

# **ENVIRONMENTAL ASSESSMENT**

## **Harleyville Reach Water Transmission Main Dorchester and Orangeburg Counties, South Carolina**

Prepared by:  
United States Army Corps of Engineers  
Charleston District  
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# Table of Contents

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<b>CHAPTER 1 INTRODUCTION</b> .....	<b>3</b>
Figure 1(a) Project Area Map. Proposed water transmission main placement shown in blue.....	2
Figure 1(b) Project Area Map. Proposed water transmission main placement shown in blue.....	3
<b>CHAPTER 2 PURPOSE AND NEED</b> .....	<b>4</b>
<b>CHAPTER 3 BASELINE ENVIRONMENTAL SETTING</b> .....	<b>4</b>
Climate .....	4
Land Use.....	4
Water Resources and Aquatic Habitat .....	5
Figure 2. Map of Santee Cooper Lakes.....	5
Terrestrial Resources and Wildlife .....	6
Figure 3(a) Wetlands Map.....	7
Figure 3(b) Wetlands Map.....	8
Air Quality and Noise.....	9
Cultural Resources.....	9
Endangered Species.....	10
Table 1. Federally threatened species (T), federally endangered species (E), species protected under the bald, federal candidate species (C) and golden eagle protection act (BGEPA) for Dorchester or Orangeburg Counties. ....	10
Hazardous Toxic and Radioactive Waste.....	10
Socioeconomics.....	11
Table 2. Select U.S. Census Bureau statistics for the town of Harlyville, SC. Estimates are from 2010 Census Data unless otherwise noted. ....	11
Recreation.....	11
<b>CHAPTER 4 ALTERNATIVES</b> .....	<b>11</b>
Alternative 1 (Proposed Project) .....	11
Alternative 2 .....	12
Alternative 3 .....	12
No Action Alternative.....	12
<b>CHAPTER 5 ANALYSIS OF ALTERNATIVES</b> .....	<b>12</b>
<b>CHAPTER 6 ENVIRONMENTAL IMPACTS</b> .....	<b>13</b>
Climate .....	13
Land Use.....	13
Water Resources and Aquatic Habitat .....	13
Terrestrial Resources and Wildlife .....	14
Air Quality and Noise.....	14
Table 3. Wetland Impacts.....	15
Cultural resources .....	17
Endangered Species.....	17

Hazardous Toxic and Radioactive Waste.....	17
Socioeconomics .....	17
Recreation.....	18
<b>CHAPTER 7 CUMULATIVE IMPACTS.....</b>	<b>18</b>
<b>CHAPTER 8 PUBLIC INVOLVEMENT AND COORDINATION.....</b>	<b>19</b>
<b>CHAPTER 9 COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS .....</b>	<b>19</b>
Clean Water Act.....	19
Clean Air Act .....	19
Endangered Species Act.....	20
Farmland Protection Policy Act .....	20
Fish and Wildlife Coordination Act .....	20
Floodplain Management (EO 11988) .....	20
Protection of Wetlands (EO 11990).....	20
National Wild and Scenic Rivers .....	21
National Historic Preservation Act (NHPA).....	21
Coastal Zone Management Act.....	21
<b>CHAPTER 10 REFERENCES.....</b>	<b>21</b>
<b>APPENDIX A: 2003 EA for Lake Marion Regional Water System</b>	
<b>APPENDIX B: Cultural Resources Report for Harleyville Reach</b>	
<b>APPENDIX C: Wetland Mitigation Worksheet</b>	
<b>APPENDIX D: List of Addresses for EA and Draft FONSI</b>	
<b>APPENDIX E: Comments</b>	

# **CHAPTER 1 INTRODUCTION**

This Environmental Assessment (EA) has been prepared by the U.S. Army Corps of Engineers, Charleston District (Corps) in compliance with the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321- 4370f, and its implementing regulations, 40 C.F.R. §§ 1500-1508, and 33 C.F.R. Part 230, to evaluate the proposed installation and operation of a potable water transmission main from Holly Hill, SC to Harleyville, SC.

The Water Resources Development Act (WRDA) of 1992 (Public Law 102-580), as amended, specifically authorized the U.S. Army Corps of Engineers (USACE) to provide assistance to non-Federal interests for carrying out water-related environmental infrastructure and resources protection and development projects. Congress has subsequently appropriated funds for USACE to participate in the planning, design and construction of the proposed Lake Marion Regional Water System Project, which requires a non-Federal Sponsor to provide 25 percent of the total project cost. The Lake Marion Regional Water Agency (LMRWA) is serving as the non-Federal Sponsor and has partnered with Santee-Cooper (a.k.a., South Carolina Public Service Authority) to serve as the agency's technical representative for the project.

The LMRWA was formed in 1995 with the goal of developing a regional water supply system that centralizes the public drinking water supplies of numerous municipalities located in Clarendon, Dorchester, and Orangeburg Counties in South Carolina. The municipalities included: Santee, Elloree, Holly Hill, Eutawville, Bowman, Branchville, St. George, Harleyville, Ridgeville, Summerton, and Manning.

The Lake Marion Regional Water Supply System was originally broken into three separate phases. Phase I consisted of the construction of a water transmission line along the U.S. Highway 301 corridor between the Town of Santee and the City of Orangeburg and the installation of two elevated storage tanks. Phase II consisted of construction of an 8 million gallon per day (MGD) drinking water treatment plant and approximately 65 miles of water transmission lines serving the municipalities of Manning, Summerton, Santee, Elloree, Holly Hill, and St. George. Phase III consisted of the future expansion of the system to other municipalities not included in Phase II. A separate EA was prepared in 2003 for Phase I and Phase II. A copy of the 2003 EA is included in Appendix A. This current EA focuses on part of Phase III of the proposed project and addresses impacts from installation and use of a water transmission main from Holly Hill SC to Harleyville SC.

Harleyville is located in Dorchester County near the intersection SC Highway 453 and Interstate 26 (i.e., Exit 177 on I-26). It is approximately 78 miles south-east of Columbia SC and approximately 47 miles north-west of Charleston SC. Holly Hill is located in Orangeburg County and is approximately 9 miles North of Harleyville. The proposed project generally follows Highway 453 from Holly Hill south to Harleyville (see Figures 1(a) and 1(b)).

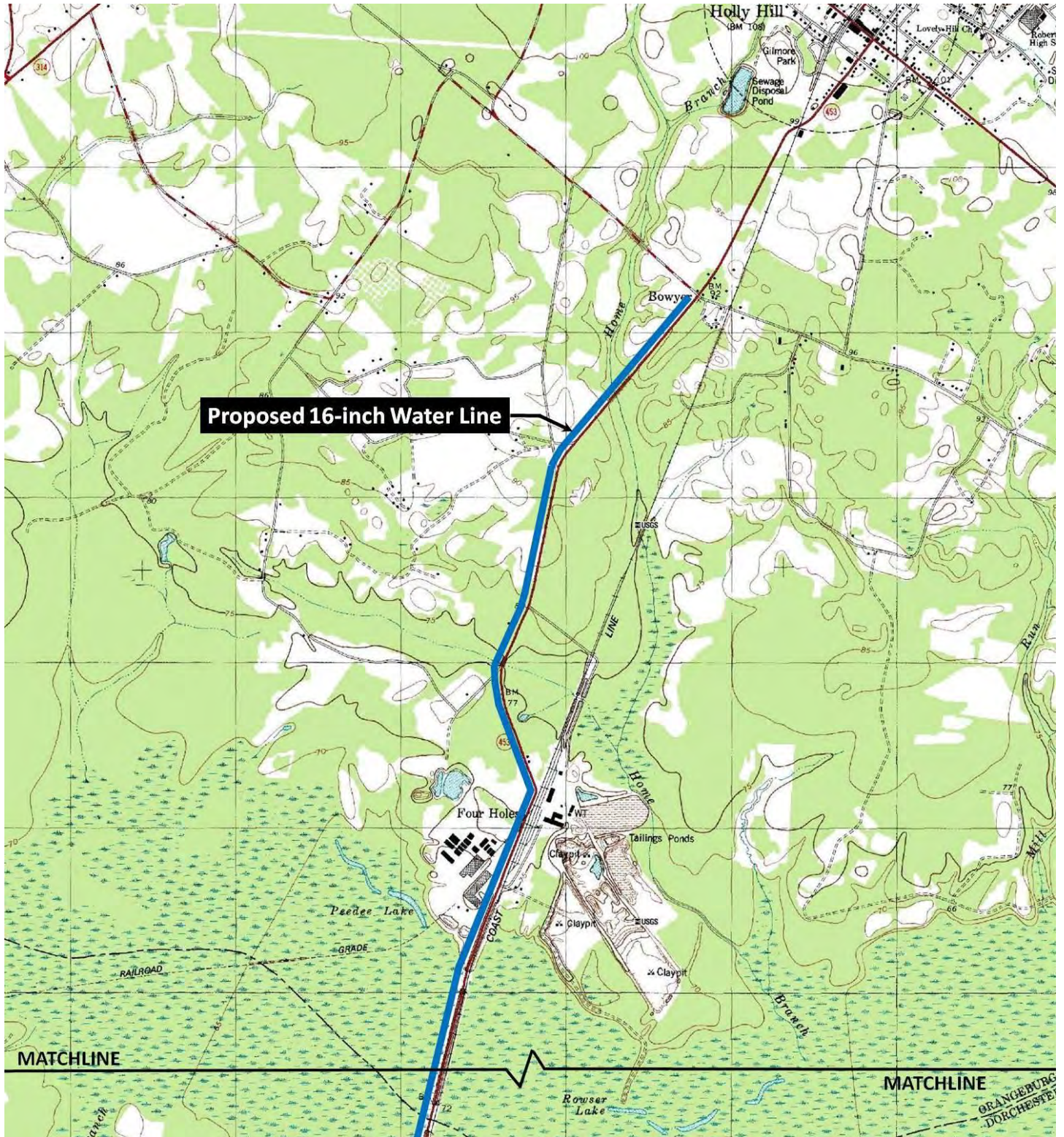


Figure 1(a) Project Area Map. Proposed water transmission main placement shown in blue.

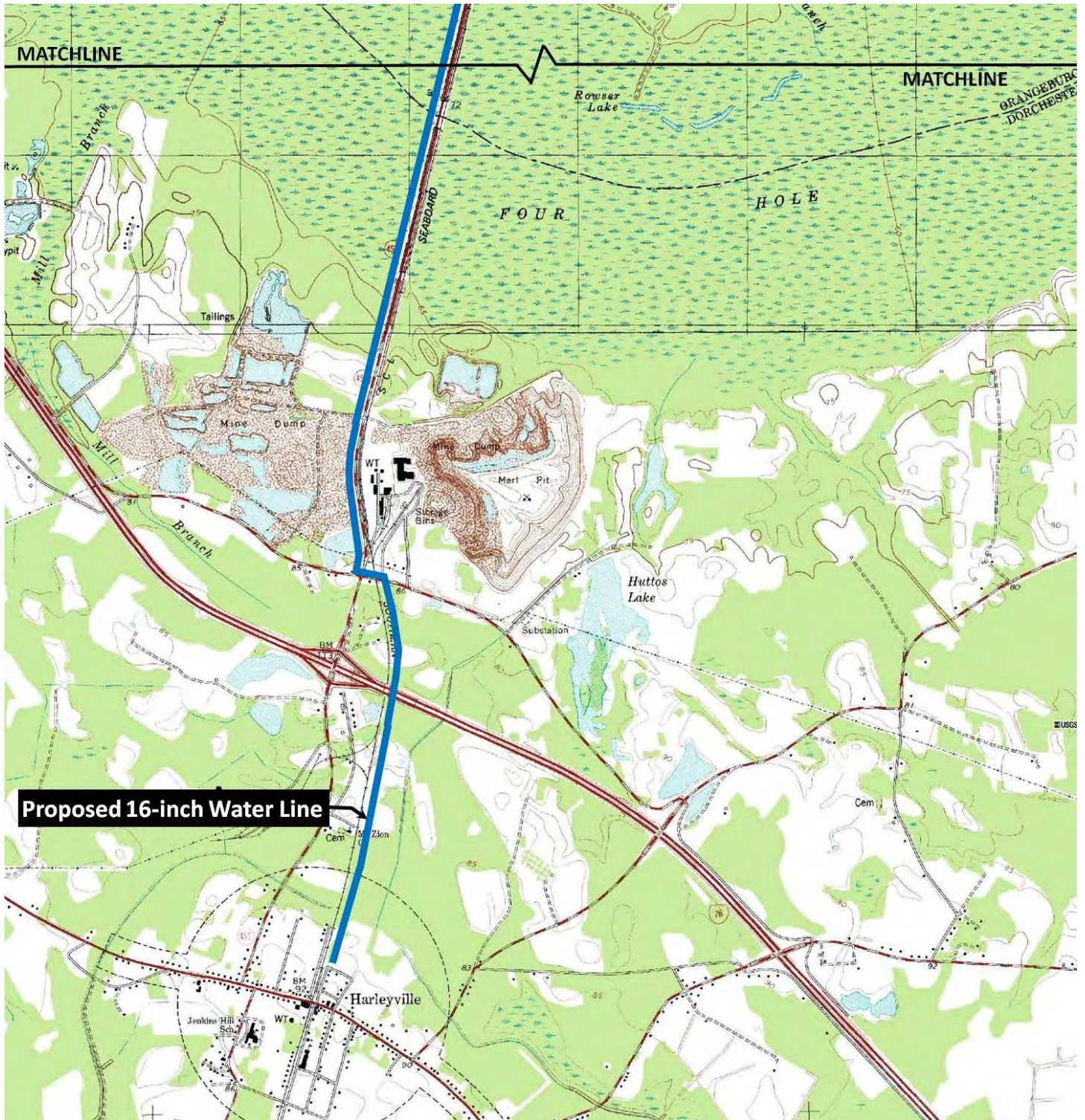


Figure 1(b) Project Area Map. Proposed water transmission main placement shown in blue.

## **CHAPTER 2 PURPOSE AND NEED**

The water transmission main to Harleyville would be the entry point of the Lake Marion System into Dorchester County. Once the line is constructed to Harleyville, the system is expected to be expanded to St. George and Ridgeville plus several smaller communities in the western half of Dorchester County. The system is also expected to serve 3 schools in the Harleyville/St. George area (i.e., Woodland High School, Harleyville-Ridgeville Middle School, and Dorchester County Career School) and 3 Commerce Parks (i.e., the Giant Industrial site located off of US Hwy 178 a few miles east of Harleyville; the Winding Woods Commerce Park located off of US Hwy 78 a few miles east of St. George; and the Ridgeville Commerce Park located near the intersection of US Hwy 78 and SC Hwy 27).

Harleyville currently gets its potable water from 2 groundwater wells that can produce a total of approximately 500 gallons per minute (GPM); although, the true capacity of their system is less than that. They currently operate at a rate of about 100,000 gallons/day. The water from these wells has a history of having a high sulfur content. The only treatment performed on their water is chlorination.

Another important aspect of connecting Harleyville to the Lake Marion system is that the 24-inch water main that provides water to the Holly Hill area is currently not being used because the low volume demand from Holly Hill does not provide sufficient flow in the pipe to maintain sufficient chlorine concentration in the water. The addition of Harleyville to the system will enable this entire section of the system to be brought on line. A 24-inch line is used up to Holly Hill because this is the section of line that is expected to ultimately be extended into western Berkeley County. Construction of the proposed project would satisfy the current and future water supply needs for a large portion of western Dorchester County. Specifically, needs related to health and safety, system operations and maintenance are key benefits for the future of the area.

## **CHAPTER 3 BASELINE ENVIRONMENTAL SETTING**

### **Climate**

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The climate in the Holly Hill/Harleyville area of South Carolina consists of long hot summers and cool winters. Summers are warm and humid (average July high and low temperatures are 92°F and 71°F, respectively), and winters are relatively mild (average January high and low temperatures are 58°F and 35°F, respectively). Precipitation occurs chiefly as rainfall and averages about 49.5 inches per year with approximately one-third of that total occurring during the months of June, July, and August.

### **Land Use**

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Land use within the project area is varied. The proposed route water transmission main generally follows the shoulder of Highway 453. In some areas it diverges from the road and

passes through successional forest consisting largely of pine trees. Land Use adjacent to the project area includes a mix of residential areas, industrial areas, forested areas, and farm lands. Several named soil types exist in the project area. The majority of soils within the project area are characterized as nearly level, well drained to very poorly drained and strongly acidic. Soil conditions and land use for the project area are similar in both Dorchester County and Orangeburg County.

## Water Resources and Aquatic Habitat

The water source for this project is Lake Marion (Figure 2). Lake Marion was created through the construction of a dam on the Santee River. The Santee River is fed by the Congaree River and the Wateree Rivers. The Congaree River is fed by the Saluda/Broad Rivers with headwaters in the mountains of North Carolina. The Wateree River is fed by the Catawba River, which also has headwaters in the mountains of North Carolina. Lake Marion was completed in the 1940's as a part of a two-lake system. The largest lake, Lake Marion, is approximately 100,000 acres and the smaller lake, Lake Moultrie, is approximately 65,000 acres. The two lakes comprise one of the largest fresh water reservoirs in the southeast and have an average annual inflow of approximately 15,000 cubic feet per second.

The Santee Cooper Lake project, which began in 1933, provides more than an adequate water supply for this region of South Carolina. The first utilization of the lake for this purpose was the construction of a surface water treatment plant on Lake Moultrie in the early 1990's. A new water treatment plant was recently constructed on the Santee Cooper System during Phase II of The Lake Marion Regional Water Supply System project. There are also existing water

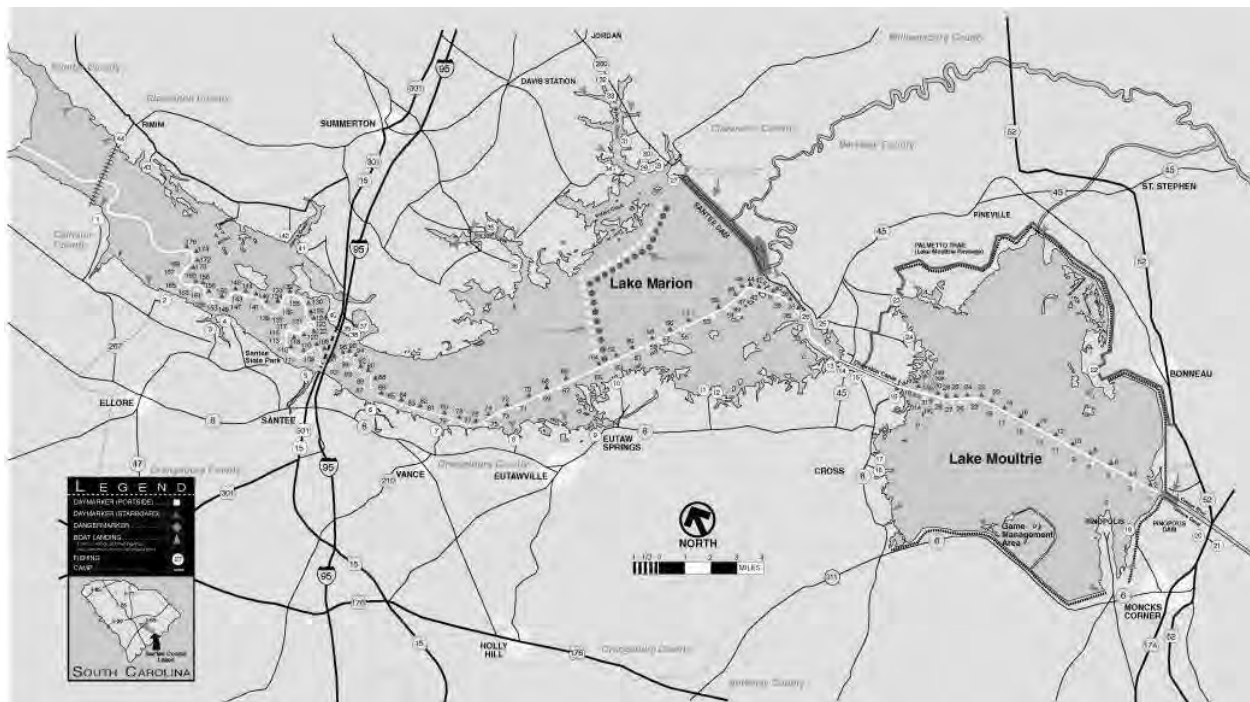


Figure 2. Map of Santee Cooper Lakes



treatment plants on the Wateree/Catawba River system and the Congaree/Saluda/Broad River system, upstream of the lakes. The raw water quality is excellent which results in minimal treatment costs.

The proposed project would begin in Orangeburg County and cross into Dorchester County where it will end in the town of Harleyville, SC. The water transmission main would cross one small stream (i.e., Home Branch), Four Hole Swamp, and numerous other wetlands (see Figures 3a and 3b). All small stream crossing would be carried out using the jack and boring process or directional drilling. This process involves drilling down and then across so the pipe can be placed under the stream without impacting the stream.

The project area encompasses part of Four Hole Swamp, which is a part of the Edisto River watershed. Four Hole Swamp is classified as “**FW**” (i.e., freshwater that is suitable for primary and secondary contact recreation and as a source of drinking water with a site specific classification that requires a dissolved oxygen (DO) level not less than 4.0 mg/L and pH between 5.0 and 8.5). Four Hole Swamp is monitored as part of South Carolina DHEC statewide water quality monitoring program. Water quality monitoring sites on Four Hole Swamp in the vicinity of the project area are listed as “impaired” on the State of South Carolina 303(d) list due to either high fecal coliform levels or low DO levels. Additionally, both the Edisto River and Four Hole Swamp are listed on the Nationwide River Inventory.

## **Terrestrial Resources and Wildlife**

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There is a considerable diversity of habitat near the project area including, swamps, early to mid successional forested areas, and open areas. Due to the diversity of habitat in and adjacent to the project area, a variety of wildlife species are expected to occur near or within the project area. Species present may include deer and small mammals (e.g., various squirrels and mice, opossum, raccoon, rabbit, fox, skunk), birds (e.g., various songbirds, ducks, and wading birds, quail, turkey doves, hawks, owls), and reptiles/amphibians (e.g., frogs, toads, lizards, snakes, turtles, alligator).

### **PRIME AND UNIQUE FARMLAND**

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and which is available for these uses. Prime farmland can be cropland, pastureland, range land, forest land, or other open vegetated lands, but cannot be urban built-up land or water.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation. It also has favorable temperature and growing season, acceptable acidity or alkalinity. It has few or rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

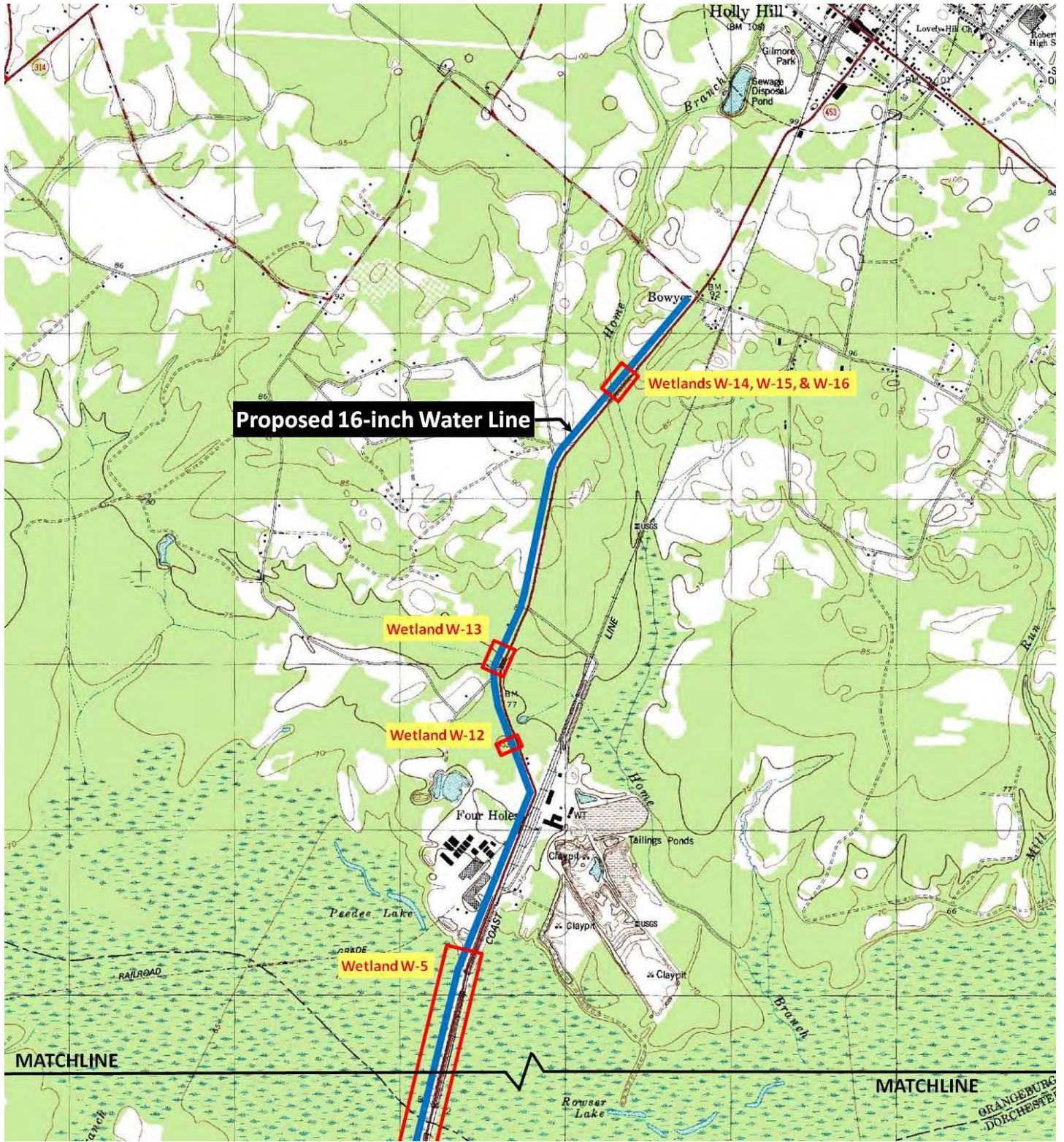


Figure 3(a) Wetlands Map

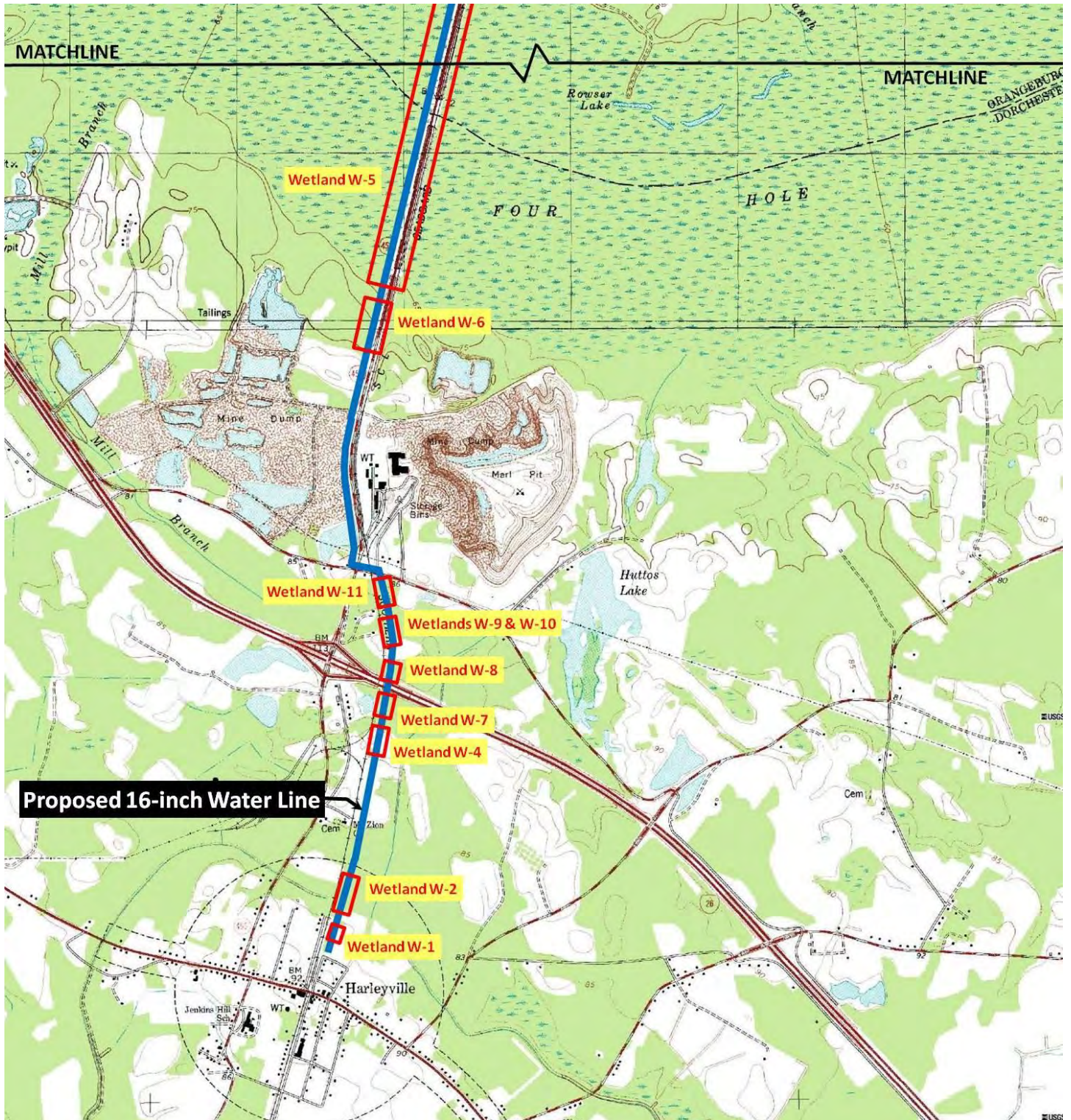


Figure 3(b) Wetlands Map

Unique farmland is land other than prime farmland used for the production of specific high value food and other fiber crops. Unique farmlands can economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.

The U.S. Department of Agriculture, Soil Conservation Service has not classified any prime or unique farmland within the project area.

## **Air Quality and Noise**

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The Clean Air Act (CAA), which was last significantly amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of national ambient air quality standards- primary and secondary. Primary standards are levels established by the EPA to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards are levels established to protect the public welfare, including protection from decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants which are called “criteria” pollutants. Those pollutants are Carbon Monoxide, Lead, Nitrogen Oxides, Particulate Matter (PM<sub>10</sub>), Particulate Matter (PM<sub>2.5</sub>), Ozone and Sulfur Dioxide. All air pollutants are listed as in attainment for Dorchester and Orangeburg Counties (EPA 2012).

The project area includes a mixture of residential, industrial and commercial areas. Generally the area is not densely populated or heavily industrialized, though surface mines and other industry exist near the project area. Traffic is the predominant source of noise in the project area. Naturally occurring noises (buzzing of insects, bird calls, etc.) are also common within the project area.

## **Cultural Resources**

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In May 2013 archaeologist with Brockington and Associates, Inc., conducted a survey of the proposed Harleyville reach water transmission main (see Appendix B). The survey was conducted at the request of the USACE Charleston District to comply with Section 106 of the National Historic Preservation Act for the construction of the water transmission main. Archaeological survey through surface inspection and systematic shovel testing at 100-foot intervals identified two sites and two isolated finds. All four of these cultural resources contained remnants of nineteenth to twentieth century farmsteads or tenant farms. Brockington and Associates Inc. recommended the sites and isolated finds not eligible for the National Register of Historic Places (NRHP).

Brockington and Associates, Inc. also conducted an architectural reconnaissance of the proposed route of the Harleyville reach water transmission main. Since the pipeline will be underground when complete, it presents no opportunity to affect any aboveground resources that might be eligible for the NRHP unless they have associated landscapes. An architectural historian from

Brockington and Associates, Inc. conducted a reconnaissance survey along the roads adjacent to the pipeline corridor to see if such landscapes are present. No historic architectural resources or landscapes were identified. At the terminus of the pipeline the proposed project is within 200 feet of the Harleyville Historic Area. However the Harleyville Historic Area and the proposed project are separated by the Southern Railroad easement. Therefore, the proposed pipeline easement will have no adverse effect on the Harleyville Historic Area. Thus, the construction and operation of the proposed Harleyville Reach Water Transmission main will affect no historic properties.

## 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 Dorchester County or Orangeburg County (lists last updated October 23, 2013) (USFWS 2014).

**Table 1. Federally threatened species (T), federally endangered species (E), species protected under the bald, federal candidate species (C) and golden eagle protection act (BGEPA) for Dorchester or Orangeburg Counties.**

County	Category	Common Name	Scientific Name	Federal Status
Dorchester	Bird	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Bird	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Bird	Wood stork	<i>Mycteria americana</i>	E
	Fish	Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E
	Fish	Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
	Plant	Canby's dropwort	<i>Oxypolis canbyi</i>	E
	Plant	Pondberry	<i>Lindera melissifolia</i>	E
	Plant	Bog Asphodel	<i>Nartheccium americanum</i>	C
	Reptile	Gopher tortoise	<i>Gopherus polyphemus</i>	C
Orangeburg	Amphibian	Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T
	Bird	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA
	Bird	Red-cockaded woodpecker	<i>Picoides borealis</i>	E
	Bird	Wood stork	<i>Mycteria americana</i>	E
	Fish	Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E
	Fish	Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
	Plant	Canby's dropwort	<i>Oxypolis canbyi</i>	E

## Hazardous Toxic and Radioactive Waste

A site inspection of the project area was conducted by USACE staff. The inspection revealed no signs of HTRW within the project area. Additionally the Environmental Protection Agency (EPA) EnviroMapper was queried on May 21, 2014. Several businesses near the project area

report to the EPA, for various categories of pollutants, but none are within the footprint of the project area.

## Socioeconomics

**Table 2. Select U.S. Census Bureau statistics for the town of Harleyville, SC.  
Estimates are from 2010 Census Data unless otherwise noted.**

<b>Subject</b>	<b>Estimate</b>
Population estimate (as of July 1 2013)	691 persons
Percent of total population that is a minority	34.7%
Total housing units	316 units
Median household income	\$42,721
Mean household income	\$47,430
Percent of families whose income in the past 12 months is below the poverty level (all families)	21.4%
Percent of families whose income in the past 12 months is below the poverty level (with related children under 18 years)	35.7%
Percent of families whose income in the past 12 months is below the poverty level (with related children under 5 years)	30.0%

## Recreation

The only recreational feature in the project area is a small boat launch area next to highway 453. The boat launch is accessed from highway 453 by a dirt side road. The boat ramp has no improvements and only small vessels, such as canoes or small flat bottomed boats, could utilize the area. During field reconnaissance anglers were observed fishing from the bridges along highway 453.

# CHAPTER 4 ALTERNATIVES

## Alternative 1 (Proposed Project)

Alternative 1 (proposed project) would connect new 16-inch potable water transmission main to an existing 24-inch water transmission main near the Town of Holly Hill and extend the water transmission main southward approximately 34,900 feet (~ 6.6 miles) to a point near the Town of Harleyville (Figure 1a and 1b). The proposed route for the new water transmission line would require crossing one small stream (i.e., Home Branch) and Four Hole Swamp. All stream crossings would be constructed using directional drilling or jack and boring. For the section of the project crossing Four Hole Swamp the pipe would be placed in the shoulder of Highway 453 or directionally drilled. Using these construction techniques would greatly reduce impacts to Four Hole Swamp

Water would be supplied from an existing state of the art water treatment plant located on Lake Marion near the Town of Santee. The water treatment plant become operational in 2008 and has the capacity to support the increased water supply needs from construction of the proposed project.

## **Alternative 2**

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Alternative 2 would be similar to Alternative 1 except the water transmission main would begin south of Santee, near the Highway 15 and Interstate 95 interchange, and run approximately 90,100 feet (~ 17 miles) southward from this area to the Town of St. George. Then, at a later time, the water transmission main would be extended to Harleyville. This route for the water transmission main would require crossing several small streams and Four Hole Swamp. The route of the water transmission main through Four Hole Swamp would follow power line right of ways. This alternative would require extensive temporary impacts to Four Hole Swamp during installation of the water transmission main.

Water would be supplied from an existing state of the art water treatment plant located on Lake Marion near the Town of Santee. The water treatment plant become operational in 2008 and has the capacity to support the increased water supply needs from construction of the proposed project.

## **Alternative 3**

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Alternative 3 would provide water to Harleyville and the surrounding areas by installing more water wells in the area. There are concerns about the increasing demand on groundwater and its effect on the capability of the aquifer to continue to produce high quality water in the area of the proposed project. These concerns have resulted in the State of South Carolina implementing a program that monitors all new groundwater wells that withdraw more than 3 million gallons per month (i.e., approximately 70 gallons/minute if operated continuously). Because of this increased demand on groundwater and the concerns about the effect on the aquifer as an additional source of potable water, groundwater is not recommended as a source of potable water for the city of Harleyville.

## **No Action Alternative**

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The No Action Alternative is the same as the most probable future without constructing the proposed project. A basic alternative to any proposed plan of improvement is the "No Action" alternative. Adoption of this alternative implies acceptance of the existing conditions in the proposed project area.

# **CHAPTER 5 ANALYSIS OF ALTERNATIVES**

A number of conceptual plans were initially evaluated based on established criteria that considered engineering feasibility, cost effectiveness, environmental impacts, and socioeconomic benefits. Alternative plans included, drilling additional wells, attaching to existing water supply systems at other locations and a "No-Action" alternative, which assessed both the immediate and long-term impacts to the region. However, only one of these plans, the proposed project, was found to satisfy the region's water supply needs. Alternative 2 was excluded due to greater

impacts to Four Hole Swamp than the proposed project and a significantly increased implementation cost. Alternative 3 was excluded due to concerns about the viability and quality of the continued and increased use of water wells and concerns about negative long term impacts to the aquifer. The no action alternative was excluded due to its failure to address the areas need for clean reliable water. Excluded alternatives were no longer considered.

## **CHAPTER 6 ENVIRONMENTAL IMPACTS**

### **Climate**

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No changes in climate would occur as a result of this project.

### **Land Use**

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Temporary impacts to soils and erosion would potentially occur during construction and during the placement of the water transmission main. Erosion could increase in areas that require the clearing of vegetation along the highly disturbed power line easement, in successional forest and along roadways. Best management practices would be implemented for construction including siltation fencing, hay bales, and directional boring or jack and boring under streams where appropriate. In addition the disturbed areas would be seeded and/or grassed to prevent future erosion and allowed to return to their previous conditions after installation of the water transmission main was completed. Construction of this proposed project would not change the existing geology of the area because the excavation cuts necessary to install the water transmission main is generally narrow and relatively shallow. Land use would remain largely unchanged after installation of the proposed project.

### **Water Resources and Aquatic Habitat**

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Temporary changes to water quality and surface waters related to turbidity and sedimentation are anticipated during construction. These impacts will be localized and proper erosion control and filtration control measures would be implemented during construction activities. Remediation procedures would prevent any potential long-term impacts and degradation of water quality resulting from the proposed work. The installation and use of the water transmission main would not affect water quality, water temperature, or other parameters during the installation phase or while in use. Additionally the additional water that would be taken from Lake Marion, as a result of this project, is not expected to significantly impact the lake. The project is consistent with applicable South Carolina water quality regulations and will not impair any such standard or fail to meet anti-degradation requirements for point or non point sources. The project would not create any shortages for or otherwise adversely affect the withdrawal capabilities of other present users of the raw water supply.

### **Wetlands**

The proposed construction and placement of the pipeline will impact wetlands in some areas along the route (see Figures 3a and 3b). Construction in these wetlands would be by either directional drilling, jack and bore or “cut and cover” following the guidelines in U.S. Army Corps of Engineers Nationwide Permit Number 12. Best management practices would be implemented for construction including siltation fencing, and hay bales where appropriate. Most



of the wetland impacts will be temporary; however, some of the wetlands will be permanently cleared (see Table 3). Wetlands W-2, W-4, W-7, W-8, W-9, W-10, and W-11 will be permanently impacted by clearing a 30-foot wide easement through the wetland. Wetlands W-13, W-14, W-15, and W-16 will be permanently impacted by widening the existing cleared corridor by 20 feet. Wetlands W-1, W-6, and W-12 will only be temporarily impacted. Wetland W-5 (i.e., Four Hole Swamp) will be impacted by temporary fill that will be placed along the shoulder of SC Highway 453 to allow directional drilling under the main stream channels of the swamp. After construction, the fill will be removed and the area restored to the existing grade. Permanent clearing of some of the wetlands will necessitate mitigation. In order to calculate mitigation requirements for damage to wetlands from construction of the proposed project the wetland mitigation worksheet was used (Appendix C). Based on the work sheet and data, included in Appendix C, it was determined that **14.76** wetland mitigation credits would be needed to mitigate for the wetland impacts. Mitigation for impacts to wetlands will be performed by purchasing mitigation credits from Francis Beidler Forest.

### **Stream Crossings and Floodplains**

The placement of the proposed waterline would not affect the floodplains or topography. Directional drilling or jack and boring would be used at all stream crossings and would result in no impacts to streams from construction of the proposed project. Best management practices would be required for construction including siltation fencing and placement of hay bales where appropriate. Construction methods such as directional drilling or jack and boring would temporarily change topography; however, once the construction is complete, the topography would be restored to its original elevation. Executive Order 11988 deters development in the 100-year floodplain for federally funded projects unless no other practical alternative is available. If development is planned within the 100-year floodplain and it is federally funded, there is an eight-step process that must be completed prior to release of funds; however, no development within the 100-year floodplain is planned as part of this project.

### **Terrestrial Resources and Wildlife**

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The proposed project would have small but insignificant impacts on some forms of natural vegetative communities due to permanent clearing of some of the wetlands. Best management practices will be implemented to ensure the clearing process will have no impact outside the construction easement. The proposed project would have a temporary adverse impact on some forms of fauna. Reptiles, amphibians, and other animals may be displaced to outlying areas during the pipeline placement and construction activities due to human presence and increased noise level. However, most of the construction is adjacent to the highway or other disturbed areas. These animals are accustomed to the highway traffic noise and other unnatural noises and should return after the construction activities are complete.

### **Air Quality and Noise**

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The South Carolina Department of Health and Environmental Control (SCDHEC) has air quality jurisdiction for the project area. The ambient air quality for Dorchester, Calhoun, Clarendon, Orangeburg, and Sumter counties has been determined to be in compliance with National Ambient Air Quality Standards and these counties are designated as attainment areas.

**Table 3. Wetland Impacts**

Wetland ID Number	Affected Acres	Type of Impact	Description of Impact	Notes
W-1	~0.054 acres	Temporary	No permanent impact. Temporary clearing of a 20-foot wide by ~118-foot long easement.	All impacts are within the temporary construction easement that will be initially cleared but allowed to re-vegetate. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-2	~0.335 acres	Clearing	Permanently cleared 30-foot wide by ~487-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-4	~0.267 acres	Clearing	Permanently cleared 30-foot wide by ~387-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-7	~0.163 acres	Clearing	Permanently cleared 30-foot wide by ~237-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-8	~0.082 acres	Clearing	Permanently cleared 30-foot wide by ~119-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-9	~0.245 acres	Clearing	Permanently cleared 30-foot wide by ~356-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-10	~0.077 acres	Clearing	Permanently cleared 30-foot wide by ~112-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-11	~0.275 acres	Clearing	Permanently cleared 30-foot wide by ~400-foot long easement.	Not a mature forest. Small to medium size trees. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-6	~0.161 acres	Temporary	No permanent impact. Area disturbed consists of a 30-foot wide by ~700-foot long easement; however, only 10 feet of the width is within the wetlands.	All impacts are within a previously cleared corridor. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-5	~0.344 acres	Temporary	No permanent impact. Five 150-foot by 20-foot temporary “islands” will be constructed from the shoulder of the road extending out into the wetlands. These “islands” will be used for directional drilling operations, and will be removed and the area restored to the existing grade after construction is completed.	Four Hole Swamp crossing.  Pipe will be laid in the embankment of Highway 453 with directional drilling at each of the 3 bridges.  The embankment is expected to be “benched” during pipeline installation, and then restored to existing grade. No fill will be added to the wetlands in these areas. The embankment will be restored to existing grade after construction is completed.
W-12	~0.017 acres	Temporary	No permanent impact. Area disturbed consists of a 30-foot wide by ~25-foot long easement.	All impacts are within a previously cleared area. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.

Wetland ID Number	Affected Acres	Type of Impact	Description of Impact	Notes
W-13	~0.092 acres permanent impact ~0.046 acres temporary impact	Clearing & Temporary	Permanently cleared 20-foot wide by ~200-foot long easement.  The area disturbed totals 30 feet in width; however, approximately 10 feet of it is already cleared. Therefore, only a 20-foot wide corridor will be permanently impacted.	Wetland associated with unnamed tributary to Home Branch.  The area impacted is a fairly mature forested area. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-14	~0.132 acres permanent impact ~0.066 acres temporary impact	Clearing & Temporary	Permanently cleared 20-foot wide by ~287-foot long easement.  The area disturbed totals 30 feet in width; however, approximately 10 feet of it is already cleared. Therefore, only a 20-foot wide corridor will be permanently impacted.	Home Branch stream crossing.  The area impacted is a fairly mature forested area. Work will be performed following the guidelines of NWP12. The stream will be bored under; therefore, there will be no impact to the stream. Area will be restored to existing grade after construction is completed.
W-15	~0.028 acres permanent impact ~0.014 acres temporary impact	Clearing & Temporary	Permanently cleared 20-foot wide by ~62-foot long easement.  The area disturbed totals 30 feet in width; however, approximately 10 feet of it is already cleared. Therefore, only a 20-foot wide corridor will be permanently impacted.	The area impacted is a fairly mature forested area. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
W-16	~0.011 acres permanent impact ~0.006 acres temporary impact	Clearing & Temporary	Permanently cleared 20-foot wide by ~25-foot long easement.  The area disturbed totals 30 feet in width; however, approximately 10 feet of it is already cleared. Therefore, only a 20-foot wide corridor will be permanently impacted.	The area impacted is a fairly mature forested area. Work will be performed following the guidelines of NWP12. Area will be restored to existing grade after construction is completed.
<b>TOTAL WETLAND ACREAGE IMPACTED:</b>			<b>~1.44 acres of wetland with small to medium size trees will be permanently cleared. All impacted wetlands will be restored to original grade. Mitigation required (see Appendix C).</b>	
			<b>~0.26 acres of fairly mature wetland forest will be permanently cleared and ~0.13 acres of wetlands within an existing cleared corridor will be disturbed. All impacted wetlands will be restored to original grade. Mitigation required (see Appendix C).</b>	
			<b>~0.344 acres of wetlands will be temporarily filled but restored to original grade, which will result in no permanent impact. No mitigation required</b>	
			<b>~0.23 acres of wetlands within an existing cleared corridor will be disturbed but restored to original grade and allowed to revegetate, which will result in no permanent impact. No mitigation required.</b>	

Implementation of the proposed action may cause temporary reduction of the air quality in the immediate areas of project construction. Construction activities would cause temporary increases in exhaust and dust emissions from equipment operations. However, since project construction would be conducted in relatively small areas at a particular point in time, air quality impacts would be localized and temporary. Upon completion of work activities in any area, air quality would be restored as construction equipment is moved away.

Implementation of the proposed project would cause temporary increase in noise levels in the areas of project construction. However, since project construction would be conducted in relatively small areas at a particular point in time, increases in noise pollution would be minimal. Upon completion of work activities in any area, noise levels would return to pre-project levels. To further reduce noise pollution construction would be limited to daylight hours in areas near dwellings.

## **Cultural resources**

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Intensive survey of the route of the proposed project by Brockington and Associates, Inc., identified two archaeological sites and two isolated artifact finds (Appendix B). Brockington and Associates, Inc. recommended these four cultural resources not eligible for the NRHP. None of these resources contains the kinds of artifact deposits or features from which we can gain important information about the past. Architectural reconnaissance identified no historic buildings or landscapes within or immediately adjacent to the footprint of the proposed project. Thus, there are no historic properties within or immediately adjacent to the proposed project. Therefore, the project as currently designed would affect no historic properties.

## **Endangered Species**

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Based on site inspections of the project area, conducted by Corps staff, the Corps has determined that the proposed project would not have significant impacts to listed species. During site inspections, no suitable habitat for listed species was observed nor were any listed species observed. The project is within the range of several of the species listed in Table 1. However, the Corps has determined that these species and appropriate habitat for them are not present with the project area and therefore there will be no effect to listed species. This determination has been coordinated with the USFWS via consultation on this document.

## **Hazardous Toxic and Radioactive Waste**

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There are no known hazardous or toxic waste sites within the immediate vicinity of the treatment plant or any of the transmission lines. No hazardous toxic or radioactive waste would be generated as a result of installation or operation of the proposed project.

## **Socioeconomics**

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According to Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, each federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of

excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, national origin, or income level. Agencies must ensure that disproportionately adverse effects are not being imposed on minority or low-income areas by federal actions.

The proposed project is not designed to create a benefit for any group or individual, but rather provides a region-wide benefit. There are no indications that the proposed water supply project would be contrary to the goals of Executive Order 12898, or would create disproportionate adverse human health or environmental impacts on minority or low-income populations of the surrounding community. This project will provide safe drinking water to all residents on an equal basis and will reduce the dependence on groundwater in the future. Implementation of the proposed project would cause no significant adverse environmental impacts to any of the residents in Orangeburg County, Dorchester County, or surrounding counties regardless of race, national origin, or level of income of residents. Disproportionate adverse effects to minority or low-income individuals would not occur. Therefore, the Corps has satisfied the requirements of the Environmental Justice Executive Order 12898.

## **Recreation**

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Implementation of the proposed action would cause temporary reduction of aesthetic appeal and interference with recreational activities in the areas of project construction. However, since project construction will be conducted in relatively small areas at a particular point in time, recreational and esthetic impacts will be localized. Upon completion of work activities in any area, esthetic values and recreational opportunities would be restored as construction equipment is moved away.

## **CHAPTER 7 CUMULATIVE IMPACTS**

Cumulative impacts are defined under section 1508.7 of NEPA as: "...the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time." The following paragraphs summarize the cumulative impacts expected from the proposed project.

Present and future development in and around the project area is controlled by management measures including control of floodplain development by zoning ordinances, subdivision regulations, and building codes. Future development in the area would be in compliance with the above listed management measures, minimizing impacts to the environment. The cumulative impacts of the total Lake Marion Regional Water Supply System (i.e., Phase I, Phase II, and Phase III) are small because the system is designed to mostly replace existing water supply systems and provide water for the expected population growth in the service area.

The impacts of the proposed project, when considered along with past, present and future actions, are cumulatively insignificant. The overall lack of impacts associated with the proposed project, as documented here, demonstrates both the benign nature and limited impacts of this

project. No negative impacts would occur from implementation of the selected alternative, as it would maintain the status quo. Continued positive impacts to recreation would occur with construction of the preferred alternative. Any impacts associated with the proposed project, when added to other past, present and reasonable foreseeable future actions are collectively insignificant.

## **CHAPTER 8 PUBLIC INVOLVEMENT AND COORDINATION**

Executive Order 12372, Intergovernmental Review of Federal Programs, states that Federal agencies shall provide opportunities for consultation by elected officials of those State and local governments that would provide the non-federal funds for or that would be directly affected by, proposed Federal financial assistance or direct Federal development. The proposed project has been coordinated with Federal, State, and local government agencies having jurisdictional responsibilities, or otherwise having an interest in the project. A list of all parties that received a notice via mail of the issuance of the Draft EA and FONSI are attached in Appendix D. All comments received are attached in Appendix E.

## **CHAPTER 9 COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS**

### **Clean Water Act**

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The proposed project would result in the placement of dredged or material into Waters of the United States. However, these activities are covered under Army Corps of Engineers Nationwide Permit Number 12.

A National Pollutant Discharge Elimination System (NPDES) permit is required for this project. Construction activities such as clearing, grading, excavating, grubbing, or filling will result in the disturbance of more than one acre of land. A storm water pollution prevention plan (SWPPP) has been prepared for the project and incorporated into the plans and specifications and will be implemented during construction. Also, to obtain coverage under a general permit for South Carolina, a Notice of Intent (NOI) application has been sent to the state. A Notice of termination will be provided when the project is completed.

### **Clean Air Act**

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The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under the proposed project are exempt by 40 C.F.R. Part 93.153.

## **Endangered Species Act**

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The requirements of Section 7 of the Endangered Species Act of 1973 have been fulfilled. Project Documentation has been provided to the USFWS for their review and comment.

## **Farmland Protection Policy Act**

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The Farmland Protection Act minimizes the unnecessary and irreversible conversion of farmland to nonagricultural uses. There is no “farmland,” as defined by this Act, impacted by any of the recommended alternatives.

The project involves the construction of water transmission main in counties with a large agricultural and rural base. The proposed pipeline reaches will follow, existing power line and highway rights-of-way where possible to avoid impacts on any prime farmland in accordance with the Farmland Protection Policy Act. No unnecessary and irreversible conversion of farmlands would occur as a result of construction of the proposed project.

## **Fish and Wildlife Coordination Act**

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The alternatives have been provided to the USFWS, in order to fulfill the requirements of the Fish and Wildlife Coordination Act. A Fish and Wildlife Coordination Act report is not considered necessary for this project.

## **Floodplain Management (EO 11988)**

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The objectives of Executive Order 11988 have been considered in the formulation of plans for this project. The following determinations have been made in response to requirements of Executive Order 11988 which pertains to floodplain management.

No practical non-floodplain alternative exists. The considered actions do not conflict with applicable state and local standards concerning floodplain protection. The considered action will not significantly affect the natural and beneficial values of the floodplain.

## **Protection of Wetlands (EO 11990)**

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The objectives of Executive Order 11990 have been considered in the formulation of plans for this project. The following determinations have been made in response to requirements of Executive Order 11990 which pertains to wetland management.

No practical non-wetland alternative exists. The considered actions do not conflict with applicable state and local standards concerning wetland protection and permitting and are covered under USACE nationwide permit number 12. The proposed project will not significantly affect the natural and beneficial values of the impacted wetlands as, where possible, areas will be allowed to return to a natural state after installation of the water transmission main and no wetlands will be permanently filled. The proposed project has avoided and minimized

wetland impacts where possible. All permanent impacts will be mitigated for to ensure no net loss of wetlands.

## **National Wild and Scenic Rivers**

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The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. A review of the Wild and Scenic River inventory list reveals that the proposed project will not affect a stream or portion of a stream that is included in the National Wild and Scenic Rivers system.

## **National Historic Preservation Act (NHPA)**

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The proposed project has been reviewed for historic properties (cultural resources listed on or eligible for listing on, the National Register of Historic Places) pursuant to regulations implementing Section 106 of the National Historic Preservation Act (NHPA). In accordance with 36 C.F.R. §800.4(d)(1), it was determined that there will be no effect to historic properties and documentation of this determination has been provided to the South Carolina State Historic Preservation Officer. Therefore, in accordance with 36 C.F.R. §800.4(d)(1)(i), the Corps' responsibilities under Section 106 of the NHPA have been fulfilled.

## **Coastal Zone Management Act**

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Dorchester County is part of the 9 counties in South Carolina under the jurisdiction of the Federal Coastal Zone Management Act and the South Carolina Coastal Zone Management Program (SCCZMP). A Coastal Zone Consistency Certification has been applied for and construction will not commence until the certification is issued. There are no technical concerns from construction of the proposed project that would impact the issuance of a Coastal Zone Consistency Certification.

# **CHAPTER 10 REFERENCES**

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## **APPENDIX A**

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### **2003 EA for Lake Marion Regional Water System**

**ENVIRONMENTAL ASSESSMENT**  
**LAKE MARION REGIONAL WATER SUPPLY SYSTEM – Phase II Project**  
**CALHOUN, CLARENDON, DORCHESTER, ORANGEBURG AND SUMTER**  
**COUNTIES, SOUTH CAROLINA**  
**EPA Grant No.: XP-984717-990**

**Introduction**

This Environmental Assessment (EA) has been developed jointly by the U.S. Army Corps of Engineers (USACE), Charleston District and the U.S. Environmental Protection Agency, Region IV, in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) (42 USC 4321-4347), 40 CFR Parts 1500-1508, 40 CFR Part 6, and 33 CFR Parts 230 and 325. The purpose of this EA is to assess and disclose potential environmental consequences associated with implementation of a proposed project or action that is utilizing Federal funds. The proposed project is the construction of the Lake Marion Regional Water Supply System.

The Lake Marion Regional Water Agency (LMRWA) was formed in 1995 with the goal of developing a regional water supply system that centralizes the public drinking water supplies of eleven municipalities located in Clarendon, Dorchester, and Orangeburg Counties in South Carolina. The eleven municipalities are: Santee, Elloree, Holly Hill, Eutawville, Bowman, Branchville, St. George, Harleyville, Ridgeville, Summerton, and Manning.

The Lake Marion Regional Water Supply System has been broken into three separate phases. Phase I consists of the construction of water transmission lines along the U.S. Highway 301 corridor between the Town of Santee and the City of Orangeburg and the installation of two elevated storage tanks. Phase II consists of construction of an 8 million gallon per day (MGD) drinking water treatment plant and approximately 65 miles of water transmission lines serving the municipalities of Manning, Summerton, Santee, Elloree, Holly Hill, and St. George. Phase III consists of the future expansion of the system to the remaining five municipalities not included in Phase II. This EA focuses on Phase II of the proposed project. A separate EA has been prepared for Phase I and separate NEPA action will occur for Phase III, as necessary, when Phase III is initiated.

**A. Proposed Project and Funding Status**

The major components of the Phase II project are (see Appendix A for figures depicting the Phase II project):

1. **Raw Water Intake and Pump Station:** The raw water intake structure will be located in Lake Marion within the old Santee River channel approximately 1500 feet from the lake shore and approximately 18 feet below the normal water level of the lake. The intake structure will consist of two stainless steel wedge wire screens capable of passing 25 MGD of raw water at an intake velocity of less than 0.5 feet per second. The intake structure will be connected to the raw water pump station by approximately 2600 feet of 42-inch diameter gravity pipe. The raw water pump station will consist of an

approximately 45-foot deep wet well with capacity for four pumps. Three 125 HP, 4200-gallon per minute (GPM) vertical turbine pumps; a 1.0 mm, 18,000 GPM self-cleaning strainer; and other miscellaneous equipment will be initially installed.

2. Water Treatment Plant: The water treatment plant will be located on a 26-acre site adjacent to the Bluffs subdivision near the Town of Santee. The plant will have a rated capacity of 8 MGD with capability for expansion up to 12 MGD. The plant will rely on ultrafiltration membranes as the main purification technology with additional treatment provided by chemical flocculation and granular activated carbon contactor processes. The plant will also contain a sludge collection system and various chemical feed systems for aiding process treatment, maintenances and disinfection. A Supervisory Control And Data Acquisition (SCADA) system will provide monitoring the facilities operation.
3. Finished Water Storage and Pump Station: The treated water (i.e., finished water) will be temporarily stored on-site at the treatment plant in two, 2-million gallon clearwells. The finished water pump station will consist of three 450 HP, 4200 GPM vertical turbine pumps and other miscellaneous equipment. Space will be provided for one additional pump to allow for future expansion of the pump station.
4. Water Distribution System: Approximately 65 miles of various sized pipelines (sizes vary from 12 inches to 36 inches) will radiate outward from the water treatment plant. This system of transmission pipelines will be divided into five separate reaches and will parallel power line, highway, and railroad rights-of-way. The reach north of Lake Marion will serve the Town of Summerton and the City of Manning with potential for future expansion into Sumter County and other parts of Clarendon County. The four reaches south of Lake Marion will serve the Towns of St. George, Elloree, Santee, and Holly Hill with potential for future expansion into Calhoun County and other parts of Orangeburg and Dorchester counties.

Construction of the treatment plant is expected to begin in late 2004 with funding provided by Federal and non-Federal entities. Construction of the various pipeline reaches is expected to begin in 2005 starting with the Santee reach. Upon completion of the Phase II project, water will be pumped to each municipality's existing water distribution system. The current water systems of each municipality will continue to exist and serve their customers. Their existing waterlines and tanks will remain in service. Customers will continue to receive their bills from their present water provider, which will continue to set water rates, approve extensions and manage their own distribution systems. The current municipal water systems will purchase their water wholesale from the LMRWA. As each municipal system expands, the citizens can choose to connect to the systems or stay on private wells. It is expected that there will be an initial group that connects immediately to the system to get away from their present

ground water supply. Then there will be a gradual connection to the system as wells or pumping equipment fails.

Initially, the Phase II project will serve approximately 10,000 residential customers and various industrial/commercial customers in the six municipalities (i.e., Manning Summerton, Santee, Elloree, Holly Hill, and St. George). By 2025, the system is expected to serve approximately 125,000 residential customers and various industrial/commercial customers. This expansion of the customer base is expected to occur by connection of the five remaining municipalities (Eutawville, Bowman, Branchville, Harleyville, and Ridgeville) to the system, expansion of each municipality's existing water system to include customers outside their present service areas, expansion of the system into Calhoun and Sumter counties, and expansion of the system into other parts of Dorchester, Clarendon, and Orangeburg counties. This expansion of the system is considered as Phase III of the project and is expected to occur over a 20 year period with an average of approximately 100 miles of pipeline being constructed each year within the 5 county area at a total cost of approximately \$182 million. Appendix B shows the final expected build out of the system by 2025.

### **Authorization and Funding**

The Water Resources Development Act (WRDA) of 1992 (Public Law 102-580), as amended, specifically authorized the U.S. Army Corps of Engineers (USACE) to provide assistance to non-Federal interests for carrying out water-related environmental infrastructure and resources protection and development projects. Congress has subsequently appropriated funds for USACE to participate in the planning, design and construction of the proposed Lake Marion Regional Water System Project, which requires a non-Federal Sponsor to provide 25 percent of the total project cost. LMRWA is serving as the non-Federal Sponsor and has partnered with Santee-Cooper (a.k.a., South Carolina Public Service Authority) to serve as the agency's technical representative for the project.

This project is partially funded by a grant actions authorized in the EPA's Fiscal Year 1999 Appropriation Act (Public Law 105-276) in the amount of \$3,000,000 and in Fiscal Year 2000 Appropriation Act (Public Law 106-74) in the amount of \$3,801,000. The total amount of \$6,801,000 was authorized to assist in the construction of the water infrastructure for the Lake Marion Regional Water Supply System project. As authorized, an EPA grant was awarded in the amount of \$1,200,000 on September 29, 1999, and \$5,601,000 on April 14, 2003, to the Lake Marion Regional Water Agency (LMRWA). The grant is conditional and subject to the compliance with the NEPA requirements. These funds are divided between Phases I and II with \$3,510,000 being used for Phase I and \$3,290,000 being used for Phase II.

## Funding Status

The total cost for the Phase II project is estimated to be \$62.3 million. The current funding sources (to date) and amounts are shown below. Additional funding, sufficient to fully fund construction of Phase II, is expected to be received.

US Army Corps of Engineers	\$15,000,000
South Carolina Bond Bill	\$6,080,000
EPA Appropriations	\$3,290,000
Orangeburg County Contributions	\$7,875,000
SC Office of Local Government	\$1,000,000
<b>Total</b>	<b>\$33,245,000</b>

## B. Existing Environment

The project area is located in the southern part of the Atlantic coastal plain and is characterized by meandering rivers, streams, wetlands, and ellipsoidal topographic depressions. The topography throughout the proposed project is generally level, the highest elevation being about 400 feet above mean sea level, which is an area just north of Woodford in Orangeburg County. The proposed project encompasses a five county area of gently rolling urban, industrial, rural, and farmland areas. Calhoun County is located in the upper and middle coastal plain and occupies approximately 380 square miles (about 241,000 acres) with a population of 15,185 people (2000 U.S. Census). Clarendon County is located in the middle coastal plain and occupies approximately 600 square miles (about 383,000 acres) with a population of 32,502 people (2000 U.S. Census). Dorchester County is in the Atlantic coast flatwoods area. The county occupies approximately 570 square miles (364,000 acres) with a population of 96,413 people (2000 U.S. Census). Orangeburg County is located in three coastal plain provinces. The county occupies approximately 1,100 square miles (704,000 acres) with a population of 91,582 people (2000 U.S. Census). Sumter County is in the eastern part of South Carolina in the coastal plain. The total area for Sumter County is approximately 690 square miles (about 442, acres) with a population of 104,646 people (2000 U.S. Census). The average annual maximum temperature is 76° F and the average annual minimum temperature is 52°F and rainfall averages 48 inches annually, with the heaviest occurring in the late summer and early fall months. The prevailing winds are predominantly from the southeast however the prevailing winds in autumn are northeast. The surface waters in the project area include freshwaters located in the southern portion of the Peedee, the central portion of the Catawba-Santee, and central/southern portion of Edisto watersheds.

Some of the more common mammals frequenting the area include the white-tailed deer, fox, mink, muskrat, opossum, and the otter. Other possible mammals included the rabbit, raccoon, skunk, gray squirrel and American beaver.

The common fish species in Lake Marion and/or creek areas include channel catfish, largemouth bass, striped bass, American shad, blueback herring, pumpkinseed sunfish,

redbreast sunfish, redbreast sunfish, redbreast pickerel, and white sucker. Other fish species include minnows, shiners, chubs, and carp.

The birds and waterfowl likely found in the area are the great blue heron, the Canada goose, wood duck, mallard duck, mourning dove, wild turkey, wintering loons, red-tailed hawk, and Cooper's hawk. Other birds included a variety of warblers, songbirds, and other neotropical migratory birds.

The various reptiles and amphibians that can be found include the American toad, Fowler's toad, bullfrog, southern leopard frog, green anole, five-lined skink, common snapping turtle, eastern box turtle, and the eastern painted turtle. Other reptiles include the rat snake, black racer, and the common garter snake.

The plants most likely to be found in the area include the bald cypress, pond pine, longleaf pine, loblolly pine, swamp cottonwood, yellow poplar, water tupelo, and the sweet gum. Under story plants include broomsedge bluestem, giant cane, rabbit tobacco, ferns, honeysuckle, and various other annuals and perennials.

### **C. Existing Drinking Water Facilities**

**Ellore Water System** - The town of Ellore is located in the northeastern portion of Orangeburg County. It lies approximately 8 miles northwest of the I-95 bridge over Lake Marion. The population of the town of Ellore is 742 (U.S. Census 2000). The town's water supply is from 3 active groundwater wells, which provide a total supply capacity of 840 GPM (1.25 MGD). The town resides at a ground elevation of approximately 150 feet. The water is pumped directly into the transmission lines consisting of 6", 8", 10", and 12" water mains and elevated storage. The existing transmission system consists of cast iron, PVC, and some asbestos. The town currently has 2 elevated storage tanks. The active storage tank holds 500,000 gallons. The second storage tank is inactive and is isolated from the distribution system. This 70,000-gallon storage tank can be activated in the case of a catastrophic event. The plant is generally well maintained and serves over 700 customers. The only water treatment process is chlorination.

**Holly Hill Water System** - The town of Holly Hill is located in the southeastern area of Orangeburg County. The population of Holly Hill is 1,281 (U.S. Census 2000). The town's water supply is from 2 active groundwater wells, which provide a total supply capacity of 1165 GPM (1.68 MGD). The town resides at ground elevation of approximately 105 feet. The water is pumped directly into the transmission lines consisting of 6", 8", 10", and 12" water mains and elevated storage. The existing transmission system consists of cast iron and PVC. The town currently has 1 elevated storage tank, which holds 500,000 gallons. The plant is generally well maintained and serves over 1200 customers. The only water treatment process is chlorination.

**Manning Water System** - The city of Manning is located in the central area of Clarendon County. The population of Manning is 4,025 (U.S. Census 2000). The town's

water supply is from 4 active groundwater wells, which provide a total supply capacity of 2,225 GPM (3.2 MGD). The town resides at ground elevation of approximately 130 feet. The supplied water is pumped into four separate storage tanks from its corresponding well and then flows by gravity into the existing system. The transmission lines consist of 6", 8", 10", 12", and 16" water mains. The town currently has 4 elevated storage tanks, which hold 500,000, 300,000, 300,000, and 100,000 gallons. The water system is generally well maintained and serves over 4000 customers. The wells generally have good quality water.

**Santee Water System** - The town of Santee is located on Orangeburg County and is on the west side of I-95. The population of Santee is 740 (U.S. Census 2000). The town's water supply is from 2 active groundwater wells, which provide a total supply capacity of 708 GPM (1.02 MGD). The town resides at ground elevation of approximately 125 to 140 feet. The associated storage tank is pumped from each well and then flows by gravity into the existing system. The existing elevated storage tanks capacities are 300,000 and 500,000 gallons. The transmission lines consist of 6", 8", 10", and 12" water mains and consist mostly of PVC pipe. The water system is generally well maintained and serves over 700 customers; however, Santee's wells exceed the iron limit. The town has frequent red water complaints.

**St. George Water System** - The town of St. George is located in the western part of Dorchester County. The population of St. George is 2,092 (U.S. Census 2000). The town's water supply is from 3 groundwater wells, which provide a total supply capacity of 605 GPM (0.87 MGD) and the town resides at ground elevation of approximately 125 to 140 feet. The three-groundwater wells are associated with three individual storage tanks, which hold 300,000, 250,000, and 100,000 gallons. The existing system consists of 6", 8" and 12" water mains and the newer portion consists of PVC pipe and the older pipelines consist of asbestos cement and iron pipe. The water system is generally well operated and maintained and serves over 2,000 customers. The only water treatment process is chlorination.

**Other Systems** - The other municipalities expected to be served by the LMRWA system all use groundwater as their source for drinking water. The number of wells, the storage capability, and the type and size of distribution lines vary with each system.

#### **D. Need for Proposed Project**

The Lake Marion Regional Water Supply System will provide a uniform and secure supply of water, fully protective of public health, to its five counties and 11 municipalities. Many of the presently utilized water sources will be proven insufficient based on projected growth. The Lake Marion Regional Water System would enhance public health by providing a reliable, high-quality water supply in compliance with drinking water regulations. The proposed Lake Marion Regional Water System would satisfy the immediate and future water supply, treatment, and transmission needs for a large portion of the five county area and would serve as a potential catalyst for economic



development. Specifically, needs related to health and safety, system operations and maintenance (O&M) and growth are key benefits for the future of the five county area. The Congaree and Wateree Rivers feed the Santee River. The Santee River and its adjacent tributaries is pooled within its banks by Wilson Dam and Pinopolis Dam to form Lake Marion (100,000 acres) and Lake Moultrie (65,000 acres), the largest fresh water reservoirs in the southeast and the most dependable source of water. The anticipated withdrawal from Lake Marion for the Regional Water Agency at a plant capacity of 12 MGD will be approximately 18 cubic feet per second (cfs) compared to a normal lake inflow of 15,000 cfs. For Lake Marion, one inch equates to an annual flow rate of 7.5 MGD or a total volume of 2,737,000,000 gallons; therefore, the lakes can easily handle the 12 MGD plant.

## **E. Alternatives Analysis**

A number of conceptual plans were initially evaluated based on established criteria that considered engineering feasibility, cost effectiveness, environmental impacts, and socio-economic benefits. Alternative plans included, drilling additional wells, upgrading and optimizing existing systems, providing additional service from nearby water systems, and a “No-Action” alternative, which assessed both the immediate and long-term impacts to the region. However, these plans did not adequately satisfy the regions water supply needs and were no longer considered. The selected alternative is a regionalized system that consists of a central water treatment plant, a raw water intake and pumping station, and approximately 65 miles of interconnecting trunklines in various sizes. The alternatives analysis listed below considers four alternatives, and the selected alternative with the final centralized treatment plant scheme.

### No action alternative

Without a centralized project, the area water authorities will not be interconnected. The primary advantage of this alternative would be monetary savings associated with their systems. Several of the municipalities would find their systems becoming less and less dependable without expensive upgrades and renovations. This alternative provides only short-term advantages derived from the lack of construction activity and disturbances to the environment in the project area. Growth in the area would be restricted. Rural residents in the project area would have to continue to rely on their own sources in spite of the water complaints. Short-term water quality impacts from construction activity would not be experienced nor would there be any temporary disturbances to air quality or noise impacts associated with construction activities. This alternative would not adversely impact any wetlands, forested habitat, or fish and wildlife resources.

The major disadvantage of the alternative is substantial and long-term. This alternative would not accomplish the overall water resource needs in the counties; therefore through time, it would result in a serious water supply deficit and further jeopardize the long-term water resource needs of the five county area. In addition, the available groundwater water supply would not be adequately distributed resulting in a continued dependence upon individual groundwater wells for many industrial and municipal uses. Without the

completed water supply system severe shortages of potable water would result in the future. For the above reasons, the no action alternative was eliminated.

#### The Construction of Additional Wells

In order to satisfy the projected water demand in the study area additional wells are required. This alternative would involve additional water transmission lines to the towns, the construction of additional storage tanks, and other facilities in the treatment of well water. All of the existing water systems within the project area, with the exception of Orangeburg DPU, currently rely on groundwater as a water supply source. The existing wells located in the study area have sufficient capacity to meet current demands; however, the ability to meet future water demands is dependent on the available quantity, quality, and the impact of proposed drinking water regulations on current treatment methods. The primary advantage to this alternative is the water treatment plant and the transmission lines would not be constructed and the wetland and forested areas would not be impacted. The primary disadvantages of installing additional wells are the monetary costs of maintaining the additional wells and the continued dependency on groundwater that would result.

#### Upgrade and Optimize Existing Systems

Upgrading and optimizing the existing systems was determined by the needs and capabilities of each of the systems from a supply, storage and distribution stand point in the LMRWA planning area. The primary disadvantages for upgrading the existing systems are: (1) the cost of upgrading these systems is approximately \$50 million, (2) the system would not provide a long term, reliable source of water, and (3) the inability to provide service to the areas outside the municipal systems. Finally, for efficiency of operations, it is typically the best option to regionalize water supply treatment whenever possible. For the above reasons, this alternative was eliminated.

#### Provide Service From Nearby Systems:

Three existing water systems in the region were reviewed that could potentially supply the needs of the LMRWA. They include: Orangeburg DPU, City of Sumter, and the Lake Moultrie Water System. In reviewing these systems in relation to their ability to provide service to LMRWA, there were three common themes that were consistent for each facility: (1) each facility is located on the perimeter of the LMRWA service area (2) each system would have to be expanded to meet the future needs of the LMRWA and (3) the distance that the treatment facility is located from the service area increases transmission cost, as well as raises water quality issues related to detention time in the pipe systems. For the above reasons, this alternative was eliminated.

#### Selected Alternative

The project will be an 8 MGD drinking water treatment plant (expandable to 12 MGD), and the installation of approximately 65 miles of water transmission pipeline (includes five separate reaches). The pipeline will follow existing power line, railroad, and highway rights-of-way. The reach north of Lake Marion will serve the Town of Summerton and the City of Manning with potential for future expansion into Sumter County and other parts of Clarendon County. The four reaches south of Lake Marion

will serve the Towns of St. George, Elloree, Santee, and Holly Hill with potential for future expansion into Calhoun County and other parts of Orangeburg and Dorchester counties. The water treatment plant will be located on a 26-acre site adjacent to the Bluffs Subdivision near the town of Santee (see Appendix A). The total project cost is estimated to be \$62.3 million (2003 baseline cost).

The water treatment plant will be based on the utilization of a Zenon Zeeweed Ultrafiltration membrane system. The configuration of the building and systems will likewise be based on the requirements of the Zenon system. The raw water will be treated with alum or a combination of alum and hydrochloric acid prior entering the treatment system. The first stage of the Zenon unit includes a mixing chamber with adequate detention time for the formation of floc particles. The treated water enters the Zenon Zeeweed Ultrafiltration membrane system, which consists of ultra filtration membranes. The membranes will be cleaned through periodic backwashing via back pulse flow and air scouring. The sludge is removed from the system through a valve in the bottom of the tank that drains in to the sludge accumulation tank. Next the treated water goes through carbon contactors, which consist of 30 inches of Granulated Activated Carbon (GAC) installed in a filter cell arrangement. The GAC will remove and/or adsorb Total Organic carbon compounds (TOC) to control taste and odor. The water proceeds to the Finished Water Storage unit where it enters a chemical feed system, which acts as a secondary disinfectant. The advantage of this treatment scheme is its ability to remove pathogens.

## **F. Environmental Consequences and Mitigative Measures**

### Stream Crossings and Floodplains

The placement of the proposed waterline along the power line easement and adjacent roadways will not affect the floodplains or topography. There are approximately 16 stream crossings involved in this project, which are covered by the U.S. Army Corps of Engineers Nationwide Permit Number 12. Best management practices will be required for construction including siltation fencing, directional boring under streams, or bridge suspension of waterlines where appropriate. If conventional stream crossings are necessary, the work will be accomplished during low flow periods as much as possible. Construction methods such as trench and cover and directional drilling will temporarily change topography; however, once the construction is complete, the topography will be restored to its original elevation.

Executive Order 11988 deters development in the 100-year floodplain for federally funded projects unless no other practical alternative is available. If development is planned within the 100-year floodplain and it is federally funded, there is an eight-step process that must be completed prior to release of funds; however, no development within the 100-year floodplain is planned as part of this project.

### Climate

No changes in climate will occur as a result of this project.

### Soils

Temporary impacts to soils and erosion would most likely occur during construction and during the placement of the waterline. Erosion would increase in areas that require the clearing of vegetation along the highly disturbed power line easement and along roadways. Best management practices would be implemented for construction including siltation fencing, hay bales, directional boring under streams or bridge suspension of waterlines where appropriate. In addition the disturbed areas would be seeded and/or grassed to prevent future erosion.

### Wetlands

The proposed construction and placement of the pipeline will temporarily impact wetlands in some areas along the route. However, the proposed pipeline reaches follow existing highway, utility line, and railroad rights-of-way. Several portions of the pipeline route included in the preferred alternative would temporarily impact wetland areas. There are 107 jurisdictional wetlands and stream crossings involved with this project. Construction of these wetland and stream crossings will either be by directional drilling or "cut and cover" following the guidelines in U.S. Army Corps of Engineers Nationwide Permit Number 12. Best management practices will be implemented for construction including siltation fencing, hay bales, directional boring under streams, or bridge suspension of waterlines where appropriate.

### Flora

The proposed action would have minimal impacts on some forms of natural vegetative communities. Best management practices will be implemented to ensure the clearing process will have no impact outside the construction easement.

### Fauna

The proposed action would have a temporary and/or permanent adverse impact on some forms of fauna. Reptiles, amphibians, and other animals may be displaced to outlying areas during the pipeline placement and construction activities due to human presence and increased noise level. However, most of the construction is adjacent to the highway or on existing power line easements. These animals are accustomed to the highway traffic noise and routine maintenance on existing power lines and should return after the construction activities are complete.

### Endangered and Threatened Species

U.S. Fish and Wildlife Service have determined that there are three potential endangered species of concern in the project area. These are the American Chaffseed, Canby's Dropwort, and Pondberry. The USACE and USFWS performed preliminary field surveys for these species in late spring of 2003. Results of the field surveys indicated that no American Chaffseed, Canby's Dropwort, and Pondberry were found within or adjacent to the proposed pipeline routes; however, a final field survey will be performed during the summer growing season prior to construction of the water treatment plant and each transmission line reach. Best management practices will be performed to protect

these plant species during construction. (This FNSI is issued subject to the completion of final field surveys and concurrence from the USFWS)

#### Historical and Archeological Features

The project involves construction in the existing power line, railroad, and roadway rights-of-way and previously disturbed areas; therefore, project concurrence has been obtained from the South Carolina Department of Archives and History. A determination has been made that this project will not have an effect upon any cultural resources or resources eligible for the National Register of Historical Places. However, should cultural resources be encountered during project activities, work shall cease and their office shall be consulted immediately. This stipulation shall be placed on constructions plans and specifications to insure that contactors are aware of it.

#### Noise and Other Pollution from Construction Activities

Implementation of the proposed action may cause temporary reduction of aesthetic appeal and interference with recreational activities in the areas of project construction. However, since project construction will be conducted in relatively small areas at a particular point in time, recreational and esthetic impacts will be localized and noise levels will be limited to daylight hours. Upon completion of work activities in any area, esthetic values and recreational opportunities will be restored as construction equipment is moved away.

The South Carolina Department of Health and Environmental Control (SCDHEC) has air quality jurisdiction for the project area. The ambient air quality for Dorchester, Calhoun, Clarendon, Orangeburg, and Sumter counties has been determined to be in compliance with National Ambient Air Quality Standards and these counties are designated as attainment areas. Implementation of the proposed action may cause temporary reduction of the air quality in the immediate areas of project construction. Construction activities would cause temporary increases in exhaust and dust emissions from equipment operations. However, since project construction will be conducted in relatively small areas at a particular point in time, air quality impacts will be localized and temporary. Upon completion of work activities in any area, air quality will be restored as construction equipment is moved away.

#### Miscellaneous Considerations

There are no parks located in the immediate area of the project. This project should have no effect on these facilities or other recreation or open spaces. No part of this project is located on any listed wild or scenic river.

#### Water Quality

Temporary changes to water quality and surface waters related to turbidity and sedimentation are anticipated during construction. These impacts will be localized and proper erosion control and filtration control measures will be implemented during construction activities. Remediation procedures will prevent any potential long-term impacts and degradation of water quality resulting from the proposed work. The water treatment plant is not expected to produce additional plant growth affecting the water

clarity and water temperature during the construction and operation of the water treatment plant. The operation of the raw water intake is not expected to significantly impact Lake Marion. The project is consistent with applicable South Carolina water quality regulations and will not impair any such standard or fail to meet anti-degradation requirements for point or non point sources. The project will not create any shortages for or otherwise adversely affect the withdrawal capabilities of other present users of the raw water supply. USACE requested water quality certification from the South Carolina Department of Health and Environmental Control in Public Notice #2003-1R-213, dated July 25,2003. (This FNSI is issued subject to all certifications/permits being acquired from the State of South Carolina.)

The indirect and cumulative impact to water quality that might occur would be the potential expansion of the existing wastewater collection and treatment services within the existing sewer service areas. All five counties in the area of the project (i.e., Sumter, Clarendon, Orangeburg, Calhoun, and Dorchester Counties) are evaluating the possible expansion and/or regionalization of wastewater treatment facilities. In the near future, Orangeburg County expects to construct a wastewater collection system along the Highway 176 corridor between I-95 and I-26. This system will have the potential to serve the wastewater needs of the Towns of Santee and Elloree. If a wastewater treatment plant expansion occurs, the proper permits would have to be obtained from South Carolina Department of Health and Environmental Control (SCDHEC), which would ensure protection of water quality.

#### Hazardous and Toxic Materials

There are no known hazardous or toxic waste sites within the immediate vicinity of the treatment plant or any of the transmission lines. A site of regional concern is the Pinewood hazardous waste landfill located near Pinewood, South Carolina. The Pinewood landfill is located approximately 1200 feet from the north shore of Lake Marion approximately 13 miles north-northwest of the water treatment plant's intake. There have been no known releases of hazardous or toxic wastes from the landfill's containment system, and, although the potential for a release exists, there are safeguards that significantly reduce the risk to the Lake Marion Regional Water System's water supply. The landfill is surrounded by groundwater monitoring wells that are periodically monitored and would detect releases from the landfill before contaminants reached the waters of Lake Marion. If contaminants did enter Lake Marion, the release rate of the contaminants into the lake would be slow, and significant diffusion, with a resulting significant reduction in contaminant concentration, would occur before the contaminants reached the treatment plant's intake. If contaminants did reach the treatment plant's intake, the concentrations would be very low and the activated carbon unit in the treatment plant would remove the contaminants from the water. Therefore, based on the above, the threat posed by the Pinewood landfill to the system's water supply is very small.

#### Cumulative Impacts

The cumulative impacts of the total Lake Marion Regional Water Supply System (i.e., Phase I, Phase II, and Phase III) are small because the system is designed to mostly

replace existing water supply systems and the expected population growth in the service area.

#### Environmental Justice Issues

The Lake Marion Regional Water project is not designed to create a benefit for any group or individual, but rather provides a region-wide benefit. There are no indications that the proposed water supply project would be contrary to the goals of Executive Order 12898, or would create disproportionate, adverse human health or environmental impacts on minority or low-income populations of the surrounding community. The public water supply project will provide safe drinking water to all residents on an equal basis and will reduce the dependence on groundwater in the future.

#### Farmland Protection Policy Act

The project involves the construction of approximately 65 miles of pipelines in counties with a large agricultural and rural base. The proposed pipeline reaches will follow existing power line and highway rights-of-way where possible to avoid impacts on any prime farmland in accordance with the Farmland Protection Policy Act.

#### Wild and Scenic River Act

A review of the Wild and Scenic River inventory list reveals that the proposed project will not affect a stream or portion of a stream that is included in the National Wild and Scenic Rivers system.

### **G. Public Participation**

The LMRWA has held regular meetings each month for approximately eight years where each of the potential participants, funding agencies, and organizations associated with the design and implementation of the project have been invited and encouraged to attend. In addition, monthly meetings with the design coordination team, which is primarily Santee Cooper, the consulting engineers, the Construction Management Team (U.S. Army Corps of Engineers), and any individuals wishing to attend from each of the participating towns including the Administrators and Councils, have been held for two years. Group meetings have also been conducted with all of the potential participants where information regarding funding, design, and permitting has been presented.

Three public meetings were held at locations throughout area covered by the system. The three meetings were held at the Santee Town Hall on September 30, 2003, from 5:00 PM until 7:00 PM, at the F.E. Dubose Campus of Central Carolina Technical College in Manning on October 1, 2003, from 5:00 PM until 7:00 PM, and at the St. George Town Hall on October 2, 2003, from 5:00 PM until 7:00 PM. Notification of the meetings was published in the Manning, St. George, and Orangeburg newspapers. Copies of the EID were also made available for review and comment at many public locations (e.g., County office buildings, public libraries, and town halls) prior to the meetings. Additionally, the EID was posted on the internet. No adverse comments were received during the public meetings or from public review of the EID.

The wholesale water costs (\$/1,000 gallons to the member utilities are projected to be:

- at 2.14 million gallons/day \$0.75
- at 4.50 million gallons/day \$0.56
- at 6.90 million gallons/day \$0.42
- at 11.5 million gallons/day \$0.37

## **H. Agencies Consulted**

The following State and Federal agencies were consulted during the environmental review of this project:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- South Carolina Department of Natural Resources
- South Carolina Department of Health and Environmental Control – Water Quality Section
- South Carolina Department of Health and Environmental Control – Office of Ocean and Coastal Resource Management
- South Carolina State Historic Preservation Office



# **APPENDIX A**

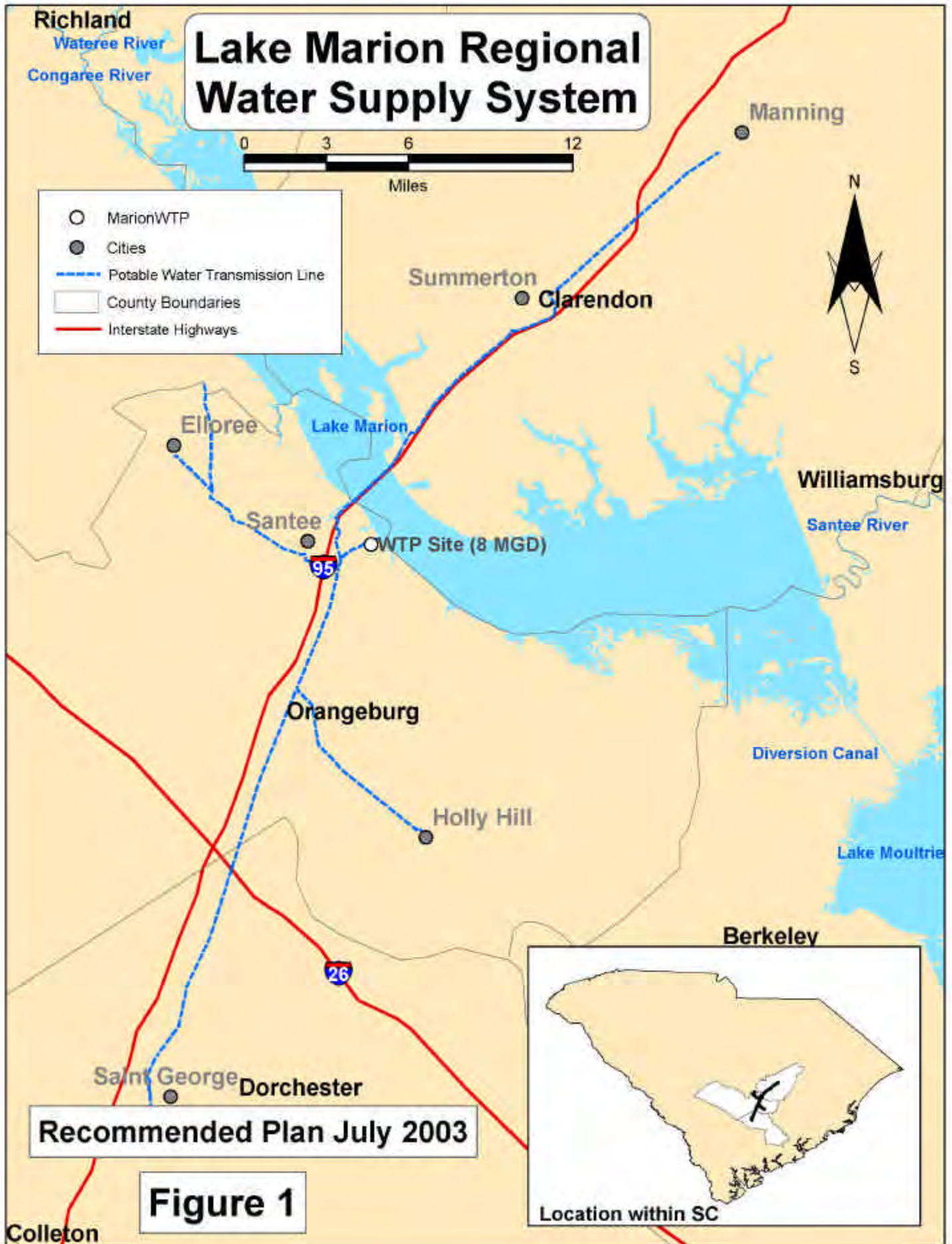
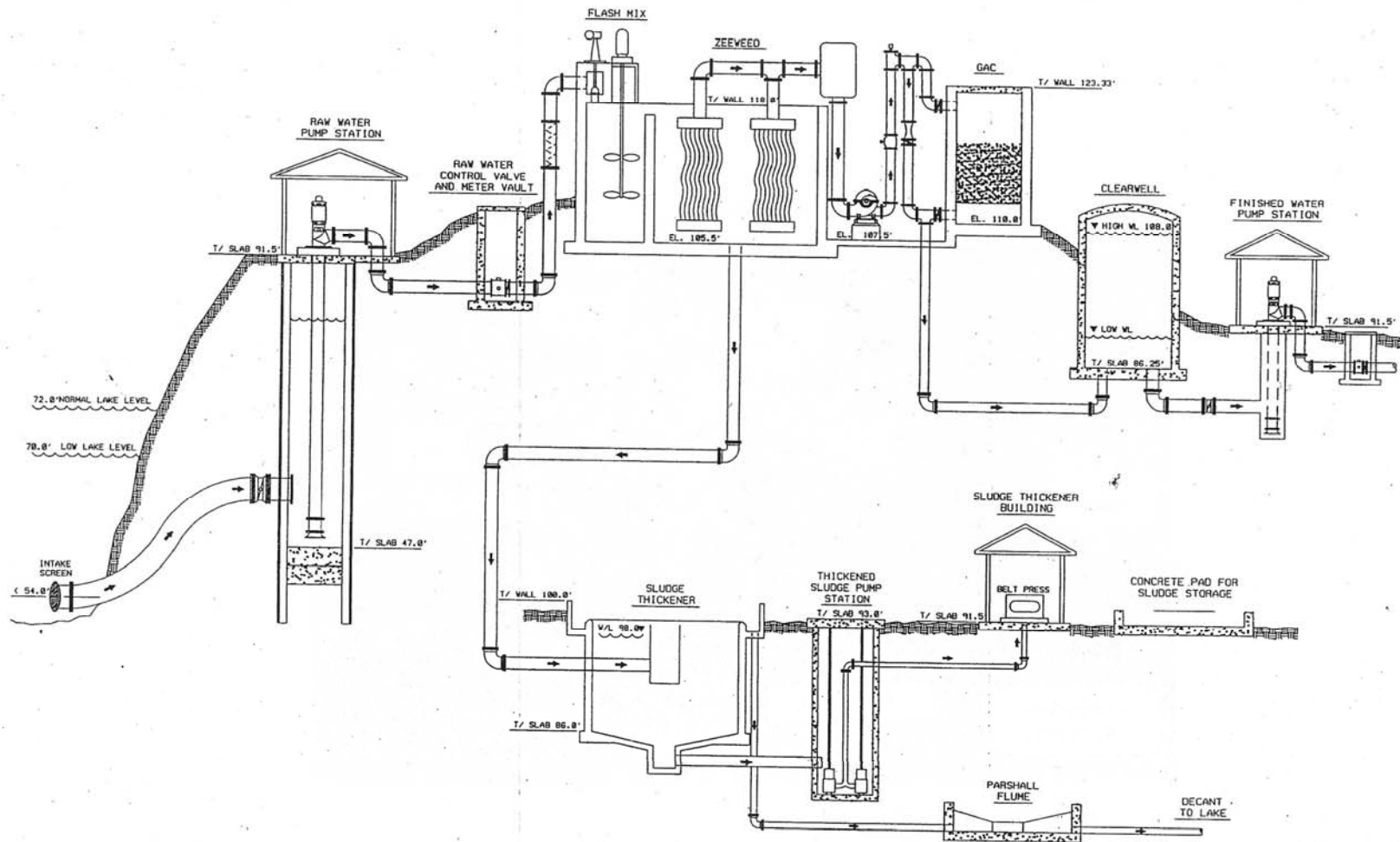


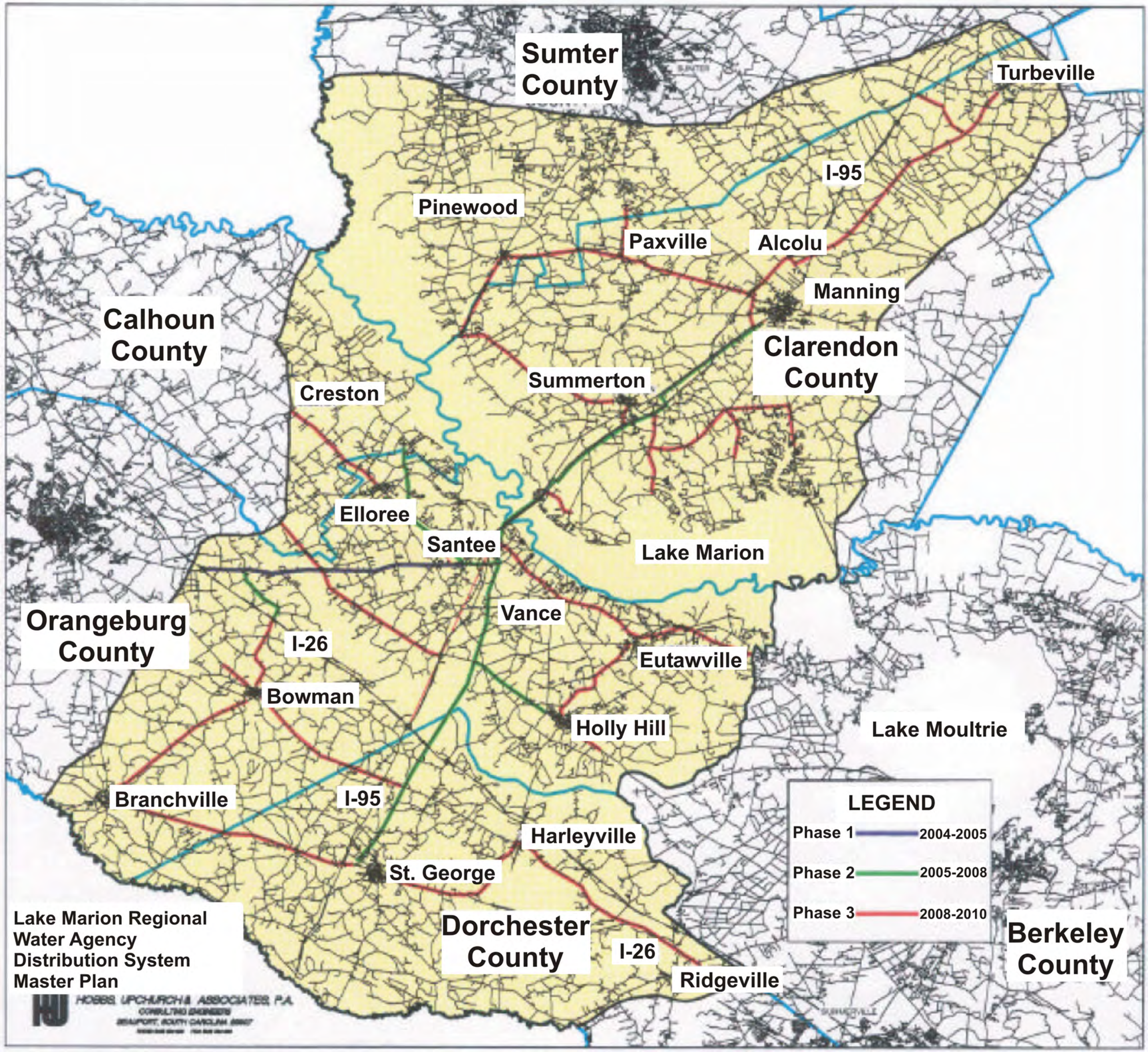


Figure 2: Water Intake & Plant Sites



**Figure 3: Schematic of Treatment Plant**

# **APPENDIX B**



Lake Marion Regional Water Agency  
Distribution System  
Master Plan

**LEGEND**

Phase 1		2004-2005
Phase 2		2005-2008
Phase 3		2008-2010

## **APPENDIX B**

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### **Cultural Resources Report for Harleyville Reach**

# Cultural Resources Survey of the Proposed Harleyville Reach Water Transmission Main

Dorchester and Orangeburg Counties, South Carolina



July 2013





# Cultural Resources Survey of the Proposed Harleyville Reach Water Transmission Main

Dorchester and Orangeburg Counties, South Carolina

July 2013

Draft Report

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## Abstract

In May 2013, archaeologists with Brockington and Associates, Inc., (Brockington) undertook an intensive survey of the proposed Harleyville Reach Water Transmission Main. The South Carolina Public Service Authority (Santee Cooper) is building the Lake Marion Regional Water System to provide fresh water from Lakes Marion and Moultrie to communities that lie in the surrounding counties. The Harleyville Reach Water Transmission Main will bring water to the Town of Harleyville. The survey was requested by the US Army Corps of Engineers (USACE), Charleston District to comply with Section 106 of the National Historic Preservation Act for permits to be issued for the construction and operation of the water pipeline.

The northern terminus of the project corridor begins approximately 350 feet southwest of the intersection of South Carolina Route 453 (SC-453) and S-38-68 (Boyer Road), where the proposed pipeline will connect with an existing element of the Lake Marion Regional Water System. The proposed pipeline, consisting of a 24-inch diameter conduit, will extend southwest along the north (or northwest) side of SC-453 (also called Gardner Boulevard) for approximately 5.05 miles, northwest of the intersection Gardner Boulevard and S-18-50 (Seven Mile Road). It then turns east for approximately 1,150 feet, crossing to the east side of SC-453 and the Southern Railroad, before turning south and paralleling the Southern Railroad and Railroad Avenue for approximately 1.46 miles until terminating north of Hutto Street in Harleyville. In order to avoid impacts to both wetlands and existing infrastructure, the proposed pipeline will be directionally drilled in three places along the easement; these include Four Hole Swamp, from west of SC-453 to the east of the Southern Railroad north of Seven Mile Road, and I-26. The easement for the pipeline is 30 feet wide throughout its entire length.

Archaeological survey through surface inspection and systematic shovel testing at 100-foot intervals identified two sites (38DR431 and 38DR432) and two isolated finds (Isolates 1 and 2). All four of these cultural resources contain remnants of nineteenth- to twentieth-century farmsteads or tenant farms. Brockington recommends sites 38DR431 and

38DR432 and Isolates 1 and 2 not eligible for the National Register of Historic Places (NRHP).

We also conducted an architectural reconnaissance of the easement. Since the pipeline will be underground when complete, it presents no opportunity to affect any aboveground resources that might be eligible for the NRHP unless they have associated landscapes. Our architectural historian conducted a reconnaissance along the roads adjacent to the pipeline corridor to see if such landscapes are present. No historic architectural resources or landscapes were identified. For approximately 1,000 feet extending north from Hutto Street, the proposed pipeline easement is located within 200 feet of the Harleyville Historic Area. However, the Harleyville Historic Area and the proposed pipeline easement are separated by the Southern Railroad easement, which is approximately 100 feet wide and the easement for Railroad Avenue, which is approximately 50 feet wide. Therefore, the proposed pipeline easement will have no adverse effect on the Harleyville Historic Area. Thus, the construction and operation of the proposed Harleyville Reach Water Transmission Main will affect no historic properties.



# Acknowledgments

We would like to thank Andrew Vane of Hazen and Sawyer, PC (Hazen and Sawyer), for providing maps and information about the proposed water pipeline and the South Carolina Public Service Authority (Santee Cooper) for funding the proposed investigations.

David Baluha directed the archaeological field investigations, with the assistance of Mike Ryan, Scott Kitchens, and Jimmy Lefebre. Sheldon Owens conducted the architectural reconnaissance. Scott Kitchens cleaned and identified the recovered artifacts under the direction of Eric Poplin. Mr. Kitchens also assisted with the preparation of the site forms. David Dellenbach and Michael Walsh prepared the report graphics. Meg Moughan and Josh Fletcher provided editorial assistance. Ms. Moughan and Mr. Walsh assembled the report.



# Table of Contents

Abstract .....	iii
Acknowledgments.....	v
List of Figures .....	viii
List of Tables .....	ix
1.0 Introduction and Methods .....	1
1.1 Introduction.....	1
1.2 Methods.....	5
2.0 Environmental and Cultural Setting.....	9
2.1 Environmental Setting.....	9
2.2 Cultural Setting .....	18
2.2.1 Pre-Contact Era .....	18
2.2.2 Contact Era .....	19
2.2.3 Post-Contact Era .....	20
3.0 Results and Recommendations .....	25
3.1 Site 38DR431 .....	25
3.2 Site 38DR432.....	28
3.3 Isolated Finds .....	30
3.4 Management Recommendations .....	30
References Cited.....	31
Appendix A - Artifact Catalog	
Appendix B - Architectural Resources	



# List of Figures

Figure 1.1 The northern portion of the Harleyville Reach Water Transmission Main on the USGS 1987 <i>Holly Hill, SC</i> quadrangle. ....	2
Figure 1.2 The central portion of the Harleyville Reach Water Transmission Main on the USGS 1973 <i>Harleyville, SC</i> and USGS 1987 <i>Holly Hill, SC</i> quadrangles. ....	3
Figure 1.3 The southern portion of the Harleyville Reach Water Transmission Main on the USGS 1973 <i>Harleyville, SC</i> quadrangle. ....	4
Figure 2.1 The northern portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing the area between Boyer Road and Don’s Auto Salvage. ...	11
Figure 2.2 The north-central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing the area near Holcim US and Four Hole Swamp. ....	12
Figure 2.3 The central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing areas around Four Hole Swamp and Argo USA. ....	13
Figure 2.4 The south-central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, Seven Mile Road, and the Southern Railroad, showing areas around Argo USA, I-26, and Railroad Avenue. ....	14
Figure 2.5 The southern portion of the proposed Harleyville Reach Water Transmission Main along the Southern Railroad, showing the area north of Harleyville. ....	15
Figure 2.6 Views of the proposed Harleyville Reach Water Transmission Main Project Area: northern portion of the project looking south along the west side of SC-453 (top); abandoned Holcim US facility along the west side of SC-453, looking north (bottom). ....	16
Figure 2.7 Views of the proposed Harleyville Reach Water Transmission Main Project Area: middle portion of the project showing an extant utilities corridor extending through Four Hole Swamp, looking north (top); southern portion of the project looking south along Railroad Avenue (bottom). ....	17
Figure 2.8 The location of the Harleyville Reach Water Transmission Main Project on the USACE (1920a) <i>Eutawville</i> and USACE (1920b) <i>Ridgeville</i> quadrangles. ....	23
Figure 3.1 Plan of sites 38DR431 and 38DR432 and Isolate 1. ....	26
Figure 3.2 Views of Site 38DR341: looking south (top) and east (bottom). ....	27
Figure 3.3 Views of Site 38DR432: looking south showing rubble (top); looking east showing brick/mortar footer (bottom). ....	29

## List of Tables

Table 1.1 Cultural Resources within 0.5 Mile of the Project Corridor.....	6
Table 2.1 Soils Encountered in the Project Route.....	10



# 1.0 Introduction and Methods

## 1.1 Introduction

In June 2013, archaeologists with Brockington and Associates, Inc., (Brockington) conducted an intensive survey of the proposed route of the Harleyville Reach Water Transmission Main in Dorchester and Orangeburg counties, South Carolina. Intensive survey of the original 6.73-mile route was conducted from June 3-7, 2013. The survey provides partial compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended), as administered by the US Army Corps of Engineers (USACE) Charleston District (33 CFR 325). The results of the survey will assist the USACE in their assessment of the effect of the project on historic properties (sites, buildings, structures, objects, or districts eligible for or listed on the National Register of Historic Places [NRHP]).

The South Carolina Public Service Authority (Santee Cooper) is building a regional water system that carries water from Lakes Marion and Moultrie to surrounding communities. Segments of this water pipeline have been built; others are in the planning stages. The portion examined during this survey extends approximately 6.73 miles. The easement for the pipeline is 30 feet wide throughout its entire length. The northern terminus of the project corridor begins approximately 350 feet southwest of the intersection of South Carolina Route 453 (SC-453) and S-38-68 (Boyer Road), where the proposed pipeline will connect with an existing element of the Lake Marion Regional Water System surveyed by Poplin and Baluha (2011). The proposed pipeline, consisting of a 24-inch diameter conduit, will extend southwest along the north (or northwest) side of SC-453 (also called Gardner Boulevard) for approximately 5.05 miles, northwest of the intersection Gardner Boulevard and S-18-50 (Seven Mile Road). It then turns east for approximately 1,150 feet, crossing to the east side of SC-453 and the Southern Railroad, before turning south and paralleling the Southern Railroad and Railroad Avenue for approximately 1.46 miles until terminating north of Hutto Street in Harleyville. In order to avoid impacts to both wetlands and existing infrastructure, the proposed pipeline will be directionally drilled in three places along the easement; these include Four Hole Swamp, from west of SC-453

to the east of the Southern Railroad north of Seven Mile Road, and I-26. Figures 1.1-1.3 display the location of the proposed water pipeline.

The survey identified two archaeological sites (38DR431 and 38DR432) and two isolated finds (Isolates 1 and 2). All four of these cultural resources contain artifacts associated with late-nineteenth- to twentieth-century occupations, likely related to small farm complexes, tenant farms, or agricultural facilities. All of these sites have been severely altered by agricultural activities or deliberate efforts to raze the houses/farm complexes. None of these sites can generate additional information about the past. We recommend these two sites and two isolated finds not eligible for the NRHP. We also conducted a reconnaissance of the pipeline route to identify any historic architectural resources or landscapes. While the pipeline will be installed underground and should not affect any significant buildings, we wanted to ensure that there were no historic landscapes associated with such buildings that might be affected. We identified no landscapes within or adjacent to the pipeline easement. Therefore, the proposed project will affect no historic properties.

We also conducted an architectural reconnaissance of the easement. Since the pipeline will be underground when complete, it presents no opportunity to affect any aboveground resources that might be eligible for the NRHP unless they have associated landscapes. Our architectural historian inspected the roads along the pipeline corridor to see if such landscapes are present. No historic architectural resources or landscapes were identified. For approximately 1,000 feet extending north from Hutto Street, the proposed pipeline easement is located within 200 feet of the Harleyville Historic Area. However, the Harleyville Historic Area and the proposed pipeline easement are separated by the Southern Railroad easement, which is approximately 100 feet wide and the easement for Railroad Avenue, which is approximately 50 feet wide. Therefore, the proposed pipeline easement will have no adverse effect on the Harleyville Historic Area. Thus, the construction and operation of the proposed Harleyville Reach Water Transmission Main will affect no historic properties.



Figure 1.1 The northern portion of the Harleyville Reach Water Transmission Main on the USGS 1987 Holly Hill, SC quadrangle.



Figure 1.2 The central portion of the Harleyville Reach Water Transmission Main on the USGS 1973 *Harleyville, SC* and USGS 1987 *Holly Hill, SC* quadrangles.

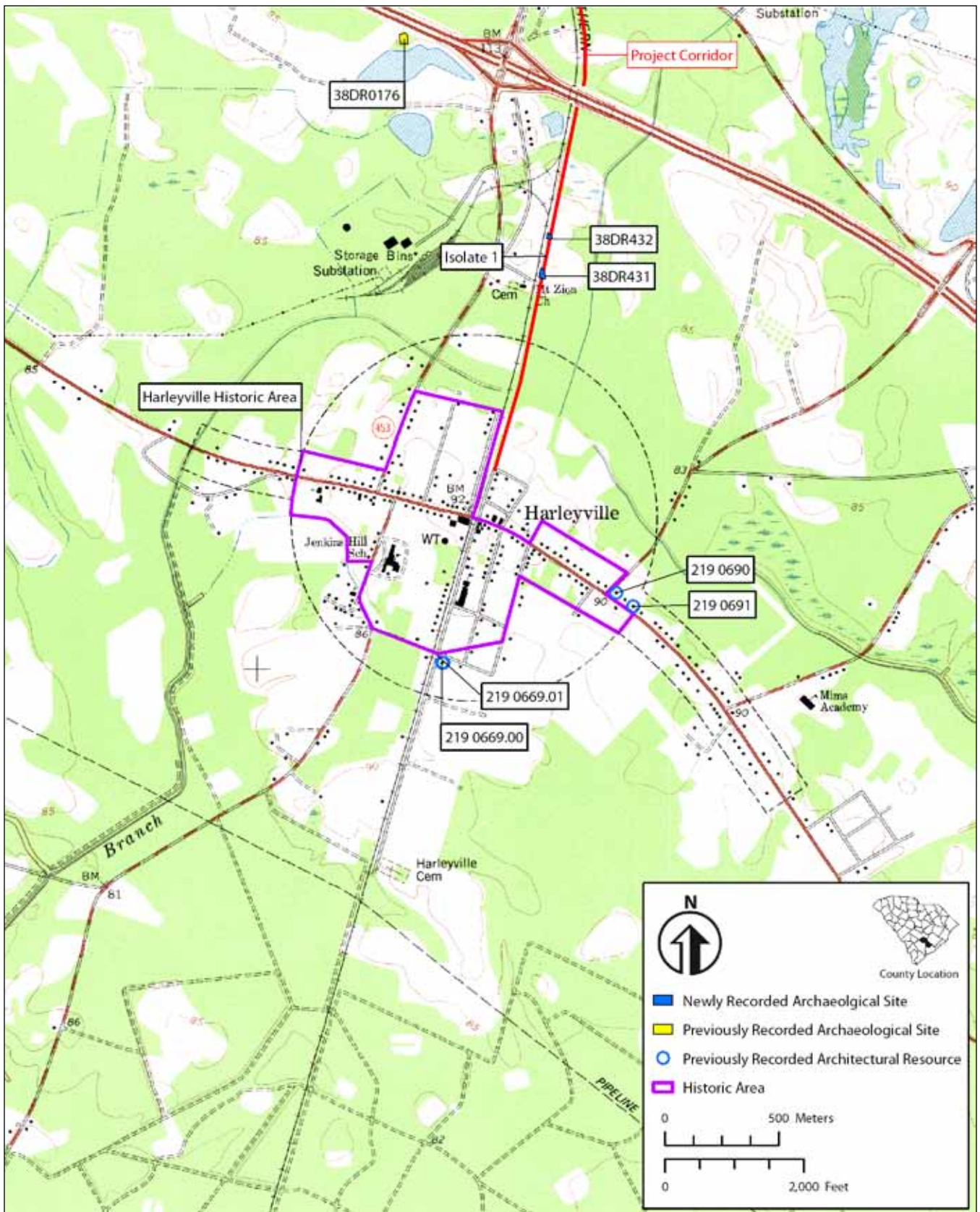


Figure 1.3 The southern portion of the Harleyville Reach Water Transmission Main on the USGS 1973 *Harleyville, SC* quadrangle.

A description of the methods employed during these investigations concludes Chapter 1. Chapter 2 presents an overview of the natural and cultural setting of the project area. Chapter 3 presents the results of the survey and management recommendations. An inventory of the artifacts recovered during the survey is appended as Appendix A. Appendix B provides a summary of the historic architectural resources identified in the Harleyville Historic Area.

## 1.2 Methods

The survey entailed three major tasks: background research, field investigations, and laboratory analyses. Descriptions of the methods employed during each task follow. A discussion of the assessment of the NRHP eligibility of the identified resources concludes Chapter 1.

**Background Research.** For this project, we reviewed ArchSite, the online database of archaeological sites, historic properties, historic architectural resources, and previous cultural resources investigations maintained by the South Carolina Department of Archives and History (SCDAH) and the South Carolina Institute of Archaeology and Anthropology (SCIAA), to locate any known resources within 0.5 mile of the project corridor. This database was reviewed by archaeologist David Baluha on June 3, 2013.

As of that date, only one previous cultural resources investigation had occurred within 0.5 mile of the project corridor: Fick and Davis (1997). Fick and Davis (1997) conducted a historic resources survey of Dorchester County, identifying four historical architectural resources (219-669.00, 219-669.01, 219-690, and 219-691) and one historic area (Harleyville Historic Area) within 0.5 mile of the project corridor. In addition, there is one archaeological site (38DR176) within 0.5 mile of the project corridor. The Harleyville Historic Area (see Figure 1.3) contains 37 historic architectural resources inside the Town of Harleyville limits; these 37 historic resources are summarized in Appendix B. All of these 37 historic architectural resources are NRHP-ineligible. Table 1.1 summarizes Resources 219-669.00, 219-669.01, 219-690, and 219-691 and 38DR176.

**Field Investigations.** Archaeologists examined the 30-foot-wide water pipeline easement throughout its length by walking a single transect along the centerline of the easement. The centerline was flagged by professional surveyors prior to the initiation of the field investigations. We inspected the ground surface within the easement along this transect and excavated one-foot diameter shovel tests at 100-foot intervals along the centerline. The location and number of each shovel test corresponded to the station number shown on the engineering schematic provided to us by Hazen and Sawyer, PC (Hazen and Sawyer) (e.g., Shovel Test 320 corresponds with Station 100-320). Shovel tests were excavated until sterile fill or impervious subsoils were encountered. Fill from all shovel tests was screened through ¼-inch mesh hardware cloth. Investigators recorded information concerning the soil conditions and the presence or absence of artifacts for each test. All tests were backfilled after documentation.

We examined locations where we identified surface features, surface artifacts, and/or buried artifacts in greater detail. Additional shovel tests were excavated within and beyond the easement to help delimit these artifact scatters, unless adjacent landowners denied permission to access their property. These tests were excavated in the same fashion as the survey shovel tests described above, with the intervals between tests ranging from 25 to 50 feet. We prepared sketch plans of individual locales showing surface features, surface artifact occurrences, and excavated shovel tests, and appropriate photographs of each locale. The limits of these locales were recorded using a survey-grade GPS receiver capable of sub-meter accuracy.

Locales with surface features or more than three artifacts from the same major time period are defined as archaeological sites. SCIAA site forms have been prepared for each site. Locales that produced two or fewer artifacts are defined as isolated finds.

We placed artifacts recovered from shovel tests or the ground surface in archivally stable, resealable plastic bags. Each bag was labeled by the transect location, its relationship to a transect shovel test locale, or with respect to a site grid. Bags from defined sites or isolated finds were placed together in a larger archivally stable, resealable plastic bag, also appropriately labeled.



**Table 1.1 Cultural Resources within 0.5 Mile of the Project Corridor.**

Resource/Site	Address	Description	Date	NRHP Status
38DR176	n/a	African American cemetery	20th century	Potentially eligible
219-669.00	207 S. Railroad Ave., Harleyville	Residence (Creighton House)	ca. 1890	Not eligible
219-669.01		Kitchen	ca. 1890	Not eligible
219-690	217 E. Main St., Harleyville	Residence (Baker House)	20th century	Not eligible
219-691	229 E. Main St., Harleyville	Residence	20th century	Not eligible

Project architectural historian Sheldon Owens drove along the roads that parallel the proposed pipeline easement from Wells to Boyer and the streets in Holly Hill where the northern leg of the pipeline enters that town. He observed and photographed any buildings that appeared to be greater than 50 years of age and that retained sufficient integrity to be included in the South Carolina Statewide Survey of historic aboveground resources. Since the pipeline will be installed underground, it will have no visual impact on any buildings; therefore, we did not conduct an intensive survey of the built environment within or adjacent to the proposed pipeline easement. Mr. Owens also inspected the easement to identify any historic landscapes or yards associated with potentially significant historic buildings or features. No such landscapes were noted.

**Laboratory Analyses.** All retained artifacts were transported to Brockington’s Mount Pleasant laboratory facility where they were cleaned according to their material composition and fragility, sorted, and inventoried. Most artifacts were washed in warm water with a soft-bristled toothbrush. Each separate archaeological context from within each site (surface collection, shovel test, or test unit) was assigned a specific provenience number. The artifacts from each provenience were separated by artifact type, using published artifact type descriptions from sources pertinent to the project area. Artifact types were assigned a separate catalog number, and artifacts were analyzed and quantity and weight were recorded. Certain artifacts tend to decompose through time, resulting in the recovery of fragments whose counts exaggerate the original amount present; in this case, artifact weight is a more reliable tool for reconstructing past artifact

density. Artifacts that were weighed but not counted include biological (i.e., wood, charcoal), floral, and faunal artifacts that have not been modified into a tool (e.g., bone comb or handle), and building materials (e.g., brick, mortar, tabby, slate, building stone). All artifact analysis information was entered into a coded Microsoft Access 2000™ database.

Post-Contact artifact analysis was primarily based on observable stylistic and technological attributes. Artifacts were identified with the use of published analytical sources commonly used for this region. Historic artifacts were identified by material (e.g., ceramic, glass, metal), type (e.g., creamware), color, decoration (e.g., transfer printed, slipped, etched, embossed), form (e.g., bowl, mug), method of manufacture (e.g., molded, wrought), production date range, and intended function (e.g., tableware, personal, clothing). The primary sources used were Noël Hume (1969) and the Charleston Museum’s type collection.

All artifacts were bagged in 4-mil-thick archival stable polyethylene bags. Artifact types were bagged separately within each provenience and labeled using acid-free paper labels. Provenience bags were labeled with the site number, provenience number, and provenience information. Proveniences were separated by site and placed into appropriately labeled acid-free boxes. Artifacts are temporarily stored at the Mount Pleasant office of Brockington until they are ready for final curation. Upon the completion and acceptance of the final report, the artifacts and all associated materials (artifact catalog, field notes, photographic materials, and maps) will be transferred to the SCIAA for curation.

**Assessment of NRHP Eligibility.** All cultural resources encountered are assessed as to their significance based on the criteria of the NRHP. As per 36 CFR 60.4, there are four broad evaluative criteria for determining the significance of a particular resource and its eligibility for the NRHP. Any resource (building, structure, site, object, or district) may be eligible for the NRHP that:

- A. is associated with events that have made a significant contribution to the broad pattern of history;
- B. is associated with the lives of persons significant in the past;
- C. embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, possesses high artistic value, or represents a significant and distinguishable entity whose components may lack individual distinction; or
- D. has yielded, or is likely to yield, information important to history or prehistory.

A resource may be eligible under one or more of these criteria. Criteria A, B, and C are most frequently applied to historic buildings, structures, objects, non-archaeological sites (e.g., battlefields, natural features, designed landscapes, or cemeteries), or districts. The eligibility of archaeological sites is most frequently considered with respect to Criterion D. Also, a general guide of 50 years of age is employed to define “historic” in the NRHP evaluation process. That is, all resources greater than 50 years of age may be considered. However, more recent resources may be considered if they display “exceptional” significance (Sherfy and Luce n.d.).

Following *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (Savage and Pope 1998), evaluation of any resource requires a twofold process. First, the resource must be associated with an important historic context. If this association is demonstrated, the integrity of the resource must be evaluated to ensure that it conveys the significance of its context. The applications of both of these steps are discussed in more detail below.

Determining the association of a resource with a historic context involves five steps (Savage and Pope 1998). First, the resource must be associated with a particular facet of local, regional (state), or national history. Secondly, one must determine the significance of the identified historical facet/context with respect to the resource under evaluation. A lack of Native American archaeological sites within a project area would preclude the use of contexts associated with the Pre-Contact use of a region.

The third step is to demonstrate the ability of a particular resource to illustrate the context. A resource should be a component of the locales and features created or used during the historical period in question. For example, early-nineteenth-century farmhouses, the ruins of African American slave settlements from the 1820s, and/or field systems associated with particular antebellum plantations in the region would illustrate various aspects of the agricultural development of the region prior to the Civil War. Conversely, contemporary churches or road networks may have been used during this time period but do not reflect the agricultural practices suggested by the other kinds of resources.

The fourth step involves determining the specific association of a resource with aspects of the significant historic context. Savage and Pope (1998) define how one should consider a resource under each of the four criteria of significance. Under Criterion A, a property must have existed at the time that a particular event or pattern of events occurred, and activities associated with the event(s) must have occurred at the site. In addition, this association must be of a significant nature, not just a casual occurrence (Savage and Pope 1998). Under Criterion B, the resource must be associated with historically important individuals. Again, this association must relate to the period or events that convey historical significance to the individual, not just that this person was present at this locale (Savage and Pope 1998). Under Criterion C, a resource must possess physical features or traits that reflect a style, type, period, or method of construction; display high artistic value; or represent the work of a master (an individual whose work can be distinguished from others and possesses recognizable greatness) (Savage and Pope 1998). Under Criterion D, a resource must possess sources of information that can ad-

dress specific important research questions (Savage and Pope 1998). These questions must generate information that is important in reconstructing or interpreting the past (Butler 1987; Townsend et al. 1993). For archaeological sites, recoverable data must be able to address specific research questions.

After a resource is associated with a specific significant historic context, one must determine which physical features of the resource reflect its significance. One should consider the types of resources that may be associated with the context, how these resources represent the theme, and which aspects of integrity apply to the resource in question (Savage and Pope 1998). As in the antebellum agriculture example given above, a variety of resources may reflect this context (farmhouses, ruins of slave settlements, field systems, etc.). One must demonstrate how these resources reflect the context. The farmhouses represent the residences of the principal landowners who were responsible for implementing the agricultural practices that drove the economy of the South Carolina area during the antebellum period. The slave settlements housed the workers who conducted the vast majority of the daily activities necessary to plant, harvest, process, and market crops.

Once the above steps are completed and the association with a historically significant context is demonstrated, one must consider the aspects of integrity applicable to a resource. Integrity is defined in seven aspects of a resource; one or more may be applicable depending on the nature of the resource under evaluation. These aspects are location, design, setting, materials, workmanship, feeling, and association (36 CFR 60.4; Savage and Pope 1998). If a resource does not possess integrity with respect to these aspects, it cannot adequately reflect or represent its associated historically significant context. Therefore, it cannot be eligible for the NRHP. To be considered eligible under Criteria A and B, a resource must retain its essential physical characteristics that were present during the event(s) with which it is associated. Under Criterion C, a resource must retain enough of its physical characteristics to reflect the style, type, etc., or work of the artisan that it represents. Under Criterion D, a resource must be able to generate data that can address specific research questions that are important in reconstructing or interpreting the past.

## 2.0 Environmental and Cultural Setting

### 2.1 Environmental Setting

The proposed Harleyville Reach Water Transmission Main project lies on the inner edge of the Lower Coastal Plain of South Carolina. This portion of the Lower Coastal Plain consists of a series of low ridges separated by dense swamps. Major river drainages lie to the north and east (the Santee), to the west (the Edisto), and to the south and west (the Ashley and the Cooper). This terrain lies atop a series of marine terraces that represent the former shorelines of North America. Changes in sea level through time resulted in the formation of these terraces; most are composed of sandy soils with some gravels derived from beach and deltaic deposits associated with the Atlantic shorelines of the Pleistocene epoch (Kovacik and Winberry 1989). Most of the project corridor lies on one of these terraces, the Wicomico. The Wicomico terrace occurs at 65-100 feet above mean sea level (amsl) (DeFrancesco 1988:83).

Before intensive settlement and agricultural modification, the study area contained a similar series of vegetative communities. General sources such as Quarterman and Keever (1962) and Shelford (1963) summarize the information on floral and faunal communities in the area. Most of the extant woodlands today are mixed pine/hardwood forests. A mixed forest supports an active faunal community including deer and small mammals (e.g., various squirrels and mice, opossum, raccoon, rabbit, fox, skunk), birds (e.g., various songbirds, ducks and wading birds, quail, turkey, doves, hawks, owls), and reptiles/amphibians (e.g., frogs, toads, lizards, snakes, turtles, alligator). Fresh and saltwater fish are abundant in the streams and marshes of the region, and shellfish are present in large numbers in most of the tidally affected waters throughout the region.

The 6.73-mile project route extends through a variety of micro-environments and contains many different named soil types. The majority of the soils within the project route are characterized as nearly level, well drained to very poorly drained, and strongly acidic. Soils data for the project route was compiled from USDA soil surveys of Dorchester and Orangeburg counties (DeFrancesco 1988; Eppinette 1990) and from the National Resources Conservation Service's online *Web Soil Survey* ([\[websoilsurvey.nrcs.usda.gov/app/HomePage.htm\]\(http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm\)\). Table 2.1 summarizes the types of soils encountered within the project route. Noboco soils are present at sites 38DR431 and 38DR432 and Isolates 1 and 2. Mouzon fine sandy loam extends across Four Hole Swamp and Home Branch. Haplaquents are man-made soils found in the area across from the Holcim US facility.](http://</a></p></div><div data-bbox=)

United States Department of Agriculture (USDA) soil surveys provide climatic data for Dorchester and Orangeburg counties (DeFrancesco 1988; Eppinette 1990). The climate of this area is subtropical, with mild winters and long, hot, and humid summers. The average daily maximum temperature reaches a peak of 80.1°F in July, although average highs are in the 80°F range from May through September. A mean high of 46.8°F characterizes the coldest winter month, January. Average annual precipitation averages 47 inches per annum. Most rain falls in the summer months during thunderstorms; snowfall is very rare. Also, the climate is very supportive of agriculture. Prevailing winds are light and generally from the south and southwest, although hurricanes and other tropical storms occasionally sweep through the area, particularly in the fall months.

The northern terminus of the project corridor begins approximately 350 feet southwest of the intersection of SC-453 and Boyer Road, where the proposed pipeline will connect with an existing element of the Lake Marion Regional Water System. The proposed pipeline, consisting of a 24-inch diameter conduit, will extend southwest along the north (or northwest) side of SC-453 for approximately 5.05 miles, northwest of the intersection Gardner Boulevard and Seven Mile Road. It then turns east for approximately 1,150 feet, crossing to the east side of SC-453 and the Southern Railroad, before turning south and paralleling the Southern Railroad and Railroad Avenue for approximately 1.46 miles until terminating north of Hutto Street in Harleyville. In order to avoid impacts to both wetlands and existing infrastructure, the proposed pipeline will be directionally drilled in three places along the easement; these include Four Hole Swamp, from west of SC-453 to the east of the Southern Railroad north of Seven Mile Road, and I-26.

**Table 2.1 Soils Encountered in the Project Route.**

Soil Name/Texture	Location	Topography	Water Table	Ph Description	Drainage	Easement Percent
Blanton sand	uplands	nearly level	2.5-3.5 feet	strongly acid	well drained	2.0
Bonneau fine sand	uplands	nearly level	3.5-5.0 feet	very strongly acid	well drained	13.0
Byars loam	depressions	nearly level	0-1.0 feet	very strongly acid	very poorly drained	1.9
Coxville loam	depressions	nearly level	0-1.0 feet	strongly acid	poorly drained	4.4
Dunbar sandy loam	interstream divides	nearly level	1.0-2.5 feet	strongly acid	somewhat poorly drained	1.0
Duplin loamy sand	flats	level	2.0-3.0 feet	very strongly acid	moderately well drained	0.2
Emporia loamy fine sand	uplands	level	3.0-4.5 feet	strongly acid	well drained	2.2
Goldsboro loamy sand	uplands	nearly level	1.5-2.5 feet	moderately acid	moderately well drained	4.1
Grifton fine sandy loam	uplands	nearly level	0-1.0 feet	strongly acid	poorly drained	16.1
Haplaquents, loamy	uplands	nearly level	n/a	n/a	n/a	5.8
Lynchburg loamy sand	flats	level	0.5-1.5 feet	very strongly acid	somewhat poorly drained	10.0
Mouzon fine sandy loam	depressions	nearly level	0-1.0 feet	moderately acid	poorly drained	23.1
Noboco loamy sand	uplands	nearly level		moderately acid	moderately well drained	8.1
Pantego sandy loam	depressions	level	0-1.0 feet	very strongly acid	very poorly drained	3.2
Rains sandy loam	depressions	level	0-1.0 feet	very strongly acid	poorly drained	3.7
Water	n/a	n/a	n/a	n/a	n/a	1.2

The proposed pipeline easement extends through a mix of commercial, industrial, and pastoral areas. Figures 2.1-2.5 display the proposed pipeline easement on recent aerial photographs (the locations of the identified sites, isolated finds, and potential historic architectural resources also are indicated). Along SC-453, between Boyer Road and Four Hole Swamp, a distance of approximately 2.6 miles, the pipeline easement passes through a mix of clearcut forest, wooded areas, and industrial areas. Industry along this stretch includes Don's Auto Salvage to the west and abandoned and active mining facilities belonging to Holcim US. Within the proposed pipeline easement, Holcim US's mining facilities include abandoned office buildings and grounds and dump sites (see Figures 1.1-1.3). The proposed pipeline easement extends along an extant utilities corridor through Four Hole Swamp, a distance of approximately 1.66 miles. Between Four Hole Swamp

and Seven Mile Road, a distance of approximately 0.6 mile, the proposed pipeline easement extends along the western edge of SC-453 following an extant utilities corridor. Along this stretch, Argo USA's concrete mining and manufacturing facility lies east of SC-453. Just north of Seven Mile Road, the proposed pipeline easement turns east following Seven Mile Road, before turning south again east of the extant Southern Railroad. Between Seven Mile Road and I-26, the proposed pipeline easement extends through dense hardwood swamp. From I-26 to Hutto Street, the proposed pipeline easement extends through mixed pine and hardwood forest. Some areas along this stretch appear to be borrowed out, perhaps for the construction of I-26. Along this stretch, the proposed pipeline easement extends along an old dirt road. This is where investigators identified Sites 38DR431 and 38DR432. Figures 2.6 and 2.7 provide views of the proposed pipeline easement.



Figure 2.1 The northern portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing the area between Boyer Road and Don's Auto Salvage.



Figure 2.2 The north-central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing the area near Holcim US and Four Hole Swamp.



Figure 2.3 The central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, showing areas around Four Hole Swamp and Argo USA.





Figure 2.4 The south-central portion of the proposed Harleyville Reach Water Transmission Main along SC-453, Seven Mile Road, and the Southern Railroad, showing areas around Argo USA, I-26, and Railroad Avenue.



Figure 2.5 The southern portion of the proposed Harleyville Reach Water Transmission Main along the Southern Railroad, showing the area north of Harleyville.



Figure 2.6 Views of the proposed Harleyville Reach Water Transmission Main Project Area: northern portion of the project looking south along the west side of SC-453 (top); abandoned Holcim US facility along the west side of SC-453, looking north (bottom).



Figure 2.7 Views of the proposed Harleyville Reach Water Transmission Main Project Area: middle portion of the project showing an extant utilities corridor extending through Four Hole Swamp, looking north (top); southern portion of the project looking south along Railroad Avenue (bottom).

## 2.2 Cultural Setting

The history of South Carolina generally can be divided into three primary eras: Pre-Contact, Contact, and Post-Contact. The Pre-Contact era of coastal South Carolina has received much attention from archaeologists. The present interpretations of that prehistory are presented briefly in this section. Readers are directed to Goodyear and Hanson (1989) for detailed overviews of previous research in the region. The following summary is divided into periods that represent distinct cultural adaptations in the region.

### 2.2.1 Pre-Contact Era

**Paleoindian Period (10000–8000 BC).** Human presence in the South Carolina Coastal Plain apparently began about 12,000 years ago with the movement into the region of hunter-gatherers. Goodyear et al. (1989) have reviewed the evidence for the Paleoindian occupation of South Carolina. Based on the distribution of distinctive fluted spear points diagnostic to the period, they see the major sources of highly workable lithic raw materials as the principal determinant of Paleoindian site location. The concentration of sites at the Fall Line possibly indicates a subsistence strategy of seasonal relocation between the Piedmont and Coastal Plain. Based on data from many sites excavated over most of North America, Paleoindian groups were generally nomadic. Their subsistence focused on the hunting of large mammals, specifically the now-extinct mammoth, horse, camel, and giant bison. Groups were probably small (i.e., kin-based bands of 50 or fewer persons). As the environment changed at the end of the Wisconsin glaciation, Paleoindian groups had to adapt to new forest conditions in the Southeast and throughout North America.

**Archaic Period (8000–1500 BC).** The Archaic is a long period of adaptation to modern forest conditions in eastern North America. Caldwell (1958) has characterized the period as movement toward Primary Forest Efficiency, meaning that during this period human groups continually developed new and more effective subsistence strategies for exploiting the wild resources of the modern oak-hickory forest. Based on extensive work in the North Caro-

lina Piedmont, Coe (1964) subdivided the Archaic period into several sequential phases recognizable by distinctive stone point/knife forms. Coe's (1964) sequence has been confirmed over large parts of the Southeast and is applicable to most of South Carolina. The Archaic also is divided into three temporal subperiods: Early (8000–6000 BC), Middle (6000–2500 BC), and Late (2500–1000 BC).

Archaic groups probably moved seasonally within a regular territory, planning and scheduling the exploitation of wild plant and animal resources. Anderson and Hanson (1988) developed a settlement model for the Early Archaic (8000–6000 BC) in South Carolina involving seasonal movement of relatively small groups (bands) within major river drainages. The Charleston region lies within the range of the Saluda/Broad band. Anderson and Hanson (1988) hypothesize that Early Archaic use of the Lower Coastal Plain was limited to seasonal (springtime) foraging camps and logistical camps; aggregation camps and winter base camps are thought to have been near the Fall Line. They also suggest that as population increased in the Middle Archaic (6000–2500 BC), band mobility decreased and territoriality increased. Blanton and Sassaman (1989) reviewed the archaeological literature on the Middle Archaic subperiod. They document an increased simplification of lithic technology through this period, with increased use of expedient, situational tools. Furthermore, they argue that the use of local lithic raw materials is characteristic of the Middle and Late Archaic. Blanton and Sassaman (1989:68) conclude that "the data at hand suggest that Middle Archaic populations resorted to a pattern of adaptive flexibility as a response to 'mid-Holocene environmental conditions' such as variable precipitation, sea level rise, and differential vegetational succession." These processes resulted in changes in the types of resources available from year to year.

Generally, there is evidence of extensive trade networks covering large areas of North America and of the establishment of sedentary villages during the Late Archaic subperiod (2500–1000 BC). Some of the best evidence of sedentary villages occurs along the South Carolina coast as large middens of oyster shell and other food remains. These refuse heaps probably indicate substantial, relatively long-term habitations.

Also, the first evidence of the manufacture and use of ceramics dates from the Late Archaic subperiod.

**Woodland Period (1500 BC–AD 1000).** During the succeeding Woodland period, sedentism apparently increased, although scheduled exploitation of wild food resources in a seasonal round continued. The Woodland period is noteworthy for several technological and social developments: (1) the widespread manufacture and use of ceramics for cooking and storage, (2) the beginnings of agriculture, and (3) construction of burial mounds and other earthworks. While evidence of burial mounds and agriculture is not extensive at the few South Carolina Woodland-period sites investigated in detail (Brooks and Canouts 1984; Trinkley 1980, 1990), ceramics are widespread and are found at many small sites throughout the state. The varied manufacturing procedures and decorative styles of these ceramics allow differentiation of site collections into three subperiods (Early, Middle, and Late) and inferences of group movement and influence from adjacent geographic areas. Trinkley (1980) and Anderson et al. (1982) have developed classificatory schemes for Woodland-period groups based on ceramics from many sites. Following Anderson et al. (1982), Poplin et al. (1993) developed a classificatory scheme for the ceramic-producing prehistoric periods in the Charleston region.

**Mississippian Period (AD 1000–1521).** The final period of prehistory in South Carolina, the Mississippian period, begins about AD 1000 and ends with the arrival and colonization of the area by Europeans in the 1500s and 1600s. During the Mississippian period, agriculture became well established, and sedentary villages and towns became the dominant habitation type (although relatively isolated farmsteads were also apparently common [see Brooks and Canouts 1984]). Ferguson (1971) proposed a model of Mississippian settlement involving major political centers dominated and surrounded by smaller villages and farmsteads. Major centers were apparently spaced about 160 kilometers apart; hypothesized centers in the project region were located at Town Creek, North Carolina; near Camden, Lake Marion, and Charleston, South Carolina; and near Augusta and Savannah, Georgia (Ferguson 1971).

Anderson (1989) and DePratter (1989) have identified large political centers on the Wateree River (near Camden), on the Oconee River (in central Georgia), and at Savannah (Georgia). These centers usually contained one or more large mounds upon which temples were built. It should be noted that the ceremonial center at the original Charles Towne settlement on Albemarle Point (38CH1) contained no mound structure (South 2002). Mississippian society appears to have been highly stratified, with hereditary ruling families, middle and poorer classes, and slaves (usually prisoners taken in war from other groups).

### 2.2.2 Contact Era

The Contact era began in South Carolina with the first Spanish explorations into the region in the 1520s. Native American groups encountered by the European explorers and settlers probably were living in a manner quite similar to the late Pre-Contact Mississippian groups identified in archaeological sites throughout the Southeast. However, the initial European forays into the Southeast contributed to the disintegration and collapse of the aboriginal Mississippian social structures; disease, warfare, and European slave raids all contributed to the rapid decline of the regional Native American populations during the sixteenth century (Dobyns 1983; Rame-nofsky 1982; Smith 1984). By the late seventeenth century, Native American groups in coastal South Carolina apparently lived in small, politically and socially autonomous, semi-sedentary groups (Waddell 1980). By the mid-eighteenth century, very few Native Americans remained in the region; all had been displaced or annihilated by the ever-expanding English colonial settlement of the Carolinas (Anderson and Logan 1981:24-25).

Waddell (1980) identified 19 distinct groups between the mouth of the Santee River and the mouth of the Savannah River in the mid-sixteenth century. Anderson and Logan (1981:29) suggest that many of these groups probably were controlled by Cofit-achequi, the dominant Mississippian center/polity in South Carolina, prior to its collapse. By the seventeenth century, all were independently organized. These groups included the Coosaw, Etiwan, and Sewee along the Ashley, Cooper, and Wando rivers and the Santee farther to the interior. The Coosaw

inhabited the area along the upper Ashley River. The Etiwans were mainly settled on the north and east sides of Charleston Harbor, but their range extended to the head of the Cooper River. The territory of the Sewee met the territory of the Etiwan high up the Cooper, and extended to the north as far as the Santee River (Orvin 1973:14).

The ethnohistoric record from coastal South Carolina suggests that the Contact-era groups of the region followed a seasonal pattern that included summer aggregation in villages for planting and harvesting domesticates, and dispersal into one- to three-family settlements for the remainder of the year (Waddell 1980:147-151). This coastal adaptation is apparently very similar to the Guale pattern of the Georgia coast, as reconstructed by Crook (1986:18).

### **2.2.3 Post-Contact Era**

The Carolina coast was first permanently settled by Europeans in 1670. The earlier Spanish attempts to settle at San Miguel de Gualdape (1526) to the north and at Santa Elena (1566–1587) to the south, as well as the short-lived French settlement on Port Royal (1562), primarily resulted in the reduction of the local Indian populations. The establishment of Charles Towne by the British in 1670, however, sparked a period of intensive hide and slave trade with the Indians of the region and provided a base from which settlers quickly spread up the Cooper River and its tributaries. Charles Towne initially was settled under the proprietary system; not until 1719 did South Carolina become a royal colony.

The early economic development in the project area initially focused on Indian trade; however, naval stores production soon replaced the skins, slaves, and other local commodities acquired from the aboriginal inhabitants of the region. Trade with the Indians was pursued aggressively through the beginning of the eighteenth century, but by 1716 conflicts with the Europeans, as well as disease, had drastically reduced or displaced the local native population.

Naval stores production flourished for a short period with the encouragement of bounties provided by the Crown. However, England failed to recognize the extent of the supply of pine on the Carolina coastal strand, and the production of naval stores quickly surpassed demand.

The new colony was organized with the parish as the local unit of government. The church building itself was to serve both religious and political purposes. As Gregorie (1961:5) explains, “The parish church was to be the center for the administration of some local government in each parish, for at that time there was not a courthouse in the province, not even in Charleston.”

In 1720, there were 107 white taxpayers and 2,027 slaves in St. James Goose Creek Parish, which contains much of the project area (Petty 1975:24). Four parishes had larger populations of taxpayers, but only one, St. Andrews, had more slaves. Most of the slaves were involved in the production of rice. As early as 1720, rice accounted for half of the colony’s profits, and the importance of rice grew over the next 140 years. It was complemented by the introduction of indigo as a cash crop in 1740 (Pinckney 1976). While rice production was restricted to the river marshes, indigo grew best in well-drained soils.

By the 1740s, the population of South Carolina had expanded dramatically. More areas were settled, with plantations spreading throughout much of the Lowcountry. Large-scale agricultural production was achieved through the operation of plantations that employed slave labor. Slaves were brought from West Africa to perform the many tasks necessary to produce cash crops on the plantations. Slave labor was especially essential to rice production, with knowledgeable slaves (i.e., those taken from African rice-producing societies) conducting and directing most of the activities associated with rice growing and harvesting (Joyner 1984). This system of production would continue until the end of the Civil War, which resulted in the abolition of slavery throughout the United States.

Most of the early settlements and plantations focused on the Cooper, Wando, Ashley, and Stono rivers and Goose Creek. These waters provided the best opportunities for profitable agricultural production (i.e., rice cultivation) as well as the best avenues of transportation to Charleston or other settlements in the region (South and Hartley 1985). Evidence of the many plantations along these rivers remains today primarily as archaeological sites, although some plantations, such as Rice Hope near Moncks Corner, are still occupied. Interior lands such as those near

Holly Hill often served as pasture lands for cattle and swine, or as a source of timber and game for plantation populations.

During the Revolutionary War, coastal South Carolina saw little action between the failed British attempt to take Charleston in 1776 and their successful occupation of the city in 1780. The British left Charleston in 1782. During the British occupation of Charleston, however, a number of plantations in St. James Goose Creek Parish were visited by British troops. Produce, stock, and slaves were removed from many plantations, often by force of arms. A number of landowners also had buildings and facilities destroyed by the British occupation forces; the Middleton plantation at Crowfield and the Moultrie estate at Otranto are two notable examples (see Elliott 1987:44 concerning losses at Crowfield). One of the principal battles of the war in the South occurred to the northeast of Holly Hill at Eutaw Springs, near Eutawville. Here the American forces of General Nathanael Greene stopped a British force moving to reinforce and relieve the besieged army of Lord Cornwallis at Yorktown, Virginia. Failure to prevent this reinforcement may have prolonged the war by allowing Cornwallis to escape capture.

An important outcome of the Revolutionary War was the removal of royal trade protection, which caused a drastic reduction in rice profitability. As a result, many planters in the study area began to supplement their rice crops with cotton agriculture. Unfortunately, soils in the study area were not as productive for cotton as those of the Sea Islands.

Although the Civil War brought extensive battles to Charleston, there were no major battles in the study area. The main impact of the war on the immediate area was social and economic upheaval. Furthermore, the ensuing Reconstruction period brought drastic changes in regional land use.

During Reconstruction, there was a dramatic increase in the number of farms and a drastic decrease in average farm size, as predominantly white landowners began selling and/or renting portions of their holdings. In 1880, 55 percent of the farms in Charleston County were tenant-operated (United States Department of the Interior 1883). In the 1880s, Berkeley County was created from interior Charleston County, with the courthouse located in the small town of Moncks Corner.

In addition to corn, cotton, and cattle, truck farming was a major element of postbellum agriculture. Truck crops accounted for 24 percent of the agricultural value for Charleston County by 1900. The importance of truck farming in Charleston County grew significantly, and in 1930 truck crops represented 79 percent of all crops grown in Charleston County (Brockington et al. 1985:49). This level of importance has remained relatively stable through the present.

In the years following World War II, the region continued to possess significant numbers of small farms. In addition, timber harvesting returned as a major industry, particularly in the more inland portions of Berkeley, Dorchester, and Orangeburg counties. In addition, when not being harvested for timber, these timberlands often serve as hunting grounds for local inhabitants. Other major industries of the region today include mining for various aggregates, including marl from which cement is made. Another major development in the region was the construction of Lakes Marion and Moultrie by the South Carolina Public Service Authority in the 1940s. This diversion of the Santee River into the Cooper River drainage generates electricity for the region, provides excellent recreational fishing and boating, and is the source of water for the Lake Marion Regional Water System.

Today, this portion of Dorchester and Orangeburg counties maintains its rural and agrarian nature. Cotton and soybeans are the most commonly grown crops, usually by farmers who rent or own large pieces of land. Much of the land also remains in the hands of timber companies, or is leased to timber companies, who grow pines for both paper pulp and saw timber. More recently, mining interests have developed a number of large mines, particularly for the production of cement from soft limestones or marls that underlie this portion of the Coastal Plain of South Carolina. Harleyville lies near two of the largest of these mines in South Carolina, facilities managed by Argo USA and Holcim US.

The Town of Harleyville was incorporated in 1893, growing up around the intersection of the 1885 Charleston, Sumter, and Northern Railroad over the Orangeburg-Charleston Highway (US Route 178). Early settlement in the Harleyville area is indicated in Mills' (1979) map of Colleton District



with the name of “Riddlespurger.” The first post office in the area is indicated on maps as “Ridell,” perhaps a shortened version of “Riddlespurger” (Fick 1997:53). By 1900, the Town of Harleyville supported numerous business establishments with an estimated population of 300. Then as now, the Town of Harleyville remains largely agrarian, as the commercial hub for local farmers, loggers, and now workers associated with nearby mining facilities. Figure 2.8 shows the USACE (1920a) Eutwaille and USACE (1920b) Ridgeville quadrangles, with the locations of the proposed project easement and site 38DR431 superimposed.

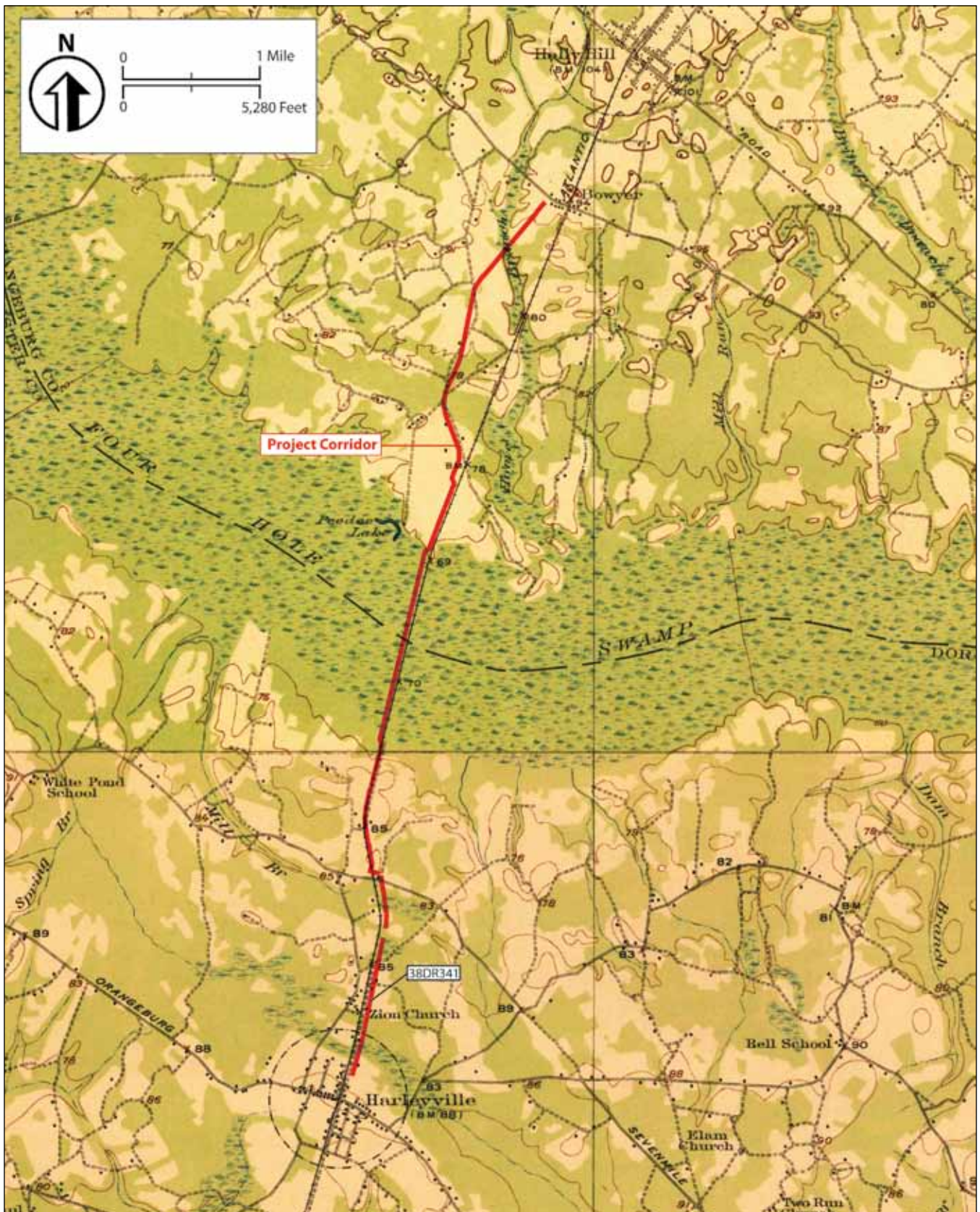


Figure 2.8 The location of the Harleyville Reach Water Transmission Main Project on the USACE (1920a) *Eutawville* and USACE (1920b) *Ridgeville* quadrangles.



## 3.0 Results and Recommendations

Intensive survey of the easement of the proposed Harleyville Reach Water Transmission Main identified two new archaeological sites (sites 38DR431 and 38DR432) and two isolated artifact finds (Isolates 1 and 2). A description of these sites and isolated artifacts follow. A reconnaissance of the built environment adjacent to the easement identified no historic resources. Management recommendations conclude Chapter 3.

### 3.1 Site 38DR431

**Cultural Affiliation:** 19<sup>th</sup>/20<sup>th</sup> century

**Site Type:** Post-Contact domestic scatter

**Site Dimensions:** 150 feet (north/south) x 100 feet (east/west)

**Elevation:** 90 feet above mean sea level

**Nearest Water Source:** Tom and Kate Branch

**Soil Type/Texture:** Noboco Loamy Sand

**Vegetation:** mixed hardwoods and pines

**NRHP Recommendation:** not eligible

Site 38DR431 is a surface/subsurface scatter of Post-Contact domestic artifacts located along an old road on a broad ridge, 100 feet east of the intersection of Kennedy Road, Railroad Boulevard, and the Southern Railroad (see Figures 1.1 and 2.4). The site measures 150-by-100 feet, oriented to grid north (12° Azimuth). Vegetation across the site consists of young mixed hardwoods and pines, with a dense understory of briars, grass, saplings, and vines. An old unpaved road extends north/south along the site. Surface visibility at the site was poor (1-25 percent) in the wooded areas and fair along the old road (26–50 percent). Two consecutive negative shovel tests at 50-foot intervals and the Southern Railroad define the site boundaries. Site 38DR431 is associated with site 38DR432 and Isolate 1 to the north. Figure 3.1 displays a plan of sites 38DR431 and 38DR432 and Isolate 1. Figure 3.2 provides views of site 38DR431.

We excavated 16 shovel tests at 25- and 50-foot intervals in and around site 38DR431; six of these shovel tests produced artifacts. Soils across the site include a very dark grayish brown (10YR3/2) loamy sand 0–1.0 foot (ft) below surface (bs) and a light yellowish brown (10YR6/4) fine sand 1.0-2.0 ft bs, underlain by a yellowish brown (10YR5/8) sandy

clay loam 2.0+ ft bs. These soils are similar to those described by Morton (2006) as Noboco Loamy Sand. We recovered artifacts 0–1.0 ft bs. None of the shovel tests exposed subsurface cultural features.

We recovered 23 artifacts from site 38DR431. These include 13 architectural artifacts (e.g., brick and nails), one hardware artifact (e.g., chimney glass), and nine kitchen-related artifacts (e.g., ceramic and glass). Ten of these artifacts are temporally diagnostic, including the amethyst glass (1880–1915), the machine-made glass (1904-present), the milkglass (1869-present), and the whiteware (1830–present). These artifacts suggest a late-nineteenth- to early-twentieth-century occupation at site 38DR431. The USACE (1920b) *Ridgeville* quadrangle shows an old road leading past one building in close vicinity to the present location of site 38DR431 (see Figure 2.8). The USACE (1943) *Ridgeville* quadrangle also shows the road but shows two buildings in the vicinity of sites 38DR431 and 38DR432. The South Carolina State Highway Department (SCSHD) (1939) *General Highway and Transportation Map of Dorchester County* and the South Carolina Department of Highways and Public Transportation (SCDHPT) (1969) *General Highway Map of Dorchester County* show clusters of four and seven buildings, respectively, near sites 38DR431 and 38DR432. However, the USGS (1973) *Harleyville, SC* quadrangle shows no buildings in this area. Therefore, site 38DR431 is the likely location of a late-nineteenth- to mid-twentieth-century tenant farm that was destroyed or abandoned in the 1960s.

We assessed the NRHP eligibility of site 38DR431 with respect to Criterion D, its ability to add significantly to our understanding of site 38DR431 and the history of Dorchester County. site 38DR431 contains artifacts associated with a late-nineteenth- to mid-twentieth-century tenant farm. These kinds of archaeological sites are common in northern Dorchester County. The artifacts do not occur in concentrations sufficient to interpret activities that occurred at the site. The subsurface artifact density at the site is very low. These factors suggest that this site does not have the potential to contain a substantial artifact assemblage and/or intact cultural features. Additional investigation of site 38DR431

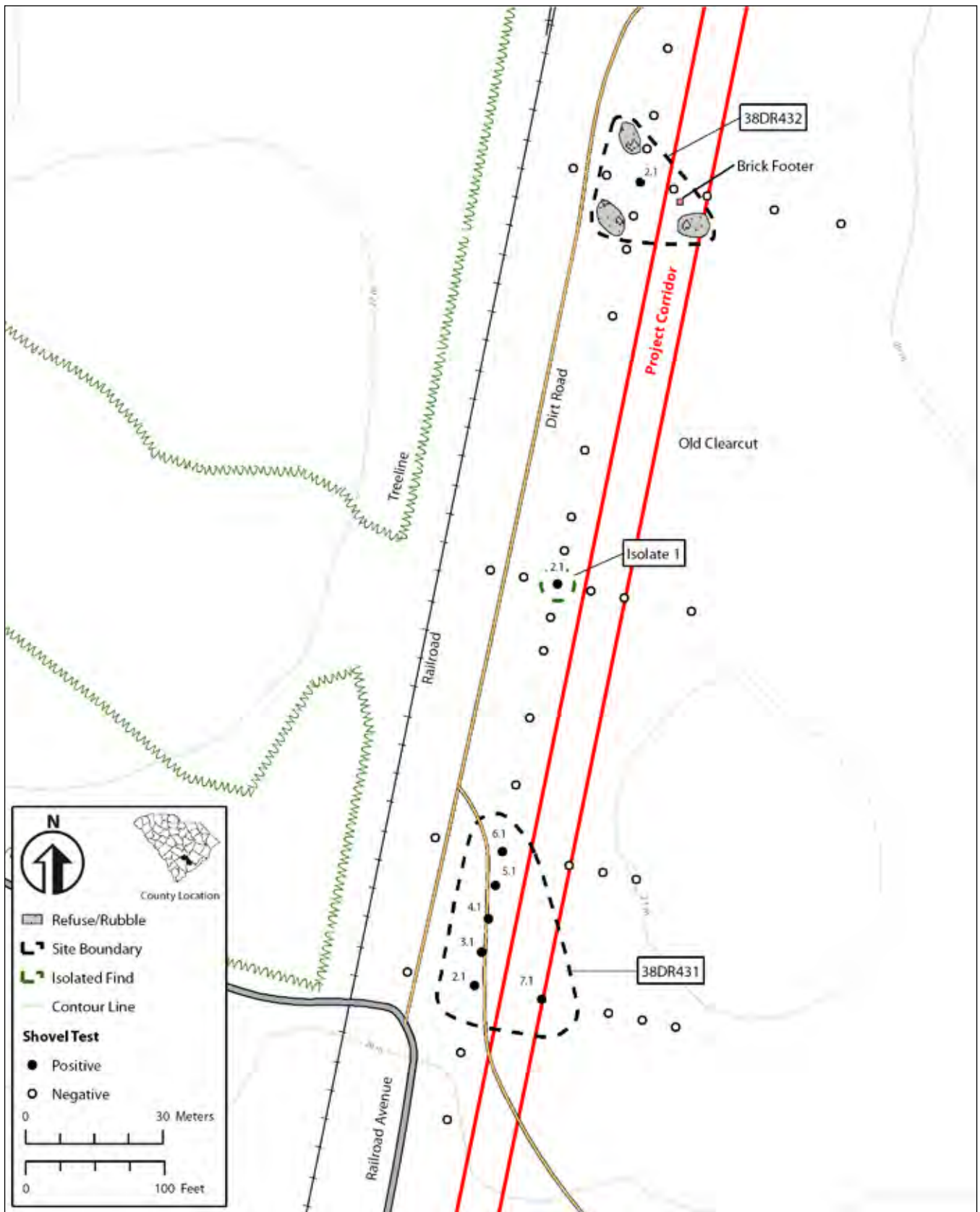


Figure 3.1 Plan of sites 38DR431 and 38DR432 and Isolate 1.



Figure 3.2 Views of Site 38DR341: looking south (top) and east (bottom).

is unlikely to generate information beyond the period of use and the presumed function(s) presented above. Site 38DR431 cannot generate significant information concerning the past settlement patterns or land-use practices in Dorchester County. Therefore, we recommend site 38DR431 not eligible for the NRHP. Additional management of this site is not warranted.

### **3.2 Site 38DR432**

**Cultural Affiliation:** 20<sup>th</sup> century

**Site Type:** Post-Contact domestic scatter

**Site Dimensions:** 130 feet (north/south) x 130 feet (east/west)

**Elevation:** 90 feet above mean sea level

**Nearest Water Source:** Tom and Kate Branch

**Soil Type/Texture:** Noboco Loamy Sand

**Vegetation:** mixed hardwoods and pines

**NRHP Recommendation:** not eligible

Site 38DR432 is a surface/subsurface scatter of Post-Contact domestic artifacts located along an old unpaved road on a broad ridge, 100 feet east of the intersection of Kennedy Road, Railroad Boulevard, and the Southern Railroad (see Figures 1.1, 2.4, and 3.1). The site measures 130-by-130 feet, oriented to grid north (12° Azimuth). Vegetation across the site consists of young mixed hardwoods and pines, with a dense understory of briars, grass, saplings, and vines. An old road extends west and north of the site. Surface visibility at the site was poor (1-25 percent) in the wooded areas and fair along the old road (26–50 percent). Investigators observed at least three concentrations of architectural materials and modern refuse across site 38DR432 (see Figure 3.1). Two consecutive negative shovel tests at 50-foot intervals and the Southern Railroad define the site boundaries. Site 38DR432 is associated with site 38DR431 and Isolate 1 to the south. Figure 3.3 provides views of site 38DR432.

We excavated 14 shovel tests at 25- and 50-foot intervals in and around site 38DR432; one of these shovel tests produced artifacts. Soils across the site include a very dark grayish brown (10YR3/2) loamy sand 0–1.0 ft bs and a light yellowish brown (10YR6/4) fine sand 1.0–2.0 ft bs, underlain by a yellowish brown (10YR5/8) sandy clay loam 2.0+ ft bs. These soils are similar to those described by Morton (2006) as Noboco Loamy Sand. We recovered artifacts 0–1.0 ft

bs. None of the shovel tests exposed subsurface cultural features. Several shovel tests excavated within site 38DR432 produced road gravel.

We recovered four artifacts from site 38DR432. These include two clear machine-made bottle glass fragments (that mend) embossed with the number “3.” These bottle glass fragments are likely portions of a milk bottle. The other two artifacts are amber bottle glass fragments. In addition, we observed brick and mortar and cinder block fragments across the site.

As discussed above, site 38DR432 is not shown on the USACE (1920b) *Ridgeville* quadrangle but is likely shown on the USACE (1943) *Ridgeville* quadrangle, as well as the SCSHD (1939) and the SCDHPT (1969) maps. Artifacts collected and observed at site 38DR432 suggest a twentieth century occupation. Conditions at site 38DR432 suggest the site may have functioned as a barn or other tenant farm-related structure. The USGS (1973) *Harleyville, SC* quadrangle does not show any buildings or structures in the vicinity of Sites 1 or 2 (see Figure 1.3).

We assessed the NRHP eligibility of site 38DR432 with respect to Criterion D, its ability to add significantly to our understanding of site 38DR432 and the history of Dorchester County. Site 38DR432 contains artifacts associated with a twentieth-century tenant farm. These kinds of archaeological sites are common in northern Dorchester County. The artifacts do not occur in concentrations sufficient to interpret activities that occurred at the site. The subsurface artifact density at the site is very low. These factors suggest that this site does not have the potential to contain a substantial artifact assemblage and/or intact cultural features. Additional investigation of site 38DR432 is unlikely to generate information beyond the period of use and the presumed function(s) presented above. Site 38DR432 cannot generate significant information concerning the past settlement patterns or land-use practices in Dorchester County. Therefore, we recommend site 38DR432 not eligible for the NRHP. Additional management of this site is not warranted.



Figure 3.3 Views of Site 38DR432: looking south showing rubble (top); looking east showing brick/mortar footer (bottom).



### **3.3 Isolated Finds**

Archaeological survey also identified two isolated artifact occurrences (Isolates 1 and 2). Isolate 1 is a ceramic marble recovered from a single shovel test at a depth of 0-1.0 ft bs. Isolate 1 is located between Sites 1 and 2 and is likely associated with activities at these two archaeological sites (see Figures 1.3, 2.4, and 3.1). Isolate 2 is an amethyst glass fragment recovered from a single shovel test at a depth of 0-1.0 ft bs. Isolate 2 is located in a wooded area in the north-central portion of the project (see Figures 1.1 and 2.2). These isolated artifact occurrences can generate no additional information about the past. We recommend these isolated finds not eligible for the NRHP. These isolated finds warrant no further management consideration.

### **3.4 Management Recommendations**

Intensive survey of the easement of the proposed Harleyville Reach Water Transmission Main identified two archaeological sites (sites 38DR431 and 38DR432) and two isolated artifact finds (Isolates 1 and 2). We recommend these four cultural resources (sites 38DR431 and 38DR432 and Isolates 1 and 2) not eligible for the NRHP. None of these resources contains the kinds of artifact deposits or features from which we can gain important information about the past. Architectural reconnaissance identified no historic buildings or landscapes within or immediately adjacent to the proposed water pipeline easement. Thus, there are no historic properties within or immediately adjacent to the project. Therefore, the project as currently designed will affect no historic properties.

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# **Appendix A**

## Artifact Catalog





# Artifact Catalog

Brockington and Associates, Inc. uses the following proveniencing system. Provenience 1 designates general surface collections. Numbers after the decimal point designate subsequent surface collections, or trenches. Proveniences 2 to 200 designate shovel tests. Controlled surface collections and 50 by 50 cm units are also designated by this provenience range. Proveniences 201 to 400 designate 1 by 1 m units done for testing purposes. Proveniences 401 to 600 designate excavation units (1 by 2 m, 2 by 2 m, or larger). Provenience numbers over 600 designate features. For all provenience numbers except 1, the numbers after the decimal point designate levels. Provenience X.0 is a surface collection at a shovel test or unit. X .1 designates level one, and X.2 designates level two. For example, 401.2 is Excavation Unit 401, level 2. Flotation samples are designated by a 01 added after the level. For example, 401.201 is the flotation material from Excavation Unit 401, level 2.

Table of Contents	
Site Number	Page Number
38DR431	1-2
38DR432	2
isolates	2

**Site Number:** 38DR431

*Catalog # Count Weight (in g) Artifact Description*

*Lithic Type Ceramic Type Temporal Range*

*Comments*

**SITE NUMBER:** 38DR431

*Provenience Number:* **2 . 1 Shovel Test 321, 900m North, 1000m East, 0-20cm**

- |   |   |     |  |  |  |                  |
|---|---|-----|--|--|--|------------------|
| 1 | 1 | 1.8 | Solarized - Amethyst Glass Fragment            |  |  |                  |
| 2 | 1 | 1.4 | Unidentifiable Square Unknown Manufacture Nail |  |  |                  |
| 3 | 4 | 2.8 | Brick, Fragment                                |  |  | discarded in lab |

*Provenience Number:* **3 . 1 Shovel Test, 925m North, 1000m East, 0-15cm**

- |   |   |     |                                  |  |  |                  |
|---|---|-----|----------------------------------|--|--|------------------|
| 1 | 2 | 3.4 | Brick, Fragment                  |  |  | discarded in lab |
| 2 | 1 | 0.1 | Colorless Chimney Glass Fragment |  |  |                  |

*Provenience Number:* **4 . 1 Shovel Test, 950m North, 1000m East, 0-20cm**

- |   |   |     |                                     |  |  |                  |
|---|---|-----|-------------------------------------|--|--|------------------|
| 1 | 1 | 1.3 | Brick, Fragment                     |  |  | discarded in lab |
| 2 | 1 | 1.6 | Whiteware, Fragment                 |  |  |                  |
| 3 | 1 | 0.3 | Colorless Window Glass Fragment     |  |  |                  |
| 4 | 1 | 0.3 | Solarized - Amethyst Glass Fragment |  |  |                  |

*Provenience Number:* **5 . 1 Shovel Test, 975m North, 1000m East, 0-15cm**

- |   |   |     |                                   |  |  |  |
|---|---|-----|-----------------------------------|--|--|--|
| 1 | 1 | 0.4 | Cobalt Blue Glass Bottle Fragment |  |  |  |
|---|---|-----|-----------------------------------|--|--|--|

*Provenience Number:* **6 . 1 Shovel Test 320, 1000m North, 1000m East, 0-30cm**

- |   |   |     |                    |  |  |                  |
|---|---|-----|--------------------|--|--|------------------|
| 1 | 2 | 4.9 | Brick, Fragment    |  |  | discarded in lab |
| 2 | 1 | 0.6 | Milkglass Fragment |  |  |                  |

<b>Site Number:</b> 38DR431									
<i>Catalog #</i>	<i>Count</i>	<i>Weight (in g)</i>	<i>Artifact Description</i>	<i>Lithic Type</i>	<i>Ceramic Type</i>	<i>Temporal Range</i>	<i>Comments</i>		
3	1	5.8	Light Blue Glass Burned						
<b>Provenience Number:</b> 7 . 1 Shovel Test, 900m North, 1050m East, 0-30cm									
1	1	2.4	Brick, Fragment						
2	1	0.6	Light Blue Glass Fragment						
3	1	4.1	Colorless Molded Glass Embossed Fragment						
4	1	8.7	Unidentifiable Square Unknown Manufacture Nail						
5	1	1.1	Unidentifiable Unknown Manufacture Nail						
<b>SITE NUMBER:</b> 38DR432									
<b>Provenience Number:</b> 2 . 1 Shovel Test 315, 1500m North, 1000m East, 0-30cm									
1	2	3.3	Colorless Molded Glass Embossed Bottle Fragment				3 cent' milk jug		
2	2	1.2	Brown Glass Fragment						
<b>SITE NUMBER:</b> isolate 1									
<b>Provenience Number:</b> 2 . 1 Shovel Test 318, 1200m North, 1000m East, 0-30cm									
1	1	2.9					clay marble		
<b>SITE NUMBER:</b> isolate 2									
<b>Provenience Number:</b> 2 . 1 Shovel Test 90, 0-30cm									
1	1	1	Solarized - Amethyst Glass Fragment						

# **Appendix B**

## Architectural Resources

<b>Resource</b>	<b>Description</b>	<b>Address</b>	<b>Date</b>
219-662	Residence	308 E. Main St.	ca. 1940
219-663	Residence	305 E. Main St.	ca. 1915
219-665	Methodist Parsonage	289 E. Main St.	1915
219-666.00	Harleyville School	S. Railroad Ave.	1937
219-666.01	Harleyville School Gym	S. Railroad Ave.	1937
219-667	Residence	171 John St.	1942
219-668	Mims House	176 S. Railroad Ave.	ca. 1930
219-671	Johnson House	Waymer St.	ca. 1935
219-672	Residence	136 Hill St.	ca. 1935
219-673	Hussey House	112 Judge St.	ca. 1915
219-674	Bell House	147 Kate St.	ca. 1885
219-675	Residence	131 Kate St.	ca. 1925
219-676.00	Pearcy-Utsey House	104 W. Main St.	ca. 1890
219-676.01	Harleyville Post Office	104 W. Main St.	1931
219-677	Utsey House	114 Bowman St.	ca. 1905
219-678	Harleyville School	118 Bowman St.	1898
219-679	Moorer House	140 W. Main St.	ca. 1890
219-680	Westbury House	144 W. Main St.	ca. 1915
219-681	Parler House	133 W. Main St.	ca. 1880
219-682	Murray House	125 W. Main St.	ca. 1910
219-683	Westbury Hardware	111-113 W. Main St.	ca. 1915
219-684	Westbury Building	107-109 W. Main St.	ca. 1910
219-685	Dotson House	120 W. Main St.	1898
219-686	Quattlebaum House	156 E. Main St.	ca. 1910
219-687	Residence	167 E. Main St.	ca. 1915
219-688	Hilton House	179 E. Main St.	1911
219-689	Knight House	224 E. Main St.	ca. 1915
219-690	Baker House	217 E. Main St.	ca. 1920
219-691	Residence	229 E. Main St.	ca. 1925
219-692	Residence	257 E. Main St.	ca. 1915
219-693	Residence	153 W. Main St.	ca. 1910
219-694	Utsey's Store	161 W. Main St.	ca. 1925
219-695	Murray House	164 W. Main St.	1899
219-696	Hutto House	178 W. Main St.	ca. 1910
219-697	Residence	188 W. Main St.	ca. 1915
219-698	Residence	200 W. Main St.	ca. 1915
219-699	Bair House	289 W. Main St.	ca. 1925

## **APPENDIX C**

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### **Wetland Mitigation Worksheet**

Wetland Mitigation Factor Scoring Definitions							
FACTORS		OPTIONS					
Type of Wetland Lost	Type	Type C (Type C wetlands include the following: man-made lakes and ponds; impoundments; vegetated lake littoral; and shallow cove areas)		Type B (Type B wetlands include the following: seeps and bogs; depressions; savannahs and flatwoods; and pocosins and bays)		Type A (Type A wetlands include the following: tidal vegetated systems; shallow subtidal bottoms; riverine systems including headwaters and riparian zones; bottomland hardwoods; and intertidal flats)	
	Score	0.2		2.0		3.0	
Wetland Priority Category	Category	Tertiary (Tertiary priority areas include the following categories of aquatic systems that do not fall into the designated primary priority category: bald cypress-tupelo gum swamp; non-alluvial swamp forest; swamp tupelo pond; pond pine woodland; pocosin (other than seepage or swale); pine flatwoods; and bottomland hardwood)		Secondary (Secondary priority areas include the following categories of vulnerable or uncommon aquatic systems that do not fall into the designated primary priority category: Carolina bay; swale pocosin; high elevation seep; pond cypress pond; bay forest; seepage pocosin; salt shrub thicket; upland depression swamp forest; and waters on the 303(d) list.)		Primary (Primary priority areas include the following: National Estuarine Sanctuaries; anadromous fish spawning waters; Wild and Scenic Rivers; State Heritage Trust Preserves; designated shellfish grounds; National Wildlife Refuges; Outstanding Resource Waters; waters officially designated by State or Federal agencies as high priority areas; Essential Fish Habitat; trout waters; old growth climax communities that have unique habitat structural complexity likely to support rare communities of plants or animals; all tidal waters; and rare aquatic systems (i.e.: hillside herb bog, piedmont seepage forest, upland bog, limestone sink, Atlantic white cedar bog, pine savannah, depression meadow, and interdune pond))	
	Score	0.5		1.5		2.0	
Existing Wetland Condition	Condition	Very Impaired (Site disturbances have resulted in the loss of most functions typically attributed to the aquatic resource type and functional recovery would require a significant restoration effort. Examples include: filled areas, excavated areas, or effectively drained wetlands (hydrology removed or significantly altered))		Impaired (Site disturbances have resulted in the loss of one or more functions typically attributed to the aquatic resource type and functional recovery is unlikely to occur through natural processes. Restoration activities are required to facilitate recovery. Examples include: areas that have been impacted by surface drainage and converted to pine monoculture or agriculture, areas that are severely fragmented, or wetlands within maintained utility corridors)		Partially Impaired (Site disturbances have resulted in partial or full loss of one or more functions typically attributed to the aquatic resource type but functional recovery is expected to occur through natural processes. Examples include: clear-cut wetlands, aquatic areas with ditches that impair but do not eliminate wetland hydrology, or temporarily cleared utility corridors)	
	Score	0.1		1.0		2.0	
Duration of Impact	Duration	0 to 1 year		1 to 3 years		3 to 5 years	
	Score	0.2		0.5		1.0	
Dominant Type of Impact*	Impact	Shade (shelter or screen by intercepting radiated light or heat. Examples of projects causing shading impacts include bridges, piers, and buildings on pilings)		Clear (remove vegetation without disturbing the existing topography of the soils)		Drain (ditching, channelization, or excavation that results in the removal of water from an aquatic area causing the area, or a portion of the aquatic area, to change over time to a non-aquatic area or a different type of aquatic area)	
	Score	0.2		1.0		2.0	
Cumulative Impact	Acres Impacted	< 0.25 acre		0.25 to 0.99 acre		1.0 to 2.99 acres	
	Score	0.1		0.2		0.5	
		5 to 10 years		Over 10 years			
	Score	1.5		2.0			
		Dredge (dig, gather, pull out, or excavate from waters of the United States)		Impound/Flood (collect or confine the flow of a riverine system by means of a dike, embankment, or other man made barrier. Impoundments may result in the formation of ponds, lakes, reservoirs, detention basins, etc, or they may limit the reach of high waters, such as levees or flood dikes)		Fill (depositing material used for the primary purpose of replacing an aquatic resource with dry land or changing the bottom elevation of a water body or wetland)	
	Score	2.5		2.5		3.0	
		3.0 to 9.99 acres		≥ 10.0 acres			
	Score	1.0		2.0			

\* Multiple impacts may occur with the project. For example, the construction of a recreational pond may include both fill impacts for the construction of the embankment and impound/flood impacts associated with impounding water for the pond itself.

*Cumulative Impact: defined by the National Environmental Policy Act as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The total acreage of permanent and temporary wetland impacts are added together to determine the value (0.1 -2.0) of the cumulative impact factor for a proposed project. The same value is used to calculate the required mitigation credits for each adverse impact associated with the proposed project.*

*Existing Condition: the degree of disturbance relative to the ability of a site to perform its physical, chemical, and biological functions. This factor evaluates site disturbances relative to the existing functional state of the system.*

*Duration: the length of time the adverse impacts are expected to last. For example, if a forested wetland is cleared to construct a temporary access road it will take more than 10 years for a similar forested canopy to develop*

<b>Wetland Mitigation Credit Calculation</b>			
<b>Factor</b>		<b>New Cleared Corridor Areas</b>	<b>Widening Existing Cleared Corridor Areas</b>
Type of Wetland Lost	Type	Type B	Type A
	Score (see above)	2.0	3.0
Wetland Priority Category	Category	Tertiary	Secondary
	Score (see above)	0.5	1.5
Existing Wetland Condition	Condition	Fully Functional	Partially Impaired
	Score (see above)	2.5	2.0
Duration of Impact	Duration	Over 10 years	Over 10 Years
	Score (see above)	2.0	2.0
Dominant Type of Impact	Impact	Clear	Clear
	Score (see above)	1.0	1.0
Cumulative Impact	Acres	1.0 to 2.99 acres	0.25 to 0.99 acre
	Score (see above)	0.5	0.2
Sum of Factors (S)		8.5	9.7
Actual Acres Impacted (A)		1.44 acres	0.26 acres
Required Credits (S x A)		12.44 Credits	2.52 Credits
<b>Total Mitigation Credits Required</b>		<b>14.76 Credits</b>	



## **APPENDIX D**

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### **List of Addresses for EA and Draft FONSI**

## List of Addressees for Draft EA and FONSI

Harold M. Young Orangeburg County Administrator	Mr. Dana Beach SC Coastal Conservation League
Mr. Jason Ward Dorchester County Administrator	Mr. Norman Brunswig Audubon South Carolina
Mr. Peter Wilson Sumter County Engineer	SC Department of Transportation
Mr. Joseph T. McElveen, Jr. Mayor, City of Sumter	South Carolina Sierra Club
Mr. Al Harris Director of Public Services	SC Nature Conservancy
Mr. Johnny Ravenell Orangeburg County Council Member	Honorable James E. Clyburn U.S. House of Representatives
Mr. Jason Purvis Town of Santee Administrator	Honorable Lindsey Graham United States Senate
Mr. John Truluck Clarendon County Engineer	Honorable Mark Sanford U.S. House of Representatives
Mr. Bob Bockman McNair Law Firm	Honorable Tim Scott United States Senate
Mr. Van Stickles Mayor, Town of Elloree	South Carolina Wildlife Federation
Mr. Caldwell Pinckney Berkeley County Councilman	South Carolina Department of Commerce
Mr. Jack Schurlknight Berkeley County Councilman	US Department of Agriculture Natural Resources Conservation Service
Mrs. Vivian F. McGhane Sumter County Council	Dr. Pace Wilbur National Marine Fisheries Services
Mr. F. Lee Prickett Calhoun County Administrator	Dr. W. Eric Emerson, Director SC Department of Archives & History
Mr. Colin Martin Director - Berkeley County Water and Sewer Authority	Mr. Chuck Hightower, Manager Water Quality Cert. and Wetlands Section SC Dept. of Health and Env. Control
Mr. Silas Seabrooks, Mayor Town of Santee	Mr. Heinz Mueller Office of Policy Management NEPA Office US EPA, Region 4
Ms. Darla Barnette Santee Cooper Regional Water System	Mr. Bob Perry Director of Environmental Programs SC Dept of Natural Resources
Mr. Deron McCormick Sumter City Manager	Mr. Thomas McCoy Acting Field Supervisor US Fish and Wildlife Service
Mr. Ronald Mitchum Berkeley-Charleston-Dorchester COG	Mr. Mark Caldwell US Fish and Wildlife Service
Mr. Dwight Stewart Clarendon County Council	Ms. Jaclyn Daly National Marine Fisheries Services
Mr. Dan Davis Berkeley County Supervisor	Mr. Curtis Joyner Office of Ocean and Coastal Resource Management
Mr. Bill Noonan Sumter County Administrator	Mr. Greg Mixon Environmental Review Program Manager
Mr. Bill Houser Clarendon County Administrator	Mr. David Wilson, PE Chief, Bureau of Water SC Dept. of Health and Env. Control
Mr. Johnnie Wright, Sr Lake Marion Regional Water Agency	Ms. Barbara Neale Office of Ocean and Coastal Resource Management
Mrs. Helen Carson Calhoun County Council Member	Ms. Emily Dale SC Department of Archives & History
A. Karim Khan Dorchester County Public Works Director	Mr. John Singh Elloree Town Administrator

Mr. Herman Keller Town of Santee, Waste Water Manager	Mr. John McLaughlin Orangeburg County Development Commission
Mr. Jim Darby Santee-Lynches Regional COG	Ms. Robin Mitchum Berkeley-Charleston-Dorchester COG
Mr. Richard Rosebrock Dorchester County Council	Mr. Darryl Bullock Berkeley-Charleston-Dorchester COG
Ms. Jennie Lillard, Mekko Kialegee Tribal Town	Mr. Robert Brown Bureau of Air Qualit – DAAIR SC Dept. of Health and Env. Control
Mr. Emman Spain Tribal Historic Preservation Officer Muscogee (Creek) Nation	Caitlin Totherow Catawba Indian Nation
Mr. Robert Thrower Tribal Historic Preservation Officer Poarch Band of Creek Indians	Mr. Charles Coleman Tribal Historic Preservation Officer Thlopthlocco Tribal Town
Ms. Virginia Nail, Chickasaw Nation Historic Preservation Officer The Chickasaw Nation	Mr. Willard Steele Tribal Historic Preservation Officer Seminole Tribe of Florida
Dr. Wenonah G. Haire Tribal Historic Preservation Officer Catawba Indian Nation	Ms. Kim Jumper Section 106 Coordinator Shawnee Tribe
Mr. Leo Henry, Chief Tuscarora Nation of New York	Ms. Lisa Stopp Tribal Historic Preservation Officer United Keetoowah Band of Cherokee Indians
Dr. Richard Allen Section 106 and NAGPRA Consultant Cherokee Nation	Ms. Henryetta Ellis Tribal Historic Preservation Officer Absentee-Shawnee Tribe of Indians of Oklahoma
Ms. Josephine Yargee Section 106 Coordinator Alabama-Quassarte Tribal Town	Mr. Tyler Howe Tribal Historic Preservation Specialist The Eastern Band of the Cherokee Nation
Mr. Russell Townsend Tribal Historic Preservation Office The Eastern Band of the Cherokee Nation	Ms. Robin Dushane Cultural Preservation Director Eastern Shawnee Tribe of Oklahoma

# **APPENDIX E**

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## **Comments**



## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407

July 28, 2014

Lt. Colonel John T. Litz  
District Engineer  
U.S. Army Corps of Engineers  
69A Hagood Avenue  
Charleston, SC 29403-5107

Attn: Alan Shirey

Re: Draft Environmental Assessment  
And Draft Finding of No Significant Impact  
Water Transmission Main  
Orangeburg and Dorchester Counties, SC  
FWS Log No. 2014-CPA-0112

Dear Colonel Litz:

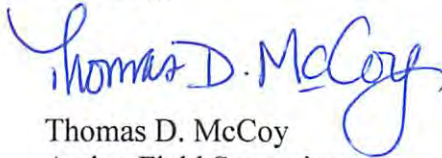
The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) dated June 24, 2014. The U.S. Army Corps of Engineers-Charleston District (Corps), working in cooperation with the Lake Marion Regional Water Agency, Santee-Cooper, and Dorchester County, is proposing to construct a water transmission main from the Holly Hill area southward to Harleyville, Dorchester and Orangeburg Counties, South Carolina. The proposed project is an extension of the Lake Marion Regional Water System. The project entails constructing a new 16-inch water main that will connect to an existing 24-inch water main near Holly Hill and follow the SC Hwy 453 corridor approximately 34,900 feet southward to Harleyville. You requested that the Service provide comments on the draft EA and draft FONSI.

The Service offers the following recommendations for your consideration in developing the final EA. Per the 2003 draft EA, final field surveys for federally protected species will be performed during the summer growing season prior to construction of the water treatment plant and each transmission line reach. Although a determination of no effect has been made for this reach of transmission line, the Service recommends that field surveys for federally protected species be conducted if potentially suitable habitat is present in the project area. All surveys should be conducted during the optimal survey window respective to each species that may be in the project area. Attached are the survey windows.

In addition, wetland impacts should be avoided and/or minimized to the greatest extent practicable by minimizing new permanent right-of-way widths as well as temporary work right-of-way widths. Mitigation should be provided for any unavoidable impacts, both temporary and permanent, in order to compensate for the loss of ecological functions caused by the placement of fill and/or removal of trees and vegetation. The cumulative impact factor used in the wetland mitigation credit calculation worksheet (page C-2) should be revised to be the same (0.5) for both types of impacts listed since the cumulative impact factor is based on the total impacts associated with the project. Mitigation requirements should be recalculated to reflect the above.

The Service appreciates the opportunity to review and provide comments on the submitted proposal and looks forward to reviewing the final EA. If you should need further assistance, please contact Mr. Mark Leao of my staff at (843) 727-4707 ext. 228, and reference FWS Log No. 2014-CPA-0112.

Sincerely,



Thomas D. McCoy  
Acting Field Supervisor

TDM/MCL

Attachment

**OCCURANCES OF FEDERALLY THREATENED, ENDANGERED, AND CANDIDATE  
ANIMAL SPECIES IN SOUTH CAROLINA**

SCIENTIFIC NAME	COMMON NAME	STATUS	TIME PERIOD	COMMENTS
<i>Acipenser brevirostrum</i>	Shortnose sturgeon*	E	February 1 – April 30	Spawning migration
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon*	E	February 1 – April 30	Spawning migration
<i>Ambystoma cingulatum</i>	Frosted flatwoods salamander	T, CH	January 1 – April 30	Larvae present in breeding ponds
<i>Balaena glacialis</i>	Right whale*	E	November 1 – April 30	Off the coast
<i>Balaenoptera physalus</i>	Finback whale*	E	November 1 – April 30	Off the coast
<i>Calidris canutus rufa</i>	Red knot	C	August 1 – May 31	Migration and wintering
<i>Caretta caretta</i>	Loggerhead sea turtle**	T	May 1 – October 31	Nesting and hatching
<i>Charadrius melodus</i>	Piping plover	T, CH	July 15 – May 1	Migration and wintering
<i>Chelonia mydas</i>	Green sea turtle**	T	May 1 – October 31	Nesting and hatching
<i>Clemmys muhlenbergii</i>	Bog turtle	T, S/A	April 15 – September 15	Active period
<i>Gopherus polyphemus</i>	Gopher tortoise	C	April 1 – October 31	Active period
<i>Dermochelys coriacea</i>	Leatherback sea turtle**	E	May 1 – October 31	Nesting and hatching
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA	October 1 – May 15	Nesting season
<i>Lasmigona decorada</i>	Carolina heelsplitter	E, CH	March 1 – September 30	Optimal survey window
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle**	E	May 1 – October 31	In coastal waters
<i>Megaptera novaengliae</i>	Humpback whale*	E	January 1 – March 31	Migration off the coast
<i>Mycteria americana</i>	Wood stork	E	February 15 – September 1	Nesting season
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	April 1 – July 31	Nesting season
<i>Trichechus manatus</i>	West Indian manatee	E	May 15 – October 15	In coastal waters
<i>Vermivora bachmanii</i>	Bachman's warbler	E	May 1 – June 15	Breeding

E Federally endangered

T Federally threatened

P Proposed in the Federal Register

CH Critical Habitat

C The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species

S/A Federally protected due to similarity of appearance to a listed species

\* Contact the National Marine Fisheries Service for more information on this species

\*\* The U.S. Fish and Wildlife Service and the National Marine Fisheries Service share jurisdiction of this species

BGEPA Federally protected under the Bald and Golden Eagle Protection Act

For additional information about these species, please visit the U.S. Fish and Wildlife Service web page at <http://endangered.fws.gov>.

**OPTIMAL SURVEY WINDOWS FOR SOUTH CAROLINA'S  
FEDERALLY THREATENED, ENDANGERED, AND CANDIDATE PLANT SPECIES**

SCIENTIFIC NAME	COMMON NAME	STATUS	SURVEY WINDOW
<i>Amaranthus pumilus</i>	Seabeach amaranth	T	July–October
<i>Amphianthus pusillus</i>	Little amphianthus or Pool sprite	T	late March–April
<i>Aster georgianus</i>	Georgia aster	C	early October–mid November
<i>Echinacea laevigata</i>	Smooth coneflower	E	late May–October
<i>Gymnoderma lineare</i>	Rock gnome lichen	E	year round
<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E	late August–October
<i>Helonias bullata</i>	Swamp pink	T	April–May
<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	T	March–May
<i>Isoetes melanospora</i>	Black spored quillwort	E	May–October
<i>Isotria medeoloides</i>	Small whorled pogonia	T	mid May–early July
<i>Lindera melissifolia</i>	Pondberry	E	February–March
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	mid May–June
<i>Oxypolis canbyi</i>	Canby's dropwort	E	mid August–September
<i>Narthecium americanum</i>	Bog asphodel	C	June–July
<i>Platanthera integrilabia</i>	White fringeless orchid	C	late July–October
<i>Ptilimnium nodosum</i>	Harperella	E	July–October in periods of low water
<i>Rhus michauxii</i>	Michaux's sumac	E	May–October
<i>Ribes echinellum</i>	Miccosukee gooseberry	T	November–July
<i>Sagittaria fasciculata</i>	Bunched arrowhead	E	mid May–July
<i>Sarracenia rubra ssp. jonesii</i>	Mountain sweet pitcher-plant	E	April–October
<i>Schwalbea americana</i>	American chaffseed	E	May–August (1–2 months after a fire)
<i>Sisyrinchium dichotomum</i>	White irisette or Reflexed blue eyed grass	E	late May–July
<i>Trillium persistens</i>	Persistent trillium	E	early March–mid April
<i>Trillium reliquum</i>	Relict trillium	E	mid March–April
These recommended survey windows were determined from species recovery plans and field observations. For additional information about these species, please visit the U.S. Fish and Wildlife Service web page at <a href="http://endangered.fws.gov">http://endangered.fws.gov</a> .			

**STATUS KEY:**

- E Federally endangered
- T Federally threatened
- C The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species





# Audubon SOUTH CAROLINA

Francis Beidler Forest  
Audubon Center & Sanctuary  
336 Sanctuary Road  
Harleyville, SC 29448  
Tel: 843-462-2150  
Fax: 843-462-2713  
www.sc.audubon.org

July 24, 2014

Alan D. Shirey  
Environmental Engineer  
U.S. Army Corps of Engineers  
Charleston District  
69A Hagood Avenue  
Charleston, SC 29403-5107

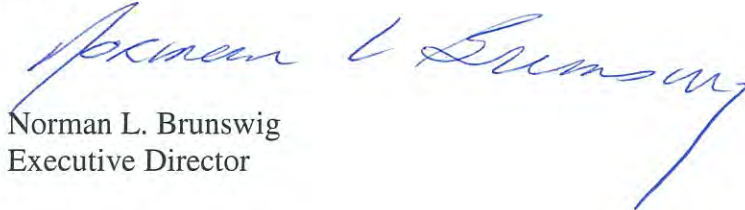
RE: Harleyville Reach

Dear Mr. Shirey:

Audubon South Carolina is most interested in the particulars of the proposed water line from Holly Hill to Harleyville and beyond. We have two concerns with the project. First, that where the waterline crosses Four Holes Swamp (on our property), that it not require a widening of the already quite wide cleared right of way. The new plan to bury the line in the edge of the highway berm removes that concern. The second, that this new water line be a point to point system, serving specific towns and industrial/commercial areas such as Harleyville, St. George, Ridgeville Commerce Park, the other developing Park near St. George, but not be or become a means for delivering water all over the middle of Dorchester County and spurring rural sprawl. Subject to Jason Ward's assurance that point to point is the purpose and that no other outcome is sought, as described in his attached message to me which is attached, we are comfortable with the plans for the new water line.

Thank you for the opportunity to comment on this plan.

Sincerely,



Norman L. Brunswig  
Executive Director

Sent via e-mail – [alan.d.shirey@usace.army.mil](mailto:alan.d.shirey@usace.army.mil)

C: Jason L. Ward, Dorchester County

## Thomas, Barbara

---

**From:** Jason Ward <WardJ@dorchestercounty.net>  
**Sent:** Thursday, July 24, 2014 10:23 AM  
**To:** Thomas, Barbara; Brunswig, Norman  
**Cc:** Shirey, Alan D SAC  
**Subject:** Lake Marion Regional Water Agency and Harleyville Reach

July 24, 2014

Norman Brunswig, State Director  
Barbara Thomas, Executive Assistant  
Audubon South Carolina  
336 Sanctuary Road  
Harleyville, SC 29448  
(Via e-mail)

Dear Mr. Brunswig and Ms. Barbara Thomas:

Originally, the Lake Marion Regional Water Agency was going to run a water line parallel to I-95 from Santee to St. George. However, that was put on hold when Berkeley County expressed an interest in receiving water. The plan was changed to incorporate an East Orangeburg - Berkeley County Reach with a spur to Harleyville to serve the town and Dorchester County.

**St. George Water and Sewer Project** – The project will provide water and sewer infrastructure for economic and community development. We plan to tie-in to Lake Marion Regional Water Agency at S.C. Hwy 453 in Harleyville, provide sewer service at I-95/I-26 and I-26/US Hwy 15 and create water and sewer loop along U.S. Hwy 178 and U.S. Hwy 78, including reclaimed water for the Winding Woods Commerce Park. Dorchester County purchased the former St. George Wastewater Treatment Plant and System in November 2009 and has made many repairs to the system and has upgraded the plant's treatment capacity by one million gallons per day.

Dorchester County views this project as a collaborative project for the 6<sup>th</sup> and 1<sup>st</sup> Congressional Districts as it further enhances activities related to the regional development strategy underway by the Lake Marion Regional Water Agency project along the I-95 Corridor. The St. George Water and Sewer Infrastructure Project provides a reliable potable water supply to the county's only certified industrial site, Winding Woods Commerce Park, and will allow storage and supply for a water reclamation and distribution system.

This request for funding reflects a strategic planning process undertaken through partnerships with Orangeburg County and others, the goal of which is to create change through a thoughtful regional approach. Orangeburg County, Dorchester County and the EDA jointly funded a strategic planning study for the I-26/I-95 area. The EDA has provided a planning grant in the amount of \$100,000 and the two counties each have provided \$50,000. This multi-phase effort for infrastructure improvements is part of the regional plan for the I-95 area.

### Planned water Improvements

Install new main water line through Harleyville, down Shortcut Road passing Woodland HS to Winding Woods (TMS# 059-00-00-006). Install new water line from Winding Woods Industrial Park to St. George. Provide water service along Highway 15 from St. George to I-26. Install a new water line from Harleyville along Highway 178 to the existing elevated storage tank located near I-95 at Wilco.

### Status of Water Improvements

- 1) Make connection from Holly Hill to Harleyville (Lake Marion Project – Projected contract award Sep
- 2) Make connection from Harleyville to Woodland High School (Future Lake Marion and County Project
- 3) Make connection from Woodland High School to Winding Woods Commerce Park (Future Lake Marion Project)
- 4) Make connection from Winding Woods Commerce Park to Town of St. George (Dorchester County and Dorchester County Project – Projected contract award Fall 2014)
- 5) Make connection from Harleyville to I-95 and Wilco Travel Center (Future Dorchester County)

Please let me know if you have any questions. We don't have any plans for residential development. Our focus is industrial development near the interchanges on I-95 and I-26 and at Winding Woods Commerce Park.

Best regards,

Jason L. Ward, County Administrator  
County of Dorchester, South Carolina

C: Alan Shirey, Army Corps of Engineers

Catawba Indian Nation  
Tribal Historic Preservation Office  
1536 Tom Steven Road  
Rock Hill, South Carolina 29730

Office 803-328-2427  
Fax 803-328-5791



July 16, 2014

Attention: Bret L. Walters  
Department of the Army  
Charleston District, Corps of Engineers  
69 A Hagood Avenue  
Charleston, South Carolina 29403-5107

Re. THPO #	SAC #	Project Description
2014-1-62		Water transmission main from the Holly Hill, SC area southward to Harleyville, SC

Mr. Walters,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Totherow at 803-328-2427 ext. 226, or e-mail [caitlinh@ccppcrafts.com](mailto:caitlinh@ccppcrafts.com).

Sincerely,

A handwritten signature in cursive script that reads "Caitlin Totherow for".

Wenonah G. Haire  
Tribal Historic Preservation Officer

JUL 22 2014



Catherine B. Templeton, Director

*Promoting and protecting the health of the public and the environment*

July 16, 2014

Bret Walters, Chief, Planning and Environmental Branch  
U.S. Army Corps of Engineers  
69-A Hagood Avenue  
Charleston, South Carolina 29403

Re: Harleyville Reach Water Transmission Main – draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI), Dorchester and Orangeburg Counties

Dear Mr. Walters:

This is in response to your letter dated June 24, 2014 in which you explain the purpose and need for the Harleyville Reach Water Transmission Line in Dorchester and Orangeburg Counties, S. C. As stated, the Army Corps of Engineers is working with the Lake Marion Regional Water Agency on the planning and assistance of the project and as a result has drafted the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI). DHEC's Division of OCRM and Bureau of Water's offer the following comments on the draft EA/FONSI and we ask this letter be included in the final EA and FONSI.

#### Project Summary:

The proposed project (preferred alternative) consists of an extension of the Lake Marion Regional Water System in that a new 16-inch water main will connect to an existing 24-inch water main near the Town of Holly Hill and will follow the SC Highway 453 corridor approximately 34,900 feet (about 6.6 miles) southward to the Town of Harleyville. The proposed project would enhance public health by providing a reliable, high-quality water supply in compliance with State drinking water regulations. The proposed project is expected to satisfy the current and future water supply needs for a large portion of the western half of Dorchester County.

Currently, there are three alternative alignments: Alignment 1 consisting of a direct path from the Town of Holly Hill to the Town of Harleyville adjacent to S. C. 453 and crossing through Four Hole Swamp; Alternative 2 would be similar to Alternative 1 except the water transmission main would begin south of Santee, near the U. S. Highway 15 and Interstate 95 interchange, and run approximately 90,100 feet (~ 17 miles) southward from this area to the Town of St. George. Then, at a later time, the water transmission main would be extended to Harleyville where this route for the water transmission main would require crossing several small streams and Four Hole Swamp; Alternative 3 would provide water to Harleyville and the surrounding areas by installing more water wells in the area.

Finally, there is a “No Action” alternative implies acceptance of the existing conditions in the project area which may drive future individual water well activities similar to alternative 3. Impacts to wetlands associated with Alternatives 1 and 2 will be a result of either directional bore or “cut and cover” potentially eligible for the U.S. Army Corps of Engineers (USACOE) Nationwide Permit (NWP) #12.

#### Specific Comments on the EA/FONSI

As to the Federal Environmental Laws mentioned in Chapter Nine (9), it is recommended that you add a reference to the Federal Coastal Zone Management Act and the South Carolina Coastal Zone Management Program (SCCZMP) as part of the project will occur in Dorchester County, which is part of the eight county coastal zone consequently subject to the enforceable policies contained within the CZMP.

Secondly, Chapter Nine (9) of the EA/FONSI does not specifically mention compliance with State environmental laws though some form of coordination with State Agencies has occurred. Specifically, applicable laws and regulations that could apply to this project would be the South Carolina Pollution Control Act, the Water Quality Certification, the South Carolina Stormwater Management and Sediment Reduction Act and any statues that apply to solid waste associated with demolition. It is the review of state permits that triggers the aforementioned Coastal Zone review known as Coastal Zone Consistency, particularly the stormwater and sediment reduction permits. Additionally, a description of the Water Quality Certification (61-101) should be included in Chapter Nine (9):

Projects requiring state or federal permits that would result in a discharge to wetlands or other waters of the United States must also obtain a Section 401 Water Quality Certification from DHEC’s Bureau of Water. Pursuant to Section 401 of the CWA, DHEC Bureau of Water must review the proposed project and analyze its potential impact to water quality, and ensure that any discharge into jurisdictional areas would be in accordance with state water quality standards.

#### General Process Comments:

As previously stated, a Coastal Zone Consistency certification will be required for other applicable State permits required for the project that take place in Dorchester County. Required permits may include, but may not be limited to, the NPDES Land Disturbance permit for the treatment of Stormwater associated with all impacts to uplands; and the Solid Waste Disposal permit for demolition of any buildings, roads, railway lines, tanks, and other potential waste management hazards that might be present along the chosen alignment. As you are aware, if the project is not eligible for NWP #12, then an individual Section 404 permit from your Agency and accompanying Section 401 Water Quality Certification from the Bureau of Water would be required. As part of the review for consistency for all permits, CZC staff will base its decision on coastal management policies contained within the South Carolina Coastal Zone Management Program (CZMP), which can be found on the agency’s website:

[www.scdhec.gov/HomeAndEnvironment/Water/CoastalManagement/CoastalZoneManagement/CoastalManagementProgram](http://www.scdhec.gov/HomeAndEnvironment/Water/CoastalManagement/CoastalZoneManagement/CoastalManagementProgram)

Additionally, the requesting party should review Chapter IV – Special Management Areas for the consideration and potential treatment of Geographic Areas of Particular Concern (GAPC’s), which could

include groundwater resources, threatened and endangered species, and areas of special historic, archaeological or cultural significance. We also advise the requesting agency to review Chapter XII - Activities in Areas of Special Resource Significance (specifically Wetlands) in preparing the final EA/FONSI. Avoidance of GAPCs or wetlands is preferred to ensure consistency.

Potential Impacts:

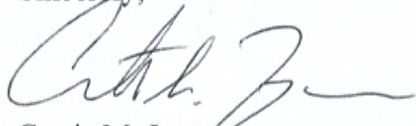
- Historic buildings: the demolition of or significant impacts to potentially historic structures must fully evaluated by the State Historic Preservation Officer (SHPO) for proper treatment prior to the review for consistency or impacts should be avoided altogether based upon SHPO's analysis of the historic value of each structure.
- Waste Disposal: it is advisable the applicant coordinate with the Agency's Bureau of Land and Waste Management to plan for the proper disposal (based on level of hazard) or recycling of all materials that will result from demolition activities.
- Water Quality: the Bureau of Water must take certification action on all Federal 404 permit applications for the discharge of dredged or fill material to waters or wetlands of the State. Therefore it is advisable that coordination takes place with the Water Quality staff.
- Best Management Practices: best Management Practices (BMP's) will likely be required as a potential condition on any Stormwater Permit based on the specific area of impact and its location to receiving waterbodies. It should be noted that CZMP policies may require the additional treatment of stormwater runoff given the proximity of the project to adjacent receiving water bodies.
- Wetlands: as previously mentioned, it is advisable the requesting agency obtain a jurisdictional determination from the U. S. Army Corps of Engineers Regulatory Branch for potential coverage under NWP #12. Actual acreage of impacts to all waters and wetlands will be critical in the review of eventual permit application(s).

The Agency reserves the right to submit additional comments, as appropriate, during the development of the EA/FONSI as modifications to the plan in response to public and agency input are likely.

DHEC staff are available to meet with the applicant prior to the submission of the appropriate paperwork to discuss the overall project and answer any questions. Please do not hesitate to contact me should you have any questions.

Page Four  
Harleyville Reach Water Transmission Main  
July 16, 2014

Sincerely,

A handwritten signature in black ink, appearing to read "C. Joyner", with a long horizontal flourish extending to the right.

Curtis M. Joyner  
Manager, Coastal Zone Consistency Section  
Regulatory Division, DHEC OCRM  
1362 McMillan Avenue, Suite 400  
Charleston, S. C. 29405  
843-953-0205  
joynercm@dhec.sc.gov

Cc: Rheta DiNovo DHEC OCRM  
Blair Williams DHEC OCRM  
Kent Coleman, DHEC BLWM  
Heather Preston, DHEC BOW  
Elizabeth Johnson, SCDAH



# South Carolina Department of Natural Resources

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mixong@dnr.sc.gov



Alvin A. Taylor  
Director  
Robert D. Perry  
Director, Office of  
Environmental Programs

July 24, 2014

Mr. Alan Shirey  
U.S. Army Corps of Engineers  
Planning and Environmental Branch  
69-A Hagood Avenue  
Charleston, SC 29403-5107

REFERNCE: Lake Marion Regional Water Agency  
Harleyville Reach Water Transmission Main  
Dorchester and Orangeburg Counties

Dear Mr. Shirey:

Personnel with the South Carolina Department of Natural Resources (DNR) have reviewed the above referenced project and evaluated its impact on wildlife and fisheries habitat, wetlands, endangered species, floodplains, water quality, recreation and other factors relating to the conservation of natural resources.

The proposed project would connect a new 16-inch potable water transmission main to an existing 24-inch water transmission main near the Town of Holly Hill. The new 16-inch main would extend 34,900 linear feet to the Town of Harleyville. The proposed water main will cross Home Branch and wetlands associated with Four Holes Swamp. Stream crossings will be accomplished using directional drilling or jack and boring methods. The Four Holes Swamp crossings will be accomplished in the shoulder of Highway 453 or by means directional drilling. Two additional alternatives and a No Action Alternative were also evaluated. Mitigation for the impacts to wetlands will be accomplished by purchasing credits from Francis Beidler Forest.

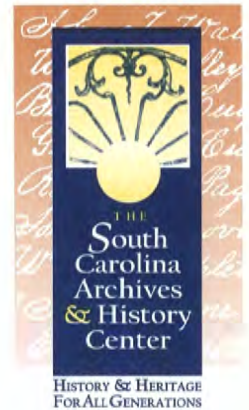
DNR concurs that the work will not significantly adversely affect environmental resources and do not offer any objections to the project as proposed. We appreciate the opportunity to review the proposed project and provide these comments. If you should have any questions, please contact me at mixong@dnr.sc.gov or 803.734.3282.

Sincerely,

A handwritten signature in blue ink, appearing to read "Greg Mixon", is written over the typed name.

Greg Mixon  
Inland Environmental Coordinator

July 18, 2014



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

Re: Lake Marion Regional Water System, EA and FONSI  
Dorchester County, South Carolina  
SHPO Project Number: 14-ED0076

Dear Alan:

Thank you for your letter of June 24, which we received on June 30, regarding the above-referenced project. We also received the Draft Environmental Assessment which included the report entitled *Cultural Resources Survey of the Proposed Harleyville Reach Water Transmission Main* as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the U.S. Army Corps of Engineers pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800. Consultation with the SHPO is not a substitution for consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public.

During the course of the survey, Brockington identified two archaeological sites (38DR431 and 38DR432) and two isolated finds. Both of the sites appeared to be heavily disturbed and were recommended as **not eligible** for listing in the National Register of Historic Places (NRHP). We concur with this assessment. Based on the description of the Area of Potential Effect (APE) and the identification of historic properties within the APE, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

To complete the consultation process: We require one (1) bound and one (1) unbound hard copy on acid-free paper and two (2) digital copies in PDF format. Investigators should send all copies directly to SHPO. SHPO will distribute the appropriate copies to SCIAA. As per the recent update to the SC Standards and Guidelines for Archaeological Investigations, please include a copy of our concurrence letter in the appendices.

If you have any questions, please contact me at (803) 896-6181 or [edale@scdah.state.sc.us](mailto:edale@scdah.state.sc.us).

Sincerely,



Emily Dale  
Staff Archaeologist/GIS Coordinator  
State Historic Preservation Office

cc: Keith Derting, SCIAA  
David Baluha, Brockington



Catherine B. Templeton, Director

*Promoting and protecting the health of the public and the environment*

July 3, 2014

Mr. Bret L. Walters, Chief  
Planning and Environmental Branch  
Department of the Army  
Charleston District, Corps of Engineers  
69A Hagood Avenue  
Charleston, SC 29403-5107

Re: Lake Marion Regional Water System Extension

Dear Mr. Walters:

On June 30, 2014, we received the Draft Environmental Assessment and Draft Finding of No Significant Impact for the Lake Marion Regional Water System Extension in Dorchester and Orangeburg Counties, South Carolina, dated June 24, 2014. *Based on the information provided in the Environmental Assessment, I am responding on behalf of the South Carolina Department of Health and Environmental Control, Bureau of Air Quality (Bureau).*

The Bureau is tasked with implementing the Federal Clean Air Act (1990, as amended) in the State of South Carolina. The Bureau is required to ensure compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Currently two criteria pollutants are of particular concern in South Carolina:

- **Ozone** – The 2008 8-hour ozone standards (primary and secondary) are currently set at 0.075 parts per million (ppm). The area represented in this proposal is meeting the 2008 ozone standards. The Environmental Protection Agency (EPA) is currently reviewing the 2008 ozone standard and the proposal of a new standard is anticipated.
- **Particulate Matter 2.5** (Particulates 2.5 microns in size and smaller) – The 2012 standard for maximum daily concentration is set at 35 micrograms per cubic meter. The 2012 standard for the maximum annual concentration is set at 12 micrograms per cubic meter. The area represented in this proposal is meeting the 2012 particulate matter 2.5 standards.

Presently only the eastern portion of York County has been designated nonattainment for the 2008 8-hour ozone NAAQS. For more information on which areas have been designated nonattainment, please visit <http://www.epa.gov/oar/oaqps/greenbk>. If a project is located in a nonattainment area, it may be subject to prescriptive requirements such as Transportation Conformity or air quality modeling.

An asbestos survey and project license may be required prior to any demolition activities such as deconstruction of a building or removal of structures in the right-of-way of a road project. If you have any questions regarding asbestos regulatory applicability you may contact Robin Mack (with the Bureau's Asbestos Section) at (803) 898-4270 or [mackrs@dhec.sc.gov](mailto:mackrs@dhec.sc.gov).

All necessary environmental permits for the subject project must be obtained in accordance with applicable state and federal regulations. If you have not already done so, please contact the Bureau of Water at (803) 898-4300 and the Bureau of Land and Waste Management at (803) 898-2000 for input regarding those program areas' assessments of this proposed project.

Emissions from construction equipment are regulated by federal standards. The Bureau would like to offer the following suggestions on how this project can help us stay in compliance with the NAAQS. More importantly, these strategies are beneficial to the health of citizens of South Carolina.

- Utilize alternatively fueled equipment.
- Utilize emission controls applicable to your equipment.
- Reduce idling time on equipment.
- Fugitive dust emissions should be minimized through good operating practices.

The Bureau can provide model clean construction contract language. A vendor may need to retrofit, repower or replace older and more polluting diesel construction equipment in order to satisfy clean construction requirements. These types of projects can be financed with Congestion Mitigation and Air Quality (CMAQ) funds, and are in fact a high priority for CMAQ funding. Please contact our office if assistance is needed.

Thank you for the opportunity to comment on this project. Should you have any further questions or comments concerning this matter, please do not hesitate to contact me at (803) 898-4122 or at [robertln@dhec.sc.gov](mailto:robertln@dhec.sc.gov).

Sincerely,



L. Nelson Roberts, Jr., Manager  
Air Quality Standards and Assessment Section  
SCDHEC Bureau of Air Quality

cc: Alan Risa, Lowcountry EQC Orangeburg Office, [risap2@dhec.sc.gov](mailto:risap2@dhec.sc.gov)  
Wendy Boswell, Low Country EQC McMillan Office, [boswelwm@dhec.sc.gov](mailto:boswelwm@dhec.sc.gov)