involve the construction of a wastewater collection system to provide wastewater services to areas off US Highway 301 near Webber Farm Road.
- 2.2 Septic Tanks.** This alternative would involve the construction of septic tank systems for residential, commercial, and industrial growth in the area adjacent to US Highway 301 near Webber Farm Road. This alternative would result in numerous septic tank systems in this portion of Orangeburg County. The wastewater treatment would become decentralized whereas the expansion of the Orangeburg DPU wastewater collection system would maintain a regionalized system. The Orangeburg DPU wastewater treatment plant maintains a high level of treatment and has the capacity available for the expansion of their collection system.
- 2.3 On-Site Wastewater Treatment Plants.** This alternative would involve the construction of an on-site wastewater treatment plant for commercial and industrial growth. This wastewater treatment plant would be economically unfeasible. The plant would not be able to receive an NPDES permit in the area; therefore, this system would be required to store wastewater for a pump and haul service.
- 2.4 No Action.** This alternative would involve no expansion of the wastewater system in Orangeburg County. As residential, commercial, and industrial growth begin to develop in the project area, septic tanks, an on-site WWTP, and/or wastewater storage requiring pump and haul services would be built to accommodate the need for wastewater treatment and disposal. This alternative would be the least environmentally friendly. Subsequently, this alternative was rejected.

## 3.0 AFFECTED ENVIRONMENT

- 3.1 Climate.** The climate in the Orangeburg, South Carolina consists of long hot summers and cool winters. Summers are warm and humid (average July temperature 81 degrees Fahrenheit), and winters are relatively mild (average January temperature of 45 degrees Fahrenheit). The mean average annual temperature is 63.5 degrees Fahrenheit. Precipitation occurs chiefly as rainfall and averages about 47.37 inches per year.
- 3.2 Threatened and Endangered Species.** Table 1 contains a list of species that have been listed by the U.S. Fish and Wildlife Service as occurring or possibly occurring in Orangeburg County (from list dated May 1, 2004). In addition to the information in Table 1, the South Carolina Heritage Preserve database (June 9, 2003 update) lists four species that are either threatened or endangered on the Orangeburg South



Swamp is monitored. Several locations on Four Hole Swamp are listed as “impaired” on the State of South Carolina 303(d) list due to either high fecal coliform levels or low DO levels. One of these locations is approximately one mile upstream of the confluence of Four Hole Swamp and Middlepen Swamp. The other impaired locations are many miles (i.e., >20 miles) downstream of the confluence of Four Hole Swamp and Middlepen Swamp and monitoring between these locations shows the water quality to be good.

Additionally, the Edisto River and Four Hole Swamp are listed on the Nationwide River Inventory.

- 3.4. Cultural Resources.** TRC Garrow Associates, Inc. conducted a Phase 1 cultural resources survey for the proposed project during the week of May 17, 2004. The survey revealed that there is one known site (Site No. 38OR0223) located with ¼ mile of the proposed project. No new sites were found during the survey by TRC. Excerpts from TRC’s report are included in Appendix B (Because of the sensitive nature of cultural resource sites, information concerning the location of the known site are not included in Appendix B. Please contact the South Carolina State Historic Preservation Office (SHPO) for information regarding the known site.).
- 3.5. Socio-Economic and Environmental Justice.** Environmental justice involves addressing disproportionately high and adverse human health or environmental effects of Federal actions on minority and low-income communities. Figure 2 illustrates the population ranges in the planning area based on 2000 Census block group data. The acreage of the 2000 Census block versus the acreage in the planning area was utilized to estimate the population range in the planning area. Each Census block is outlined in red, and the population range in each Census block is designated by the appropriate color. As seen in the figure, the population varies from 0 to approximately 378. As illustrated the planning area is a rural area of Orangeburg County. Figure 3 illustrates the approximate poverty level in the planning area based on percentages of 2000 Census block group data using the same method described above for the population estimates. The poverty level in the planning area ranges from 0% to approximately 30%. As seen in the figure, the majority of the planning area is in the 0% to 30% poverty range. Figure 4 illustrates the approximate minority ratio based on percentages as stated in 2000 Census block group data using the same method described above for the population estimates. The minority ratio in the planning area ranges from approximately 0% to 100%. As seen in the figure, the minority ratio varies throughout the planning area.
- 3.6. Land Use.** Figure 5 illustrates the planning area land use for the proposed gravity line, force main and pump station. As seen in the figure, the majority of the planning area is cropland/pasture or forested. There is little development in the area.

- 3.7. Air Quality.** Air quality in South Carolina is measured and regulated by the South Carolina Department of Health and Environmental Control. At the present time, the State of South Carolina including Orangeburg County is in attainment with National Ambient Air Quality Standards.
- 3.8. Noise.** Environmental noise is a conglomeration of distant and nearby noise sources. Distant noise sources observed within the project area include vehicular noise. Types of nearby noise sources observed within the project area include vehicular noise and naturally occurring noises (buzzing of insects, bird calls, etc.).
- 3.9. Wetlands.** Wetlands in the immediate area of the project consist of a small, unnamed perennial stream that is a tributary to Middlepen Swamp and an intermittent stream that is a tributary to this unnamed perennial stream. These wetlands are classified as forested wetland (see Figures 1A and 5).

#### **4.0 ENVIRONMENTAL CONSEQUENCES**

- 4.1 General.** There are periodic, short-term, minimal adverse impacts and beneficial effects related to the proposed wastewater improvements. These impacts/effects are discussed in detail below.
- 4.2 Climate.** The proposed project will have no effect on the climate of Orangeburg County
- 4.3 Biological Resources.** To minimize any potential adverse environmental impacts, the following conservation measures/Best Management Practices will be employed:
- Heavy equipment will be placed on mats when working in wetland areas.
  - No herbicides will be allowed within or adjacent to wetland areas.
  - No fill will be placed in wetlands. Adjacent access roads and drainage ditches will not alter natural flow regimes through wetland areas.
  - Prior to the beginning of any construction activities, appropriate erosion control measures, such as silt fences, silt barriers, or other suitable devices, will be placed between the construction area and affected waterways (wetlands) and maintained in a functioning capacity until the area is permanently stabilized upon project completion.
  - All necessary steps will be taken to prevent oil, tar, trash, debris, and other pollutants from entering adjacent wetlands and/or waterways.

- Once initiated, the project will be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment.
- Upon completion, all disturbed areas will be permanently stabilized with vegetative cover and/or rip-rap, as appropriate.
- Construction activities will avoid, to the greatest extent practical, encroachment into any wetland areas. Where practicable, sidecast soil material from trench excavation will be placed on the side of the trench opposite streams and wetlands.
- Excess soil will be removed to an approved upland disposal site.

**4.4 Water Quality.** Implementation of the proposed project will result in temporary water quality degradation at the wetland sites. All work in wetlands will be performed in accordance with the guidelines of Corps of Engineers Nationwide 12 permit (see Appendix E for additional information).

Approximately 0.41 acre of wetlands along Weber Farm Road (see Figure 1A) will be affected by the proposed project. This effect entails clearing a 30-foot wide easement and trenching and backfilling for the wastewater pipeline. After completion of the construction activities, only 20 feet of the easement width will be permanently maintained; the other 10 feet of width will be allowed to naturally re-vegetate. This results in approximately 0.27 acre of wetlands that are permanently impacted by land clearing and approximately 0.14 acre of wetlands that are only temporarily impacted. The permanently cleared easement will be located approximately 100 feet from the cleared corridor created by Weber Farm Road. Directional drilling is not possible at this location because the pipeline being installed is a gravity line that must be installed on a very shallow grade (i.e., 0.40% grade – an approximate two foot drop over a 500 foot length). No net fill will be placed in wetlands and there will be no net loss of wetland acreage. A smaller section of wetlands in the pipeline corridor near the existing pump station will not be affected by construction activities. This section of pipeline will be installed by directional drilling. Directional drilling can be used at this location because this section of pipeline is force main and, therefore, is not dependent on the slope of the pipe. The overall impacts on water quality will be low with most of the impact being only temporary (see Appendix E for additional information).

**4.5 Threatened and Endangered Species.** S&ME, Inc. conducted a threatened or endangered species assessment for the proposed project on May 12 and 13, 2004. Based on the findings and analysis, S&ME, Inc. believes the activities proposed by Orangeburg County pose no threat to threatened or endangered species. A copy of their findings is included in Appendix A. A biological assessment was submitted to the USFWS, and the response letter from their office (dated June 14, 2004) stated that they concur with the determination that the proposed action is not likely to

adversely affect resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act. A copy of the response letter from USFWS is included in Appendix A.

- 4.6 Cultural Resources.** Based on the results of the Phase I cultural resource survey conducted by TRC Garrow Associates, Inc. (see Appendix B), the Corps of Engineers has concluded that no historic properties will be affected by the proposed project, and no further cultural resource investigations should be required. In a letter dated September 22, 2004, the South Carolina State Historic Preservation Office concurred with this determination (see Appendix C).
- 4.7 Socio-Economic Resources.** The proposed wastewater collection system should aid in promoting commercial and industrial growth in the area, which will increase jobs in the area.
- 4.8 Environmental Justice.** Environmental justice involves addressing disproportionately high and adverse human health or environmental effects of Federal actions on minority and low-income communities. There are no minority or low-income communities located in the planning area that would be negatively impacted. The proposed project will positively affect 100% of the population in the planning area by providing a safe, reliable system of wastewater collection as well as providing employment opportunities to the area with the development of potential commercial and industrial developments. Residents living in the vicinity of the proposed wastewater collection system will not be forced to connect to the system; therefore, the proposed project does not have the potential to be a financial burden to low-income residents.
- 4.9 Land Use.** There are no known conflicts with any existing or proposed Federal, state, or local land use plans. With growth in the planning areas spurred by the wastewater collection system, the land use will most likely change from cropland/pasture or forested to more developed land use patterns.
- 4.10 Air Quality.** The wastewater lines and pump station constructed for the Orangeburg County Wastewater Improvements Project will not generate any air emissions. Air quality will only be affected during the construction phase. Minor fugitive emissions may be created due to increased dust levels, machinery exhausts, odors, and smoke, in the event burning is required. This may decrease visibility along the highways in the vicinity of the construction. The minor emissions could aggravate respiratory problems such as emphysema or other pulmonary conditions for individuals in the immediate vicinity of the construction for a brief time only during construction. Air quality should return to normal following completion of the project.

**4.11 Noise.** Ambient noise levels will increase as a result of the project construction machinery and any associated equipment during project construction. The increase will be minor and temporary in nature. Noise levels will return to normal following completion of the project. As development occurs in the project area due to the wastewater collection system, noise levels may increase due to the increase in traffic in the area.

**4.12 Cumulative Impacts.** The construction of the proposed collection system will not result in adverse short-term cumulative impacts to the environment for Orangeburg County. However, with the construction of the proposed collection system, this area is expected to see additional population growth in the future. This growth includes residential, commercial, and industrial developments. The proposed collection system would be able to serve the proposed industrial sites adjacent to Interstate 26. The proposed collection system will eliminate the need for septic tanks for residential, commercial, and industrial developments as well as eliminating the need for any on-site storage of wastewater utilizing pump and haul systems. Maintaining a regional wastewater collection system will provide a high level of wastewater treatment for the area eliminating potential groundwater contamination. This is the most environmentally friendly alternative for wastewater treatment.

As mentioned previously, construction of the proposed collection system will stimulate growth in the area, but the growth will be controlled utilizing local zoning and land use legislation. Without the proposed collection system, development would be uncontrolled and less desirable. With an increase in growth in an area, the possible long-term environmental effects may include the following:

- Destruction of additional wetlands and forested areas.
- Increase of water pollution within the ground and surface waters.
- Increase of solid waste from residential, commercial, and industrial developments.
- Increase of noise and air pollution associated with population growth.
- Increase of surface runoff affecting the existing watersheds causing a decrease of water clarity and water quality.

## **5.0 UNAVOIDABLE ADVERSE ENVIRONMENTAL CONSEQUENCES**

There are short-term impacts that will result with the construction of the wastewater collection system. Construction of the wastewater line will be performed using mostly the “cut and cover” method with a short length being performed using direction drilling techniques. “Cut and cover” construction involves the use of backhoes and track hoes for digging the trench for pipe placement. Bulldozers would be used for required clearing and for spreading clean fill dirt, if needed. Trucks would be used for any necessary backfill after pipe placement and for hauling debris. In areas along the route that cannot support the equipment, the trucks would be used to place fill on the ground in order to stabilize the work area. Fill material will be placed in unstable areas to allow construction, but the

material will be removed and the area restored to natural elevations following construction. Minimal adverse effects may be expected to result from this action, and this action would not contribute to any long-term or large-scale adverse impacts or detrimental effects in the area. A detailed discussion of all environmental impacts expected to result from the project is contained in Section 4.0 above. The principal adverse impact would be related to the permanent impact (due to permanent land clearing) to approximately 0.27 acre of wetlands and the temporary impact (due to initial land clearing, followed by natural re-vegetation) to approximately 0.14 acre of wetlands. There will be no net fill added to any wetlands and no loss of wetland acreage.

## **6.0 COORDINATION WITH OTHERS**

Copies of the Draft Environmental Assessment and Finding of No Significant Impact were sent to approximately 75 agencies/organizations/tribes/individuals for coordination and consultation. Comments received from these addressees are included in Appendix C.

## **7.0 CONCLUSIONS**

The proposed wastewater collection system project does not have any long-term, unacceptable adverse impacts that are expected to occur. Based on the threatened or endangered species assessment and the Phase 1 cultural resources survey these resources should not be adversely affected. Only 0.41 acre of wetlands will be disturbed of which only 0.27 acre of wetlands will have a permanent impact (caused by land clearing). No fill will be added to wetlands and there will be no net loss of wetland acreage.

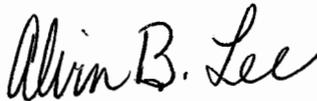
# FINDING OF NO SIGNIFICANT IMPACT

## WASTEWATER IMPROVEMENTS IN ORANGEBURG COUNTY ALONG U.S. HWY 301, WEBER FARM ROAD, AND BIG BUCK BOULEVARD

Based on the attached Environmental Assessment and in consideration of other pertinent documents, I conclude that the environmental effects of constructing the proposed wastewater collection system are not significant and the preparation of an Environmental Impact Statement is not warranted. Specific factors considered in making the determination include the following:

1. Water quality will not be significantly affected.
2. Wetlands will not be significantly affected.
3. No cultural resource will be affected.
4. No significant adverse impact to threatened or endangered species will occur.
5. No significant land use changes will occur.
6. Air and noise quality will not be significantly affected.
7. Fish and wildlife will not be significantly affected.

29 OCT 04  
DATE

  
ALVIN B. LEE  
Lieutenant Colonel, EN  
Commander, U.S. Army Engineer District  
Charleston

# **APPENDIX A**



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407

June 14, 2004

Mr. Charles Oates  
S&ME, Inc.  
231 Labonte Street  
Conway, South Carolina 29526

Re: Threatened & Endangered Species assessment  
Orangeburg County Contract No. 1 & 2 Sewer Line Project  
Orangeburg County, South Carolina  
S&ME Project No. 1618-04-228  
FWS Log No. 4-6-04-I-361

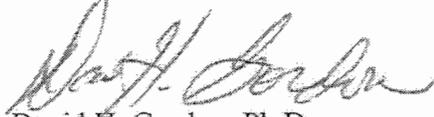
Dear Mr. Oates:

The U.S. Fish and Wildlife Service (USFWS) has reviewed the plans for this proposed project. Based on our review and the information received:

- We concur with your determination that the proposed action will have no effect on resources under the jurisdiction of the USFWS that are currently protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act). Therefore, no further action is required under Section 7(a)(2) of the Act.
- We concur with your determination that the proposed action is not likely to adversely affect resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act.
- It is our opinion that the proposed action is not likely to have reasonably foreseeable adverse effects on resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act.
- The proposed project may impact wetlands. Please contact the U.S. Army Corps of Engineers, Charleston District for more information.

If you should have any questions, please contact Paula Sisson at (843)727-4707, ext. 18 and reference FWS Log No. 4-6-04-I-361.

Sincerely,

A handwritten signature in cursive script, appearing to read "David H. Gordon".

David H. Gordon, Ph.D.  
Acting Field Supervisor

DHG/PTS

**Threatened & Endangered Species Assessment  
Orangeburg County Contract No. 1 & 2  
Proposed Sewer Line Project  
Orangeburg County, South Carolina**

Prepared for:

Orangeburg County  
c/o B.P. Barber & Associates  
Post Office Box 1116  
Columbia, South Carolina 29202-1116

Prepared by:

S&ME, Inc.  
231 Labonte Street  
Conway, South Carolina 29526

May 17, 2004



May 17, 2004

US Fish & Wildlife Service  
176 Croghan Spur Road, Suite 200  
Charleston, SC 29407

**Reference: Threatened & Endangered Species Assessment  
Orangeburg County Contract No. 1 & 2 Sewer Line Project  
Orangeburg County, South Carolina  
S&ME Project No. 1618-04-228**

Dear Mrs. Sisson,

Please find the following copy of a Threatened and Endangered Species Assessment for above-mentioned project. Based on a review of the federal and state databases in conjunction with an on-site review, it is our opinion that installation of the proposed sewer line will pose no threat to any federal or state threatened and/or endangered species.

If you have any questions or require additional information, please do not hesitate to contact me at (843) 347-7800.

Sincerely,

Charles Oates

The U.S. Fish and Wildlife Services (USFWS) has reviewed the plans for this proposed project. Based on our review and the information received, we concur with your determination that the proposed action:

- Will have no effect on resources under the jurisdiction of the USFWS that are currently protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.) (Act). Therefore, no further action is required under Section 7(a)(2) of the Act.
- Is not likely to adversely affect resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act.
- It is our opinion that the proposed action is not likely to have significant adverse wetland impacts. Please contact the Corps of Engineers for more information.

U.S. Fish and Wildlife Service, 176 Croghan Spur Road, Suite 200, Charleston, SC 29407, (843) 727-4707

FWS Log No. \_\_\_\_\_ Date \_\_\_\_\_

Field Supervisor \_\_\_\_\_

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## **Introduction**

On behalf of Orangeburg County, S&ME has completed a threatened and endangered species assessment for the proposed sewer line expansion in Orangeburg County, South Carolina. The purpose of this assessment is to provide a professional opinion as to the existence of any rare, threatened or endangered species within the limits of the proposed project study area.

## **Scope of Work**

B.P. Barber & Associates, engineers for Orangeburg County, provided the scope of services and a set of plans that included a survey of the utility right-of-way along state and county roads.

Aerial photographs were reviewed to identify areas of potential habitat for Federal/State and local rare, threatened or endangered species. A ground survey of the entire study area was conducted to confirm the existence or absence of any endangered, threatened or candidate species. The identification of threatened or endangered species was facilitated by use of various field guides, federal/state lists and previous experience.

## **Site Description**

The project study area is located southeast of the town of Orangeburg (see figure 1). The project consists of approximately 17.5 miles of proposed force main sewer line and five miles of proposed gravity sewer line. The 17.5 miles of proposed force main sewer line follows an ancillary system of state and county road right-of-ways. The proposed force main sewer line installation will be within the limits of the existing utility right-of-way, approximately 15' wide from the edge of the pavement. The five miles of gravity sewer line will follow the run of two small creeks. The project study area is located on the USGS 7.5 Min. Orangeburg South and Indian Camp Branch, South Carolina Quadrangles.

The existing utility right-of-way has been cleared and maintained on approximately 78% of the study area. The remaining 22% of the project study area are portions of the gravity sewer line right-of-way

where the proposed easement has not been cleared. These areas are comprised of densely vegetated mature hardwood areas including, Sweetgum (*Liquidambar styracflua*), Water oak (*Quercus nigra*) and Red maple (*Acer rubrum*). The under-story is comprised of densely vegetated saplings and herbaceous plants including, Chinese privet (*Ligustrum sinense*), Sassafras (*Sassafras albidium*) and Muscadine grape (*Vitis rotundifolia*).

## **Methodology**

The South Carolina Heritage Preserve database and the USFWS database were reviewed prior to the survey to obtain information of any known species located on or near the proposed project area. The project study area was surveyed in the field using the following methodology.

The majority of the study area is within the limits of the recently mowed utility right-of-way (see site photographs). These areas were surveyed at a slow rate of speed, approximately five (5) miles per hour. Areas that had not been recently mowed were surveyed by walking the centerline of the right-of-way. The wooded portions of the gravity sewer line right-of-way were surveyed by walking the centerline and the boundary lines of the right-of-way easement. The wetland / upland transition zones and stream margins were 100% surveyed within the limits of the easement.

## **Summary of Findings**

The South Carolina Heritage Preserve database (updated on June 09, 2003) has four species that are either Threatened (T) or Endangered (E) listed on the Orangeburg South Quadrangle and no species listed on the Indian Camp Branch Quadrangle. The US Fish and Wildlife Service (USFWS) database has five species listed as potentially present in Orangeburg County that are either Threatened (T) or Endangered (E) (see addenda).

A ground survey was conducted on May 12 & 13, 2004, of the entire project study area by Charles Oates, Environmental Professional for S&ME, Inc.

**Plants:**

**No Effect**

Approximately 78% of the project study area is within the limits of existing utility R.O.W. that are cleared and maintained on a regular basis. The majority of the R.O.W. had been mowed or sprayed with herbicides prior to the survey. The remaining 22% of the study area where the gravity sewer line is to be installed is densely vegetated with mature Sweetgum (*Liquidambar styracflua*), Red Maple (*Acer rubrum*) and Water oak (*Quercus nigra*) with a dense understory of various species of Blackberry (*Rubrus spp.*) and hardwood saplings. During this survey there were no Federal and/or State threatened (T) or endangered (E) plant species located, or suitable habitat to support these species located within the limits of the study area.

**Vertebrates:**

**No Effect**

**Birds:**

There was no habitat encountered during this survey to support any state or federally protected species of birds within the limits of the study area. The Red-cockaded woodpecker (*Picoides borealis*) requires mature Longleaf pines (*Pinus palustris*) with an open understory that does not exceed 15' in height. The trees should be evenly spaced with an open park like stand. The Bald Eagle (*Haliaeetus leucocephalus*) requires mature trees for nesting that area in close proximity to large bodies of water to feed.

**Reptiles & Amphibians:**

The Flatwoods salamander (*Ambystoma cingulatum*) is listed as a federally threatened species for Orangeburg County in the USFWS database. The habitat requirements for this species are pine flatwoods, moist savannas and/or isolated cypress/gum ponds. There was no suitable habitat encountered during the site review of the project study area.

**Marine Species:**

There are no streams large enough to support the Shortnose sturgeon within the limits of the project study area.

**Fish:**

There are no state or federally protected species of fish listed for Orangeburg County.

**Mammals:**

There are no state or federally protected species of mammals listed for Orangeburg County.

**Recommendations**

Based on our findings and analysis, it is our position that the activities proposed by Orangeburg County pose no threat to either species of endangered mussel.

At the time of this survey, there were no species of flora or fauna located within the limits of the study area that would be listed as a federal or state threatened or endangered species. As a result of this survey, it is not likely that the installation of the force main or gravity sewer lines would have an adverse effect on any of the federal and/or state threatened or endangered species listed for this county.

Please note that the US Fish & Wildlife Service (USFWS) and the NCDENR are the Federal and State regulatory agencies and should approve of the proposed project prior to the initiation of any site work.

**Limitations**

This report has been prepared for the exclusive use of Orangeburg County and its designees for specific application to the subject tract. Copies of our report may be distributed provided their use is consistent with the scope and intent of our services. Our findings have been developed in accordance with generally accepted standards of practice. No other warranty is expressed or implied. The client recognizes that future changes in regulations and guidelines may affect the conclusions/ findings presented in this report.

## **Acknowledgement**

S&ME, Inc. appreciates the opportunity to be of service to you by performing a threatened and endangered species assessment on the subject tract and preparing this report. Should you have any questions or require additional information please contact us at (843) 347-7800.

**ADDENDA**

## Threatened and Endangered Species Orangeburg County, South Carolina

### US Fish & Wildlife Service (USFWS)

Common Name	Scientific Name	Status	Occurrences
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known

### SC Department of Natural Resources Heritage Preserve Program (SCDNR HPP)

#### USGS 7.5 Minute Orangeburg South, South Carolina Quadrangle

Common Name	Scientific Name	Status	Occurrences
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	Known

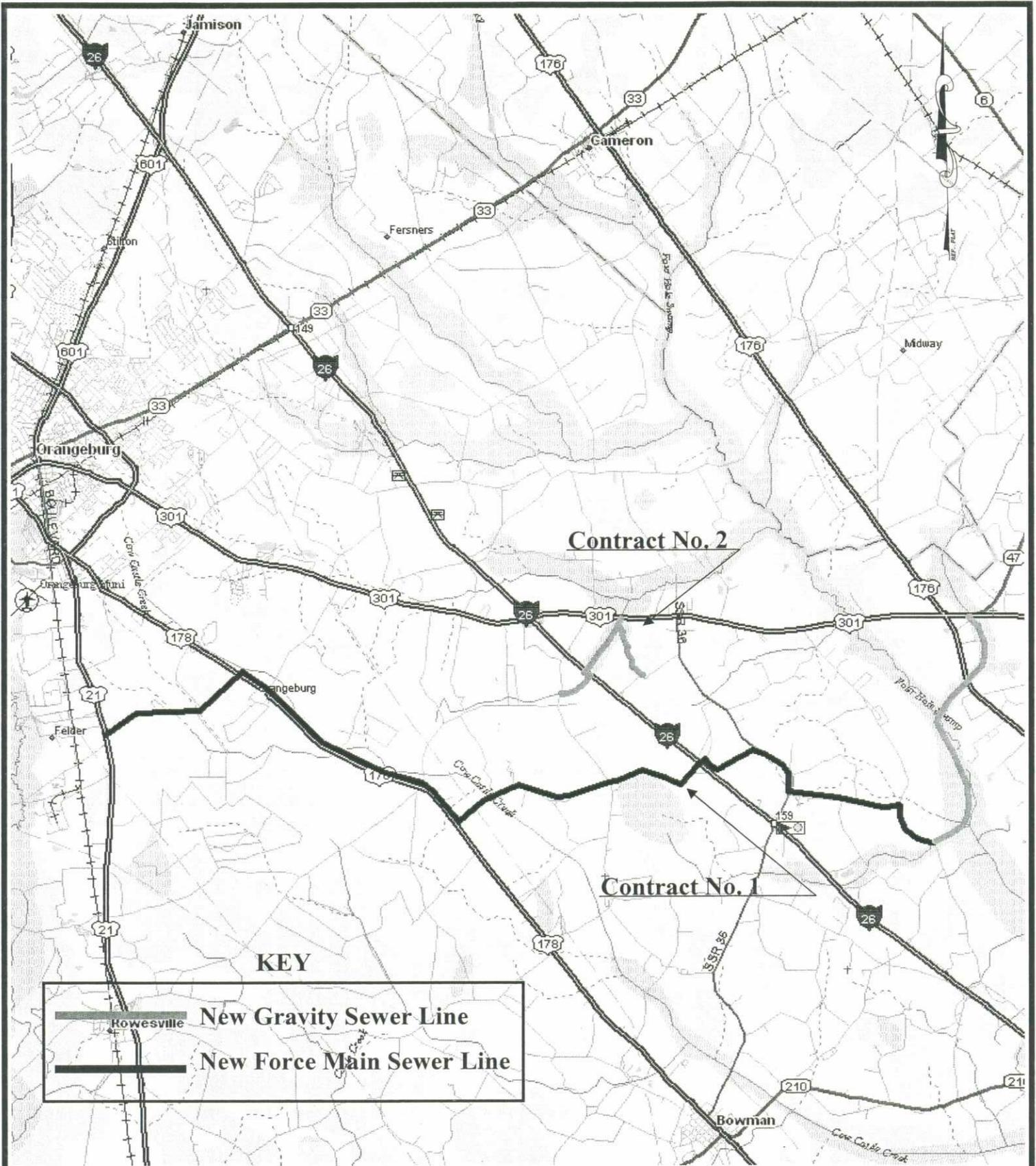
#### USGS 7.5 Minute Indian Camp Branch, South Carolina Quadrangle

Common Name	Scientific Name	Status
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No listings of any know occurrences listed for this quadrangle.

(T) Threatened

(E) Endangered



**KEY**

	<b>New Gravity Sewer Line</b>
	<b>New Force Main Sewer Line</b>

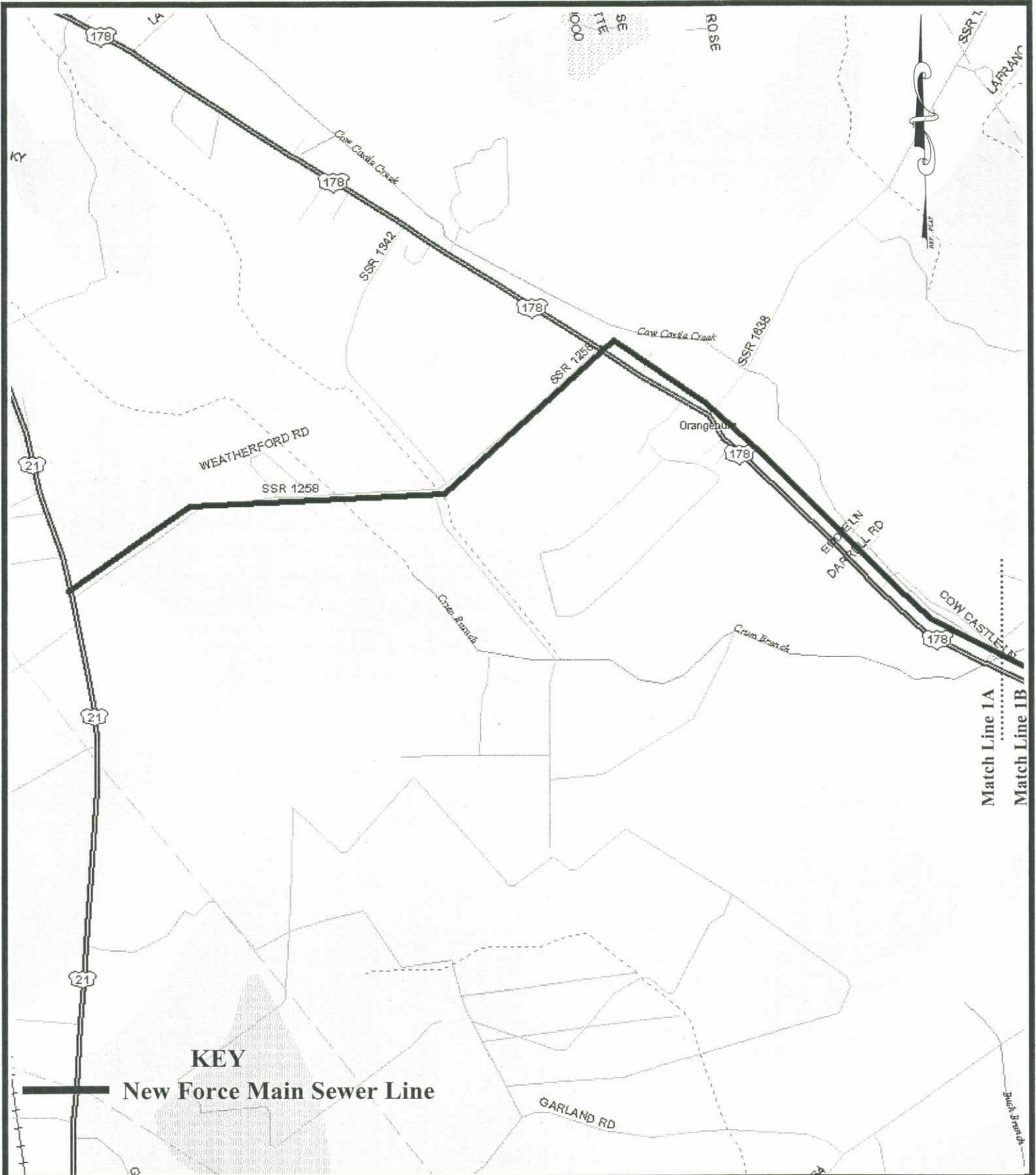
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SOURCE:	1999 DeLORME Street Atlas
DRAWN BY:	CCO
DATE:	May, 2004



**ENVIRONMENTAL SERVICES  
ENGINEERING • TESTING**

<b>SITE VICINITY MAP</b> Orangeburg Co. Industrial Park Sewer Line Orangeburg County, South Carolina
JOB NO. 1618-04-228

FIGURE NO <b>1</b>
-----------------------



SCALE:	NTS
SOURCE:	1999 DeLORME Street Atlas
DRAWN BY:	CCO
DATE:	May, 2004

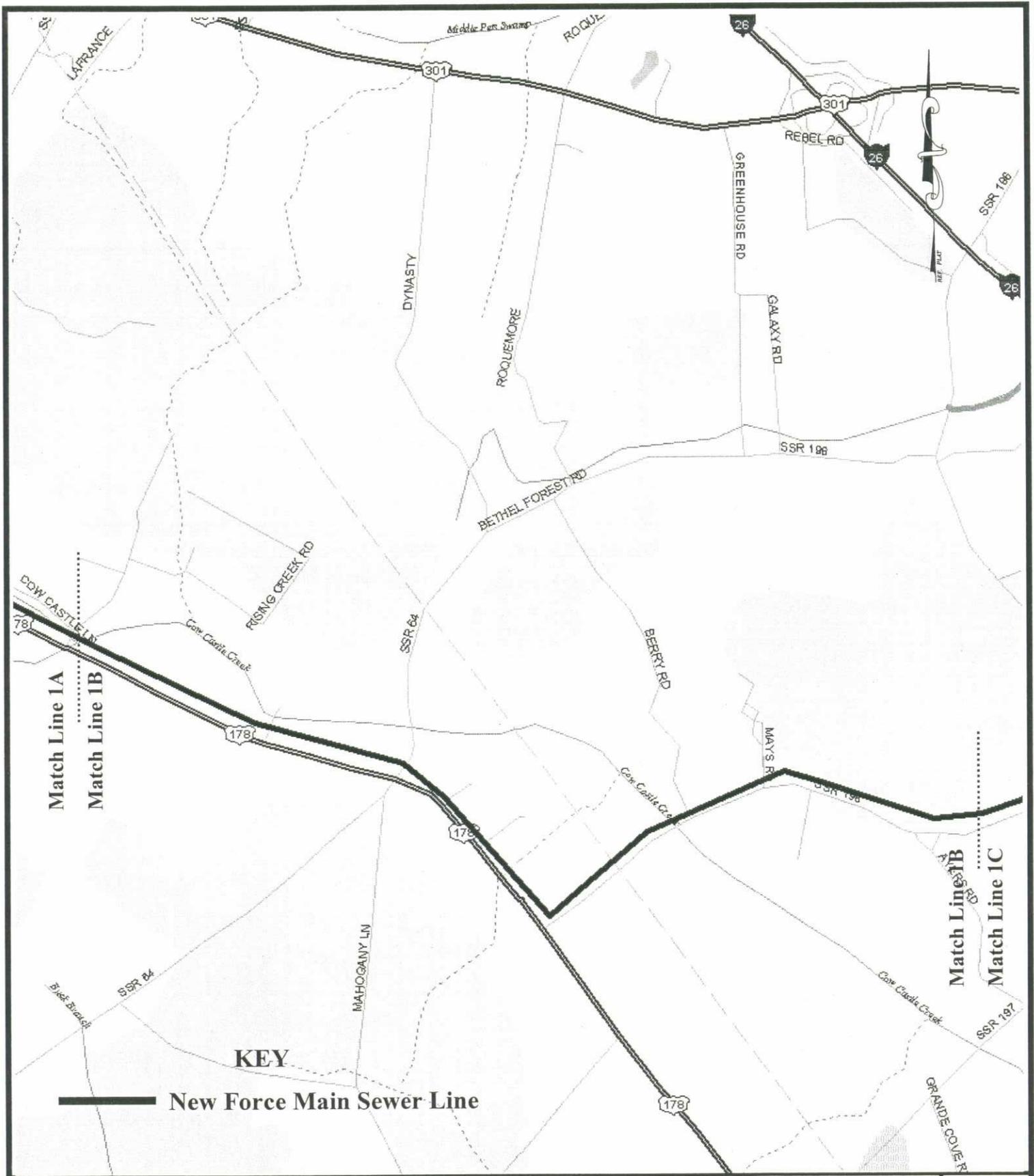


**S&ME**  
 ENVIRONMENTAL SERVICES  
 ENGINEERING • TESTING

**SITE VICINITY MAP**  
 Orangeburg Co. Industrial Park Sewer Line  
 Orangeburg County, South Carolina

JOB NO. 1618-04-228

FIGURE NO  
**1A**



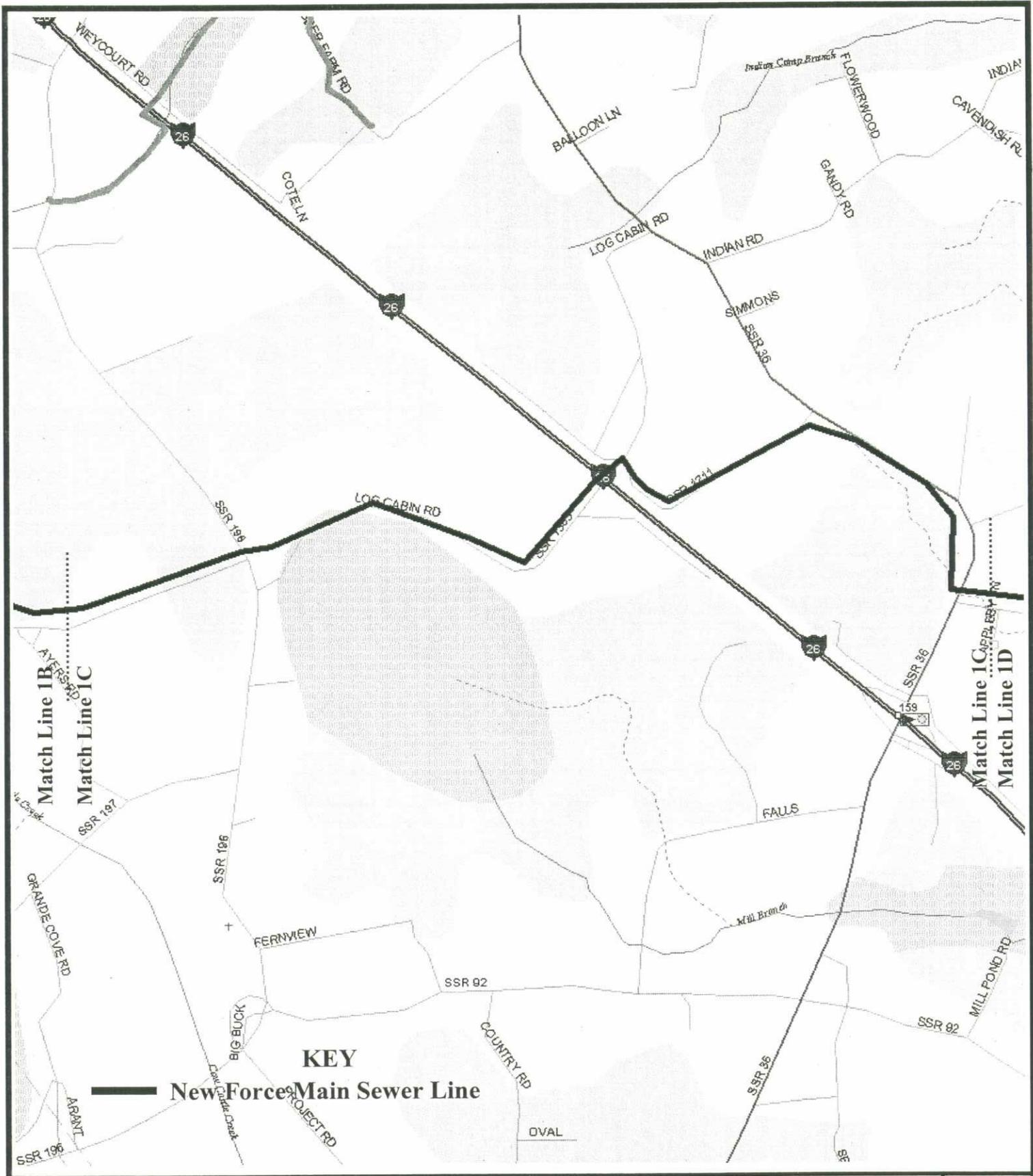
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DRAWN BY:	CCO
DATE:	May, 2004



**SITE VICINITY MAP**  
 Orangeburg Co. Industrial Park Sewer Line  
 Orangeburg County, South Carolina

JOB NO. 1618-04-228

FIGURE NO  
**1B**

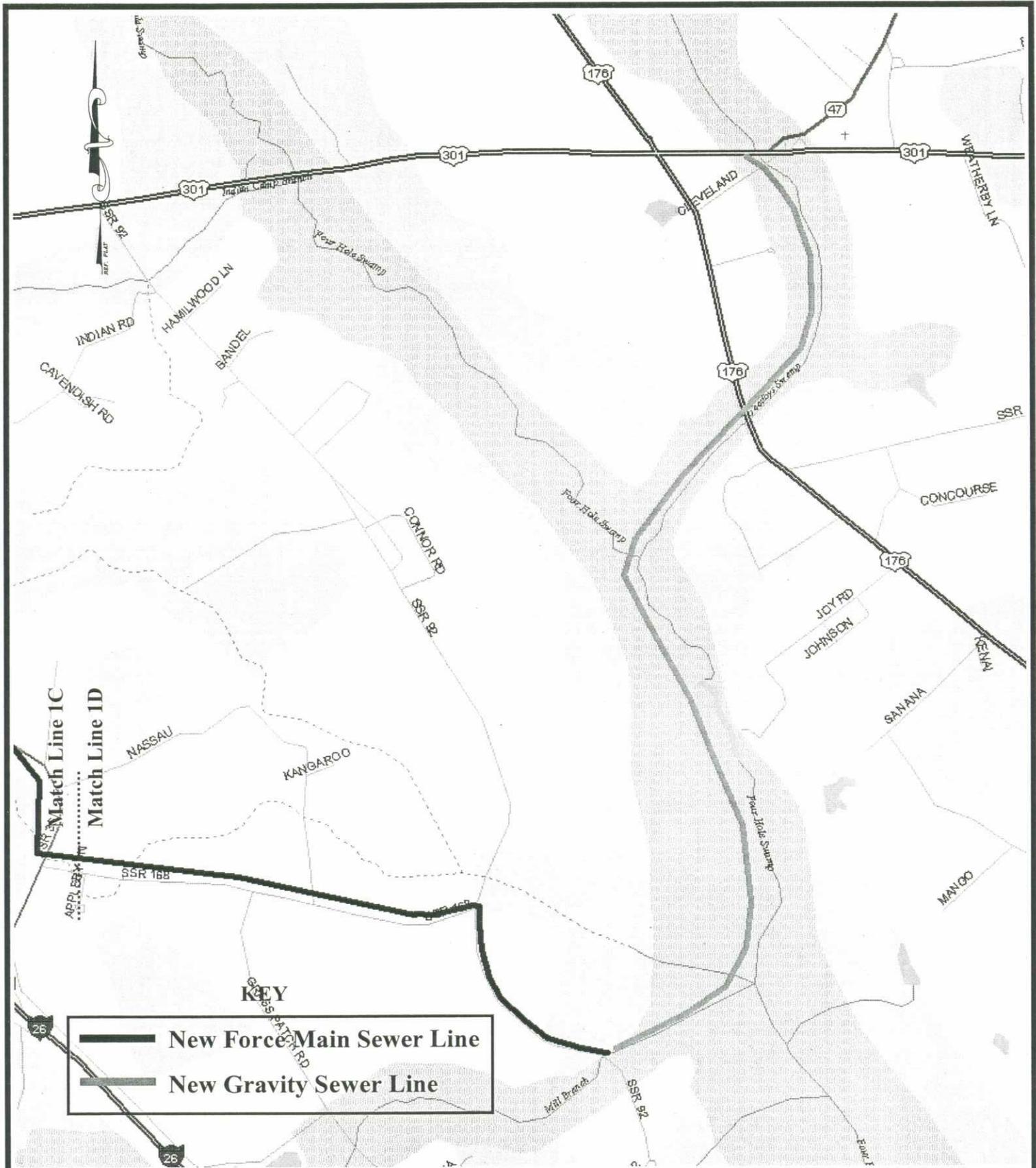


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 SOURCE: 1999 DeLORME Street Atlas  
 DRAWN BY: CCO  
 DATE: May, 2004



SITE VICINITY MAP  
 Orangeburg Co. Industrial Park Sewer Line  
 Orangeburg County, South Carolina  
 JOB NO. 1618-04-228

FIGURE NO  
 1C

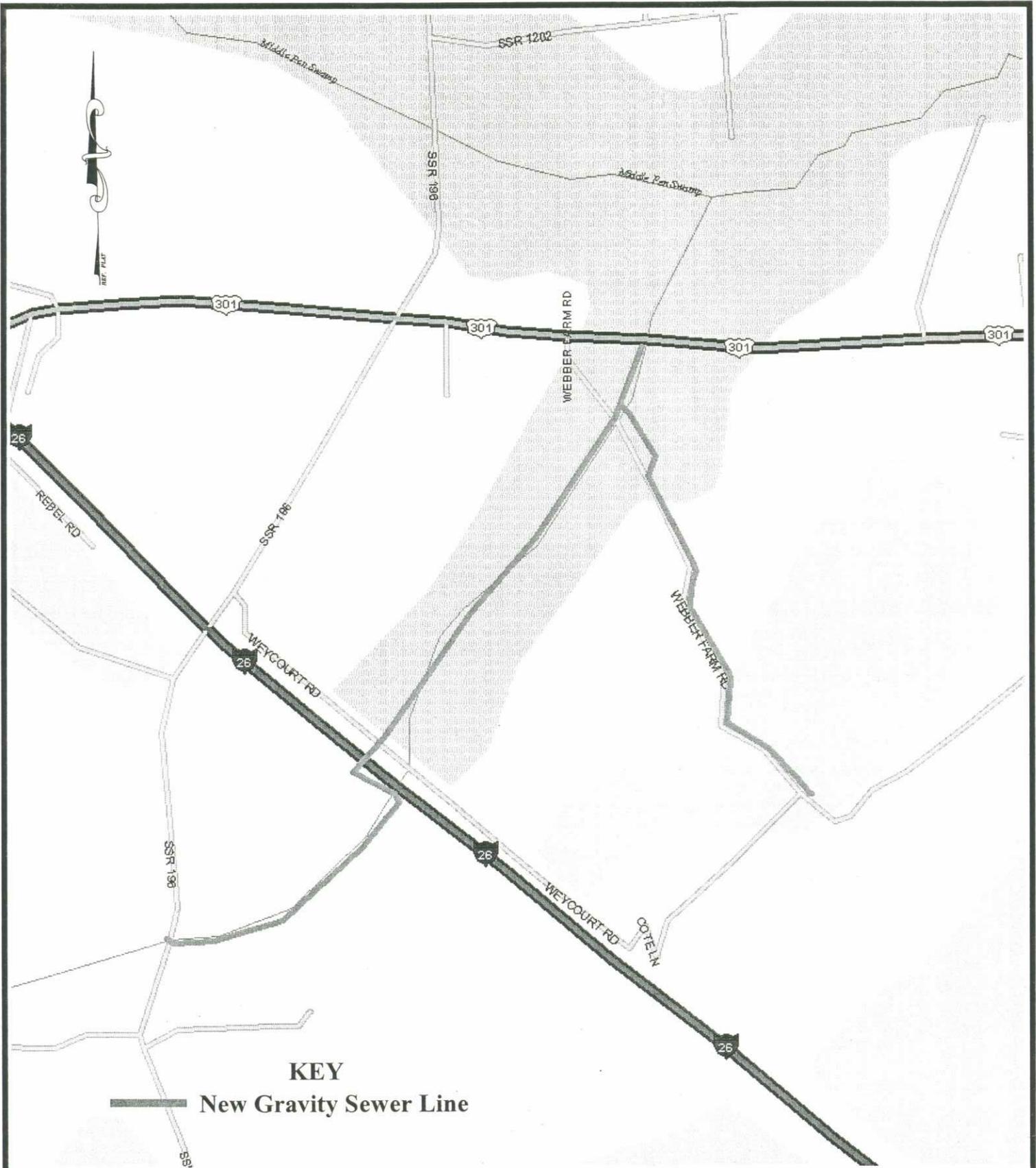


SCALE:	NTS
SOURCE:	1999 DeLORME Street Atlas
DRAWN BY:	CCO
DATE:	May, 2004



SITE VICINITY MAP
Orangeburg Co. Industrial Park Sewer Line
Orangeburg County, South Carolina
JOB NO. 1618-04-228

FIGURE NO
1D



**KEY**  
 New Gravity Sewer Line

SCALE:	NTS
SOURCE:	1999 DeLORME Street Atlas
DRAWN BY:	CCO
DATE:	May, 2004

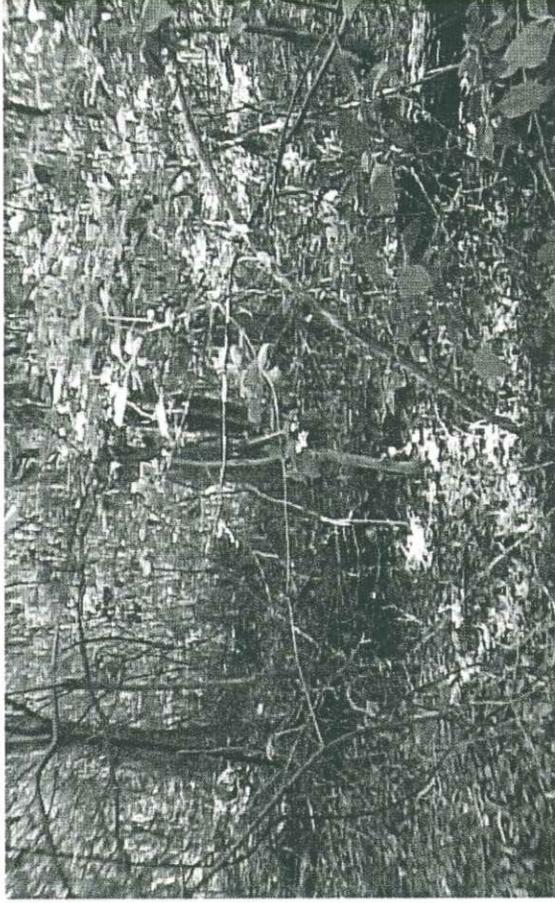
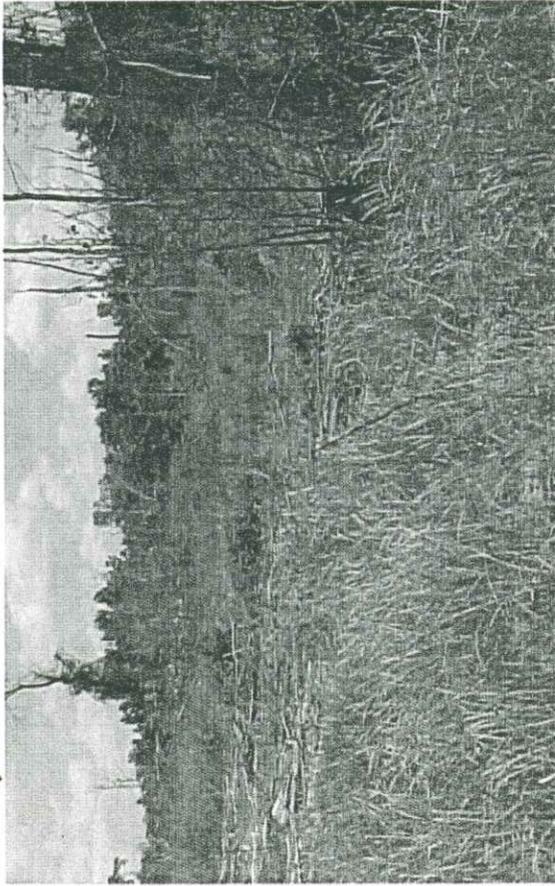


**SITE VICINITY MAP**  
 Orangeburg Co. Industrial Park Sewer Line  
 Orangeburg County, South Carolina

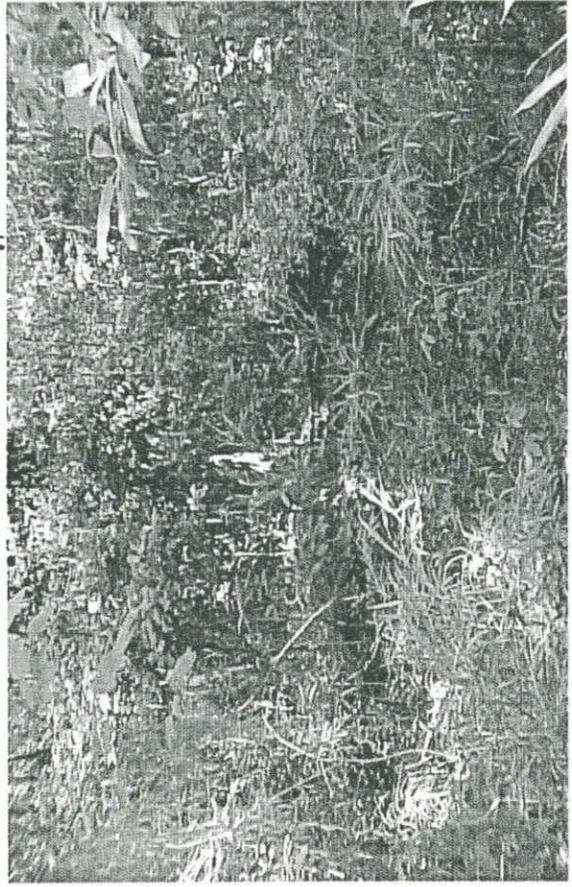
JOB NO. 1618-04-228

FIGURE NO  
 1E

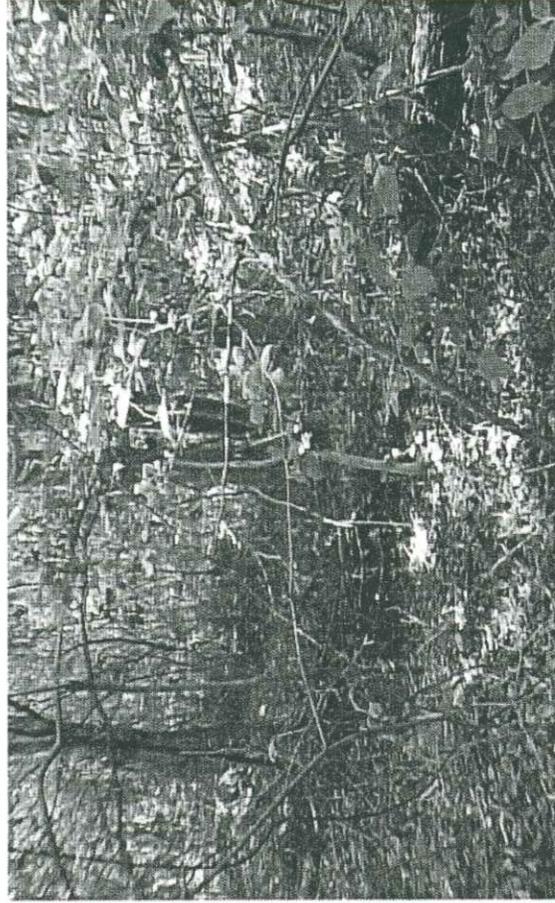
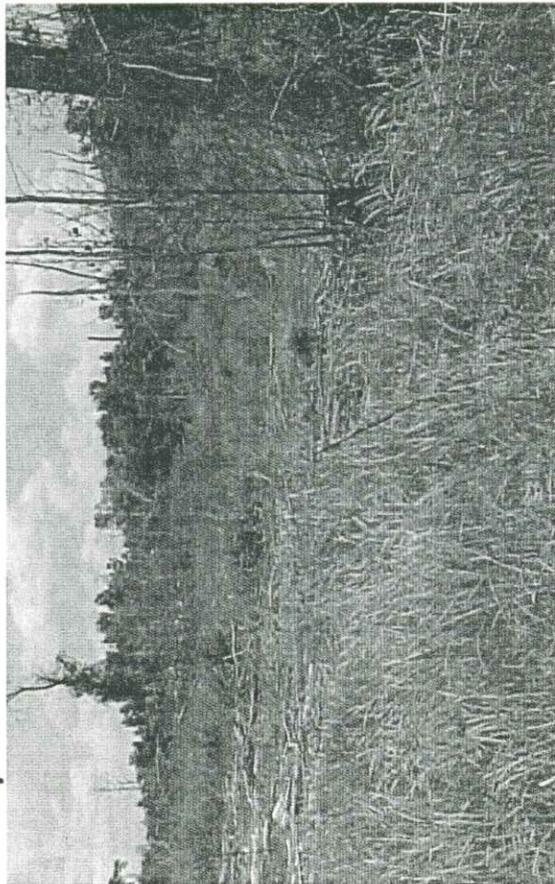
Threatened & Endangered Species Assessment  
Orangeburg County Contract No. 1 & 2 Sewer Line Project  
S&ME Project Number: 1618-04-228



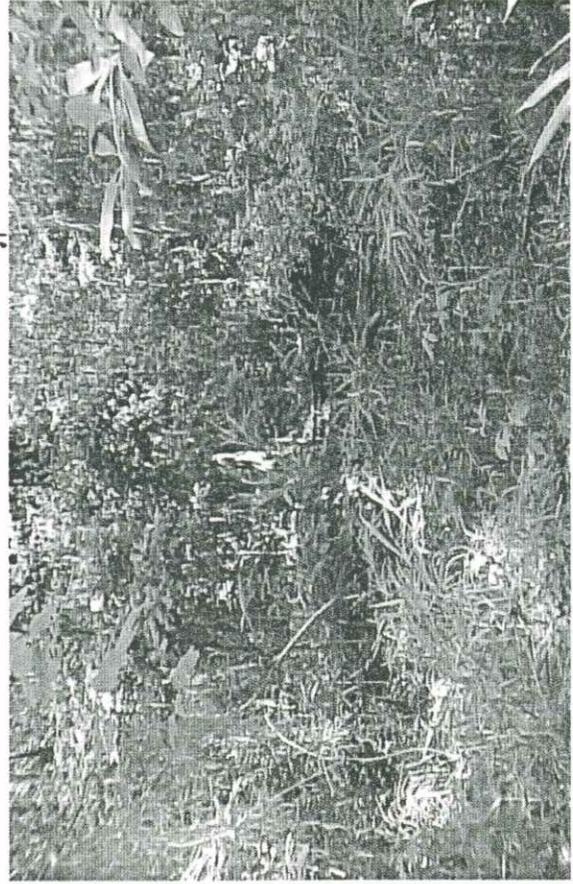
Typical forested areas that the gravity sewer line will cross



Threatened & Endangered Species Assessment  
Orangeburg County Contract No. 1 & 2 Sewer Line Project  
S&ME Project Number: 1618-04-228



Typical forested areas that the gravity sewer line will cross



## **APPENDIX B**



*Customer-Focused Solutions*

**INTENSIVE CULTURAL RESOURCES SURVEY OF  
1.6 MILES OF FORCE MAIN AND ONE PUMP STATION SITE,  
AND A RECONNAISSANCE SURVEY OF 0.85 MILE  
OF GRAVITY SEWER LINE  
ORANGEBURG COUNTY, SOUTH CAROLINA  
(CONTRACT #2)**

**DRAFT REPORT**

Submitted to:  
S&ME, Inc.  
231 Labonte Street  
Conway, South Carolina 29526

Submitted by:  
TRC Garrow Associates, Inc.  
621 Chatham Avenue  
Columbia, South Carolina 29205

TRC Project #: 43405

A handwritten signature in cursive script that reads 'Julie A. Kloss'. The signature is written above a horizontal line.

Julie Kloss, M.A.  
Principal Investigator

Authored by:  
Julie Kloss and Renee Ballard

June 2004



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## I. INTRODUCTION

During the week of May 17, 2004, TRC conducted a Phase I cultural resources survey of 1.6 miles of force main and one pump station site, and a reconnaissance survey of 0.85 mile of gravity sewer line in Orangeburg County, South Carolina (Figure 1). This work was done on behalf of S&ME, Inc. and B.P. Barber & Associates, Inc. Julie Kloss served as the as Principal Investigator, and was assisted by technicians Van Steen and Karen Black Elk.

The project tract begins at S.C. Highway 301 at the location of the pump station site. The tract branches off in two directions, one generally southeast, and the other southwest. The portion branching to the southwest was subject to an intensive survey, and the portion branching to the southeast was subject to a reconnaissance survey. Vegetation consists of mixed pine and hardwoods with a small amount of underbrush, as well as planted and fallow fields. Based on vegetation, topography, and the nature of the undertaking, the Area of Potential Effects (APE) is considered to be the sewer line and pump stations, plus a 0.25-mile radius around the pump station site (the only above-ground facilities). During the survey, no new sites or historic structures were discovered

All work for this project was performed in accordance with the National Historic Preservation Act of 1966 (as amended) and has met the qualifications specified in the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (FR 48:44716-44742) and the *South Carolina Standards and Guidelines for Archaeological Investigations* (SHPO et al. 2000).

This report continues with a discussion of the natural setting and cultural context of the project area in Chapter II, and an overview of the investigation methods in Chapter III. Chapter IV presents the results of the survey, and Chapter V contains a summary of the investigations and presents recommendations concerning NRHP eligibility and other management concerns.

**FIGURE 1 DELETED DUE TO THE SENSITIVITY OF THE  
LOCATION OF CULTURAL RESOURCE SITES**

## II. NATURAL AND CULTURAL CONTEXT

### PROJECT SETTING

The project area is located in an inter-riverine portion of South Carolina's Middle Coastal Plain region. The dominating features of this area are swamps, such as Four Hole and Goodbys Swamp. Soil types encountered during the survey include the Alpin, Bonneau, Lucy, and Mouzon soil series. Alpin and Bonneau soils consist of well drained to excessively drained sand and are generally found on upland landforms and river terraces. The Lucy series consists of very deep, well-drained loamy sand found on ridge tops and side slopes. Mouzon soils are poorly drained fine sandy loams usually found on low-lying stream terraces.

Commonly found vegetation in the Orangeburg County vicinity consists of a mixture of pines and hardwoods, including loblolly and longleaf pine, and turkey and post oak, as well as dogwood and hickory. The understory is generally light and includes cabbage palmetto, myrtle, and gallberry. Common agricultural crops include corn, soybeans, small grains, and tobacco. The average annual temperature is 63.5 degrees F, and yearly precipitation is approximately 48 inches (USDA NRCS n.d.).

### PREHISTORIC OVERVIEW

The prehistory of South Carolina begins sometime prior to 12,500 B.P. and ends with the arrival of the first European explorers in the mid-sixteenth century. A general discussion of the prehistoric occupations and material culture are presented below.

#### **Paleoindian Period (12,500–10,000 B.P.)**

The arrival of humans in eastern North America is currently the subject of much debate, with suggested dates starting as much as 35,000 years ago (Dillehay 1989). Ongoing investigations along the Savannah River are focused on addressing this issue; however, in terms of known occupations, the earliest inhabitants of the area are generally accepted as arriving ca. 12,500 years ago (radiocarbon years before present). The Paleoindian period is marked by the cessation of the Pleistocene geological era and the beginning of the Holocene, a period of climatic and environmental change in much of the country (Anderson and O'Steen 1992). The Paleoindians in the eastern United States are thought to have formed small bands of hunter-gatherers who foraged the woodlands and, to a lesser extent, exploited the megafauna of the period (Lepper and Meltzer 1991). Evidence for Paleoindian occupation in the Coastal Plain is scant and limited to surface finds of diagnostic lanceolate projectile points (Goodyear et al 1989). Sea levels were as much as 9 m lower than at the present time, and it is generally believed that most evidence for Paleoindian occupations along the South Carolina coast is now submerged (Brooks et al 1989).

### **Archaic Period (10,000–3,000 B.P.)**

A warming climate and changing environment led to changes in subsistence patterns and technology over time. These changes signal the Archaic period (ca. 10,000 to 3,500 B.P.), which is better understood than the Paleoindian period. Sea levels, however, were still much lower than at present and Archaic sites are not well represented along the coast.

Much of the Archaic sequence for South Carolina is based on work in the North Carolina Piedmont conducted by Joffre Coe (1964). Research in South Carolina since that time has focused on regional adaptations to the changing environment (Anderson 1992, Sassaman 1993), and while duplication of Coe's Piedmont sequence has not been possible (Blanton and Sassaman 1989:58), his chronology still provides the basic framework for interpretation of Archaic sites in South Carolina.

The Late Paleoindian/Early Archaic transition is marked by the presence of Hardaway and Dalton points, with distinctive concave bases and side notches (Coe 1964). Locally, the Taylor Point is recognized as a Hardaway-Dalton equivalent and is found primarily in the southern part of the state (Sassaman 1992, Michie 1992). Corner-notched Palmers and Kirks are firmly placed as Early Archaic types, along with a variety of bifurcates (e.g., Lecroy and St. Albans), few of which are found outside the Carolina Piedmont (Anderson 1992). Instead, the corner-notched tradition appears to continue into the Middle Archaic period, which sees the advent of more expedient types such as Stanly, Guilford and Morrow Mountain, with Morrow Mountain points predominate across the state (Coe 1964; Blanton and Sassaman 1989).

Early and Middle Archaic lifestyles continued to focus on hunting and foraging, with settlement patterns focused on river floodplains. Population is thought to have increased substantially during these periods (Goodyear et al 1989). By the time of the Late Archaic, the expedient tools of the preceding subperiod were giving way to stemmed bifaces, most notably the ubiquitous Savannah River point which is found under various names from Florida to Canada. During the Late Archaic, settlement patterns begin to change and there is an increase in repeated, intensive occupations of a seasonal nature (Sassaman 1993).

The terminal Late Archaic marks the introduction of fired clay pottery. Trinkley (1990:2) reasons that the technology heralds a new period of adaptation, while most others suggest that the introduction of ceramics did not result in a change in settlement or subsistence patterns (Sassaman and Anderson 1994:30). Regardless, around 4,500 B.P. ceramics were beginning to appear in the middle and lower Savannah River Valley and along coast. Fiber-tempered Stallings wares are the first to appear, found throughout the Coastal Plain (Sassaman 1993:20). Subsequent to, and somewhat coeval with Stallings is Thom's Creek, which marks the transition from the Archaic to the Woodland periods (Anderson et al. 1982; DePratter 1979; Trinkley 1990; Williams 1968). Thom's Creek, like Stallings, is found throughout the Coastal Plain of South Carolina, including Orangeburg County (Poplin et al 1992:26).

In addition to pottery, assemblages from Late Archaic sites in the area include Savannah River and small Savannah River stemmed projectile points, soapstone cooking discs, and occasionally shell tools, and worked bone (Trinkley 1980; Williams 1968).

### **Woodland Period (ca. 1050 B.C.–A.D. 1150)**

Although Thom's Creek pottery is found on Early Woodland sites, the appearance of Refuge wares is often used to denote the beginning of the period (ca. 3,000 B.P.). Refuge is characterized by coarse sand temper and surface treatments including simple stamping, punctate, plain, and dentate stamping (DePratter 1979; Williams 1968). Deptford-type ceramics (check- and linear check-stamped with coarse sand temper) make an appearance toward the end of the period and are found on sites throughout the Middle and Late Woodland periods. Diagnostic lithics are similar to the small-stemmed bifaces of the Late Archaic.

Most researchers agree that during this period there was an increase in population, with an attendant movement by small groups into settings previously under-utilized (Anderson and Joseph 1988:218; Hanson 1982). Investigations on the interior Coastal Plain suggest that along the Savannah and Congaree Rivers there was a shift away from the floodplains to upland settings along tributaries (Anderson and Joseph 1988; Sassaman et al. 1990), and it is likely that circumstances were no different along the Edisto River. Subsistence patterns were similar to those of the Late Archaic, with less reliance on coastal resources and an increasingly circumscribed range (Anderson and Joseph 1988, Oliver 1981).

The Deptford series, originally defined on the lower Savannah River (DePratter 1979; Williams 1968), serves as the bridge from the Early to the Middle Woodland (ca. 2,300–1,000 B.P.) throughout the coastal regions. The hallmark of the series is check and linear check stamping, with simple-stamped and cordmarked types as less common surface treatments. Although the Deptford tradition was originally thought to be a coastal tradition, the discovery of Deptford and Deptford-related ceramic types at non-coastal sites has suggested that the Deptford tradition has a larger geographic distribution (Stephenson et al. 2002). Sites discovered within the interior Coastal Plain of South Carolina with large amounts of Deptford ceramics, such as the Sable site, suggest that there were significant, non-coastal occupations (Anderson 1975a, 1975b, 1979; Ryan 1972; Trinkley 1980). Further inland, the Yadkin series, characterized by its crushed quartz temper, is the dominant Early/Middle Woodland ceramic recovered from the North Carolina Piedmont (Anderson et al. 1996:271–275, Coe 1964). It can be found in the project vicinity as well.

Toward the latter end of the Middle Woodland period, typology becomes more confused and there is no established regional sequence. Ceramics with either sand or grog temper (or both) and cordmarked or fabric-impressed surfaces dominate all Woodland assemblages, with cordmarked sherds more common in the south, shifting towards an emphasis on fabric-impressed to the north (Anderson et al. 1996). Thus, Late Woodland ceramic technologies are a continuation of the Middle Woodland, with no clear transitional type. Subsistence patterns also appear to have evolved slowly. Late Woodland settlements are small, dispersed, and less integrated than those associated with the Deptford phase (Sassaman et al. 1990:14; Stoltman 1974). Subsistence was based on generalized hunting, fishing, and gathering, and although cultigens such as squash and maize had been introduced into the region by this time, they were not a significant food source (Wood et al. 1986).

## **Mississippian Period (ca. A.D. 1150–1550)**

The post-Woodland Mississippian period is marked by social, economic, and technological changes resulting in cultural complexity not found previously in prehistoric Southeastern societies. Complicated-stamped pottery and small triangular projectile points are the diagnostic elements of Mississippian material culture. Increasing reliance on agriculture and construction of large ceremonial complexes are the social hallmarks of the period.

Mississippian mound centers are located along major river drainages, and in South Carolina they are found in the Savannah River valley and along the Wateree River. There is continuing debate on how and how far a given center's influence extended (Anderson 1989; Hally 1996; Blitz; 1999). Cultural and political influences aside, Mississippian sites can be found along any drainage with a floodplain in the region. Away from the ceremonial complexes these tend to be somewhat isolated "farms".

According to Anderson et al. (1982), the Santee pottery series is the initial Mississippian manifestation on the Coastal Plain, with a range from the Lower Santee River in the Coastal Plain to the Santee-Wateree basin on the Fall Line, north of the project area. To the south, along the Savannah River, Savannah and Irene components appear to have a more localized distribution (Braley 1990). There are no recorded ceremonial complexes along the Edisto River drainage, and it is not known if Mississippian influences were derived from Savannah River or Wateree-Santee cultures. It has been suggested that this region is a "buffer zone" between major provinces, namely Cofitachequi on the Wateree River and Ocute on the Oconee River in Georgia, which is thought to be the parent of the Savannah River occupations (Anderson 1989:119; DePratter 1989:142).

## **HISTORIC OVERVIEW**

Religious conflicts and the desire to find new avenues of trade and economic wealth prompted the movement of Europeans across the Atlantic Ocean in the sixteenth century. Spain and Portugal were the first European nations to establish overseas empires. In 1514 Lucas Vasquez de Ayllon sent an expedition north of the Bahama Islands to find native people to replenish the labor force that was dwindling from disease in the Caribbean. The expedition report prompted Ayllon to return to South Carolina in 1521, where natives were put aboard ships headed for Hispaniola. In 1525 Ayllon returned again to the coast of South Carolina and set up a small colony named San Miguel de Gualdape (Edgar 1998:21–22).

The French in 1562 began attempts at starting a settlement along the coast of South Carolina. They set up a fort named Port Royal on present-day Parris Island. Neither San Miguel de Gualdape nor Port Royal lasted more than a year after their founding. Poor relations with the Native Americans, swampy environment, and limited supplies caused both settlements to fail (Edgar 1998:26–27).

Though Spain and France made other attempts to set up colonies on the South Carolina coast none were successful. In 1672 a colonizing party from England established a settlement on the Ashley River, named Charleston. Charleston was successful and opened the door to further settlement in South Carolina (Edgar 1998:48–51; Mills 1972:172).

Settlement by Europeans in Orangeburg County was minimal before 1735. Henry Sterling, an Indian trader and the first European settler to this area, obtained land in 1704 by Lyon's Creek (Salley 1969:18). Sterling's daughter Mary and her husband Richard Heath moved to the Santee River area in 1719 (Chaplin 1981:4).

Early English and Scots-Irish settlers lived along the Edisto River in the Amelia Township, which was located along the Cherokee Path. There was little initial support of heavy settlement of this township because a military garrison was located up the Santee River. This garrison was thought sufficient to protect the colonists' trade interest along the Cherokee path, since Amelia was originally considered a place for Indians and traders to conduct business (Meriwether 1940:42).

During the 1730s German and Swiss families, mostly farmers, settled in Orangeburg County in considerable numbers. These German settlers gave Orangeburg its name in honor of William IV, Prince of Orange (Salley 1969:34–35). Though the German immigrants focused their settlement in the location of present-day Orangeburg, they also occupied and farmed land as far out as Four Hole Swamp (Salley 1969:46). By 1737, German settlers were exporting wheat and corn as well as producing rice, hemp and indigo. Their industriousness and the fertility of the soil facilitated their agricultural success (Culler 1995:25; Mills 1972:659).

Religion was important to the German and Swiss immigrants who were Calvinists. Three years after the establishment of Orangeburg, Reverend John Gisendanner arrived at the settlement. He was the leading church official in Orangeburg County for 22 years. During that time he kept detailed records, in German, of the baptisms and marriages of his parishioners (Mills 1972:657).

During the Revolutionary War, Orangeburg County experienced a few minor skirmishes. When the British took control of Orangeburg, General Sumter besieged and took over the city jail . On September 5, 1781 the British lost to patriot forces in a battle at Eutaw Springs, which lies on the shore of Lake Marion (Mills 1972:662).

In the late 1700s Orangeburg County went through a series of boundary changes. The Orangeburg District originally encompassed present day Bamberg, Barnwell, Lexington, Calhoun, and Orangeburg counties, along with the Orangeburg, Amelia, and Saxe-Gotha (Lexington) townships established in 1730 (Culler 1995:7; Edgar 1998:52). A 1785 act split the Orangeburg district into Orange, Lexington, Lewisburg, and Winton (along the Savannah River) counties. Though the Orangeburg district was re-established when these four counties were eliminated in 1791, the district was divided again in 1804 into Lexington, Barnwell and Orangeburg counties (Trinkley 2003:12).

After the 1770s, when the threat of Indian attacks was gone, Orangeburg County grew considerably. By 1840, the City of Orangeburg had a jail, courthouse, several churches, taverns, stores and a railroad connecting the city to Charleston (Culler 1995:104; Trinkley 2003:12). As Orangeburg County began to flourish the number of slaves increased as well. As the production of cotton became more important, the use of slave labor became widely used. By the 1860s the population of whites in the county was 8,000 while the slave population was more than twice that. At this time, Orangeburg was ranked sixth out of the 30 districts in regard to cash value of its farms and plantations (Culler 1995:435).

During the Civil War, Orangeburg County was largely unaffected; however, toward the end of the war, Sherman burned the City of Orangeburg as he marched through South Carolina (Edgar 1998:371). After the war, attempts to increase cotton production and the widespread adoption of sharecropping led to increasing landlessness among the state's farm producers. By 1900, six out of every ten farmers in South Carolina were either sharecroppers or tenants. Out of this group of landless farmers, 78 percent were black (Edgar 1998:430, 450–451). In 1900, Orangeburg County ranked first in the state in cotton and corn production.

As cotton prices fell from 1920 through the 1940s, Orangeburg County suffered more than the rest of the state. Two-fifths of the farms in the county were mortgaged (Trinkley 2003:16). When cotton was no longer a profitable crop, farmers in Orangeburg began focusing production on corn, soybeans, and other specialty crops. This move away from cotton allowed Orangeburg County to maintain its large number of farms, which in 1945 totaled almost 7,000 (South Carolina Department of Agriculture 1948:224).

The project area, which extends east of Orangeburg to the Four Hole Swamp area, consists of agricultural land that is geographically uninterrupted by the surrounding towns. Its history then is best represented through the general agricultural history of the county that started with the settlement of German immigrants in 1735.

### **III. METHODS**

#### **LITERATURE REVIEW**

Prior to fieldwork, TRC conducted background research at the South Carolina Department of Archives and History (SCDAH) in Columbia, and at the South Carolina Institute of Archaeology and Anthropology (SCIAA) in Columbia. The records examined at SCDAH included a review of their GIS-based Cultural Resource Information System (CRIS) for sites listed in or eligible for inclusion in the National Register of Historic Places (NRHP), and a review of CRIS and the SCDAH Finding Aid for previous architectural surveys near the project area. The records examined at SCIAA include the master archaeological site maps, state archaeological site files, and any associated archaeological reports.

#### **FIELD INVESTIGATIONS**

Archaeological investigations for this project included reconnaissance survey of 0.85 mile of gravity sewer line within existing road right-of-way, and a Phase I intensive survey of approximately 1.6 miles of proposed force main and one pump station location. The reconnaissance survey consisted of surface inspection of exposed ground and the excavation of judgmental shovel tests in areas with a high potential to contain archaeological sites. These areas of high potential were chosen based on the presence of previously recorded sites, as well as topography, and distance to water.

The intensive survey of the proposed five miles of gravity sewer line was carried out using a combination of surface inspection and shovel testing techniques. Shovel tests were excavated at 30-m intervals along the project corridor, except within areas of standing water, very poorly drained soils, or on steep slopes. All shovel tests were approximately 30 cm in diameter and excavated to sterile subsoil. Soil was screened through 0.25-inch hardware mesh, and artifacts were bagged according to provenience. Notes were recorded in a field journal. A pedestrian survey was conducted along all other areas with good surface exposure. When artifacts were encountered, additional shovel tests were excavated at 15-m intervals to determine the size of the site.

All sites and isolated finds were documented with maps and photographs. Detailed field notes were maintained concerning sites located during the survey. This information included site size, site depth, soil type, and other relevant information. All site locations were recorded using a Garmin GPS receiver (15-m accuracy) and plotted on USGS 7.5-minute topographic maps and project plans.

In addition to the archaeological survey, a windshield reconnaissance of the APE surrounding the two proposed pump station locations was conducted to determine whether the construction of the pump stations would affect any above-ground National Register listed or eligible properties.

## LABORATORY METHODS

All artifacts recovered were cleaned, identified, and analyzed using analytical techniques summarized below. Following analysis all artifacts were bagged according to site, provenience, and specimen number. Following the South Carolina interim guidelines established for artifact curation, only acid-free plastic bags and artifact tags were used.

Lithics were initially identified as either debitage or tools. Debitage was sorted by raw material type and size graded using the mass analysis method advocated by Ahler (1989); each flake was also examined for use-wear. Formal tools were classified by type when possible, and attribute data (e.g., thickness, length, weight) was recorded for all tools. Projectile point typology generally followed that contained in Coe (1964) and Justice (1987).

Ceramics greater than 1 cm<sup>2</sup> were sorted first by sherd type (i.e., rim, body), surface treatment, and temper (using the Wentworth scale). These groups were further analyzed for other diagnostic attributes, such as paste texture, interior treatment, rim form, and rim/lip decoration. The data gathered at this level of analysis were used to place the sherds within established regional types (where possible). Information on the ceramic typology of the project area was derived primarily from Anderson et al. (1996), DePratter (1979), Trinkley (1990), and Williams (1968). Sherds less than 1 cm<sup>2</sup> were classified as “residual sherds” and only their frequency and weight were recorded.

Historic artifacts were washed or otherwise cleaned as appropriate. They were separated by material type and further sorted into functional groups, for example glass was further sorted into window, bottle, or other glass. Temporal assignments were based on the chronologically sensitive attributes (i.e., maker’s marks; glass color) using established references for historic materials, including Noel Hume (1970), South (1977), and Miller (1991), among others.

The artifacts, field notes, maps, photographs, and other technical materials generated as a result of this project will be temporarily curated at the TRC office in Columbia. All of the materials will be delivered to SCIAA for final curation upon conclusion of the project.

## **IV. RESULTS OF INVESTIGATIONS**

### **LITERATURE REVIEW**

A search of the files and records at SCIAA revealed there is one previously recorded archaeological site, 38OR223, within a 0.25-mile radius of the proposed sewer line (see Figure 1). Site 38OR223 was recorded by Josh Fletcher of Brockington and Associates in 1999 (Harvey and Fletcher 1999). This is a multi-component site that includes a historic domestic scatter dating to the late nineteenth–early twentieth century, and prehistoric artifacts from the Late Archaic and Early Woodland periods. This site was also recommended as not eligible for inclusion in the NRHP.

A review of the records at SCDAAH revealed no previously recorded historic structures within a 0.25-mile radius of the two proposed pump station locations.

### **ARCHAEOLOGICAL SURVEY**

A total of 65 shovel tests were excavated along the proposed sewer line and pump station location. Typical soils encountered during the survey included three distinct strata. Stratum I (0-20 cm) consisted of a very dark grayish brown (10YR3/2) sandy loam, stratum II (20-40 cm) consisted of a yellowish brown (10YR5/4) sand, and stratum III consisted of a yellowish red (5YR5/8) sandy clay. Most of the survey area was located in agricultural fields or pastures and the soil was heavily disturbed by agricultural activities. The survey resulted in the discovery of no new archaeological sites.

### **HISTORIC ARCHITECTURAL RESOURCES**

A windshield survey of the 0.25-mile radius around the proposed pump station location was conducted to determine whether the proposed undertaking would affect any above-ground historic properties. All roads within the proposed APE were driven and all existing above-ground structures were examined for National Register eligibility using the criteria established by the U.S. Department of Interior and the National Park Service. The survey resulted in the location of no historic properties.

## **V. SUMMARY AND RECOMMENDATIONS**

The purpose of this project was to conduct an intensive survey of 1.6 miles of force main and one pump station location, and a reconnaissance survey of 0.85 mile of gravity sewer line within existing right-of-way in Orangeburg County, South Carolina. The cultural resource investigations resulted in the discovery of no archaeological sites or historic structures.

Based on these results, it is TRC's recommendation that no historic properties will be affected by the proposed undertaking. It is also TRC's recommendation that no further cultural resource investigations be required.

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## **APPENDIX C**

## Shirey, Alan D SAC

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**From:** Prescott Brownell [Prescott.Brownell@noaa.gov]  
**Sent:** Friday, October 22, 2004 12:02 PM  
**To:** SAC Alan D. Shirey; NMFS Robin Wiebler  
**Subject:** Orangeburg Wastewater Improvement Project EA



Card for Prescott  
Brownell

National Marine Fisheries Service (NMFS) has reviewed the Draft EA and FONSI for Wastewater Improvements in Orangeburg County along U.S. Highway 301, Weber Farm Road, and Big Buck Boulevard, dated September 2004.

Based on review of the information provided in the EA and familiarity with the project area, NMFS does not anticipate adverse effects on trust fishery resources.

Thank you for the opportunity to participate in early planning on this project.

Sincerely

Prescott Brownell  
National Marine Fisheries Service  
843-762-8591



# United States Department of the Interior

**FISH AND WILDLIFE SERVICE**  
176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407

September 21, 2004

Mr. Joseph Jones  
Chief, Planning Branch  
U.S. Army Corps of Engineers  
69A Hagood Avenue  
Charleston, SC 29403-5107

Dear Mr. Jones:

The U.S. Fish and Wildlife Service have reviewed the Draft Environmental Assessment (DEA) and Finding of No Significant Impact, received with your letter of September 8, 2004, for wastewater improvements in Orangeburg County, South Carolina. The project includes construction of a wastewater pump station, two 8-inch gravity sewer lines and a force main.

The DEA is generally adequate in its description of the existing fish and wildlife resources and the evaluation of project impacts. As stated in the document, consultation under Section 7 the Endangered Species Act, as amended (16 U.S.C. 1531-1543), was completed on June 14, 2004, with a determination of "not likely to adversely affect" listed species.

Sincerely,

Timothy N. Hall  
Field Supervisor

TNH/EME



September 22, 2004

Mr. Alan Shirey  
Department of the Army  
Charleston District, Corps of Engineers  
69A Hagood Avenue  
Charleston, SC 29403-5107

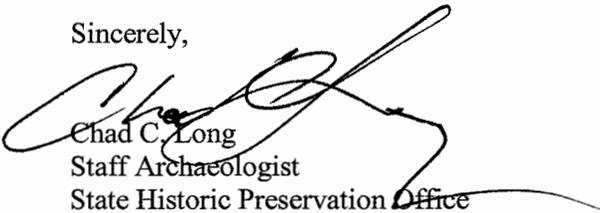
RE: Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for Wastewater Improvements in Orangeburg County Along U.S. Highway 301, Weber Farm Road, and Big Buck Boulevard.

Dear Mr. Shirey:

Thank you for providing us with the above-referenced document prepared in compliance with the National Environmental Policy Act. The information provided in the document and within Appendix B indicates that no historic properties will be affected by the proposed undertaking. We recommend that a copy of the archaeological survey report be provided to our office and the South Carolina Institute of Archaeology and Anthropology (SCIAA) for filing.

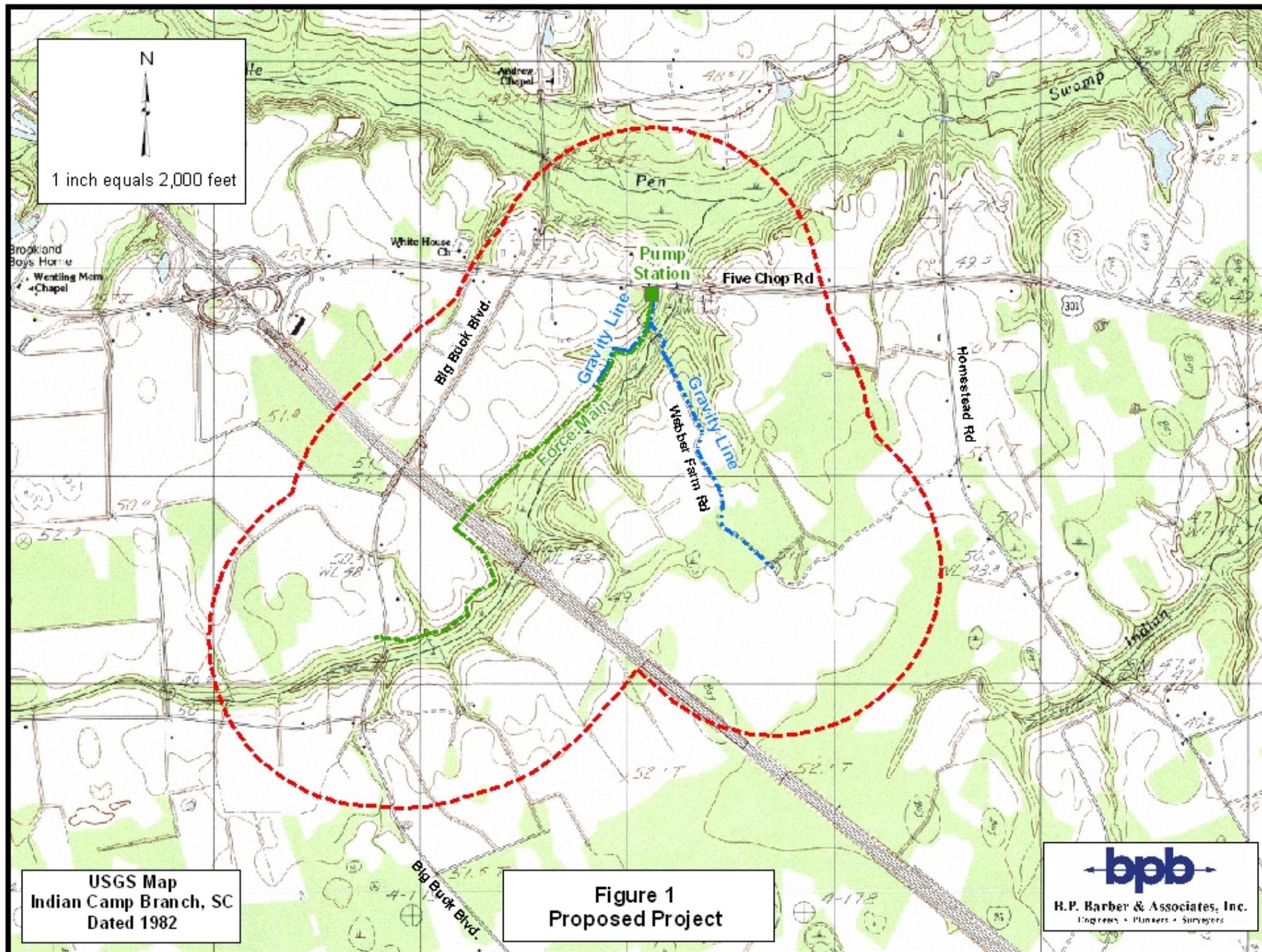
This letter was written to assist you with your obligations under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, as amended. If you have any questions, please call me at (803) 896-6181.

Sincerely,



Chad C. Long  
Staff Archaeologist  
State Historic Preservation Office

## **APPENDIX D**



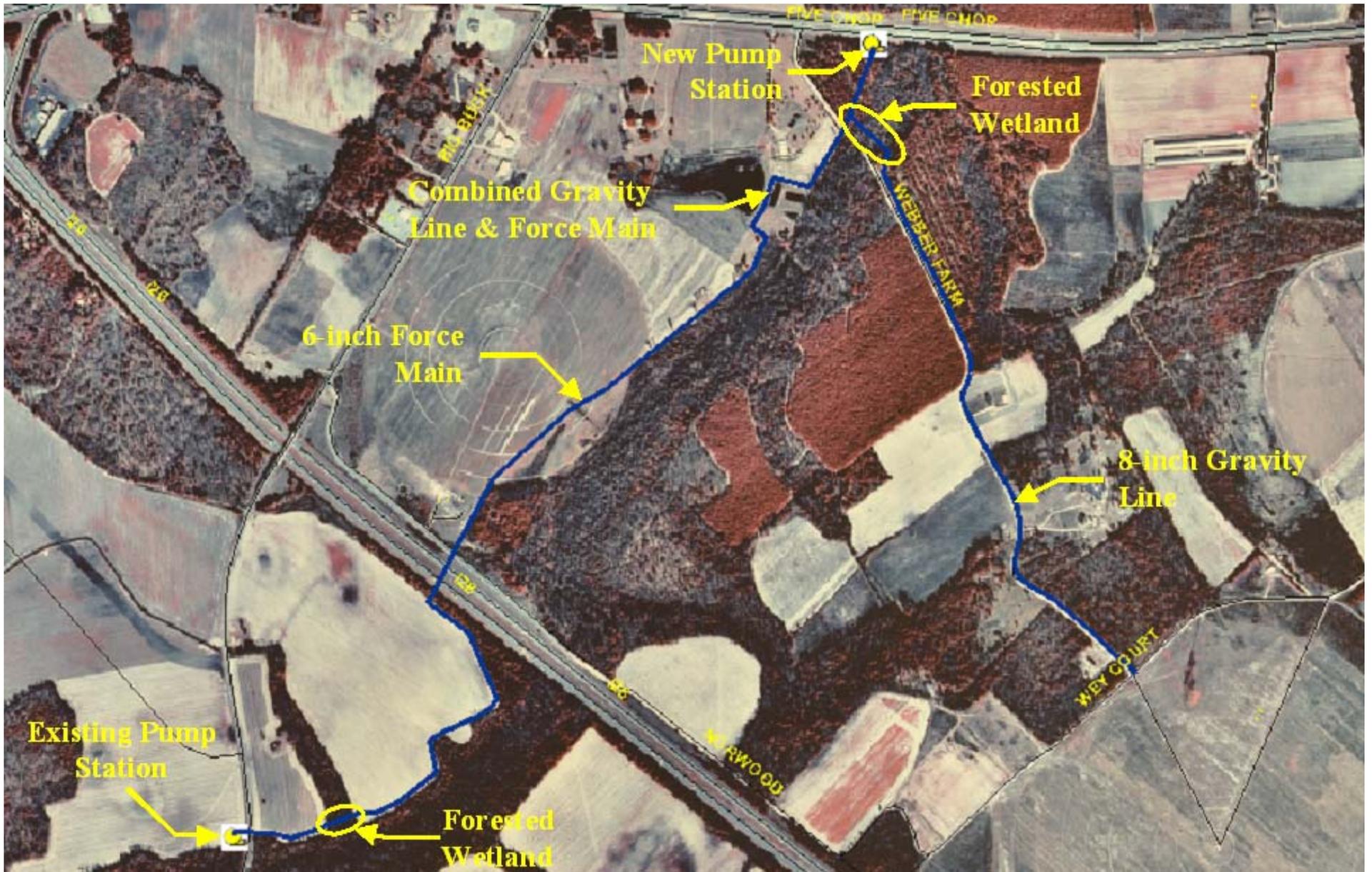
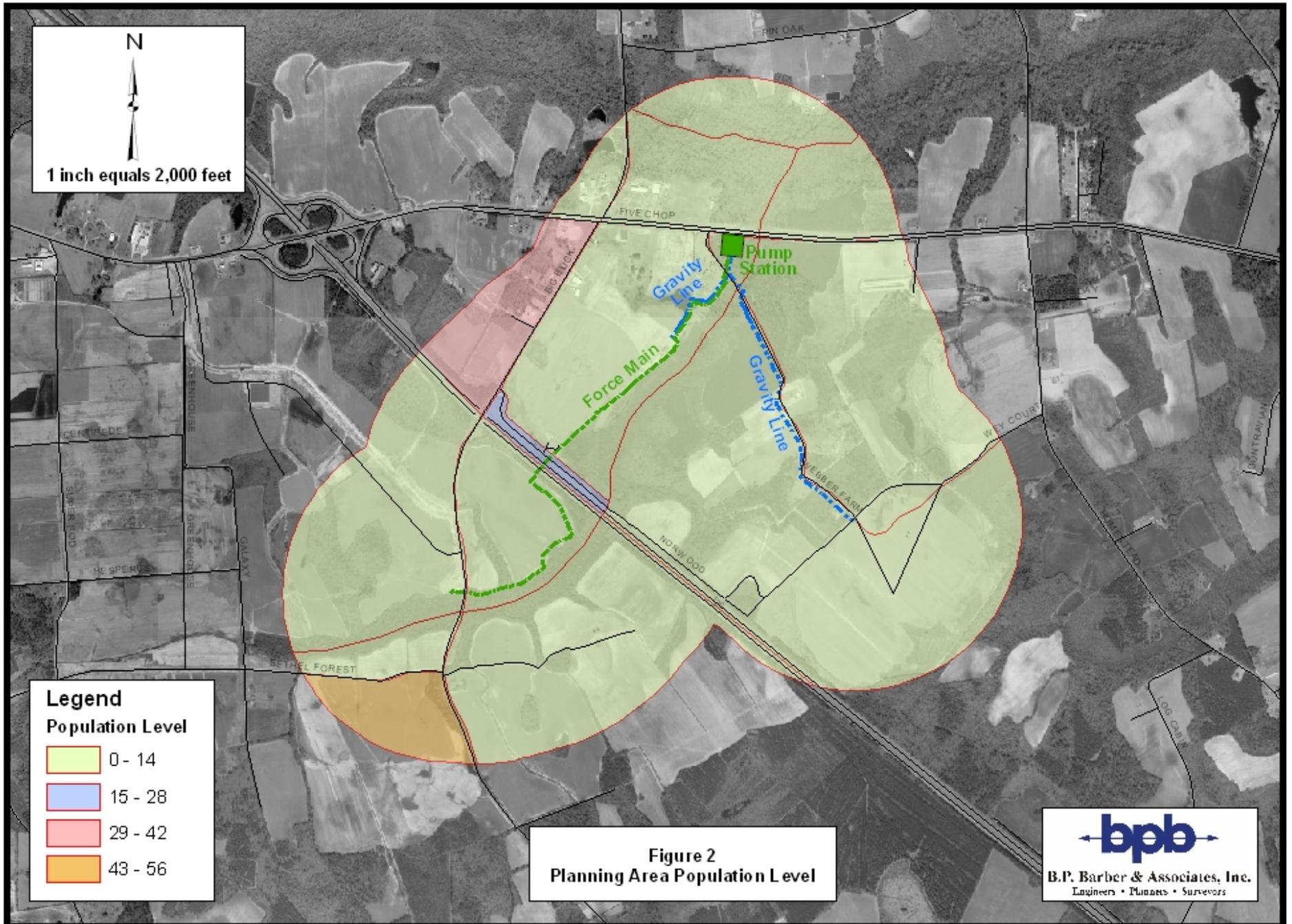
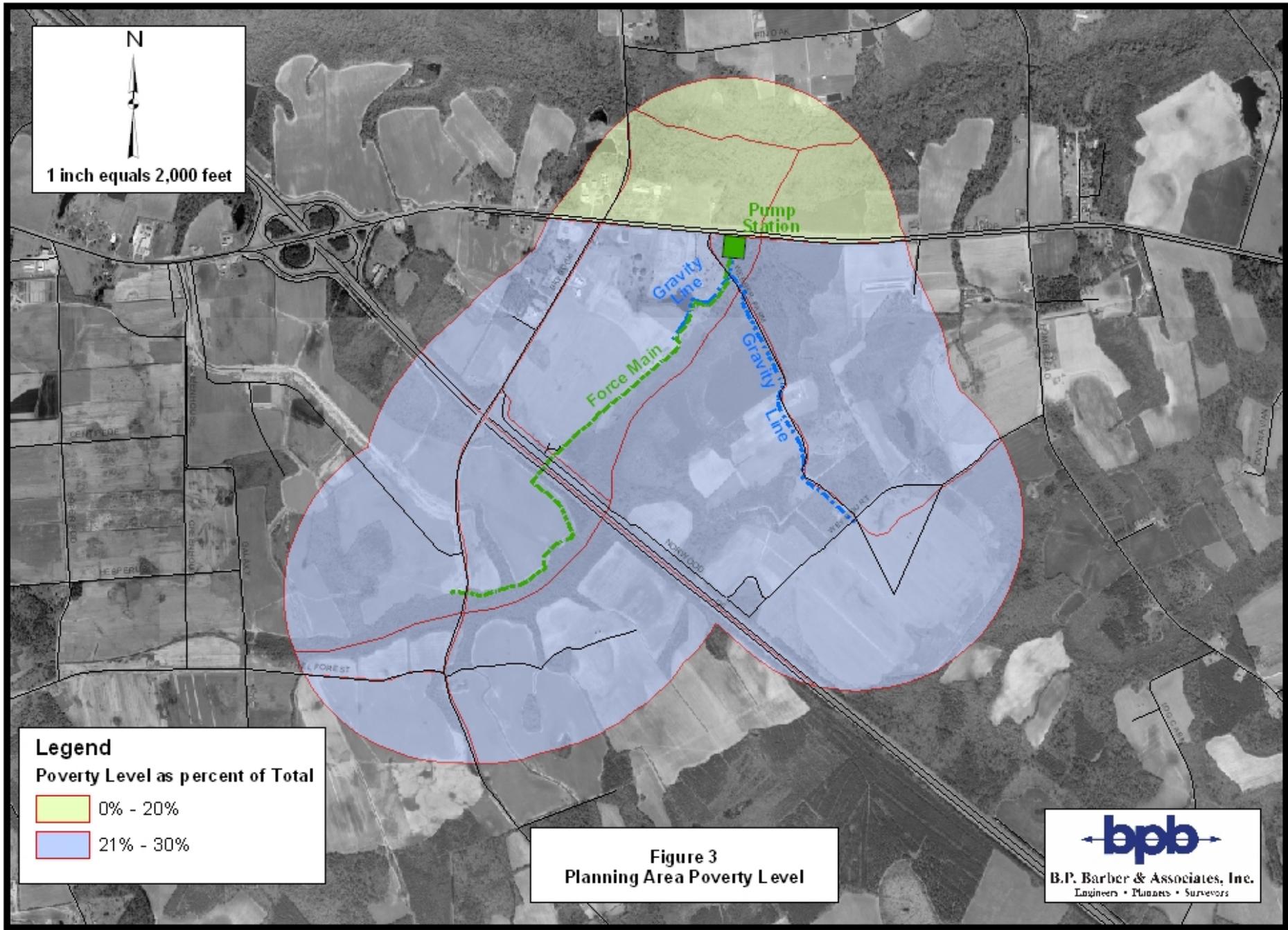


Figure 1A: Aerial Photograph of Proposed Project Area



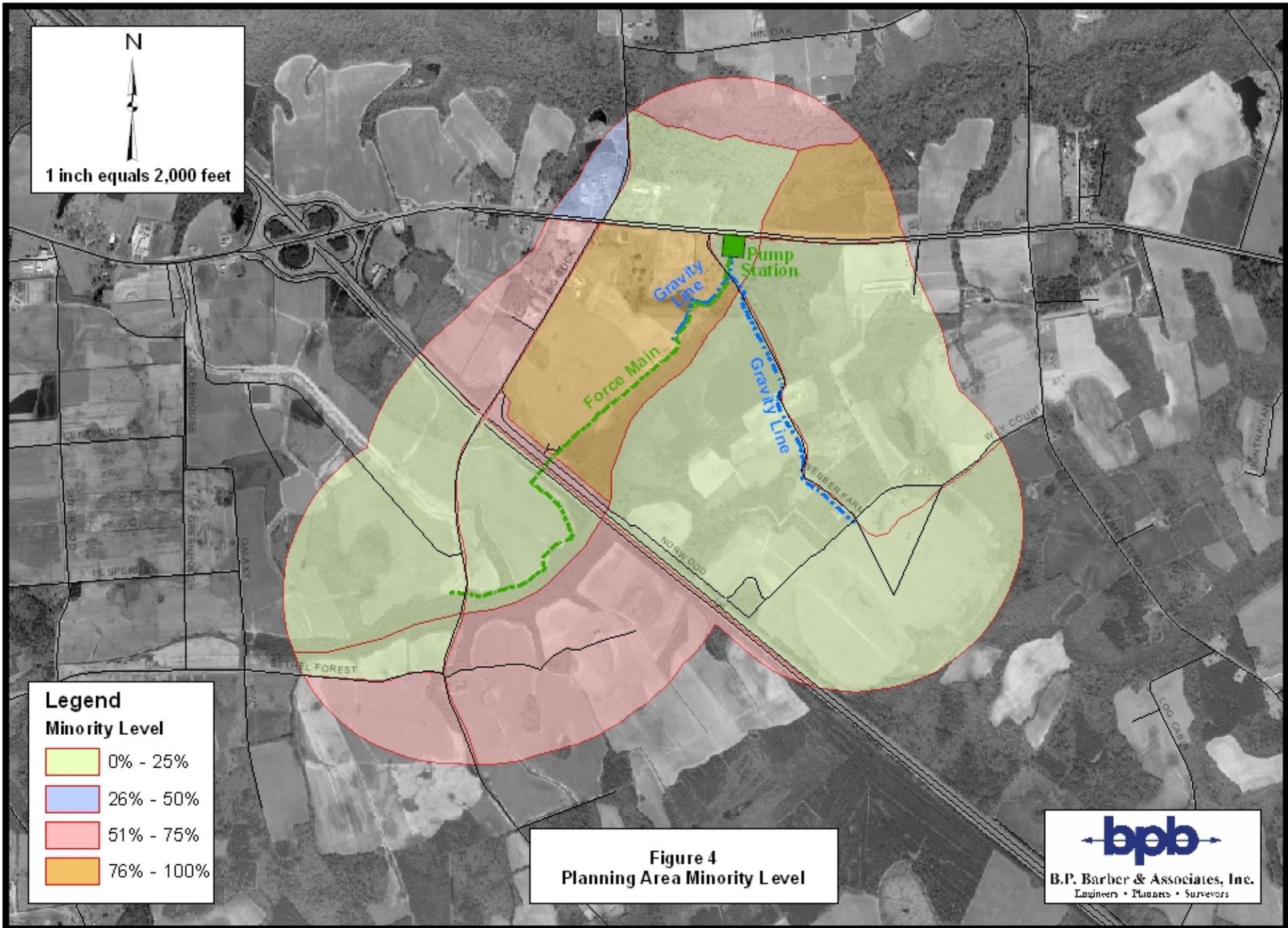


N  
 1 inch equals 2,000 feet

**Legend**  
 Poverty Level as percent of Total

	0% - 20%
	21% - 30%

**Figure 3**  
 Planning Area Poverty Level



N  
 1 inch equals 2,000 feet

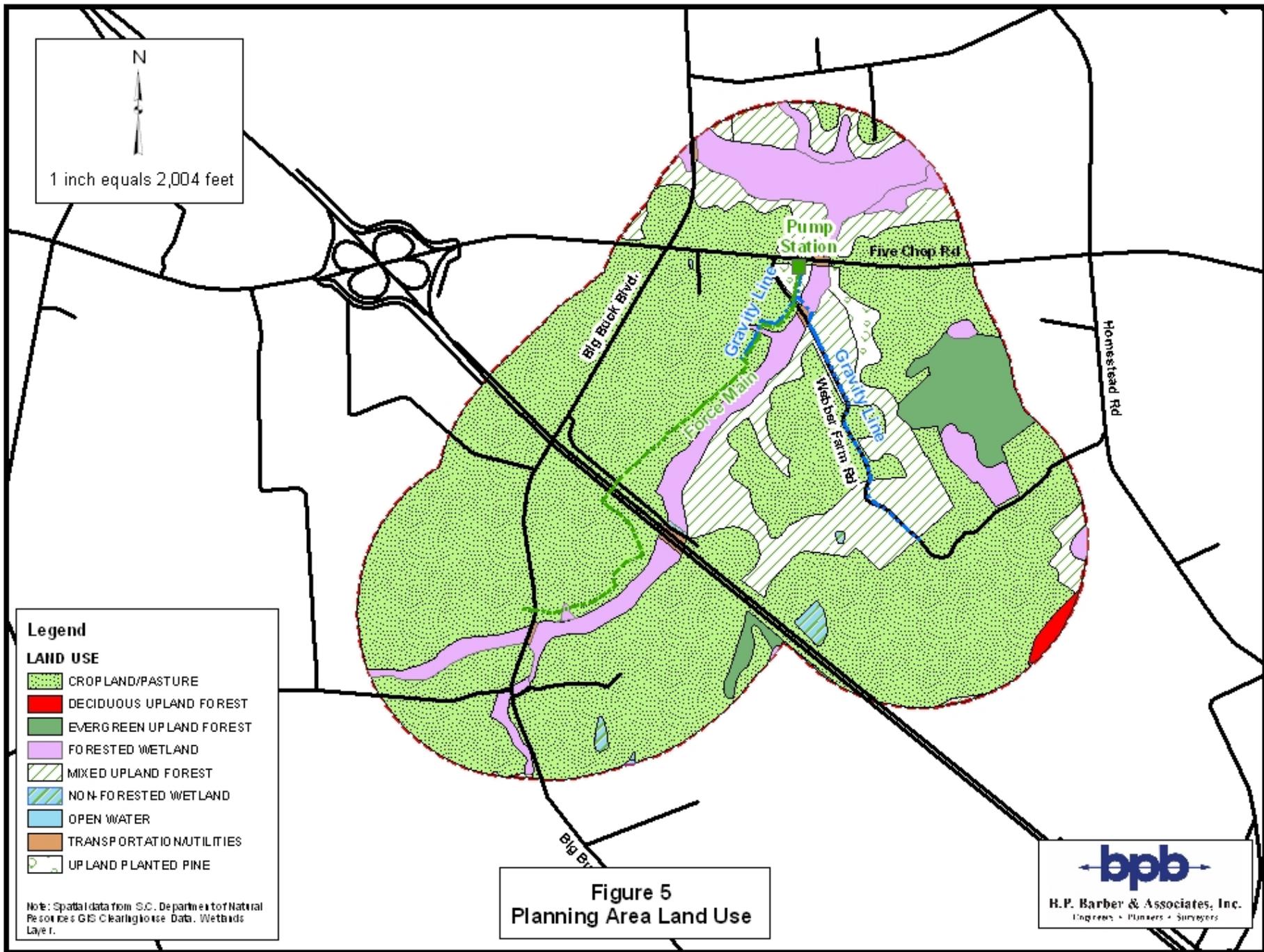
**Legend**

**Minority Level**

Light Green	0% - 25%
Light Blue	26% - 50%
Light Red	51% - 75%
Orange	76% - 100%

**Figure 4**  
**Planning Area Minority Level**

**bpb**  
 B.P. Barber & Associates, Inc.  
 Engineers • Planners • Surveyors



## **APPENDIX E**



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
CHARLESTON DISTRICT, CORPS OF ENGINEERS  
69A Hagood Ave  
CHARLESTON, SOUTH CAROLINA 29403-5107

October 18, 2004

Planning Branch

Mr. Quinton Epps, Manager  
Water Quality Certification and  
Wetlands Planning Section  
South Carolina Department of  
Health and Environmental Control  
Bureau of Water Pollution Control  
2600 Bull Street  
Columbia, South Carolina 29201

Dear Mr. Epps:

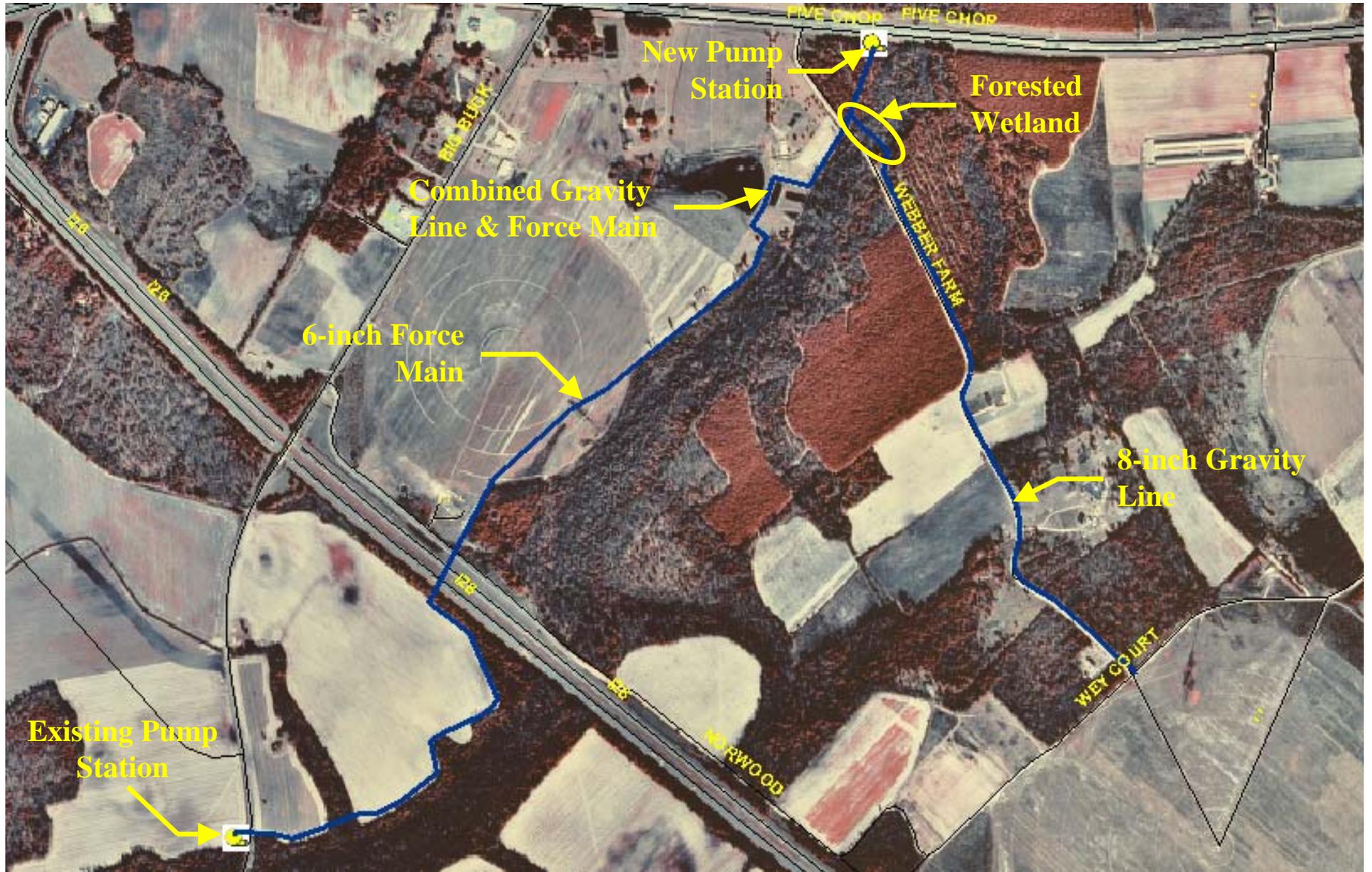
This letter is in reference to the Wastewater Improvements in Orangeburg County Along U.S. Highway 301, Weber Farm Road and Big Buck Boulevard in Orangeburg County, South Carolina. The Environmental Assessment (EA) for this project was distributed on September 8, 2004. As discussed in the EA, approximately 0.41 acres of wetlands extending approximately 580 linear feet in the vicinity of Weber Farm Road (see attached figures) will be cleared for the proposed project. Of this, 0.27 acres will be permanently maintained. The remaining 0.14 acres of wetlands will include only temporary impacts and will be allowed to revegetate naturally.

Please accept this letter as notification that this project is being constructed in accordance with Nationwide Permit number 12 for Utility Construction. If you have any questions regarding this project or the EA, please call Mr. Alan Shirey at 843-329-8166.

Respectfully,

  
Joseph A. Jones  
Chief, Planning Branch

Enclosure





## 404(b)(1) Evaluation

### Wastewater Improvements In Orangeburg County Along U.S. Hwy 301, Weber Farm Road, and Big Buck Boulevard

#### Orangeburg County, South Carolina

#### I. PROJECT DESCRIPTION

- a. **Location and General Description.** Orangeburg County is located in the south central portion of South Carolina and encompasses approximately 1,100 square miles with 91,582 people according to the 2000 U.S. Census. The proposed project will serve as a wastewater collection system to areas within eastern Orangeburg County off US Highway 301 along Webber Farm Road and off US Highway 301 to Big Buck Boulevard. The collection system will be designed to accommodate wastewater flow from residential, commercial, and industrial developments that may utilize the wastewater system in the future. The system will be able to serve the industrial sites adjacent to Interstate 26 as well. As illustrated in Figures 1 and 1A (see Appendix A), the collection system, a localized collection system, consists of a 200-gpm-pump station, approximately 7,100 feet of six (6) inch force main, and approximately 8,400 feet of eight (8) inch gravity line. Wastewater collected through this system will be pumped through the force main to the southwest along a tributary of Middlepen Swamp to an existing pump station and force main owned and operated by the City of Orangeburg Department of Public Utilities (DPU) located in the City/County Industrial Park at the intersection of US Highway 301 and Interstate 26.
- b. **Authority and Purpose.** The Orangeburg County wastewater improvements project is being constructed in response to a need for wastewater infrastructure in this portion of the county. The U.S. Army Corps of Engineers (USACE) was authorized by the Water Resources Development Act (WRDA) of 1992 (Public Law 102-580), as amended, to provide assistance to non-Federal interests for carrying out water-related environmental infrastructure and resources protection and development projects.
- c. **General Description and Quantities of the Dredged or Fill Material.** There will be no dredging or filling with the exception of laying pipeline.
- d. **Description of the Proposed Discharge Site(s).** Approximately 0.41 acre of the proposed project involves work in wetlands and approximately 0.27 acre includes a permanent impact on the wetland (as a result of land clearing). Approximately 0.14 acre of wetland impacts will be temporary (as a result of land clearing) returning the areas to previous undisturbed conditions. No net fill will be placed in wetlands, and there will be no net loss of wetland acreage.

- e. **Description of Disposal Method.** Construction of the wastewater lines will be performed using mostly the “cut and cover” method. This method involves the use of backhoes and track hoes for digging the trench for pipe placement. Bulldozers would be used for required clearing and for spreading clean fill dirt, if needed. Trucks would be used for any necessary backfill after pipe placement and for hauling debris. In areas along the route that cannot support the equipment, the trucks would be used to place fill on the ground in order to stabilize the work area. Fill material will be placed in unstable areas to allow construction, but the material will be removed and the area restored to natural elevations and reseeded following construction.

II. **FACTUAL DETERMINATIONS.** Due to the minimal acreage of wetlands being disturbed with the construction of the proposed project, many of the following determinations are not applicable to the proposed project.

a. **Physical Substrate Determinations.**

- (1) **Substrate Elevation and Slope.** Only two (2) locations will impact wetlands for the proposed project. Appendix B includes a plan and profile for each area of wetlands crossing.
- (2) **Sediment Type.** Appendix C includes a soils map illustrating the soils type for the project area. As illustrated wetland crossings 56 and 57 take place in Ellore loamy sand as identified in the USDA-NRCS soil survey for Orangeburg County. These soils are nearly level and poorly drained.
- (3) **Dredged/Fill Material Movement.** Construction of the wastewater lines will be performed using mostly the “cut and cover” method. This method involves the use of backhoes and track hoes for digging the trench for pipe placement. Bulldozers would be used for required clearing and for spreading clean fill dirt, if needed. Trucks would be used for any necessary backfill after pipe placement and for hauling debris. In areas along the route that cannot support the equipment, the trucks would be used to place fill on the ground in order to stabilize the work area. Fill material will be placed in unstable areas to allow construction, but the material will be removed and the area restored to natural elevations and reseeded following construction. Temporary, minor movement of sediments associated with current flow during construction may occur. However, significant movement of materials removed from the wetlands is not expected to occur. Only 0.27 acre of wetlands will be permanently impacted, and 0.14 acre of wetlands will be temporarily impacted. All permanent wetland impacts will be the result of land clearing; there will be no net loss of wetland acreage.

- (4) **Physical Effects on Benthos.** Benthic organisms in the vicinity of the construction will be impacted by the heavy equipment, removal of vegetative matter and sediments. It is expected that organisms will recolonize the wetland areas following construction activities.
- (5) **Actions Taken to Minimize Impacts.** The route chosen for the proposed project impacts a minimal amount of wetlands. Directional drilling will be utilized to eliminate any impact on wetlands at wetland crossing number 58 (see Appendix B).

**b. Water Circulation, Fluctuation and Salinity Determinations.**

- (1) **Water.**
  - (a) **Salinity.** This is a freshwater wetland. There are no coastal or saline influences; therefore, construction will have no impact on salinity.
  - (b) **Water Chemistry.** Temporary changes in water chemistry related to increased turbidity levels at the construction site may occur. Impacts would be temporary and minimal in nature.
  - (c) **Clarity and Color.** The water may become temporarily cloudy at the construction site during construction activity due to increased turbidity levels associated with disturbance of sediments. As noted above, this is expected to return to normal levels shortly after construction ends.
  - (e) **Odor.** Construction activities may result in a release of hydrogen sulfide (rotten egg) odor from the disturbance of sediments and decaying vegetation. This will be a temporary impact and will not result in long-term effects.
  - (f) **Taste.** The water is not used as a drinking water source, so this is not applicable.
  - (g) **Dissolved Gas Levels.** There may be minor impacts to dissolved oxygen levels as a result of increased turbidity levels. However, the impacts will be localized and temporary, relocating through the wetlands as construction activity moves.
  - (h) **Nutrients.** Nutrient levels in the wetlands are impacted particularly by storm water runoff. These high nutrient loads cause increased growth of undesirable vegetation. Best management practices will be utilized to minimize any increase in storm water runoff due to construction. Once construction is complete, nutrient levels are expected to return to normal levels.

- (i) **Eutrophication.** High nutrient loading causes eutrophication. As stated above, once construction is complete nutrient levels are expected to return to normal levels.

(2) **Current Patterns and Circulation.**

- (a) **Current Patterns and Flow.** A minimum amount of wetland acreage (0.41 acre) will be impacted by the proposed project. However, any impacts to flowing streams will result in changes to current patterns and flow regardless of the size of the stream. For this project, these impacts would be temporary, returning flow/current to natural conditions following construction activities.

- (b) **Velocity.** As with part (2)(a) above, construction across streambeds with flowing water will result in changes in velocity. Again however, the impacts will be temporary and will return to normal conditions following construction.

- (c) **Stratification.** With only 0.34 acre of disturbance for wetland crossing number 57 and only 0.07 acre of disturbance for wetland crossing 56, this is not applicable to the proposed project.

- (d) **Hydrologic Regime.** With only 0.34 acre of disturbance for wetland crossing number 57 and only 0.07 acre of disturbance for wetland crossing 56, this is not applicable to the proposed project.

- (3) **Normal Water Level Fluctuations.** With only 0.34 acre of disturbance for wetland crossing number 57 and only 0.07 acre of disturbance for wetland crossing 56, this is not applicable to the proposed project.

- (4) **Salinity Gradients.** This is a freshwater wetland. There are no coastal or saline influences; therefore, this is not applicable.

- (5) **Actions That Will Be Taken to Minimize Impacts.** Work within the wetlands will be limited to completing only the construction activity necessary for the proposed project. In addition, the following conservation measures/Best Management Practices will be followed:

- Heavy equipment will be placed on mats when working in wetland areas.
- No fill will be placed in wetlands. Adjacent access roads and drainage ditches will not alter natural flow regimes through wetland areas.
- Prior to the beginning of any construction activities, appropriate erosion control measures, such as silt fences, silt barriers, or other suitable devices, will be placed between the construction area and

affected waterways (wetlands) and maintained in a functioning capacity until the area is permanently stabilized upon project completion.

- Once initiated, the project will be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment.
- Upon completion, all disturbed areas will be permanently stabilized with vegetative cover and/or rip-rap, as appropriate.
- Construction activities will avoid, to the greatest extent practical, encroachment into any wetland areas. Where practicable, sidecast soil material from trench excavation will be placed on the side of the trench opposite streams and wetlands.
- Excess soil will be removed to an approved upland disposal site.

c. **Suspended Particulate/Turbidity Determinations.**

- (1) **Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site.** Turbidity will increase during construction operations, but will return to normal levels when construction is complete.
- (2) **Effects (degree and duration) on Chemical and Physical Properties of the Water Column.**
  - (a) **Light Penetration.** During construction, light penetration will diminish due to a temporary increase in turbidity levels as sediments are disturbed. Light penetration will return to normal levels shortly after construction for the temporarily impacted wetland areas.
  - (b) **Dissolved Oxygen.** Dissolved oxygen (DO) levels may decrease during construction as a result of increased turbidity. However, DO levels should return to normal shortly after construction.
  - (c) **Toxic Metals and Organics.** Testing of sediments from the wetlands has not been conducted. However, the project is located in a rural setting surrounded by either forested land or agricultural land. Therefore, there is no expectation of toxic metal or organic contaminants in the sediments. While it is expected that releases of sediments into the water column will occur during construction, it is not anticipated that any unacceptable adverse impacts will occur. Further, sediment loading will return to normal levels following construction.
  - (d) **Pathogens.** The project is located in a rural setting surrounded by either forested land or agricultural land. Therefore, there is no

expectation of high pathogen loading in the sediments. While it is expected that releases of sediments into the water column will occur during construction, it is not anticipated that any unacceptable adverse impacts will occur. Further, sediment loading will return to normal levels following construction.

- (e) **Aesthetics.** During construction, there would be an increase in the ambient noise levels, which will return to normal levels following construction.

**(3) Effects on Biota.**

- (a) **Primary Production & Photosynthesis.** Primary production and photosynthesis may decrease temporarily during construction due to turbidity increases; however, these factors should return to normal shortly after construction is complete.
- (b) **Suspension/Filter Feeders.** Temporary impacts would include increased turbidity, which may reduce oxygen levels and impact food intake.
- (c) **Sight Feeders.** A minimal, temporary disruption due to construction disturbances is possible. A rapid recovery is expected since most sight feeders are transient and can relocate until construction activities are complete.

- (4) **Actions taken to Minimize Impacts.** The above noted impacts are temporary and conditions should improve following construction. It is unlikely that further minimization in these areas is possible.

d. **Contaminant Determinations.** This is a rural environment with little industrial or commercial areas from where high risk contaminants would have originated. In addition, as noted above, very little wetland acreage will be disturbed. As such, there is “no reason to believe” that unacceptable levels of contaminants would be present and no further examination of contaminants is required.

e. **Aquatic Ecosystem and Organism Determinations.**

- (1) **Effects on Plankton.** Effects on plankton would be related to turbidity associated with the construction activity. Effects would be minor and temporary in duration.
- (2) **Effects on Benthos.** Benthic activity at the construction site would be impacted as sediments are disturbed or removed. These disturbances will be temporary and recolonization will occur following construction.

- (3) **Effects on Nekton.** Not applicable.
- (4) **Effects on Aquatic Food Web.** Not applicable.
- (5) **Effects on Special Aquatic Sites.**
  - (a) **Sanctuaries and Refuges.** Not applicable.
  - (b) **Wetlands.** Approximately 0.41 acre of wetlands along Weber Farm Road (see Figure 1A) will be affected by the proposed project. This effect entails clearing a 30-foot wide easement and trenching and backfilling for the wastewater pipeline. After completion of the construction activities, only 20 feet of the easement width will be permanently maintained; the other 10 feet of width will be allowed to naturally re-vegetate. This results in approximately 0.27 acre of wetlands that are permanently impacted by land clearing and approximately 0.14 acre of wetlands that are only temporarily impacted. The permanently cleared easement will be located approximately 100 feet from the cleared corridor created by Weber Farm Road. Directional drilling is not possible at this location because the pipeline being installed is a gravity line that must be installed on a very shallow grade (i.e., 0.40% grade – an approximate two foot drop over a 500 foot length). No net fill will be placed in wetlands and there will be no net loss of wetland acreage. A smaller section of wetlands in the pipeline corridor near the existing pump station will not be affected by construction activities. This section of pipeline will be installed by directional drilling. Directional drilling can be used at this location because this section of pipeline is force main and, therefore, is not dependent on the slope of the pipe. All work in wetlands will be performed in accordance with the guidelines of Corps of Engineers Nationwide 12 permit.
  - (c) **Mud Flats.** Not applicable.
  - (d) **Vegetated Shallows.** Not applicable.
  - (e) **Coral Reefs.** Not applicable.
  - (f) **Riffle and Pool Complexes.** Not applicable.
- (6) **Threatened and Endangered Species.** There are no known threatened or endangered species within the project area. Subsequently, unacceptable adverse impacts to threatened or endangered species are not anticipated or expected.

- (7) **Other Wildlife.** A wide variety of wildlife - birds, mammals, reptiles and amphibians – utilize the wooded areas. Impacts to wildlife in the project area would be associated with the construction activities. Wildlife would be expected to leave the area during construction, but would return when construction is complete.
- (8) **Actions to Minimize Impacts.** Plans and specs for the project specify requirements to ensure impacts to the environment are minimized or avoided. In addition, the following conservation measures/Best Management Practices will be followed:
- Heavy equipment will be placed on mats when working in wetland areas.
  - No fill will be placed in wetlands. Adjacent access roads and drainage ditches will not alter natural flow regimes through wetland areas.
  - Prior to the beginning of any construction activities, appropriate erosion control measures, such as silt fences, silt barriers, or other suitable devices, will be placed between the construction area and affected waterways (wetlands) and maintained in a functioning capacity until the area is permanently stabilized upon project completion.
  - Once initiated, the project will be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment.
  - Upon completion, all disturbed areas will be permanently stabilized with vegetative cover and/or rip-rap, as appropriate.
  - Construction activities will avoid, to the greatest extent practical, encroachment into any wetland areas. Where practicable, sidecast soil material from trench excavation will be placed on the side of the trench opposite streams and wetlands.
  - Excess soil will be removed to an approved upland disposal site.

f. **Proposed Disposal Site Determinations.**

- (1) **Mixing Zone Determination.** Not applicable. The State of South Carolina Department of Health and Environmental Control (SCDHEC) does not recognize mixing zones.
- (2) **Determination of Compliance with Applicable Water Quality Standards.** The proposed project has been determined to be in compliance with the Nationwide Permit Number 12. The South Carolina Department of Health and Environmental Control certified Nationwide Permit Number 12 with 401 Water Quality Certification and Coastal Zone Consistency Specific Conditions and General Conditions on March 15, 2002. The Coastal Zone conditions are not applicable to this project, but

the conditions of the 401 Water Quality Certification are applicable and will be adhered to throughout the project.

**(3) Potential Effects on Human Use Characteristics.**

- (a) Municipal and Private Water Supply.** This project will have no impact on municipal/private water supplies since these wetland areas are not utilized for municipal or private water supply.
- (b) Water Related Recreation.** Not applicable.
- (c) Aesthetics.** The construction activity will have a negative impact on visual and audible aesthetics. However, the activity will move relatively rapidly, so no one area will endure the aesthetic impacts for long.

- g. Determination of Secondary and Cumulative Effects on the Aquatic Ecosystem.** Initial negative effects related to this project include those associated with turbidity, impacts to the benthic community, and aesthetics. These effects are considered temporary and a minimal amount of wetland area will be permanently impacted.

**III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.**

- a.** No significant adaptations of the guidelines were made relative to this evaluation.
- b.** Alternatives that were considered involved septic systems, on site wastewater treatment plants, and no action. The proposed project was selected because it would provide a safe reliable wastewater collection system that would be more environmentally friendly than the other alternatives.
- c.** The proposed construction described in this evaluation would not cause or contribute to violations of any known applicable state water quality standards, which would result in permanent damage to the ecosystem.
- d.** The proposed construction described in this evaluation would not cause or contribute to violations of any known applicable state water quality standard.
- e.** The proposed project will not violate the Endangered Species Act of 1973.
- f.** The proposed project will not result in significant adverse affects on human health and welfare in regard to municipal and private water supplies, plankton, fish, wildlife, and special aquatic sites. The life states of aquatic life and other wildlife will not be adversely affected. Significant adverse affects on aquatic ecosystem

diversity, productivity and stability, and recreational, aesthetic and economic values will not occur.

- g.** Steps taken to minimize potential adverse impacts of the construction on aquatic ecosystems include limiting construction to the minimum alternative needed to provide the required protection. In addition, the conservation measures and Best Management Practices will be incorporated into the plans and specs, which will minimize impacts to threatened and endangered species and other aquatic and terrestrial life.
- h.** The proposed project will not cause unacceptable adverse impacts to any known, significant historic sites.
- i.** On the basis of the guidelines, the proposed construction is specified as complying with the requirement of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

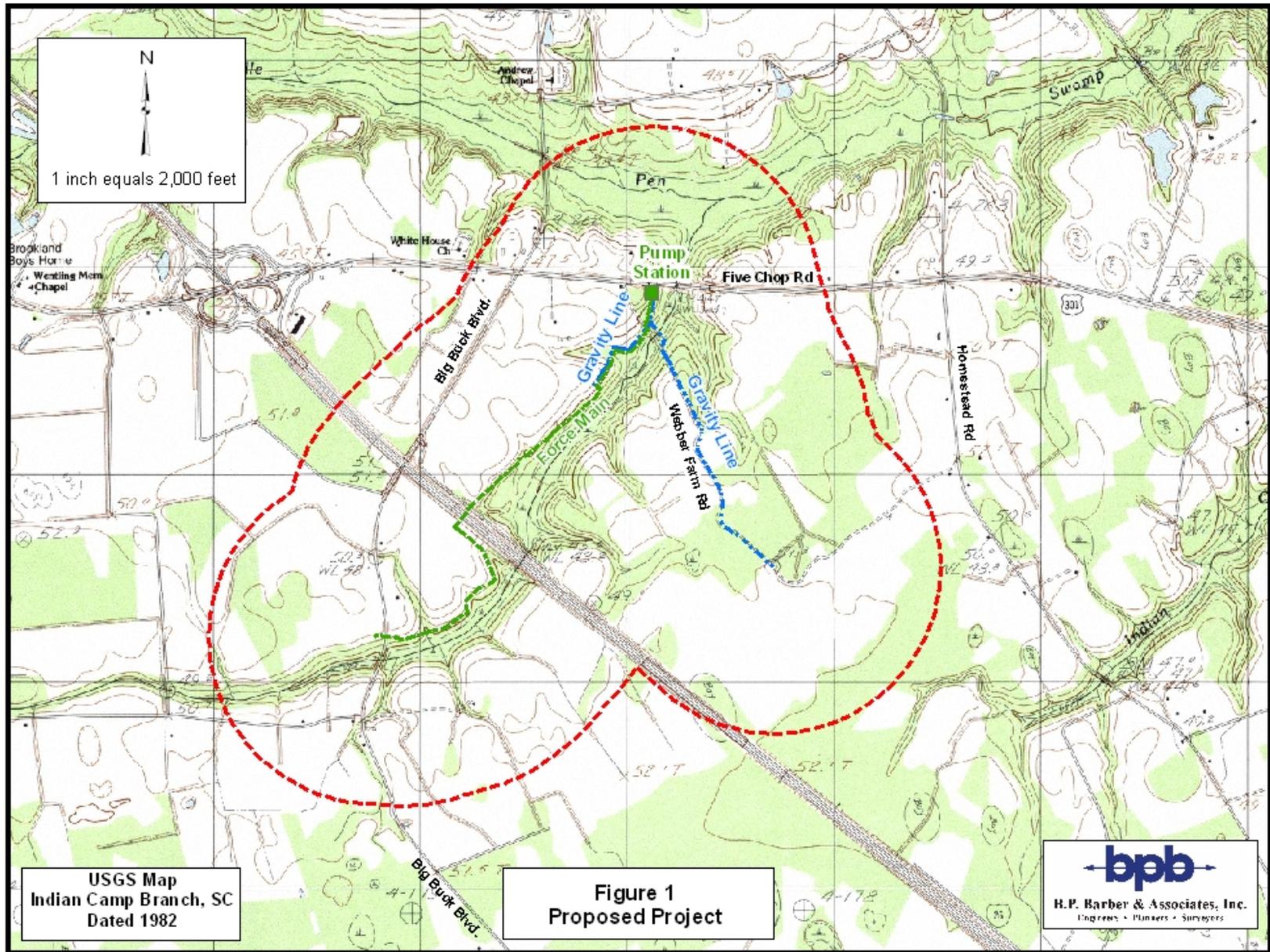
16 Nov 04

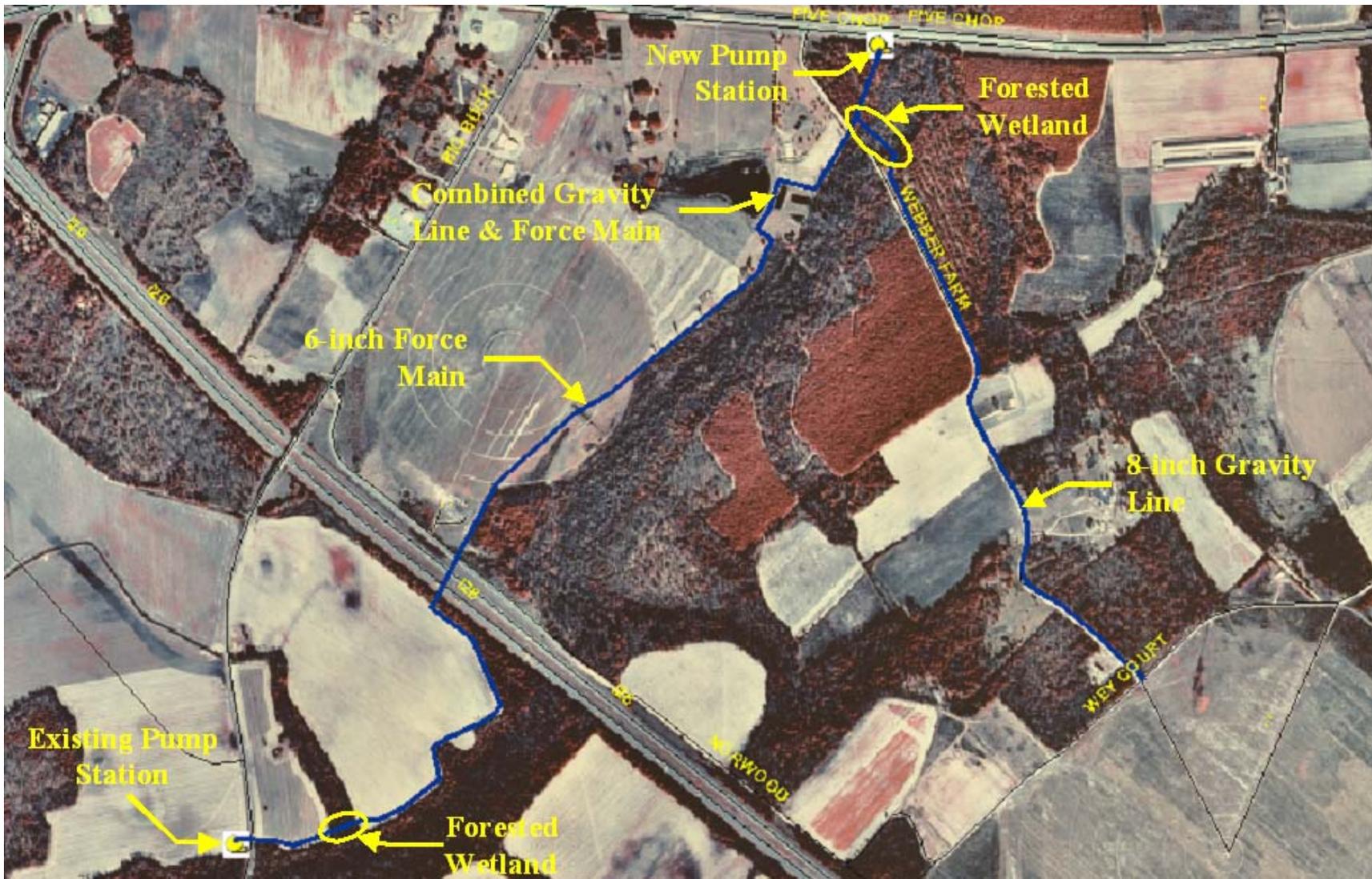
DATE



Alvin B. Lee  
Lieutenant Colonel, EN  
Commanding

# **APPENDIX A**





**Figure 1A: Aerial Photograph of Proposed Project Area**

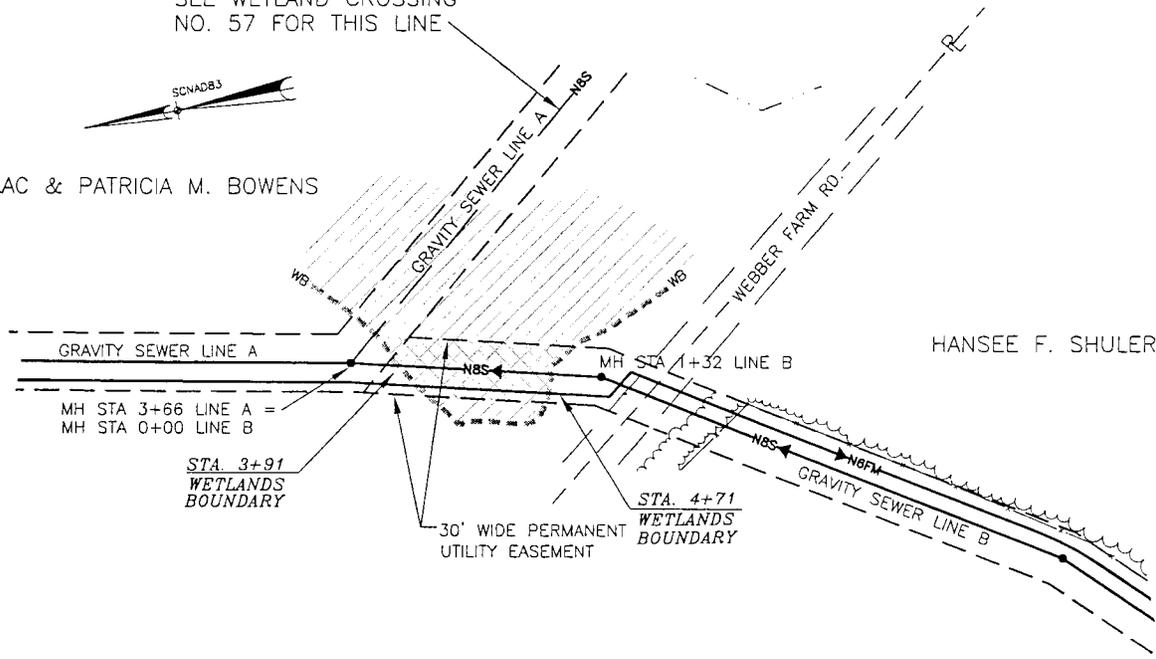
## **APPENDIX B**

56

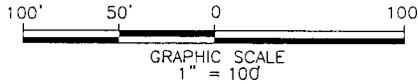
SEE WETLAND CROSSING NO. 57 FOR THIS LINE

ISAAC & PATRICIA M. BOWENS

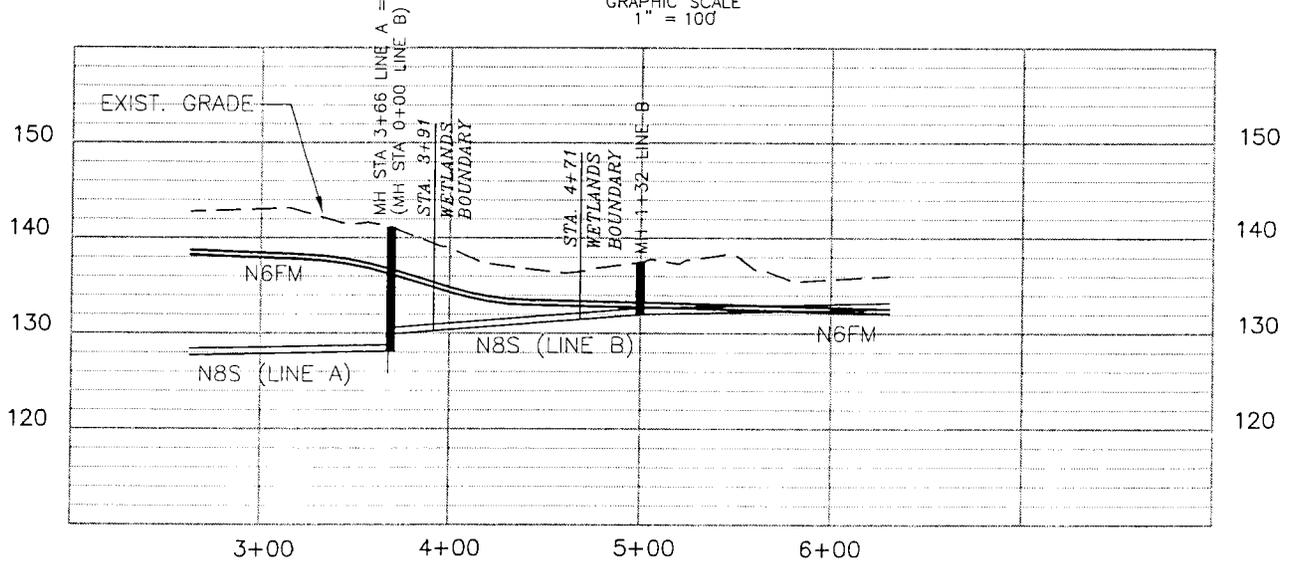
HANSEE F. SHULER



**PLAN**



PERMANENT IMPACTS  
= 0.037 ACRE  
TEMPORARY IMPACTS  
= 0.031 ACRE



**PROFILE**

SCALE: 1" = 100' HORZ./ 1" = 20' VERT.

**LEGEND**

- EXISTING GRADE
- WETLANDS IMPACT
- WETLANDS (NOT IMPACTED)
- SILT FENCE
- WETLANDS BOUNDARY

56

Project Title: PROPOSED CONSTRUCTION OF GRAVITY SEWER, FORCE MAIN, WATER MAIN AND 2 SEWER PUMP STATIONS

Project Location: NEAR ORANGEBURG, ORANGEBURG COUNTY, S.C.

Applicant: ORANGEBURG COUNTY

Authorized Agent: B.P. BARBER & ASSOCIATES, INC.

Drawing Scale: AS SHOWN Date: OCT., 2003

Application #: Sheet of

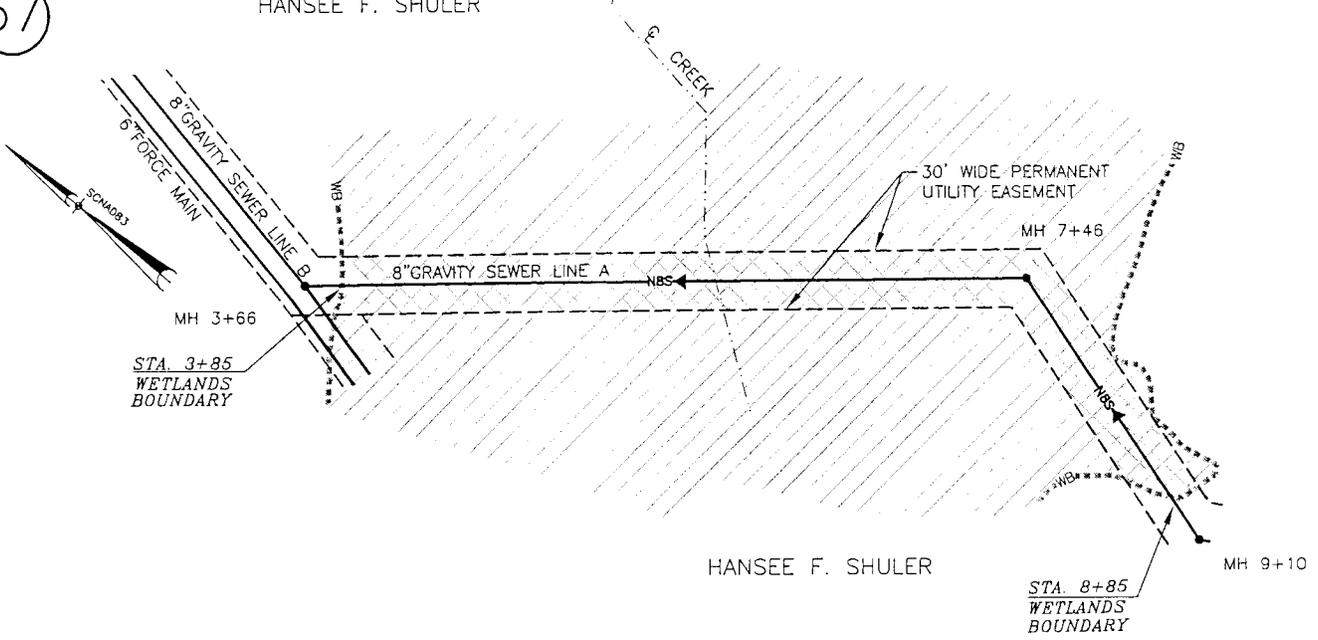
Revisions	
Date	Initials

PROJECT NO. 02122

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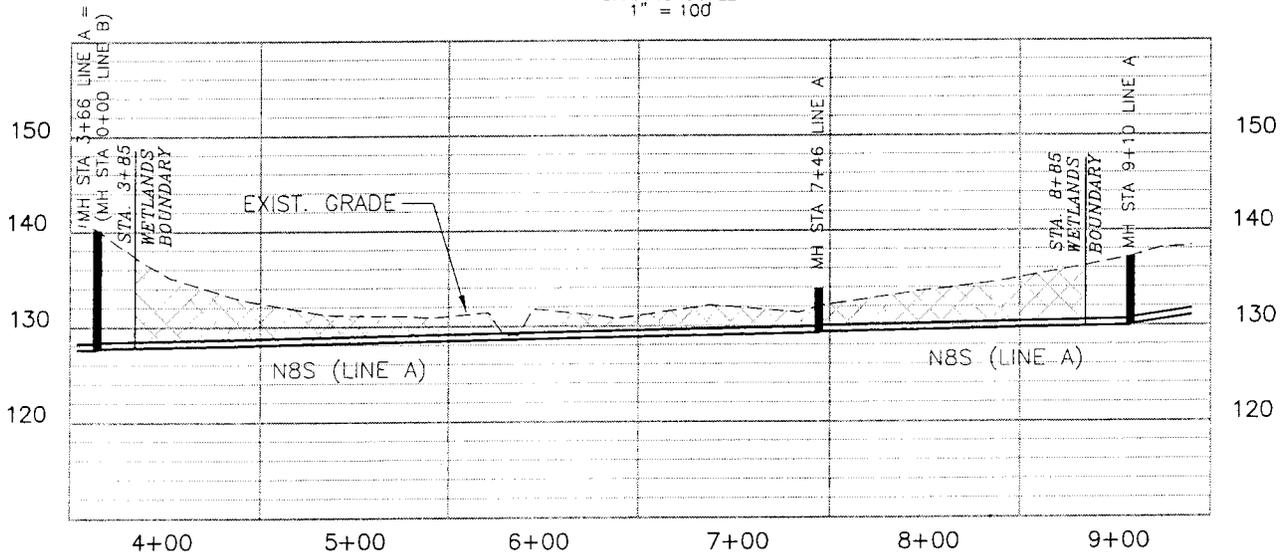
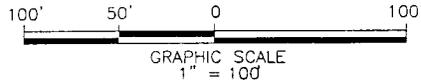
57

HANSEE F. SHULER



PERMANENT IMPACTS  
= 0.230 ACRE  
TEMPORARY IMPACTS  
= 0.110 ACRE

### PLAN



### PROFILE

SCALE: 1" = 100' HORZ./ 1" = 20' VERT.

#### LEGEND

- EXISTING GRADE
- WETLANDS IMPACT
- WETLANDS (NOT IMPACTED)
- SILT FENCE X X X
- WETLANDS BOUNDARY

WETLAND CROSSING NUMBER

57

Project Title: PROPOSED CONSTRUCTION OF GRAVITY SEWER, FORCE MAIN, WATER MAIN AND 2 SEWER PUMP STATIONS

Project Location: NEAR ORANGEBURG, ORANGEBURG COUNTY, S.C.

Applicant: ORANGEBURG COUNTY

Authorized Agent: B.P. BARBER & ASSOCIATES, INC.

Drawing Scale: AS SHOWN

Date: OCT., 2003

Application #:

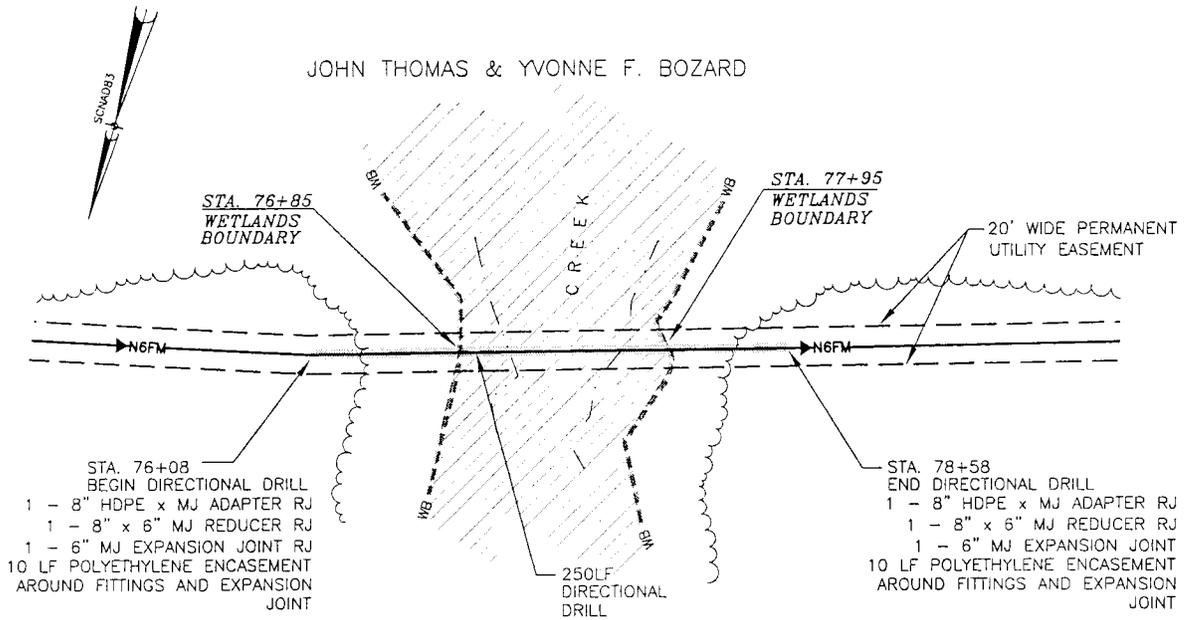
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Revisions	
Date	Initials

PROJECT NO. 02122

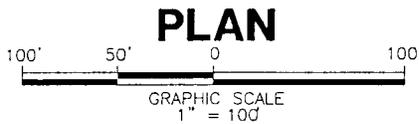
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JOHN THOMAS & YVONNE F. BOZARD

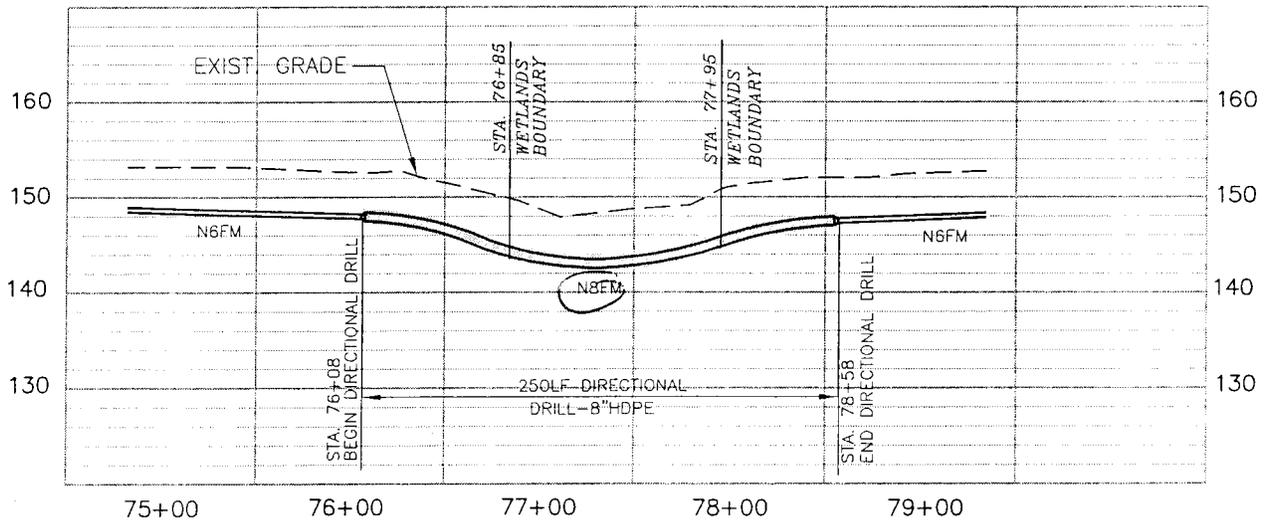


JOHN THOMAS & YVONNE F. BOZARD

PERMANENT IMPACTS  
= 0.0 ACRE  
TEMPORARY IMPACTS  
= 0.0 ACRE



**NOTE:**  
NO IMPACTS (DIRECTIONAL  
DRILL UNDER WETLANDS)



**PROFILE**  
SCALE: 1" = 100' HORZ./ 1" = 20' VERT.

**LEGEND**

- EXISTING GRADE
- WETLANDS IMPACT
- WETLANDS (NOT IMPACTED)
- SILT FENCE
- WETLANDS BOUNDARY
- WETLAND CROSSING NUMBER

Project Title: **PROPOSED CONSTRUCTION OF GRAVITY SEWER, FORCE MAIN, WATER MAIN AND 2 SEWER PUMP STATIONS**

Project Location:  
NEAR ORANGEBURG, ORANGEBURG COUNTY, S.C.

Applicant: ORANGEBURG COUNTY

Authorized Agent: B.P. BARBER & ASSOCIATES, INC.

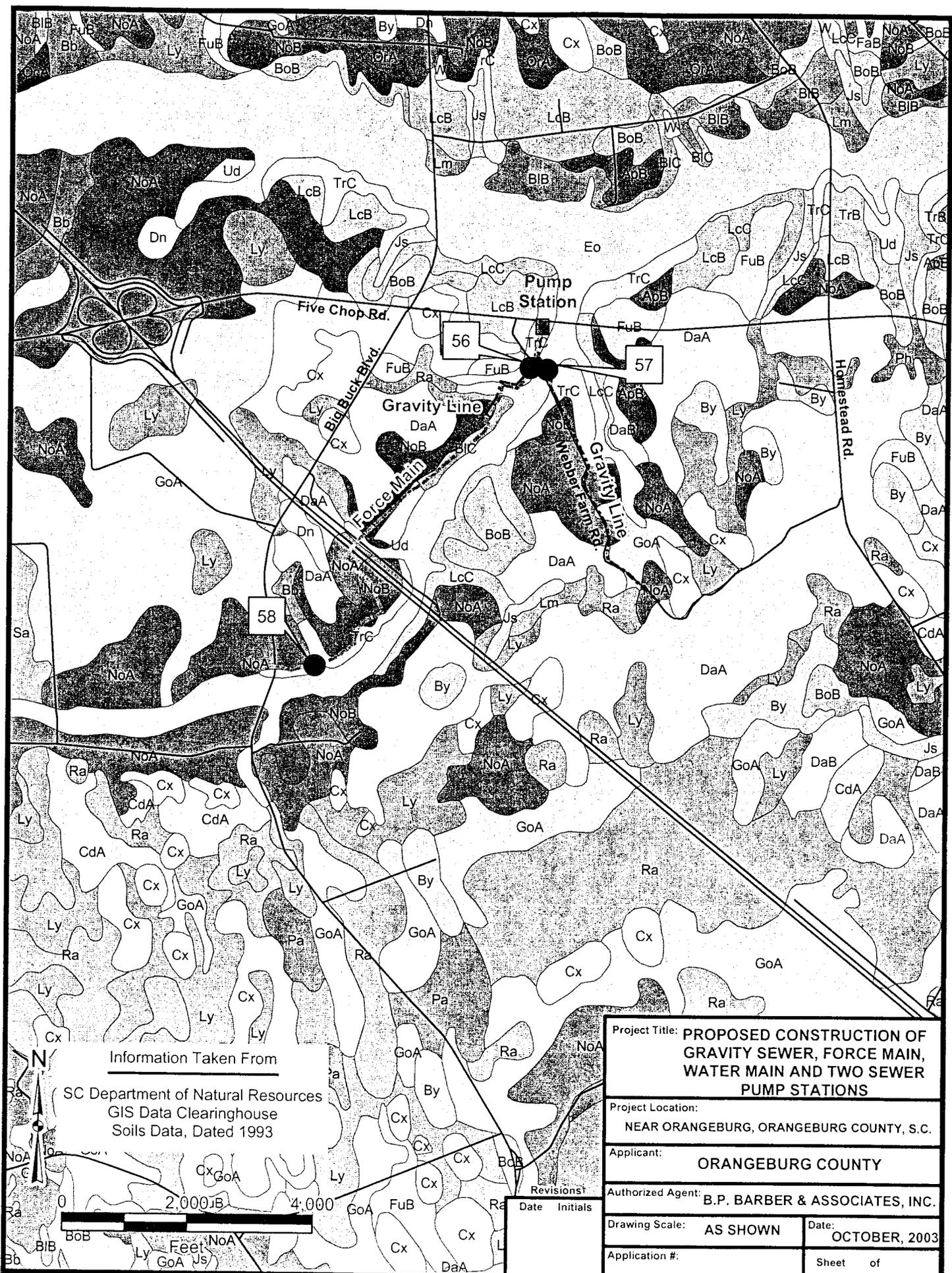
Drawing Scale: AS SHOWN Date: OCT., 2003

Application #: Sheet of

Revisions	
Date	Initials

PROJECT NO. 02122

## **APPENDIX C**



Information Taken From

SC Department of Natural Resources  
GIS Data Clearinghouse  
Soils Data, Dated 1993

**Project Title:** PROPOSED CONSTRUCTION OF  
GRAVITY SEWER, FORCE MAIN,  
WATER MAIN AND TWO SEWER  
PUMP STATIONS

**Project Location:**  
NEAR ORANGEBURG, ORANGEBURG COUNTY, S.C.

**Applicant:**  
ORANGEBURG COUNTY

**Authorized Agent:** B.P. BARBER & ASSOCIATES, INC.

**Drawing Scale:** AS SHOWN **Date:** OCTOBER, 2003

**Application #:** \_\_\_\_\_ **Sheet** of \_\_\_\_\_

Revisions	Date	Initials

