DRAFT
ENVIRONMENTAL ASSESSMENT

CONSTRUCTION AND OPERATION OF A NEW NATIONAL VETERANS' CEMETERY

Columbia-Greenville, South Carolina Area

U.S. Department of Veterans Affairs
National Cemetery Administration
810 Vermont Avenue, NW
Washington, D.C. 20420

March 21, 2006

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Draft
Environmental Assessment

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810 Vermont Avenue, NW
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The 30-day Public Comment Period for this document ends on April 23, 2006.
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TABLE OF CONTENTS

List of Acronyms iv

Executive Summary ix

1.0 INTRODUCTION 1-1

2.0 PURPOSE AND NEED 2-1
- 2.1 PURPOSE OF PROPOSED ACTION 2-1
- 2.2 NEED FOR ACTION 2-1

3.0 DESCRIPTION OF ALTERNATIVES 3-1
- 3.1 NO ACTION ALTERNATIVE 3-1
- 3.2 PROPOSED ACTION ALTERNATIVE 3-1
  - *3.2.1 Site Selection Process for the New National Veterans' Cemetery 3-2*
  - *3.2.2 Alternative Sites Considered and Dismissed from Detailed Analysis 3-4*
  - *3.2.3 Alternative Sites Retained for Detailed Analysis 3-4*
  - *3.2.4 Comparison of Alternatives 3-21*

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 4-1
- 4.1 GEOLOGIC SETTING 4-1
  - *4.1.1 Geology 4-1*
  - *4.1.2 Topography 4-3*
  - *4.1.3 Soils 4-4*
  - *4.1.4 Geologic Hazards 4-23*
- 4.2 WATER RESOURCES 4-28
  - *4.2.1 Surface Water 4-30*
  - *4.2.2 Groundwater 4-41*
  - *4.2.3 Wetlands 4-41*
  - *4.2.4 Floodplain Management 4-51*
- 4.3 BIOLOGICAL RESOURCES 4-58
  - *4.3.1 Vegetation, Fish and Wildlife 4-59*
  - *4.3.2 Threatened and Endangered Species 4-64*
- 4.4 CULTURAL RESOURCES 4-67
  - *4.4.1 Methodology 4-68*
  - *4.4.2 Affected Environment 4-70*
  - *4.4.3 Environmental Consequences and Mitigation Recommendations 4-73*
- 4.5 SOCIOECONOMICS AND RELATED RESOURCES 4-76
  - *4.5.1 Noise and Other Aesthetic Concerns 4-76*
  - *4.5.2 Air Quality 4-80*
  - *4.5.3 Community Services 4-84*
  - *4.5.4 Land Use and Zoning 4-87*
  - *4.5.5 Utilities 4-89*
  - *4.5.6 Local and Regional Economics 4-94*
  - *4.5.7 Demographics 4-97*
  - *4.5.8 Environmental Justice 4-99*
  - *4.5.9 Transportation, Parking, and Traffic 4-102*
- *4.6 SOLID AND HAZARDOUS MATERIALS AND WASTES 4-121*
  - *4.6.1 Findings – Sedalia Site 4-122*

4.6.2 Findings - Whitmire Site *4-125*
4.6.3 Findings - Fort Jackson Site *4-128*
4.6.4 Environmental Consequences and Mitigation Recommendations *4-133*
4.7 CUMULATIVE IMPACTS 4-135
4.7.1 Sedalia Site *4-135*
4.7.2 Whitmire Site *4-136*
4.7.3 Fort Jackson Site *4-137*
4.8 COORDINATION AND PERMITS 4-138
4.8.1 Water Resources *4-138*
4.8.2 Biological Resources *4-142*
4.8.3 Cultural Resources *4-143*
4.8.4 Socioeconomics and Related Resources *4-144*
4.9 POTENTIAL FOR GENERATING CONTROVERSY AND PUBLIC INVOLVEMENT 4-145
4.9.1 Review of Published Articles *4-145*
4.9.2 VA NCA Issuance of Notices Regarding the Project *4-148*
4.9.3 American Indian Consultation *4-148*
4.9.4 Agency Coordination *4-149*
4.9.5 Conclusion *4-149*

5.0 AMERICAN INDIAN AND AGENCY COORDINATION 5-1

6.0 REFERENCES 6-1

7.0 LIST OF PREPARERS 7-1

Figures

FIGURE 1 - SEARCH AREA FOR A COLUMBIA-GREENVILLE, SOUTH CAROLINA AREA NATIONAL CEMETERY 2-3
FIGURE 2 – POTENTIAL NATIONAL CEMETERY SITE LOCATION VICINITY MAP 3-5
FIGURE 3 - SEDALIA SITE LOCATION MAP 3-7
FIGURE 4 - SEDALIA SITE CHARACTERISTICS 3-9
FIGURE 5 - WHITMIRE SITE LOCATION MAP 3-13
FIGURE 6 - WHITMIRE SITE CHARACTERISTICS 3-15
FIGURE 7 - FORT JACKSON SITE LOCATION MAP 3-17
FIGURE 8 - FORT JACKSON SITE CHARACTERISTICS 3-19
FIGURE 9 - SEDALIA SITE SOIL CONSTRAINTS MAP 4-5
FIGURE 10 - WHITMIRE SITE SOIL CONSTRAINTS MAP 4-13
FIGURE 11 - FORT JACKSON SITE SOIL CONSTRAINTS MAP 4-17
FIGURE 12 - SEDALIA SITE WETLANDS & WATER RESOURCES MAP 4-31
FIGURE 13 - WHITMIRE SITE WETLANDS & WATER RESOURCES MAP 4-35
FIGURE 14 - FORT JACKSON SITE WETLANDS & WATER RESOURCES MAP 4-37
FIGURE 15 - SEDALIA SITE - FLOODPLAIN MAP 4-51
FIGURE 16 - WHITMIRE SITE - FLOODPLAIN MAP 4-53
FIGURE 17 – FORT JACKSON SITE - FLOODPLAIN MAP 4-57
FIGURE 18 – FORT JACKSON SITE EXISTING TRAFFIC VOLUMES 4-111
FIGURE 19 – FORT JACKSON SITE BACKGROUND TRAFFIC VOLUMES 4-113

TABLE OF CONTENTS

Appendices

Appendix A - Site Photographs
Appendix B - Notice of Intent
Appendix C - Agency Coordination and American Indian Consultation Letters
Appendix D - Archaeology Site Maps (in VA NCA's, American Indian Nations', and SC SHPO's copies only)
Appendix E - Potential NRHP-Eligible Standing Structures within the Area of Potential Effect
Appendix F – Additional Phase I ESA Information for Fort Jackson Site
Appendix G – Fort Jackson Conservation Easement (Beaver Pond)
Appendix H – Fort Jackson Biological Assessment

LIST OF ACRONYMNS

%g	percentage of the acceleration of gravity or “ground-shaking”
ADA	Americans with Disabilities Act
A.M.	Ante Meridiem
AADT	Annual Average Daily Traffic
ACM	asbestos-containing material
AHPA	Archaeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
AOCs	Areas of Concern
APE	Area of Potential Effect
AQI	Air Quality Index
ARPA	Archaeological Resources Protection Act
ASTM	American Society for Testing and Materials
ATR	Automatic Tube Recorders
ATSDR	Agency for Toxic Substances and Disease Registry
BA	Biological Assessment
BC SRM	British Columbia, Sustainable Resource Management
BCR	Bird Conservation Region
bgs	below ground surface
BMPs	Best Management Practices
BO	Biological Opinion
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CO	carbon monoxide
COG	Council of Governments
CORRACTS	Resource Conservation and Recovery Act Corrective Action
CR	County Road
CWA	Clean Water Act
DE	District Engineer
DHEC	Department of Health and Environmental Control
DNR	Department of Natural Resources
DoD	Department of Defense
DSNL	day-night sound level
EA	Environmental Assessment
EAC	Early Action Compact
EDR	Environmental Data Resources, Incorporated
EIS	Environmental Impact Statement
EMS	emergency medical service
EO	Executive Order
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency

FINDS	Facility Index System
FIRM	Flood Insurance Rate Map
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FY	fiscal year
GIS	Geographic Information Systems
gpd	gallons per day
gpm	gallons per minute
HMU	Habitat Management Unit
I	Interstate
INRMP	Integrated Natural Resources Management Plan
LBP	lead-based paint
LOS	Level of Service
LQG	large-quantity generator
LUST	leaking underground storage tank
MCL	maximum contaminant level
mg/L	milligrams per Liter
MGD	million gallons per day
MM	millimeter
MMI	Modified Mercalli Intensity
mph	miles per hour
msl	mean sea level
MTBE	methyl tert-butyl ether
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	National Cemetery Administration
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NO_2	nitrogen dioxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWP	Nationwide Permit
O_3	ozone
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
PCF	Palmetto Conservation Foundation
pH	potential of hydrogen
P.M.	Post Meridiem

PM_{10}	Particulate Matter less than 10 microns
PCN	Preconstruction Notification
ppb	parts per billion
ppm	parts per million
PSI	Pollutant Sub-Index
PWS	potable water supply
RCRA	Resource Conservation and Recovery Act
RCRAInfo	Resource Conservation and Recovery Act Comprehensive Information System
RCW	Red-Cockaded Woodpecker
RDX	cyclotrimethylene trinitramine (explosive material widely used by the military)
REC	Recognized Environmental Condition
RFI	RCRA Facility Investigation
ROW	right-of-way
SC	South Carolina
SCDAH	SC Department of Archives and History
SCDHEC	SC Department of Health and Environmental Control
SCDHHS	SC Department of Health and Human Services
SCDNR	SC Department of Natural Resources
SCDOT	SC Department of Transportation
SCE&G	SC Electric and Gas
SCEMD	SC Emergency Management Division
SCFC	SC Forestry Commission
SCGS	SC Geological Survey
SCPC	SC Pipeline Corporation
SDMU	Standard Density Management Area
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SHWS	State Hazardous Waste Site
SIP	State Implementation Plan
SO_2	sulfur dioxide
SQG	small-quantity generator
SWMU	Solid Waste Management Unit
T&E	Threatened and Endangered
TSD	Treatment-Storage-Disposal
U.S.	United States
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VA	U.S. Department of Veterans Affairs

VOC	volatile organic compound
WUS	Waters of the U.S.
WWQMS	Watershed Water Quality Management Strategy

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EXECUTIVE SUMMARY

The National Cemetery Administration (NCA) of the United States Department of Veterans Affairs (VA) has prepared an Environmental Assessment (EA) of the potential environmental consequences of constructing and operating a new national cemetery in the Columbia-Greenville, South Carolina area. This EA has been completed pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and VA regulations (38 CFR 26.4[a]).

Purpose and Need for Action

The National Cemetery Expansion Act of 2003 (Public Law 108-109) requires the VA NCA to establish six new national cemeteries within four years and the VA NCA has identified the veteran population that is concentrated in the Columbia-Greenville area as a priority. The purpose of the proposed action would be to construct and operate a new national cemetery that would provide veterans and their families living in the 21-county Columbia-Greenville area the opportunity to be buried in a national cemetery, and to benefit from the honor and privilege bestowed upon them by a grateful nation for their service to their country.

Alternatives Considered

The VA NCA identified the proposed action, the construction and operation of a new national veterans' cemetery in the Columbia-Greenville, South Carolina area, as the best way to meet the purpose and need for action.

The cemetery action would be conducted in multiple phases with Phase I anticipated for completion in late 2010. Phase I would provide a fast-track burial section, development of approximately 5,000 gravesites for casketed interments, 2,450 sites for cremated remains including a columbarium, and appropriate structures/facilities to support cemetery operations. The total development area for Phase I is expected to be 50 acres, and would provide for approximately 10 years of burials. Subsequent development phases would occur on about 200 more acres and increase the total number of interment sites within the cemetery to a total of 17,677.

The VA NCA anticipates that approximately 250 acres would be necessary to meet the needs for burials through the year 2030, and thus sought available sites of sufficient size that would meet this requirement. Four sites within a 75-mile radius of the Columbia-Greenville focal point were initially offered to the VA NCA for consideration. Each site was preliminarily evaluated against ten criteria for VA NCA cemetery development, after which one of the sites was eliminated from further consideration. Three sites complied with most of the VA NCA's criteria for development of a national cemetery, as evaluated in this Environmental Assessment (EA). The alternative sites include: "Sedalia Site," a 477-acre site in Union County, South Carolina; "Whitmire Site," a 433-acre site in Newberry County, South Carolina; and "Fort Jackson Site," a 600-acre site in the northern portion of the U.S. Army Training Center and Fort Jackson, Richland County, South Carolina.

The No Action Alternative is also evaluated in this EA. Under the No Action Alternative, the VA NCA would not develop a new national cemetery in the Columbia-Greenville, South Carolina area. Veterans in the area would have to use another national, state, or private cemetery, perhaps outside their state of residence or more than 75 miles away.

Consequences of the No Action Alternative

Based on the evaluation contained herein, no environmental impacts would be associated with the No Action Alternative. The use of other veterans' or private cemeteries could create a hardship for veterans' families for attending the funerals and for gravesite visitations. If veterans and their families must resort to private burials, they would be deprived the benefit, honor, and privilege bestowed upon them by a grateful nation for their service to their country. Furthermore, the VA NCA would fail to meet its mission and congressional mandate to serve veterans concentrated in the Columbia-Greenville area.

Consequences of the Proposed Action Alternative

Under the proposed action alternative, impacts to a particular alternative site would occur only to the site chosen for implementation of the proposed action.

Geology, Topography, Soils, and Water Resources. Minimal impacts are expected to geology and soils, surface water, and water quality at each of the three alternative sites. The VA NCA is committed to the use of best management practices (BMPs) that would minimize project impacts. No 100-year floodplain areas are located on the Sedalia Site. About 20 percent of the Whitmire Site and 9 percent of the Fort Jackson Site are located within the 100-year floodplain. No impacts to the floodplain would occur as long as this area was avoided during development and BMPs were implemented. No adverse impacts to groundwater are anticipated at any of the alternative sites. No indications of contaminated groundwater or surface water were identified at any of the alternative sites.

Topography of the selected site would be altered by grading for burial areas, roads, parking areas, building pads, detention ponds, and service facilities; however, extensive topographic alteration is considered undesirable in cemetery development. In general, topographic impacts at any of the alternative sites would not be significant. Topographic alterations would be greatest at the Sedalia and Whitmire Sites where the relief is 190 feet and 167 feet, respectively, and least at the Fort Jackson Site where the relief is 155 feet.

The potential for shallow rock and groundwater exists in a significant portion of the Whitmire Site that would require a well-planned site layout and limit the available area for interments. These conditions exist at the Sedalia Site as well, but over a much smaller area. Soil and groundwater conditions at the Fort Jackson Site are suitable over most of the site for cemetery development.

The only alternative site with prime farmland soils is the Sedalia Site; thus, this site should be given a higher level of protection under the Farmland Protection Policy Act. A cemetery design at the Sedalia Site that avoids conversion of the prime farmland to developed land, or selection of one of the other alternative sites for the cemetery, should be considered.

Wetlands and Waters of the U.S. Impacts to jurisdictional wetlands and Waters of the U.S. (WUS) could occur at the Sedalia, Whitmire, and Fort Jackson Sites, depending on the layout and design of the cemetery at these sites. About 9,000 linear feet of WUS, an approximately 5-acre pond, and an approximately 25-acre wetland area are present on the Sedalia Site. About 7,500 linear feet of WUS, and three beaver pond/wetland areas encompassing about 5, 10, and 45 acres, respectively, are present within the Whitmire Site. About 92 acres of wetlands and a 7-acre beaver pond, which is under a conservation easement, are present on the Fort Jackson Site.

The onsite wetlands and WUS would be delineated for the site chosen for the new cemetery and the wetland boundaries would be considered during cemetery master planning. Additional acreage appears to be available at all three sites beyond the necessary 250 acres, which would enable VA NCA to avoid and/or minimize impacts to wetlands and WUS through careful planning and site layout. The VA NCA will consult with the U.S. Army Corps of Engineers (USACE) and apply for a federal permit if necessary due to impacts to wetlands, or where dredging and filling activities would occur in WUS or wetlands. The VA NCA would also conduct compensatory mitigation as necessary due to permitting requirements.

Vegetation and Wildlife. Impacts would occur to existing vegetation due to the need for site grading and installation of grass and native species landscaping at the cemetery site. Additionally, there would be minor impacts on terrestrial species, creating a permanent loss of habitat for mobile generalist species. The VA NCA would develop and plan for control of invasive species at the site chosen for cemetery development.

Threatened and Endangered Species. No threatened and endangered (T&E) species have been identified at the Sedalia, Whitmire, and Fort Jackson Sites and no impacts to T&E species would occur. However, the Fort Jackson Site contains potential foraging habitat for the federally protected Red-Cockaded Woodpecker (RCW). Transfer of the Fort Jackson Site to the VA NCA for cemetery development would affect the long-term population goals of Fort Jackson's RCW Management Plan. Planned future habitat for the RCW could be adversely impacted if this site were selected. Fort Jackson has consulted with the U.S. Fish and Wildlife Service (USFWS) regarding the potential effect of the property transfer on the RCW management goals. Significant adverse impacts to the RCW at the Fort Jackson Site are not anticipated to result from cemetery development.

Cultural Resources. Archaeological sites are located on all three alternative sites. The South Carolina State Historic Preservation Office (SHPO) has requested that additional survey of high probability portions of the Sedalia and Whitmire Sites be conducted for the purpose of identifying and assessing archaeological sites. If either site is chosen for VA cemetery development, the VA NCA would consult with the appropriate American Indian Nations and notify them of the findings of any surveys performed. In addition, the Casey Family Cemetery (dating back to the late 1700s) may be situated somewhere within the Whitmire Site. Should the Whitmire Site be chosen for VA cemetery development and the Casey Family Cemetery be found, the VA NCA would consult with the SHPO to develop a plan for avoidance or mitigation of any potential adverse effects. Eight archaeological sites have been found within the Fort Jackson Site. Five of the sites have been determined ineligible for inclusion in the National Register of Historic Places (NRHP), and three sites are potentially eligible and have undergone additional testing.

A plan of avoidance of the archaeological sites on the selected site will be developed in consultation with the American Indian Nations and SHPO. If avoidance is not possible, the VA NCA would further consult with American Indian Nations and SHPO, and mitigation of any potential adverse effects would be necessary for the sites or the portions of sites that would be developed. For those sites that would be impacted by cemetery development, a data recovery plan would be developed in consultation with American Indian Nations and the SHPO.

Eleven aboveground historic resources were identified adjacent to the Sedalia Site and one aboveground historic resource was identified on the Whitmire Site; if the VA NCA chooses either of these sites for cemetery development, these resources will be investigated to assess their eligibility for listing in the NRHP. No aboveground historic resources are located on or adjacent to the Fort Jackson Site.

Noise and Air Resources, Aesthetics, Community Services. Temporary and minor impacts would occur to existing noise conditions and air quality during construction. Aesthetic changes to the selected site would occur (change from forested land to developed cemetery) but would not be considered adverse by most viewers because of the aesthetically pleasing landscaping and site development features that would be implemented. Overall, with the construction of a new national cemetery at the Sedalia Site, noise and aesthetic impacts would be minimal. Traffic noise from US 176/SC 121 would be a negative, although intermittent, impact to a national cemetery at the Whitmire Site. Noise from small arms fire and other troop-training activities at the Fort Jackson Site, although intermittent, would be a negative and potentially unacceptable noise impact to mourners and other visitors to a veterans' cemetery. If the Fort Jackson Site were selected for cemetery development, the Army plans to establish a 1,640-foot (500-meter) noise buffer surrounding the property, but additional measures may need to be implemented to lessen these noise impacts on cemetery visitors.

No additional or new community services would be needed at the selected site due to implementation of the proposed action.

Zoning and Land Use. Existing zoning and land uses would not be significantly adversely affected. Both the Sedalia and Whitmire Sites are located within rural portions of Sumter National Forest; surrounding development is very limited. The Fort Jackson Site is located within an increasingly developed portion of east Columbia and residential, commercial, and light industrial development is located adjacent to the site.

At the Sedalia Site, development would not occur within a buried fiber optic right-of-way (ROW) that crosses the site, and aboveground electric power lines located within two onsite ROWs would either be avoided or relocated. Relocation of utilities adjacent to the nearby Sumter National Forest would require coordination with the U.S. Forest Service (USFS). At the Whitmire Site, no development would occur within a buried natural gas pipeline ROW that crosses the site. The VA NCA would coordinate with and obtain encroachment permits from the appropriate utility if onsite utility ROWs need to be crossed by a cemetery access road, irrigation system, or utilities. Utility ROWs are also located along roadways and the boundaries of the Fort Jackson Site.

Utilities. Electricity and potable water are available to all three alternative sites. Sanitary sewer service is not available at the Sedalia and Whitmire Sites and a septic system would need to constructed onsite. The septic system would need to be carefully sited to avoid shallow rock and groundwater at these sites. No adverse impacts to utilities would occur as a result of the proposed action at any of the three sites.

The regional economy would be beneficially impacted as a result of the proposed action, regardless of which site is developed as the new cemetery; the local economy associated with the chosen site would experience beneficial impacts during both construction and operation due to increased spending by workers and visitors. No adverse impacts would occur to minority or low-income populations as a result of the proposed action at any of the alternative sites.

Transportation. The proposed action would generate additional traffic in the area due to construction, funerals, cemetery workers and visitors, and service deliveries. About 356 vehicle trips are anticipated to be generated daily. Most trips would occur during off-peak hours, and most visitor trips would likely occur on weekends.

Levels of Service (LOS) at the Sedalia Site would remain very good ("A"), with no traffic delays expected due to the minimal existing volumes on nearby roadways. While aspects such as potential other nearby development, existing volumes and lack of congestion, condition of the roadway, and the available sight distance do not affect traffic operations, the main impediment for this site is the distance from the Interstate system and the circuitry of travel, which would require enhanced directional signage to be installed and maintained to direct visitors to the site.

LOS at the Whitmire Site would also remain very good ("A"), with no traffic delays expected from development of the cemetery at this site. While aspects such as potential other nearby development, condition of the roadway, and the available sight distance do not affect traffic operations, the main impediments for this site are the distance from the Interstate system and the concern for safety due to the high speed of traffic with the large percentage of trucks that visitors would encounter while accessing the site. Also, access roads into the cemetery from each side of US 176/SC 121 would need to be constructed and maintained.

LOS at the Fort Jackson Site would decrease from "A" during the peak times to "B," "C," and "B" during the AM peak, noon peak, and PM peak times, respectively. The cemetery would generate the greatest amount of traffic when adjacent street volumes are relatively low. Certain aspects of the area and site would impact traffic operations, such as the potential for nearby development. However, the main benefits of this site, from a transportation and traffic perspective, are the proximity to the Interstate system and an existing intersection from the probable main entrance that is already improved with available turn lanes.

Solid and Hazardous Waste. Potential solid and hazardous waste issues were identified at all three alternative sites.

Historic land use of the Sedalia Site has been pastoral, agricultural, residential (two former homesteads), and more recently, silviculture and hunting. The presence of asbestos-containing materials and lead-based paint in an onsite hunt cabin would be evaluated and if present, the materials would be removed and disposed of in accordance with applicable regulations. Limited

dumping of domestic debris and an onsite soil pile of unknown origin and content were observed onsite; these would be further assessed and disposed of accordingly. Aerial photograph review, interview information, and review of regulatory database information did not identify any environmental concerns associated with the Sedalia Site. No environmental concerns related to offsite properties were identified at the Sedalia Site.

Historic land use of the Whitmire Site has been silviculture and residential (two former homesteads identified), and more recently, silviculture and hunting only. Limited-size dump areas, apparently of domestic solid waste only, and scattered empty 55-gallon drums and other domestic solid waste were observed in several locations onsite. The ground surface in some portions of the site has been subjected to erosion and disturbance due to past logging activities. Due to a heavy covering of pine straw on the ground across much of the site, other dump areas may be present onsite but not observed. Aerial photograph review, interview information, and review of regulatory database information did not identify any environmental concerns associated with past usage of the Whitmire Site. Furthermore, no environmental concerns related to offsite properties were identified at the Whitmire Site.

The Fort Jackson Site has been used for Army military training exercises for several decades. Pines have been planted and east-west trending firebreaks have been constructed across the site. Due to the previously open nature of the northern portion of the Fort Jackson Installation, the potential exists for dump sites to be located onsite but not observed. At least two gravel/sand pits are located onsite; no environmental concerns to the Fort Jackson Site were identified in relation to these borrow areas.

As is the majority of Fort Jackson, the Fort Jackson Site is classified by the Installation as Low/Lightly Dudded and the potential exists for the site to be impacted by ordnance/munitions. The suspected dudded area of the site consists of 95 acres along the southern perimeter of the proposed 600-acre transfer parcel. Although live ammunition is not currently allowed during field training, the historic use of the site is not documented. Also, the site is located north of the abandoned Salerno Rocket Range, which was used during the Vietnam War for training with rockets, rifle grenades, and 40-millimeter high-explosive shells, and is considered to be highly contaminated with unexploded ordnance. The site is also located adjacent to and north of a former range, and the southern portion of the site is within an area identified by Fort Jackson staff as a “range ricochet area.” Therefore, areas adjacent the Fort Jackson Site are considered “Suspect” and “Scattered Dud” Areas. If this site was chosen for the new cemetery, the VA NCA plans to conduct an ordnance survey of the site to further assess this recognized environmental condition and the potential for, and risk of, encountering unexploded ordnance during cemetery development. The Army has agreed to clean up all areas where any ordnance has been discovered.

An uncontrolled dump site representing a REC is located north of Percival Road adjacent (and topographically upgradient) of the Fort Jackson Site. Additional investigation is recommended to assess potential impacts from this site to environmental media at the Fort Jackson Site. Additionally, in response to a Freedom of Information Act (FOIA) request, the Loveless and Loveless Inc. Mine #2 site was identified in the general area of the uncontrolled dump site. A FOIA has been submitted requesting additional information regarding this mine site. At the time of publication of this EA, the additional information had not been received.

Solid waste would be generated during construction of the new cemetery; any solid waste found or generated during construction would be disposed of at a permitted landfill in accordance with regulatory requirements. Limited amounts of solid waste would also be generated during operation of the cemetery. Recycling and reuse would be performed when applicable, and solid waste would be disposed of in a permitted landfill in accordance with regulatory requirements.

Limited types and amounts of hazardous materials would be used during construction (mainly fuel for vehicles) and operation of the cemetery (herbicides, pesticides, petroleum, etc.). These would be handled in accordance with BMPs and all applicable regulations, and their usage at the selected site is not expected to result in significant impacts to the environment.

Cumulative Impacts. Very limited development is occurring near the Sedalia and Whitmire Sites. Rapid development is occurring near the Fort Jackson Site, and Fort Jackson's mission is expected to increase, although slightly, due to the recent Base Realignment and Closure (BRAC) announcements. Further, the addition of a national cemetery is not expected to generate additional significant development in any of the three alternative site areas. BMPs implemented in association with the cemetery development would limit all potential cumulative impacts to insignificant regardless of which site is developed as the new cemetery.

American Indian, Agency and Public Coordination / Potential for Controversy. Numerous American Indian Nations, and agencies and agency representatives were contacted during the NEPA process. No controversial issues have been identified by these persons and agencies to date. The VA NCA plans to continue consultation and coordination with American Indian Nations and regulatory agencies throughout the site selection, design, and construction processes to resolve any issues that are identified. Several newspaper articles have been published that describe the project and tout the benefits of a new national veterans' cemetery in the Columbia-Greenville area. In addition, notification of and outreach to the public near the three alternative sites has not identified any potential for controversy regarding the project.

Based on the findings of the EA, a Finding of No Significant Impact (FONSI) is appropriate regardless of which site is chosen for development as the new national veterans' cemetery, and an Environmental Impact Statement (EIS) is not required.

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1.0 INTRODUCTION

The National Cemetery Administration (NCA) is one of three administrations within the United States (U.S.) Department of Veterans Affairs (VA). The VA NCA is responsible for the operation and maintenance of 120 national cemeteries and the construction of new national cemeteries. The VA NCA is also responsible for providing cemetery services to veterans and other eligible persons pursuant to the provisions of the National Cemeteries Act of 1973 and other statutory authority and regulations.

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and VA Regulations, (38 CFR 26.4 [a]). The VA policy includes provisions to:

- Act with care in carrying out its mission of providing services for veterans to ensure it does so consistently with national environmental policies. Specifically, the VA shall ensure that all practical means and measures are used to protect, restore, and enhance the quality of the human environment;
- Avoid or minimize adverse environmental consequences, consistent with other national policy considerations;
- Prepare concise and clear environmental documents which shall be supported by documented environmental analyses; and
- Preserve historical, cultural, and natural aspects of our national heritage.

As such, the VA NCA is using this EA in the planning process and to aid in considering the potential environmental consequences of constructing and operating a new national veterans' cemetery in the Columbia-Greenville, South Carolina area. URS Group, Inc. (URS) prepared the EA on behalf of the VA NCA, based on VA NCA-provided information, site reconnaissances in April and May 2005, and February 2006, and data obtained from interviews, websites, regulatory agency personnel, newspaper articles, previous studies and reports, and other readily available sources of information.

In addition to describing the Purpose and Need for action (Section 2.0), this EA describes the alternative actions that have been evaluated by the VA NCA (Section 3.0); describes the Affected Environment and Environmental Consequences (Section 4.0) of implementing the alternative actions and the required coordination and environmental permits; discusses the Agency Coordination (Section 5.0) that has been conducted and is ongoing in association with the NEPA process; lists the References (Section 6.0) that have been used during preparation of this EA; and summarizes the qualifications of the Preparers (Section 7.0) of this EA. The Appendices at the end of the document are: Site Photographs (Appendix A), Notice of Intent (Appendix B), Agency Coordination and American Indian Consultation Letters (Appendix C), Archaeology Site Maps (Appendix D), Potential National Register-Eligible Standing Structures within the Area of Potential Effect (Appendix E), Additional Phase I Environmental Site Assessment Information (Appendix F), Fort Jackson Conservation Easement (Appendix G), and Fort Jackson Biological Assessment (Appendix H).

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2.0 PURPOSE AND NEED

2.1 PURPOSE OF PROPOSED ACTION

The National Cemetery Expansion Act of 2003 (Public Law 108-109) requires the VA NCA to establish six new national cemeteries within four years and the VA NCA has identified the veteran population that is concentrated in the Columbia-Greenville area as a priority. The purpose of the proposed action is to construct and operate a new national cemetery that would provide veterans and their families living in the unserved 21-county Columbia-Greenville area the opportunity to be buried in a national cemetery, and to benefit from the honor and privilege bestowed upon them by a grateful nation for their service to their country.

2.2 NEED FOR ACTION

One of the strategic goals of the VA NCA is to assure that the burial needs of veterans are met, and it has been recognized for some time that there was a need for additional cemetery facilities. The death of veterans has been increasing each year as World War II and Korean War-era veterans advance in age. VA NCA estimates indicate that veteran deaths would peak at 687,000 in the year 2008. From 2000 to 2008, the annual rate of veteran deaths is expected to increase by approximately 10.5 percent per year. This progressive increase in veteran deaths results in a corresponding increase in the demand for burial space in national cemeteries, a demand that exceeds current capacity (VA NCA, 2000).

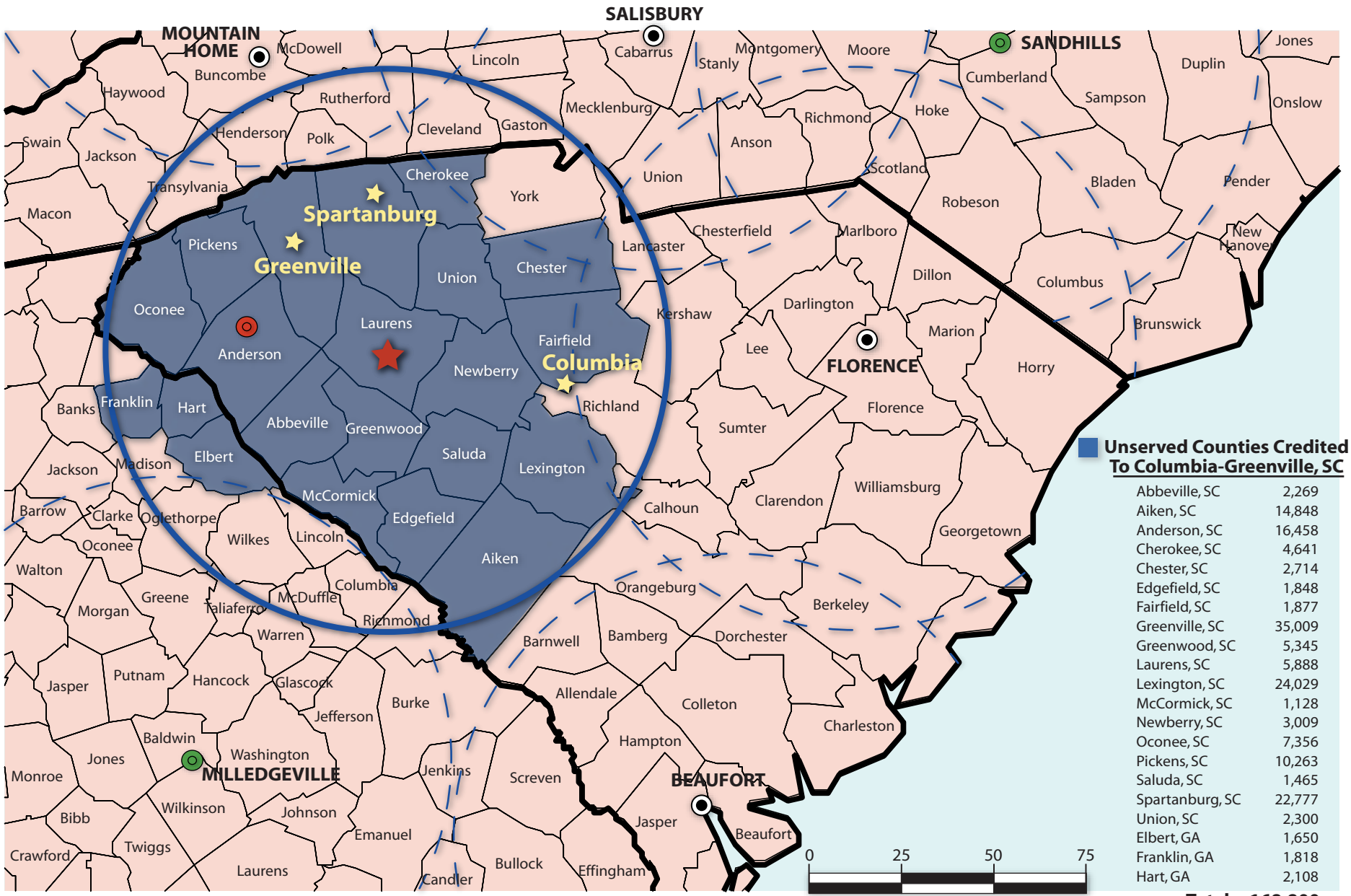
National veterans' cemeteries are already located in Florence, South Carolina, and Beaufort, South Carolina (Figure 1). At current burial rates, the Florence National Cemetery can accommodate in-ground casketed burial space until about mid-2006, and in-ground cremated burial space until about 2010. An expansion project is planned, but is currently on hold (Robinson, 2006). The Beaufort National Cemetery will likely deplete availability of casketed burial spaces by end of 2006; no cremated burial spaces are available. A 15-acre expansion project is planned to provide additional interment space at Beaufort National Cemetery (Gray, 2005). The expansion project can accommodate 723 traditional in-ground casketed burials, 1,885 pre-placed crypts in-ground casketed burials, 693 in-ground cremated burial spaces, and 83 memorials (Phillips, 2006). The expansion would allow for an additional 10 years of burials at Beaufort National Cemetery (VA NCA, 2006a). However, based on a demographic study of the number and location of veterans in the area, even with these cemetery expansions, the VA NCA identified the need for a new national veterans' cemetery in South Carolina.

A new state veterans' cemetery anticipated for completion in 2007 under the VA State Grant Program is being planned for Anderson, South Carolina (Figure 1). The cemetery site is located along South Carolina (SC) 4-1116, near the intersection of SC 78 and SC 178 between the towns of Belton and Anderson. At full build-out, this cemetery would encompass nearly 60 acres. Phase I of the project would develop about 22 acres and provide 6,000 gravesites, 800 pre-placed crypts, 740 in-ground remain sites, and 800 columbarium niches (Gebhardtsbauer, 2005). At full build-out, it would provide a total of 18,095 gravesites, 2,400 pre-placed crypts, 3,000 in-ground cremain sites, and 2,000 to 3,000 columbarium niches.

Other nearby national veterans' cemeteries are located in Mountain Home and Salisbury, North Carolina and nearby state veterans' cemeteries are located in Sandhills, North Carolina, and Milledgeville, Georgia (Figure 1).

The VA NCA has determined through experience that few people will elect burial at a national cemetery that is farther than 75 miles from their home. There is also reluctance for burial to take place across a state line from their place of residence. The VA NCA identified 21 counties (shown on Figure 1) in South Carolina and Georgia that currently are "unserved" by a national veterans' cemetery, including a population of 168,800 veterans. The largest concentrations of unserved veterans are located near major cities, in Greenville County (20.7 percent), Lexington County (14.2 percent), and Spartanburg County (13.5 percent). Even with the opening of the new state veterans' cemetery at Anderson, the demand for burial space in veterans' cemeteries is expected to exceed available capacity. Hence, the optimum focal point for a cemetery for the veteran population in South Carolina was identified generally as the Columbia-Greenville area (Figure 1).

The VA NCA estimates that the proposed Columbia-Greenville Area National Cemetery would open in 2009, and that 772 casket and cremain interments would be needed in the first year. The number of interments is expected to increase each year for the subsequent four years, and 904 interments are projected for the year 2013. After this peak year, the number of annual interments would begin to decline, with 721 interments projected for the year 2030. The cumulative interments for planning year 2030 would be approximately 17,677. The VA NCA anticipates that approximately 250 acres would be necessary to meet the needs for burials through 2030, and thus sought available sites of sufficient size that would meet this requirement.



- National Cemetery Location
- A State Veterans' Cemetery in Anderson, SC is in the planning process.
- State Veterans' Cemetery Location
- Center of Search Area
- Major Cities

CLIENT: Department of Veterans Affairs		TITLE: Search Area For A Columbia-Greenville Area National Cemetery	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 1
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 2-3
FILE: H:\proj\VA Cemetery\GreenvilleColumbia\Focal Point.ai	CHKD BY: A. Yarnell		

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3.0 DESCRIPTION OF ALTERNATIVES

The alternatives considered in this EA are the No Action Alternative and the Proposed Action Alternative, which could be implemented at any of three alternative sites. This section describes the No Action Alternative, the Proposed Action Alternative, and the three alternative sites being considered for the new Columbia-Greenville national veterans' cemetery.

3.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the VA NCA would not develop a new national cemetery in the Columbia-Greenville, South Carolina area. No new construction would occur, and the alternative sites being considered for the new cemetery would not be affected.

Under the No Action Alternative, veterans in the area would have to use one of the operational national cemeteries in South Carolina, the planned new state veterans' cemetery in Anderson, or a private cemetery for burial. The use of other cemeteries in South Carolina or elsewhere could create a hardship for the veterans' families and friends for attending funerals and for gravesite visitations. Lack of space in the nearest veterans' cemeteries might force veterans' families to use a private cemetery. If veterans and their families must resort to private burials, they would be deprived of the benefit, honor, and privilege bestowed upon them by a grateful nation for their service to their country. Furthermore, the VA NCA would fail to meet its mission and congressional mandate to serve veterans concentrated in the Columbia-Greenville area.

3.2 PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative involves construction and operation of a new national veterans' cemetery on a site that would be acquired by the VA NCA in the Columbia-Greenville area.

Cemetery development at the selected site would occur in phases, with Phase I anticipated for completion in 2010. Phase I of the proposed action would provide a fast-track burial section, development of approximately 5,000 gravesites for casketed interments, 2,450 sites for cremated remains including a columbarium, and appropriate structures/facilities to support cemetery operations. The total development area for Phase I is expected to be 50 acres, and would provide for approximately 10 years of burials. The design and construction would include the following elements and features:

- Access roads
- Entrance area
- Administration / Public Information Center with Gravesite Locator and Public Restrooms
- Flag/Assembly Area
- Memorial Walkway/Donations Area
- Committal Shelters (two)
- Roadway system and parking
- Site furnishings
- Interment Area (burial sections)

  - Casketed Remains – approximately 5,000 full casket gravesites including 4,200 crypts
  - Cremated Remains – approximately 450 in-ground sites and approximately 2,000 columbaria niches
  - Garden for scattering of cremated remains
- Grading, drainage, fencing, and landscaping
- Maintenance Complex
- Irrigation system
- Utility distribution systems

As listed above, during Phase I of the development, 2,450 sites for cremated remains and approximately 5,000 gravesites are proposed for construction. These gravesites would be either pre-placed crypts or standard gravesites, depending upon site geology and the ability to excavate gravesites to a required depth. Gravesite sections are typically developed as 1- to 2-acre areas, which provide a more personal atmosphere. Where practicable, existing trees and vegetation would be used as natural boundaries between gravesite sections. Additional landscaping would be added where needed.

Two access roads are typically proposed for national cemeteries. One road would be the main entrance for public use during funerals and visitations. A second road would be used as a service road for maintenance vehicles and delivery vehicles.

Subsequent development phases through 2030, the last year that NCA data projections are available, would bring the cumulative total to 17,614 interment sites.

3.2.1 Site Selection Process for the New National Veterans' Cemetery

3.2.1.1 Focal Point of Search

Once the VA NCA determined that there was a need for a new national cemetery in South Carolina, a demographic analysis was conducted to establish the focal point for the site search. This focal point is the center of the search area and was determined by examining the number and location of veterans living within the area to be served, and the availability or proximity of existing veterans' cemeteries. The VA NCA has found that a radius of 75 miles from the focal point is an optimum distance for planning purposes.

Based on the demographic analysis, the Columbia-Greenville area was identified as the focal point for the site search (Figure 1). The radius for the search was 75 miles, and encompassed 18 counties in South Carolina and 3 in Georgia. The current veteran population within the search radius is approximately 148,757 for FY 2005 and is expected to be 17,614 for FY 2008 (VA NCA, 2005).

3.2.1.2 Site Evaluation

The VA NCA considered a total of five sites within the 75-mile radius of the Columbia-Greenville area focal point (Sedalia Site, Whitmire Site, Fort Jackson Site #1, Fort Jackson Site

#2, and Fort Jackson Site #3, which reconfigures the Fort Jackson Site #1 site boundaries per request of the U.S. Department of Defense (DoD) in January 2006. Various parties offered these sites for sale or federal government transfer to the VA NCA. Each site was evaluated against ten evaluation criteria. These criteria include:

1) **Proximity** – The site should be located as close as possible to the densest veteran population in the area under consideration. Not only actual distance, but also travel time to the site should be considered.

2) **Size** – Sufficient acreage must be available to provide gravesites for at least a 40-year projection. Interment rates and acreage requirements are projected based upon veteran population within a 75-mile radius of a projected site.

3) **Shape** – The site should exhibit uniform and generally square or rectangular boundaries that are undivided by roads or easements. Irregularly shaped sites are most difficult to access and less efficient to design and develop.

4) **Accessibility** – The site should be readily accessible via highways and major public roadways. Proximity to highway interchanges and public transportation is desirable. The quality of access highways is also considered.

5) **Utilities and Water –** The availability of public utilities (electricity, water, sewer, and natural gas) is important. However, onsite septic systems and potable water wells or ponds are acceptable. An adequate water supply for irrigation is of primary importance.

6) **Surrounding Land Use** – Sites adjacent to visually objectionable activities, loud noise, high traffic, or other nuisance elements should be avoided. Both current and projected land uses should be considered.

7) **Soils** – Soils should be of a quality that would provide adequate topsoil for growing turf, be adequately suitable for constructing roads and buildings, and be free of shallow depth groundwater. There should be no sub-surface obstructions or hazardous waste present.

8) **Topography** – Comparatively level to rolling terrain is desirable for areas to be developed. The grade of burial sites should be in the 2 to 15 percent range. There should be sufficient slope to enable proper drainage of the site. Ravines, wetlands, and sinkholes cannot be developed.

9) **Aesthetics** – Existing site amenities such as pleasant views and quality vegetative cover are favorable.

10) **Restrictions to Development** – The presence of man-made elements such as historic/ archaeological elements, utility easements, rights-of-way, or mineral rights can hamper or legally prevent development. The presence of endangered species can also limit land development.

In addition to the ten criteria listed above, each site was reviewed for its ability to permit the VA NCA to bring into service a cemetery that fulfills an unmet need for veterans in the Columbia-Greenville area in a timely manner. Ease and simplicity of acquisition is beneficial because it expedites the delivery of a functioning cemetery to the veteran community.

3.2.2 Alternative Sites Considered and Dismissed from Detailed Analysis

Each of the four initial alternative sites for a new national veterans' cemetery was evaluated against these criteria; one of the sites (Fort Jackson Site #2) was eliminated due to its less-desirable location on the Installation (hidden access, poorly maintained secondary road access, absence of utilities, smaller site size, and less opportunity for expansion capabilities) as well as nearby Red-Cockaded Woodpecker (RCW, a federally protected species) habitat and large areas of wetlands, which would have limited initial cemetery development and future expansion capabilities.

3.2.3 Alternative Sites Retained for Detailed Analysis

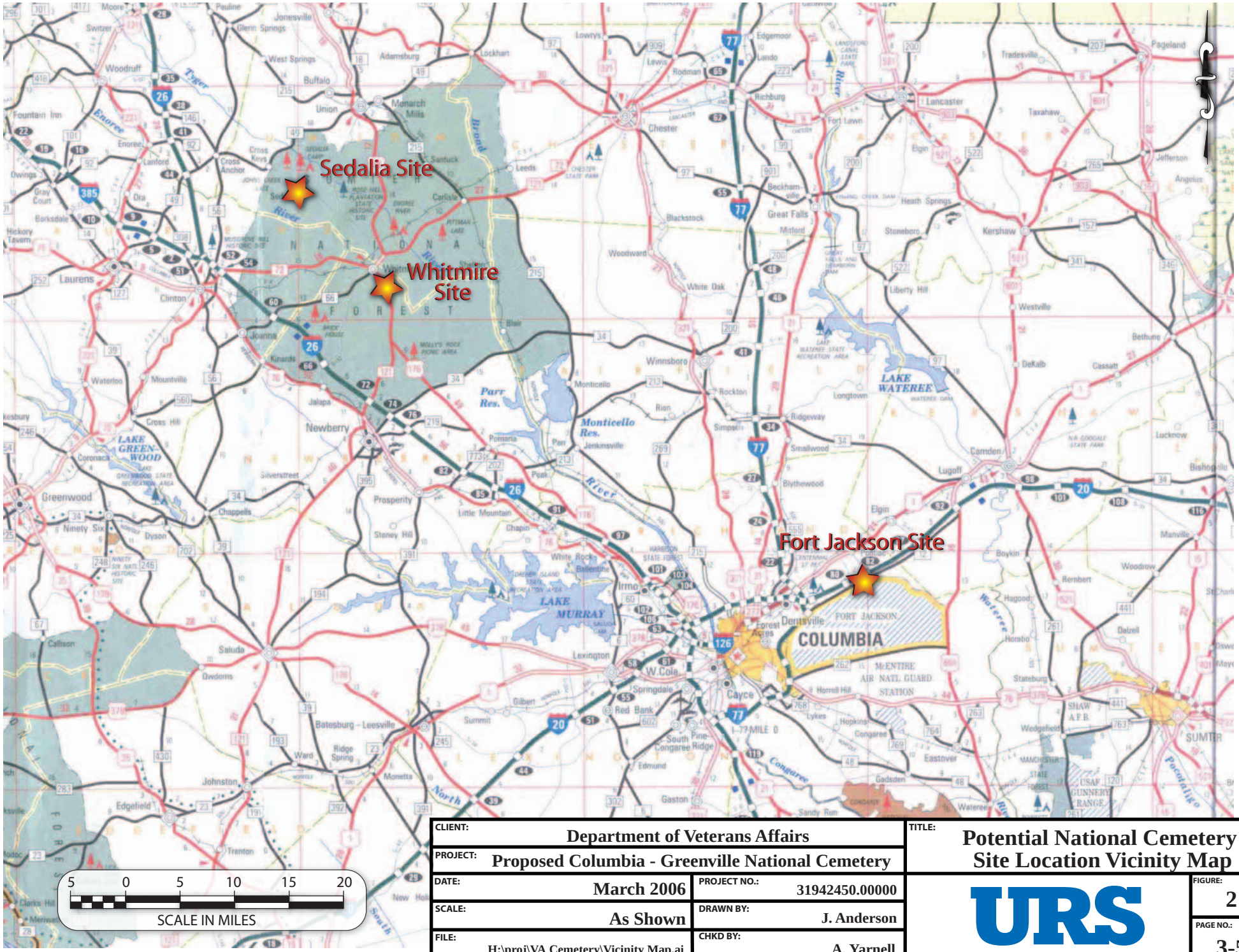
The three remaining alternative sites did not necessarily meet all of the ten site selection criteria but were thought to represent viable alternatives for further consideration for the new national veterans' cemetery in the Columbia-Greenville area. The VA NCA henceforth evaluated three alternative sites in depth. Part of the evaluation process included studies by URS Group, Inc. (URS) in April – June 2005 and the preparation of a preliminary draft EA for VA NCA review that focused on the "Sedalia Site, " the "Whitmire Site," and the "Fort Jackson Site."

From June 2005 to January 2006, the VA NCA continued in-house evaluation of these three sites and continued discussion with the property owners and the DoD. During this timeframe, with the announcement of the Base Realignment and Closure (BRAC) list and DoD's re-evaluation of areas within Fort Jackson that might be required for continued military training, the DoD requested that the "Fort Jackson Site" be modified to exclude some existing training areas and to include stream, wetland and floodplain areas that were "carved out" of the initial site. The revised "Fort Jackson Site" contains about 350 acres of the site initially evaluated by URS, and about 150 acres that are adjacent to the initial site. Per request of the VA NCA, in February and March, 2006, URS evaluated the new acreage associated with modified Fort Jackson Site and modified the EA to address the Fort Jackson Site as it is currently configured.

The locations of the three alternative sites are shown on Figure 2, and they are described in the following sections of this document.

3.2.3.1 Proposed Action Alternative Site 1 (Sedalia Site) - Construct New National Cemetery on 477-Acre Site in Union County, South Carolina

Under this alternative, the VA NCA would acquire and develop a 477-acre irregularly shaped site located in the community of Sedalia, a rural section of Union County, South Carolina (Figure 3 and Figure 4). A willing property owner has offered to sell the site to the VA NCA.



CLIENT: Department of Veterans Affairs		TITLE: Potential National Cemetery Site Location Vicinity Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 2
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-5
FILE: H:\proj\VA Cemetery\Vicinity Map.ai	CHKD BY: A. Yarnell		

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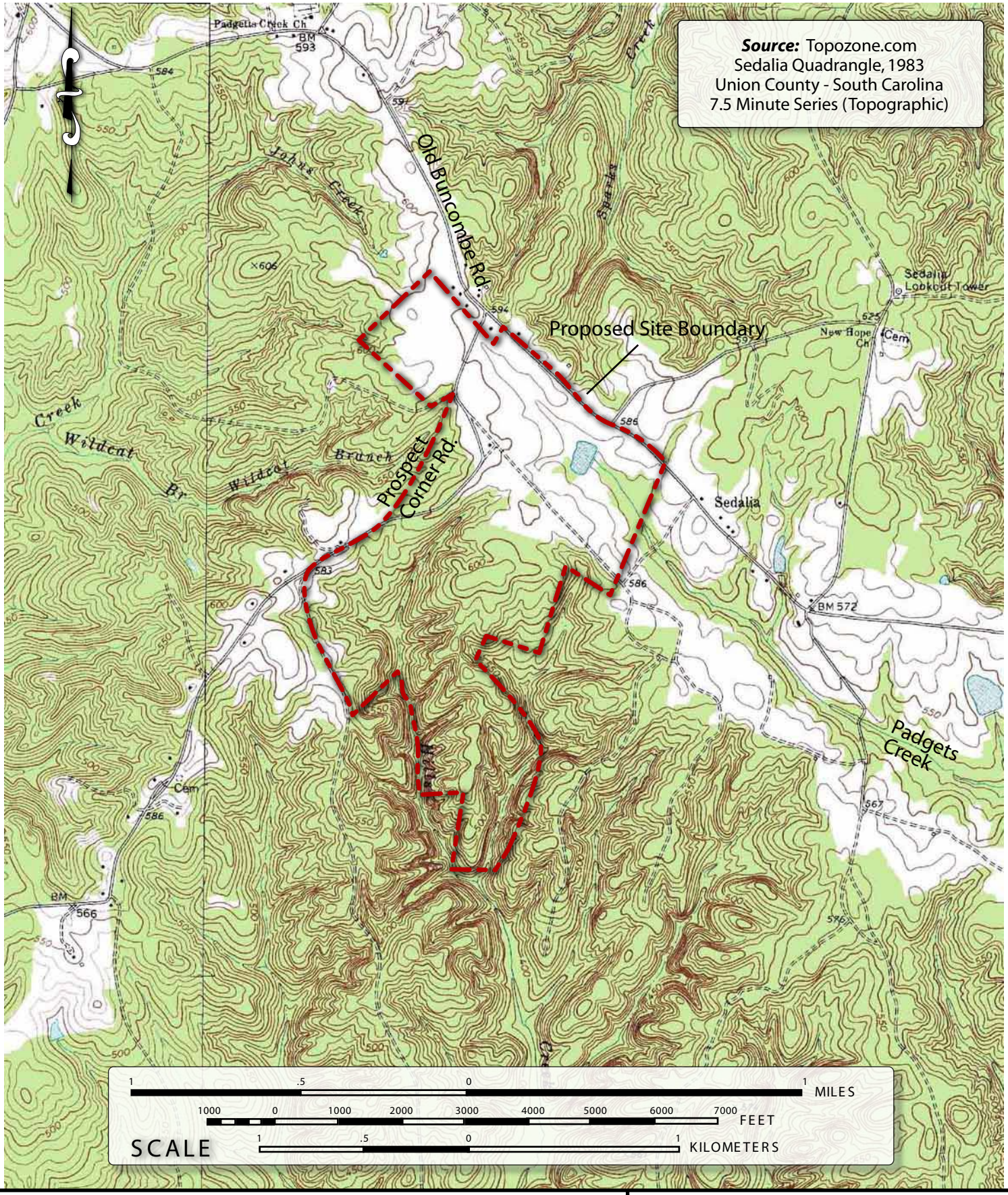

CLIENT: Department of Veterans Affairs		TITLE: Sedalia Site Location Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 3
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-7
FILE: H:\proj\VA Cemetery\Sedalia\SedaliaSitemap.ai	CHECKED BY: A. Yarnell		

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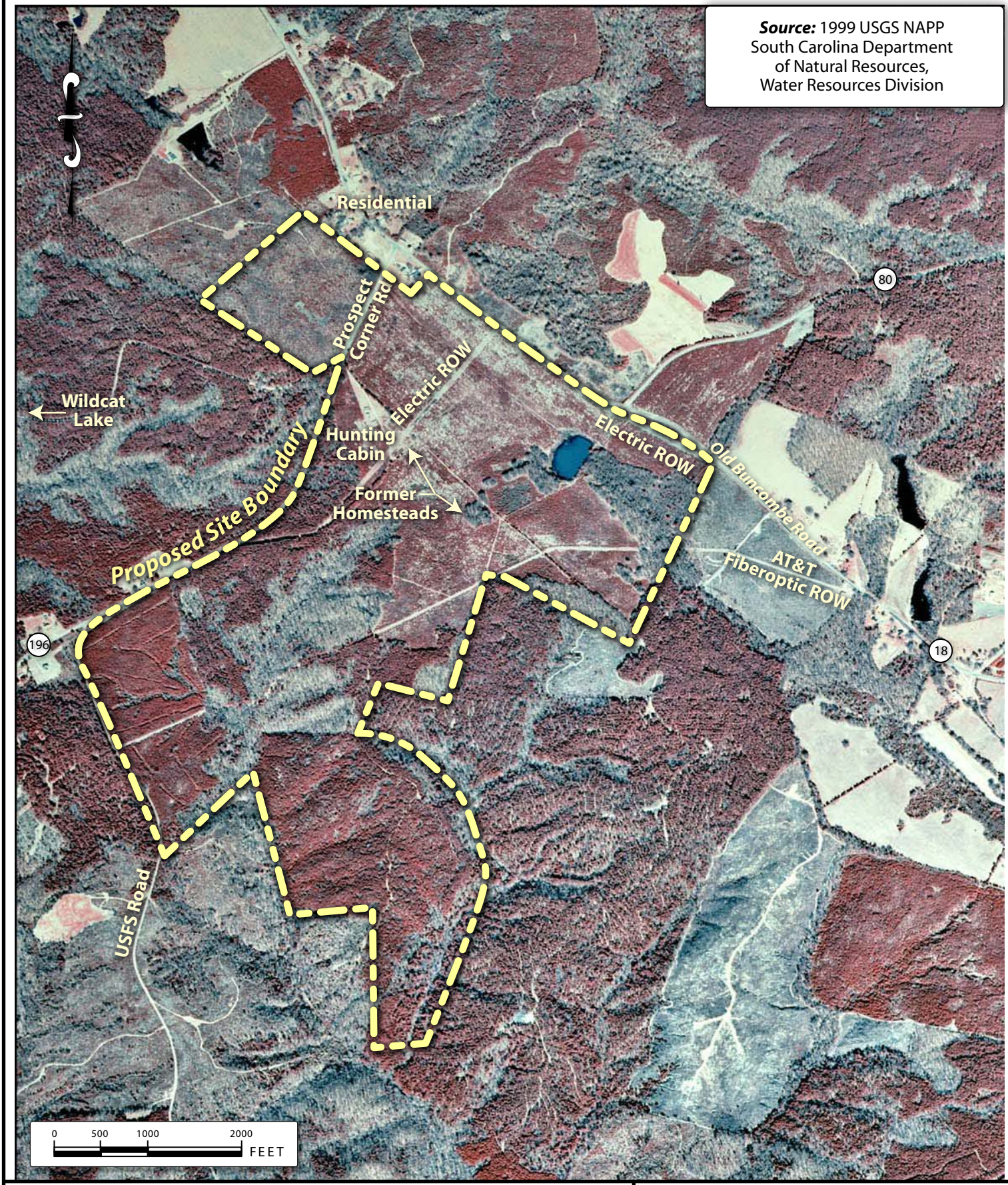

CLIENT: Department of Veterans Affairs		TITLE: Sedalia Site Characteristics	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31945450.00000	URS	FIGURE: 4
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-9
FILE: H:\proj\VA Cemetery\Sedalia\SedaliaInfared.ai	CHECKED BY: A. Yarnell		

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The site is designated herein as the "Sedalia Site" and is bounded by Secondary State Route S44-18 (also known as Old Buncombe Road) to the north; by forestland and Prospect Corner Road (Secondary State Route S44-196) to the west; by a U.S. Forest Service (USFS)-maintained road and forestland to the south; and by forestland to the east (Figure 4). The majority of the surrounding forestland is owned by the USFS and, during site visits in April 2005, some of the timber was being harvested. A few residential parcels are located directly adjacent to the northwestern corner of the site.

The Sedalia Site is made up of three parcels and is used primarily for silviculture and for hunting. While the majority of the site is planted in pines, the northeastern portion of the site near an onsite pond and areas along creeks are forested with hardwoods (hardwoods appear as blue-tinted vegetation on the infrared photograph presented as Figure 4). A manmade earthen dam, about 10 feet tall, 10 feet wide at its crest (wide enough to drive a vehicle), and about 400 feet long, forms the eastern (downstream) edge of the pond. A cleared area containing a hunting cabin and open-sided shed is located in the northwestern section of the site. Historically, the Sedalia Site and vicinity have been used for agricultural, pastoral, or silvicultural purposes.

Three utility right-of-ways (ROWs) traverse the Sedalia Site: an underground AT&T fiber optic ROW from the site's northeastern corner to its southwestern corner, and two aboveground electrical power line ROWs, one in the northeastern portion of the site along Old Buncombe Road, and one traversing the northwestern portion of the site (see Figure 4). Electricity and potable water are provided to the onsite hunting cabin; no other utilities are present onsite.

3.2.3.2 Proposed Action Alternative Site 2 (Whitmire Site) - Construct New National Cemetery on 433-Acre Site in Newberry County, South Carolina

Under this alternative, the VA NCA would acquire and develop a 433-acre irregularly shaped site approximately 3 miles from the town of Whitmire in a rural section of Newberry County, South Carolina (Figure 5). A willing property owner has offered to sell the site to the VA NCA.

The site is designated herein as the "Whitmire Site" and is bounded by Duncan Creek to the north, by forestland to the east, by a creek to the southeast, and by forestland to the southwest and west (Figure 6). United States (US) 176/State Route 121 (SC 121) traverses the center of the site in a north-south direction. Some of the adjacent forestland is USFS land, and a USFS-maintained road (Sulfur Springs Road) is located in the southeastern corner of the site.

The Whitmire Site consists of one parcel and is used primarily for silviculture (pine forest appears as red-tinted vegetation on the infrared photograph presented as Figure 6) and for hunting. A portion of the northwestern section of the site consists of hardwoods along the floodplain of Duncan Creek (see blue-tinted vegetation indicated on Figure 6).

A South Carolina Pipeline Corporation (SCPC) high-pressure natural gas pipeline and ROW traverse the southeastern portion of the site (see Figure 6). The only permanent structure on the site is a pipeline rectifier station, located in the southern corner of the site within the SCPC ROW. A second set of natural gas lines and a ROW are located in the northern portion of the site just east of US 176/SC 121 along an old concrete roadbed (Figure 6). This natural gas line

crosses Duncan Creek along an old concrete bridge (Figure 6). High-tension electrical lines and the associated ROW traverse the area in a north-south direction, just to the west of the site, touching one point on the site boundary (Figure 6).

Potable water, natural gas, and electric power lines are present along US 176/SC 121 through the site, but no utilities are currently provided to the site. The closest sanitary sewer service is provided at the Renfro manufacturing facility located about 2,000 feet north of the site along US 176/SC 121 (see Figure 6).

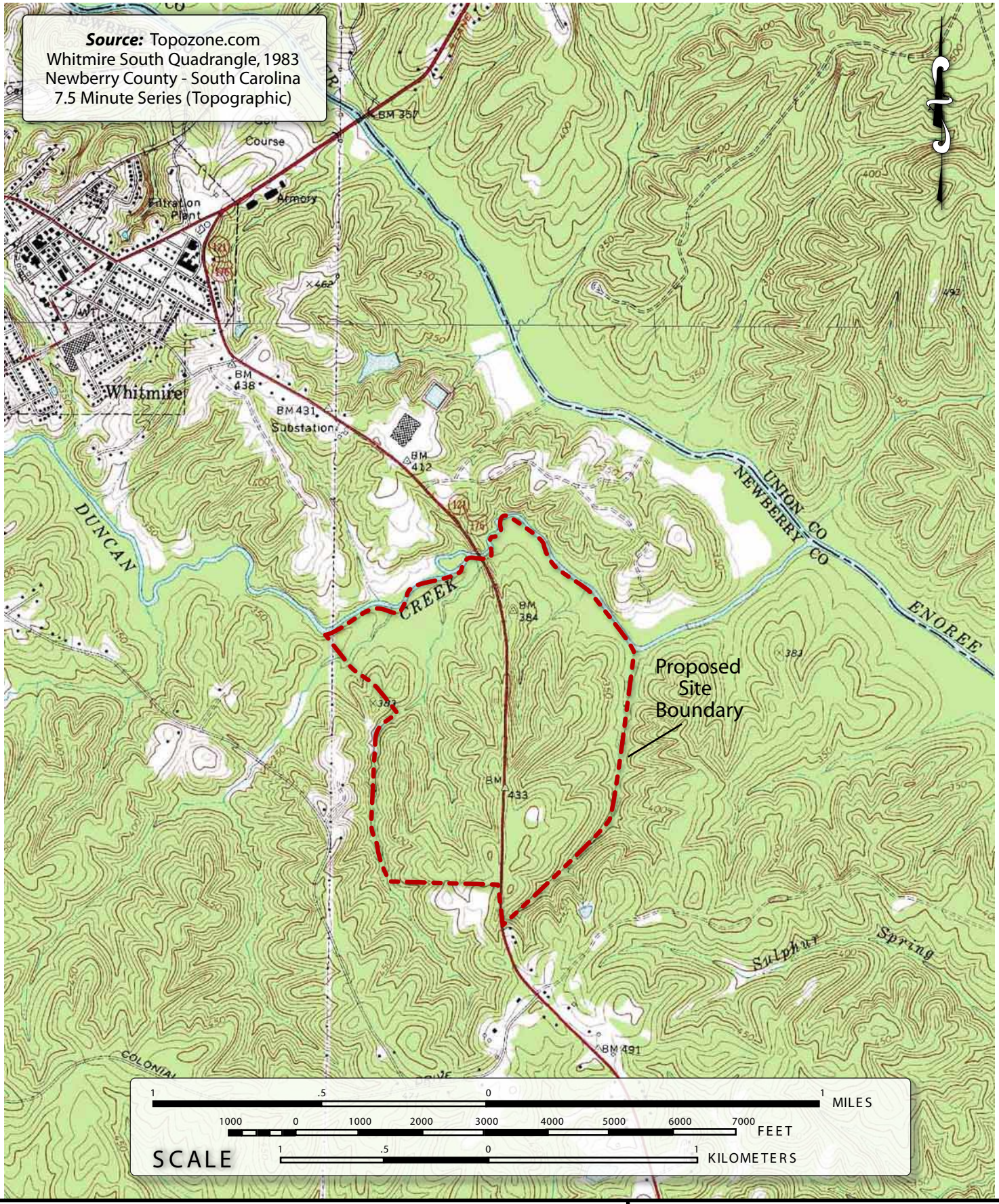
3.2.3.3 Proposed Action Alternative Site 3 (Fort Jackson Site) - Construct New National Cemetery on a 600-Acre Site in Fort Jackson, Richland County, South Carolina

Under this alternative, a 600-acre site located within the U.S. Army Training Center and Fort Jackson ("Fort Jackson" or "Installation") would be transferred from the DoD to the VA NCA. Fort Jackson is located in Columbia, Richland County, South Carolina, and encompasses more than 52,000 acres, including more than 1,000 buildings, and more than 50 ranges and field training sites. The Installation is the largest and most active Initial Entry Center in the U.S. Army, training 34 percent of all soldiers and 69 percent of the women entering the Army each year (Fort Jackson, 2005).

The site is designated herein as the "Fort Jackson Site" and is bounded to the north by Percival Road (located off the Installation), to the east by Spears Creek Church Road, partially on the south by a portion of North Tower Road, to the west by a portion of Wildcat Road, and to the east, south, and west by active field exercise training areas within Fort Jackson (Figures 7 and 8). Colonels Creek tributaries and wetlands dissect the site. Along Percival Road, Fort Jackson Gate 8 provides access to the site at Wildcat Road, and Gate 9 provides access to the site at Spears Creek Church Road. These gates have been closed to all vehicular traffic since late 2001 due to new force protection requirements.

The Fort Jackson Site is actively managed for timber by the Installation's forestry department, and the site is currently mainly planted in loblolly pine and slash pine. The site is used for Army field training exercises (predominantly portions of Training Area 11A and a small portion of 4A, shown on Figure 8); limited onsite hunting by off-duty military, retired military, and civilian personnel by permit at various times of the year and Installation-sponsored hunting camps for the public during deer season.

Fort Jackson has constructed east-west trending firebreaks across the undeveloped portions of the Installation. Fort Jackson started clearing the firebreaks in 1956, and they consist of strips of land cleared of vegetation, about 15 feet wide, and about 600 feet apart. Such firebreaks cross the Fort Jackson Site from east to west as shown on Figure 8.



CLIENT: Department of Veterans Affairs		TITLE: Whitmire Site Location Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 5
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-13
FILE: H:\proj\VA Cemetery\Whitmire\WhitmireSitemap.ai	CHECKED BY: A. Yarnell		

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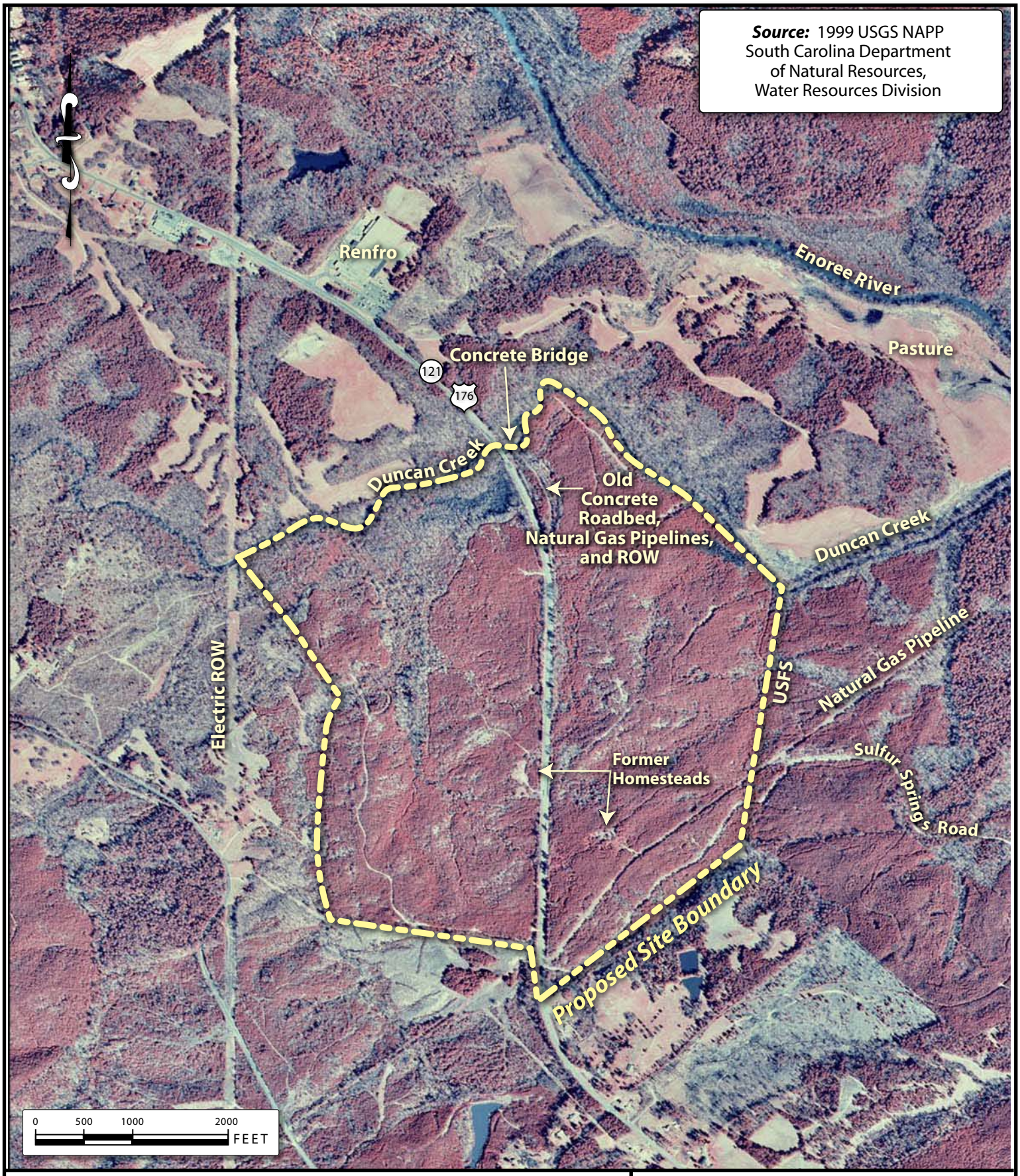

CLIENT: Department of Veterans Affairs		TITLE: Whitmire Site Characteristics	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 6
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-15
FILE: H:\proj\VA Cemetery\whitmere\whitmere infared.ai	CHECKED BY: A. Yarnell		

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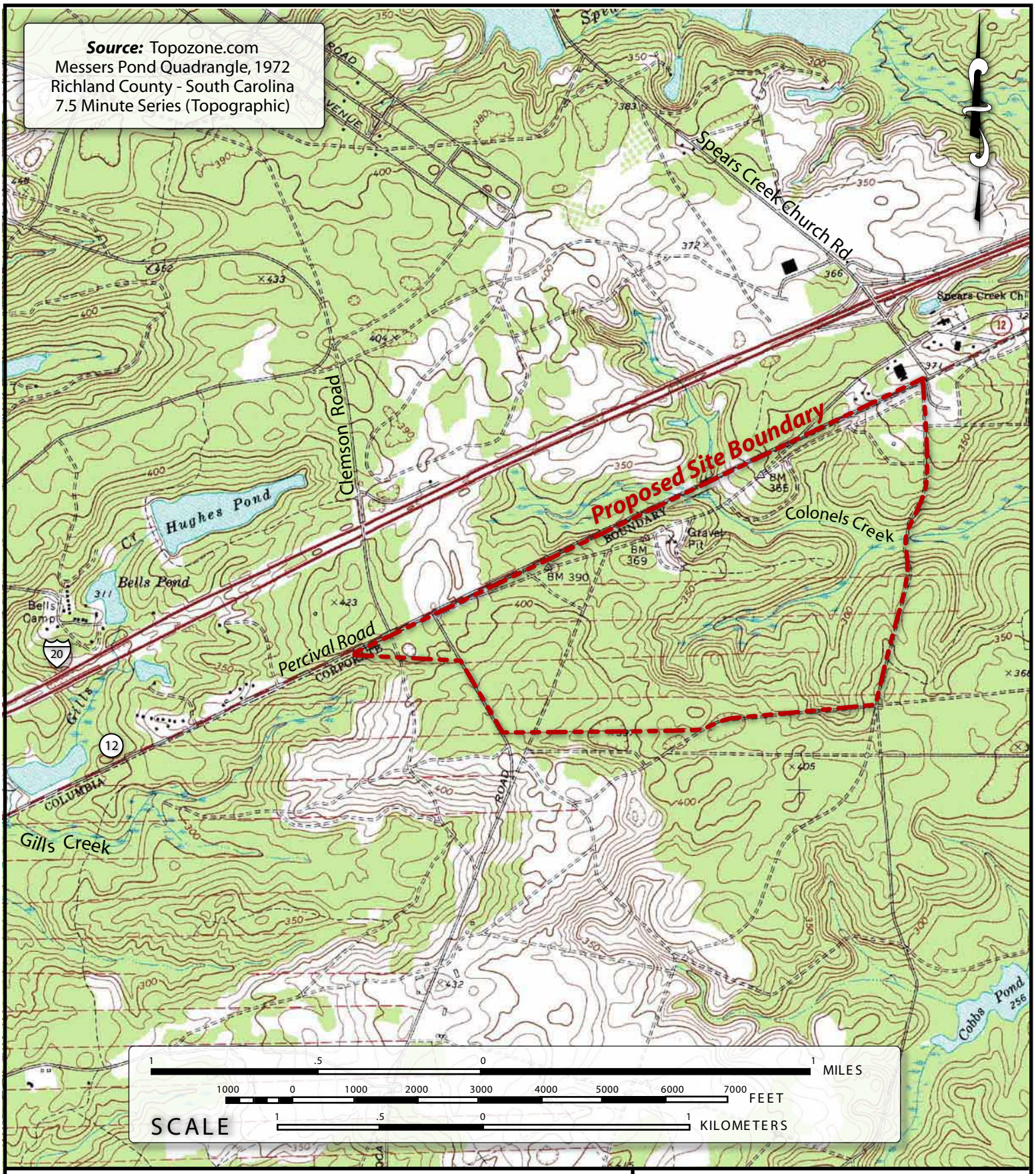

CLIENT: Department of Veterans Affairs		TITLE: Fort Jackson Site Location Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 7
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-17
FILE: H:\proj\VA Cemetery\FtJackson\FtJacksonSiteMapRev.ai	CHECKED BY: A. Yarnell		

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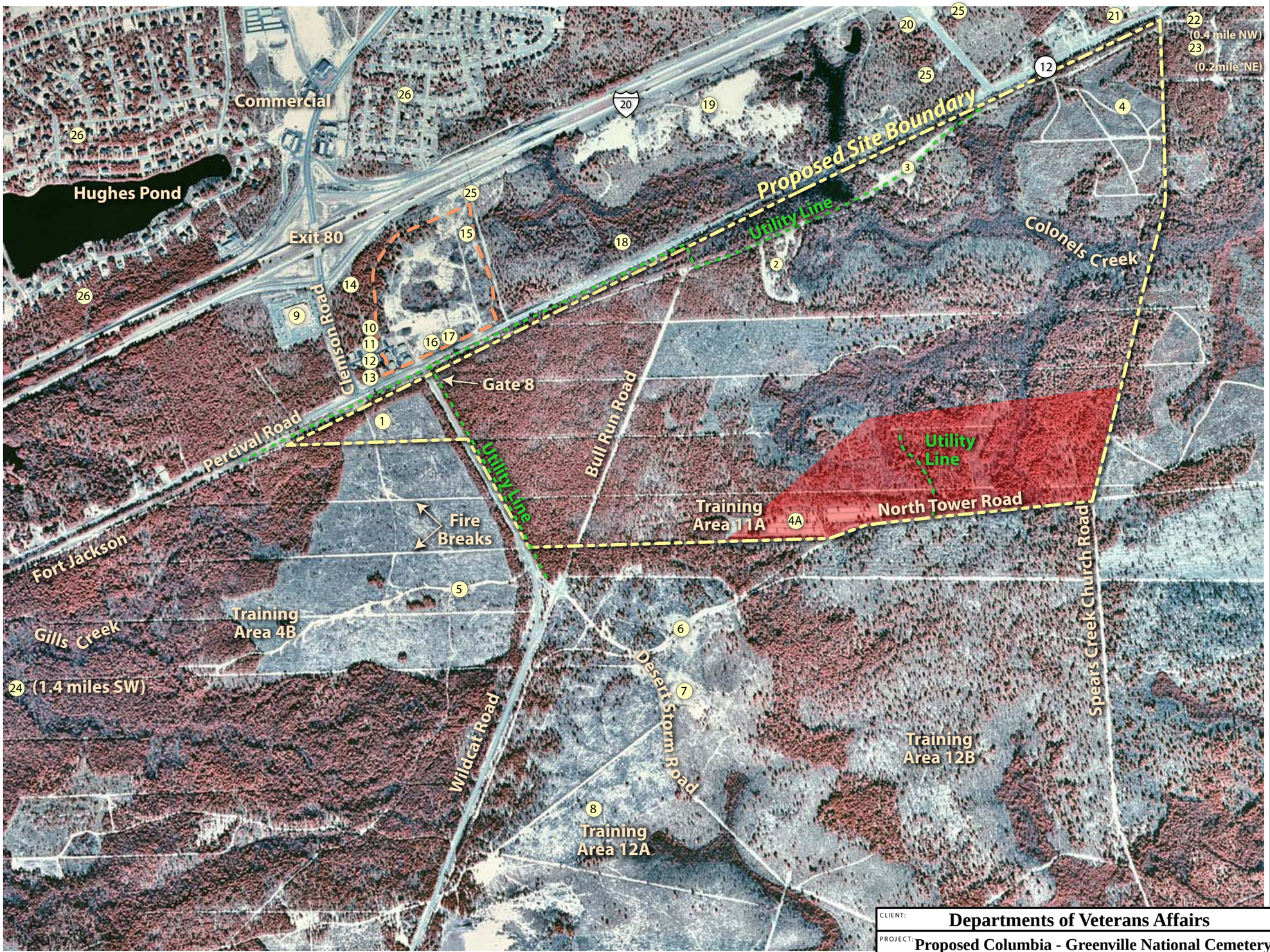

Source: 1999 USGS NAPP
South Carolina Department
of Natural Resources,
Water Resources Division

ON-SITE
1 - Borrow Pit
2 - Gravel Pit
3 - Former Training Area/Borrow Pit
4 - Former Building/Training Structure
4A - Food Plot

OFF-SITE
5 - Dump Site/Logging Staging Area
6 - Observation Mound
7 - Sand Pit/Previous Range
8 - Abandoned Salerno Rocket Range
9 - Companion Property & Casualty
10 - Carolina Paint & Body
11 - Wendy's
12 - Space Place Storage
13 - Sparkleberry Apartments
14 - Capital Hyundai Chevrolet Dealership
15 - Un-permitted Construction Debris Landfill
16 - Mounded Soil
17 - Land for Sale
18 - Undeveloped Pine Scrub
19 - Columbia BMX Park
20 - Clothing World
21 - Furniture Services, Inc. and Apartment & Corporate Relocation Services
22 - Townsend Saw Chain Company NPL Site
23 - Arrowhead Plastics South (Former Small Quantity Generator)
24 - SWMU 23
25 - Cell Tower
26 - Residential

- Utility Line (Electrical & Communcation)
- Approximate Location of Loveless and Loveless Inc. Mine #2
- Approximate Location of "Dudded" Area

0 .25 .5 KILOMETERS
0 .25 MILES

CLIENT: Departments of Veterans Affairs		TITLE: Fort Jackson Site Characteristics	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 8
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 3-19
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Fort Jackson would designate various buffer zones around the Fort Jackson Site, in which no training or other troop-related activities would be allowed to occur, including: 328 feet (100 meters) for all troop activities, 1,640 feet (500 meters) for activities that generate noise (such as ammunition fire), and 3,280 feet (1,000 meters) for troop activities involving smoke and tear gas (Olsen, 2006). Along the site periphery, Spears Creek Church Road, North Tower Road, and Wildcat Road would continue to be used by Fort Jackson, but all roadways from the Installation into the Fort Jackson Site would be closed to traffic. To accommodate vehicular transport of relocatable buildings into and out of the Installation, Fort Jackson is considering construction of a new access gate to be located west of Gate 8 on Percival Road, and a new roadway along the northwestern site boundary to connect Percival Road to Wildcat Road.

All utilities are available along Percival Road to the north of the Fort Jackson Site. Various utilities for Fort Jackson are located along roadways within the site, and a BellSouth easement is located in the Percival Road right-of-way along the northern boundary of the site.

3.2.4 Comparison of Alternatives

3.2.4.1 Site Selection Criteria

The site selection criteria as they relate to each of the three alternative sites for implementation of the proposed action alternative are described in depth in this section, and are summarized in the following table.

Table 1 – Comparison of Alternatives

SITE SELECTION CRITERIA	Sedalia Site	Whitmire Site	Fort Jackson Site
Proximity	In Union County, near the center of the search area. Closest site to Greenville and Spartanburg; farthest site from Columbia.	In Newberry County, near the center of the search area.	In Columbia, Richland County. Near eastern limit of search area. Farthest site from Greenville and Spartanburg; closest site to Columbia.
Size	477 acres – adequate.	433 acres – adequate.	600 acres – adequate.
Shape	Irregular property boundaries, bisected by drainage ways and streams. 40-acre parcel separated from rest of site by Prospect Corner Road. Fiber optic cable ROW traverses the site. Two electric power ROWs, which could be relocated, traverse the site.	Irregular property boundaries, bisected by drainage ways and steams. Site is approximately equally bisected by US 176/SC 121. Natural gas pipeline and 40-foot ROW traverses the site; natural gas pipelines and 5-foot ROW in the northern portion of site along old concrete roadway.	Generally straight property boundaries, bisected by drainage ways and streams.

SITE SELECTION CRITERIA	Sedalia Site	Whitmire Site	Fort Jackson Site
Accessibility	Accessible via Old Buncombe Road from Interstate (I)-26 and SC 49. Must traverse from 9 to 19 miles of circuitous road to reach Interstate.	Accessible via I-26 and SC 121 and US 176. Must traverse 13 miles of state road to reach Interstate.	Accessible via I-20, Clemson Road and Percival Road.
Utilities and Water	Potable water and electricity onsite. Sanitary sewer service not available; onsite septic system would be required. Natural gas service not available in the area. Onsite pond and tributaries.	Potable water, electricity, and natural gas service available along US 176/SC 121. Sanitary sewer service not available at the site but is provided about 2,000 feet north along US 176/SC 121; onsite septic system may be needed. Duncan Creek bounds property to the north; tributaries to Duncan Creek traverse the site.	Potable water, electricity, sanitary sewer, and natural gas are available along Percival Road adjacent to the site. Colonels Creek tributary branches traverse the site. Onsite beaver dam pond that is deed restricted.
Surrounding Land Use	A few residential structures; mostly silviculture and some pasture. Within Sumter National Forest (U.S. Forest Service [USFS]). Surrounding land uses are compatible with a national cemetery. Property is not zoned.	Adjacent properties are forestland used for silviculture and hunting, some of which is USFS land. Some pasture. Surrounding land uses are compatible with a national cemetery. Property is zoned R-2 – cemetery is a conditional use of R-2.	Fort Jackson manages the adjacent land to the west, south, and east for silviculture, military training exercises, hunting, and Red-Cockaded Woodpecker habitat management. Properties to the north along Percival Road are commercial and light industrial, some residential. Surrounding land uses, with troop training buffer zones to be established, are compatible with a national cemetery. Property is zoned governmental.

SITE SELECTION CRITERIA	Sedalia Site	Whitmire Site	Fort Jackson Site
Soils	Generally favorable for development with the exception of the southern 10-15 percent of the site and along drainage ways where shallow rock and steep slopes exist. Some prime farmland.	Soil conditions are fair to poor over most of the site, with shallow rock and groundwater expected over one-third of the site. No prime farmland.	Soil conditions generally good over most of the site with the only limitation being a tendency of open excavations to cave due to loose sand. Fair to poor conditions along drainage ways due to shallow groundwater. No prime farmland.
Topography	Relatively flat to slight slopes over the northern one-third to one-half of the site with steep slopes over the southern one-third and along southern drainage ways.	Moderate slopes cover most of the site with flat areas limited to the northwest and northeast along Duncan Creek.	Gently rolling terrain over most of the site, favorable for development.
Aesthetics	Surrounding properties are predominantly forested, some used for silviculture.	US 176/SC 121 traverses the site. Duncan Creek forms northern boundary. Surrounding properties are predominantly forested, some used for silviculture. Natural gas pipeline ROW traverses the site.	Adjacent to Percival Road and some commercial/light industrial development. Cannot be seen from I-20. Current vegetation is planted pine and scrub/shrub.
Restrictions to Development	In the southern one-third of the site soil conditions may make septic tank system difficult to construct and may require special interment practices for burial vaults. Shallow bedrock and some steep slopes in the southern portions of the site and along drainage ways may lessen amount of developable land. Onsite wetlands and pond. AT&T fiber optic cable ROW and two overhead electric power lines traverse the site. Power lines could be relocated.	Shallow bedrock; some steep slopes. Soil conditions may make septic tank system difficult to construct. Irregular boundaries, steep slopes, depth to bedrock may lessen amount of developable land. Onsite wetlands. 100-year floodplain along Duncan Creek in northern section of site. 40-foot wide natural gas pipeline and ROW traverses the site, and two natural gas pipelines and ROW are along the old concrete roadbed; some limitations to development.	Soils across the site have a tendency to cave in shallow excavations due to loose sands. No construction or impacts can occur within 7-acre conservation easement. Onsite wetlands. 100-year floodplain and wetlands along Colonels Creek in eastern section of site. Utility ROWs along roadways. Ordnance survey to be performed.

3.2.4.2 Suitability for Development of the National Cemetery

Some of the VA NCA's primary considerations for assessing a site's suitability for development of a national veterans' cemetery and a comparison of the three sites considering these considerations are shown on the following table.

Table 2 - Site Comparison Matrix

	Sedalia Site	Whitmire Site	Fort Jackson Site
Total Acreage	477	433	600
Wetland Areas (percent, approx.)	10	15	15
High Groundwater Areas (less than 4 feet) (percent, approx.)	0	25	15
Floodplain Area	0 percent / 0 acres	20 percent / 87 acres (approx.)	9 percent / 54 acres (approx.)
Practicable Development Area (percent, approx.) [1]	60	20	82
Aesthetics	Fair	Fair	Good
Permits (number, estimated)[2]	3[2]	3[2]	3
The following factors were assigned a "1" – "5" rating with "5" being the highest rating			
Traffic Evaluation - Overall Rating	3.4	3.6	4
Estimated Suitability for Development Based on Soil Types	3.8	2	4.5
Potable Water – Likelihood of Obtaining a Good Source	5	5	5
Sewer – Existing Availability of Sewer Service or Anticipated Favorable Conditions for Septic System	4	2	5
Irrigation Water Availability	5	5	5

[1] Practicable Development Area – percent of site with well-drained soils mapped by Natural Resources Conservation Service as being 4 feet deep or more.
[2] Also requires coordination/approval to cross pipeline/electrical/fiber optic easements.

<u>Practicable Development Area</u>

Total acreage of the sites is provided, and from this figure the percent of the site with well-drained soils present at a depth of 4 feet or more (as mapped by the Natural Resources Conservation Service (NRCS) was estimated and calculated into percent, resulting in the Practicable Development Area. Note that the percent of wetland, high groundwater, and/or floodplain will coincide to some extent. Refer to Sections 4.1 and 4.2 for detailed information

on soils and water resources at each site. The acreage of surface water and an appropriate buffer is excluded from the Practicable Development Area.

Aesthetics

This parameter considers the compatibility of the aesthetics of the site and its surroundings with development of a national cemetery. Primary considerations were visual and audible issues, in addition to vegetation cover and existing neighboring land uses.

Permits

The parameter referred to as permits identifies the preliminary estimate of the number of environmental permits (federal, state, and local) that could be required to develop a given site.

Refer to Section 4.8 for additional information on permits.

Traffic Evaluation Overall Rating

The Traffic Evaluation Overall Rating is based on the projected ease of construction, safety of operation, and access to a site considering the existing nearby principal highways, as well as the condition of the probable access. To evaluate the three proposed sites for the development of a national veterans' cemetery, seven traffic evaluation categories were developed. For each category, each site was evaluated based on a 1 to 5 scale, with a rating of "1" indicating poor conditions and a rating of "5" indicating excellent conditions. The following is a description of each evaluation category:

Access to Regional Highway System: A "1" rating is due to limited access, or required extended travel from a major highway network that may involve travel on unimproved roads; a "5" rating indicates easy accessibility to major throughways.

Potential Congestion Problems: A "1" rating is due to heavily developed areas in the vicinity of the site that could be a source for potential congestion; a "5" rating indicates little development, or development not prone to large trip generation.

Critical Intersection Locations: A "1" rating is due to several congested intersections near or en-route to the site; a "5" rating indicating limited or uncongested intersections near the site.

Pavement and Roadway Conditions: A "1" rating is due to poor pavement conditions, cracking, no shoulders, or unimproved roads; a "5" rating indicates good road surface, shoulders, and turning lanes.

Proposed Access Locations: A "1" rating is due to limited potential access locations into the site and/or conflicts (i.e. grades, wetlands, etc.); a "5" rating indicates numerous potential driveway locations.

Sight Distance: A "1" rating is due to poor available sight distances from potential site access locations; a "5" rating indicates excellent sight distances.

Other Development Projects: A "1" rating is due to numerous or significant other development projects, which could increase congestion near the site in the future; a "5" rating indicates little or no potential impact from other development projects in the area.

Overall Rating: A "1" rating indicates a less desirable site location based on the preceding categories; a "5" rating indicates an optimal site location overall. The Overall Rating of a site is based on the average of the individual traffic evaluation categories.

Refer to Section 4.5.9 for additional detail on the traffic conditions and issues related to each site.

Soils

The soils evaluation is based on the characteristics of the soils as mapped by the NRCS county Soil Surveys and considers the availability on any given site of large areas of soils that meet NCA cemetery development criteria (i.e., projected ability to accommodate 7-foot-deep interments [double-depth crypts] above rock and groundwater) in order to maximize cemetery acreage and a wastewater system of conventional design, and the ability of the terrain's ridges, valleys, or natural breaks in the topography to define interment areas without extensive grading. A geotechnical study would be needed to definitively characterize the onsite soils, and it is expected that one would be performed for the site selected for cemetery development.

Each site was evaluated based on 1 to 5 scale, with a rating of "1" indicating estimated poor conditions and a rating of "5" indicating estimated good conditions.

The Sedalia Site would require, and the Whitmire Site would likely require, an onsite septic system for disposal of sanitary wastewater. The soils evaluation also considered the onsite soils and the South Carolina Department of Health and Environmental Control (SCDHEC) regulations (2004 Code of Regulations, effective September 24, 2004) for septic systems ("sewage treatment and disposal system"), which require the following minimum site conditions:

Maximum seasonal high water table elevation -	- Not less than 6 inches below the bottom of the proposed soil absorption trenches or alternate system
Depth to rock -	- Greater than 1 foot below the bottom of the proposed soil absorption trenches or alternate system
If maximum estimated wastewater flow exceeds 1,500 gallons per day -	- Must meet large system SCDHEC standards

System must be -	- At least 5 linear feet from a building or property line or under a building, driveway, or parking area - At least 50 linear feet from a private well or beyond a minimum distance specified by SCDHEC from a public supply well - At least 50 linear feet from the ordinary high water (within the banks) elevation of an impounded or natural body of water, including streams - At least 10 feet upslope and 25 feet downslope of interceptor drains - At least 25 feet from a drainage ditch or at least 15 feet from the top of the slope of embankments or cuts of 2 feet or more vertical height when the soil absorption area of a trench is to be placed higher in elevation than the invert of the cut, ditch, or gully

Refer to Section 4.1.3 for detailed soils information for each site.

Potable Water

The assigned rating per the potable water parameter indicates the likelihood of obtaining a potable water source suitable in quality and quantity for the project, based on the information obtained on well water and surface water supplies currently existing in the immediate area of a given site, and on the availability of other alternative potable water sources to a given site.

Each site was evaluated based on 1 to 5 scale, with a rating of “1” indicating estimated low likelihood and a rating of “5” indicating estimated high likelihood of obtaining a good potable water source.

Refer to Sections 4.2.1, 4.2.2, and 4.5.5 for additional information on the availability of surface water, groundwater, and municipal water supplies, respectively, for each site.

Sewer

Each site was evaluated based on 1 to 5 scale, with the overall rating based on the availability of a nearby municipal sewer system or the perceived ability of a given site to meet the South Carolina requirements for septic systems.

Refer to Sections 4.1.3 (soils) and 4.5.5 (utilities) for additional information.

Irrigation

This parameter considers the estimated relative capacity of a given site to provide a reliable source of irrigation water from drilled wells and the estimated ease with which an irrigation reservoir (pump and store scenario) can be constructed. The number and type of regulatory

permits required is a consideration, as is the existence of any ponds or lakes on a site. . Each site was assigned an overall rating based on a 1 to 5 scale.

Refer to Section 4.2 for additional information on water resources.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected (existing) environment at each of the three alternative sites and then describes the potential environmental consequences due to implementation of the alternatives – no action and the proposed action - at each of the alternative sites. The existing conditions descriptions of the Sedalia Site and Whitmire Site are based on evaluations completed by URS in April – June 2005. In March 2006, owner representatives for these sites confirmed that conditions at these sites had not changed from the previous year. For the Fort Jackson Site, the existing condition description is based on evaluations completed by URS in April – June 2005 and February – March 2006.

4.1 GEOLOGIC SETTING

This section describes the geology, topography, soils, and potential geologic hazards of each of the three alternative sites. Information was obtained from the U.S. Geological Survey (USGS), the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the South Carolina Geological Survey (SCGS), other applicable publications and websites, and agency personnel, and was supplemented by onsite observations of URS personnel.

4.1.1 Geology

4.1.1.1 Affected Environment – Sedalia Site

The Sedalia Site and Union County are situated in the Piedmont Physiographic Province of South Carolina, which is a dissected peneplain (nearly flat land surface representing an advanced stage of erosion) that contains a few remnants of an ancient mountain range. The Piedmont Physiographic Province in South Carolina is situated north and west of the Coastal Plain Physiographic Province. The Piedmont Province is the non-mountainous portion of the older Appalachians, and its typical landscape is a rolling surface of gentle slopes with minimal relief (averaging about 50 feet) cut by or bounded by valleys of steeper slope and greater depth, often several hundred feet. The Piedmont's surface is the result of degradation, as the underlying rocks are deformed. The current topography of the Piedmont Province is due to differences in underlying rock, either in material constitution or in structural features made during older uplifts (USDA, 1975).

Massive metamorphic and igneous crystalline rocks underlie the Piedmont Province. The igneous rocks include granites, pegmatites, and diabases, and intruded into cracks and joints in the existing rock about 200 million years ago. The metamorphic rocks consist of a variety of gneisses, schists, phyllites, meta-sediments, and meta-volcanics. The granular metamorphic rocks (gneiss, meta-sediments, and meta-volcanics) weather to a more porous and permeable saprolite, while phyllitic and schistostic metamorphic rock weathers to a more clay-rich, less permeable saprolite (SCDHEC, 2002).

The bedrock underlying the soils in Union County primarily consists of granite, gneiss, schist, gabbro, diorite, and alluvium. Dikes of material derived from minor rocks intrude into these major underlying rocks (USDA, 1975).

4.1.1.2 Affected Environment – Whitmire Site

Like the Sedalia Site, the Whitmire Site is situated in the Piedmont Physiographic Province of South Carolina with the same characteristics described in Section 4.1.1.1, above. The bedrock underlying the Whitmire Site and Newberry County primarily consists of volcanic rocks of the Carolina slate belt, gneiss and schist (mostly mica-gneiss and mica-schist), and granite rocks, massive and weakly foliated (USDA, 1960).

4.1.1.3 Affected Environment - Fort Jackson Site

Fort Jackson is on the northwestern edge of the Atlantic Coastal Plain Province, a region of low to moderate relief and gently rolling plains known as the Sand Hills. The Fall Line, a zone that marks the boundary between younger, softer sediments of the Coastal Plain Province and ancient, crystalline rocks of the Piedmont Province, lies about 4 miles west of the cantonment area in the southwestern portion of Fort Jackson (USDA, 1978).

The principal geologic formation in the Sand Hills is the Tuscaloosa, which consists of marine deposits of light-colored sands and kaolin clays. Most soils at Fort Jackson are formed from sediment of the Tuscaloosa. A layer of Quaternary sand terrace overlies the Tuscaloosa formation, which lies upon a complex of old metamorphic and igneous rock. The Tuscaloosa complex generally consists of clay strata overlying unconsolidated sands (Gene Stout and Associates, 2004).

Four primary stratigraphic units are recognized within the Fort Jackson Installation: the bedrock Carolina Slate Group, comprised of meta-crystalline rocks of Paleozoic age and only outcrops in a very limited section of the northwestern boundary; the Upper Cretaceous sediments, which overlie the Carolina Slate Group, consist of poorly sorted, micaceous, quartz sands with abundant interstitial, clastic, and thick-lensed beds of clay, and outcrop over most of Fort Jackson; the Tertiary sediments that overlie the Upper Cretaceous sediments; and the Quaternary Alluvium, which is a late Cenozoic deposit of sediments eroded from the Upper Cretaceous sediments and Tertiary sediments and, in some cases, transported from locations outside the northern Fort Jackson boundary by stream action. Wind-blown sand deposits exist across much of the Fort Jackson property. Typically, these deposits have not been mapped by the SCGS because they lack significant thickness (less than 5 feet thick reported) and are sporadic in occurrence (Willoughby, 1999). Kaolin clay is found in economically significant quantities, and is mined commercially outside of Fort Jackson.

At least two former sand/gravel pits are present within the Fort Jackson Site, and at least one former mine site is located north of the site along Percival Road. Based on review of historical aerial photographs, these appear to have been used for several decades beginning in the 1940s.

4.1.1.4 Environmental Consequences and Mitigation Measures

No Action Alternative

No construction would occur under the No Action Alternative, and no impacts to geological resources would occur.

Proposed Action Alternatives

Under implementation of the Proposed Action Alternative at each site, it is assumed that disturbance for development of the cemetery would not be deep enough to affect geological resources.

4.1.2 Topography

4.1.2.1 Affected Environment – Sedalia Site

Elevation of the Sedalia Site ranges from approximately 420 to 610 feet above mean sea level (msl), based on review of the USGS 7.5-minute topographic map (1986a). The topography of the Sedalia Site is nearly level to gently sloping in the northeastern portion of the property along Old Buncombe Road (Figure 3). The slope becomes steeper toward the southwest, with the highest elevation in the central portion of the property. Relief is greatest along Hills Creek and its intermittent tributaries where slopes range from 15 to 40 percent. There are areas on the property where severe erosion from stormwater runoff has left deep incisions that were dry at the time of URS' site visits in April and May 2005.

4.1.2.2 Affected Environment – Whitmire Site

Elevation of the Whitmire Site ranges from approximately 310 to 477 feet above msl, with the highest elevation in the southern portion of the site (Figure 5; USGS, 1986b). The topography of the property is moderately sloping, decreasing from the southern portion of the property toward the floodplain of Duncan Creek along the northern property boundary. The Duncan Creek floodplain is large and the only portion of the site that is relatively level. Slopes are steep along the intermittent drainages to Duncan Creek that almost cross the property from north to south in several areas. Areas of severe erosion from stormwater runoff on the property have left deeply incised drainages.

4.1.2.3 Affected Environment – Fort Jackson Site

Elevation of the Fort Jackson Site ranges from approximately 275 to 430 feet above msl with the highest elevation in the western portion of the property. The topography of the property is gently rolling (Figure 7; USGS, 1972). The majority of the property slopes toward Colonels Creek, located in the eastern portion of the property.

4.1.2.4 Environmental Consequences and Mitigation Measures

No Action Alternative

Under the No Action Alternative, there would be no impact on topography at the three alternative sites, as the VA NCA would not construct a new national veterans' cemetery in South Carolina.

Proposed Action Alternatives

Under the Proposed Action Alternative, topography of the selected site would be altered by grading for burial areas, roads, parking areas, building pads, detention ponds, and service facilities. The excavation and/or fill quantities would depend upon the severity and areal distribution of relief on the selected site. The relief is greatest at the Sedalia Site (190 feet), intermediate at the Whitmire Site (167 feet), and least at the Fort Jackson Site (155 feet). The most significant relief on the Sedalia and Whitmire Sites is associated with slopes to drainages. Major drainages at the Sedalia Site occur in the southwestern portion of the property, while major drainages at the Whitmire Site cross the property to the west of US 176/SC 121 and the northern half of the property east of US 176/SC 121.

Topographic alterations would be greatest at the Sedalia and Whitmire Sites and least at the Fort Jackson Site. Guidance contained in county ordinances for grading, drainage, and construction would be followed during site preparation. In general, extensive topographic alternation is considered undesirable in cemetery development. Therefore, during master planning and design for the VA NCA cemetery, the magnitude of topographic alteration would be minimized to the extent possible.

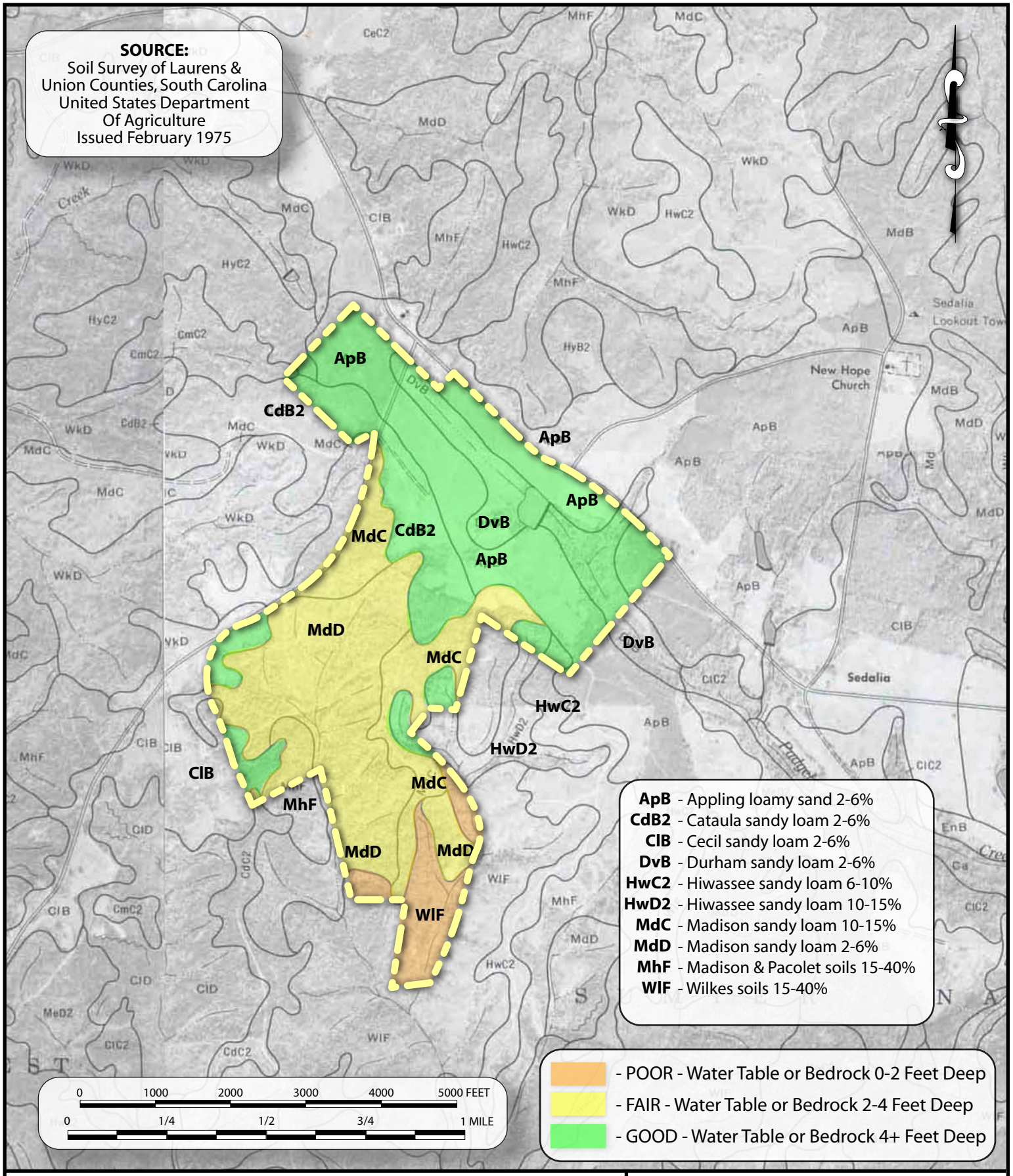
4.1.3 Soils

Soils have been classified throughout most of the United States by the USDA according to characteristics that affect their suitability for agriculture or development. Soil Surveys provide information on the soil and water features that relate to runoff or infiltration of water, flooding, grading and excavation, and land development. This information is helpful in planning land uses and engineering projects that are likely to be affected by the amount of runoff from the watersheds, flooding and seasonal high water table, or presence of bedrock or a cemented hardpan in the upper 5 or 6 feet of the soil.

USDA soil surveys often describe the degree and kind of soil limitations related to development including shallow excavations, small commercial buildings, and local roads and streets. Most cuts and fills are considered less than 6 feet deep. Small commercial buildings are considered those with foundation loads no greater than that of a three-story structure. Local roads and streets are defined as those that have an all-weather surface that can carry light to medium traffic year-round. They have a subgrade of underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded with soil material at hand. Shallow excavations include various underground developments (e.g. pipelines, sewer lines), including cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture or consistency of soils; the tendency of soil to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by the slope of the soil and the probability of flooding.

4.1.3.1 Affected Environment – Sedalia Site

Mapped Soil Units. Mapped soil units are shown on Figure 9.



CLIENT: Department of Veterans Affairs		TITLE: Sedalia Site Soil Constraints Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	DESIGNED BY: 31942450.00000	URS	FIGURE: 9
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The majority of soils located on the Sedalia Site are characterized as gently sloping to strongly sloping soils that are strongly acid in part of the subsoil and are located on uplands (USDA, 1975). Mapped soil units located on the Sedalia Site include Appling loamy sand, Cataula sandy loam, Cecil sandy loam, Durham sandy loam, Hiwassee sandy clay loam, Hiwassee sandy loam, Madison sandy loam, Madison and Pacolet soils, and Wilkes soils (Figure 9). The USDA (1975) descriptions of these soils are summarized below:

The Appling loamy sand (ApB), 2 to 6 percent slopes, is a prime farmland soil and was mapped in the northern third of the site. The Appling soil type is a deep, well-drained soil that is formed in material weathered from granite, gneiss, and schist. These soils are typically located on gently sloping to sloping formations. Permeability is moderate and erosion control measures are needed with these soils.

Cataula sandy loam (CdB2), 2 to 6 percent slopes, is a prime farmland soil that was mapped near the central portion of the site in the area occupied by the hunting cabin. Cataula soils are well drained, gently sloping to sloping, and have a fragipan. These soils formed in clayey and loamy material weathered from granite, gneiss, and schist. Permeability is slow. Erosion is the main hazard with these soils. Surface runoff is rapid.

Cecil sandy loam (ClB), 2 to 6 percent slopes, was mapped in a very small portion of the site along the southwestern boundary. Cecil soils are gently sloping to strongly sloping and well-drained soils. The Cecil soils were formed in clayey and loamy material weathered from granite, gneiss, and schist. Permeability is moderate.

Durham sandy loam (DvB), 2 to 6 percent slopes, is a prime farmland soil that was mapped along the drainages to and from the onsite pond in the northern portion of the site. Durham soils are well drained and gently sloping to sloping. These soils formed on broad ridges in material weathered from granite and gneiss. Permeability is moderate and erosion control measures are necessary with these soils.

Hiwassee sandy loam (HwC2), 6 to 10 percent slopes, eroded, and Hiwassee sandy loam (HwD2), 10 to 15 percent slopes, eroded, were mapped in very small areas near the eastern boundary of the site. Hiwassee soils are gently sloping to strongly sloping and are well drained. These soils were formed in material weathered from gneiss, schist, or from old general alluvium that was more than 10 percent weatherable minerals. Permeability is moderate and erosion is the main hazard with these soils.

Madison sandy loam (MdC), 6 to 10 percent slopes, and Madison sandy loam (MdD), 10 to 15 percent slopes, were mapped over much of the southern half of the Sedalia Site. The Madison and Pacolet soils (MhF), 15 to 40 percent slopes, were mapped along the southwestern border of the site in a limited area of the Sedalia Site. These are mainly Madison soils mixed with some Pacolet soils and the soils profile is representative of the Madison series. Madison soils are gently sloping to steep, moderately deep to very deep, and are well drained. These soils were formed in material weathered from quartz-mica gneiss or quartz-mica schist and quartz-diorite pegmatite high in feldspar and mica.

Permeability is moderate and erosion is the chief hazard with the Madison soils. Madison sandy loam is a "statewide important soil."

The Wilkes soils (WlF), 15 to 40 percent slopes, are sloping to steep, shallow over weathered to hard rock material, and are well drained; they were mapped in the southern-most portion of the Sedalia Site. These soils formed in material weathered from diorite, hornblende gneiss, and hornblende schist. Permeability is moderately slow and erosion is a main management concern with these soils. These soils are typically located on side slopes adjacent to streams.

Prime Farmland Soils. Prime farmland soils are those that have characteristics favorable for economic production of sustained high yield crops. The Union County Soil and Water Conservation District office was contacted regarding the prime farmland soils located on the Sedalia Site. Based on URS' preliminary estimate, a little more than half of the 477-acre Sedalia Site is considered to be prime farmland or soils of state importance (soil types ApB, CdB2, DvB, MdC and MdD).

A Farmland Conversion Impact Rating form (AD-1006) was sent to the Union County Soil and Water Conservation District office for evaluation of the Sedalia Site and assessment of the acreage that would be converted directly from prime farmland soils to developed land. The form scores impacts to farmland based on several different criteria outlined within the Farmland Protection Policy Act (FPPA). In their response, the Union County Soil and Water Conservation District office scored the site a 168. Based on the FPPA, a site receiving a score of 160 or greater should be given increasingly higher levels of consideration for protection. According to the FPPA, when making decisions on proposed actions for sites receiving scores totaling 160 or more, agency personnel should consider:

- use of land that is not farmland or use of existing structures;
- alternative sites, locations and designs that would serve the proposed purpose but convert either fewer acres of farmland or other farmland that has a lower relative value; and
- special siting requirements of the proposed project and the extent to which an alternative site fails to satisfy the special siting requirements as well as the originally selected site.

Depth to High Water Table and Depth to Bedrock for Onsite Mapped Soils Types. Table 3, developed from the *Soil Survey of Laurens and Union Counties*, summarizes the depth to high water table and depth to bedrock for each of the mapped soil units at the Sedalia Site. While the depth to high water table in the soil survey is stated to be 6 feet for most of the site, it is likely to be deeper than 6 feet over most of the higher portions of the site, and shallower in the low-lying areas along creeks and in floodplains.

Table 3– Soil Characteristics, Limitations, and Depth to Bedrock, Sedalia Site

Mapped Soil Units	Depth to Seasonal High Water Table (ft)	Depth to Bedrock (ft)
Appling loamy sand, 2 to 6 percent slopes	6	> 5
Cataula sandy loam, 2 to 6 percent slopes		
Cecil sandy loam, 2 to 6 percent slopes		
Durham sandy loam, 2 to 6 percent slopes		
Hiwassee sandy loam, 6 to 10 percent slopes		
Hiwassee sandy loam, 10 to 15 percent slopes		
Madison sandy loam, 6 to 10 percent slopes		3 - 6
Madison sandy loam, 10 to 15 percent slopes		
Madison & Pacolet soils, 15 to 40 percent slopes		
Wilkes soils, 15 to 40 percent slopes		2 - 4

Physical and Chemical Properties of the Mapped Soil Units. The soil survey also provides estimated values for several soil characteristics and features that affect the behavior of soils in engineering use. The physical and chemical properties of the mapped soil units on the Sedalia Site, as described by the USDA (1975), are provided in Table 4. As shown, permeability of the Sedalia Site soils ranges from very slow to moderate, and soil pH ranges from 4.5 to 7.3. The shrink-swell potential of Sedalia Site subsoils ranges from low to moderate.

Table 4 – Physical and Chemical Properties of Soils, Sedalia Site

Mapped Soil Units	Depth (inches)	Permeability (inches per hour)	Soil Reaction pH	Shrink-Swell Potential
Appling loamy sand, 2 to 6 percent slopes	0-7 7-11 11-44 44-55 55-72	2.0-6.3 0.63-2.0 0.63-2.0 0.63-2.0 2.0-6.3	5.6-6.5 5.6-6.5 4.5-5.5 4.5-5.5 4.5-5.5	Low Low Moderate Low Low
Cataula sandy loam, 2 to 6 percent slopes	0-6 6-24 24-37 37-50	0.63-2.0 0.20-0.63 0.06-0.20 0.20-0.63	5.1-6.5 4.5-6.0 4.5-6.0 4.5-6.0	Low
Cecil sandy loam, 2 to 6 percent slopes	0-5 5-79	0.63-2.0	5.1-6.5 4.5-6.0	Low
Durham sandy loam, 2 to 6 percent slopes	0-14 14-60	0.63-2.0	4.5-6.0 4.5-5.5	Low
Hiwassee sandy loam, 6 to 10 percent slopes	0-6 6-19 19-63	0.63-2.0	5.6-6.5	Low Moderate Low
Hiwassee sandy loam, 10 to 15 percent slopes	0-6 6-19 19-63	0.63-2.0	5.6-6.5	Low Moderate Low
Madison sandy loam, 6 to 10 percent slopes	0-54	0.63-2.0	4.5-6.0	Low

Mapped Soil Units	Depth (inches)	Permeability (inches per hour)	Soil Reaction pH	Shrink-Swell Potential
Madison sandy loam, 10 to 15 percent slopes	0-54	0.63-2.0	4.5-6.0	Low
Madison & Pacolet soils, 15 to 40 percent slopes	0-54	0.63-2.0	4.5-5.5	Low
Wilkes soils, 15 to 40 percent slopes	0-7 7-12 12-24	0.63-2.0 0.2-0.63 0.63-2.0	5.6-6.5 6.1-7.3 6.1-7.3	Low

Source: *Soil Survey of Laurens and Union Counties, South Carolina*, USDA, 1975
Note: "Risk of Corrosion" and 'Erodibility" data were not provided in the soil survey

Soil Type Limitations for Development. Table 5 presents the soil characteristics for the Sedalia Site in terms of their limitations for different aspects of site development, as provided by the USDA: "slight" indicates that soil properties are favorable for the specified use and any limitation is minor and easily overcome; "moderate" indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design; and "severe" indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required.

The soil survey does not list "Shallow Excavations" as a type of development, so interpretations of soil characteristics were made from the information presented in the soil survey.

Table 5 – Soil Characteristics for Site Development, Sedalia Site

Mapped Soil Units	Degree and Types of Limitations			
	Shallow Excavations	Sites for Light Industry (small commercial buildings)	Local Roads and Streets	Septic Tank Filter Fields
Appling loamy sand, 2 to 6 percent slopes	- - -	Moderate: fair bearing strength	Moderate: fair traffic-supporting capacity	Moderate: moderate permeability
Cataula sandy loam, 2 to 6 percent slopes		Severe: high corrosion potential	Severe: poor traffic-supporting capacity	Severe: slow permeability
Cecil sandy loam, 2 to 6 percent slopes		Fair bearing strength; moderate shrink-swell potential	Moderate: fair traffic-supporting capacity	Moderate: moderate permeability
Durham sandy loam, 2 to 6 percent slopes		Moderate: fair bearing strength	Moderate to severe: fair to poor traffic-supporting capacity	Slight: 2 to 6% slopes
Hiwassee sandy loam, 6 to 10 percent slopes		Moderate: fair bearing strength – 2-8% slopes; Severe for grading: 8 to 15% slopes	Moderate: fair traffic-supporting capacity	Moderate: moderate permeability
Hiwassee sandy loam, 10 to 15 percent slopes		Severe for grading: 8 to 15% slopes		
Madison sandy loam, 6 to 10 percent slopes	Moderate: bedrock commonly within 3	Moderate: fair bearing strength	Severe: poor traffic-	Moderate: moderate permeability; bedrock commonly within 3 to 6

Mapped Soil Units	Degree and Types of Limitations			
	Shallow Excavations	Sites for Light Industry (small commercial buildings)	Local Roads and Streets	Septic Tank Filter Fields
Madison sandy loam, 10 to 15 percent slopes	to 6 feet of surface	Severe for grading: 8 to 40% slopes	supporting capacity	feet of surface
Madison and Pacolet soils, 15 to 40 percent slopes	Severe: 15-40% slopes			Severe: 15 to 40% slopes
Wilkes soils, 15 to 40 percent slopes	Severe: bedrock within 2 to 4 feet of surface		Severe: bedrock within 2 to 4 feet of surface	Severe: bedrock within 2 to 4 feet of surface

Source: *Soil Survey of Laurens and Union Counties, South Carolina,* USDA, 1975
- - - = information not provided in soil survey

As shown in Table 5, the USDA identifies the following limitations based on the soil types mapped at the Sedalia Site:

Shallow Excavations - Slight to severe limitations for shallow excavations due to depth to bedrock and slope.

Sites for Light Industry - Fair to severe restrictions for small commercial buildings due to high corrosion potential, bearing strength, slopes requiring grading, and shrink-swell potential.

Local Roads and Streets - Moderate limitations for most soils to severe limitations for Madison and Wilkes soils for local roads and streets due to poor traffic support capacity and depth to bedrock.

In addition, the majority of the Sedalia Site has moderate limitations for septic tank filter fields due to moderate permeability and depth to bedrock.

4.1.3.2 Affected Environment – Whitmire Site

Mapped Soil Units. Based on information provided in the soil survey (USDA, 1960), the majority of soils located on the Whitmire Site are characterized as gently sloping to steep soils that are strongly acid in part of the subsoil and are located on uplands. According to the soil survey, mapped soil units located on the Whitmire Site include Cecil clay loam, Cecil sandy loam, Local alluvial land, Mixed alluvial land, Wickham fine sandy loam, Wilkes sandy loam, and Worsham sandy loam (Figure 10). Descriptions of these soils are summarized below:

Cecil sandy loam (CdB2), 2 to 6 percent slopes, Cecil clay loam (CcB3), 2 to 6 percent slopes, Cecil clay loam (CcC3), 6 to 10 percent slopes, and Cecil clay loam (CcD3), 10 to 15 percent slopes were mapped on the majority (uplands) of the Whitmire Site. Cecil soils consist of deep, well-drained, gently sloping to steep, acid soils formed from weathered quartz, gneiss, and granite. The depth to bedrock ranges from 2 to 20 feet. This soil is subject to severe erosion. The steeper sloped soils have very rapid runoff, which has formed many shallow gullies.

Local alluvial land (Lc), 6 to 10 percent slopes was mapped in a small area along a drainage to Duncan Creek in the northeastern section of the Whitmire Site. Local alluvial land is deep and well drained. It is composed of materials washed from the uplands and deposited on nearly level areas and gentle slopes in depressions and shallow drainage ways. Local alluvial land is medium to strongly acidic. Infiltration is moderately rapid to rapid.

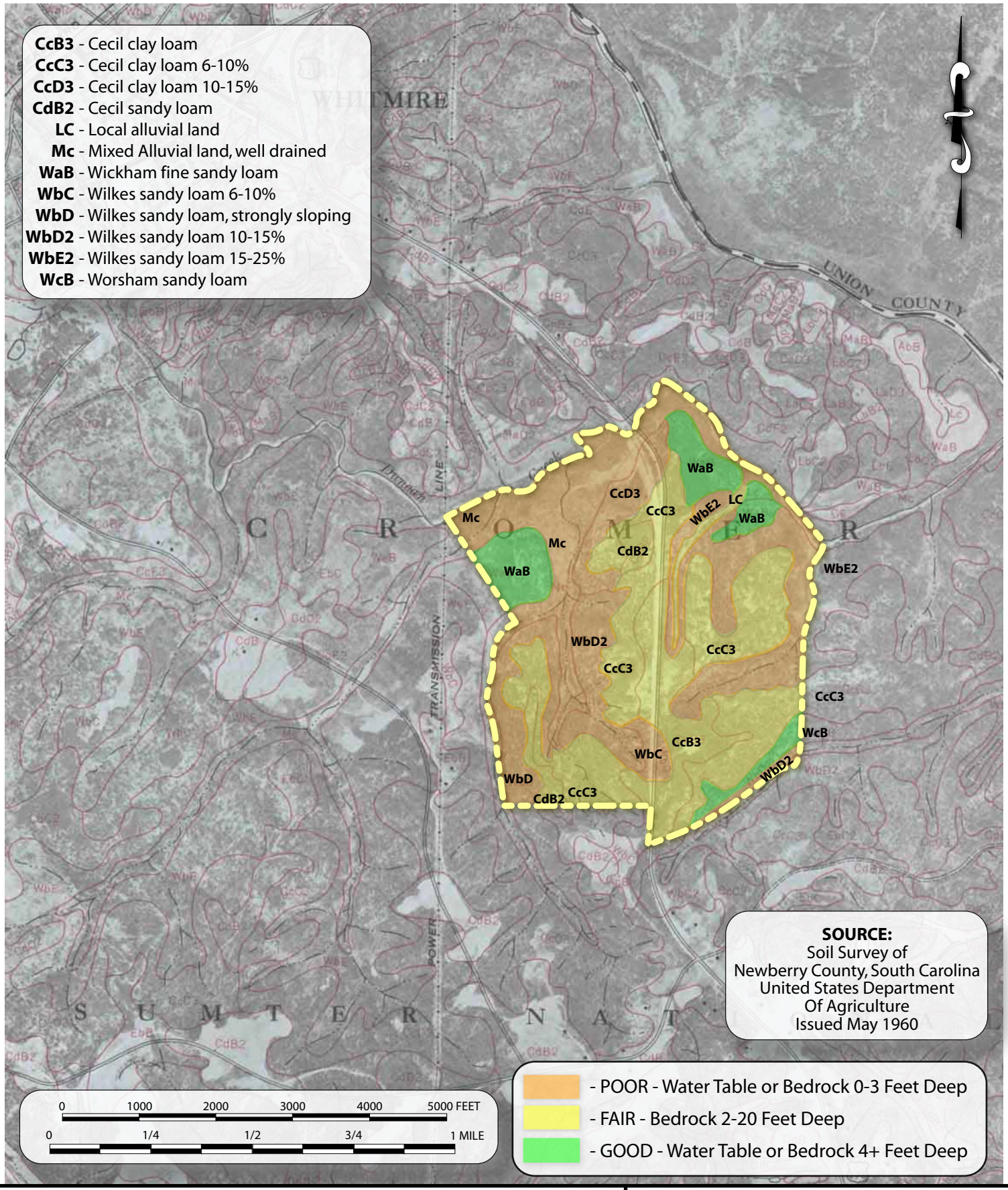
Mixed alluvial land (Mc) was mapped over a wide area along Duncan Creek and along drainage ways in the northwestern section of the Whitmire Site. Mixed alluvial land consists of deep, strongly acid, poorly drained to well-drained deposits of alluvium derived from rocks that occur in the county. This soil occurs in elongated strips along small streams and is frequently flooded. The soil has a moderately high water table at a depth of 3 feet or less in some areas. Infiltration and permeability are moderately rapid.

Wickham fine sandy loam (WaB), 2 to 6 percent slopes is located in pockets in the northern section of the site. Wickham soils are deep, well drained, and gently sloping to sloping. These soils are acidic. The rate of infiltration is moderate and the permeability is moderate. The parent material was alluvium washed from soils that formed from residuum weathered from granite, gneiss, schist, gabbro, diorite, hornblende, and Carolina slate.

Wilkes sandy loam (WbC), 6 to 10 percent slopes, Wilkes sandy loam (WbD2), 10 to 15 percent slopes, Wilkes sandy loam (WbD), strongly sloping, and Wilkes sandy loam (WbE2), 15 to 25 percent slopes, were mapped along drainages on the Whitmire Site. Wilkes soils consist of shallow, acidic, gently sloping to steep soils. Runoff is very rapid. Permeability is slow and the rate of infiltration is moderate. The parent material was residuum weathered from acidic, crystalline rock cut by dikes of dark colored basic rock. When this soil is located on a 6 to 10 percent slope the runoff is rapid and the depth to bedrock ranges from 1 to 4 feet. Shallow gullies and sheet erosion are common in the steep phase.

Worsham sandy loam soils (WcB), 2 to 6 percent slopes, consist of gently sloping and poorly drained soils; this soil type was mapped along the drainage on the southeastern property boundary of the Whitmire Site. These soils are strongly acidic. Infiltration is moderate and permeability is slow. The parent material was residuum weathered from granite, gneiss, schist, and Carolina slates. The depth to bedrock is variable but typically at a depth greater than 5 feet.

Prime Farmland Soils. Based on a review of a list of prime farmland soils for Newberry County, as provided by the USDA, no prime farmland soils are located on the Whitmire Site.



CLIENT: Department of Veteran Affairs		TITLE: Whitmire Site Soil Constraints Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 10
SCALE: 1:20 000	DRAWN BY: J. Anderson		PAGE NO.: 4-13
FILE: H:\proj\VA Cemetery\Whitmere\WhitmereSoils.ai	CHECKED BY: A. Yarnell		

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Depth to High Water Table and Depth to Bedrock for Onsite Mapped Soils Types. The soil survey contained limited data regarding the depth to high water table and depth to bedrock information for the mapped soil units at the Whitmire Site. The soil survey identified Mixed alluvial land soils to have a high water table (depth of 3 feet or less in some areas). These soils are predominantly located on the Duncan Creek floodplain in the western/northwestern portion of the Whitmire Site, which compromises approximately 20 percent of the site. The soil survey identified the Cecil soils to have a depth to bedrock of 2 to 20 feet, Wilkes soils to have a depth to bedrock of 1 to 4 feet, and Worsham soils to have a depth to bedrock of greater than 5 feet.

Physical and Chemical Properties of the Mapped Soil Units. The soil survey provided limited physical and chemical properties of the mapped soil units on the Whitmire Site. Permeability of the Whitmire Site soils ranges from slow to moderately rapid and the soils are listed as acidic to strongly acidic. The Mixed alluvial land has a moderately rapid permeability, the Wickham soil has a moderate permeability, and the Wilkes and Worsham soils have a slow permeability.

Soil Type Limitations for Development. The soil survey does not include an evaluation of soil limitations. The following discussion of soil limitations is, therefore based on interpretations of soil characteristics presented in the soil survey.

Table 6 describes the degree and kind of soil limitations related to development including shallow excavations, small commercial buildings, and local roads and streets. As provided by the USDA, degree is defined as follows: “slight” indicates that soil properties are favorable for the specified use; any limitation is minor and easily overcome; “moderate” indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design; and “severe” indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required.

Table 6 – Soil Characteristics for Site Development, Whitmire Site

Mapped Soil Units	Degree and Type of Limitations			
	Shallow Excavations	Small Commercial Buildings	Local Roads and Streets	Septic Tank Field Filters
Cecil	Moderate: depth to bedrock ranging from 2 to 20 feet			- - -
Local alluvial land	- - -			
Mixed alluvial land	Severe: depth to water table less than 3 feet			Moderate: moderately rapid permeability
Wickham	- - -			Moderate: moderate permeability
Wilkes	Severe: depth to bedrock can be very shallow (1 to 4 feet)			Severe: slow permeability
Worsham	- - -			

- - - = information not provided in soil survey

As shown in the previous table, the USDA identifies the following limitations based on the soil types mapped at the Whitmire Site:

Shallow Excavations - Moderate to severe limitations for shallow excavations due to depth to bedrock and shallow depth to the water table.

Small Commercial Buildings - Moderate to severe restrictions for small commercial buildings, and drainage and paving features (parking lots) due to depth to bedrock and shallow depth to the water table.

Local Roads and Streets - Moderate to severe limitations for local roads and streets due to depth to bedrock and shallow depth to the water table.

Septic Tank Filter Fields - Moderate to severe limitations for septic tank filter fields due to slow to moderate permeability.

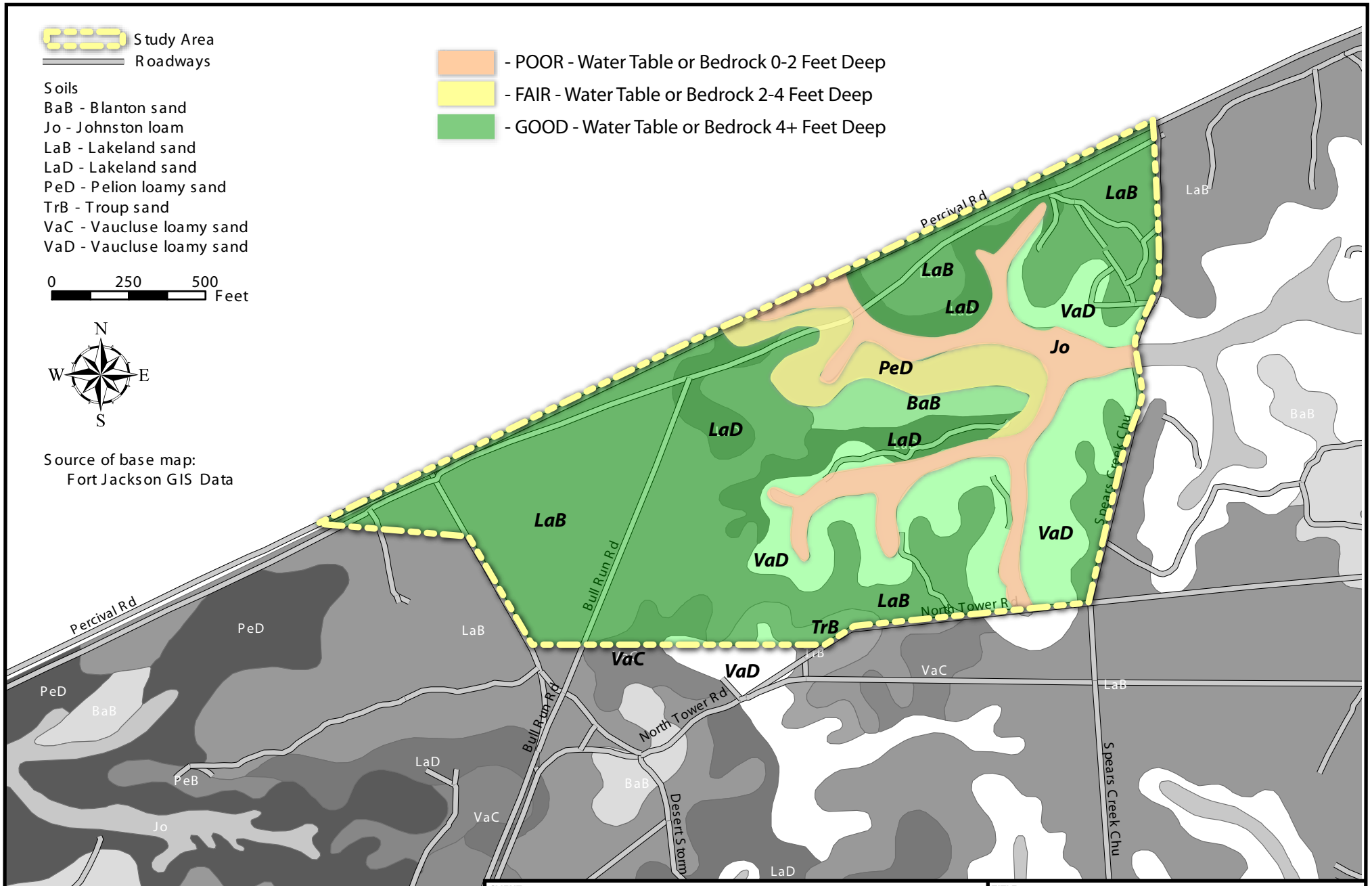
4.1.3.3 Affected Environment – Fort Jackson Site

Mapped Soil Units. Based on information provided in the soil survey (USDA, 1978), the majority of soils located on the Fort Jackson Site are characterized as nearly level to strongly sloping soils on the Sand Hills. According to the soil survey, mapped soil units located on the Fort Jackson Site include Blanton sand, Johnston loam, Lakeland sand, Pelion loamy sand, Troup sand, and Vaucluse loamy sand (Figure 11). Descriptions of these soils are summarized below:

The Blanton soil (BaB), 0 to 6 percent slopes, is a deep, well-drained, nearly level to gently sloping soil on convex side slopes in the Coastal Plain uplands; it was mapped on only a very small portion of the Fort Jackson Site, adjacent to the Colonels Creek drainage ways. This soil is strongly acidic to moderately acidic in the surface and subsurface layers and very strongly acidic to strongly acidic in the subsoils. Permeability is rapid in the surface layers and moderate in the subsoil. After prolonged or heavy rains this soil has a perched water table at the top of the subsoil (41 to 96 inches below ground surface).

Johnston loam soils (Jo) are deep, very poorly drained, nearly level soils on floodplain; these soils were mapped along Colonels Creek drainage ways located on the eastern portion of the Fort Jackson Site. This soil has moderately rapid permeability in the surface layers and rapid permeability in the subsoils. This soil has a high water table most of the year, and water covers the ground surface during the wet season. This soil floods frequently and for long durations. The flooding, high water table, and other wetness characteristics result in severe limitations for development.

Lakeland sand (LaB), 2 to 6 percent slopes, and Lakeland sand (LaD), 10 to 15 percent slopes, were mapped on over 75 percent of the Fort Jackson Site. Lakeland sand soils are deep, excessively drained, gently sloping, sandy soils that are located on smooth, convex ridge tops in the Sand Hills. The soil is very strongly acidic to moderately acidic throughout. Permeability is very rapid. Runoff is slow on the gentle slopes and moderate on the steeper slopes. Limitations are slight for most construction purposes.



CLIENT:	Department of Veterans Affairs	TITLE:	Fort Jackson Site Soil Constraints Map
PROJECT:	Proposed Columbia - Greenville National Cemetery		
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 11
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-17
FILE: H:\proj\VA Cemetery\FtJacksonSoils.ai	CHKD BY: A. Yarnell		

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Pelion loamy sand (PeD), 6 to 15 percent slopes, was mapped adjacent to Colonels Creek drainage ways along the eastern portion of the Fort Jackson Site. Pelion soils are deep, moderately well-drained, gently sloping soils. These soils are strongly acidic or very strongly acidic throughout. Runoff is medium and erosion is a hazard in cultivated areas. Permeability is moderately slow or slow. Wetness, slow percolation, and low strength are limitations for development and are severe limitations where the slopes are 6 to 15 percent.

Troup sand soils (TrB), 0 to 6 percent slopes, are deep, nearly level or gently sloping, well-drained soils; these soils were mapped in a very small portion of the site along North Tower Road. These soils are strongly acidic to very strongly acidic. Permeability is rapid in the surface layers and moderate in the subsoil. Runoff is slow and the soil is subject to leaching.

Vaucluse loamy sand soils (VaC), 6 to 10 percent slopes, and Vaucluse loamy sand soils (VaD), 10 to 15 percent slopes are well-drained, sloping soils mapped on the Fort Jackson Site, east of Bull Run Road and north of North Tower Road. Permeability is moderate in the subsoil above the fragipan and slow in the fragipan. The firm, brittle, and cemented fragipan is located at a depth of 14 to 32 inches and is approximately 29 inches thick.

Prime Farmland Soils. Based on a review of the list of prime farmland soils for Richland County, as provided by the USDA, no prime farmland soils are located on the Fort Jackson Site.

Depth to High Water Table and Depth to Bedrock for Onsite Mapped Soils Types. Table 7, developed from the soil survey, summarizes the depth to high water table and depth to bedrock for each of the mapped soil units at the subject property. Soils are placed in *hydrologic groups* according to their runoff-producing characteristics. The majority of the soils mapped on the Fort Jackson Site fall into Hydrologic Group A, which consists of soils having a rapid infiltration rate.

The majority of the Fort Jackson Site is underlain by soils that do not exhibit a high water table. The water table alongside the creeks and wetland areas can be at shallower depths and may be perched during the wet season. As indicated in Table 7, Fort Jackson Site soils are deep, and bedrock is not expected to be encountered within the upper 5 feet.

Table 7 – Soil Characteristics, Limitations, and Depth to Bedrock, Fort Jackson Site

Mapped Soil Units	Hydrologic Group	High Water Table Depth (ft)	Depth to Bedrock (ft)
Blanton	A	> 6	> 5
Johnston	D	1.0 – 1.5 apparent, Nov. - June	
Lakeland	A	> 6	
Pelion	B/D	1.0 – 2.5 perched, Nov. - April	
Troup	A	> 6	
Vaucluse	C		

Physical and Chemical Properties of the Mapped Soil Units. The soil survey also provides estimated values for several soil characteristics and features that affect the behavior of soils in engineering use. These physical and chemical properties of the mapped soil units on the proposed site are provided in Table 8.

Permeability of the Fort Jackson Site soils ranges from slow to very rapid. The shrink-swell potential of soils is low. The risk of corrosion of Fort Jackson Site soils, based on the soil survey, ranges from low to high for uncoated steel, with low corrosion risk soils occupying the majority of the site. A rating of moderate to high for risk of corrosion to concrete is provided in the soil survey, with moderate risk soils occupying the majority of the site.

Table 8 – Physical and Chemical Properties of Soils, Fort Jackson Site

Mapped Soil Units	Depth (inches)	Permeability (inches/hour)	Soil Reaction pH	Shrink-Swell Potential	Risk of Corrosion		Erodibility (0.02-0.69)
					Uncoated Steel	Concrete	
Blanton	0-50 50-96	6.0-20 0.6-2.0	4.5-6.0 4.5-5.5	Low	Low High	High	0.17 0.32
Johnston	0-38 38-66	2.0-6.0 6.0-20	4.5-5.5	Low	High	High	0.20 0.17
Lakeland	0-29 29-99	>20 >20	4.5-6.0	Low	Low	Moderate	0.17 ---
Pelion	0-10 10-26 26-48 48-57	2.0-6.0 0.6-2.0 0.06-0.6 0.6-2.0	4.5-6.5 3.6-5.5 3.6-5.5 3.6-5.5	Low	High	High	0.24 0.17 0.20 0.15
Troup	0.48 48-75	6.0-20 0.6-2.0	4.5-5.5	Low	Low	Moderate	0.17 0.20
Vaucluse	0-15 15-29 29-58 58-72	6.0-20 0.6-6.0 0.06-0.2 2.0-6.0	4.5-5.5 4.5-5.5 4.0-5.5 4.0-5.5	Low	Low	High	0.17 0.20 0.17 0.17

Source: *Soil Survey for Richland County, South Carolina* (USDA, 1978).

Soil Type Limitations for Development. Table 9 presents available data from the soil survey relating to soil limitations for development, including shallow excavations, small commercial buildings, and local roads and streets. Since sanitary sewer service is available adjacent to the Fort Jackson Site, along Percival Road, the suitability of onsite soils for septic tank filter fields was not assessed.

Table 9 – Soil Characteristics for Site Development, Fort Jackson Site

Mapped Soil Units	Degree and Types of Limitations		
	Shallow Excavations	Small Commercial Buildings	Local Roads and Streets
Blanton	Severe: cut banks cave	Slight	Slight
Johnston	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness
Lakeland	Severe: cut banks cave	Moderate: slope	Slight

Mapped Soil Units	Degree and Types of Limitations		
	Shallow Excavations	Small Commercial Buildings	Local Roads and Streets
Pelion	Severe: wetness	Moderate: wetness, slope, low strength	Moderate: Low strength
Troup	Severe: cut banks cave	Slight	Slight
Vaucluse	Moderate: slope	Moderate: slope	Moderate: slope

Source: *Soil Survey for Richland County, South Carolina* (USDA, 1978).

As shown in the previous table, the USDA identifies the following limitations based on the soil types mapped at the Fort Jackson Site:

Shallow excavations - Severe limitations for shallow excavations due to loose sands resulting in cut banks caving, and wetness along the adjacent streams and wetland areas.

Small commercial buildings - Slight to moderate restrictions for small commercial buildings and drainage and paving features (parking lots) on the majority of the site due to slopes.

Local roads and streets - Slight to moderate limitations for local roads and streets on the majority of the site due to slope and low soil strength.

4.1.3.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, there would be no impact on soils at the three alternative sites, as the VA NCA would not construct and operate a new veterans' cemetery in South Carolina.

Proposed Action Alternatives

Under the Proposed Action Alternative, potential impacts associated with soils were evaluated using the following criteria for all three alternative sites:

- Increased erosion during construction activities and following completion of the proposed project; and
- Potential constraints to development as a result of soil and geologic conditions (shallow bedrock, high water table, soil stability, topography) in the area of the proposed project.

The potential for erosion of soils ranges from slight to moderate at the Sedalia Site, severe at the Whitmire Site, and slight at the Fort Jackson Site. Construction of roads and building pads at the Whitmire Site would potentially induce erosion and sedimentation. Guidance contained in county and SCDHEC ordinances for grading, drainage, and construction will be considered, and

through the preparation and implementation of a site-specific grading and erosion control plan including Best Management Practices (BMPs), the effects of soil erosion would be reduced to a less than significant level. During construction, measures would be employed to prevent eroded soil from entering site drainage ways, including: placement of hay bales or other acceptable materials such as sediment barriers; the installation of temporary earth berms and/or sediment traps; use of fabric silt fences; spreading hay or straw on exposed areas; development of temporary settling areas; and use of other means for slowing runoff and reducing sediment loads.

Development of the Sedalia Site would convert land mapped and identified as prime farmland to non-farming uses. The USDA NRCS's evaluation of the site in consideration of prime farmland yielded a score greater than 160, indicating it should be given increasingly higher levels of consideration for protection. Accordingly, from a prime farmland and FPPA perspective, the Sedalia Site is the least desirable site of the three alternative sites unless the cemetery design could avoid or reduce conversion of the prime farmland. Development of the Whitmire Site or Fort Jackson Site for the cemetery would not result in conversion of prime farmland.

4.1.4 Geologic Hazards

Geologic hazards in South Carolina are generally related to minor earthquake events and the potential for soil liquefaction in the Columbia region. These and related potential geologic hazards in the region of each of the alternative sites are discussed in this section.

Seismicity. The southeastern United States is an area of diffuse, low-level seismicity. Earthquakes are fairly common in South Carolina; approximately 10 to 15 earthquakes are recorded annually in South Carolina, of which 3 to 5 are felt or noticed by people (FEMA, 2005). Approximately 70 percent of South Carolina earthquakes are located in the Middleton Place-Summerville Seismic Zone, which is centered near Charleston. The Middleton Place-Summerville Seismic Zone experiences intraplate earthquakes, which are earthquakes that occur in the stable portions of continents that are not near plate boundaries. Many of the intraplate earthquakes occur as a result of re-activation of ancient faults.

The two most significant historical earthquakes to occur in South Carolina were the 1886 Charleston/Summerville earthquake and the 1913 Union County earthquake. The 1886 earthquake in Charleston had an estimated magnitude of 7.7 on the Richter scale, and was the most destructive earthquake to ever occur in the eastern United States in terms of lives lost, human suffering, and devastation. The 1913 Union County earthquake occurred near the town of Union (located approximately 10 miles northeast of the Sedalia Site) with an estimated magnitude of 5.5 on the Richter scale. Shock waves extended from the western portion of South Carolina into adjacent Georgia and North Carolina, and into parts of Virginia. Forecasts indicate there is a 40 to 60 percent chance of a magnitude 6 earthquake somewhere in the central and eastern United States within the next 30 years. (SCEMD, 2005)

The South Carolina Department of Natural Resources (SCDNR) has produced a map depicting earthquake intensities by county, based on the Modified Mercalli Intensity (MMI) Scale. The intensities are the highest likely to be experienced under the most adverse geologic conditions, such as would be produced by a combination of the 1886 Charleston earthquake and the Union

County earthquake. The following is a description of the two MMI Scale categories that apply to the three alternative sites:

- Category VII: People have difficulty standing. Considerable damage in poorly built or badly designed buildings, old walls, spires and other structures. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at rooflines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furniture is overturned and damaged. Some sand and gravel stream banks cave in.

- Category VIII: Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes may occur in springs and wells; sand and mud are ejected in small amounts (SCDNR, 2005).

Estimating future seismicity of an area is difficult; however, it is the opinion of most seismologists that statistical estimates of historical seismicity provide the best measure of seismic hazard presently available. Consequently, historical seismicity was used as the basis for the new hazard maps being prepared by the USGS. These maps depict earthquake hazards in terms of the level of vibration that has a given probability of being experienced during some time period. The USGS hazard maps will be used by the Building Seismic Safety Council in its revisions to the seismic risk maps that will be adapted for use in State and local building codes. The Seismic Hazard map for South Carolina (USGS, 2002) defines the level of vibration (in percentage of the acceleration of gravity, %g), or "ground-shaking" that has a 10 percent probability of occurring in 50 years. A 10 percent probability in 50 years is equivalent to an average of one earthquake every 450 years.

Landslides. In mountainous regions subjected to earthquakes, ground shaking may trigger landslides, rock and debris falls, rock and debris slides, slumps, and debris avalanches. Certain mountainous regions are also susceptible to landslides during periods of heavy rainfall due to steep slopes or weak soils or rock.

Liquefaction. Soil liquefaction is a process by which the strength of granular-saturated soils is reduced during human-induced events or seismic shaking. Requisite conditions for liquefaction to occur include saturated granular soils with a loose-packed grain structure capable of progressive rearrangement of grains during repeated cycles of seismic events. Liquefaction susceptibility is a measure of a soil's inherent resistance to liquefaction, and can range from not susceptible, regardless of the magnitude of seismic events, to highly susceptible, which means that very little seismic energy is required to induce liquefaction (BC SRM, 2005).

Subsidence. Land subsidence is the lowering of the land surface elevation due to changes that take place underground. Common causes of land subsidence include fluid withdrawal (e.g., pumping water, oil, and gas from underground reservoirs); dissolution of limestone aquifers (sinkholes); collapse of underground mines; drainage of organic soils; and hydrocompaction (ground surface collapse from excessive wetting of certain low-density weak soils which are

previously dry and collapsible). Subsidence can be caused by any process that results in lowering of the water table, including drought, dry seasons, and excessive withdrawal of groundwater.

A sinkhole is a large dissolution cavity open to the ground surface. Some sinkholes form when the roofs of caves collapse; others form at the surface by rock dissolving downward. Sinkholes may also form as a result of lowering the water table by excessive pumping of groundwater. The geology of the Piedmont Physiographic Province in South Carolina is not favorable for the development of sinkholes. Sinkholes are localized to specific portions of the state where limestone of appreciable thickness is relatively near the surface (less than 30 to 40 feet below ground surface [bgs]). These conditions occur primarily in two regions of the state within the Atlantic Coastal Plain - in south-central South Carolina (eastern Orangeburg County, western Berkeley County and northern Dorchester County) and in northeastern South Carolina (inland parts of Horry County and adjoining areas).

Volcanic Eruption. There are no known volcanoes in South Carolina.

Radon. In areas with large granitic-type formations underlying the surface layer of soil, radon gas intrusion can become an indoor air pollution problem. Radon is a colorless, odorless gas that is produced from the natural radioactive decay of granite and phosphate-derivative geologic formations. Radon can escape through the surface soil and accumulate inside enclosed spaces to levels that pose risks to human health, including lung cancer. Accumulation is most frequently found when structures have inadequate ventilation.

The U.S. Environmental Protection Agency (USEPA) uses three zone designations, 1 (high), 2 (moderate), and 3 (low), to identify the radon potential in each county of each state. The USEPA radon-potential map utilizes data from uranium analysis of rock samples, airborne radiometric surveys, soil data on permeability and radon content, and indoor radon measurements (USEPA, 1999). The USEPA's indoor air quality standard is for radon not to exceed 4 picoCuries per liter (pCi/L).

4.1.4.1 Affected Environment – Sedalia Site

Seismicity. The Sedalia Site is located in the vicinity of the Buzzards Roost and Boogertown shear zones and the Cross Anchor fault, and is also located in the area of influence of the Middleton Place-Summerville Seismic Zone (Howard, 2005).

A Seismic Hazards map produced by the USGS for South Carolina indicates that the Sedalia Site is in an area of 6 %g (USGS, 2002). The hazard indicated by this map is greatest in the central coastal area of South Carolina, and shows the influence of the continuing activity near Charleston (Frankel, 1995). Earthquake intensity in Union County is estimated to be Category VIII (SCDNR, 2005).

Earthquakes are a geologic hazard to Union County and the Sedalia Site based on geologic data collected in the county and previous tectonic events (Howard, 2005).

Landslides. Although the Sedalia Site is located in an area with earthquake activity, the potential for landslides is considered to be low due to the relatively shallow slopes of a majority

of the soils at the site. On the portions of the Sedalia Site with steeply sloping soils, the bedrock is shallow, with characteristic that reduce the potential for landslides in these areas.

Liquefaction. According to data compiled by Youd and Perkins (1978), the estimated susceptibility of the Sedalia Site to liquefaction is low based on the type and age of deposits that underlie the Sedalia Site. However, a representative of SCGS indicated that the Sedalia area had not been investigated fully to adequately assess the liquefaction hazard potential of the area (Howard, 2005).

Soil Erosion. Soils throughout most of the Sedalia Site have a slight to moderate erosion hazard, and are not expected to be subject to extensive erosion problems (USDA, 1975). Based on information presented by the SCGS and URS' site observations, the portion of Union County in which the Sedalia Site is situated is subject to severe erosion and gully formation.

Subsidence. Based on the reported groundwater withdrawal in Union County, low reported drainage of organic soils, and absence of soils susceptible to hydrocompaction, the Sedalia Site does not appear to susceptible to subsidence issues.

Radon. The Sedalia Site is located in a Zone 3 Area for radon concentrations, indicating average radon levels less than 2 pCi/L and subsequent low potential to exceed the USEPA's recommended residential action level. The regulatory database search conducted for this assessment provided radon data for seven sites within Union County. The average radon level on the first floor (the only level sampled) for these seven sites was assessed to be 0.790 pCi/L. ([EDR, 2005; USEPA, 1999)

4.1.4.2 Affected Environment – Whitmire Site

Seismicity. The Whitmire Site is located in the area of influence of the Middleton Place-Summerville Seismic Zone, and is located in the vicinity of the Buzzards Roost and Boogertown shear zones and the Cross Anchor fault (Howard, 2005).

A Seismic Hazards map produced by the USGS for South Carolina indicates that the Whitmire Site is in an area of 7 %g (USGS, 2002). Earthquake intensity in Newberry County is estimated to be Category VII (SCDNR, 2002).

Earthquakes pose a geologic hazard to Newberry County and the Whitmire Site based on geologic data collected in the county and previous tectonic events (Howard, 2005).

Landslides. No evidence of existing or potential landslide areas was observed at the Whitmire Site during URS' site reconnaissance in May 2005. While the Whitmire Site is located in an area with known earthquake activity, the relatively shallow slopes of the soils across a majority of the site correlate to a relatively low potential for landslides. Additionally, in areas at the Whitmire Site with steeply sloping soils, the bedrock is shallow, with characteristics that reduce the potential for landslides.

Liquefaction. Based on the type and age of deposits that underlie the Whitmire Site, the estimated susceptibility of the Whitmire Site to liquefaction is low (Youd and Perkins, 1978).

However, a representative of SCGS indicated that the Whitmire area had not been investigated fully to adequately assess the liquefaction hazard potential of the area (Howard, 2005).

Soil Erosion. Soils on a majority of the Whitmire Site present no to moderate erosion hazard, and are not expected to be subject to erosion problems. However, the Cecil soils are reported to have a moderate to severe erosion hazard and potentially could pose a hazard to development of the site in the areas where Cecil soils occur (USDA, 1960). Based on information presented by the SCGS and site observations, the portion of Newberry County in which the Whitmire Site is situated is subject to severe erosion and gully formation.

Subsidence. The Whitmire Site does not appear to be prone to subsidence conditions such as land collapse, sinkholes, drainage of organic soils, and hydrocompaction.

Radon. The Whitmire Site is located in a Zone 3 Area for radon concentrations, indicating average radon levels less than 2 pCi/L and subsequent low potential to exceed the USEPA's recommended residential action level. The regulatory database search performed for this assessment provided radon data for two sites within Newberry County. The average radon level on the first floor (only level sampled) for these two sites was assessed to be 1.250 pCi/L (EDR, 2005; USEPA, 1999).

4.1.4.3 Affected Environment – Fort Jackson Site

Seismicity. The Fort Jackson Site is located in the area of influence of the Middleton Place-Summerville Seismic Zone (Howard, 2005).

A Seismic Hazards map produced by the USGS for South Carolina indicates that the Fort Jackson Site is in an area of 7 %g (USGS, 2002). Earthquake intensity in Richland County is estimated to be Category VIII (SCDNR, 2005).

Landslides. No evidence of existing or potential landslide areas was observed at the Fort Jackson Site during URS' site reconnaissances in April and May 2005 and February 2006. Given the gentle slopes across the Fort Jackson Site, it is unlikely that the site would be subject to landslides.

Liquefaction potential. Based on the type and age of deposits that underlie the Fort Jackson Site, the estimated susceptibility for liquefaction is moderate. However, this limitation could be overcome with proper placement of structures within the site and suitable foundations and site preparation as defined during the design phase of the project. Additional inquiries made to the SCGS and the Richland County NRCS office regarding the liquefaction potential of soils on the Fort Jackson Site has not been received as of the date of this EA.

Soil Erosion. The mapped soil units at the Fort Jackson Site have a slight erosion hazard (USDA, 1978), and are not expected to be subject to severe erosion problems.

Subsidence. According to information provided by Fort Jackson personnel, soil erosion and collapse of excavations are common at the Installation due to the high sand content in the soils. There have been reported problems with foxholes collapsing due to the sand content of the soils.

Fort Jackson personnel indicated that if the soils are thoroughly wetted, the erosion potential does not pose an issue. Additionally, small erosional areas have been reported in association with small storm drain outflows by roadways (Estaba, 2005).

Radon. Similar to the Sedalia and Whitmire Sites, the Fort Jackson Site is situated in a Zone 3 Area for radon concentrations. The regulatory database search performed in support of this assessment provided radon data for 83 sites within Richland County. The average radon levels on the first floor and basement for these 83 sites were assessed to be 0.610 pCi/L and 1.345 pCi/L, respectively. (EDR, 2006; USEPA, 1999)

4.1.4.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, geologic hazards would not be experienced because the VA NCA would not construct and operate a new national veterans' cemetery in South Carolina.

Proposed Action Alternatives

Under the Proposed Action Alternative, potential impacts associated with geologic hazards were evaluated based on the potential for subjecting people, structures, or property to major geologic hazards such as landslides, mudslides, or ground failure.

There is a moderate potential for seismic activity in the vicinity of the Sedalia, Whitmire, and Fort Jackson Sites. The liquefaction susceptibility of the Sedalia and Whitmire Sites is estimated to be low; however, the liquefaction susceptibility has not been fully assessed for these areas and could pose a hazard to development of these sites. The liquefaction susceptibility of the Fort Jackson site is estimated to be moderate based on the types of deposits that underlie the site. Additional recommendations relative to the liquefaction potential for soils on the Fort Jackson Site are pending pursuant to responses from the SCGS to URS' inquiries made in support of this EA.

Adverse impacts related to radon are not expected at any of the three alternative sites.

4.2 WATER RESOURCES

This section describes water rights issues in South Carolina and the water resources relative to each of the alternative sites, including surface water quantity and quality, groundwater quantity and quality, floodplains, and wetlands. It also presents observations made by URS during the site reconnaissances in April and May 2005. Information was obtained mainly from the USGS, SCDHEC, FEMA, USEPA, and various other state and county agencies. Environmental consequences and permitting requirements related to water resources are also presented.

Water Rights in South Carolina. Due to the relative abundance of water in the southeastern United States, South Carolina does not have the complex set of water right laws that are typically found in the arid western U.S. Instead, much of the riparian laws are based on Common Law precepts of riparian rights granted to property owners in riparian areas. South Carolina does not

have many of its own water right laws, including mandatory stream buffers. However, the value of protecting riparian resources is recognized in the State and industries using land in riparian areas (like the timber industry) generally engage in the use of voluntary BMPs to protect these resources. Also, stormwater must be managed during construction in accordance with the federal Clean Water Act's (CWA) National Pollutant Discharge Elimination System (NPDES).

South Carolina Water-Related Permitting Requirements

NPDES Stormwater. For any land-disturbing activities, regardless of size, the responsible entity must complete SCDHEC Form 3306, "Standard Application Form for Land Disturbing Activities-Stormwater Permitting." The completed form (Section 2C), a fee, and a professionally prepared stormwater management and sediment and erosion control plan that is prepared by a professional engineer, Tier B land surveyor, or a landscape architect, must be submitted to SCDHEC. The stormwater management and sediment and erosion control plan must identify site-specific BMPs to be implemented at the site. Upon review of these required materials, SCDHEC decides whether to issue an NPDES permit.

In addition, when a Section 404 permit is required by the U.S. Army Corps of Engineers (USACE) for the impact of discharges on waters and wetlands, the applicant must also comply with the Water Quality Certification program (from Section 401 of the CWA). Section 401 requires that the State issue certification for any activity which requires a Federal permit and may result in a discharge to State waters. This certification must state that applicable effluent limits and water quality standards will not be violated." During review of applications for Water Quality Certification, SCDHEC evaluates whether there are feasible alternatives to the activity, if the activity is water dependent, and the intended purpose of the activity. Certification is denied if the activity will adversely affect existing or designated uses. SCDHEC cannot issue a federal permit if certification is denied, in accordance with Regulation 61-101.

Interbasin Transfer of Surface Water. South Carolina law permits some interbasin transfer of water (SC R.121-12). A transfer may take place within 15 designated water basins, including the two that contain the three sites: the Broad and Catawba River basins. A Class I Permit is required from the South Carolina Water Resources Commission for any transfer of over 1 million gallons per day (MGD), or a transfer that is 5 percent or more of the 7-day, 10-year low flow (meaning the lowest average flow for a duration of 7 days with a recurrence interval of 10 years), whichever is less. For any transfers less than 1 MGD, a Class II permit must be obtained.

Surface Water Withdrawal. Any entity that withdraws surface water close to or over 3 million gallons/month must register with the SCDHEC Bureau of Water using the Water Use Registration Form (3764). Along with this form, the withdrawing entity would need to submit an annual report on monthly water usage and provide SCDHEC with a map of the site location showing the intakes, general technical information on the pumps and the irrigation system.

Groundwater Withdrawal. For areas in the coastal plain (east of the Fall Line) that are not in "capacity use areas" (such as Richland County), an entity withdrawing groundwater for irrigation water must submit a Notice of Intent (NOI) for construction and operation of a well under South Carolina general permit # SCW00000000 (SCDHEC Form 3647). The South Carolina-certified well driller used to drill a well is required to submit a Water Well Record Form (SCDHEC Form

1903) within 30 days of completion of the well. For all other counties (such as Union and Newberry), it may only be necessary to register with SCDHEC if groundwater withdrawal amounts are near or exceed 3 million gallons/month.

A representative of SCDHEC stated that a well permit request would initiate a search by SCDHEC for potential groundwater contamination in the vicinity of the proposed well. If a well is utilized to service more than 25 people, the well must meet federal permitting requirements. (SCDHEC, 2005)

Wetlands. Additional permitting requirements related to wetlands are presented in Section 4.2.3.

4.2.1 Surface Water

SCDHEC has initiated a Watershed Water Quality Management Strategy (WWQMS) to integrate monitoring, assessment, problem identification and prioritization, water quality modeling, planning, permitting, and other management activities by river drainage basins. SCDHEC has delineated eight major drainage basins encompassing hundreds of minor watersheds. Every year, SCDHEC develops or revises a management plan and implementation strategy for one basin. SCDHEC also samples chemical and physical parameters monthly at fixed primary stations located in or near high-use waters. In addition, SCDHEC samples secondary stations (near discharges and areas with a history of water quality problems) monthly from May through October for fewer parameters (SCDHEC, 2005).

The Sedalia and Whitmire Sites are located in the Broad River Basin, which incorporates 32 watersheds, approximately 4,332 stream miles, and approximately 2.4 million acres within South Carolina. The Fort Jackson Site is located in the Catawba Basin, which incorporates 21 watersheds, approximately 2,943 stream miles, and approximately 1.5 million acres within South Carolina.

Surface water is fairly plentiful at both the Sedalia and Whitmire Sites, which are primarily forestland and surrounded by forestland in the Sumter National Forest, and at the Fort Jackson Site, a military installation adjoining suburban, commercial and light industrial development on its north side.

In general, the surface water quality in the upstate area is mixed and there are many streams and rivers that report high enough levels of fecal coliform to prohibit recreational activities. Nutrients, bacteria, changing pH, siltation, pesticides, and metals impair many stream and river miles in South Carolina. Three streams and rivers near the proposed sites are listed on the 2004 State's list of impaired waters (Section 303[d] of the Clean Water Act) (SCDHEC, 2005).

Surface water quality is mainly dependent on non-point and point source discharges associated with land usage. The leading sources of degradation in South Carolina's rivers and streams are influx of fecal coliform and changing pH caused by municipal point sources, urban runoff and storm sewers, and agriculture and forestry activities. Non-point source stormwater pollution is partially attributed to soil erosion generated by clearing activities at construction sites. Sites that are greater than 1 acre in size within the State of South Carolina, and on a case-by-case basis for sites that are less than 1 acre, are required to have a NPDES construction permit.

4.2.1.1 Affected Environment – Sedalia Site

Hydrologic System. The Sedalia Site is primarily located in the Enoree River Basin, a part of the larger Broad River Basin. The Enoree River Basin is divided into several smaller sub-basins (one of them is also called the Enoree River). The southern part of the Sedalia Site is part of the Enoree River sub-basin, which occupies 83,245 acres of the Piedmont region of South Carolina, and its primary land uses are forestland (81.7 percent), scrub/shrub land (11.4 percent), agricultural land (5.5 percent), urban land (0.9 percent), barren land (0.4 percent), and ponds and lakes (0.1 percent). This sub-basin has 181.9 stream miles in the watershed (SCDHEC, 2005).

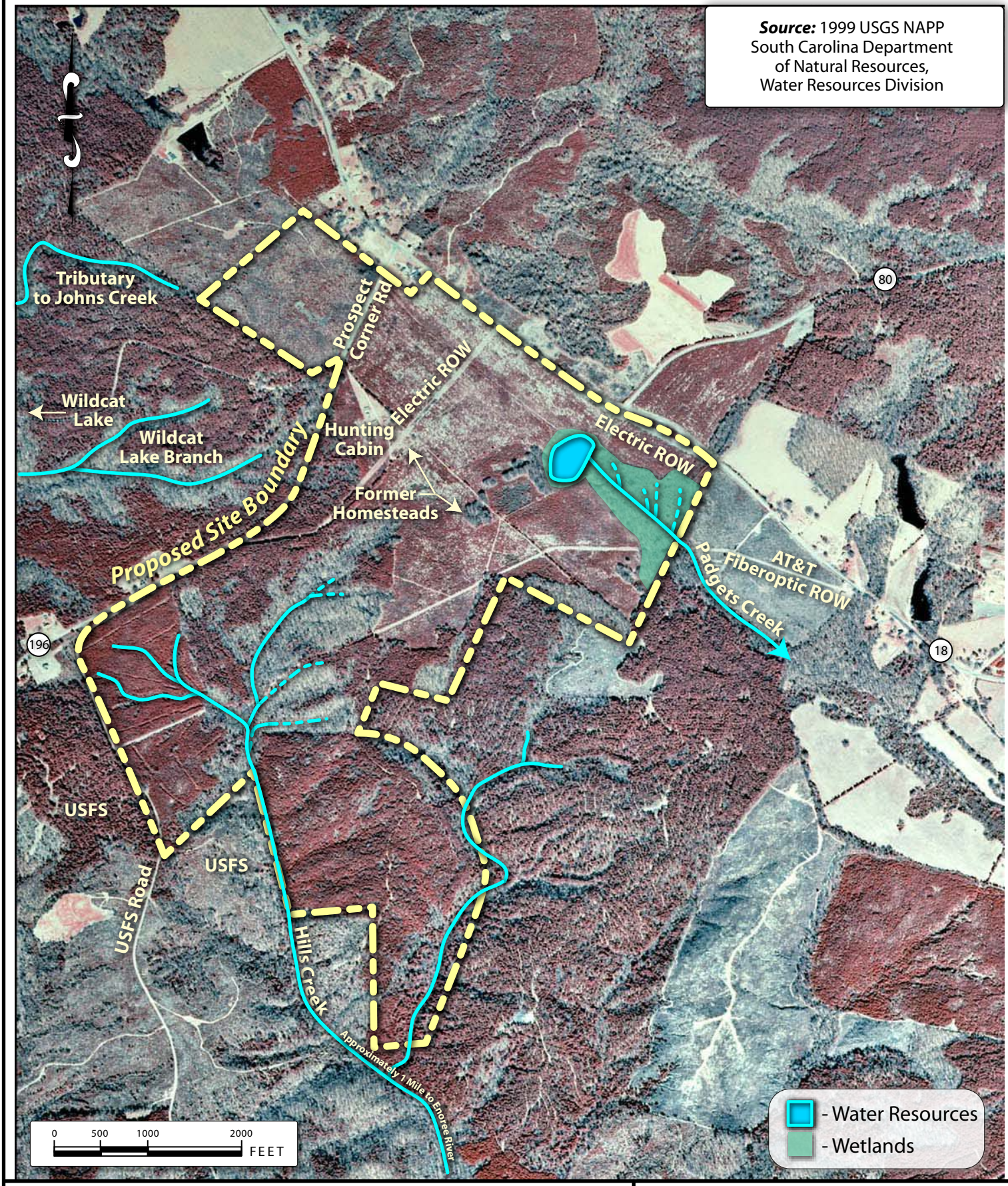
The northern part of the Sedalia Site is in the Tyger River Basin, which is also a part of the Broad River Basin. The Tyger River Basin is also divided into several small sub-basins, one of which is also called the Tyger River. The northern part of the Sedalia Site is part of the Tyger River sub-basin, which occupies 138,402 acres of the Piedmont region. Its primary land uses are very similar to the Enoree River sub-basin: forestland (81.8 percent), scrub/shrub land (10.9 percent), agricultural land (6.2 percent), urban land (0.7 percent), barren land (0.3 percent), and ponds and lakes (0.1 percent). This sub-basin has 181.9 stream miles in the watershed (SCDHEC, 2005).

The Sedalia Site contains the headwaters and an approximately 4,400-foot long stretch of Hills Creek in the center-west to the southwestern border areas of the site (Figure 12). The upper reaches of this creek flow through the Sedalia Site surrounded by steep banks. The Sedalia Site also contains a small intermittent tributary of Hills Creek in the southeastern corner. Hills Creek is a tributary of the Enoree River, and it is approximately 3 land-miles from its headwater in the Sedalia Site to the Enoree River.

A small, approximately 5-acre pond is located in the northeastern section of the site; the pond has an earthen dam on its eastern end. During URS' site reconnaissance, the pond appeared to be fairly shallow and was being overtaken by vegetation. This pond is the source of water for a small channel of water flowing from the dam to the east (see Figures 3 and 12), and becoming Padgetts Creek. Padgetts Creek runs approximately 10 land-miles and then flows into the Tyger River.

Water Use and Quality. Union County relies primarily on surface water for its water supply, including industrial use, commercial use, domestic use, irrigation, livestock, and power generation (SCDHEC, 2002). Water is currently supplied to the onsite hunting cabin by the Meansville-Riley Road Water Company, which obtains the majority of the County's water from the Broad River. The water treatment process of the company is standard and does not require any special treatment (Folmer, 2005).

No water quality information was readily available for either Hills Creek or Padgets Creek. Based on its relatively small watershed, it is unlikely that Hills Creek has any significant water quality issues as it is relatively small, originates in the Sedalia Site, and the surrounding land use is mostly forested. Padgetts Creek is a longer creek that also originates within the Sedalia Site.



CLIENT: Department of Veterans Affairs		TITLE: Sedalia Site Wetlands and Water Resources Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 12
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-31
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At one of SCDHEC's water quality-monitoring sites downstream from the Sedalia Site on the Enoree (1 mile northeast of the town of Whitmire at the bridge crossing of US 176/SC 121; see Figure 5), the water quality was good for aquatic life but was not good for recreational use due to the presence of fecal coliform. Due to the levels of fecal coliform recorded at the monitoring station approximately 10 miles downstream of the site, this section of the Enoree River is on the 2004 State's 303(d) list of impaired waters (SCDHEC, 2005). Much further upstream near the town of Woodruff (see Figure 2), the Enoree had very high levels of zinc, chromium, and cadmium that resulted in poor aquatic habitat. SCDHEC reported evidence that this situation was improving (SCDHEC, 2005).

Water quality on the Tyger River at the crossing of US 72 (near the confluence of Padgets Creek and the Tyger River) is fully supported for aquatic life. SCDHEC has reported an increasing trend in total phosphorus concentrations and a significant decreasing trend in pH. Recreational uses are not recommended due to fecal coliform levels but SCDHEC reported evidence that this situation is improving (SCDHEC, 2005). Due to the levels of fecal coliform recorded at the monitoring station at the US 72 crossing, this section of the Tyger River is on the 2004 State's 303(d) list of impaired waters (SCDHEC, 2005).

Stormwater Management. A stormwater management system is not present on or adjacent to the Sedalia Site. Stormwater infiltrates site soils or flows into onsite drainages and creeks. Union County has not been delegated the authority to review stormwater management permits, and all requests for NPDES land-disturbing permits must be submitted to SCDHEC.

4.2.1.2 Affected Environment - Whitmire Site

Hydrologic System. The Whitmire Site is located in the Duncan Creek sub-basin and is bounded on its north side by Duncan Creek. The Duncan Creek sub-basin is part of the Enoree River Basin. Duncan Creek flows from just north of Laurens, South Carolina, passes north of the Clinton, South Carolina, flows through the Sumter National Forest, and then enters the Enoree River just south and east of the town of Whitmire. The Duncan Creek sub-basin is approximately 76,743 acres in size and primarily flows through forestland (74.9 percent of land cover in watershed), but also through scrub/shrub land (12.4 percent), and agricultural land (7.1 percent). Other land uses in this watershed include urban land (4.5 percent), barren land (0.7 percent), and ponds and lakes (0.4 percent). The Duncan Creek sub-basin has 134.1 stream miles in the watershed.

The centerline of Duncan Creek forms the northern border of the Whitmire Site (see Figures 5 and 13). Duncan Creek is a fairly large creek and several tributaries flow through the Whitmire Site before entering the creek. The creek flows approximately 6,000 feet along the northern border of the Whitmire Site and then flows another 3,200 feet (approximately) before it enters the Enoree River to the east. Several tributaries to Duncan Creek cross the site and bound the site to the east and southeast. Some of the creek banks are deeply incised.

Two shallow wetland areas caused by beaver dams are present on the site: one just south of Duncan Creek and west of US 176/SC 121; the other in the eastern part of the site where Duncan Creek flows away from the site (see Figure 13). Both of these wetland areas are located within the FEMA-designated 100-year floodplain as described in Section 4.2.4.

Water Use and Quality. Newberry County relies primarily on surface water for its water supply, including industrial use, commercial use, domestic use, irrigation, livestock, and power generation (SCDHEC, 2002).

The nearby town of Whitmire draws its water from the Enoree River, just upstream from the confluence of Duncan Creek and the Enoree River (downstream of the Whitmire Site). The town's average daily water use is approximately 700,000 gallons per day (gpd) and its water system has a total pump capacity of 1.0 MGD of water. The water treatment process of the company is standard and does not require any special treatment (Dunnaway, 2005).

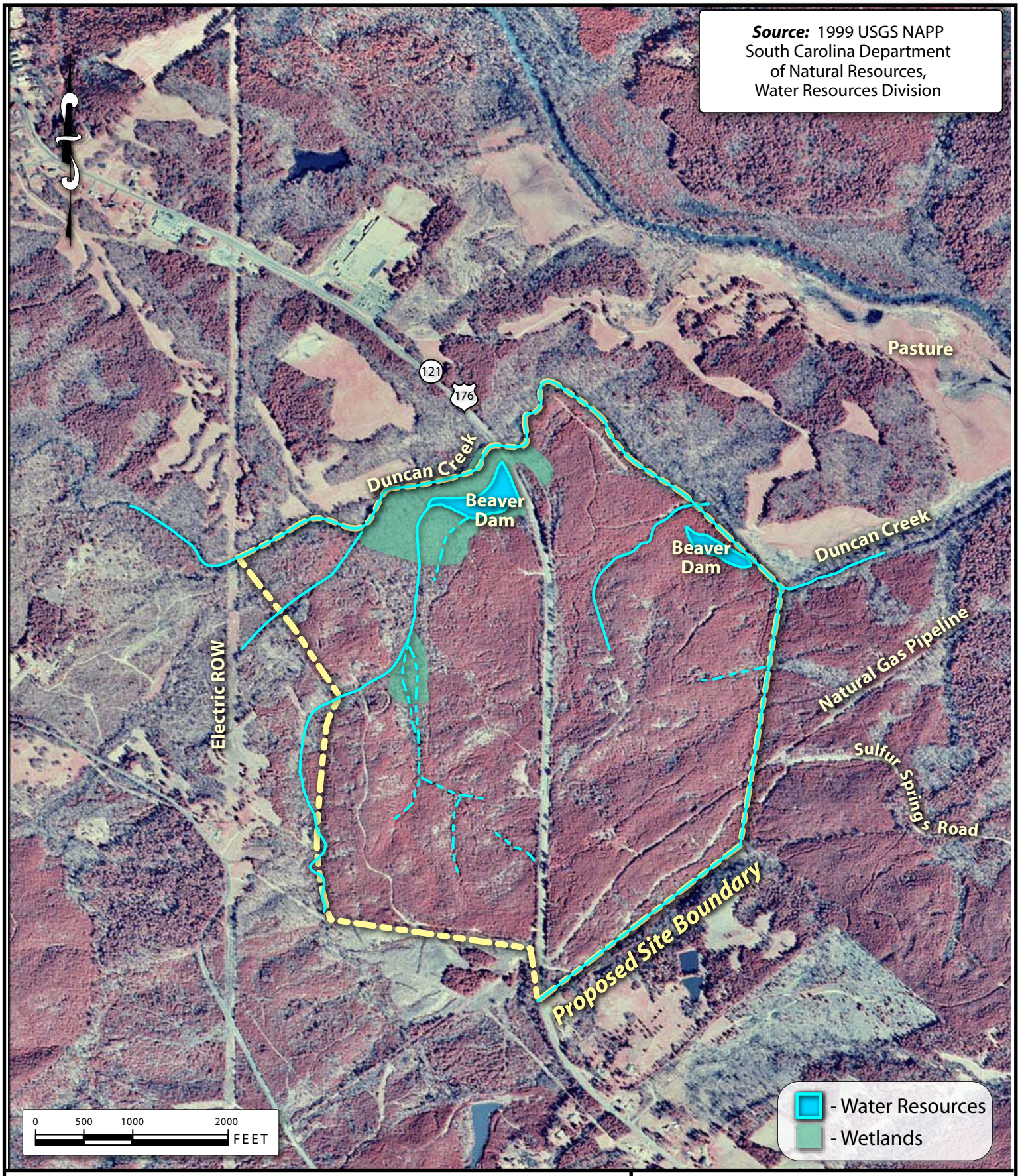
At a SCDHEC water quality monitoring station located on Duncan Creek at US 176/SC 121 (within the project site), 1.5 miles southeast of the town of Whitmire, the water quality was sufficient to support aquatic life, based on the macroinvertebrate community data studied by SCDHEC. However, historically, there have been very high levels of zinc (1995) and chromium (1997) and recreational use is not encouraged in Duncan Creek due to an increasing presence of fecal coliform bacteria. SCDHEC samples the water quality at this location on a monthly basis. During a field visit the week of April 18 - 22, 2005, URS staff observed a high degree of sedimentation in Duncan Creek. Due to the levels of fecal coliform recorded at the monitoring stations at the US 72 crossing of the Enoree River (1 mile northeast of Whitmire) and the US 176/SC 121 crossing of Duncan Creek, both of these sections are on the 2004 State's 303(d) list of impaired waters (SCDHEC, 2005).

Stormwater Management. A stormwater management system is not present on or adjacent to the Whitmire Site. Stormwater infiltrates site soils or flows into onsite drainages and creeks.

Newberry County has its own Erosion and Sediment Control Ordinance that must be followed in preparation of the SCDHEC-required stormwater management and sediment and erosion control plan. Newberry County will be delegated the authority by SCDHEC to review stormwater management permits on July 1, 2005, so all applicants after that date must send the required documentation to the newly designated authority in Newberry County (most likely the Department of Planning and Zoning) (Brooks, 2005).

4.2.1.3 Affected Environment – Fort Jackson Site

Hydrologic System. Fort Jackson is divided between two major drainage basins: the Congaree (in the western part of the Installation, which includes the Gills Creek and Cedar Creek sub-basins) and the Catawba (which includes the Colonels Creek sub-basin). The Fort Jackson Site is located primarily in the Colonels Creek sub-basin just to the east of the Gills Creek sub-basin (Figure 14). A small portion of the site, roughly the area west of Bull Run Road, is in the Gills Creek sub-basin.



CLIENT: Department of Veterans Affairs		TITLE: Whitmire Site Wetlands and Water Resources Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 13
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-35
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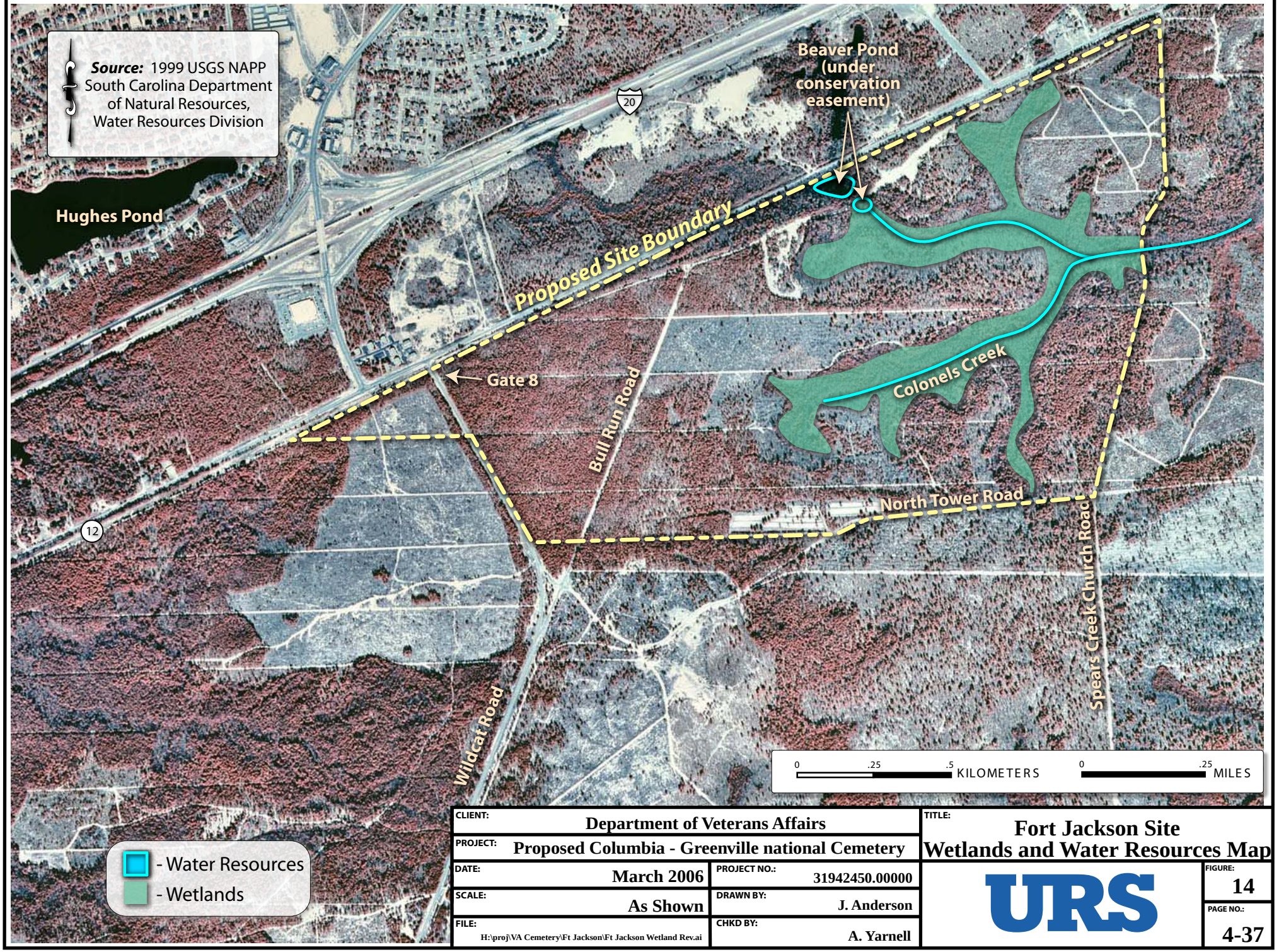

CLIENT:	Department of Veterans Affairs	TITLE:	Fort Jackson Site Wetlands and Water Resources Map
PROJECT:	Proposed Columbia - Greenville national Cemetery		
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 14
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-37
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The Colonels Creek sub-basin occupies 44,637 acres of the Sand Hills and Upper Coastal Plain regions of South Carolina. Land use in the watershed includes forested land (87.0 percent), agricultural land (5.3 percent), forested wetland, lakes and ponds (1.2 percent), urban land (0.6 percent), scrub/shrub land (0.8 percent), and barren land (0.1 percent). Colonels Creek originates just north of the Fort Jackson Site near the town of Pontiac and flows through the eastern portion of Fort Jackson and into the Wateree River. Tributaries to Colonels Creek originate within the Fort Jackson Site.

A shallow wetlands area is present along the Colonels Creek tributaries in the eastern section of the Fort Jackson Site. A 7-acre beaver dam pond (see Figure 14) is located at the Colonels Creek crossing south of Percival Road, within the Fort Jackson Site. The beaver pond is part of an area protected by a conservation easement (Appendix G).

Water Use and Quality. Richland County obtains a majority of its public and industrial water supplies from the City of Columbia water system, which processes 62 MGD from the Broad River at Columbia (Broad River Diversion Canal) and from Lake Murray on the Saluda River (west of the City). City of Columbia potable water distribution pipes are located along Percival Road, just north of the Fort Jackson Site.

The surface water body flowing through the site, Colonels Creek, is a blackwater system and is characterized by naturally low pH (and thus, is corrosive). The water quality has been monitored by SCDHEC and is considered good for both aquatic life and recreational use.

Fort Jackson performs limited irrigation, primarily for the golf course. The source of golf course irrigation water is surface water from golf course ponds. If the ponds are low, Fort Jackson has the ability to use City of Columbia water.

Stormwater Management. A stormwater management system is not present on or adjacent to the Fort Jackson Site. Stormwater infiltrates site soils or flows into onsite or adjacent drainages and creeks.

Fort Jackson is located in Richland County, which has been delegated the authority by SCDHEC to review stormwater management permits. Permit applications (SCDHEC Form 3306) must be submitted to the Administration and Engineering Division of the Richland County Department of Public Works.

4.2.1.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative there would be no impacts to surface waters present in the area of the cemetery site alternatives because no construction would occur.

Proposed Action Alternatives

Stream Buffer. Under the Proposed Action Alternative, the VA NCA plans to carefully consider, during the cemetery master planning phase of the project, incorporating a 25-foot vegetative

buffer around all water bodies and floodplain areas within the selected site. The buffer would help to protect these water resources and provide an extra measure of safety from flooding, as well as preserve these natural amenities for the enjoyment of visitors to the national cemetery.

NPDES Permitting Requirements. Construction activities and the increase of impervious surfaces due to the development of roads and buildings on the Sedalia, Whitmire, and Fort Jackson Sites could result in increases of sediment and pollutants in streams on or adjacent to the sites. The VA NCA would complete the SCDHEC Form 3306, "Standard Application Form for Land Disturbing Activities-Stormwater Permitting," and submit the completed form (Section 2C), a fee, and a professionally prepared stormwater management and sediment and erosion control plan to the appropriate regulatory authority.

Site-specific BMPs would be described in the stormwater management plan, and their implementation would minimize many of these potential adverse impacts. Specific measures to manage sediment and erosion during construction could include silt fences, rip-rap-lined drainage ways with check dams, and temporary sediment traps and basins. Following construction, bare areas would be re-vegetated to stabilize site soils. Also, erosion-control fabric would be installed along slopes generated during development of the site, to establish vegetation growth.

The delegating authority would review the required NPDES information and issue an NPDES permit if the potential negative effects of construction runoff to the area's streams and surface water are adequately mitigated.

Irrigation Water Needs at Proposed Cemetery. About 100 acre-feet per year of water would be needed during the new cemetery's first 10 years of operation (2009 to 2019). About 200 acre-feet of water per year would be needed during the next 10 years (Phase II), and about 300 acre-feet of water per year would be needed during the third 10-year period of cemetery operation. These water usages convert to 2,716,857 gallons/month for the first 10 years, 5,433,713 gallons/month for the second 10 years, and 8,150,570 gallons/month for the third 10 years.

For its irrigation water supply, the VA could choose from three options: surface water, groundwater or existing potable water supplies. Both surface water and groundwater withdrawals would require registration with SCDHEC and monitoring of water use due to the amount of monthly water consumption expected at the national cemetery. In addition, adequate supplies of surface water might not exist at the three sites, with the exception of Duncan Creek at the Whitmire Site, unless a water impoundment structure was constructed. Additional information regarding dam construction and permitting requirements is presented in Section 4.8.1 of this EA. Groundwater is generally more difficult to extract in the Piedmont region of South Carolina, which includes the Sedalia and Whitmire Sites, because of the predominance of clay soils in this region. For the Fort Jackson Site, low pH levels in the soil and adjoining streams make the use of surface water a less desirable alternative. The use of potable water would require an agreement with the local water supply utility as described above.

4.2.2 Groundwater

Although South Carolina relies heavily on surface water as a source of public supply, 99 MGD were obtained from groundwater wells in 2000, which constitutes approximately 18 percent of the total used for public supply. In 2000, groundwater was the only source of water supply for one-third of the State's population. More than half of the 300 largest municipalities and water authorities rely on wells. In addition, groundwater provides about 64 MGD for rural domestic use, 57 MGD for industrial use, 190 MGD for crop irrigation, and 25 MGD for golf course irrigation.

Based on a USEPA published report, overall groundwater quality in South Carolina is excellent, although the number of reported groundwater contamination cases rose from 60 cases in 1980 to 3,350 cases in 1998. The increase in the number of contaminated sites was reportedly due primarily to the increased monitoring at underground storage tank (UST) sites. The primary source of contamination is leaking USTs (LUSTs), which impacted 2,650 monitoring sites. Other major sources of contamination include spills, landfills, hazardous waste sites, and land application of waste.

Groundwater Quality and Formaldehyde. The environment, and specifically the water table of the area, is considered when constructing cemeteries so that water does not become a problem during periods of excessive precipitation (Douthit, 1994).

Organic loading rates to groundwater associated with body decomposition are a consideration of any cemetery operation. The main constituent of the loading rate is the time associated with body decomposition. The end products of body decomposition are ammonia and ammonia compounds, hydrogen sulfide, and hydrogen phosphide. These are gases that produce unpleasant odors associated with protein putrefaction. Protein putrefaction produces mercaptans, which possess an unpleasant odor and are insoluble in water; methane, a colorless, odorless gas; hydrogen; nitrogen; carbon dioxide; and water (VA NCA, 1994).

The practice of using formaldehyde in embalming evolved as a way to kill bacteria and to neutralize the undesirable odors associated with decomposition. Formaldehyde is an organic compound that readily bonds with many other substances. The National Institute for Occupational Safety and Health (NIOSH) states that formaldehyde is immediately dangerous to life and health at 20 parts per million (ppm). Formaldehyde dissolves easily in water, but it does not last a long time in water and is not commonly found in drinking water supplies (ATSDR, 1999). Formaldehyde used during embalming reacts with body tissues to create molecular compounds that are inert (VA NCA, 1994). The formaldehyde used in modern embalming processes is a biodegradable chemical that, upon contact with protein from any source, is no longer formaldehyde. Upon contact with protein, the formaldehyde will become water and the protein will be transformed into fixed protein. The fixed protein will, over time, decompose into carbon-based elements, based upon its original complex structures. Any residual formaldehyde that may be found in cavities of the body will react with air or other proteins to form formic acid, water, and carbon dioxide, which are all natural components of the soils in many areas (Douthit, 1994).

4.2.2.1 Affected Environment - Sedalia Site

Groundwater supplies in the Piedmont Physiographic Province of South Carolina come from three types of hydrogeologic environments, which include the unweathered fractured crystalline bedrock, the overlying saprolitic regolith, and to a limited extent the alluvial valley fill deposits. A majority of public and private wells are completed in the fractured crystalline bedrock. The bedrock has not been fully characterized hydrologically; therefore it is not known if separate or distinct aquifers exist within the bedrock. For this reason, the water-bearing portion of the Piedmont bedrock has been collectively termed the "bedrock aquifer" (Oldham, 1986). Yields from crystalline bedrock vary widely among individual wells, depending primarily on the existence of joints and fractures within the rock. Where fractures exist, yield and specific capacity further vary based on the size of fractures and degree of fracture interconnection. The overlying saprolite is hydrologically connected with the underlying bedrock and provides the primary source of recharge water to the bedrock aquifer. Yields of 4 to 170 gpm have been recorded in the Piedmont, which indicates the large variability in the occurrence, size, and interconnection of joints and other fractures that exist in this aquifer. The bedrock typically yields small amounts of water to domestic users, small cities, and low-water-demanding industries.

Although the majority of South Carolina's Piedmont groundwater supplies come from the bedrock aquifer, the overlying regolith composed primarily of saprolitic soils is also a significant water-producing unit. Saprolite is an in-place weathering product of the crystalline rock, which ranges from non-existent at some locations to over 150 feet thick in other locations. Many of the original structures of the parent bedrock (i.e., fractures, dikes, faults, foliations, etc.) are preserved in saprolite and act as preferential paths of groundwater flow. Although there are many localized exceptions, saprolite in the South Carolina Piedmont is typically dominated by silt-sized particles, with varying amounts of sand and clay, depending upon the parent rock's original texture and mineralogy. The saprolite in the South Carolina Piedmont typically exhibits high porosity and low permeability resulting from relatively high clay content. The diminished relief of the South Carolina Piedmont has allowed for greater saprolite development.

Groundwater in the South Carolina Piedmont moves by caprolitic action through the saprolite and discharges to surface water bodies, wells, or is released from storage to the underlying bedrock through fractures. Due to the typically low hydraulic conductivity, saprolite generally provides low yielding wells and is normally suitable only for low-volume, domestic water demands. Saprolite aquifer wells are more susceptible to contamination from bacteria and near-surface sources due to the characteristically shallow depth and construction methods (which often times do not create an adequate surface seal). Saprolite aquifer water chemistry is similar to water in the underlying bedrock aquifer, with calcium and bicarbonate being the dominant ions.

Based on analytical data collected by SCDHEC from a statewide network of wells, water quality and chemistry have been found to be highly variable among the aquifers, as well as among differing regions of the same aquifer. The chemistry data also indicate that groundwater mineralization increase in a general coastward trend. In the South Carolina Piedmont, the analytical data indicate that a majority of the groundwater's chemical "signature" is developed in

the overlying saprolite aquifer, although some changes in water chemistry continue to occur as water migrates through the deeper bedrock aquifer. (SCDHEC, 2001)

Groundwater is not currently withdrawn on the Sedalia Site. However, due to the rural location of the Sedalia Site, domestic wells are common in the site vicinity. No federal or state groundwater supply wells and no public water wells were identified within a 1-mile radius of the Sedalia Site (EDR Well Search Report, 2005).

A septic system is currently utilized in association with the hunting cabin located in the northern portion of the site. In addition, there is the potential for septic systems or outhouses to have been associated with two reported former homesteads located on the Sedalia Site. No indications of contaminated groundwater onsite or adjacent to the Sedalia Site were identified by review of regulatory databases conducted in support of this assessment.

Acidity and alkalinity are measured according to the pH (potential of hydrogen) scale. Reportedly, typical pH of the groundwater in Union County ranges from 5 to 7 (SCDHEC, 2005). Groundwater is used in the vicinity of the Sedalia Site for drinking water (but no federal, state, or public supply wells were identified within 1 mile, as stated above). Groundwater quality in Union County is reported to be good, and domestic well water does not require treatment to be potable.

The primary supply for irrigation water in Union County is from surface waters; there are few reported irrigation wells in Union County (Meansville-Riley Road Water Company, 2005).

4.2.2.2 Affected Environment - Whitmire Site

Groundwater supplies in Newberry County and within the vicinity of the Whitmire Site are obtained from the Piedmont bedrock and saprolite.

No groundwater is currently withdrawn on the Whitmire Site. Water wells were likely associated with two or more former onsite residences, but no evidence of onsite wells was observed during URS' site visits.

Water is currently supplied to the Whitmire Site vicinity by the City of Whitmire Public Works Department. According to a representative of the Public Works Department (Dunnaway, 2005), domestic water has been supplied to the site vicinity for approximately 1 year. Domestic wells are common in the vicinity of the Whitmire Site; approximately 35 to 40 residences out of 45 in the vicinity of the site utilize wells for domestic water. Groundwater wells in Newberry County average 150 to 200 feet in depth.

Based on a review of the EDR Well Search Report for the Whitmire Site, no Federal, State, or public water supply wells were identified in a 1-mile radius of the property (EDR Well Search Report, 2005).

The typical pH of the groundwater in Newberry County ranges from 5 to 7 (SCDHEC, 2005). Groundwater quality in Newberry County is reported to be good, and domestic well water does not require treatment to be potable.

The primary supply for irrigation water is from surface waters; there are few reported irrigation wells in Newberry County (Dunnaway, 2005). The well permitting process for Newberry County is similar to that for the Sedalia Site.

No indications of contaminated groundwater onsite or adjacent to the Whitmire Site were identified through a review of regulatory databases conducted in support of this assessment.

4.2.2.3 Affected Environment - Fort Jackson Site

Shallow groundwater quality was studied in the Columbia metropolitan area as part of the USGS National Water Quality Assessment Program. The study was designed to examine the recent effects of human activities on shallow groundwater in an urban setting. Thirty shallow monitoring wells were installed in selected residential and commercial areas constructed between 1960 and 1990. Groundwater samples were collected and analyzed for major ions, nutrients, pesticides, volatile organic compounds (VOCs), chlorofluorocarbons (CFCs), and dissolved gasses. Significant findings are as follows:

- Nitrate nitrogen was detected at 26 of the groundwater monitoring sites. The median concentration was 1.0 milligram per liter (mg/L) and all concentrations were below the USEPA maximum contaminant level (MCL) of 10 mg/L for drinking water.

- Pesticides were detected at 22 of the sites. All pesticide concentrations detected were below existing USEPA MCLs. Atrazine, diethyl atrazine, simazine, and dieldrin were the most commonly detected pesticides and pesticide metabolites in samples from the monitoring wells. Atrazine and simazine have large groundwater leaching potentials that make them more likely to be detected in groundwater.

- VOCs were detected at 27 groundwater sites, and 2 of those sites had 15 different VOCs. Methyl tert-butyl ether (MTBE) and trichloroethylene exceeded the USEPA MCLs in one sampling event at two monitoring sites. Chloroform was detected at 21 sites. Other VOCs detected in more than 5 wells include chloromethane, dichlorobromomethane, benzene, 1,1,1-trichloroethane, iodomethane, trichloroethylene, tetrachloroethylene, 1,1-dichloroethane, dichloromethane, 4-isopropyl-1-methylbenzene, MTBE, and acetone.

Analytical results of the groundwater monitoring in Columbia indicate that shallow groundwater is affected by human activities. However, concentrations of contaminants at most of its groundwater monitoring sites in the study area do not currently present a human health risk because the majority of the population in the metropolitan area uses surface water for the drinking water supply. There could be some risk to aquatic biota from groundwater containing elevated concentrations of contaminants that discharge to streams (Reuber and Hughes, 1996).

As previously discussed, the Fort Jackson Site is situated in the Sand Hills region of the Atlantic Coastal Plain Physiographic Province. Confined (artesian) and unconfined (water table) groundwater conditions exist at Fort Jackson. The principal aquifer beneath Fort Jackson is the Upper Cretaceous/Middendorf aquifer, the more permeable layers of which produce large quantities of water. Perched water table conditions also exist at the Installation because

permeable surface soils with high infiltration rates overlie sandy clay and clay layers of low permeability (ecology and environment, Inc., 2001).

The Middendorf Aquifer in South Carolina is situated directly over the crystalline bedrock and provides groundwater to numerous domestic, municipal, and industrial users. Middendorf sediments are comprised of fine to coarse quartzitic and arkosic sands, with discontinuous interbeds of sandy clays, kaolins, and gravel. The Middendorf Aquifer in South Carolina is comprised of clean quartz sands that have been thoroughly leached. Water from the Middendorf Aquifer is generally soft, acidic, and low in dissolved solids, with locally high iron contents. The Middendorf Aquifer has high transmissivities and is capable of yielding considerably greater than 1,000 gpm. Based on data from the SCDHEC network wells in the Middendorf Aquifer, yields ranged from 10 to 1,012 gpm. The variability in productivity arises from differences in well construction and development, as well as local effects of aquifer transmissivity. Proper well development in the Middendorf Aquifer is essential to achieve maximum yields.

Sediments of Cretaceous age and younger in the Coastal Plain range from zero feet in depth (non-existent) at the Fall Line (located north of the Fort Jackson Site) to approximately 4,000 feet at the southern boundary of the state. These sediments are situated on crystalline bedrock and contain an abundance of groundwater. Currently, approximately 200 MGD is pumped from wells in the Atlantic Coastal Plain. Many sand aquifers in the Cretaceous section yield water that is soft and remarkably low in mineral content; some of it is similar to rainwater in the concentration of dissolved solids. Saline water which was trapped in the sediments during deposition has been flushed out and replaced by freshwater to a maximum depth of 2,000 feet in an area about 40 miles inland from the southern part of the coastline. Wells in the Coastal Plain sediments are used for domestic and small-irrigation supplies and, in the southern end of the county, for industrial supplies. In the Eastover area (Eastover is located approximately 10 miles southeast of the Installation boundary) several large industrial and farm-irrigation wells pump 2,000 gpm or more. The portion of Richland County in which Fort Jackson is situated has considerable additional groundwater supply potential; however, its development is somewhat restricted in areas by exceedingly deep water levels that reduce the drawdown available to wells in certain aquifer zones (Newcome, 2003).

Fort Jackson has nine drinking water wells: three at the Weston Lake Recreational Area and six in training ranges, located away from the cantonment area (McDowell, 2005). The purpose of the training range wells is to provide local drinking water to soldiers during training activities/exercises (i.e., to fill lister bags, which hold 10 – 15 gallons of water). The wells are not connected to a drinking water system. Depths for seven of the nine wells range from 108 to 300 feet. The other two wells are under direct influence of surface water. The wells are monitored monthly by both Fort Jackson and SCDHEC for the following parameters: haloacetic acids (by-product of drinking water disinfection), total trihalomethanes (by-product of drinking water disinfection), lead, and copper. SCDHEC monitors the wells annually for nitrates. A private contractor also monitors chlorine levels on a daily basis (Green, 2005). Except for these nine wells, Fort Jackson does not withdraw groundwater onsite. The primary source of potable water at Fort Jackson is the City of Columbia water system.

Domestic wells are common in the vicinity of the Fort Jackson Site. Reported well depth in the immediate vicinity of the Fort Jackson Site is approximately 100 feet bgs. Wells in this vicinity are high yield wells (i.e., good water volume production).

The EDR Well Search Report for the Fort Jackson Site did not indicate the presence of any federal, state, or public supply wells within a 1-mile radius of the property. However, one irrigation well and one potable water supply (PWS) system were identified by EDR within the 1-mile search radius of the site (EDR Well Search Report, 2006). According to the search report, the Spring Valley Mobile Home Park PWS system has had three reported violations. These violations, as reported by EDR, consist of the following: two violations of the monthly MCL for coliform on April 1, 1994, and violation of the "initial tap sampling for Pb and Cu" (lead and copper) on July 1, 1993.

Groundwater is used in the vicinity of the Fort Jackson Site for drinking water. Based on data provided by SCDHEC, the typical pH of the groundwater in the vicinity of the Fort Jackson site ranges from 3.5 to 5. However, shallow groundwater is typically of a more acidic pH than deeper groundwater. Groundwater quality in Richland County is reported to be generally good, and domestic well water in the vicinity of the site reportedly does not require treatment to be potable. Domestic well systems on the Installation are treated with chlorine for disinfection purposes (SCDHEC, 2005).

The well permitting process for Richland County is similar to that for the Sedalia and Whitmire Sites.

4.2.2.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, there would not be impacts to groundwater resources existing at the three alternative sites. The septic system receiving waste generated at the Sedalia Site would continue to receive sanitary sewage.

Proposed Action Alternatives

As stated earlier, formaldehyde and other chemicals used in embalming fluids combine with body proteins to form complex compounds that are stable. Therefore, with implementation of the Proposed Action Alternative, it is unlikely that embalming fluids would pose a threat to groundwater quality at any of the alternative sites.

Under implementation of the Proposed Action Alternative at the Sedalia Site, it is unlikely that the septic tank abandonment and the removal of the potential former outhouses (associated with the former homesteads) would adversely impact groundwater quality. Conversely, removal of these systems would be a potential beneficial impact to groundwater quality in the vicinity.

A principal consideration of the potential impact of a cemetery operation on the quality of groundwater is whether the burials occur in the unsaturated soil zone above the water table, that is, above the boundary of the zone of saturation. Because water flows through soil under

tension, percolating water will not wet soil under an impermeable object. Buried objects, such as burial boxes or vaults, shield the soils beneath from percolating water. Water reaching the surface of these objects will be deflected and will flow down the sides of the objects. When the water reaches the bottom of the object, it will continue to flow downward with gravity.

In contrast to interment in unsaturated soil, water entry would occur in burial boxes that extend to the saturated zone. Since groundwater is not held in pores by tension, water will flow into any voids created in the groundwater zone. Crypts are not waterproof, so a burial box or vault placed beneath the water table, or in a location where a rise in the water table will reach it, could fill with water. The VA NCA plans to carefully evaluate the depth to groundwater at potential interment areas to select suitable uses for those areas that might be unsuitable for interment sites. Therefore, under the Proposed Action Alternative, development of the Sedalia, Whitmire, or Fort Jackson Sites should have no negative impacts on the quality of groundwater, because the interments would not be developed in the zone of saturation.

At the Sedalia Site, the high water table is estimated to be 6 feet bgs. Under the Proposed Action Alternative, development of the Sedalia Site should have no negative impacts on the quality of groundwater, because the interments would not be developed in the zone of saturation.

The high water table is estimated to be 3 feet bgs at the Whitmire Site, in the vicinity of Duncan Creek and associated on-site tributaries. The shallow water table at these portions of the Whitmire Site would prohibit development of these areas for interment sites; however, development of the remainder of the site should have no negative impacts on the quality of groundwater, because the interments would not be developed in the zone of saturation.

The high water table is estimated to be less than 2.5 feet bgs along the drainage ways in the eastern portion of the Fort Jackson Site, and more than 6 feet bgs across the remainder of the site. Under the Proposed Action Alternative, development of the Fort Jackson Site should have no negative impacts on the quality of groundwater, because the interments would not be developed in the zone of saturation.

The reported low pH of shallow groundwater in the vicinity of the Fort Jackson Site poses a potential limitation to development due to the potential corrosive nature of the subsurface soils and water. In addition, the low pH levels found in Colonels Creek precludes it from being a good source of untreated irrigation water due to its corrosive nature. If water from Colonels Creek were used as a source of irrigation, it would need to be treated with alkali prior to use.

If the VA NCA were to drill a well for irrigation water at any of the alternative sites, the VA would need to comply with SCDHEC policies and regulations.

4.2.3 Wetlands

EO 11990, Protection of Wetlands, requires federal agencies to avoid or minimize impacts to wetlands to the maximum extent possible.

All activities that involve the discharge of fill material into jurisdictional waters are subject to the permit requirements of the U.S. Army Corps of Engineers (USACE). Such permits are typically

issued on the condition that the applicant agrees to provide mitigation that results in no net loss of wetland areas, functions, or values. A wetland is defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The filling or grading of such waters is regulated by the USACE under authority of Section 404 of the Clean Water Act. All projects involving federal funds must comply with Executive Order (EO) 11990, Protection of Wetlands. Where possible, projects must be designed to minimize or avoid impacts to wetlands. No permits for filling wetlands can be issued until the SCDHEC issues a 401 certification that the proposed activity will meet state water quality standards. SCDHEC is also responsible for issuing and enforcing NPDES permits.

In April 2005, URS conducted a general reconnaissance of the Sedalia and Whitmire Sites and in February 2006, of the Fort Jackson Site, to identify potential jurisdictional "Waters of the United States" (WUS) according to the criteria set forth in the 1987 USACE *Wetlands Delineation Manual*. Boundaries of potential wetlands that were identified on each of the surveyed properties were not delineated.

4.2.3.1 Affected Environment – Sedalia Site

At the time of the April 2005 reconnaissance, the Sedalia Site consisted of one impounded pond, which contained open water and extensive aquatic vegetation, as well as emergent vegetation along the western edge (Figure 12). The pond is fed by a spring. Discharge from the pond flows into a small stream to the southeast, and becomes Padgets Creek. The site visit identified the area to the east of the pond surrounding the stream as a potential wetland; a portion of this area is identified on the National Wetland Inventory (NWI) map as a freshwater emergent wetland. The approximate wetland boundaries were identified by the presence of hydrophytic vegetation and hydrology indicators. The pond covers approximately 5 acres. The wetland area observed during the site visit covers approximately 25 acres.

The property also contains several unnamed tributaries that drain into Hills Creek, which is located along the southern property boundary (Figure 12). The streams and tributaries consist of approximately 9,000 linear feet of WUS (areas with a defined bed and bank). (Note that the areas indicated on Figure 12 are approximate and are not to scale.)

4.2.3.2 Affected Environment - Whitmire Site

During the site reconnaissance in April 2005, the Whitmire Site had three main drainages from the uplands to the 100-year floodplain along Duncan Creek (Figures 13 and 16). The potential wetland areas identified were confined to the 100-year floodplain and the boundaries were identified by the presence of hydrophytic vegetation and hydrology indicators. Two beaver dams were located within these wetland areas, one on the northeast side of the site and one on the west side of the site. The beaver dam on the northeast side of the site covers approximately 5 acres. This beaver dam was identified on the NWI map as a palustrine, broad-leaved deciduous scrub/shrub wetland.

The northwestern portion of the Whitmire Site is also located within the 100-year floodplain, and the majority of this area would be considered a wetland. The beaver dam in this area is located near the intersection of US 176/SC 121 and Duncan Creek and occupies an area of approximately 10 acres. The beaver dam is located within a larger wetland area, a portion of which is mapped on the NWI map as freshwater emergent wetlands. This wetland area is approximately 45 acres in size, including the beaver dam.

A third, smaller freshwater emergent wetland area, was identified south of the large wetland along one of the tributaries of Duncan Creek. The smaller wetland area covers approximately 7 acres. In addition to the three main drainages and three wetland areas, several smaller tributaries to Duncan Creek are present on the Whitmire Site. These smaller tributaries consist of approximately 7,500 linear feet of WUS. (Note that the areas indicated on Figure 13 are approximate and are not to scale.)

4.2.3.3 Affected Environment - Fort Jackson Site

Wetland areas on the Fort Jackson Site were identified from data available through Fort Jackson's Geographic Information System (GIS) database, and confirmed during site reconnaissance by URS. The GIS data and site reconnaissance indicate that there are approximately 92 acres of wetland areas and other surface water features within the Fort Jackson Site (Figure 14). No formal delineation of these wetlands has been made; rather the GIS-estimated boundaries are based on data on NWI maps, topographic quadrangles, and aerial photography. Based on URS' site observations, Fort Jackson's mapping data are reasonably accurate.

Several wetland areas, including Colonels Creek and its tributaries, are located in the eastern portion of the Fort Jackson Site. One surface water feature is an approximate 7-acre beaver pond located along the northern boundary of the Fort Jackson Site. This area is protected under a conservation easement (see Appendix G). The 7 acres under conservation include a 50-foot conservation buffer that surrounds the beaver pond. This buffer can not be disturbed by construction activities.

Most of the wetlands are bottomland hardwood occurring adjacent to stream systems (Colonels Creek and tributaries). The vegetation associated with these wetlands typically extends to the limits of the floodplain. Canopy species consist of black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and sweet gum (*Liquidambar styraciflua*). The sub-canopy is dominated by hardwood saplings, ironwood (*Ostrya virginiana*) and river birch (*Betula nigra*). This community supports a shrub and ground cover dominated by giant cane (*Arundinaria gigantean*), fetterbush (*Leucothoe racemosa*), wax myrtle (*Myrica sp.*), sedges (*Carex sp.*), and rushes (*Juncus sp.*).

4.2.3.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, there would be no impacts to wetlands, as no construction would occur.

Proposed Action Alternatives

The amount of wetland area that would be impacted, if any, at each of the alternative sites by cemetery development cannot be determined without performance of a formal wetland delineation and evaluation of the proposed design for the entire build-out of the cemetery. At the Sedalia Site, the onsite pond and associated wetland comprise approximately 30 acres and WUS comprise approximately 9,000 linear feet. At the Whitmire Site, two beaver dams/associated wetland areas and other wetland areas comprise approximately 57 acres and WUS comprise approximately 7,500 linear feet. At the Fort Jackson Site, the onsite beaver pond comprises 7 acres (it would not be impacted by cemetery development, due to the existing conservation easement), and wetland areas or other surface water features comprise approximately 85 acres.

With the proposed action, a formal wetland delineation of the selected cemetery site utilizing the criteria set forth in the 1987 *USACE Wetland Delineation Manual* would be performed prior to undertaking master planning, in accordance with VA NCA policy. The VA NCA would consult with the USACE for verification of the formal delineation and to discuss appropriate regulatory/permitting requirements. During development planning, every reasonable effort would be made to avoid impacts to jurisdictional WUS. If impacts are unavoidable, they would be minimized to the extent possible. Where impacts to jurisdictional wetlands would occur, the VA NCA would obtain the appropriate permits from the USACE and certifications from SCDHEC, and propose mitigation appropriate to the actual impacts expected to offset unavoidable impacts.

To mitigate erosion and siltation to streams, a stormwater management and sediment and erosion control plan would be implemented at the cemetery development site. The Plan would specify BMPs to prevent construction pollutants and sediment from moving off site and into receiving waters. BMPs would include measures such as silt fencing and sedimentation ponds during construction. Additionally, the project design would incorporate protection for existing riparian forest buffers such as those along Duncan Creek and Colonels Creek, or development of vegetated riparian buffers. In addition, BMPs would include the use of other protection on stream banks and exposed areas to decrease potential erosion and sedimentation from pollutants in stormwater runoff in the future.

4.2.4 Floodplain Management

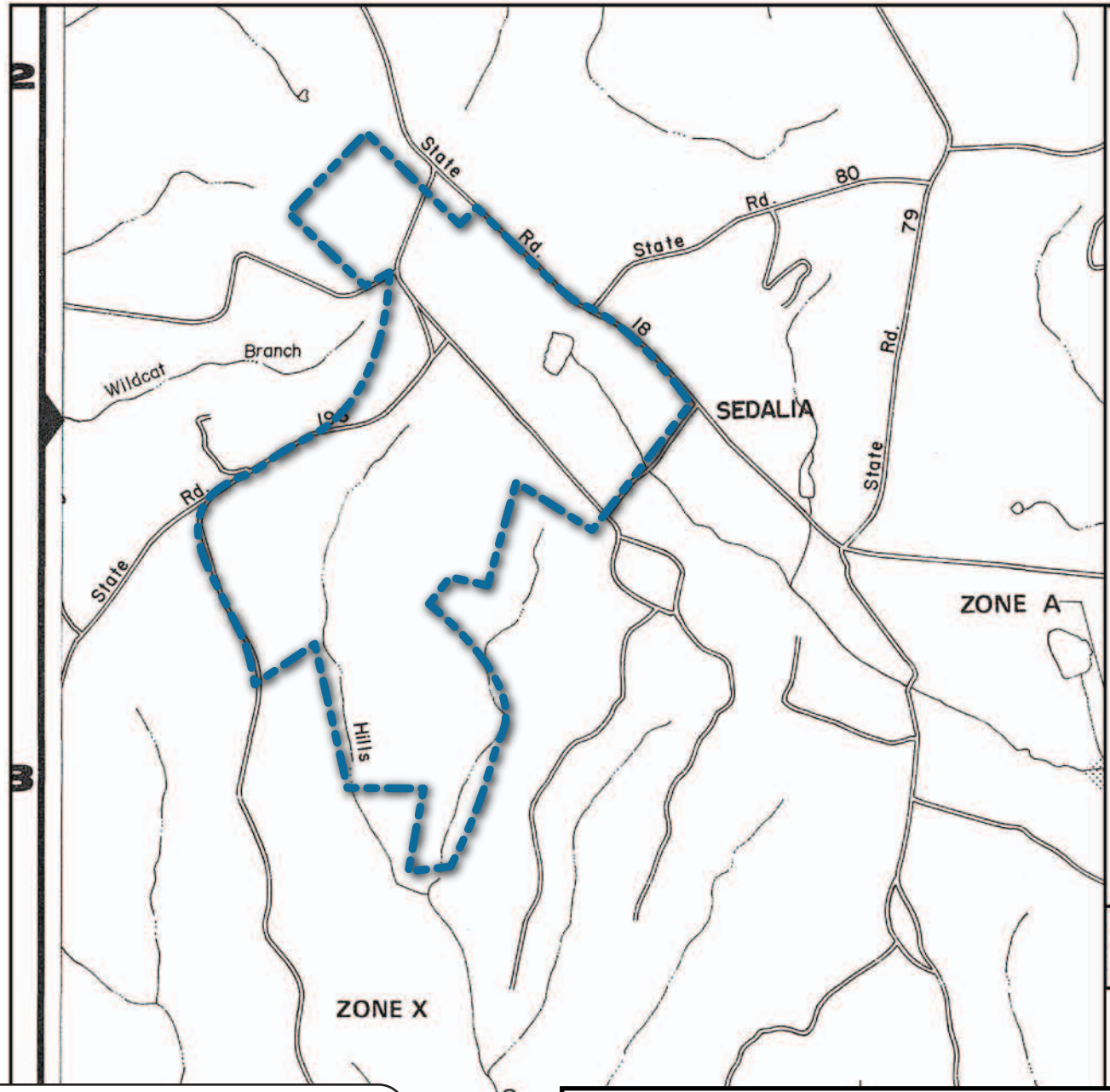
Executive Order (EO) 11988, Floodplain Management, requires federal agencies to take action to avoid development inside floodplains unless there are no practicable alternatives.

4.2.4.1 Affected Environment - Sedalia Site

Per review of the FEMA Flood Insurance Rate Map (FIRM), no FEMA-designated floodplains are present within the Sedalia Site (see Figure 15).

4.2.4.2 Affected Environment - Whitmire Site

Duncan Creek forms the northern boundary of the Whitmire Site and there is a 100-year floodplain designated by FEMA along this stretch of Duncan Creek and its tributaries (see Figure 16).



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

UNION COUNTY,
SOUTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 200 OF 250

COMMUNITY—PANEL NUMBER:
450185 0200 B
EFFECTIVE DATE:
MARCH 18, 1991

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

2000 0 2000
SCALE IN FEET

A - Areas of 100-yr flood
AE - Areas of 100-yr flood
AH - Areas of 100-yr shallow flooding
AO - Areas of 100-yr shallow flooding
X - Areas of 500-yr flood

CLIENT:	Department of Veterans Affairs	TITLE:	Sedalia Site - Floodplain Map
PROJECT:	Proposed Columbia - Greenville National Cemetery		
DATE:	March 2006	PROJECT NO.:	31942450.00000
SCALE:	As Shown	DRAWN BY:	J. Anderson
FILE:	H:\proj\VA Cemetery\Sedalia\Sedalia FIRM.ai	CHKD BY:	A. Yarnell

URS

FIGURE: 15

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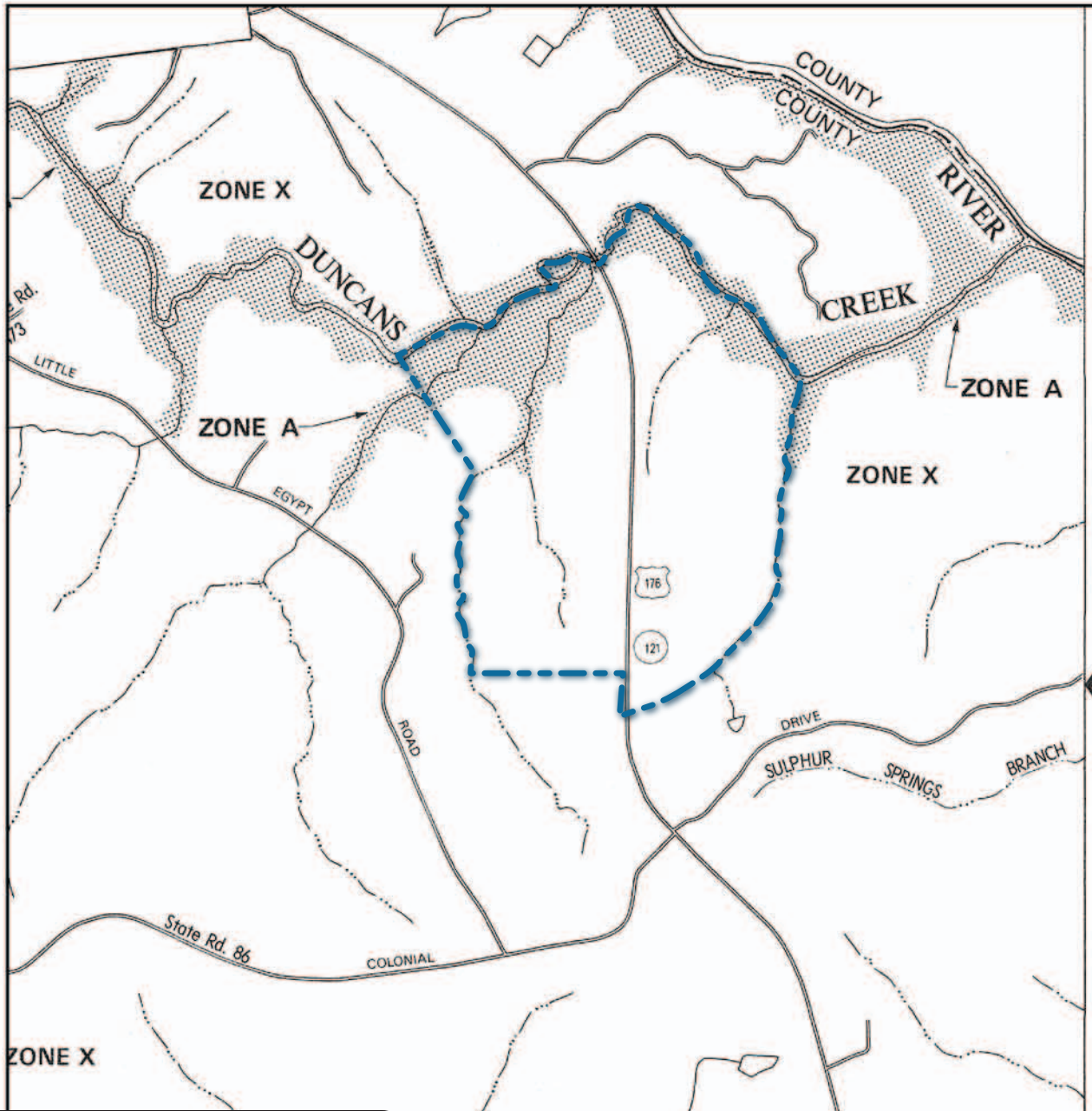


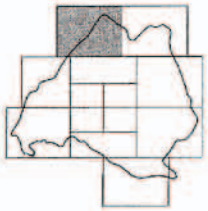
NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

NEWBERRY COUNTY, SOUTH CAROLINA
UNINCORPORATED AREAS

PANEL 25 OF 225

PANEL LOCATION



COMMUNITY—PANEL NUMBER:
450224 0025 B

EFFECTIVE DATE:
DECEMBER 15, 1990

Federal Emergency Management Agency

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2000 0 2000
SCALE IN FEET

A - Areas of 100-yr flood
AE - Areas of 100-yr flood
AH - Areas of 100-yr shallow flooding
AO - Areas of 100-yr shallow flooding
X - Areas of 500-yr flood

CLIENT:	Department of Veterans Affairs	TITLE:	Whitmire Site - Floodplain Map
PROJECT:	Proposed Columbia - Greenville National Cemetery		
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 16
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-53
FILE: H:\proj\VA Cemetery\Whitmere\Whitmere FIRM.ai	CHKD BY: A. Yarnell		

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The floodplain on the site is at its widest point west of US 176/SC 121, which bisects the Whitmire Site. Along the northwestern boundary of the site, the 100-year floodplain on the south side of Duncan Creek and on both sides of the tributaries that flow through the site reaches widths of 800 feet. East of US 176/SC 121, the floodplain on the south side of Duncan Creek in the proposed site is narrower (300 to 500 feet).

The floodplain is approximately 20 percent of the site, or about 87.4 acres. The FEMA FIRM was prepared in 1990 and any increase in impervious surface in the Duncan Creek sub-basin upstream of the site since then could have increased the flood levels of Duncan Creek. Future urbanization in the watershed could also increase flood levels.

Newberry County, through its Flood Damage Prevention Ordinance (Ordinance Number 06-33-03, as amended), administers the Duncan Creek designated floodplain within the Whitmire Site. Any development within the FEMA-designated floodplain requires a development permit and certification requirements (Section 310) from Newberry County.

Historically, the South Carolina Department of Natural Resources (SCDNR) has recorded 12 riverine floods in Newberry County that have resulted in $110,723 worth of flood claims since 1978. Since the project area is undeveloped, the historical flood information available did not reveal whether the area within the project site is frequently flooded.

4.2.4.3 Affected Environment - Fort Jackson Site

Several creeks flow through the Fort Jackson installation and most of them have FEMA-designated floodplains. The eastern half of the Fort Jackson Site contains a fairly significant part of the Colonels Creek FEMA-designated floodplain ("Special Flood Hazard Area" [SFHA]) (Figure 17). The floodplain is relatively narrow (typically around 200 feet wide with the widest point around 600 feet) and roughly follows the shape of the two branches of Colonels Creek until the branches' confluence just west of Spears Creek Church Road. The northern branch is approximately 3,000 feet long from Percival Road until its confluence with the southern branch, which is approximately 3,200 feet from its point of origin until the confluence. After the confluence, Colonels Creek flows another 400 feet until it reaches the site boundary at Spears Creek Church Road. The overall size of the floodplain within the site is approximately 55 acres. The flood zone is an approximate A Zone, also known as "unnumbered A Zones," which indicates that base flood elevations have not been determined, but periodic inundation by flood waters can be expected to occur in this area.

The western boundary of the site is proximate to, but does not include, the Gills Creek FEMA-designated floodplain.

4.2.4.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, there would be no impacts to the 100-year floodplain because no construction would occur.

Proposed Action Alternatives

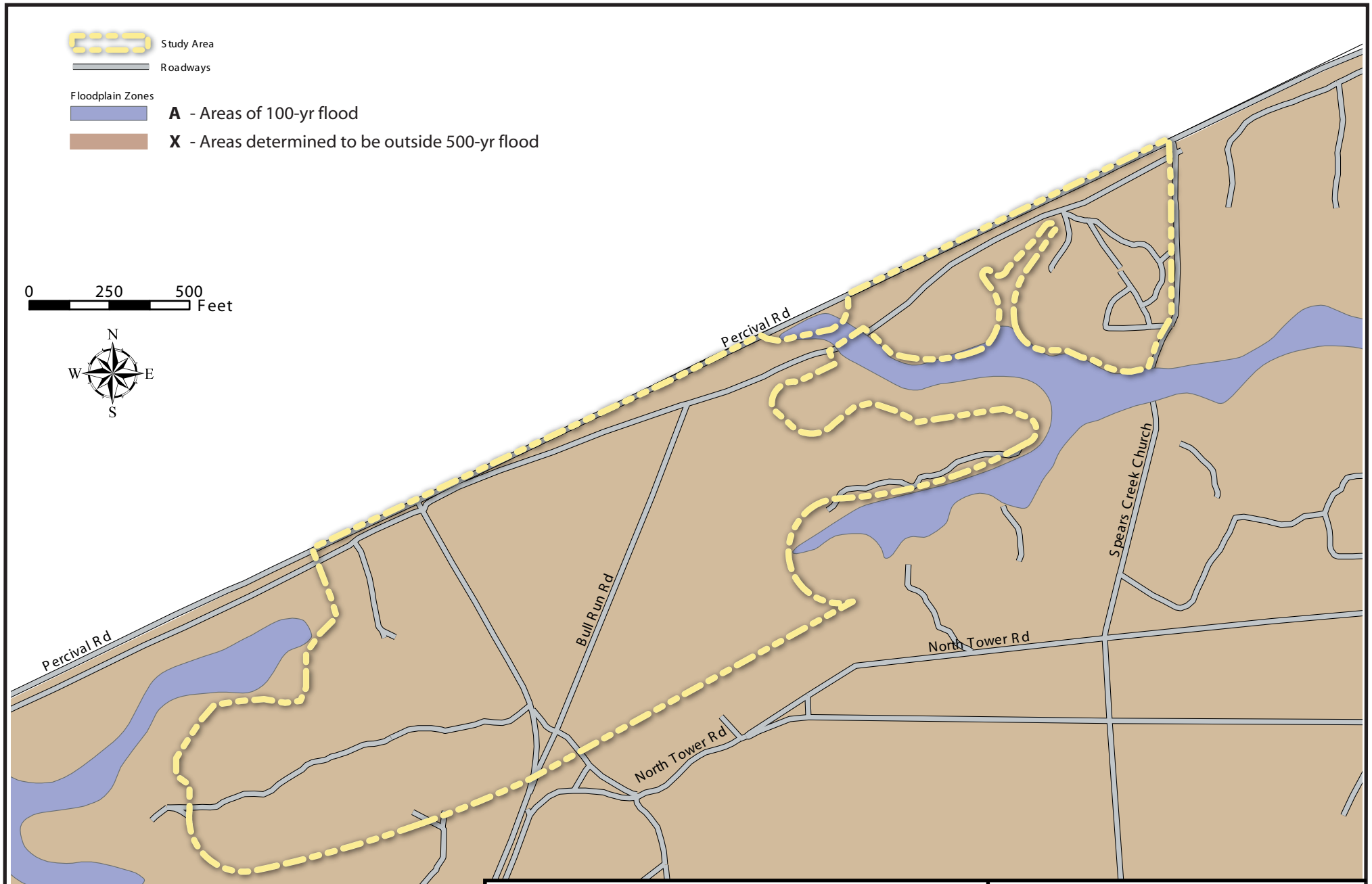
If the Sedalia Site were selected for the new national cemetery, the development of the site for a national cemetery would have no impacts on the 100-year floodplain because a 100-year floodplain is not located onsite or immediately downstream

The portion of the Whitmire Site that lies in the floodplain is relatively small (about 20 percent of the total site acreage). If the Whitmire Site were selected for the new national cemetery, Newberry County requested that the VA NCA enter into an agreement with the County that it would not develop the FEMA-designated floodplain. Based on preliminary master planning discussions, the VA NCA does not plan for any construction or development within the FEMA-designated floodplain at the Whitmire Site, if this site were chosen for the national veterans' cemetery. Provided no development occurs within the floodplain, the property could be developed as needed for a cemetery without negative impacts to the 100-year floodplain. However, if development within the floodplain were needed, it would require a development permit and certification requirements (Section 310) from Newberry County. Also, the VA NCA would perform the necessary assessments and complete a Finding of No Practicable Alternative, if necessary, for development within the floodplain.

Based on preliminary master planning discussions, the VA NCA does not plan for any construction or development within the FEMA-designated area within the Fort Jackson Ste. While it is permissible to build in the SFHA, any construction would have to comply with FEMA regulations, South Carolina policy, and the City of Columbia's floodplain ordinance. Due to the fact that Base Flood Elevations have not been determined in this area, the National Flood Insurance Program (NFIP) requires that every effort be made to use any flood data available in order to achieve a reasonable measure of flood protection. The VA NCA would have to comply with the State of South Carolina and the City of Columbia's floodplain ordinance for any development in the SFHA. Section 4.8.1 of this document presents more information about the City of Columbia's floodplain requirements.

4.3 BIOLOGICAL RESOURCES

This chapter describes the existing biological features of the Sedalia, Whitmire, and Fort Jackson Sites for the proposed Columbia-Greenville Area National Cemetery. This section includes general site observations and a review of the potential Threatened and Endangered (T&E) species that may be found on each of the respective properties. The following discussion is based on a review of available literature and observations made during site visits on April 19-21 and April 27, 2005. Information about federal and state protected species was obtained from the U.S. Fish and Wildlife Service (USFWS) website in April 2005.



CLIENT: Department of Veterans Affairs		TITLE: Fort Jackson Site - Floodplain Map	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 17
SCALE: As Shown	DRAWN BY: J. Butler		PAGE NO.: 4-57
FILE: H:\proj\VA Cemetery\FtJacksonFIRM.ai	CHKD BY: A. Yarnell		

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URS performed an ecological reconnaissance of each site during the site visits in April 2005. The ecological reconnaissance included characterizing the upland and wetland communities, recording the presence of plants and wildlife observed, and an assessment of the potential for the presence of state- and federal-protected species and their habitats. Photographs were also taken depicting site conditions at the time of the reconnaissance.

4.3.1 Vegetation, Fish and Wildlife

Information about biological resources was obtained from general site observations and from available information sources. The purpose of the ecological reconnaissance was to characterize habitats and to evaluate whether sensitive resources might be present. In addition, plant and animal species observed were recorded. Contacts were made with the USFWS and South Carolina Natural Heritage Trust Program. Applicable field guides and taxonomic keys were used to identify plant and animal species observed on the alternative sites.

The development and operation of the proposed cemetery requires that the VA NCA comply with EO 13112, Invasive Species, which requires all federal agencies to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Invasive species under EO 13112 include terrestrial plants and animals, aquatic plants and animals, and microbes. South Carolina has established laws regarding the removal or control of invasive species (South Carolina State Crop Pest Commission. 1976).

The following is a list of the more common exotic (invasive) flora found proximate to the alternative sites, most of which were identified on the site visits. A more comprehensive field search for invasive species would need to be completed once the final site is selected.

- Chinese tallow tree (*Triadica sebifera*)
- autumn olive (*Elaeagnus umbellate)*
- Chinese privet (*Ligustrum sinensis*)
- multiflora rose (*Rosa multiflora*)
- Japanese honeysuckle (*Lonicera japonica*)
- kudzu (*Pueraria lobata*)
- Chinese wisteria (*Wisteria sinensis*)
- Japanese wisteria (*Wisteria floribunda*)
- Japanese stiltgrass (*Microstegium vimineum*)
- common reed (*Phragmites australis*)
- wart-removing herb (*Murdannia keisak*)

EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires federal agencies to support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency activities.

"Migratory bird resources" refers to migratory birds and the habitats upon which they depend. Priority land birds for the Bird Conservation Region (BCR) within which the three alternative sites are located include:

- Red-Cockaded Woodpecker (*Picoides borealis*)
- Bachman's Sparrow (*Aimophila aestivalis*)
- Henslow's Sparrow (*Ammodramus henslowii*)

This BCR is characterized by a patchwork of woodlots, pastures, and urban areas. The three alternative sites are predominantly planted pine plantation.

Since Red-Cockaded Woodpecker (RCW) is listed as a federally endangered species and is discussed in Section 4.3.2. Bachman's Sparrow is primarily found in open pine woods, but utilizes grassy fields as well. A key habitat requirement for breeding and wintering is thick, grassy cover. Henslow's Sparrow primarily breeds in wet meadows and winters in moist, grassy areas within open pine woods. This species also will utilize dry fields.

4.3.1.1 Affected Environment – Sedalia Site

Vegetation. A general characterization of habitats present on the Sedalia Site was conducted during the April 2005 site visit. Two primary vegetative communities exist on the site. The dominant vegetative community is planted pine. The planted pine community occupies approximately 80 percent of the property. Approximately 200 acres of the improved loblolly pines (*Pinus taeda*) were planted 12 years ago. The remaining pines appeared to be planted prior to that time, with the exception of two small areas that were harvested and replanted within the past 10 years due to beetle infestations. The pine plots are actively managed to limit development of shrub and herbaceous vegetation in the understory.

The second most prominent plant community is the hardwood community, which is located within drainages and mainly within the central portion of the property. The dominant trees include oaks (*Quercus sp.*), maples (*Acer sp.*), sweet gum, and dogwoods (*Cornus florida*). Shrubs, vines, and herbaceous vegetation include blueberry bushes (V*accinium sp.)*, muscadine (*Vitis rotundifolia)*, Christmas fern (*Polystichum acrostichoides)*, bluets (*Houstonia caerulea)*, violet woodsorrel (*Oxalis violacea*), jack-in-the-pulpit (*Arisaema triphyllum*), and rattlesnake weed (*Hieracium venosum*).

As stated previously, several invasive species were identified onsite during URS' site visit.

Fish and Wildlife. Few wildlife species were sighted on the Sedalia Site during the site visit in April 2005. The property has water available and appears to be suitable habitat for a variety of wildlife. The only avian species observed were the red-headed woodpecker (*Melanerpes erythrocephalus*) and kingfisher (*Alcedo atthis*). Reptilian species observed included a copperhead snake (*Agkistrodon contortrix*) and several frog and lizard species. Minnows were observed in Hills Creek. Mammalian species sighted were white-tailed deer (*Odocoileus virginianus*) and grey squirrel (*Sciurus caroliniensis*). Wild turkeys (Meleagris gallopavo) are known to inhabit the property. Coyote (*Canis latrans*) or dog tracks were also observed on the

property. The habitat on the Sedalia Site provides foraging opportunity for a range of wildlife species and allows deer hunting.

No birds that are protected under the Migratory Bird Treaty Act were observed on the Sedalia Site during URS' site reconnaissance. Bachman's Sparrow and Henslow's Sparrow occur or have the potential to occur on the Sedalia Site. Habitat at the Sedalia Site is not optimal for either species because of the dense planted pines, lack of grass and shrub cover under the pine canopy, and, in the case of Henslow's Sparrow, dry conditions. Hardwood areas on the site would support other migratory land birds adapted to upland or riparian border habitats, but this habitat is limited in area relative to the pine community.

4.3.1.2 Affected Environment – Whitmire Site

Vegetation. A general reconnaissance of habitats present on the Whitmire Site was conducted during the April 2005 site visit. Two primary vegetative communities exist on the site. The dominant vegetative community is the planted pine community. The planted pine community encompasses approximately 80 percent of the property, which was last logged and replanted approximately 10 to 12 years ago (Daves, 2005). The floodplains located onsite have a thick understory, while the understory within the planted pine community is minimal.

The second most prominent plant community is the hardwood community, which is located within drainages and mainly in the Duncan Creek 100-year floodplain. The dominant species include winged elm (*Ulmus alata*), oak, maple, sweet gum, dogwood, ironwood, river birch, black willow (*Salix nigra*), and sycamore (*Platanus occidentalis*). Representative shrubs, vines and herbaceous vegetation include privet (*Ligustrum sinensis*), wax myrtle, blueberry, muscadine, Virginia creeper (*Parthenocissus quinquefolia*), greenbrier, poison-ivy (*Toxicodendron radicans*), jasmine (*Gelsemium sempervirens*), giant cane, Christmas fern, American holly (*Ilex opaca*), wild strawberry (*Fragaria virginiana*), bluets, and violet woodsorrel.

As stated previously, several invasive species were identified onsite during URS' site visit.

Fish and Wildlife. The Whitmire Site would support the same wildlife as the Sedalia Site, since there is similar habitat and available water supply. Avian species were heard and a red-tailed hawk (*Buteo jamaicensis*) was observed. Reptilian species observed included a copperhead snake and a variety of frogs and lizards. Mammalian species sighted were white-tailed deer and grey squirrel. The habitat on this property provides foraging opportunity for a range of wildlife species and allows for deer hunting.

No birds that are protected under the Migratory Bird Treaty Act were observed on the Whitmire Site during URS' site reconnaissance. The planted pine community at the Whitmire Site does not provide optimum habitat for either Bachman's Sparrow or Henslow's Sparrow. Habitat requirements, as discussed in Section 4.3.1, are better met for the former species than for the latter. Hardwood areas associated with drainages on the site and, more importantly, extensively present on the Duncan Creek floodplain, provide good habitat for those migratory bird species that utilize riparian border habitats.

4.3.1.3 Affected Environment – Fort Jackson Site

Vegetation. The Fort Jackson Site is actively managed for timber by the Installation's forestry department, and the upland portions of site are currently planted in loblolly pine, slash pine (*P. elliottii*), and longleaf pine (*P. palustris*). Other plant species observed within the planted pines include: scrub oak (turkey oak [*Q. laevis]* and blackjack oak [*Q. marilandica]*), and Christmas fern.

A mixed pine-hardwood community is present in the transition area between the upland pine community and the bottomland hardwood community. The transition community consists of loblolly pines, red maple, and sweet gum. Sub-canopy species include pine and hardwood saplings and wax myrtle. The bottomland hardwood communities are located adjacent to streams and typically extend to the limits of the floodplain. Canopy species typically consist of black gum, red maple, and sweet gum. The sub-canopy is dominated by hardwood saplings, ironwood, and river birch. The shrub layer is dense and dominated by giant cane, fetterbush, wax myrtle, sedges, and rushes. This area is frequently inundated, and wetland identifiers are prominent.

As stated previously, several invasive species were identified onsite during URS' site visit.

Fish and Wildlife. Due to the extensive timber management activities at the Fort Jackson Site and training activities occurring onsite, limited wildlife observations were made during URS' site reconnaissances in April 2005 and February 2006. Avian species were heard but not observed. The property is used for hunting and is known to be inhabited by wild turkey and white-tailed deer. Coyote or dog tracks were also observed on the property. The site is also likely used by beavers (*Castor canadensis*), reptiles, and small mammals.

No birds that are protected under the Migratory Bird Treaty Act were observed on the Fort Jackson Site during URS' site reconnaissances. The planted pine habitat at the Fort Jackson Site is not optimal for Bachman's Sparrow and less suitable for Henslow's Sparrow. The area is used for ground training and intensive timber management practices and management for the RCW has limited the ground cover preferred by these species. Dry conditions also make this habitat less favorable for utilization by Henslow's Sparrow. Bachman's Sparrow has been recorded on the Installation and Henslow's Sparrow has the potential to occur, but has not been recorded. Other migratory birds dependent upon upland hardwood or riparian-associated habitats are not expected to be present on the Fort Jackson Site because of lack of habitat diversity on the site.

4.3.1.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Vegetation, and Fish and Wildlife. Under the No Action Alternative, no impacts to existing vegetation or to fish and wildlife would occur because the cemetery would not be constructed.

Migratory Birds. Under the No Action Alternative, migratory birds would not be affected because the existing habitats would not be altered by cemetery development.

Proposed Action Alternatives

Vegetation. All three of the alternative sites have a history of human disturbances and alterations that include timber harvesting and reseeding of pine trees. Construction of the project would require removal of large areas of planted pine communities, regardless of which site were selected for cemetery development. The hardwood communities that occur in the drainages and on the floodplain at the Sedalia, Whitmire, and Fort Jackson Sites would not be extensively impacted by site development since these areas would be avoided as much as possible. The existing native hardwood habitat already is fragmented because adjoining properties have altered the climax native landscape, mainly through timber harvesting. The adjacent landscapes include commercial and light industrial facilities near the Fort Jackson Site, farms including timber farms near the Sedalia and Whitmire Sites, and single-family residential housing near the Sedalia Site.

The VA NCA typically designs a cemetery using natural vegetation buffers between gravesite areas. The absence of natural vegetation would therefore require comparable landscape construction for the development of the proposed cemetery on any of the alternative sites.

Once a final site selection is made, the VA NCA will compile a definitive list of invasive species for that site and conduct further consultation with the SCDHEC regarding mitigation measures for the removal and control of those species as appropriate. Controls would then be incorporated into the final maintenance plans for the cemetery as necessary.

Fish and Wildlife. At all three alternative sites, human disturbances and site alterations would have minor impacts on terrestrial species and the quality of habitat currently present. The species observed and expected to utilize the alternative sites are generalist species that utilize a variety of interspersed/fragmented habitats. The project would result in the permanent loss of moderate-quality wildlife habitat in the form of planted pine communities at all three of the alternative cemetery sites, with minor impacts on higher quality hardwood habitat on the Sedalia and Whitmire Sites. Since the cemetery would be developed in phases, the wildlife would relocate as the phases are developed. The majority of the species that currently use the sites have adapted to living in disturbed and/or suburban areas and co-existing with human activity.

Migratory Birds. At any of the three alternative sites, predominantly planted pine habitat would be altered to a park-like setting by cemetery development. Potential impacts to migratory birds, other than land birds, would not occur. Stand-level effects on a limited number of migratory bird species, if they utilize the alternative site habitats, could occur from development of the cemetery. Only Bachman's Sparrow populations are considered a conservation priority for pine habitat. Potential stand-level effects on this species could occur from development of the cemetery, but these effects would be small and it is unlikely that there would be any measurable adverse effects at larger scales. Adverse edge effects would be increased, but potential adverse effects on migratory land birds would be minimized by staged development (50 acres during the first 10 years of cemetery development). Conversion of the existing planted pine habitat to a park-like setting with native vegetation would increase habitat diversity for those migratory bird species with differing upland habitat requirements. Native vegetation would remain in riparian buffers to preserve this habitat for those migratory bird species that breed in riparian-associated vegetation.

These effects would be small and it is unlikely that there would be any measurable adverse effects at larger scales. This would be confirmed during more detailed survey of the selected site if required; however, the need for further consultation with the USFWS concerning potential adverse impacts is not anticipated.

Potential impact to the RCW is discussed in Section 4.3.2.

4.3.2 Threatened and Endangered Species

The South Carolina Rare, Threatened and Endangered Species Inventory website (SCDNR, 2006) was reviewed for the occurrence of threatened and endangered (T&E) species on or adjacent to the alternative cemetery sites prior to URS' site visits. The South Carolina Natural Heritage Trust Program also was contacted regarding whether T&E occurrences had been reported since the last database update. As of the date of this report no response has been received. The USFWS website (USFWS, 2006) was reviewed and provided the same listing as the South Carolina Rare, Threatened and Endangered Species Inventory website for federally threatened and endangered species for the counties of concern. The USFWS and SCDNR were contacted to obtain the most current records of federal- or state-listed species occurrences and any other relevant information that should be assessed as part of this EA. Responses to these coordination letters are provided in Appendix C.

4.3.2.1 Affected Environment - Sedalia Site

Based on available information and coordination, there are no federal or state T&E species listed for Union County. However, there are 17 occurrences of T&E species within about 5 miles of the site (Appendix C).

4.3.2.2 Affected Environment - Whitmire Site

Based on available information and coordination, there three federal-listed T&E species listed for Newberry County, which are the Bald Eagle (*Haliaeetus leucocephalus*) Carolina heelsplitter (*Lasmigona decorate*), and Wood Stork (*Mycteria Americana*). It is unlikely that a Bald Eagle or Wood Stork would occupy the Whitmire Site, since there is no large water body located near the property, which Bald Eagles and Wood Storks prefer. No Bald Eagles or Wood Storks were observed at the time of URS' April 2005 site visit; although a formal survey was not conducted. Additionally, the Carolina heelsplitter, a mollusk, prefers small to large stream and river habitat, and no known occurrences of the Carolina heelsplitter are identified near the Whitmire site, based on review of the SCDNR database (2006).

Other than the Bald Eagle and Wood Stork, listed as state-endangered, no additional state T&E species are listed for Newberry County. However, there are five occurrences of T&E species within about 5 miles of the site (Appendix C).

4.3.2.3 Affected Environment - Fort Jackson Site

Based on available information and coordination, one federally listed threatened species and six federally listed endangered species are found in Richland County:

Common Name	Scientific Name	Status (federal/state)
Bald Eagle	*Haliaeetus leucocephalus*	T/SE
Red-Cockaded Woodpecker	*Picoides borealis*	E/SE
Shortnose sturgeon	*Acipenser brevirostrum*	E/-
Smooth coneflower	*Echinacea laevigata*	E/SE
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E/SE
Canby's dropwort	*Oxypolis canbyi*	E/SE
Carolina heelsplitter	*Lasmigona decorate*	E/-
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	-/SE
Pine barrens treefrog	*Hyla andersonii*	-/ST

T-Threatened; E-Endangered; SE-state endangered; ST-state threatened

Fort Jackson has surveyed the Fort Jackson Site for suitable habitat for these federally listed species. No populations are known to exist on the Fort Jackson Site.

In addition to these federal species, the state lists Rafinesque's big-eared bat and the pine barrens treefrog as state endangered and state threatened, respectively, in Richland County. Rafinesque's big-eared bat is known to occur on the Installation, but the pine barrens treefrog has not been recorded (Gene Stout and Associates, 2004).

Federal-listed species of concern for Richland County include 13 plants, 5 birds, and 1 species each of amphibian, fish, and reptile. Fort Jackson monitors threatened and endangered species that occur on the Installation. According to the Installation's records, the Smooth coneflower, Rough-leaved loosestrife, and the RCW are present on the Installation. Based on these records, there are no Smooth coneflower or Rough-leaved loosestrife populations located within the boundaries of the Fort Jackson Site. Habitat for the shortnose sturgeon and Carolina heelsplitter do not occur on or near the Fort Jackson Site and none of the other listed species were observed during URS' April 2005 site visit, although formal surveys were not conducted. Additionally, one federally listed candidate species, Georgia aster (*Aster georgianus*), has been recorded for Richland County. None has been found on Fort Jackson. Dr. Bert Pittman, Botanist with the SCDNR, has indicated to Fort Jackson staff that there is no suitable habitat on the Installation for this species (Dutton, 2006).

Excluding the Cantonment Area, the majority of the Fort Jackson land area, including the Fort Jackson Site, is located within current or potential RCW habitat (Fort Jackson, 2001). The RCW constructs roost/nest cavities in old-growth pine trees with a minimum age of approximately 60 to 70 years. RCW foraging habitat includes pine-dominated stands that are at least 30 years of age. The Fort Jackson Site contains a few pine stands that are over 30 years of age and could be used as foraging habitat by the RCW. These pine stands are located mainly on the eastern portion of the site.

The last detailed RCW survey conducted by the Installation at the Fort Jackson Site occurred in 1999, at which time no cavity trees were identified within the boundaries of the site. With concurrence from the USFWS, the Installation ceased yearly inspections after 1999 because no pioneering was occurring and only existing nest cavity trees were being identified in this area of

the Installation. No RCW cavity trees were identified on the Fort Jackson Site during URS' April 2005 or February 2006 site visits, although a formal survey was not conducted. A known active RCW nest cavity tree is located about a half mile to the southeast of the site. Pines of suitable size and age for RCW cavities were identified on the 600-acre site in June 2005. No pines were found containing RCW cavities or cavity starts and no evidence was found that indicated prior or current use of the 600-acre site by RCW. Although there are no active RCW clusters within the Fort Jackson Site, transfer of this property to another entity (such as the VA NCA) for cemetery development would affect the long-term population goals of the Installation's RCW Management Plan.

Section 7 of the Endangered Species Act requires Fort Jackson to carry out a program for the conservation of the RCW. Additionally, federal properties are required to employ all methods and procedures necessary to bring the RCW to the point to which the Endangered Species Act measures are no longer necessary (Fort Jackson, 2001). Based on the Installation's RCW Management Plan, consultation with the USFWS is required each time an activity results in the removal of suitable foraging habitat for active clusters or recruitment clusters. Further, prior to any significant land-disturbing activities in suitable RCW habitat, a survey of the affected area for previously unrecorded cavity trees will generally be required. The existing RCW Management Plan is an agreement between Fort Jackson and the USFWS. Therefore, Fort Jackson is required to consult with the USFWS regarding the effect of a property transfer on the management goals stated in the current RCW Management Plan.

In February 2006, Fort Jackson submitted a Biological Assessment (BA) to the USFWS regarding the potential site transfer to the VA (Appendix H). The purpose of the BA was to provide factual information on the presence or absence of federally listed T&E animal and plant species and their habitat on the 600-acre Fort Jackson Site. It also assessed the anticipated impact to these species from the potential land transfer. The USFWS would use this information in preparation of a Biological Opinion (BO), if needed, for the land transfer from the Army to the VA.

As part of the RCW Management Plan, approximately 501 acres of the 600-acre proposed cemetery site are located in the Standard Density Management Area (SDMA) of the Habitat Management Unit (HMU) for the RCW. At least two RCW recruitment clusters could be supported on the 501 acres by the year 2065. Fort Jackson requested the USFWS reduce the installation RCW population goal by two groups in the SDMA if the land is transferred to the VA.

The BA refers to Fort Jackson's June 2005 survey for RCW cavity trees that found no evidence that indicated prior or current use of this parcel by RCW species (as stated above).

Additionally, none of the other federally listed T&E species for Richland County are known to exist on the proposed cemetery site and no effect to these species is expected as a result of the proposed land transfer. Therefore, the BA's conclusion was that the proposed property transfer action "is not likely to adversely affect" threatened/endangered plant and animal species listed in Richland County.

The USFWS responded to Fort Jackson's BA on March 1, 2006: "The Service has determined that the proposed project is not likely to adversely affect federally listed or proposed, endangered

or threatened species, including the RCW. Therefore, the requirements of Section 7 of the Act have been fulfilled relative to the proposed action, and no further consultation is necessary at this time."

4.3.2.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

No impacts to T&E species would occur under the No Action Alternative because the cemetery would not developed on any of the alternative sites.

Proposed Action Alternatives

Based on a preliminary site assessment, agency coordination, and available information, the Sedalia and Whitmire Sites do not have federal- or state-listed T&E flora or fauna species inhabiting and/or utilizing the sites. The Fort Jackson Site is within the RCW management area for the Installation. The primary species of concern or critical habitat observed and/or listed for each of the sites are indicated below.

Sedalia Site:	No listed species or critical habitats are listed as being present onsite.
Whitmire Site:	No listed species or critical habitats are listed as being present onsite.
Fort Jackson:	Red-Cockaded Woodpecker. No active clusters and limited foraging habitat is present.

Based on this information, adverse impacts to T&E species are not expected to occur at the Sedalia or Whitmire Sites.

At the Fort Jackson Site, no direct adverse impacts to protected species are expected. Planned future habitat for the RCW could be adversely impacted if this site were selected. The impact could occur since the proposed project would eliminate existing pine stands that RCWs could use for foraging, and would preclude implementation of the long-leaf pine reforestation program planned for this area to create future nesting and foraging habitat for the RCW. Regarding the potential selection of the Fort Jackson Site and development by the VA NCA as a new cemetery, the USFWS has responded that the proposed project is not likely to adversely affect federally listed or proposed, endangered or threatened species.

4.4 CULTURAL RESOURCES

A limited cultural resources survey of the three alternative sites was conducted to document the presence of previously identified cultural resources within each site's area of potential effect (APE), to identify and record all previously unknown cultural resources in the APE, and to propose preliminary significance determinations for those resources. The cultural resources task was conducted in compliance with NEPA and Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), which requires the VA NCA to evaluate each site alternative for potential environmental impacts, including those to cultural resources. The preliminary investigations of the three sites for archaeological and historic resources were conducted using

the procedures outlined in 36 CFR 800 for federal agency compliance with Section 106. Other pertinent regulations and statutes pertaining to the protection of cultural resources include the Antiquities Act of 1906; the Historic Sites Act of 1935; the Archaeological and Historic Preservation Act of 1974 (AHPA); the American Indian Religious Freedom Act of 1978 (AIRFA); the Archaeological Resources Protection Act of 1979 (ARPA); and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

Of primary importance for this EA is Section 106 of the NHPA, which dictates that federal agencies or project proponents must assess potential effects to significant cultural resources within lands subject to proposed undertakings when federal lands, funds, and/or permits are involved. The identification of sites eligible for listing in the National Register of Historic Places (NRHP) is a primary component of such work, and the evaluation of archaeological sites to determine NRHP significance is accomplished by applying criteria of eligibility as identified in 36 CFR 60.

4.4.1 Methodology

4.4.1.1 Consultation

To initiate American Indian consultation, the VA NCA contacted 22 American Indian representatives for federally recognized tribes with ties to South Carolina (Appendix C).

The procedure for identifying contacts followed the guidance prepared by the U.S. Army Training Center and Fort Jackson (Gene Stout and Associates, 2004). American Indian tribes with ties to South Carolina that were not listed were identified with the help of the South Carolina State Historic Preservation Office (SHPO). Fort Jackson and the South Carolina SHPO provided contact names and addresses. In June 2005, the VA NCA sent letters to each representative, requesting comments or concerns regarding culturally sensitive areas that might exist within or near the vicinity of the three alternative sites. To date, four responses have been received (Appendix C).

Coordination letters regarding cultural resources were also sent to the South Carolina SHPO, the Historical Society of South Carolina, the Confederation of South Carolina Local Historical Societies, the Archaeological Society of South Carolina, the African-American Heritage Commission – SC, the Daughters of the American Revolution, South Carolina State Society, the First Families of SC 1670-1700 - SC Society, the Sons of Confederate Veterans, South Carolina Division, the Sons of the American Revolution - SC Society, and the United Daughters of the Confederacy- SC Division.

4.4.1.2 Background Research

To initiate the collection of information on existing cultural resources, conditions, and constraints, URS conducted a literature review and records search for the three alternative sites at the South Carolina SHPO, the South Carolina Department of Archives and History, the South Carolina Institute of Archeology and Anthropology (which houses the state archaeological site files), the Union County Library, and the Newberry County Library. URS personnel also examined available aerial photographs dating from the mid- to late-20th century to better

understand the history of land use for each site. This review focused on identifying potentially significant cultural resources known to exist within or adjacent to the project APEs and to estimate the likelihood and nature of unrecorded cultural resources in the APEs. Potentially significant cultural resources are defined as those historic or prehistoric sites that have not been evaluated for eligibility for inclusion in the NRHP or that have been evaluated and found eligible for inclusion in the NRHP. The records search and literature review indicated that several cultural resource investigations have taken place adjacent to the current project alternative sites, resulting in the recording of numerous archaeological sites. The results of the research are summarized below.

4.4.1.3 Field Visits

In April 2005, URS cultural resources professionals meeting the U.S. Secretary of Interior's standards for professional qualifications undertook field visits to the Sedalia and Whitmire Sites. In each case, the site visit was undertaken to:

- field check the status/condition of known or suspected cultural resources identified within the APEs during background research;
- identify cultural resources not previously recorded but readily detectable through visual survey;
- assess the likelihood of encountering additional cultural resources at each site should a more intensive survey methodology be employed later (e.g., systematic shovel testing);
- evaluate the preservation state of known cultural resources; and
- evaluate the potential for intact cultural deposits to be present at each site based on the history of land use and current condition of the land.

The subject properties were surveyed through a combination of visual inspection and shovel testing, with the former being the principal means of investigation. Visual inspection was conducted along roads, ridges, stream courses, and floodplains. Exposed surfaces (e.g., unimproved roads, food plots, etc.) were examined and shovel test pits were excavated where appropriate based on the professional judgment of the investigating principal archaeologist. Shovel tests were excavated typically where land use impacts were minimal and surface visibility was poor.

Historic structures, standing or collapsed, and/or other historic features found within the APEs were further documented with photographs. At a minimum, one front elevation of each represented structure was photographed. A plan view, showing horizontal dimensions, was also prepared. Detailed notes were taken to record construction techniques and materials used. Historic buildings were surveyed and photographed.

No field visit was undertaken for the Fort Jackson Site for the specific purpose of identifying/evaluating cultural resources. The Installation already has a complete cultural resources inventory for the subject property and the course of action for that site--should it be selected for cemetery development --is clear with regard to cultural resources.

4.4.2 Affected Environment

4.4.2.1 Affected Environment - Sedalia Site

Background Research. A review of the South Carolina archaeological site files revealed over 50 recorded sites within a 1-mile radius of the Sedalia Site; however, only five of these known sites lie within the Sedalia Site. These five sites are 38UN19, 38UN20, and 38UN21, consisting of small, low-density lithic (quartz) surface scatters; 38UN143, a surface scatter of 19th/20th century artifacts found in a utility line corridor; and 38UN144, a Woodland/19th and 20th century artifact scatter situated along an old dirt road (see Figure D-1 in Appendix D). While no eligibility determination is provided on the site file form for 38UN19, 38UN20, or 38UN21, the fact that these sites were eroding at the time they were recorded (1977) and that all were reported to have been "100% collected," suggests that they are not eligible for inclusion in the NRHP. Site 38UN143 is listed as not eligible due to the commonness of 19th/20th century artifact scatters in the area, while Site 38UN144 is listed as not eligible due to a lack of integrity caused by previous erosion.

A map of the Sedalia area made of colonial plats surveyed and granted as Royal Grants (pre-Revolutionary War) and state plats surveyed and granted by the State of South Carolina after the American Revolution shows that the land making up the Sedalia Site was held by several owners including William Skelton, Thomas Lehrie, Isaac Pearson, Thomas Roberts, Walter Roberts, Joseph Willbanks, John Nix, Joseph Randett, and William Gist (Union County Historical Foundation, 1976: Map 9). The land historically was used for farming. The current owner purchased five tracts of land comprising the Sedalia Site in the 1960s and utilized it for the cultivation of soybeans, cotton, and corn. The land was also used as a pasture for livestock. Approximately 12 years ago, 189 acres of the site were planted with pines. The owner suggested that there were at one time two homesteads located within the site; however these homesteads were untraceable in map research and no physical evidence remains onsite of these two homesteads, other than clearings near older hardwoods located along the unimproved access roads.

Site Observations. Much of the Sedalia Site has been heavily impacted by past and ongoing silviculture (see Figure 4). Prior to that, the land was used for cotton cultivation. Food plots are also maintained at various locations throughout the study area. Consequently, ridges are heavily eroded and rutted and side slopes are striated with erosional gullies.

Visual inspection of unimproved roads traversing ridge backs revealed occasional and very light scatters of lithic debitage and/or historic material (glass, whiteware); however, shovel tests excavated in the immediate vicinity recovered no artifacts and exposed soil profiles revealed very little or no topsoil. No artifacts were noted on surfaces or found in shovel tests situated in low-lying areas adjacent to streams.

While no formal delineations of the artifact scatters were undertaken, the lack of topsoil noted in shovel test pits and the generally poor condition of the land strongly suggests that any archaeological site found throughout the Sedalia Site would be considered ineligible for inclusion in the NRHP.

The current owner attests to, and the presence of clearings marked by hardwood trees support that, historically within the Sedalia Site two former homesteads existed; however, the site was visually surveyed and there is no physical fabric left of any buildings or associated structures. There were no historic buildings or structures found on the Sedalia Site.

Eleven residential properties adjacent to the Sedalia Site were identified as being more than 50 years old, thus requiring additional investigation if the Sedalia Site were selected as the national veterans' cemetery location. The Palmetto Conservation Foundation (PCF), as a part of a larger Union County historic structure inventory, recently surveyed these properties. The preliminary recommendation by PCF is that none of the 11 properties adjacent to the Sedalia Site property is eligible for NRHP listing; however, the report has not yet been reviewed by the SHPO or published. It is recommended that until PCF's report is accepted by the SHPO, these 11 properties be further investigated to rule out their potential eligibility for NRHP listing. The properties of concern include seven residential properties along Old Buncombe Road and four structures along Prospect Corner Road that are more than 50 years old (see Figure E-1 and the corresponding photographs in Appendix E).

4.4.2.2 Affected Environment - Whitmire Site

Background Research. A review of the South Carolina archaeological site files revealed 16 known sites within a 1-mile radius of the Whitmire Site; however, only 1 of these sites (38NE102) lies within the Whitmire Site boundaries (see Figure D-2 in Appendix D). The site files describe 38NE102 as a surface scatter associated with a demolished house dating to the mid to late 19th century. The site is listed as not eligible due to the fact that it has been destroyed.

Site 38NE102 corresponds with one of two structures shown on the 1941 and 1954 NRCS aerial photographs of the area. Review of historic aerial photographs also indicated another structure about 900 feet northwest of 38NE102 on the west side of US 176/SC 121 (see Figure D-2 in Appendix D). No record of this second structure was found in the South Carolina site files; however, evidence of it was found during URS' April 2005 site visit (see below).

Additional information on the historical uses of the Whitmire Site and adjoining properties was gathered from historical aerial photographs, historical topographic maps, and the radius-search report (EDR, 2005). The land was originally owned by the Levi Casey family and as of 1785 was comprised of 316 acres (Union County Historical Foundation, 1976: Map 3). Levi Casey, a Revolutionary War hero, also served as a representative of the Newberry District in the State legislature. In addition, the Pre- and Post-Revolution Land Grant Atlas (housed at the state archives, as well as the Union and Newberry County libraries) indicates that a Casey Family Cemetery is located somewhere in the vicinity of the Whitmire Site, very possibly within the site itself. Prior to 2004, when the land was transferred to the current owner, various companies (NCSC Forests Investments LLC, Weyerhaeuser Company, and Prutimber) had owned the land and actively logged it. The land was also used for hunting deer and turkey until recently.

Site Observations. The vast majority of the Whitmire Site has been severely impacted by past and ongoing silviculture (see Figure 6). Prior to that, the land was used for cotton cultivation. Until recently, it also had been leased to one or more hunting clubs. Food plots linked by eroded and sometimes washed out dirt roads have been maintained throughout the site. Ridges are badly

eroded and have been greatly disturbed by heavy equipment associated with silviculture and the maintenance of food plots. Side slopes are striated with erosional gullies.

As a result of visual inspection by URS, the two house sites (one of which is 38NE102) shown on the 1941 and 1954 NRCS aerial photographs were located (see Appendix D). Site 38NE102 was found to be situated in a food plot and has been completely destroyed. Very little evidence of it remains. The second house site to the northwest has been reduced to push piles among planted pines. No intact structural elements were found. No shovel test pits were excavated in the vicinity of either house site due to the obvious severity of land use impacts to each. No other potential archaeological sites were located as a result of visual inspection or judgmental shovel testing throughout the study area. No evidence of the Casey Family Cemetery was found; however, it is quite possible that long-term agriculture/silviculture has obscured, redeposited, or destroyed any surface evidence of the cemetery.

The field survey of this property resulted in the identification of one abandoned bridge structure more than 50 years old that is associated with a former roadbed over Duncan Creek (see Figure E-2 and the corresponding photographs in Appendix E). The state of South Carolina is currently engaged in a statewide historic bridge inventory. To date, no formal determinations have been made as a result of this work and the bridge has not been previously assessed for NRHP eligibility as a result of any other investigation. It has been recommended by the SHPO that a survey card be prepared for the identified bridge on the Whitmire Site should the site be selected for the VA cemetery (Appendix C).

4.4.2.3 Affected Environment - Fort Jackson Site

Background Research. Various cultural resource surveys have been conducted within the Fort Jackson Installation. The Fort Jackson Site has been completely surveyed for archaeological resources (Dutton, 2006). As a result of a Phase I survey, eight archaeological sites were found within the Fort Jackson Site boundaries as currently defined. Five of these sites (38RD413, 38RD750, 38RD752, 38RD755, and 38RD756) were determined ineligible for inclusion in the NRHP, while three sites (38RD751, 38RD753, and 38RD754) were listed as potentially eligible. The three potentially eligible sites have since undergone Phase II testing to make a definitive eligibility determination for each.

As a result of the Phase II testing, 38RD751 will be recommended as eligible (presently potentially eligible) for inclusion in the NRHP when the report is completed. This site is a 1.1-acre prehistoric artifact scatter consisting of lithic and ceramic material dating to the transitional Late Archaic-Early Woodland and Mississippian periods. Analysis of findings for the remaining two sites has not been completed; however, indications are that 38RD753 will be considered eligible and 38RD754 might be considered eligible. Site 38RD753 consists of a 1.36-acre lithic and ceramic artifact scatter dating to the Middle Woodland period, while 38RD754 is a 0.58-acre lithic scatter of unknown cultural affiliation.

Fort Jackson has consulted with the appropriate American Indian Nations, and sent each nation copies of the archaeological survey reports that address each of the above-described sites (Dutton, 2006).

Two NRHP-eligible aboveground resources are located on the Installation, but neither is on or adjacent to the Fort Jackson Site (Gene Stout and Associates, 2004).

Background research indicates that prior to becoming a military installation at the beginning of World War I, the land associated with Fort Jackson was originally owned by Wade Hampton III, the grandson of General Wade Hampton I. Wade Hampton III operated a large cotton plantation (Hardy, Heck, Moore & Associates, Inc.: 12). With the damage caused to the Columbia area during the Civil War, along with the blight caused by the boll weevil, the land stopped being used for the production of cotton. The Columbia Chamber of Commerce purchased the land associated with the Hampton estate in 1915 in an effort to persuade the U.S. War Department to locate 1 of its planned 16 new cantonments in Columbia. The War Department selected the site as cantonment number six and phase I of the Installation construction was complete by December 22, 1917 (Ibid: 19 and 35). The parcel identified as the Fort Jackson Site was purchased by the government in 1940; prior to that time the site was rural residential in nature.

The Installation throughout its existence has been used to train and mobilize troops for World War I, World War II, the Korean War, the Vietnam conflict, Desert Storm, and the Iraq War. The Installation has also been used for demobilization and processing soldiers upon return from war. The Installation was ordered closed on two occasions; the first time was after the end of World War I. In 1922, by General Order No. 33, the Installation was ordered closed and the infrastructure demolished (Ibid: 49). Again in April of 1950, the order for the Installation to be closed was made, but outbreak of the Korean War required the Installation be utilized again for mobilization efforts. In March of 1956, the Installation at Fort Jackson was designated a United States Infantry Training Center (Ibid: 101).

Field Observations. As noted above, eight archaeological sites (three potentially eligible and five ineligible sites) have been recorded within the Fort Jackson Site boundaries as currently defined. No historic structures or buildings were identified within the APE or adjacent to it.

Since a thorough inventory of cultural resources already exists for the Fort Jackson Site, no field visit to this site was undertaken by URS cultural resources personnel; however, the absence of standing historic structures within the APE was substantiated by URS in April and May 2005 and February 2006 during field visits addressing other components of this EA. A few training aids, such as a checkpoint on the Installation's boundary road that parallels Percival Road, are present within the APE, but these are not considered historic.

4.4.3 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, there would be no impacts to archaeological or historic structural resources on any of the three alternative sites since development of the cemetery would not occur.

Proposed Action Alternatives

Sedalia Site. At present, the South Carolina archaeological site files show five sites (38UN19, 38UN20, 38UN21, 38UN143, and 38UN144) within the Sedalia Site boundaries. Sites 38UN143 and 38UN144 are listed as ineligible for inclusion in the NRHP and can be eliminated from further consideration under Section 106. No eligibility statement is given for the other three sites; however, other available information strongly suggests they would be considered ineligible as well.

Background research and observations made during the field visit to the Sedalia Site indicate that the likelihood of encountering potentially eligible or eligible archaeological sites within the subject property is remote. Again, it is very unlikely that a more exhaustive survey methodology would do more than identify and delineate a few small, ineligible sites and isolated finds.

The South Carolina SHPO was apprised of these findings and asked for guidance with regard to further action (if any) required under Section 106. If the Sedalia Site is selected, the SHPO recommends additional shovel testing of high probability areas for the purpose of identifying potential archaeological resources. High probability areas should be defined using the predictive model developed for that purpose by the USFS. In addition, Sites 38UN19, 38UN20, and 38UN21 should be revisited in order to make a definitive eligibility statement for each (Appendix C).

Given that there are known archaeological resources within the Sedalia Site, the VA NCA would additionally consult with the American Indian Nations with ties to South Carolina if the Sedalia Site were chosen as the location for the new cemetery. If practicable, an avoidance plan (design components separated from the site(s), fencing, etc.) would be developed and implemented. If avoidance of any known sites or newly discovered sites is not possible, a plan for the proper disposition of those resources would be developed in consultation with the SHPO and the Nations prior to any ground-disturbing activities.

No aboveground historic resources were identified on the Sedalia Site, so none would be affected. There are 11 residential properties 50 years old or older on properties adjacent to the site that have not previously been surveyed or evaluated for NRHP eligibility. Should the Sedalia Site be selected as the preferred location for the new VA cemetery, it would be necessary to survey and investigate each of the properties to assess their eligibility for inclusion in the NRHP. Should any or all of the properties be determined eligible for the NRHP, an assessment of the proposed undertaking's impact on identified historic resources would be required and recommendations for mitigation would be developed should the determination be that the proposed undertaking would have the potential to negatively impact identified historic resources.

Whitmire Site. The South Carolina archaeological site files show only one site (38NE102) within the Whitmire Site; this site is listed as ineligible for inclusion in the NRHP and can be eliminated from further consideration under Section 106. In addition, aerial photographs of the Whitmire Site revealed a structure lying about 900 feet northwest of 38NE102. During a visual survey of the Whitmire Site, this structure was found to have been destroyed, with piles of bricks and other building materials observed among planted pines. Although no formal delineation of the site

was undertaken, its apparent disturbed state suggests that it would not be considered a significant archaeological resource.

Based on background research and observations made during the field visit, the likelihood of encountering potentially eligible or eligible archaeological sites within the Whitmire Site is remote. It is very unlikely that a more exhaustive survey methodology would do more than identify and delineate a few small, ineligible sites and isolated finds. However, the Casey Family Cemetery may be situated somewhere within the Whitmire Site. An upland setting on a level or gently sloping surface would be the most likely topographic association for such a resource. Given that a reasonably thorough visual inspection of all landforms in the Whitmire Site failed to locate the cemetery, and considering the level of impact to the original surface, the best chance for relocating any graves or markers would probably be during land clearing for the VA NCA cemetery should the Whitmire Site be selected.

The South Carolina SHPO was apprised of these findings and asked for guidance with regard to further action (if any) required under Section 106. If the Whitmire Site is selected, the SHPO recommends additional shovel testing of high probability areas for the purpose of identifying potential archaeological resources. High probability areas should be defined using the predictive model developed for that purpose by the USFS. In addition, the SHPO requested that construction managers and personnel be made aware of the possible existence of the Casey Family Cemetery within the Whitmire Site. All ground disturbing activities should stop in the vicinity of any grave markers or depressions identified during the construction process until a determination concerning the presence of human remains can be made by a qualified cultural resources professional. Should the Casey Family Cemetery be found, a plan for avoidance or mitigation of adverse effects should be developed in consultation with the South Carolina SHPO prior to construction activities.

Given that there is one known archaeological resource within the Whitmire Site, the VA NCA would additionally consult with the American Indian Nations with ties to South Carolina if the Whitmire Site were chosen as the location for the new cemetery. If practicable, an avoidance plan (design components separated from the site(s), fencing, etc.) would be developed and implemented. If avoidance of the known site or any newly discovered sites is not possible, a plan for the proper disposition of those resources would be developed in consultation with the SHPO and the Nations prior to any ground-disturbing activities.

In compliance with Section 106 of NHPA, the abandoned bridge on the Whitmire Site would require further survey and investigation to evaluate the structure's eligibility for the NRHP. Should it be determined that the structure is eligible for the NRHP, the proposed undertaking would be assessed in terms of its potential to impact the structure. Mitigation recommendations would be developed should it be determined that the proposed undertaking has the potential to adversely impact a historic resource.

Fort Jackson Site. The Installation has found eight archaeological sites within the Fort Jackson Site boundaries. As previously stated, three of the sites are potentially eligible for inclusion in the NRHP. One of the three sites will be recommended as eligible for inclusion in the NRHP when the Phase II report is completed.

Given that there are eight known archaeological resources within the Fort Jackson Site, the VA NCA would additionally consult with the American Indian Nations with ties to South Carolina if the Fort Jackson Site were chosen as the location for the new cemetery. If the Fort Jackson Site is chosen for the new VA cemetery, the VA NCA preliminarily plans to avoid impacts to all eligible and potentially eligible archaeological sites, and an avoidance plan (design components separated from the site(s), fencing, etc.) would be developed. In addition, the VA NCA plans to avoid all ineligible sites that are deemed worthy of avoidance by the American Indian Nations. If avoidance of known sites is not possible, a plan for the proper disposition of those resources would be developed in consultation with the SHPO and the Nations prior to any ground-disturbing activities.

Since no aboveground historic resources eligible or potentially eligible for the NRHP are located within or adjacent to the APE at the Fort Jackson Site, no further investigation of aboveground historic resources would be required should the Fort Jackson Site be selected for the VA cemetery.

4.5 SOCIOECONOMICS AND RELATED RESOURCES

4.5.1 Noise and Other Aesthetic Concerns

4.5.1.1 Affected Environment - Sedalia Site

The Sedalia Site in Union County is comprised of approximately 477 acres of densely wooded land in rural northwest South Carolina. The site historically was used as a farm. In the 1960s, when the current property owner took possession of the land, it was used for raising cattle and growing soybeans, cotton, and corn. Today most of the site is covered with pine trees planted 12 years ago. The site is also used for hunting. The area surrounding the site is minimally developed with primarily single-family residences or is forestland; some of the forestland is managed by the USFS and clearcutting was occurring during URS' site reconnaissance. The site is accessible from Routes 18 and 196, which are both lightly traveled two-lane rural routes. The majority of observed traffic in the vicinity of the site consisted of automobiles, with the occasional large truck hauling lumber. The traffic patterns on the roadways adjacent to the Sedalia Site do not significantly impact the aesthetics of this pastoral site.

The noise environment at the Sedalia Site is primarily influenced by vehicular traffic on nearby roads and by adjacent residences. Additionally, the Sedalia Site is utilized seasonally for hunting. The only manmade noise generated at the Sedalia Site is from occasional hunting activities and the periodic logging of timber.

The average daily traffic volume along Old Buncombe and Prospect Corner Roads is quite low, based on volume data supplied by South Carolina Department of Transportation. There have

been no complaints from the site area, which would be expected since there is only a small existing population (Inman, 2005).

Union County currently does not have a noise ordinance; however, due to noise complaints generated by an off-road racing track within another part of the County and other concerns, Union County is considering implementation of a noise ordinance (Inman, 2005).

4.5.1.2 Affected Environment - Whitmire Site

The Whitmire Site is located within the Sumter National Forest in Newberry County. The site had previously been owned by paper companies and used for logging, but has not been used for this purpose in the past 10 to 12 years (Daves, 2005). The site is densely forested with streams and creeks running throughout. Some of the adjacent parcels are USFS land that is managed for silviculture.

US 176/SC 121 bisects the site. The highway is heavily trafficked by large trucks transporting goods and timber from the National Forest. The speed limit on US 176/SC 121 is 55 miles per hour (mph). The site is considerably impacted in terms of aesthetics by the constant noise and reverberations caused by the traffic on US 176/SC 121.

Approximately 1 mile north of the Whitmire Site is a manufacturing facility, Renfro. Directly south of the Whitmire Site is primarily single family residential housing. The development in this area has primarily occurred along the US 176/SC 121 corridor, with a few scattered buildings directly east and west of the highway.

The noise environment at the Whitmire Site is primarily influenced by vehicular traffic on nearby roads and adjacent residences, as well as the periodic logging of timber on adjacent properties. Currently, the Whitmire Site is impacted by the vehicular noise generated from the traffic volume and high percentage of trucks on US 176/SC 121.

Other noise generators include an aircraft flight line over the eastern portion of the Whitmire Site and the seasonal use of the site and surrounding properties for hunting. No aircraft noise was heard during the URS site visits and the site has been closed to hunting since late 2004 (Daves, 2005).

The Newberry County Noise Ordinance as listed in the Newberry County Zoning Code (No. 12-224-01) allows construction activities between the hours of 7 Ante Meridiem (A.M.) and 10 Post Meridiem (P.M.). This Ordinance does not apply to “sounds emanated from governmental activities,” tree harvesting, land clearing, or yard and lawn maintenance (Newberry County, 2005).

4.5.1.3 Affected Environment - Fort Jackson Site

The Fort Jackson Site is comprised of 600 acres of undeveloped, gently rolling wooded land that is used for Army field training exercises. Wetlands and ponds are present in the eastern portion of the site. It is bounded to the north by Percival Road, which is currently undergoing development, primarily residential in nature to the west and commercial and light industrial to

the north of the site. Grounds used for field training exercises within the Installation surround the rest of the Fort Jackson Site, which if not relocated would somewhat impact the setting of the proposed cemetery. The area, although not far from Columbia, is rural in character.

The noise environment at the Fort Jackson site is primarily influenced by vehicular traffic on nearby roads and activities on adjacent properties within the Installation. The volume of vehicular traffic along Percival Road is 8,420 vehicles west of Clemson Road and 5,175 vehicles east of Clemson Road (Traffic Data Collection, 2005). Currently, little to no noise is generated on the Fort Jackson Site except during military training exercises. During URS' site visits, noise (small arms fire) from nearby training areas was audible throughout the Fort Jackson Site.

Based on a study of noise generators and noise impacts conducted at Fort Jackson in 1995 by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), the primary noise generators at the Installation at that time were small arms, demolition, and artillery.

The 1995 study also mapped the noise contours on the Installation. Zone III was defined as the area where the day-night sound level (DNSL) is greater than 75 decibels, A-weighted, and is considered an area of severe noise exposure which is unacceptable for noise-sensitive activities. Zone II was defined as the area where the DNSL is between 65 and 75 decibels, A-weighted, which is considered to have a significant noise exposure and is, therefore, "normally unacceptable" for noise-sensitive land uses.

All Noise Zone III areas generated by the small arms range, demolition, and artillery fire are contained within the Installation. Areas primarily affected by this level of noise include the small arms ranges adjacent to Dixie Road and Hartsville Guard Road, Training Area 7A, the South Impact Area, the 1LT Joe V. Abernathy and LTC Terry D. Allen Jr. ranges, and SCARNG artillery firing points. Zone II boundaries generated by range operations extend over training areas adjacent to firing ranges and impact areas. No Zone II noise contours extend beyond the boundaries of the Installation. Fort Jackson has established sound buffer areas adjacent to portions of the Installation perimeter to mitigate any potential for disturbance of noise-sensitive uses located off-post. These zones, which are approximately 2,950 feet wide, are adjacent to Leesburg Road and Highway 601, along the southern and eastern borders of the Installation, respectively (Gene Stout and Associates, 2004).

Although the Fort Jackson Site is located outside of the Noise Zone III areas, small arms fire is audible throughout the site. Also, on wet rainy or damp days, the noise from hand grenades being used in training exercises reportedly can be heard within an approximate 8-mile radius.

Should the VA NCA select the Fort Jackson Site for cemetery development, the Army would establish a 1,640-foot (500-meter) noise buffer surrounding the property, per Fort Jackson policy. The buffer would lessen the tendency of noise generated through training exercises adversely affecting receptors on the Fort Jackson Site.

Richland County Noise Ordinances as listed in the Richland County Code (No. 1947-90, § I, 1-16-90; No. 2083-91, § I, 4-16-91; and No. 2280-92HR, §§ I, II, 12-15-92) restrict noise volumes within any residential zone of the unincorporated areas of the County to use or operate any machine or device "for the producing or reproducing of sound, or to create, assist in creating,

permit, continue, or permit the continuance of any noise, including vehicular noise, in excess of 62 decibels between the hours of 7:00 A.M. and 10:00 P.M. of one day and in excess of 55 decibels between the hours of 10:00 P.M. of one day and 7:00 A.M. of the following day, or in a manner which is deemed to be excessive by the county sheriff's department." This Ordinance does not apply to industrial, commercial, or manufacturing noise; noise on construction sites; or noise generated from the lawful operation of farm equipment (Richland County, 2005).

4.5.1.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, noise levels and landscapes at the three alternative sites would not be altered and adverse impacts would not occur.

Proposed Action Alternative

Under the Proposed Action Alternative, the development of any of the alternative sites as a national cemetery would introduce new roadways, buildings, and gravesites on the selected site, ultimately altering the rural landscape and aesthetics of the site. However, national cemeteries are required to maintain a park-like setting so that the cemetery grounds are visually pleasing to visitors and families of veterans. The VA NCA typically designs a cemetery with separate gravesite sections as small as 1.5 to 2.5 acres by preserving native vegetation and adding landscape plantings (Wells, 2000).

Cemetery landscaping would be used to buffer the cemetery from noises generated on the surrounding properties. The same landscaping would also buffer the adjacent properties from any noise generated at the cemetery. Gunfire from hunters on adjacent and nearby lands would be a negative, although intermittent, noise impact on mourners and visitors to a cemetery on either the Sedalia or Whitmire Sites. The high volume of traffic noise generated along US 176/SC 121 at the Whitmire Site could continue to be a source of constant noise even with landscaping buffers in place. Overall, US 176/SC 121 would have a moderate negative effect on noise levels on the proposed national cemetery alternative at the Whitmire Site into the foreseeable future. Small arms fire from military training exercises near the Fort Jackson Site could continue to be a source of intermittent noise, even with the cemetery's landscaping buffers in place. The 1,640-foot (500-meter) noise buffer that Fort Jackson would impose around the cemetery to separate it from noise-generating training activities would also diminish, although presumably not eliminate, this noise and would negatively impact sensitive receptors (mourners and other visitors) at the cemetery. In other parts of the Installation, Fort Jackson has established 2,950-foot wide sound buffer area to mitigate any potential for disturbance of noise-sensitive uses located off-post. Additional measures beyond those currently proposed for the Fort Jackson Site may need to be implemented to lessen these noise impacts on cemetery visitors.

Sensitive receptors such as residences in the vicinity of the alternative site locations would experience temporary increases in noise levels during cemetery construction. Sources of construction noise would include earthmoving equipment, trucks, utility vehicles, and paving equipment. Construction activities would occur during the time periods allowable under local noise ordinances.

After the construction phase has been completed, everyday noise levels could increase in the area as a result of routine cemetery operations. Gardening and general upkeep of cemetery grounds requires the use of leaf blowers, weed eaters, and lawn mowers, potentially generating the loudest noises of all. Grounds maintenance typically occurs between 9 A.M. and 3 P.M. Typical noise generators aside from general grounds maintenance are small dump trucks, small tractors with blowers, backhoes, and vehicles such as sedans and vans. Since national cemeteries normally operate between 8 A.M. and 4:30 P.M. during the week, and on rare occasion, during a weekend, noise impacts are likely to be minor (Wells, 2000; Williams, 2001).

Funeral services for veterans often include a performance of Taps either by compact disk player, bugle, or carillon, or a gun salute with rifles. The duration of Taps is about 10 to 15 seconds, and gun salutes generally last less than 10 seconds. All national cemeteries are converting to the installation of a digital sound system that plays Taps and would be located in the areas where funerals are conducted. This would limit any sound to within 60 feet of the source (Wells, 2000; Williams, 2001).

As many as 356 vehicles would visit the proposed cemetery daily, driven either by employees or visitors, for a funeral, or for deliveries. This increase in vehicular traffic would have a corresponding increase in noise levels, but it is assumed that most of the vehicles would be properly maintained and would emit a minimal amount of noise. It is not anticipated that noise generated by employees, visitors, funerals, and deliveries would impact the surrounding area.

Overall, with the construction of a new national cemetery at the Sedalia Site, noise and aesthetic impacts to those resource areas would be minimal. Traffic noise from US 176/SC 121 would be a negative, although intermittent, impact to a national cemetery at the Whitmire Site. Noise from small arms fire would be a high negative impact to a national cemetery at the Fort Jackson Site.

4.5.2 Air Quality

The Air Quality Index (AQI) is the national standard for reporting air pollution levels to the general public. An index such as the AQI is necessary because there are several air pollutants, each with different typical ambient concentrations and each with different potential levels of harm. The AQI uses a single number and a term to describe the air quality. Ambient air quality is measured for both primary (health) and secondary (welfare) standards. The national primary standards establish the level of air quality necessary to protect the public from any known or anticipated adverse effects of a pollutant with an adequate margin of safety to protect sensitive members of the population.

The AQI is based on the Federal Episode Criteria, the short-term Federal National Ambient Air Quality Standards (NAAQS) per requirements in the Clean Air Act (CAA) of 1990, as amended, and the Federal Significant Harm levels for five of the "criteria pollutants," namely:

- ozone (O_3)
- sulfur dioxide (SO_2)
- carbon monoxide (CO)
- particulate matter less than 10 microns (PM_{10})

- nitrogen dioxide (NO_2)

The AQI is computed from data collected by pollution monitors in an area, and the Pollutant Sub-Index (PSI) for each pollutant is computed using formulas derived from standard index/concentration relations. The data used are:

- O_3 - the highest 1-hour average so far for that calendar day
- SO_2 - the highest 1-hour average so far for that calendar day
- CO - the highest 8-hour average for the 16 preceding 8-hour periods
- PM_{10} - the most recent 24-hour average
- NO_2 - the highest 1-hour average so far for that calendar day (if above 600 parts per billion [ppb])

Secondary standards establish the level of air quality necessary to protect public welfare by preventing damage to crops and livestock, deterioration of materials and property, and adverse impacts to the environment, including prevention of reduction in visibility.

The CAA requires that air quality in every state meet health based NAAQS. Using data from each state's ozone monitoring network and recommendations from the respective states, the USEPA determines if geographic areas of the state are in attainment (meet the standard) or non-attainment (exceed the standard). States with areas that are non-attainment are required to revise their State Implementation Plan (SIP) with necessary control measures to ensure that the standards are attained and maintained by a specified date.

Prescribed fires may contribute to changes in air quality. Air quality of a regional scale is affected only when many acres are burned on the same day. Local problems are more frequent and occasionally acute due to the large quantities of smoke that can be produced in a given area during a short period of time. Smoke from prescribed burns consists of ash particulate, partly consumed fuel, and liquid droplets. Typically, prescribed fires produce insignificant amounts of CO, CO_2, hydrocarbons, and nitrogen oxides. Particulates resulting from prescribed burns represent a concern as due to reduction in visibility. The amount of particulate generated into the air depends on amount and type of fuel consumed, fuel moisture content, and rate of fire spread as determined by timing and type of firing technique used. Rate of smoke dispersal depends mainly on atmospheric stability and wind speed (USFS, 1989).

4.5.2.1 Affected Environment - Sedalia Site

The Sedalia Site is located within Union County, which is designated as in attainment for all criteria pollutants. Since the Sedalia Site is within the area listed as in attainment for all criteria pollutants, CAA conformity requirements are not applicable to this site.

Air quality and odors at the Sedalia Site are primarily affected by and related to vehicular traffic (automobile vehicle exhaust emissions) on the surrounding roadways (Old Buncombe Road and Prospect Corner Road). Manmade air emissions and odors are negligible at the Sedalia Site, as the property is located in a rural area.

Occasional prescribed burns, conducted by the USFS, occur mainly on adjacent and nearby USFS land. The USFS-prescribed fire program for the Francis Marion and Sumter National Forests burns 40,000 to 50,000 acres per year for fuel reduction, wildlife habitat restoration, site preparation, fire-dependent ecosystem restoration and maintenance, vegetation management and control, and forest health (or disease control) (USFS, 2004). The Sumter National Forest fire season is February 15 to May 15 (USFS, 2005).

According to USFS guidelines, forest management activities will be implemented using best available smoke management technology, so that all prescribed fire activities do not violate the following:

- South Carolina Smoke Management Guidelines for Forestry Prescribed Burning Operations;
- CAA Amendments of 1977;
- SIP for any prescribed fire within USEPA-designated nonattainment and maintenance areas; and
- NAAQS.

The South Carolina Smoke Management Guide, which is in compliance with the CAA, and burning notification process must be followed for all prescribed burns (SCFC, 2005).

According to a representative of the USFS, Sumter National Forest, there is a low potential that the Sedalia Site would be impacted by prescribed burns on adjacent and nearby USFS lands. Potential impacts would occur one to two times per year, at a maximum. However, impacts from prescribed burns are “relatively unpredictable” (Rosemeyer, 2005).

4.5.2.2 Affected Environment - Whitmire Site

The Whitmire Site and Newberry County are designated as in attainment for all criteria pollutants and CAA conformity requirements are not applicable.

Air quality and odors at the Whitmire Site are primarily affected by and related to automobile vehicle exhaust emissions from the surrounding roadways (US 176/SC 121, Little Egypt Road, and Sulfur Springs Road. Air emissions and odors are minimal, to at times moderate, along the roadways, and non-existent at the interior of the property, as the Whitmire Site is located in a rural area.

Occasional prescribed burns would occur on adjacent and nearby USFS land at the Whitmire Site. According to a representative of the USFS, potential impacts to the Whitmire Site are anticipated to be moderate. (Rosemeyer, 2005)

4.5.2.3 Affected Environment - Fort Jackson Site

The Fort Jackson Site is located in Richland County, which is designated as in attainment for criteria pollutants CO, PM_{10}, NO_2, Pb, and SO_2. Although not in attainment for O_3, Richland County is not designated as a non-attainment area for O_3, as the effective date of noncompliance has been deferred through the development and implementation of the Early Action Compact

(EAC). By signing the EAC, USEPA agreed to defer the effective date of the non-attainment designation for participating areas. However, areas participating in the EAC that do not meet all of the terms of the EAC, including established milestones, would forfeit participation and would be designated according to requirements within USEPA's 8-hour ozone implementation rule; i.e., Transportation Conformity and non-attainment New Source Review. USEPA has provided an option for areas currently meeting the 1-hour ozone standard, like Richland County, South Carolina, to attain the 8-hour ozone standard by December 31, 2007, and obtain cleaner air sooner than federally mandated. This option requires an expeditious time line for achieving emissions reductions sooner than expected under the 8-hour ozone implementation rulemaking, while providing "fail-safe" provisions for the area to revert to the traditional SIP process if specific milestones are not met.

According to the Director of SCDHEC Air Quality Division, the standards instituted under the EAC have resulted in the improvement of air quality sooner than is required under the CAA. The Director also indicated that it is likely the EAC for Richland County will continue, as will the deferment of the non-attainment designation. Since the Fort Jackson Site is within the area listed as non-attainment for O_3, EAC requirements are applicable to the project. According to the SCDHEC, there are no additional requirements for the EAC beyond the State regulations; however, some of the regulations are more restrictive under the EAC than in attainment areas. Specifically, small boilers are subject to air permitting and open-air burning is limited or banned. (SCDHEC, 2005)

Air quality and odors at the Fort Jackson Site are primarily affected by automobile vehicle exhaust emissions generated by vehicles on the adjacent roadways including Percival Road, prescribed burning (seasonal), and to a limited extent, air traffic at the Installation. Manmade air emissions and odors at the Fort Jackson Site are generally non-existent, as it is located in undeveloped portions of the Installation. However, some of the training exercises that occur on the site, within Training Area 11A, include use of smoke and tear gas an average of 2 weeks per month. The effects of tear gas from the canisters used in the training operations can be noticed within a 66-foot (20-meter) radius, with the tear gas dissipating within a maximum 328-foot (100-meter) radius. Windy conditions dissipate the tear gas faster than in calm weather conditions.

The Columbia area near the Fort Jackson Site, especially along the Interstate (I)-77 corridor, is currently undergoing substantial development. This development is primarily residential, retail, and mixed-use. Also within the area of the Fort Jackson Site, there is potential for development of mixed office and retail centers in the northeast Columbia area.

4.5.2.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, no significant impacts to air quality would occur within the area of the Sedalia and Whitmire Sites, as the sites would remain undeveloped. Within the vicinity of the Sedalia Site, there is limited potential for development of surrounding areas. Although development is occurring and planned within Newberry County, a majority of the

development is located in the immediate vicinity of downtown Newberry and Whitmire. The Whitmire Site area is rural in nature with little development planned.

Due to the development in the Fort Jackson Site area, a gradual increase in traffic would occur and add to the amount of vehicle emissions in the area; however, it is not anticipated that significant impacts would result under the No Action Alternative in the near future.

Proposed Action Alternatives

Under the Proposed Action Alternative, the construction of the VA NCA national cemetery would potentially create an average of 356 daily vehicle trips to the cemetery, thereby increasing the amount of vehicle emissions in the area of the proposed cemetery site. The operation of heavy equipment would have minor, temporary negative impacts on air quality during the construction phase. These impacts would be primarily in the form of increased exhaust pollutants, which are concerns because they contribute the pollutants (i.e., nitrogen oxide and reactive organic gases) that combine under certain atmospheric conditions to create ground-level O_3. Exhaust pollutants can be minimized by good vehicle maintenance. Windblown dust, soil, and sand could also occur during the construction phase as a result of equipment movement over exposed soil and sandy areas. Fugitive dust could be greatly minimized by appropriate dust-control measures such as wetting the surfaces and by re-vegetating disturbed areas as soon as possible. No significant impacts would result from implementation of the proposed action alternative at the Sedalia and Whitmire Site locations.

Since the Fort Jackson Site is in an area subject to the EAC, EAC requirements are applicable to the project. Additionally, SCDHEC and the Richland County EAC Coordinator have requested that the VA NCA consult with these agencies in the event the Fort Jackson Site is selected. Proposed development activities and the operation of the cemetery at the Fort Jackson Site are not expected to produce objectionable odors affecting ambient air quality.

To minimize the potential for Army training exercises to adversely impact air quality at the Fort Jackson Site, the Army plans to establish a 3,280-foot (1,000-meter) buffer zone for smoke and tear gas along the boundary of the site and surrounding training areas. Use of tear gas is not expected to adversely affect cemetery workers or visitors at this site, due to the proposed buffer and the dissipating effects of tear gas as discussed above.

4.5.3 Community Services

Each of the three alternative sites' counties provides numerous community services. Each has a veteran's services office that provides support to veterans and their families. Some of the other community services, particularly those that relate to the proposed action, are described in this section.

4.5.3.1 Affected Environment – Sedalia Site

The Sedalia Site is located in Union County, South Carolina, which has a Council/Supervisor form of government and is governed by a six-member Council. A County Supervisor appointed

by the Board of Supervisors runs the day-to-day business of the County (Union County Website, 2005).

The Union County Sheriff's Department provides police service to the Sedalia Site area. The Sheriff's department also provides funeral escort services for the County and would provide such services to the Sedalia Site if it were chosen for the new national cemetery. Fort Jackson also provides military honors for veterans' funerals in a three-state area, which includes the Sedalia Site.

The Cross Keys Fire District, comprised of approximately 50 to 75 volunteer firefighters, services the Sedalia Site area (Fore, 2005). It is located on SC 49 between Union and Cross Anchor (see Figure 2).

The closest hospital is the Wallace Thompson Hospital located approximately 12 miles from the Sedalia Site in the City of Union. This hospital also provides emergency medical service (EMS) for paramedic and ambulance service (Fore, 2005).

The Sedalia Site is located in the Union County School District (Fore, 2005).

The nearest city to the Sedalia Site is Union, which boasts several commercial establishments. Several tourist attractions are located within the City of Union and Union County, including Rose Hill State Park and Sumter National Forest.

4.5.3.2 Affected Environment – Whitmire Site

The Whitmire Site is located in Newberry County, South Carolina. It is governed under a Council/Administrator format and is governed by the Newberry County Council, a five-member Council and a Chairman who is elected at large (Newberry County Executive Summary, 2004). A County Administrator, appointed by the Newberry County Council, is responsible for executing the policies, directives and legislative actions of County Council; directing and coordinating activities of Newberry County Government; supervising the spending of county funds as directed by Council, or in accordance with the approved county budget; preparing reports for Council on finances and administrative activities; informing Council of anticipated revenues that are necessary to meet the financial requirements of the county; responding to requests for information or assistance from the public; preparing and presenting annual budget requests to Council for approval; overseeing capital projects; participating in economic recruitment activities; and working with Newberry County elected officials in reaching common goals (Newberry County Website, 2005).

The Newberry County Sheriff is the Chief of Law Enforcement and is responsible for coordinating the law enforcement activities throughout the County (Newberry County, 1998). Currently, the County Sheriff's Department, with 28 sworn deputies, has police jurisdiction over the Whitmire Site (Carroll, 2005; Newberry County, 1998). According to the *1998 Newberry County Comprehensive Plan*, the Whitmire Police Department has 5 full-time officers, and the Newberry County Sheriff's Department has 28 full-time police officers. The Newberry County Sheriff's Department provides funeral escort services for the County (Dunnaway, 2005). Fort

Jackson also provides military honors for veterans' funerals in a three-state area, which includes the Whitmire Site.

The Chairman of the Newberry County Board of Rural Fire Control is designated as Chief of the County Fire Service and he is responsible for coordinating the fire-fighting activities of all forces when they are requested for support. The Whitmire Volunteer Fire Department services the Whitmire Site area. The closest Fire House is located on Gilliam Street in downtown Whitmire, approximately 1.5 miles from the Whitmire Site.

The closest hospitals to the Whitmire Site are the Newberry County Memorial Hospital in the City of Newberry, and the Wallace Thompson Hospital in the City of Union (Newberry County, 1998). The Newberry County EMS operated by the County Memorial Hospital and the Rescue Squad provide EMS and ambulance service to the area.

Whitmire Elementary and Whitmire High Schools, located in the town of Whitmire are the two public schools near the Whitmire Site (Newberry County, 1998).

The nearest city is Newberry, which boasts several commercial establishments. Several tourist attractions are located in Newberry and Newberry County, including the Newberry Opera House, Lake Murray, and Sumter National Forest.

4.5.3.3 Affected Environment – Fort Jackson Site

The Fort Jackson Site is located in Richland County just outside of Columbia, South Carolina. The elected 11-member Richland County Council oversees the operations of the Richland County government (Richland County Website, 2005).

The Richland County Sheriff's Department's Districts 2 and 6 have jurisdiction over the area adjacent to the Fort Jackson Site (the site sits on the district line). Approximately 50 officers serve these two districts (Richland County Sheriff's Office, 2005). The City of Columbia Police Department and/or the Richland County Sheriff's Department provide polices and funeral escort services. Both provide two off-duty officers for funeral services upon request by the funeral homes. Fort Jackson also provides military honors for veterans' funerals in a three-state area, which includes the Fort Jackson Site.

The Columbia Fire Department's Battalion 3 serves the area near the Fort Jackson Site with six fire stations and approximately 20 full-time and 60 volunteer firefighters. The closest station to the site is Sand Hill, approximately 3 miles away (Maples, 2005).

The nearest general hospital to the Fort Jackson Site is Providence Hospital Northeast, approximately 8 miles away (Richland County Website, 2005).

The Fort Jackson Site is located within the Richland County School District 2 (Richland County School System, 2005).

The Fort Jackson Site is managed and the onsite activities are controlled by the DoD as part of the Fort Jackson Installation. Security, fire, and all other required services are currently provided by the DoD.

The city of Columbia boasts several commercial establishments, restaurants and hotels/motels. In addition, Fort Jackson provides many additional amenities to active-duty and retired military personnel and their families. This includes use of its facilities such as the exchange, recreation centers, two golf courses, banking services, and eating establishments. Additional amenities include the following: hospital, U.S. Post Office, library, lodging facilities, youth services, religious support, Red Cross, commissary, shoppettes, fitness centers, bowling center, Weston Lake Recreational Area, Twin Lakes Family Recreation Center with recreational trails, Heise Pond Hunting and Fishing Center, swimming pools, water park, and autocraft shop.

4.5.3.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, impacts to community services would not occur because the cemetery would not be developed.

Proposed Action Alternatives

Under the Proposed Action Alternative for the Sedalia, Whitmire, and Fort Jackson Sites, fire, police, and EMS service would not be adversely affected, and additional fire, police, or EMS service would not be required. School systems would not be directly affected.

The Union County Sheriff's Department would provide funeral escort services to the Sedalia Site if this site were chosen for the new cemetery. If more officers were needed in addition to those on duty, or if off-duty officers needed to be hired to meet demand, the particular funeral service company and the Sheriff's Department would coordinate (Gregory, 2005).

Currently, the Newberry County Sheriff's Department has jurisdiction over the Whitmire Site. The VA may enter into an agreement with the Whitmire Police Department to provide police service to the Whitmire Site if it were selected for the new cemetery (Carroll, 2005). The Newberry County Sheriff's Department would be able to provide escort services to the Whitmire Site.

If the VA NCA selected the Fort Jackson Site for the new cemetery, the site would fall under the jurisdiction of the local police and fire departments, whereas Fort Jackson currently provides these services to the site as needed. It would not be necessary to hire additional police personnel for funeral services, according to a representative of the local police department.

Veterans and their families visiting the new cemetery, regardless of where it was located, could partake in the many amenities offered to them at the Fort Jackson Installation. However, this would be more likely to occur if the cemetery were located at the Fort Jackson Site, rather than at the Sedalia or Whitmire Sites.

4.5.4 Land Use and Zoning

4.5.4.1 Affected Environment – Sedalia Site

The entire Sedalia Site is located within the Sumter National Forest. The site is about 10 miles from several I-26 exits. The Sedalia Site is almost completely bounded on the north by Old Buncombe Road. Prospect Corner Road is the western boundary of the site; however, a small piece of the site extends beyond Prospect Corner Road to the northwest along Old Buncombe Road. Hunt Club Road is located east of the site. The southern boundary is relatively undefined by roads but extends almost equally on either side of the Hills Creek watershed to a point where two unnamed logging trails converge. The 477-acre site is currently used for silviculture and hunting. Access to the site is currently available along the roads mentioned above that bound it to the northwest and northeast and by logging trails that are loosely defined on USGS maps. Based on a review of aerial photographs dated 1951, 1960, 1965, 1989, and 1996, the Sedalia Site has been historically undeveloped and used for silviculture, agriculture, and pasture.

Currently, there is a hunting cabin and an open storage shed at the Sedalia Site. There are also two Lockhart overhead electrical power line easements, and a 20-foot wide AT&T fiber optic line easement traversing the site.

The zoning classification for the Sedalia Site is not designated because Union County does not have a Comprehensive Plan as of the writing of this EA. The land for the site would probably be designated agricultural, open space, or low-density residential if it were to be categorized.

4.5.4.2 Affected Environment – Whitmire Site

The Whitmire Site is located in Newberry County, about 11 miles north of I-26 and about ½ mile from the town limits of Whitmire in the Sumter National Forest. The site, almost entirely woodland, is approximately 433 acres and abuts Duncan Creek to the north. Based on a review of aerial photographs dated 1941, 1954, 1964, 1970, and 1981, the Whitmire Site has been historically undeveloped or used for silviculture. Currently, a 40-foot wide SCPC natural gas pipeline cuts across the southeast section of the Whitmire Site; the associated ROW occupies approximately 2.43 acres (Sherbert, 2004). A second SCPC natural gas pipeline ROW and a Clinton-Newberry natural gas pipeline are present in the northern portion of the site, east of US 176/SC 121 along the old concrete roadbed. This SCPC ROW is 5 feet wide. The Clinton-Newberry line is within the highway ROW (Ringer, 2005).

The zoning classification for the Whitmire Site is zoned R-2 (Rural District). A cemetery is an approved conditional use associated with this zoning.

Currently the area surrounding the Whitmire Site is a mixture of rural land uses, including agricultural, low-density residential and limited timber industry use.

4.5.4.3 Affected Environment – Fort Jackson Site

The Fort Jackson Site is located along the northern edge of the Fort Jackson Installation at Gate 8. It abuts Percival Road along its northern boundary and is about ¼ mile from I-20. It is in the

city limits of Columbia inside of Richland County. The 600-acre site consists of gently rolling wooded terrain currently used for field training by Army personnel. Based on review of aerial photographs dated 1947, 1955, 1960, 1964, 1966, 1970, 1973, 1974, 1976 and 1980 and information provided by Installation environmental staff, the Fort Jackson Site has been either historically undeveloped or used as a military training operations area.

The zoning classification for the Fort Jackson Site is formally designated as training area/hunting area (Gene Stout and Associates, 2004). The Installation's INRMP basically functions as the Land Use Plan for the Installation, which performs its planning separately from the surrounding civilian jurisdictions. The land for the site has no zoning classification (Columbia Planning and Zoning Department, 2005). The site contains potential RCW habitat and is included in Fort Jackson's RCW Management Plan. Additionally, an approximate 7-acre conservation easement encompasses a beaver pond surrounded by a 50-foot buffer along the northern border of the Installation and south of Percival Road; the conservation easement is included in the Fort Jackson Site (Appendix G). Restrictions associated with the conservation easement are as follows, per the permit:

> "The following activities shall be prohibited by Fort Jackson Regulation within the boundaries of the beaver pond pool portion of the mitigation area: filling, draining (except temporarily to repair water control structures or dams, or remove beaver dams), dredging, clearing, cutting or destroying vegetation (except for beaver dam materials), excavating, erecting, constructing, releasing wastes, or otherwise doing any work not mentioned above; introducing exotic species into the Property (except biological controls pre-approved in writing by the Corps and DHEC); and from changing the grade or elevation (unless the pond size is increased), impairing the flow or circulation of waters, reducing the reach of waters, and any other discharge or activity requiring a permit under the clean water or water pollution control laws and regulations, as amended. The upland buffer may not be excavated, the elevation changed, or the vegetation removed by clear-cutting. Thinning of the upland buffer is allowed. The following are expressly excepted from this paragraph: a) cumulatively very small impacts associated with hunting, fishing, and similar recreational or educational activities, consistent with the continuing natural condition of the Property; b) removal or trimming of vegetation hazardous to persons or property, or timber downed or damaged due to natural disaster; c) restoration or mitigation required under law, d) prescribed burning, e) thinning timber."

In the plan for Richland County, all property within the Fort Jackson area is left blank on the maps, but the area immediately north of the Installation, which abuts the Fort Jackson Site, is designated suburban village area. This area is seen as a future low-density expansion corridor for greater Columbia. The Fort Jackson Site is bounded to the north by Percival Road, which is currently undergoing development, primarily light industrial and commercial to the north, and primarily residential to the west.

4.5.4.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, changes in zoning or land use would not occur at the three alternative sites and no impacts would occur. The alternative sites would remain as undeveloped forestland with occasional tree harvesting. Fort Jackson would likely continue to use the Fort Jackson Site for training exercises.

Proposed Action Alternatives

Current land uses (and potential future zoning classifications) of the three alternative sites are compatible with a cemetery.

Significant changes in zoning or land use designations to surrounding properties are not expected to occur at the Sedalia and Whitmire Sites as a result of the Proposed Action Alternative.

Residential and commercial growth adjacent to the Fort Jackson Site is not expected to occur at any higher density than currently occur and is not expected to result in significant adverse impacts as a result of the Proposed Action Alternative. In addition, the VA NCA would probably reserve land along the edges of the property for a vegetative buffer, which would effectively screen the sites from any potential neighbors. Grounds used for field training exercises within the Installation surround the rest of the site, which if not relocated, would somewhat impact the setting of the proposed cemetery. However, according to Fort Jackson Range Rules, various buffer zones would be established that separate the cemetery from any field training activities: 328 feet (100 meters) for troops, 1,640 feet (500 meters) for noise, and 3,280 feet (1,000 meters) for smoke and tear gas (Wyatt, 2006).

4.5.5 Utilities

The availability of potable water, electricity, natural gas, sanitary sewer service, telephone service, and solid waste collection and disposal were evaluated at each alternative site as described in the following sections. Utilities and utility ROWs that traverse the sites are also described.

4.5.5.1 Affected Environment – Sedalia Site

Potable Water. The Meansville-Riley Road Water Company provides water service in the Sedalia Site area. Three-inch PVC water distribution lines run along Old Buncombe Road and along Prospect Corner Road. A line also extends to the hunt cabin on the Sedalia Site (Folmer, 2005).

Sanitary Sewer Service. Public sanitary sewer service is not available in the Sedalia Site area; both the onsite hunt cabin and nearby properties utilize septic systems. Specific construction details of the onsite septic system were not available.

Electricity. Lockhart Power Company provides electric power to the area and to the hunting cabin at the Sedalia Site.

Two Lockhart Power Company ROWs, containing overhead 14,400 kilovolt power lines, traverse the Sedalia Site; one ROW traverses the northwestern portion of the site with a single line to the hunt cabin, and the second ROW runs adjacent to the northeastern portion of the site along Old Buncombe Road. The ROWs are approximately 40 feet wide (Garner, 2005).

Natural Gas. Natural gas service is not available in the area; some residents use refillable propane tanks and fuel oil tanks (Fore, 2005).

Telephone Service. Telephone service in the area is provided by Southern Bell, but it does not currently extend onto the Sedalia Site.

A 20-foot wide approximately 6,500-foot long AT&T easement for an underground fiber optic line traverses the site from the northeastern corner to the southeastern corner. Crossing the easement with roads or sprinkler systems requires an encroachment permit from AT&T (Knox, 2005).

Solid Waste Disposal. Solid waste collection service is not available for the Sedalia Site. County-area residents must take their solid waste to County-operated waste convenience centers located throughout the County. The closest County waste convenience center to the Sedalia Site is located approximately 2 to 3 miles away in Cross Keys. Waste is collected at these convenience centers and then transported to a solid waste landfill (Fore, 2005). Private solid waste collection service is also available in the area.

4.5.5.2 Affected Environment – Whitmire Site

Potable Water. The town of Whitmire water utility has a potable water distribution line along US 176/SC 121, through the Whitmire Site. The town's 1 MGD surface water plant draws from the Enoree River and an alternate facility draws from Duncan Creek (Newberry County, 1998).

Sanitary Sewer Service. Public sanitary sewer service is not currently available at the Whitmire Site (Dunnaway, 2005). The town of Whitmire's sewer lines extend from the town southward along US 176/SC 121 to the Renfro sock manufacturing facility located about 2,000 feet north of the Whitmire Site boundary (see Figure 6).

Electricity. Duke Power and the Newberry County Electric Co-op both provide electrical service in the area (Newberry County Comprehensive Plan, 1998). However, Duke Power's service does not extend south of Duncan Creek. Thus, Newberry County Electric Co-op would provide service to the Whitmire Site and has overhead electrical lines running along US 176/SC 121 (Dunnaway, 2005). A Duke Power high-tension electric transmission line ROW is located at the northwestern corner of the Whitmire Site.

Natural Gas. The Clinton-Newberry Natural Gas Authority provides natural gas service to the area and has 4-inch gas mains running along US 176/SC 121 (Ringer, 2005).

A South Carolina Pipeline Corporation (SCPC) 40-foot easement/right-of-way (ROW) for a single 8-inch diameter steel high-pressure natural gas pipeline traverses the eastern portion of the Whitmire Site (see Figure 6). The pipeline was reportedly installed about 3 to 4 feet below ground surface in the late 1960s (Franklin, 2005). A system containing a rectifier that applies electricity to the pipeline for the cathodic protection system is located along the ROW in the southeastern portion of the property, just north of Sulfur Springs Road. SCPC maintains the ROW by mowing it about every 2 years and by routinely removing any obstructions (Semple, 2005; SCPC, 2005). No trees or permanent structures (other than the rectifier described above) were observed in the ROW during field visits by URS in April 2005.

According to SCPC's Supervisor ROW Services, a landowner may plant lawn grass, row or cover crops, and flowers (shallow-rooted vegetation) in the ROW, and may maintain the ROW without a permit from SCPC. Crossings for water lines, septic drain fields, communications cables, driveways, roadways, electric lines, overhead cables, sewer lines, drainage ditches, logging road, and fences are allowed on the ROW as long as they are installed perpendicular (non-parallel) to the ROW; SCPC requests that a drawing of the proposed encroachment be submitted to, and an Encroachment Permit be obtained from, SCPC. No permanent structures (such as buildings, parking lots, flag poles, sprinkler heads, signs, septic tanks, etc.), water impoundments, or deeply routed vegetation (trees and shrubs) are allowed in the ROW under any circumstances. (Semple, 2005; SCPC, 2005)

A second, 5-foot wide, SCPC natural gas line ROW and a Clinton-Newberry Natural Gas Authority gas line ROW run along the old concrete roadbed that nearly parallels US 176/SC 121 in the northern section of the Whitmire Site. This gas lines cross Duncan Creek along the old concrete bridge; the Clinton-Newberry Natural Gas Authority line runs to a closed textile mill in the town of Whitmire.

Telephone Service. Telephone service is available through Bell South. Currently there are underground lines running along US 176/SC 121 adjacent to the site (Dunnaway, 2005).

Solid Waste Disposal. Solid waste collection service is not currently available at the Whitmire Site. Solid waste must be taken to a County-run waste collection point, where it is then hauled away to a solid waste landfill. The closest waste collection facility is located approximately 2 miles away at 2293 South Carolina Highway 66 (Newberry County Website, 2005). Private companies also provide sanitation collection service to area residents (Dunnaway, 2005).

4.5.5.3 Affected Environment – Fort Jackson Site

Potable Water. The City of Columbia Water Works provides domestic (potable) water to the Fort Jackson Site area. Water distribution lines run along the north side of Percival Road to 20 feet east of Clemson Road at the Sparkleberry Hill Apartments (Martin, 2005).

The City of Columbia Water Works also provides irrigation water for the Fort Jackson Site area. The irrigation tap size varies between ¾ and 2 inches (Martin, 2005).

Sanitary Sewer Service. Sanitary sewer service is provided to the Fort Jackson Site area by East Richland County. The existing sewer line runs along Percival Road (Brazelle, 2005).

Electricity. South Carolina Electric and Gas (SCE&G) provides natural gas and electric services to the site area. Electric lines run along Percival Road (Eisele, 2005). Electric lines for Fort Jackson are located along the southern side Percival Road in the SCDOT right-of-way and adjacent to the Fort Jackson Site, and along Wildcat Road in the southwestern portion of the site.

Natural Gas. SCE&G also provides natural gas services to the site area. Natural gas is available at Clemson Road and at Spears Creek Church Road (across Percival from Wildcat) (Eisele, 2005).

Telephone Service. Bell South provides telephone service in the area; telephone lines are buried in the rights-of-way along both sides of Percival Road (Moon, 2005 and 2006). Communications lines for Fort Jackson are also located along Percival Road, Wildcat Road, and a portion of the unpaved perimeter road along the northern portion of the site. Fort Jackson also operates a communication line for field operations, from North Tower Road into the southeastern portion of the Fort Jackson Site.

Solid Waste Disposal. Sanitation service is provided to the Fort Jackson Site area by the City of Columbia Public Works Department or by Richland County Public Works. Both provide pickup service to the area along Percival Road (Lawson, 2005).

4.5.5.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, a national cemetery would not be constructed; therefore, no additional infrastructure would be required and no changes to current utility services would occur.

Proposed Action Alternatives

As previously stated, the proposed VA NCA national cemetery would require potable water, sewage disposal, electricity, and telephone service. Water for landscape irrigation is also an important concern at national cemeteries. Large quantities of water are necessary to maintain the park-like appearance required by the VA NCA. A park-like appearance is aesthetically pleasing to funeral attendees and cemetery visitors alike. Therefore, the availability of public water supply for landscape irrigation is very important in cemetery site selection.

Sedalia Site. Potable water is already provided to the Sedalia Site and is amply available; no upgrades were identified as being needed if the VA NCA were to develop the Sedalia Site as a national veterans' cemetery. The Meansville-Riley Road Water Company would charge approximately $1465 to tap into the existing water lines (Folmer, 2005). The Water Company would also allow the VA NCA to use their water for irrigation purposes, if desired, and ample water is available.

Electricity is already provided to the Sedalia Site and is amply available; no upgrades were identified as being needed if the VA NCA were to develop the Sedalia Site as a national veterans' cemetery. Relocating the Lockhart Power Company electric lines in either or both

ROWs traversing the Sedalia Site would require coordination with Lockhart Power. A Lockhart Power representative would visit the site and assess the feasibility of relocating the electric lines, after which the VA NCA and Lockhart Power would need to agree on the terms of relocation (Parker, 2005). Additionally, if the lines were to be relocated to land adjacent to the Sumter National Forest, which borders the Sedalia Site, coordination with the USFS would be necessary (Parker, 2005).

Since no sanitary sewer service is available in the area, an onsite septic system would be required for a new national cemetery at the Sedalia Site. The majority of the Sedalia Site has moderate limitations for septic tank filter fields due to moderate permeability and depth to bedrock. To install a septic system onsite, SCDHEC requires submittal of a permit application along with a $100 fee and plat of the property. SCDHEC would then visit the site and subsequently coordinate with the VA NCA regarding the design of the septic system (Bennett, 2005).

Natural gas service is not provided to the area; if it were needed for the new cemetery, the VA NCA would need to extend a natural gas pipeline onsite or purchase it in canisters.

The VA NCA would need to haul the cemetery's solid waste to one of the County-operated waste convenience centers, the closest of which is located approximately 2 to 3 miles away in Cross Keys. The VA NCA could also hire one of several solid waste pickup contractors that serve the area.

Whitmire Site. At the Whitmire Site, all necessary utilities exist in the area. Potable water, electricity, and natural gas lines running along US 176/SC 121 could easily be brought onto the site for the new national veterans' cemetery. Potable water could be used for irrigation water for the new national veterans' cemetery if desired by the VA NCA, and is amply available.

Extending the town of Whitmire's sanitary sewer lines from the Renfro facility to the Whitmire Site would require a small pump station to be installed near Duncan Creek to pump the wastewater from the site to Whitmire's wastewater treatment plant, located just north of Duncan Creek (Dunnaway, 2005). The cost of this sanitary sewer extension would be approximately $50,000 and would be borne by the town of Whitmire (Dunnaway, 2005).

A septic system may be the more feasible and less-costly option for the Whitmire Site. To install a septic system onsite, a permit application, $100 fee, and a plat of the property must be submitted to the SCDHEC. SCDHEC would then visit the site and subsequently coordinate with the VA NCA regarding the septic system design (Bennett, 2005). The septic system would have to be located within an area of the site with suitable subsurface characteristics. These are summarized in Sections 3.2.4.2 and 4.1.3 of this EA.

Only limited cemetery development could occur on SCPC's 40-foot natural gas pipeline; the ROW encompasses 2.43 acres, and no gravesite development or cemetery activities could occur within the ROW. The VA NCA could cross the easement with roads (only those perpendicular to the pipeline are allowed) or sprinkler systems. During the master planning phase of the project, the VA NCA would coordinate with SCPC and obtain an Encroachment Permit as necessary.

Fort Jackson Site. All necessary utilities would be available to the Fort Jackson Site. However, these utilities would have to be extended into the site from Percival Road. Also, Fort Jackson would need to relocate their communication and electric lines from the site as needed, to offsite locations.

4.5.6 Local and Regional Economics

4.5.6.1 Affected Environment – Sedalia Site

The Sedalia Site is located in unincorporated Union County. Union County's highway infrastructure includes access within 30 minutes drive time of I-26 and I-85. The County is within 1.5 hours drive of I-40, I-20 and I-77. The County is within a 2-hour drive of Interstate 95. The major routes connecting Union County to these interstate highway systems is US 176, a four-lane divided highway that travels east-west connecting the County to I-85 in Spartanburg. SC 49 is a north-south trade route, which connects the County to Charlotte, North Carolina 1-hour north, and I-26 and I-385 to the south near Clinton, South Carolina. Union County is predominantly rural. The Sumter National Forest encompasses a large portion of the southern half of the County; therefore, most of the population and economic activity are found in the northern portions of Union County (Vandeford, 2005).

In the past, the textile industry was an important economic base for Union County and also for the region as a whole (Vandeford, 2005). However, in Union County, as in much of the south, the textile industry has been in decline. Despite this decline, the textile industry employs approximately 1,000 people in Union County (Vandeford, 2005). Recently, Union County has drawn attention for its surge in economic growth in manufacturing, which began in 1994 (South Carolina Department of Commerce, 1999-2001). Major employers in Union County include manufacturing, educational, health and social services, retail trade, and construction (U.S. Census Bureau, 2000). The City of Union is the County seat and generally the economic hub of the County (Stanley Vandeford, 2005). Additionally, distribution, metalworking and plastics and forestry are important economic sectors in Union County. Furthermore, hunting and fishing draw many people from within and outside the County and contribute to Union County's appeal and economics (Vandeford, 2005).

Total taxes paid on properties in Union County for calendar year 2001 amounted to $66,916,973 (South Carolina Association of Counties, 2005). Total taxes paid on the Sedalia Site in 2004 were $700.86 (Union County Tax Assessor's Office, 2005). The total market value of the Sedalia Site in 2005 was $410,000, and the total use value in 2005 was $50,460 (Union County Tax Assessor's Office, Farm Appraisal Card, 2005).

4.5.6.2 Affected Environment – Whitmire Site

The Whitmire Site is located in unincorporated Newberry County. Newberry County is located in the midlands of South Carolina between Columbia and the Greenville/Spartanburg area. The I-26 Corridor running through Newberry County is the life-line of economic development in the county, not only due to the traffic passing through the County, but also by providing access to markets outside of the county. I-26 intersects with I-20 and I-77 in Columbia, with I-85 in

Greenville/Spartanburg, and I-40 in Asheville 122 miles from the City of Newberry. Additionally, I-26 provides direct access to Charleston and its seaport, which is 149 miles from the City of Newberry (Newberry County, 1998).

While the City of Newberry is the commercial hub of the County, the rural nature of the rest of the County continues to attract many new residents, particularly to the areas around Lake Greenwood and Lake Murray (Central Midlands Council of Governments Website, 2004). Much of Newberry County is agricultural, with corn, millet, wheat, and soybeans being the staple crops. In addition, dairy, poultry, and cattle farming, as well as forestry constitute the main agricultural activities in the County. The Newberry County Industrial Park, located on I-26 between Columbia and Greenville, is attractive to industry (Central Midlands Council of Governments, 2004).

Manufacturing, services, government, and wholesale/retail trade are important economic sectors (Central Midlands Council of Governments, 2004). Major employers in Newberry County include Louis Rich, Renfro FL, American Fiber & Finishing, Georgia Pacific, Shakespeare Electronics & Fiberglass, International Paper-Newberry Lumber mill, and McKechnie Components (Central Midlands Council of Governments, 2004).

According to the Newberry County Treasurer's Office, total taxes paid on properties in Newberry County for calendar year 2004 were $11,115,976.41 (Lindler, 2005). Total taxes paid on the Whitmire Site in 2004 were $1,129.21 (Newberry County Tax Assessor's Office, Farm Appraisal Card, 2005). The total use value of the Whitmire Site in 2005 was $55,743 (Newberry County Tax Assessor's Office, Farm Appraisal Card, 2005). The market value was not listed on the farm appraisal card.

4.5.6.3 Affected Environment – Fort Jackson Site

Fort Jackson is located just outside the city limits of Columbia, South Carolina, in the central part of the State known as the Midlands, and is adjacent to I-20. Columbia is served by several interstate highways including I-20, which runs east-west, I-26, which runs northwest-southeast, and I-77, which runs north to Charlotte, North Carolina. The Columbia Metropolitan Airport, the area's major air transportation provider, served a total of 1,247,862 passengers in 2004, a 23.88 percent increase over 2003. During the first four months of 2005, 467,587 passengers passed through the airport, a 35.54 percent increase from 2004 (Columbia Metropolitan Airport, 2005).

Columbia, South Carolina's capital, is growing at a record level and is at the geographical heart of the Southeast's increasing population and economic market (Central SC Alliance, 2005). Greater Columbia's population is currently more than 583,000, and is expected to increase to 648,700 by 2010, and to 1 million by 2025 (Greater Columbia Chamber of Commerce, 2005). Major employers in the Columbia area include Palmetto Health, Blue Cross-Blue Shield of SC, Richland School District #1, SCE&G, and United Parcel Service (Greater Columbia Chamber of Commerce, 2005).

The Fort Jackson Site land value has not been assessed because it is government-owned and therefore no taxes are paid.

4.5.6.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, changes in property taxes or in local or regional economic trends would not occur. Therefore, no impacts would occur. The area's businesses and municipalities would not benefit from the potential increase in spending that would be expected near the new cemetery site during both construction and operation.

Proposed Action Alternatives

Under the Proposed Action Alternative, the VA NCA would purchase either the Sedalia or Whitmire Sites from private landowners, or a federal government real property transfer of the Fort Jackson Site would occur between the DoD and the VA NCA. Because the Sedalia or Whitmire Sites would then be government-owned, property taxes would not be paid to the State or to the County (the federal government is exempt from paying taxes on its own land). Hence, property tax revenues including school and county tax revenues would decrease for these two counties into the foreseeable future. The impact to revenues would be minimal since only approximately 0.001 percent (Sedalia Site) of the property tax revenues for Union County, and 0.010 percent (Whitmire Site) of the property tax revenues for Newberry County, are derived from these properties. The Fort Jackson Site is federal government land and therefore pays no state or local taxes; therefore, selection of the Fort Jackson Site would have no effect on the property tax revenue for Richland County or the City of Columbia.

Existing funeral-related service providers such as funeral homes would be beneficially affected by the presence of a national cemetery as veterans and their relatives eligible for burial would require their services. Cemeteries, on the other hand, may experience negative impacts on their business since aging veterans may elect to be honored by burial in the new national cemetery rather than in private or church-owned cemeteries.

The new cemetery would bring visiting tourists, and family members and friends of departed veterans. Furthermore, the influx of visitors would benefit local businesses such as gas stations and restaurants in the vicinity of the new national cemetery. This would bring approximately 356 vehicles per day (note these estimates also include employees and delivery persons).

The development of a new national cemetery in the Columbia-Greenville area would create approximately 10 permanent jobs at the cemetery itself, and support nearby businesses serving the cemetery. Construction activities would provide temporary employment for area citizens. Overall, the construction of a new national cemetery at any of the alternative site locations would result in beneficial impacts to the local economies.

The socioeconomic effect of a new VA cemetery would be substantially more beneficial to the local economies associated with the Sedalia or Whitmire Site areas than to the economies associated with the Fort Jackson Site area due to the lower local tax base and socioeconomic opportunities existing in these communities at present.

4.5.7 Demographics

4.5.7.1 Affected Environment

The VA NCA Budget and Planning Service Department estimated the number of annual veteran funeral services, among other information, for a national cemetery in the Greenville/Columbia area for FY 2008 through FY 2026 (VA NCA, [1]2005). The estimates revealed that there are approximately 148,757 veterans currently located within the 21 South Carolina and Georgia counties (Franklin, Hart, Elbert, Oconee, Pickens, Greenville, Spartanburg, Cherokee, Anderson, Laurens, Union, Chester, Fairfield, Newberry, Greenwood, Abbeville, McCormick, Edgefield, Saluda, Aiken, and Lexington) included in the 75-mile search area (VA NCA, 2005).

4.5.7.2 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, a new national veterans' cemetery in the Columbia-Greenville, South Carolina area would not occur. Veterans and their dependents electing to be buried in a national cemetery would have to consider state or private cemeteries or national cemeteries in other areas of South Carolina, North Carolina, Georgia or the U.S. Furthermore, the amount of space available for new interments at national cemeteries in other locations in South Carolina and the U.S. would continue to decrease.

Currently, only two other national cemeteries are located in South Carolina: Beaufort National Cemetery about 160 miles southeast of the Columbia-Greenville metropolitan area and Florence National Cemetery about 80 miles northeast of the Columbia-Greenville metropolitan area. The Florence National Cemetery is the closest cemetery to Columbia-Greenville; however, this historic cemetery has been in continual service since 1864. Even with its recent 10-acre expansion, Florence will be unable to accommodate the anticipated burial needs for both the Columbia-Greenville and Charleston metropolitan areas – it is expected to deplete its availability of in-ground casketed burial space by mid-2006 and in-ground cremated burial space in 2010. Further, Florence is outside of the 75-mile optimum focal point for the veteran population in the Columbia-Greenville metro area. The Beaufort National Cemetery located on the coast of South Carolina is the second closest national cemetery and is currently open for burials; however, the cemetery has been in continuous service since 1862 and is well outside of the 75-mile optimum focal point for the veteran population in the Greenville/Columbia metro area. This cemetery is also running out of burial space and a needed expansion for more burial space is planned.

No state veterans' cemeteries are currently located in South Carolina. The new state veterans' cemetery in Anderson is anticipated for completion in 2007, but given the lack of burial space available at the two existing South Carolina national veterans' cemeteries and the large veteran population in the Columbia-Greenville area, this new cemetery would not be able to accommodate all the veterans desiring interment in a veterans' cemetery in the upstate South Carolina area through 2030.

The No Action Alternative would negatively impact the nation's veteran population, leaving them without adequate national veterans' facilities befitting their service to the nation.

Furthermore, the VA NCA would fail to meet its mission and 2003 congressional mandate to serve veterans concentrated in the Columbia-Greenville area.

Proposed Action Alternatives

The VA NCA estimates that for the opening year 2009 for the proposed Columbia-Greenville Area National Veterans' Cemetery, the total number of interments at the new cemetery, including both caskets and cremains, would be 772. The number of interments is expected to increase each year for the subsequent four years; the number of interments projected for 2013 is 904. After this peak year, the number of annual interments would begin to decline. The number of interments projected for 2030, the last year that NCA data projections are available, is 721. The percentage of veterans being interred at the new national cemetery versus other nearby national cemeteries is expected to increase over the duration of the planning period due to space constraints in the other national cemeteries. Spouses and minor dependent children would also be eligible for burial at the cemetery.

Table 11 shows projected annual interments at the new Columbia-Greenville Area National Cemetery:

Table 11 - Projected Annual Interments, Columbia-Greenville Area National Veterans' Cemetery

Fiscal Year	No. of Veterans (within 75-mile radius)	No. of Veteran Deaths (within 75-mile radius)	Total Annual Interments [a]
2010	152,769	4,237	772
2015	147,370	4,139	852
2025	124,976	3,584	723

Source: VA NCA, Office of Policy and Planning, May 18, 2005; VA NCA, 2006b
[a] This includes estimated dependent interments

It is projected that the Columbia-Greenville Area National Veterans' Cemetery would remain available for interments until at least 2030, depending on demographic growth and demand for interments (VA NCA, [1]2005). The cumulative interments for 2030 would be approximately 17,677. The VA NCA anticipates that approximately 250 acres would be necessary to meet the needs for burials through at least 2030.

The construction and operation of a new veterans' cemetery at any of the three alternative sites would have a beneficial effect by providing adequate facilities within a reasonable distance of the veteran population.

4.5.8 Environmental Justice

EO 12898 requires that any federally funded project address environmental justice in minority and low-income populations and to evaluate whether the project would have a disproportionately adverse effect on minority and/or low-income populations.

4.5.8.1 Affected Environment – Sedalia Site

According to the South Carolina State Housing and Finance Authority, there are 19 assisted housing complexes in Union County. Most of these complexes are Section 8 properties located in the city limits of the town of Union and three in the town of Jonesville. Persons of White descent make up 67.8 percent of the county's population. Persons of Asian and/or Hispanic or Latino or American Indian descent represent 1.8 percent of the population. The most numerous minority group is African Americans, who represent 31 percent of the population in Union County. The County has 11.1 percent of its families living in poverty. In the census tracts nearest to the Sedalia Site (Census Factfinder mapping Website, 2005), the area near the Sedalia Site is shown to have a low African American minority population (of only 23 percent) and a low proportion of the County's families in poverty (at only 7.8 percent) relative to the County as a whole.

4.5.8.2 Affected Environment – Whitmire Site

According to the South Carolina State Housing and Finance Authority, there are 10 assisted housing complexes in Newberry County. Only two of these are Section 8 properties and they are located in the town of Whitmire on Subertown Road, which is about 1 mile from the Whitmire Site. Persons of White descent make up 64.0 percent of the County's population. Persons of Asian and/or Hispanic or Latino or American Indian descent represent 2.9 percent of the population. The most numerous minority group is African Americans, who represent 33.1 percent of the population in Newberry County. The County has 13.6 percent of its families living in poverty. In the census tracts nearest to the Whitmire Site (Census Factfinder mapping Website, 2005), the area near the Whitmire Site is shown to have a low African American minority population (of only 26.8 percent) relative to the County as a whole, but has a higher proportion of the County's families in poverty (at 17.1 percent) relative to the County as a whole (at 13.6 percent).

4.5.8.3 Affected Environment – Fort Jackson Site

According to the South Carolina State Housing and Finance Authority, there are 99 assisted housing complexes in Richland County. These properties are spread throughout the Columbia Metropolitan area but are mainly concentrated in the inner neighborhoods of the city and none are near the Fort Jackson Site. These properties are a mixture of Section 8, Tax Credits, Public Housing, Convalescent Centers, and subsidized housing, all of which are more than 1 mile away from the Fort Jackson Site. Persons of White descent make up 50.3 percent of the County's population. Persons of Asian and/or Hispanic or Latino or American Indian descent represent 4.5 percent of the population. The most numerous minority group is African Americans, who

represent 45.2 percent of the population in Richland County. The County has 10.1 percent of its families living in poverty.

In the census tracts nearest to the project sites (Census Factfinder mapping website, 2005) the area near the Fort Jackson Site is shown to have a low African American minority population (of only 24.2 percent) and a low proportion of the County's families in poverty (at only 5.4 percent) relative to the County as a whole.

The following table demonstrates the various population distributions around the three alternative sites in 2000:

Table 12 - Race and Poverty Status as Percentage of Total Population∗

Ethnicity	Union County	Sedalia Site	Newberry County	Whitmire Site	Richland County	Fort Jackson Neighborhood	South Carolina
White	67.8	75.8	64.0	72.7	50.3	66.7	67.2
African American	31.0	23.0	33.1	26.8	45.2	25.2	29.5
American Indian	0.1	0.2	0.3	0.2	0.2	0.4	0.3
Asian/Pacific Islander	0.2	0.0	0.3	0.1	1.7	4.9	0.9
Hispanic/ Latino	0.7	0.1	4.2	0.7	2.7	3.2	1.0
Poverty Status (Families)	11.1	7.8	13.6	17.1	10.1	5.1	10.7

∗ Source: U.S. Census Bureau, Profiles of General Demographic Characteristics, 2000. Note: percentages may add to equal greater than 100 since respondents may enter more than one race in the census record.

As shown in the preceding table, Richland County has the largest minority population of all three counties. In terms of poverty rates, the Whitmire Site has the highest percentage at the county and census-tract (Whitmire Site area) level. Even larger minority and low-income populations may exist in all three counties as a whole because the census often does not count illegal immigrants. South Carolina as a whole has a greater minority population than the Sedalia and Whitmire Sites and a lower minority population than the Fort Jackson area. As shown in Table 12, South Carolina as a whole has a greater minority population than Union and Newberry Counties and a lower minority population than Richland County (U.S. Census Bureau, 2000).

It is not known, however, how much of this population currently accesses the Sedalia and Whitmire Sites as de facto parks and natural areas. The number of such visitors is probably very low, and reportedly, only loggers and local hunters with permission from the landowners use the sites.

Hunting is allowed at Fort Jackson with modified public access (Morrow, 2005). Most areas of the Installation are open for hunting, including the Fort Jackson Site, unless it is a known unexploded ordnance area or the area is being used for training exercises/activities. In 2004, 340

annual hunting permits were issued, which provided access for all types of hunting activities. People eligible for annual hunting permits include active-duty military, retirees, and civilian employees. Public access is allowed through Morale, Welfare, and Recreation (MWR) during whitetail deer season. MWR sponsors four to five hunter camps per year, each lasting 1.5 days for approximately 15 people each (approximately 60 people per year).

Hunting seasons consist of the following:

- Whitetail Deer – 15 August – 1 January (7 days/week);
- Small Game – 1 January – early March and 1 September – 1 January; and,
- Turkey – Month of April.

4.5.8.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, no impacts would occur to minority or low-income populations near the three alternative sites because existing conditions would not change.

Proposed Action Alternatives

Under implementation of the Proposed Action Alternative, all three sites would retain their open space characteristics, as national cemeteries are required to maintain a park-like setting so that the cemetery grounds are visually pleasing to visitors and to families of veterans. Retaining the land use as open space into perpetuity would have beneficial impacts for the communities near all three sites, so the potential for negative impacts experienced from the loss of existing natural areas would be partially offset. This short-term disruption of open space would be compensated by the beneficial aesthetic impacts of new landscaping and a park-like setting.

Under each of the Proposed Action Alternatives, nearby residents directly adjacent to the proposed cemetery sites could experience minor impacts from changes in views. Present pine forests would change to columbarium walls, decorative iron fencing, assorted tree species, a grassy slope or grade, and sidewalks. The landscaping for the project would most likely possess a visual buffer between the cemetery and the surrounding parcels. Because the changes, as proposed, would be aesthetically pleasing, indirect negative impacts occurring to the setting of the neighborhood as a result of the proposed project would be lessened. Impacts may not necessarily be interpreted as negative by residents since they would have views of tended, landscaped open space.

No existing or proposed public housing is located within the vicinity of the Sedalia Site and the Proposed Action Alternative at the Sedalia Site would not affect public housing. Implementation of the proposed action at the Sedalia Site would not have any adverse or disproportionate effects to minority and/or low-income populations in the site vicinity or in Union County.

Implementation of the Proposed Action Alternative at the Whitmire Site would not affect public housing complexes in Whitmire or Newberry County. Implementation of the proposed action at

the Whitmire Site would not have any adverse or disproportionate effects to minority and/or low-income populations.

Assisted housing complexes in Richland County, which are a mixture of Section 8, Tax Credits, Public Housing, Convalescent Centers, and subsidized housing; all are more than 1 mile away from the Fort Jackson Site and would not be affected by implementation of the Proposed Action Alternative at the Fort Jackson Site. Implementation of this alternative would not have any adverse or disproportionate effects to minority and/or low-income populations in the City of Columbia or Richland County.

Based on the distribution of the population around Fort Jackson, there would be no disproportionate negative impacts to minority and low-income residents if the Proposed Action Alternative were implemented at the Fort Jackson Site.

Essentially, minority and low-income populations in the Columbia-Greenville search area are not likely to experience significant negative impacts from the Proposed Action Alternative, and they are expected to benefit from the project from the creation of new jobs and increased local spending that would occur in association with the new cemetery.

4.5.9 Transportation, Parking, and Traffic

4.5.9.1 Affected Environment – Sedalia Site

Transportation Network. The Sedalia Site is located in the southwestern portion of Union County and the property is within the Sumter National Forest. The site is bounded by Old Buncombe Road (Secondary State Route S44-18) to the northeast and the intersecting street of Prospect Corner Road (Secondary State Route S44-196) to the northwest. For visitors to the national cemetery originating from the north, south, and east, the primary route of travel would normally be I-26. There are three possible exits from I-26 that could be utilized to access the Sedalia Site; however, all of them are quite circuitous (see Figure 2). The exit number on I-26, the route that would be taken from that exit, and the approximate distance to the Sedalia Site are shown in Table 13.

Table 13 - Routes from I-26 to Sedalia

Exit Number	Route Towards Sedalia	Distance To Sedalia (Miles)
41	SC 92 to SC 49 to S44-18	12
44	SC 49 to S44-18	9
52	SC 56 to SC 49 to S44-18	19

For visitors from generally east of the site who elect not to use the interstate highway system, the primary routes that would be traversed include SC 121, US 176, SC 56, and SC 49. None of these is a direct route, as Old Buncombe Road would have to be accessed to travel to the site.

Old Buncombe Road, as it traverses the Sedalia Site, is one lane in each direction, with each lane averaging 11 feet in width. Due to some of the horizontal and vertical curvature, Old Buncombe

Road has a combination of double yellow center line (no passing) and dashed lines (passing allowed) separating the lanes of travel. The road has an open cross section (no curb and gutter or sidewalk) with grass shoulders. When driving between Sedalia and Whitmire, no posted speed limit signs were observed by URS, possibly due to vandalism. The comfortable driving speed was 55 mph. The closest intersection to Prospect Corner Road on Old Buncombe Road is Secondary State Route 80, which is approximately 0.6 mile to the southeast. There are no separate turns at the Old Buncombe Road intersection with Prospect Corner Road or Secondary State Route 80. During one of URS' site visits in April 2005, traffic volumes on Old Buncombe Road were light, with an occasional logging truck. Observed traffic volumes on Prospect Corner Road were very minimal.

Prospect Corner Road, adjacent to the Sedalia Site, is one lane in each direction, with each lane averaging 10 feet in width. During the site visit in April 2005, it appeared that Prospect Corner Road had recently been repaved and no center line striping was evident. However, small rectangular yellow plastic raised pavement markers were placed to separate the lanes of travel. The road has an open cross section (no curb and gutter or sidewalk) with minimal grass shoulders. When driving along Prospect Corner Road in the vicinity of the site, no posted speed limit signs were observed by URS. Prospect Corner Road has no intersecting streets proximate to Old Buncombe Road.

Existing Traffic Volumes. Several sources were referenced to obtain historical traffic data on both Old Buncombe Road and Prospect Corner Road. Web sites visited included South Carolina Department of Transportation (SCDOT), Catawba Council of Governments (COG), and Union County. Consequently, a search was unable to locate either current or historic annual average daily traffic (AADT) volume information in reasonable proximity to the site. Ultimately, in conversation with Mr. Marshall Bogan of SCDOT, he was able to locate in his records a count from 2002 that showed an AADT of 250 vehicles on Old Buncombe Road.

To collect current traffic data, 24-hour machine counts/Automated Tube Recorders (ATRs) were performed on May 11, 2005 on Prospect Corner Road adjacent to the Sedalia Site. In addition to collecting traffic volume data, information was recorded regarding the different types of vehicle (cars versus trucks) and the speed of traffic. Turning movement counts were not performed at the intersection of Old Buncombe Road and Prospect Corner Road because of the field observations of minimal volumes; it was seen that the intersection operates at a very desirable Level of Service (LOS).

The specific data for Prospect Corner Road are shown in Table 14.

Table 14 - Traffic Volumes on Prospect Corner Road at Sedalia Site

Criteria	Value
Volume (bi-directional 24 hour volume)	172
Classification (% cars/% trucks & buses)	97/3
Speed (85th percentile in mph)	54

Source: ATR Data Recorded by Traffic Data Collection, 2005

The volume data collected and that found by Mr. Bogan indicate that both Old Buncombe Road and Prospect Corner Road, which are secondary SRs, carry very little traffic volumes, the vast majority of the vehicles are passenger cars, and that the speeds at which drivers are operating are not excessive.

Planned Transportation Improvement Projects. Information was obtained from the SCDOT Statewide Transportation Improvement Program, Revision 2 January 27, 2005, for projects in Union County, which is part of the Catawba COG. The only project listed in Union County for this 3-year program from October 1, 2005 – September 30, 2007 is for an intersection improvement at Secondary State Route 16 and Secondary State Route 178. This intersection is in the City of Union, which is several miles away from Sedalia and will have no influence on the Sedalia Site.

Background Traffic Volumes. Projected volumes that are anticipated to be traveling along both Old Buncombe Road and Prospect Corner Road during the future year, independent of a national cemetery being operational (no-build), are referred to as the background volumes. To determine the background traffic volumes, as historic traffic data were not available, other criteria were used to estimate a growth rate. The criterion used was census data, which indicated that the population of Union County has decreased over the last 3 years. As population has decreased the traffic volumes would decrease accordingly. Therefore, to provide a conservative estimate of background traffic volumes, current volumes were held constant.

During URS' site visit in April 2005, representatives of Union County mentioned a project that was under consideration to create a dam with the resultant lake to be used for water resources and recreation. If the lake became operational, there would possibly be an increase in traffic on Old Buncombe Road. Ms. Metheney of the USACE, Charleston Division indicated that the dam and lake study was in the very preliminary concept evaluation stages (no commitments had been made that the facility would be constructed) and had not progressed to the point where potential site-generated traffic could be estimated.

4.5.9.2 Affected Environment - Whitmire Site

Transportation Network. The Whitmire Site is located in Newberry County just south of the incorporated limits for the Town of Whitmire. The overall property is within the Sumter National Forest and is bisected by US 176/SC 121. For visitors to the national cemetery originating from the north, south, and east, the primary route of travel will normally be I-26. There are three exits from I-26 that could be utilized to access the Whitmire Site; see Figure 2. The exit number on I-26, the route that would be taken from that exit, and the approximate distance to Whitmire are shown in Table 15.

Table 15 - Routes from I-26 to Whitmire Site

Exit Number	Route Towards Whitmire	Distance To Whitmire (Miles)
54	SC 72	15
60	SC 66	13
72	SC 121	13

For visitors from generally east of the Whitmire Site that elect not to use the interstate highway system, the primary routes to be traversed would include SC 34, SC 121/SC 72, and US 176.

US 176/SC 121 as it traverses the Whitmire Site has one 12-foot lane in each direction separated by a double yellow centerline. The road has an open cross section (no curb and gutter or sidewalk) with grass shoulders and no pronounced horizontal curves. The posted speed limit for US 176/SC 121 is 55 mph. The grade for US 176/SC 121 is relatively flat except at the northern end of the property as it is in a downgrade towards Duncan Creek. There are no intersecting streets in the section of US 176/SC 121 that traverses the site. However, Sulfur Springs Road, which is an unpaved road that provides access for park personnel into this section of Sumter National Forest, is on the east side of US 176/SC 121 along the southern boundary of the site.

North of Duncan Creek as US 176/SC 121 approaches and enters the Town of Whitmire, the speed limit changes to 45 mph. Also just north of Duncan Creek is the Renfro Corporation facility where a separate northbound right turn lane and a separate southbound left turn lane are provided for accessing this plant.

The main entrance to the national cemetery, which would provide access to the visitor's center and other public buildings, would have to be located on US 176/SC 121. A second access would also be located on US 176/SC 121 that would be used primarily for maintenance and service vehicles. The exact location of the driveways would be determined during the design phase using criteria such as sight distance and other relevant factors. As US 176/SC 121 has no discernable horizontal or vertical curves, except for the very northern portion of the property near Duncan Creek where it is in a downgrade, the location of the driveways could be flexible to accommodate other design features of the cemetery proper.

Existing Traffic Volumes. Through the count program reported by SCDOT, traffic counts are performed annually statewide; one location is relatively near the Whitmire Site. Count location number 121 is on US 176/SC 121 south of the site. Table 16 shows the AADT volumes at this station for the years 1997 through 2004.

Table 16 – Annual Average Daily Traffic on US 176/SC 121 near Whitmire Site

Year	AADT
1997	3,900
1998	4,300
1999	4,100
2000	4,000
2001	4,300
2002	3,900
2003	3,300
2004	3,700

Source: SCDOT for Central Midlands COG

The reported data have shown both an increase and a decrease in the AADT. In conversation with Teresa C. Powers, Planning & Economic Development Director for Newberry County, she indicated a few possible explanations for these fluctuations. One reason is that the Renfro

Corporation had been temporarily closed so the workers and goods transferring to this facility would contribute to a decrease in AADT during this time frame. Another possible explanation is that as the population is aging in Newberry County, more residents are retiring. As these individuals are no longer employed full time, less commuting trips would be using SC 121 from Whitmire to the Town of Newberry.

To supplement the SCDOT counts, 24-hour machine counts/ATRs were performed on May 11, 2005 adjacent to the site. Turning movement counts were not performed at this site as there are no intersections adjacent to the Whitmire Site on US 176/SC 121 except for Sulfur Springs Road, which is only used sporadically by USFS personnel. In addition to collecting traffic volumes data, information was recorded regarding the different types of vehicle (cars versus trucks) and the speed of traffic. The location-specific data are shown in Table 17.

Table 17 - Traffic Volumes on US 176/SC 121 at Whitmire Site

Criteria	Value
Volume (bi-directional 24 hour volume)	3,590
Classification (% cars/% trucks)	82/18
Speed (85th percentile)	61

Source: ATR Data Recorded by Traffic Data Collection, 2005

From the volume data collected, the peak hours for traffic volumes were: 243 vehicles for the morning peak hour from 6:15 A.M. to 7:15 A.M., 178 vehicles for the noon peak hour, and 301 vehicles from 2:30 P.M. to 3:30 P.M.. Regarding the percentage of the vehicles that are trucks, the data collected indicates 18 percent. Observations made during the URS April 2005 site visit validate this information in that a number of tractor-trailers and logging trucks were seen traversing US 176/SC 121. The 85th percentile speed is higher than the posted speed limit. This information is not too surprising, although very disconcerting, in that US 176/SC 121 is a through route, relatively straight and flat in the area of the site, and has no stop control (for example. Stop-and-go traffic lights) proximate to the site.

Planned Transportation Improvement Projects. Information was obtained from the SCDOT Statewide Transportation Improvement Program, Revision 2 January 27, 2005, for projects in Newberry County, which is part of the Central Midlands COG. The closest projects to the Whitmire Site listed in Newberry County for this 3-year program from October 1, 2005 – September 30, 2007 are for widening and improvements to SC 121 in the vicinity of I-26 in the Town of Newberry. These projects are several miles away from the Whitmire Site and will have no direct influence on the site. However, for visitors and funeral corteges that would use I-26 Exit 72, traversing this portion of SC 121 should be more convenient.

Background Traffic Volumes. Projected volumes that are anticipated to be traveling along US 176/SC 121 during the future year, independent of the national cemetery being operational (no-build), are referred to as the background volumes. To determine the background traffic volumes, existing traffic volumes were projected employing a growth rate calculated using the reported AADT volumes from 1997 to 2001. Using these values, the growth rate for traffic volumes along US 176/SC 121 was estimated to be 2.47 percent. This result was discussed with Ms. Powers of Newberry County and she indicated that it appeared reasonable for anticipating traffic

growth. To determine a conservative projection for the background volumes in 2008, a growth factor of 2.5 percent was applied. For this analysis, the background peak hour traffic volumes are expected to be 262 vehicles during the morning peak commuting period, 192 vehicles during the noon hour, and 324 vehicles during the evening peak commuting period.

4.5.9.3 Affected Environment - Fort Jackson Site

Transportation Network. The Fort Jackson Site is located in Richland County, more specifically on the eastern side of the City of Columbia. It is adjacent to Percival Road, along the northern boundary of Fort Jackson. Clemson Road has an interchange with I-20, Exit 80, less than 0.5 miles from Percival Road.

In this corridor, I-20 mainline has two lanes in each direction and at Clemson Road has a diamond interchange. For both the eastbound and westbound off-ramps at their intersection with Clemson Road, there is a separate right turn lane and a left turn lane. The Clemson Road/I-20 westbound ramp intersection is unsignalized. The Clemson Road/I-20 eastbound ramp intersection is signalized and has special signage that restricts the eastbound off-ramp outside lane to right turns only from 7 A.M. to 9 A.M. but allows both left and right turns from the outside lane during all other hours. This traffic control was instituted to facilitate movements through this intersection that are influenced by the development and circulation patterns in the immediate area. There is a large amount of residential development to the north, so allowing dual left turns, especially during the return-home-in-the-evening peak period, would allow for the intersection to function more efficiently. In the morning with the office development on Percival Road, dedicating the outside lane for the east-to-go-south right turn will support this maneuver by not having a left-turning vehicle restrict right turns on red.

Clemson Road is a five-lane urban roadway (curb and gutter on both sides) with two 12-foot lanes in each direction and a center left turn lane that becomes a left turn lane at the interchange ramps and other intersections. The road is posted with a 45 mph speed limit.

At Percival Road, where Clemson Road forms a T intersection, Clemson Road is stop controlled. To facilitate access to the Blue Cross-Blue Shield office park and other developments to the west, the curb lane of southbound Clemson Road is free flowing and has its own westbound lane on Percival Road, thereby eliminating a weave maneuver.

Percival Road, which is State Route 12 (SC 12), has primarily one lane, 12 feet in width, in each direction with turn lanes provided at major intersections and driveways. From west of the Blue Cross-Blue Shield office park to Clemson Road, Percival Road is widened to provide an eastbound left turn lane and a second westbound lane. This second westbound lane facilitates right turns into the office park. For the westbound Percival Road approach to Clemson Road, a separate right turn lane is provided. There is also a striped-out area, mirroring the westbound left turn lane that is not used by existing traffic.

The main entrance to the new national cemetery, which would provide access to the visitor's center and other public buildings, would optimally be located opposite Clemson Road. There are benefits to this location. One benefit is that it is directly connected to the I-20 interchange via Clemson Road. A second benefit is that the Clemson Road/Percival Road intersection has been

improved to accommodate all of the necessary turn lanes except for an eastbound right turn lane, which would minimize entrance construction costs as well as the disruption to traffic while it is being constructed. A third benefit is that as development continues in this area and traffic grows, a stop-and-go traffic signal could be warranted, which would facilitate the accessing maneuvers for the national cemetery.

A second access that would be used primarily for maintenance and service vehicles can be located at the eastern end of the site where an existing entrance (Gate 9) for Fort Jackson is located. This driveway is currently closed and if the cemetery were located here, it would take minor modifications to upgrade the driveway to accommodate the service vehicles and the employees.

At both potential driveway locations, the sight distance is more than adequate, as Percival Road is relatively flat and relatively straight.

As shown on Figure 8, Wildcat Road, North Tower Road, and Spears Creek Church Road are along the boundaries of the Fort Jackson Site, and all within the Fort Jackson installation. The bridge over Colonels Creek on Spears Creek Church Road has been washed out and is non-operational. Bull Run Road connects Wildcat Road and North Tower Road with the unpaved perimeter road along the northern installation boundary.

Existing Traffic Volumes. Through the count program reported by the SCDOT, traffic counts are performed annually statewide. There are several locations within the Central Midlands COG that are on SC 12, with more than one being adjacent to the Fort Jackson Site. Count location number 216 was selected to evaluate traffic trends and the reported AADT volumes for the years 1998 through 2002 and are shown in Table 18.

Table 18 – Annual Average Daily Traffic on SC 12 near Fort Jackson Site

Year	AADT
1998	5,500
1999	5,800
2000	6,300
2001	6,200
2002	7,500

Source: Central Midlands COG Website, 2004

The reported data have shown both an increase and a decrease in the AADT during this time period. Using the data from 1998 to 2002, traffic has grown at this count station at a rate of 8 percent per year. This is an unusually high growth rate possibly influenced by recent new developments generating traffic in the area. To provide as conservative an analysis as possible, this rate was applied to existing volumes to determine future traffic.

To supplement the SCDOT counts, 24-hour machine counts/ATR were performed on May 17, 2005 and turning movement counts were performed on December 6, 2004. The ATRs were performed on Clemson Road north of Percival Road and on Percival Road both east and west of Clemson Road; the summary data are shown in Table 19. The turning movement counts were

conducted at the Clemson Road intersections with the I-20 westbound ramps, the I-20 eastbound ramps, and Percival Road. The existing peak hour turning movement counts are shown in Figure 18.

Table 19 - Traffic Volumes near Fort Jackson

Criteria	Value
Clemson Road	
Volume (bi-directional 24 hour volume)	7,900
Classification (% cars/% trucks)	87/13
Speed (85th percentile)	38
Percival Road west of Clemson Road	
Volume (bi-directional 24 hour volume)	8,430
Classification (% cars/% trucks)	90/10
Speed (85th percentile)	53.5
Percival Road east of Clemson Road	
Volume (bi-directional 24 hour volume)	5,175
Classification (% cars/% trucks)	87/13
Speed (85th percentile)	53.7

Source: ATR Data Recorded by Traffic Data Collection, 2005

Planned Transportation Improvement Projects. Information was obtained from the SCDOT Statewide Transportation Improvement Program, Revision 2 January 27, 2005, for projects in Richland County, which is part of the Central Midlands COG. No project was proximate to the Fort Jackson Site where it would have an impact upon visitors and funeral corteges that would use I-20 Exit 80, Clemson Road, and Percival Road.

Background Traffic Volumes. Projected volumes that are anticipated to be traveling along the adjacent routes during the future year, independent of the national cemetery being operational (no-build), are referred to as the background volumes. To determine a conservative projection for the background volumes in 2008, existing traffic volumes were projected employing the 8 percent growth rate calculated above; these volumes are shown in Figure 19.

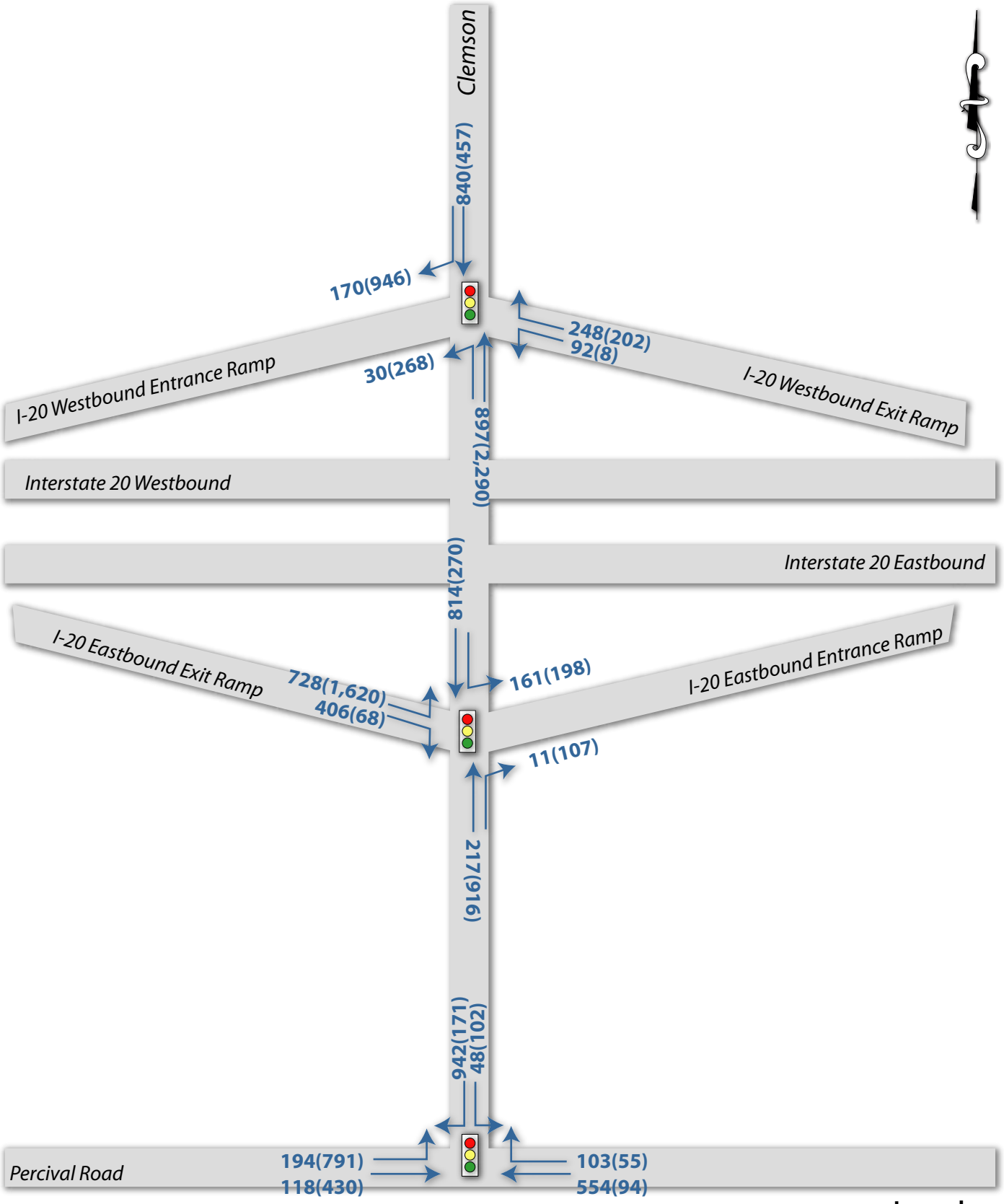
4.5.9.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

The No Action Alternative would have no impact on transportation, parking, or traffic at any of the three alternative sites because the cemetery would not be built.

Proposed Action Alternatives

The proposed Columbia-Greenville Area National Cemetery would generate additional traffic in the area of the cemetery due to construction, funerals, cemetery visitors, cemetery employees, and service deliveries. The introduction of these additional volumes would have an impact on traffic operations in the vicinity of the site selected for development.



FORT JACKSON SITE

Legend:
AM(PM)

CLIENT: Department of Veterans Affairs		TITLE: Fort Jackson Site Background Traffic Volumes	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 18
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-111
FILE: H:\proj\VA Cemetery\FtJacksonTrfficBckgrnd.ai	CHECKED BY: A. Yarnell		

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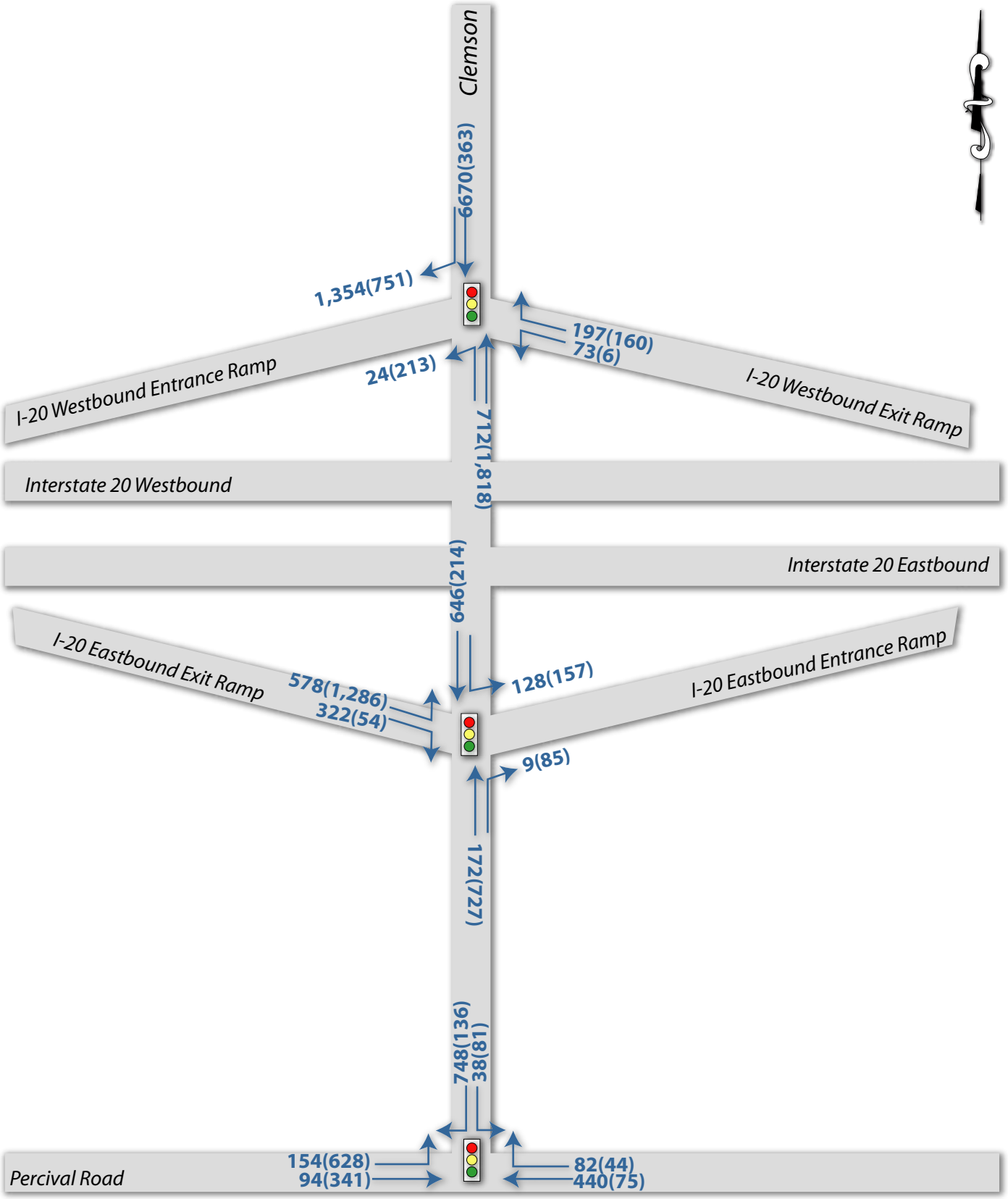

FORT JACKSON SITE

Legend:
AM(PM)

CLIENT: Department of Veterans Affairs		TITLE: Fort Jackson Site ExistingTraffic Volumes	
PROJECT: Proposed Columbia - Greenville National Cemetery			
DATE: March 2006	PROJECT NO.: 31942450.00000	URS	FIGURE: 19
SCALE: As Shown	DRAWN BY: J. Anderson		PAGE NO.: 4-113
FILE: H:\proj\VA Cemetery\FtJacksonTrfficExisting.ai	CHECKED BY: A. Yarnell		

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To estimate the amount of traffic that would be generated by the site, information was referenced from the Final Environmental Assessment for the Sacramento Area National Cemetery dated August 2002 (URS, 2002). In general terms, the Columbia-Greenville site would be approximately two-thirds as large as the Sacramento site. Consequently, the funeral cortege, visitor, and employee-generated volumes were adjusted accordingly; the service deliveries were held constant.

It is anticipated that construction-oriented traffic would ultimately be less than fully operational cemetery traffic so no separate assessment for construction generated traffic was performed. There were different reasons for taking this approach. When the facility is being constructed, all of the work would be internal to the site, so delivery of large equipment such as graders and paving machines would be a single maneuver in and a single maneuver out. Also the construction workers' trips for the different phases (including grading, utility installation, visitor center construction, and roadway paving) would not exceed the number of trips generated by the funeral cortege and visitors. Consequently, evaluating the fully operational site-generated traffic provides the maximum expected impact. Table 20 shows the anticipated daily generated trips (adjusted volumes from the Sacramento study) for the site.

Table 20 - Projected Daily Generated Trips Associated with the New Cemetery

Trip Type	Entering	Exiting	*Total*
Funeral Corteges	160	160	*320*
Other Visitors	7	7	*14*
Service Deliveries	1	1	*2*
Employees	10	10	*20*
Total	*178*	*178*	***356***

Source: Sacramento Area National Cemetery, URS Corporation, 2002.

Primarily employee-generated trips would take place within the morning or evening peak hours. The cemetery would employ approximately 10 people. To be conservative, it is assumed that all employees would arrive in the morning peak hour and leave in the evening peak hour. Therefore, the employees are projected to generate 10 morning peak hour entering trips and 10 evening peak hour exiting trips.

Remaining trips generated by the cemetery would take place during off-peak hours. Funeral corteges would generally occur between the hours of 9:00 A.M. and 3:00 P.M., with the majority occurring between 10:00 A.M. and 2:00 P.M. Service trips would randomly occur during the normal weekday operating hours of 8:00 A.M. to 5:00 P.M., while visitor trips could occur at any time on any day of the week. However, most visitor trips are expected to occur on weekends and holidays.

Sedalia Site

Future Traffic Volumes. When the proposed cemetery would be operational in the year of 2008, as stated earlier it would generate approximately 356 vehicular trips per day. These volumes would more than double the amount of existing traffic on the access routes. However,

as the existing volumes are quite low, the site-generated trips would not affect the traffic along these routes.

Traffic Operations. To assess the impact to traffic operations, the LOS along Old Buncombe Road for the background traffic volumes was calculated. Then the traffic anticipated to be generated by the new national cemetery was added and LOS was again calculated to quantify the impact to operations.

The employee site-generated trips in the morning and evening peak hours were added by distributing them equally to the north and to the south along Old Buncombe Road. During the noon hour, it was assumed that two funeral corteges would arrive and depart, which represents a total of 68 trips (34 entering and 34 exiting) that would be generated. LOS for this analysis are summarized in Table 21.

Table 21 – Background and Future Levels of Service, Sedalia Site

	Background LOS*			Future LOS*		
	AM Peak	**Noon Peak**	**PM Peak**	**AM Peak**	**Noon Peak**	**PM Peak**
Old Buncombe Road at Sedalia Site	A	A	A	A	A	A

*LOS is a measure of overall intersection delay. LOS ranges from A to F, with A representing conditions with no significant delay and F representing excessive delay.

These projections indicate that Old Buncombe Road near the Sedalia Site would experience an impact to traffic operations during the peak periods as a result of the proposed cemetery site-generated traffic. However as the existing volumes are quite minimal, this impact is minor.

Suitability of Development of the National Cemetery – Sedalia Site

As previously described in Section 3.2.4.2, seven traffic categories were evaluated based on a 1 to 5 scale, with “1” being poor conditions and “5” being excellent conditions. Refer to Section 3.2.4.2 for further description of the rank definitions.

Access to Regional Highway System (Rating of “1” out of a possible “5”). Given the service area that the national cemetery would be central to is 75 miles, it is expected that the majority of the visitors would travel I-26 as part of their trip to the site. Even though there are three potential interchanges that could be used to exit, travel along the State and County Routes would be rather circuitous, entailing from 9 to 19 miles of travel from the interstate before they are close to the site. Due to visitors having to traverse different routes, advance guide signs would have to be installed and maintained.

Potential Congestion Problems (Rating of “4” out of a possible “5”). The site is within Sumter National Forest, which greatly limits the ability of adjacent parcels to be developed. Consequently, future congestion problems are not anticipated.

Critical Intersection Locations – (Rating of "4" out of a possible "5"). Other than the intersection of Old Buncombe Road and Prospect Corner Road, the only other intersection proximate to the site is Old Buncombe Road with Secondary SC 80. Observations made during the URS site visits in April 2005 indicated traffic in this area is minimal; therefore, intersection congestion is not an issue.

When the national cemetery is operational, funeral corteges would create isolated operational impediments to traffic flow on Old Buncombe Road. It would be advisable to make arrangements with the local police department for traffic control to allow the procession to enter and exit the roadway safely.

Pavement and Roadway Conditions (Rating of "3" out of a possible "5".) From visual inspection, the pavement riding surface and shoulders appear to be in good condition. One concern would be the future condition of the pavement as the adjacent roads are Secondary State Routes and their maintenance and resurfacing schedule is less frequent than the Primary State Routes.

Proposed Access Locations (Rating of "3" out of a possible "5".) The main entrance to the national cemetery, which would provide access to the visitor's center and other public buildings, could be located on either Old Buncombe Road or Prospect Corner Road. The secondary access for the maintenance and service facility has the same option. The exact location of the driveways would be determined during the design phase. For the sections of Old Buncombe Road and Prospect Corner Road that are adjacent to the Sedalia Site, sight distance is good and is not expected to be an inhibiting factor.

If the national cemetery main driveway were located on Old Buncombe Road, to facilitate the accessing maneuver for funeral corteges and visitors, consideration should be given to constructing a separate northbound left turn lane and southbound right turn lane. If the national cemetery main driveway were located on Prospect Corner Road, consideration should be given to constructing these separate turn lanes on Old Buncombe Road at its intersection with Prospect Corner Road because this intersection would have to be traversed. Constructing a separate right and left turn lane at the service entrance driveway would not be as critical as the main entrance.

Both Old Buncombe Road and Prospect Corner Road along the section adjacent to the site are relatively flat and straight. There is flexibility to locate the main entrance to accommodate other interior features developed for the site. The location for the driveway for the service and maintenance operations area for the facility can be flexible as well. Constructing a separate right and left turn lane at this driveway are not as critical as the main entrance.

Sight Distance (Rating of "5" out of a possible "5".) Sight distance is more than adequate along both Old Buncombe Road and Prospect Corner Road.

Other Development Projects (Rating of "4" out of a possible "5".) The site is within Sumter National Forest, which greatly limits the ability of adjacent parcels to be developed. However, as Union County pursues projects, such as the contemplated dam, additional traffic would be introduced to the routes traversed by cemetery-oriented traffic.

Overall Rating (Rating of "3.4" out of a possible "5".) Certain aspects of the area and site do not impact traffic operations such as the potential for development, existing volumes and lack of congestion, condition of the roadway, and the available sight distance. The main impediment is the distance from the Interstate system and the circuitry of travel (requiring enhanced directional signage be installed and maintained) to direct visitors to the site.

Whitmire Site

Traffic Operations. To assess the impact to traffic operations, the LOS along US 176/SC 121 for the background traffic volumes was calculated. Then the traffic anticipated to be generated by the national cemetery was added and LOS was again calculated to quantify the impact to operations.

The employee site-generated trips in the morning and evening peak hours were added by distributing them equally to the north and to the south along US 176/SC 121. During the noon hour, it was assumed that two funeral corteges would arrive and depart, which represents a total of 68 trips (34 entering and 34 exiting) that would be generated. These trips would likely use SC 121 from the south as this interchange with I-26 provides the more direct route. Realistically, regardless of the direction from which the funeral cortege originated, the additional traffic would be present along the corridor. LOS for this analysis are summarized in Table 22.

Table 22 – Background and Future Levels of Service, Whitmire Site

	Background LOS*			Future LOS*		
	AM Peak	Noon Peak	PM Peak	AM Peak	Noon Peak	PM Peak
US 176/SC 121 at Whitmire Site	A	A	A	A	A	A

*LOS is a measure of overall intersection delay. LOS ranges from A to F, with A representing conditions with no significant delay and F representing excessive delay.

These projections indicate that US 176/SC 121 near the Whitmire Site would experience only small increases in impact to traffic operations during the peak periods as a result of the proposed cemetery site-generated traffic. In the future, the midday peak hour will continue to be the least critical peak period. The cemetery would generate the greatest amount of traffic when adjacent street volumes are relatively low.

Suitability of Development of the National Cemetery – Whitmire Site

As previously described in Section 3.2.4.2, seven traffic categories were evaluated based on a 1 to 5 scale, with "1" being poor conditions and "5" being excellent conditions. Refer to Section 3.2.4.2 for further description of the rank definitions.

Access to Regional Highway System (Rating of "1" out of a possible "5"). Given the service area that the new national cemetery would be central to is 75 miles, it is expected that the majority of the visitors would travel I-26 as part of their trip to the site. Even though there are three potential interchanges that could be used to exit, travel along the State Routes would entail at least another 13 miles before being at the site.

Potential Congestion Problems (Rating of "4" out of a possible "5"). The site is within Sumter National Forest, which greatly limits the ability of adjacent parcels to be developed. However, the Renfro Corporation plant is directly to the north on the other side of Duncan Creek.

Critical Intersection Locations (Rating of "4" out of a possible "5"). There are no intersections along the section of US 176/SC 121 adjacent to the site except for Sulfur Springs Road, which is a service access road for park personnel. Even with the Town of Whitmire being directly to the north along US 176/SC 121, observations made during the URS April 2005 site visits indicated that the town's intersections did not have congestion challenges.

When the national cemetery is operational, funeral corteges would create isolated operational impediments to traffic flow on US 176/SC 121. With the high speed of traffic and the large percentage of trucks, it would be advisable to make arrangements with the local police department for traffic control to allow the procession to enter and exit the roadway safely.

Pavement and Roadway Conditions (Rating of "4" out of a possible "5"). From visual inspection, the pavement riding surface and shoulders are in good condition.

Proposed Access Locations (Rating of "2" out of a possible "5"). US 176/SC 121 along the section adjacent to the site is relatively flat and straight except for the northern portion, which is a downgrade towards Duncan Creek. There is flexibility to locate the main entrance to accommodate other interior features developed for the site.

Of concern is the high percentage of trucks (18 percent) and the high rate of speed (85th percentile speed is 61 mph) on US 176/SC 121 adjacent to the site. To promote ease of access for visitors to this site, consideration should be given to constructing both a left turn lane and a right turn lane on US 176/SC 121 at the main entrance.

Regarding the driveway for the service and maintenance operations area for the facility, this should be located at the far southern portion of the site. Constructing a separate right and left turn lane at this driveway is not as critical as the main entrance.

Sight Distance (Rating of "5" out of a possible "5"). Sight distance is more than adequate along this section of US 176/SC 121.

Other Development Projects (Rating of "5" out of a possible "5"). The site is within Sumter National Forest, which greatly limits the ability of adjacent parcels to be developed.

Overall Rating ("3.6" out of a possible "5"). Certain aspects of the area and site do not impact traffic operations such as the potential for development, condition of the roadway, and the available sight distance. The main impediments are the distance from the Interstate system and the concern for safety due to the high speed of traffic with the large percentage of trucks that visitors would encounter while accessing the site.

Fort Jackson Site

If the Fort Jackson Site were selected for the national cemetery, Fort Jackson would consider constructing a new gated entrance west of Gate 8 on Percival Road, and a new roadway from this gate to Wildcat Road along the existing firebreak that forms the northwestern boundary of the Fort Jackson Site. This gate would be used infrequently for movement of large relocatable buildings into and out of Fort Jackson.

Bull Run Road and the unpaved northern installation perimeter roadway within the Fort Jackson Site would be closed to Installation traffic, as would Wildcat Road where it enters the Fort Jackson Site to the north. Gate 8 would be closed to Installation traffic. Both cemetery and Fort Jackson personnel would have access to North Tower Road and Spears Creek Church Road along the perimeter of the Fort Jackson Site, as well as Gate 9.

Future Traffic Volumes. During the future year the facility would become operational, 2008, the proposed cemetery is expected to generate approximately 356 vehicular trips per day. The additional trips would represent an increase in traffic volumes of approximately 4.5 percent on Clemson Road or a 4.2 percent increase on Percival Road in the vicinity of the Fort Jackson Site.

Traffic Operations. To assess the impact to traffic operations, the LOS at the intersection of Clemson Road and Percival Road for the background traffic volumes was calculated. Then the traffic anticipated to be generated by the new national cemetery was added and LOS was again calculated to quantify the impact to operations.

Due to the direct access from the I-20 interchange to the Clemson Road and Percival Road intersection, the analysis assigned all of the cemetery site-generated traffic through the interchange and then along Clemson Road. At the Clemson Road and Percival Road intersection, the funeral cortege and visitor trips were added as southbound through maneuvers for entering the facility and northbound through maneuvers for exiting the facility. The employee site-generated trips were added as southbound left turn maneuvers during the morning peak hour and as westbound right turn maneuvers during the evening peak hours at the Clemson Road and Percival Road intersection.

To perform a conservative analysis of the impact to operations, during each of the peak hour periods, it was assumed that two funeral corteges would arrive and depart, which represents a total of 68 trips (34 entering and 34 exiting) that would be generated. Again, these trips would most likely use Clemson Road from its interchange with I-20 because it provides the more direct route for access throughout the region. LOS for this analysis are summarized in Table 23.

Table 23 – Background and Future Levels of Service, Fort Jackson Site

	Background LOS*			Future LOS*		
	AM Peak	Noon Peak	PM Peak	AM Peak	Noon Peak	PM Peak
Clemson Road and Percival Road	A	A	A	B	C	B

*LOS is a measure of overall intersection delay. LOS ranges from A to F, with A representing conditions with no significant delay and F representing excessive delay.

These projections indicate that the intersection near the Fort Jackson Site would experience only small increases in impact to traffic operations during the peak periods as a result of the proposed cemetery site-generated traffic. In the future, the midday peak hour will continue to be the least critical peak period. The cemetery would generate the greatest amount of traffic when adjacent street volumes are relatively low.

Suitability of Development of the National Cemetery – Fort Jackson Site

As previously described in Section 3.2.4.2, seven traffic categories were evaluated based on a 1 to 5 scale, with "1" being poor conditions and "5" being excellent conditions. Refer to Section 3.2.4.2 for further description of the rank definitions.

Access to Regional Highway System (Rating of "5" out of a possible "5"). Given that there is an interchange exit with I-20 is within ½ mile of the probable main entrance to the new national cemetery at Clemson Road, and Clemson Road provides direct connectivity to the site, access from the regional highway system is extremely easy.

Potential Congestion Problems (Rating of "3" out of a possible "5"). The site is on the eastern border of the City of Columbia. There is an existing Blue Cross-Blue Shield mid-rise office building on the north side of Percival Road west of Clemson Road that generates a significant number of morning and evening peak commuting trips by their employees. Traffic volumes are expected to increase in this immediate vicinity.

Critical Intersection Locations (Rating of "3" out of a possible "5"). The unsignalized intersection of Percival Road and Clemson Road currently operates at LOS A and is expected to operate at LOS C in 2008 when the new national cemetery would be operational. As development continues in this area, the intersection would have to be monitored for installing a stop-and-go traffic signal. A future traffic signal at this intersection would facilitate ease of access to this site.

The Clemson Road intersections at the I-20 ramps currently operate at acceptable LOS and are not expected to be negatively impacted by the introduction of the site-oriented traffic.

Pavement and Roadway Conditions (Rating of "4" out of a possible "5"). From visual inspection, the pavement riding surface and shoulders are in good condition.

Proposed Access Locations (Rating of "5" out of a possible "5"). Clemson Road provides direct access at the probable main entrance to the site. Due to the widening of Percival Road, turn lanes to accommodate the maneuvers into the main driveway already exist.

Regarding the driveway for the service and maintenance operations area for the facility, there is an existing driveway (access currently closed) to Fort Jackson at the eastern end of the site that can be modified to accommodate all of the service and maintenance operations.

Sight Distance (Rating of "5" out of a possible "5"). Sight distance is more than adequate along this section of Percival Road.

Other Development Projects (Rating of "3" out of a possible "5"). A residential subdivision is under construction to the west of the site and there were at least two signs along this section of Percival Road advertising other parcels for sale. Also, a street on the east side of Clemson Road north of Percival Road has one or more commercial developments under construction and lots graded for other building construction. It can be expected that traffic in this area will increase, and Clemson Road has been constructed to handle the increased volumes.

Overall Rating (Rating of "4.0" out of a possible "5"). Being in an urbanized area proximate to an Interstate interchange, it is no surprise that development is occurring in this area. Certain aspects of the area and site would impact traffic operations, such as the potential for development. However, the main benefits to this site are the proximity to the Interstate system and existing intersection from the main entrance already being improved with available turn lanes.

4.6 SOLID AND HAZARDOUS MATERIALS AND WASTES

Phase I Environmental Site Assessments (ESAs) were conducted for each of the three alternative sites through site reconnaissance and review of public records and historical documents. The objective of these assessments was to identify "recognized environmental conditions" that might exist on the sites. The American Society for Testing and Materials (ASTM) Practice E 1527-00 Standard Practice for Environmental Site Assessments, defines recognized substances or petroleum products on a property under conditions that indicate "an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the site or into the ground, groundwater, or surface water of the property."

The Phase I ESAs consisted of the following tasks:

Site Reconnaissance: Surface conditions and current activities on the site and adjoining properties were observed during a site reconnaissance conducted on April 5, 19, and 20, 2005, at the Sedalia Site; April 5, 20, and 21, 2005 at the Whitmire Site; and April 6, April 27, and May 11, 2005 and February 2, 2006 at the Fort Jackson Site.

Records Review and Interviews: Review of records included information obtained from public agencies through EDR to assess whether current or past site usage within the study area might have created a potential for contamination of the property. The study area for the records review

was based on the ASTM Practice and consisted of the following as measured from the property boundary:

- The property and adjoining properties (0.5-mile radius) for registered USTs, Resource Conservation and Recovery Act (RCRA) hazardous waste generators (large-quantity generators [LQGs] and small-quantity generators [SQG]), and Emergency Response Notification System (ERNS) reported releases.

- Radius of 0.5 mile for LUSTs, Resource Conservation and Recovery Act Information System (RCRIS) Transportation-Storage-Disposal (TSD) facilities, state of South Carolina permitted landfill sites or solid waste disposal sites, and federal and state Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) sites.

- 1.0-mile radius for State Hazardous Waste Sites (SHWS), RCRA Corrective Action (CORRACTS) TSD facilities, and state and federal Superfund sites (National Priorities List [NPL] sites).

The review of records also included a review of historical aerial photographs, USGS topographic maps, and interviews with persons knowledgeable of the site and surrounding properties, and other historical documentation (i.e., maps, land surveys, etc.) to characterize past activities on and around each alternative site. Additionally, inquiries were made of SCDHEC and the Health Departments and Fire Departments for the alternative site areas for information regarding environmental permits, environmental violations or incidents, and/or the status of enforcement actions at each of the subject and adjacent properties. The local electric providers were also contacted to obtain information on potential polychlorinated biphenyl (PCB)-content of electrical transformers located on the sites.

4.6.1 Findings – Sedalia Site

Site Reconnaissance and Related Inquiries. The Sedalia Site is bounded by residences and Old Buncombe Road to the north, by wooded, undeveloped land to the south and east, and by Prospect Corner Road, residences and wooded land to the west. A burned soil pile containing a few discarded rusted empty 55-gallon drums and household debris was observed at the rear of an adjacent residence near northern property boundary along Old Buncombe Road. Based on the distance from this area to the Sedalia Site boundary, the area does not appear to present an environmental concern to the Sedalia Site. A few residences on the west side of Prospect Corner Road were observed to have heating oil tanks. Based on the distance of these structures to the Sedalia Site, they do not appear to present an environmental concern to the Sedalia Site. No other environmental concerns were observed on the adjacent properties.

An AT&T fiber optic ROW traverses the central portion of the Sedalia Site, running southwest to northeast. No environmental concerns were identified in association with the AT&T fiber optic ROW.

Overhead electric power lines were observed in two ROWs and to the hunting cabin on the site. At least one pole-mounted electrical transformer was observed on the Sedalia Site. No labeling

regarding PCB content was observed on the transformer; however, no signs of leakage (staining or discoloring of the unit and adjacent soils, or distressed vegetation) were noted during the site reconnaissance. The transformer and power lines are owned and maintained by Lockhart Power Company, which maintains responsibility for remediation associated with the release of dielectric fluids from its equipment.

Cattle dipping vats are excavated areas that were filled with a pesticide (arsenic) solution for the control and eradication of cattle parasites. Other pesticides such as DDT were also widely used. An apparent cattle pen (working chutes and head-gates) was observed on the Sedalia Site, and was heavily overgrown. No indications of cattle-dipping vats (i.e., excavations, depressions, etc.) were observed during the site reconnaissance or in a review of the historical aerial photographs for the site.

It is the assumption that pesticides and herbicides were likely applied as a part of the historical agricultural activities conducted onsite. It is URS' experience that, if applied and stored in accordance with label directions, the application of agricultural chemicals does not typically result in elevated residual concentrations in the soils except in areas where the chemicals would tend to accumulate, such as mixing, loading, and storage areas. URS did not identify potential chemical mixing, loading, or storage areas on the subject property during the site reconnaissance or review of historical information. The historical presence of the onsite agricultural activities is not likely to represent an environmental concern to the Sedalia Site.

During the site reconnaissance, a hunting cabin and an associated open-air shed for storage were observed on the northwestern portion of the site. These structures were reportedly constructed circa 1989. Based on the reported date of construction of the structures and observations of the construction materials, no suspected asbestos-containing materials (ACMs) or lead-based paint (LBP) were noted. Additionally, no indications of flaking paint were observed on the structures during URS' site visits. No asbestos or paint samples were collected or analyzed as part of this Phase I ESA.

Wastewater from the hunting cabin located on the Sedalia Site currently consists of sanitary wastes which discharge to an onsite septic system located near the structure. Septic systems or outhouses, and water wells, were also likely associated with two older homesteads previously located on the site (see Figure 4). Although a septic system is currently located on the Sedalia Site and any previous septic systems or wells may still be located on the site due to the historic residential use of the site, the systems and/or wells are unlikely to have caused adverse environmental impacts to the subject property based on the reported type of influent (sanitary wastes only) to the system (Sanders, 2005).

During the site reconnaissance, a small soil mound was observed on the Sedalia Site, south of the onsite pond. This pile appeared to consist primarily of soil. The surface was covered in vegetation, and contained a partially embedded automobile tire and a metal stake. No staining or other indications of potential environmental concern (i.e., unusual odors, etc.) were observed on or in the vicinity of the soil mound. The property owner did not have any historical information on the origin of the soil pile. A shovel test was conducted during the archaeological survey of the Sedalia Site, and was dug approximately 3 feet from the soil mound. The shovel test, excavated

to a depth of less than 2 inches, revealed a soil profile of less than 1 inch of topsoil. Within approximately 100 yards of this excavation, a shovel test indicated a topsoil depth of approximately nine to ten inches. Based on the relatively shallow topsoil in the immediate vicinity of the soil pile and site observations, it appears that the soil mound is most likely a result of grading activities at the site.

Only limited surface dumping was observed on other portions of the Sedalia Site during the site visits; the dumping predominantly appeared to consist of domestic waste with some automotive waste (tires). No indications of dumping were observed from the historical aerial photograph review. However, there is the potential for unobserved dumping given the historic use of portions of the site for residences. Also, much of the ground surface was covered with a layer of pine straw, which obscured site soils and ground features.

Generally, conditions on the Sedalia Site have not changed since URS' site visits in 2005 (Fore, 2006).

Historical Aerial Photograph Review. URS personnel reviewed historical aerial photographs for the site dated 1951, 1960, 1965, 1989 and 1996. The photographs were obtained from the USDA, NRCS office in Union, South Carolina. The following summarizes the observations noted:

- In the 1951 aerial photograph, a majority of the site appears to consist of wooded, undeveloped land. The northern portion and the central western portion of the Sedalia Site appear to be utilized as agricultural land. A man-made (dammed) pond is located at the northeastern portion of the site. The site is bounded to the north by a road (Old Buncombe Road, running northwest to southeast), and an intersection (Old Buncombe Road and Prospect Corner Road). Agricultural land and several apparent residential structures are located further north. Wooded, undeveloped land is visible south and east of the site. A road bounds the subject property to the west (Prospect Corner Road, running southwest to northeast), beyond which are scattered residences, agricultural land, and wooded land. It should be noted that due to the large scale of the 1951 photograph, additional details could not be discerned.

- In the 1960 aerial photograph, the site and surrounding properties appear relatively unchanged from the 1951 photograph. Increased wooded land is visible north of the site, beyond Old Buncombe Road (previously agricultural).

- In the 1965 aerial photograph, increased wooded land is visible on the northern portion of the Sedalia Site; increased wooded land is also visible in the site vicinity. The remaining properties in the surrounding area appear relatively unchanged from the 1960 photograph.

- In the 1989 aerial photograph, increased wooded land is visible on the central western portion of the Sedalia Site; increased wooded land is also visible in the site vicinity. Two small structures (current hunt cabin and storage structure) are visible at the northwestern portion of the site. The remaining properties in the surrounding area appear relatively unchanged from the 1965 photograph.

- In the 1996 aerial photograph, the northern portion and the central western portion of the Sedalia Site appear to have been planted with pines. The AT&T fiber optic ROW is visible traversing the site. Cleared land is visible northwest of the site, beyond the roadway intersection, and scattered residences are visible southeast of the site, along Old Buncombe Road.

No evidence of dumping or other environmental concerns were observed during the historical aerial photograph review.

Agency Records Review and Related Inquiries. A review of public records provided to URS by EDR indicated no NPL sites, SHWS reports, or CORRACTS sites within a 1.0-mile radius of the subject property. No RCRIS TSD facilities, CERCLIS sites, UST sites, LUST sites, or permitted solid waste landfills were listed within a 0.5-mile radius of the subject property. No RCRA LQG or SQG were reported within a 0.25-mile radius of the subject property. No ERNS listings were reported on or adjacent to the subject property ([3]EDR, 2005). Additionally, neither the subject property nor adjoining properties were identified in any of the EDR databases reviewed. SCDHEC does not maintain any files for the subject property or adjacent properties (Knight, 2005).

Inquiries were made to SCDHEC, the South Carolina Department of Health and Human Services (SCDHHS), Union County office, and the Union County Fire Department for information regarding environmental permits, environmental violations or incidents, and/or the status of enforcement actions at the site or adjacent properties. Neither the site nor adjacent properties appeared on any of the database lists reviewed by SCDHEC. No response has been received from the Health Department and Fire Department as of the date of this EA.

4.6.2 Findings - Whitmire Site

Site Reconnaissance and Related Inquiries. A natural gas pipeline was observed traversing the southern portion of the site, east of US 176/SC 121 (see Figure 6). The pipeline is owned and maintained by the SCPC. A cathodic protection rectifier is located at the southern portion of the Whitmire Site, north of Sulfur Springs Road and east of US 176/SC 121. According to representatives of the SCPC, no potential environmental concerns (i.e., PCBs, mercury, lead, etc.) are associated with the pipeline or the rectifier from past spills or leaks. Additionally, no aboveground storage tanks are associated with the natural gas pipeline or rectifier (Sembler, 2005). The presence of the natural gas pipeline and the rectifier do not appear to represent an environmental concern to the Whitmire Site.

Natural gas pipelines are also located along the old concrete roadbed in the northern portion of the site, east of US 176/SC 121. No environmental concerns on the Whitmire Site, related to these pipelines, were identified.

Cattle dipping vats are excavated areas that were filled with a pesticide (arsenic) solution for the control and eradication of cattle parasites. Other pesticides such as DDT were also widely used. Although the Whitmire Site was utilized for cattle grazing, no apparent indications of cattle-dipping vats (i.e., excavations, depressions, etc.) were observed during the site reconnaissance or in a review of the historical aerial photographs for the site.

It is the assumption that pesticides and herbicides were likely applied as a part of the historical agricultural activities conducted on-site. It is URS' experience that, if applied and stored in accordance with label directions, the application of agricultural chemicals does not typically result in elevated residual concentrations in the soils except in areas where the chemicals would tend to accumulate, such as mixing, loading, and storage areas. URS did not identify potential chemical mixing, loading or storage areas on the subject property during the site reconnaissance or review of historical information. The historical presence of the on-site agricultural activities is not likely to represent an environmental concern to the Whitmire Site.

Septic systems or outhouses, and water wells, were also likely associated with the two homesteads previously located on the site (see Figure 6). Although any previous septic systems may still be located on the site due to the historic residential use of the site, the systems and/or wells are unlikely to have caused adverse environmental impacts to the subject property based on the type of influent (sanitary wastes) to the systems.

During the site reconnaissance, a debris pile was observed on the central portion of the site and immediately west of US 176/SC 121. Based on a review of historical aerial photographs and the nature of materials observed during URS' site reconnaissance (bricks, sheet metal, etc.), it appears that the debris was associated with a former homestead (Figure 6). The structure was noted in the 1941 through 1954 aerial photographs. Based on the estimated date of construction of the structure (prior to 1941), there is the potential for ACMs and LBP to be present. No asbestos or paint samples were collected or analyzed as part of this Phase I ESA.

Also noted during the site reconnaissance were several areas of debris and dumping on the site. The debris appeared to consist primarily of household waste, several 55-gallon drums, and bags of fertilizer. The 55-gallon drums appeared to be empty; no labeling was observed on the drums regarding former content. No staining or other indications of potential environmental concern (i.e., unusual odors, etc.) were observed on or in the vicinity of the debris. There is the potential for unobserved dumping given the historic use of portions of the site for residences and the proximity of the site to roadways (access for "midnight dumping"). Also, much of the ground surface had been disturbed by previous logging operations and was covered with a thick layer of pine straw, which obscured underlying ground features.

In addition, an area of extensive dumping was observed immediately south of the Whitmire Site, beyond the unnamed tributary to Duncan Creek that bounds the property to the southeast. The debris appeared to consist of equipment and other machinery. URS could not access the adjacent site for additional investigation, but it appeared that the dumping was associated with the adjacent residential parcel to the south. Additionally, no information could be obtained regarding the nature of this dumping area (duration of dumping, condition of surrounding soils, etc.). Based on the location of the dumping site (hydrologically cross gradient) relative to the Whitmire Site, it does not appear that the offsite dumping area represents an environmental concern to the Whitmire Site.

Generally, conditions on the Whitmire Site have not changed since URS' site visits in 2005 (Carroll, 2006).

Historical Aerial Photograph Review. URS personnel reviewed historical aerial photographs for the site dated 1941, 1954, 1964, 1970, 1981, and 1999. The photographs were obtained from the USDA, NRCS office in Newberry, South Carolina. The following summarizes the observations noted:

- In the 1941 aerial photograph, a majority of the site appears to consist of wooded, undeveloped land. A road (US 176/SC 121) traverses the center of the site, running north to south. A structure is visible on the southern portion of the site, east of US 176/SC 121, and a structure is visible on the central portion of the site and immediately west of US 176/SC 121. The site is bounded to the north by a creek (Duncan's Creek) beyond which is undeveloped land. Scattered residences and agricultural and wooded land are visible south of the site. The site is bounded to the east by wooded, undeveloped land. A road (Little Egypt Road), scattered residences, and wooded, undeveloped land are visible west of the Whitmire Site.

- In the 1954 aerial photograph, the site and surrounding properties appear relatively unchanged from the 1941 photograph.

- In the 1964 aerial photograph, the structure formerly located on the central portion of the site and immediately west of US 176/SC 121 is no longer visible. The remainder of the site and surrounding properties appear relatively unchanged from the 1954 photograph.

- In the 1970 aerial photograph, a utility ROW (SCPC high-pressure natural gas pipeline) is visible on the southern portion of the site east of US 176/SC 121. The structure formerly located on the southern portion of the site, east of US 176/SC 121 is no longer visible. The remainder of the site and surrounding properties appear relatively unchanged from the 1964 photograph.

- In the 1981 aerial photograph, the site and surrounding properties appear relatively unchanged from the 1970 photograph.

- In the 1999 aerial photograph, the eastern portion of the site appears to have been planted with pines. Numerous unimproved (dirt) roads traverse the site. The surrounding properties appear relatively unchanged from the 1981 photograph.

No evidence of dumping or other environmental concerns were observed on the historical aerial photograph review.

Agency Records Review and Related Inquiries. A review of public records provided to URS by EDR indicated no NPL sites, SHWS reports, or CORRACTS sites within a 1.0-mile radius of the subject property. No RCRIS TSD facilities, CERCLIS sites, UST sites, LUST sites, or permitted solid waste landfills were listed within a 0.5-mile radius of the subject property. No RCRA LQG or SQG were reported within a 0.25-mile radius of the subject property. No ERNS listings were reported on or adjacent to the subject property ([5]EDR, 2005). Additionally, neither the subject property nor adjoining properties were identified in any of the EDR databases reviewed.

According to Mr. B. Tom Knight, Manager of Groundwater Quality, SCDHEC does not maintain any files for the subject property or adjacent properties (Knight, 2005).

Inquiries were made to the SCDHEC, the SCDHHS, Newberry County office, and the Whitmire Fire Department for information regarding environmental permits, environmental violations or incidents, and/or the status of enforcement actions at the site or adjacent properties. Neither the site nor adjacent properties appeared on any of the database lists reviewed by SCDHEC. Responses from the Health Department and Fire Department have not been received as of the date of this EA.

One facility, Renfro Corporation at 22514 SC Highway 121, located approximately 0.5 mile north of the Whitmire boundary, is listed as a Facility Index System (FINDS) facility. The FINDS contains both facility information and "pointers" to other sources of information that contain more detail. The Renfro Corporation is a sock manufacturing facility, and the FINDS listing is due to the Renfro facility's air permit. Based on the dispersion of the air emissions from the facility and the distance of the facility relative to the Whitmire Site, it is not anticipated that the Renfro FINDS facility would represent a Recognized Environmental Condition to the Whitmire Site.

4.6.3 Findings - Fort Jackson Site

Site Reconnaissance and Related Inquiries. The Fort Jackson Site is used for military field training exercises and includes Training Area 11A and a small portion of Training Area 4B. Training exercises include the use of tear gas and smoke. The site is planted in pines and contains east-west trending firebreaks spaced about 600 feet apart.

The subject property is not fenced along Percival Road, thereby allowing public foot traffic. Minor dumping has been observed along firebreaks, especially near Wildcat Road (McCracken, 2006). Dump sites/landfills were not visually identified during URS' 2005 and 2006 site visits, but the potential exists for the presence of dump sites/landfills on the Fort Jackson Site.

The subject property also contains a borrow pit and a gravel pit. The borrow pit is located approximately 0.18 mile west of Wildcat Road near the northern Installation boundary (see "1" on Figure 8). The gravel pit is located approximately 0.2 mile east of Bull Run Road and approximately 0.1 mile south of Percival Road (see "2" on Figure 8). Both areas were identified in the field by depressions in the ground surface and the re-growth of pine trees. URS did not observe any visible signs of dumping in either of these areas. During review of historical aerial photographs (discussed below), an additional former training area/borrow pit was identified east of the gravel pit (see "3" on Figure 8). This area was observed as a cleared area during the site reconnaissance. Based on the historical aerial photographs, the size and shape of these three borrow pit areas changed over time. The centers of these three areas are identified by the locations of the numbers on Figure 8.

A building is indicated on the topographic map (Figure 7, Messers Pond Quadrangle, 1972 Richland County – South Carolina, 7.5 Minute Series) in the northeastern corner of the subject property, north of an unnamed road above Fire Break 68 and west of Spears Creek Church Road (see "4" on Figure 8). The general location was identified in the field by the re-growth of rows

of planted pine trees. URS observed no visible signs of a building foundation or domestic gardens/plantings. Any signs of a building may have been removed during pine tree planting activities. Fort Jackson has no records of a permanent structure in that portion of the subject property. However, a temporary training structure may have been present in 1972 (i.e., wooden bleachers or other type of training structure) (Peel, 2005). URS observed no visible signs of dumping or waste disposal practices in this area of the Fort Jackson Site.

Fort Jackson has four levels of "dudded" areas. "Dudded" areas are areas formerly used for military training involving live munitions that are believed to contain "duds," or unexploded munitions. Such areas have been classified according to the knowledge of the area conditions and activities, and are therefore limited based on the corresponding conditions. These areas are listed below in decreasing order of the potential presence of duds:

- Known Dudded or High Concentration Impact Area – no entry or digging;
- Suspect Dudded – no soil disturbance or digging without approval;
- Scattered Dudded - no digging unless approved; and,
- Low/Lightly Dudded – Installation-wide, including the subject property.

The abandoned Salerno Rocket Range is located approximately 0.6 mile south of the subject property, and is within a parcel of land bordered by Wildcat, Desert Storm, Shenandoah, and Junction City Roads (see "8" on Figure 8). The range area is suspect dudded and concertino wire and warning signs are posted along the boundary prohibiting access. The range was abandoned in 2000 and no range fan is available (a range fan is the area anticipated to be impacted by ordnance and is based on launch sites and the range of ordnance used) (Olsen, 2005). The Salerno Rocket Range was used during the Vietnam War (1966 – 1973) for Infantry Advanced Individual Training (Wyatt, 2005 and 2006). During training exercises, high explosives were used including rockets, rifle grenades, and 40-millimeter (MM) high-explosive shells. The Salerno Rocket Range activities also impacted Training Area 12A (see Figure 8) with the 40-MM shells. The range is highly contaminated with unexploded ordnance and cleanup is not anticipated for the next ten plus years. With the proximity of the Salerno Rocket Range to the subject property and no available range fan, it must be assumed that the potential exists for range operations to have impacted the subject property.

Based on the review of a 1966 aerial photograph, Fort Jackson staff identified a former range approximately 0.3 mile northeast of the abandoned Salerno Rocket Range and approximately 0.3 mile south of the Fort Jackson Site in the area of the sand pit (see "7" on Figure 8). Because the history and range fan are unknown for this range, it is assumed that the potential exists for range operations to have impacted the southern portion of the subject site. For firing ranges it is typical for 90 to 95 percent of the munitions to land in the target area, 5 percent to ricochet, and 0 to 5 percent to land in the buffer zone (Wyatt, 2006). The subject site is located within the buffer zone of the former range.

The Fort Jackson Site is classified by the Installation as Low/Lightly Dudded. The acreage of the suspected dudded area is 95 acres (Burghardt, 2006). For current field training activities, live ammunition cannot be used other than in impact areas. Also, training activities are not allowed within 328 feet (100 meters) of the Fort Jackson boundary (Dwelley, 2005). However, no

documentation is available stating that the subject property is "clean." The potential exists for the Fort Jackson Site to be impacted by ordnance/munitions based on the following:

- The subject property was acquired by Fort Jackson in 1940. Fort Jackson staff report that no records or written documents have been found regarding the locations and activities conducted during training exercises dating back to the 1940s. Current usage includes use of tear gas canisters; un-used canisters and other ordnance could be present on the site.

- One unexploded ordnance was found in Training Area 11A in 1997 (Wyatt, 2005). One small area of Training Area 11A was used for live mortar fire along North Tower Road heading west to east. A portion of Training Area 11A is located within the subject property and is a Low/Lightly Dudded Area. Figure 8 shows the general location of Training Area 11A.

- Salerno Rocket Range and a second former range are located south of the Fort Jackson Site (discussed above).

- Training Area 12A, located south of the Fort Jackson Site and within an area bordered by Wildcat, Desert Storm, Shenandoah, and Junction City Roads, has been closed because of unexploded ordnance (Maitland, 2005) (see Figure 8). Training Area 12A contains Known and Suspect Dudded Areas (Wyatt, 2006).

- In addition to Training Area 12A (discussed above), Training Area 12B is also closed because of unexploded ordnance (Wyatt, 2005 and 2006). Training Area 12B also contains Suspect and Scattered Dudded Areas. There are no records of munitions use in Training Area 4B; this area is Low/Lightly Dudded. Training Area 12B is located within an area bordered by North Tower, Desert Storm, and Spears Creek Church Roads. Training Area 4B is located west of Wildcat Road and south of Percival Road. The general locations of Training Areas 4B, 12A, and 12B are shown on Figure 8.

Historical Aerial Photograph Review. URS personnel examined aerial photographs dated 1938, 1947, 1955, 1966, 1970, 1974, 1989, 1990, and 1994. The 1938 photographs, obtained from the University of South Carolina Library, had soil markings on them, making them difficult to read. Aerial photographs viewed at Fort Jackson, with the assistance of Mr. Jim McCracken, Fort Jackson Environmental Specialist, included 1947, 1955, 1966, 1970, 1974, 1989, and 1994. Aerial photographs dated 1955, 1966, 1970, and 1990 were also obtained from EDR ([2]EDR, 2005). The following summarizes the information noted:

- In 1947, there was no building present in the northeast corner of the subject property. The borrow and gravel pits were present (see "1"and "2" on Figure 8). Another cleared area was east of the gravel pit, possibly a training area or another borrow pit (see "3" on Figure 8). For the most part, the subject property and surrounding properties were undeveloped.

- In 1955, the gravel and borrow pits were present along with the cleared area east of the gravel pit. For the most part, the subject property was undeveloped. No building was

evident in the northeast corner of the subject property but Spears Creek Church was present on Percival Road. Two areas were cleared south of the subject property at Wildcat and North Tower Roads, possibly an observation mound and sand pit (see "6" and "7" on Figure 8). Also, there was little development along Percival Road.

- In 1966, firebreak construction was evident. I-20 was evident along with two cleared areas on the northern side of Percival Road at the intersection of Wildcat Road. Development was evident at the intersection of Spears Creek Church Road and Percival Road.

- From 1966 to 1974, there was little change. The subject property was still primarily undeveloped.

- In 1989, the two offsite cleared areas, possibly an observation mound and sand pit, were becoming revegetated (see "6" and "7" on Figure 8).

- In 1994, an area west of Wildcat Road had been cleared and logged. The borrow and gravel pits were present (see "1", and "2" on Figure 8, respectively). The former training/borrow pit area east of the gravel pit was becoming revegetated except for a path running east to west through the northern portion of the area (see "3" on Figure 8). For the most part, the subject property was undeveloped.

Agency Records Review and Related Inquiries. A review of public records provided to URS by EDR indicated one CERCLIS NPL site and one RCRAInfo SQG site within a 1.0-mile radius of the Fort Jackson Site. No landfill sites or solid waste disposal sites were listed within a 1.0-mile radius of the Fort Jackson Site. No ERNS listings were reported on or adjacent to the Fort Jackson Site ([1]EDR, 2006). The following sites were identified in the study area for the records review:

- One NPL site within approximately 0.4 mile of the subject property. CERCLIS is a database that includes selected information on sites that are either proposed to or on the NPL and sites that are in the screening and assessment phase for possible inclusion on the NPL. The source of this database is the USEPA.

- One RCRAInfo SQG site within approximately 0.2 mile of the subject property. RCRAInfo is a database that includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by RCRA. The source of this database is the USEPA.

Neither of the two above-listed sites is located on the Fort Jackson Site itself. Both sites are briefly discussed below. Additional information regarding these two sites is provided in Appendix F.

The one reported NPL site was the Townsend Saw Chain Company, located approximately 0.4 mile northwest from the subject property (see "22" on Figure 8). This 50-acre site was discovered in 1981. Contaminants of concern included chromium, cadmium, and volatile organic compounds, with chromium being the primary contaminant. A groundwater pump and

treat system was installed in 1982 and was replaced in 2000 with an in situ groundwater remediation system. With the groundwater plume migration apparently to the northeast and ongoing remediation, this NPL site does not appear to be an environmental concern to the Fort Jackson Site (see Appendix F for additional information).

The one reported RCRA SQG site was the Arrowhead Plastics South, located approximately 0.2 mile northeast from the subject property (see "23" on Figure 8). Violations noted during Compliance Evaluation Inspections conducted in 1997 and 1990 were addressed within the following two months. As of February 2002, the site was deactivated as a SQG by SCDHEC. Based on this information, it does not appear that this site is an environmental concern to the Fort Jackson Site (see Appendix F for additional information).

Additional records were reviewed, which included the Fort Jackson Environmental Restoration Program. In 1990, A.T. Kearney, Inc. performed an interim RCRA Facility Assessment (RFA) and identified 46 Solid Waste Management Units (SWMUs) and three Areas of Concern (AOCs) and recommended that RCRA Facility Investigations (RFIs) be conducted at 18 of those sites (A.T. Kearney Inc., 1990). None of the identified SWMUs or AOCs were located within the Fort Jackson Site.

The nearest SWMU or AOC on Fort Jackson to the Fort Jackson Site is SWMU 23, the Old Remagen Impact Range, located approximately 1.4 miles to the southwest (see "24" on Figure 8). A Phase II RFI was completed in November 2001. This SWMU contained numerous piles of grenade spoons and internal detonation devices. Based on the results of the Phase II RFI, no further action was recommended with respect to site groundwater, subsurface soil, surface water, and sediment. However, the Phase II RFI stated that capping of the site surface soils should be considered to remove any potential risks to ecological receptors (ecology & environment, Inc., 2001). SWMU 23 is not anticipated to impact the subject property due to the distance between the SWMU and subject property (see Appendix F for additional information).

A UST site was also identified during the records search. Former Crown SC-635, UST Permit No. 07890, 2409 Percival Road, is approximately 3 miles southwest of the subject property on the north side of Percival Road. Groundwater investigation results from 1999 indicated that the groundwater plume was migrating onto Fort Jackson property. December 2004 analytical results indicated that the plume was naturally attenuating and no longer impacting Fort Jackson. The site, a candidate for conditional closure, is not anticipated to impact the subject property due to the distance between the UST site and the subject property, and due to the southerly groundwater flow direction in the UST site vicinity (see Appendix F for additional information).

A Phase I ESA, performed by URS for a private client in the vicinity of Fort Jackson in December 2003, revealed an un-permitted construction debris landfill on the north side of Percival Road at the intersection of Fort Jackson's Wildcat Road (see "15" on Figure 8). A records search did not reveal additional information regarding this site. SCDHEC had no records regarding this landfill and the history of operation was not documented. Based on tax assessor records, it appeared that the presence of the landfill, which operated in the 1980s, resulted in contamination. The tax assessor records did not specify the contaminants or the media impacted (i.e., soil, groundwater, or both). According to the records, the extent of contamination was not

known, but had resulted in a significant devaluation of the property value and a lawsuit. Because of the lack of information (i.e., groundwater flow direction, non-specified contaminants, level and extent of contamination, lawsuit status), this landfill presents a Recognized Environmental Condition for the Fort Jackson Site (see Appendix F for additional information). Additionally, the Loveless and Loveless Inc. Mine #2 has been identified in the general area of this construction debris landfill. A Freedom of Information Act (FOIA) letter has been submitted requesting additional information regarding this mine site. At the time of publication, the additional information had not been received.

4.6.4 Environmental Consequences and Mitigation Recommendations

No Action Alternative

Under the No Action Alternative, impacts resulting from the presence of solid or hazardous waste material would not occur, as none of the alternative sites would be developed.

Proposed Action Alternatives

Under the proposed action at the selected alternative site, solid waste would be generated during construction of the new cemetery; any solid waste found or generated during construction would be disposed of at a permitted landfill in accordance with regulatory requirements. Limited amounts of solid waste would also be generated during operation of the cemetery. Recycling and reuse would be performed when applicable, and solid waste would be disposed of in a permitted landfill in accordance with regulatory requirements.

Limited types and amounts of hazardous materials would be used during construction (mainly fuel for vehicles) and operation of the cemetery (fertilizers, herbicides, pesticides, petroleum, paint products, cleaning supplies, etc.). These would be handled in accordance with BMPs and all applicable regulations. Their usage at the selected site is not expected to result in significant impacts to the environment.

Sedalia Site. Based on the site reconnaissance, records review, and historical photograph review, no Recognized Environmental Conditions were identified in association with the Sedalia Site.

The following actions based on the findings of the Phase I ESA are recommended in association with the Sedalia Site:

- the current subject property owner properly dispose of any asbestos-containing materials or lead-based paint at the hunt cabin and open shed, prior to acquisition by the VA NCA;
- the current septic system associated with the hunting cabin should be properly closed in accordance will applicable State and county guidelines;
- if, during construction/development of the site, former septic systems, outhouse trenches, or wells are encountered, the structures should be removed and disposed of properly; and

- the soil mound be further assessed regarding its contents, or be properly disposed of by the owner of the Sedalia Site, prior to acquisition by the VA NCA.

Whitmire Site. Based on the site reconnaissance, records review, and historical photograph review, no Recognized Environmental Conditions were identified in association with the Whitmire Site.

The following actions based on the findings of the Phase I ESA are recommended in association with the Whitmire Site:

- if during construction/development of the site, former septic systems, outhouse trenches, or wells are encountered, the structures should be removed and disposed of properly;

- the debris associated with the former homestead west of US 176/SC 121 should be assessed for potential asbestos and lead (in paint) content for proper disposal;

- since the debris associated with the former homestead potentially contains asbestos, it is recommended that the VA NCA request the current subject property owner to remove these materials prior to acquisition of the site by the VA NCA; and

- the current subject property owner properly disposes of materials from the dumping areas, prior to acquisition by the VA NCA.

Fort Jackson Site. Based on the site reconnaissance, records review, and historical photograph review, the following Recognized Environmental Conditions were identified for the Fort Jackson Site:

- The off-site un-permitted construction debris landfill on the north side of Percival Road at the intersection of Fort Jackson's Wildcat Road.

- Although the subject property is classified as Low/Lightly Dudded, the potential exists for training activities to have adversely impacted the Fort Jackson Site. With the abandoned Salerno Rocket Range and a second former range located south of the subject site, the range fan of the Salerno Rocket Range and the buffer zone of the former range have the potential to impact the southern portion of the Fort Jackson Site.

For the off-site un-permitted construction debris landfill, it is recommended that additional research be conducted on this landfill and, based on the results, conduct groundwater sampling along the south side of Percival Road at the intersection of Wildcat Road to evaluate whether the landfill has impacted the Fort Jackson Site. Pending the results of the FOIA request for the Loveless and Loveless Inc. Mine #2, also located in this general area, the recommendation may be modified accordingly.

Regarding the potential presence of munitions on the subject property, the VA NCA will perform a survey to evaluate whether previous training activities have impacted the Fort Jackson Site, and the Army has agreed to remove any munitions discovered. In addition to the proposed buffer zones of 328 feet (100 meters) for troops, 1,640 feet (500 meters) for noise, and 3,280 feet (1,000

meters) for smoke and tear gas between the Fort Jackson Site and surrounding training areas, a Fort Jackson representative recommended that a 6-foot-high chain link fence topped with 1 foot of razor wire be installed around the perimeters of Training Areas 12A and 12B with signage warning of the explosive hazards.

4.7 CUMULATIVE IMPACTS

Cumulative impacts, as defined in 40 CFR 1508.7, are project effects resulting 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 actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Under the No Action Alternative, the status quo would be maintained and cumulative significant impacts would not exist or occur.

The Sedalia and Whitmire Sites are both surrounded by the Sumter National Forest, which limits the development potential of the areas surrounding the sites. However, use and management of the forest will undoubtedly have effects on surrounding areas.

The USFS completed the Revised Land and Resource Management Plan (Forest Plan) for the Sumter National Forest in January 2004, which will guide the management of the Sumter National Forest for the next 10 to 15 years (USFS, 2004). The new Forest Plan establishes the management direction and associated long-range goals and objectives for the Sumter National Forest; and establishes management areas and prescriptions, among other things.

The revised Forest Plan defines goals and objectives for restoring natural communities such as woodland, savanna, and open grassland and their habitats; maintaining many fire-dependent habitats including dry-mesic oak forest, dry and xeric oak forest, shortleaf pine/pitch pine/ pine-oak forest and loblolly pine-oak; and restoring shortleaf pine, shortleaf pine/oak communities. Furthermore, acreage within the Riparian Corridor would increase and BMPs would be implemented to protect surface waters and other sensitive habitats.

4.7.1 Sedalia Site

Nearly 55,000 acres of the northern part of Union County have been reserved as part of the Sumter National Forest (Union County Website, 2004-2006), indicating a low potential for development in these areas.

A major development being planned in the Sedalia Site area is the proposed Patriots Lake in Union County. It would be located on the northern boundary of the Sumter National Forest, just north of the City of Union. The Tyger River and Fairforest Creek would be dammed to create a 5,000-acre lake with approximately 70 miles of shoreline with a capacity estimated to be more than 46 billion gallons of water. Limited development would be allowed and the recreational opportunities would be extensive (Jeter, 2004). The proposed lake would be largely within land owned by the federal government and managed by the USFS (Sumter National Forest, which consists of 365,000 acres in Abbeville, Chester, Edgefield, Fairfield, Greenwood, Laurens,

McCormick, Newberry, Oconee, Saluda and Union counties). This USFS land is commonly referred to as a "production forest" and is managed for its timber production. The USFS is also committed to offering the public as much access in the Sumter National Forest as possible for recreation. The USFS does an outstanding job in fulfilling these sometimes conflicting objectives (Jeter, 2004).

The idea of such a lake was first presented in 1989 when the Sumter National Forest conducted a survey that showed fishing and boating were the number one recreational needs in the county and surrounding areas. The idea was dropped when it met opposition on up the line of authority but four small fishing ponds in the forest near Sedalia were built as a result (Greer, 2004).

The proposed Patriots Lake would provide the kind and number of jobs required to attract and retain people in order to grow the local economy. More than 20 million people live within 200 miles of Union, and many of them are in the market for the kind of recreational opportunities a 5,000-acre lake could provide (Jeter, 2004). In addition to the visitors for a weekend or a week of fishing and boating, the proposed lake would be a focus for full-time retirement residents. All these people would be in need of goods and services. Jobs would be created in the construction industry, retail services, medical care and a long list of other categories (Jeter, 2004).

If the lake is approved, an estimated $50 million to $60 million in timber would be cut from the lake site, of which a portion could be used to construct the dam. The lake would also allow Rose Hill Plantation State Park to be enlarged, including a marina and other recreational facilities (Greer, 2004). In addition to the obvious economic benefits that would flow into the local economy from a large recreational lake, there is a potential for other favorable consequences that would affect the entire lower Piedmont region, such as a reliable new water supply source (Jeter, 2004).

Before Patriots Lake is built, it will be subjected to rigorous reviews by state and federal environmental and land management agencies (Jeter, 2004). Every town in Union county has donated $200,000 to encourage the USACE to conduct a study (Collins, 2004).

No other major developments are planned for Union County or the Sedalia Site area (Inman, 2005).

The proposed lake project and the VA NCA cemetery project would result in a cumulative adverse impact to vegetation and wildlife in Union County, and increased economic spending and roadway traffic. However, since the lake project is in the very preliminary concept evaluation stages and would not be implemented for several years if at all, significant adverse cumulative impacts are not anticipated.

4.7.2 Whitmire Site

The Town of Whitmire has been awarded grant funding for five projects (Carroll, 2005) that would likely increase visitation, and henceforth, spending and vehicular traffic in the Whitmire area.

The first grant project is for the downtown Whitmire area and is approximately 90 percent complete. This $310,000 project will provide better handicap and pedestrian walkways and crossings, in accordance with the Americans with Disabilities Act (ADA), throughout the Main Street area. The project will also remove existing overhead power lines and install traditional streetlights along Main Street (Carroll, 2005).

The second grant project for the downtown Whitmire area is approximately 10 percent complete, and will improve the façades of the downtown businesses and install traditional streetlights extending from downtown to the town community center and park area. Additional sidewalk repairs will be made to the downtown Whitmire area and the remaining utilities will be removed from Main Street. Total project cost is approximately $470,000 project (Carroll, 2005).

Another grant-funded project that is approximately 10 percent complete involves the construction of a 10-acre park and playground area located one block off Main Street in downtown Whitmire. This $482,000 project will include covered picnic areas, outdoor stages, playground equipment, restrooms, lighting, benches, and resurfacing the three existing tennis courts. Lighting will be installed at the Whitmire Recreation Complex on the remaining unlighted field (Carroll, 2005).

A grant project to bring Whitmire's water treatment plant up to the latest standards is approximately 98 percent complete. This $488,000 project includes repairs and installation of new equipment such as pumps for chemicals, a main backup pump, for backwashing, different valves, and backflow preventers (Carroll, 2005).

Another grant project in Whitmire is approximately 98 percent complete and involves replacement of existing water lines that currently provide insufficient water flow to homeowners and fire hydrants. Most of the 4-inch lines slated for replacement do not have adequate flow for firefighting activities. This $490,000 project will provide better water flow and fire protection to Whitmire residents (Carroll, 2005).

In addition to the grant projects, the old textile mill in Whitmire has been sold and is slated for a new sawmill that will take old timbers from other mills and to make flooring and other products (Carroll, 2005). If the new sawmill becomes operational it will provide additional employment opportunities, increase spending, and increase traffic in Whitmire.

Most of the growth in Newberry County is occurring around the City of Newberry, the County seat and in the southeastern portion of Newberry County near Lake Murray (Powell, 2005).

The Whitmire Site area is rural in nature with little development. Implementation of the proposed action would not have a significant adverse cumulative impact because the planned development projects are occurring at least 1 mile from the site and little development is anticipated directly adjacent to the site.

4.7.3 Fort Jackson Site

Based on the September 8, 2005 final BRAC report, which became official on November 9, 2005, Fort Jackson is expected to gain approximately 600 staff. An approximately 288,000-

square foot consolidated Drill Sergeant training school will be constructed at Fort Jackson, along with a consolidated Chaplain School for multiple branches of the DoD. Preliminary plans indicate facilities will be constructed in the cantonment area. Also, a U.S. Army Reserve Southeast Regional Readiness Command Headquarters facility will be constructed in the cantonment area near Gate 1.

The Columbia area near the Fort Jackson Site, especially along the I-77 corridor, is currently undergoing substantial development. Most of this development is residential, retail, and mixed-use (Crow, 2005). Within the area of the Fort Jackson Site, there is potential for additional development of mixed office, retail centers, and residential development, particularly along Percival Road and Clemson Road, north of the site.

Fort Jackson planning staff has expressed concerns regarding traffic increases with the increased urbanization that has been occurring in the vicinity of Fort Jackson. To address some of these concerns, Fort Jackson has requested funds for a "Joint Land Use Study" for the study area around Clemson Road and the Interstate (Dwelley, 2006). While the cemetery development would further develop an undeveloped portion of the Fort Jackson Installation, the development that is occurring in the vicinity of Fort Jackson would occur regardless of implementation of the proposed action at the Fort Jackson Site.

Development of the Fort Jackson Site for a new VA NCA cemetery would convert undeveloped federal land to developed federal land, and increase traffic and air emissions, and economic spending in the area. Cumulatively, the impacts are not expected to be significant.

4.8 COORDINATION AND PERMITS

4.8.1 Water Resources

NPDES Stormwater. For all three sites, SCDHEC form 3306, "Standard Application Form for Land Disturbing Activities-Stormwater Permitting," a fee, and a professionally prepared stormwater management and sediment and erosion control plan that is prepared by a professional engineer, Tier B land surveyor, or a landscape architect, would be submitted to SCDHEC. The stormwater management and sediment and erosion control plan would identify site-specific BMPs to be implemented at the site. Upon review of these required materials, SCDHEC would decide whether to issue an NPDES permit.

In addition, if a Section 404 permit were required by the USACE for the impact of discharges on waters and wetlands, then the VA must also comply with the Water Quality Certification program (from Section 401 of the Clean Water Act). "Section 401 requires that the State issue certification for any activity which requires a Federal permit and may result in a discharge to State waters. This certification must state that applicable effluent limits and water quality standards will not be violated." During review of applications for Water Quality Certification, SCDHEC evaluates whether there are feasible alternatives to the activity, if the activity is water dependent, and the intended purpose of the activity. Certification is denied if the activity will adversely affect existing or designated uses. SCDHEC cannot issue a Federal permit if certification is denied, in accordance with Regulation 61-101.

Interbasin Transfer of Surface Water. An interbasin transfer of water is not expected at any of the three sites. If a transfer were needed, a Class I Permit would be required from the S.C. Water Resources Commission for any transfer over 1 MGD, or a transfer that is 5 percent or more of the 7-day, 10-year low flow (meaning the lowest average flow for a duration of 7 days with a recurrence interval of 10 years) (whichever is less). For any transfers less than 1 MGD, a Class II permit must be obtained.

Surface Water Withdrawal. For all three alternative sites, if the VA NCA were to withdraw close to or over 3 million gallons/month of surface water, Water Use Registration Form (3764) must be submitted to SCDHEC Bureau of Water. Along with this form, the withdrawing entity would need to submit an annual report on monthly water usage and provide SCDHEC with a map of the site location showing the intakes, general technical information on the pumps and the irrigation system.

Groundwater Withdrawal. If the VA NCA were to install and operate a water well in Richland County (Fort Jackson Site), a Notice of Intent (NOI) for construction and operation of well under South Carolina general permit # SCW00000000 (SCDHEC form 3647) must be submitted to SCDHEC. The SC-certified well driller that is used to drill a well is required to submit a Water Well Record Form (SCDHEC form 1903) within 30 days of completion of the well.

For the Sedalia and Whitmire Sites, it may only be necessary to register with SCDHEC if groundwater withdrawal amounts are near or exceed 3 million gallons/month.

If a well is utilized to service more than 25 people, the well must meet federal permitting requirements (SCDHEC, 2005).

Impoundment of Stream/River. Before beginning construction of a dam in South Carolina for the purpose of impounding water, a permit must be obtained from the SCDHEC. However, permitting is not required for small dams that meet the following criteria:

> "less than twenty-five feet in height from the natural bed of the stream or watercourse measured at the downstream toe of the dam, or less than twenty-five feet from the lowest elevation of the outside limit of the dam, if it is not across a stream channel or watercourse, to the maximum water storage elevation and has an impounding capacity at maximum water storage elevation of less than fifty-acre feet unless a situation exists where the hazard potential as determined by the department is such that dam failure or improper reservoir operation may cause loss of human life" - (South Carolina Code of Laws, Section 49-11)

South Carolina has over 50,000 dams, of which only 2,200 are large enough to be regulated under state law. If the VA NCA proposed to construct a dam that required permitting, they would pursue a permit through SCDHEC. The permit application requires a general description of the dam, including the following:

a) Height of dam
b) Surface area of impoundment at normal pool level
c) Volume of water impounded at normal pool level
d) Watershed area

e) Description of the ground cover, slope, shape, and soils of the watershed
f) Existing impoundments on stream
g) Description of the downstream area likely to be damaged by a failure of the proposed dam, including number and type of buildings, number of residents, number and description of public utilities and roads, distance from dam to downstream property line
h) Stream flow characteristics
i) Description of probable future development of the downstream area that might be damaged by a failure of the dam
j) Use or purpose of the impoundment
k) Location, including nearest street address
l) USGS map or aerial photograph, showing the exact location of the proposed dam, location of roads, utilities, access to site, outline of impoundment, watershed, and property lines

Once this application is submitted, the SCDHEC determines whether a proposed dam will be classified as low, significant, or high hazard. Significant and high hazard dams will require additional engineering study, such as a computer-generated breach analysis. Classification also determines engineering design elements such as minimum spillway requirements.

Under South Carolina state law, anyone who impounds water in the state is liable for damages caused by the failure or improper operation of an impoundment. This includes damage to any future developments downstream of the dam.

Waters of the US. For the selected alternative site, streams, drainages, and wetland areas would need to be evaluated to identify and delineate jurisdictional WUS that would be subject to permitting under Section 404 of the Clean Water Act. Once the location and boundaries of jurisdictional wetlands and other WUS on the selected site are known, construction plans that avoid these areas or minimize unavoidable impacts to functions and values of these areas would be developed. If impacts to jurisdictional areas are unavoidable, an application would be made for the appropriate USACE Section 404 permit and SCDHEC 401 Water Quality Certification. If unavoidable loss of WUS is less than 0.1 acre, a permit would not be required, but a report to the USACE District Engineer (DE) detailing the level of impact and any mitigation to offset unavoidable loss of WUS may be required, as in the case of Nationwide Permit (NWP) 39.

It is anticipated that unavoidable impacts to WUS may meet the criteria for permitting under the NWP program, such as NWP 14-Linear Transportation Crossings or NWP 39-Residential, Commercial, and Institutional Developments, if total permanent loss of WUS does not exceed 0.5 acre and, in the case of NWP 39, there is no loss of open waters below the ordinary high water mark or loss is not greater than 300 linear feet of stream bed. For intermittent streams, the 300-linear foot threshold can be waived by the DE, if it is determined that impacts on the aquatic environment are minimal. If these criteria are met, the project qualifies for permitting under the NWP program. The applicant would submit a Preconstruction Notification (PCN), including verification of the WUS delineation, and a mitigation proposal to offset permanent losses of WUS to ensure that these losses result only in minimal adverse effects to the aquatic environment. For NWPs to be authorized, the DE must determine that an action complies with

the terms and conditions of the particular NWP, adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts, if applicable. The permit also is subject to NWP General Conditions and Regional Conditions.

On a case-by-case basis, as determined by the DE for NWP 39, the establishment of vegetative buffers next to unaffected open waters or streams on the property may be required. These buffers must be maintained and protected through restrictive covenants or other means of conservation and preservation.

If a road segment has multiple crossings of streams, the DE may determine that NWP 14 is not applicable and that an Individual Permit is required. Also, if the threshold criteria for permitting under NWP 14 or under NWP 39 are exceeded, an Individual permit would be required.

In South Carolina, the USACE District Office coordinates the Section 404 permitting process with State and other Federal agencies under a Joint Application. Any permit must have a Section 401 Certification issued by SCDHEC before the permit is authorized by the USACE District Office. The 401 Certification documents that the activity complies with state water quality standards, protection of classified uses, and associated water quality impacts. The authorized permit is subject to the State's General Conditions and NWP-specific Regional Conditions. Anticipated timeframes for authorization of Section 404 permits are at least 6 months for a NWP and 12 months or longer for an Individual Permit. SCDHEC will typically issue the 401 Certification within these respective timeframes.

All three alternative sites have WUS within the property boundaries and any of the sites selected would be subject to Section 404 permitting based on the level of impact to jurisdictional WUS if impact is unavoidable.

Additionally, if the Fort Jackson Site were selected, the property transfer would include an approximate 7-acre conservation easement that encompasses the beaver pond, associated wetlands, and 50-foot buffer. As part of the property transfer, Fort Jackson would be required to complete a "report of excess" per Army regulations, which is required when the Army excesses any real estate. The report of excess (AR 405-90, paragraph 2-1) would include the following notice: "NOTICE: This Property Subject to a letter of commitment to the United States Army Corps of Engineers." The area under conservation could not be impacted through construction activities and would need to be maintained as a conservation easement by the VA NCA (refer to Section 4.5.4 of this EA for the provisions of the Conservation Easement).

FEMA Floodplain. The 100-year floodplain would not be impacted if the Sedalia Site were developed as the new national cemetery.

Newberry County, through its Flood Damage Prevention Ordinance (Ordinance Number 06-33-03, as amended), administers the Duncan Creek designated floodplain within the project site. Any development within the FEMA-designated floodplain would require a development permit and certification requirements (Section 310) from Newberry County. If the Whitmire Site were selected for the new national cemetery, Newberry County requested that the VA NCA enter into an agreement with the County that it would not develop the FEMA-designated floodplain.

The City of Columbia administers the Colonels Creek FEMA-designated floodplain within the Fort Jackson Site (located in Division 3, Flood Hazard Reduction, of Chapter 21, Stormwater Management and Sedimentation Control, of the Municipal Code). Any development in or near the FEMA-designated floodplain would have to comply with Section 21-173 of the Municipal Code which provides development standards for streams without established base flood elevations or floodways:

> "Located within the areas of special flood hazard established in section 21-127, where small streams exist but where no base flood data has been provided or where no floodways have been provided, the following provisions apply:
> (1) No encroachments, including fill material or structures, shall be located within a distance of the stream bank equal to five times the width of the stream at the top of the bank or 20 feet on each side from the top of the bank, whichever is greater, unless certification by a professional engineer is provided demonstrating that such encroachments will not result in any increase in flood levels during the occurrence of the base flood discharge.
> (2) New construction or substantially improved structures shall be elevated or flood proofed to elevations established in accordance with section 21-153(9) or the lowest floor (including basement) shall be elevated at least three feet above the highest adjacent grade. (Code 1979, § 6-12053; Ord. No. 2003-028, 5-7-03)."

4.8.2 Biological Resources

Invasive Species. In consideration of EO 13112, Invasive Species, SCDHEC would be consulted during the cemetery Master Planning phase to identify appropriate mitigation measures for the removal and/or control of invasive species.

Migratory Birds. EO 13186 requires federal agencies to support the conservation intent of the Migratory Bird Treaty Act by avoiding and minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions and to ensure that the effects of these federal actions are reviewed under NEPA. Scoping input regarding migratory bird species has been received from the USFWS (see Appendix C). Coordination with the USFWS regarding potential effects on migratory birds will continue through the review process for this EA.

At any of the three alternative sites, predominantly planted pine habitat would be altered to a park-like setting by cemetery development. Potential impacts to migratory birds, other than land birds, would not occur. Stand-level effects on a limited number of migratory bird species, if utilizing the alternative site habitats, could be possible from development of the cemetery. These effects would be small and it is unlikely that there would be any measurable adverse effects at larger scales. This would be confirmed during more detailed survey of the selected site if required; however, the need for further consultation with the USFWS concerning potential adverse impacts is not anticipated.

Threatened and Endangered Species. Based upon review of available information and the field survey conducted by URS ecologists, no federal- or state-listed or proposed T&E species or their critical habitats were identified at either the Sedalia or Whitmire Sites. If either of these sites is

selected for cemetery development and previously unrecorded federal- or state-protected species are discovered during planning or construction activities, then consultation with the appropriate agencies would be initiated.

Fort Jackson and the USFWS are undergoing consultation regarding the potential transfer of property to the VA NCA and the resulting changes to the current RCW Management Plan goals. Further coordination or consultation between the VA NCA and the USFWS is not required if the VA NCA were to select the Fort Jackson Site for development of the national cemetery.

4.8.3 Cultural Resources

Should either the Sedalia Site or Whitmire Site be selected by the VA NCA for cemetery development, the South Carolina SHPO recommends additional shovel testing of high probability areas for the purpose of identifying archaeological resources. High probability areas should be defined using the predictive model developed for that purpose by the USFS. The SHPO also requests the following if either of these sites is chosen as the location for the new national cemetery:

> **Sedalia Site –** Three of the five previously recorded sites, Sites 38UN19, 38UN20, and 38UN21, should be revisited in order to make a definitive eligibility statement for each. All indications are that these sites would be found ineligible; nevertheless, confirmation of eligibility and consultation is required.
>
> **Whitmire Site** - Construction managers and personnel should be made aware of the possible existence of the Casey Family Cemetery within subject property. All ground-disturbing activities must stop in the vicinity of any grave markers or depressions identified during the construction process until a determination concerning the presence or absence of human remains can be made by a qualified cultural resources professional. Should the Casey Family Cemetery be found, a plan for avoidance or mitigation of adverse effects will be developed in consultation with the South Carolina SHPO.

In addition, given that there are known archaeological resources within the Sedalia Site and Whitmire Sites, the VA NCA would additionally consult with the American Indian Nations with ties to South Carolina if either of these sites was chosen as the location for the new cemetery. If practicable, an avoidance plan (design components separated from the site(s), fencing, etc.) would be developed and implemented. If avoidance of any known sites or newly discovered sites is not possible, a plan for the proper disposition of those resources would be developed in consultation with the SHPO and the Nations prior to any ground-disturbing activities.

Given that there are eight known archaeological resources within the Fort Jackson Site, the VA NCA would additionally consult with the American Indian Nations with ties to South Carolina if the Fort Jackson Site were chosen as the location for the new cemetery. If the Fort Jackson Site is chosen for the new VA cemetery, the VA NCA preliminarily plans to avoid impacts to all eligible and potentially eligible archaeological sites, and an avoidance plan (design components separated from the site(s), fencing, etc.) would be developed. In addition, the VA NCA plans to avoid all ineligible sites that are deemed worthy of avoidance by the American Indian Nations. If avoidance of known sites is not possible, a plan for the proper disposition of those resources

would be developed in consultation with the SHPO and the Nations prior to any ground-disturbing activities.

Efforts to identify historic standing structures on the three alternative sites revealed that none OF the sites contain or have adjacent to them previously identified historically significant resources. Reconnaissance surveys conducted at each site lead to the identification of 11 properties potentially eligible for the NRHP adjacent to the Sedalia Site, 1 abandoned structure potentially eligible on the Whitmire Site, and none within the vicinity of the Fort Jackson Site. Further research and analysis for the identified properties at both the Sedalia and Whitmire Sites would be necessary if either site were selected for the new national cemetery. This investigation would include assessment of NRHP eligibility for each resource and evaluation of the proposed undertaking potential to impact any resources determined to have historical significance, in compliance with 36 CFR 800, and consultation with the SHPO.

4.8.4 Socioeconomics and Related Resources

Air Quality. SCDHEC and the Richland County EAC Coordinator have requested that the VA NCA consult with these agencies in the event the Fort Jackson Site is selected for cemetery development.

Utilities. Coordination with the local utility companies would be required regardless of which site is selected for cemetery development. Additional coordination and permitting requirements are outlined below.

Construction of a septic system at the Sedalia or Whitmire Sites would require coordination with, and a permit from, SCDHEC.

At the Sedalia Site, the VA NCA would coordinate with Lockhart Power regarding relocation, if needed, of the two existing electric power lines. Relocation of one of the electric power lines adjacent to USFS land would also require consultation with the USFS. Encroachment permits would be obtained if necessary, including from AT&T for the fiber optic ROW.

At the Whitmire Site, the VA NCA would coordinate with SCPC and Clinton-Newberry Natural Gas Authority regarding the natural gas line ROWs, and encroachment permits would be obtained from the applicable utility company if needed.

Transportation. The Sedalia Site is located in unincorporated Union County and both Old Buncombe Road and Prospect Corner Road are SC secondary SRs. The access driveways to the site would require coordination primarily with the State with consideration for the County development regulations.

The Whitmire Site is located in unincorporated Newberry County and the roadway abutting the site is a South Carolina State Route. The access driveways to the site would require coordination primarily with the State with consideration for the County development regulations.

The Fort Jackson Site is located in unincorporated Richland County and the roadway abutting the site is a South Carolina State Route. The access driveways to the site would require coordination primarily with the State with consideration for the County development regulations.

4.9 POTENTIAL FOR GENERATING CONTROVERSY AND PUBLIC INVOLVEMENT

The potential for the VA NCA project to generate controversy was assessed by reviewing newspaper articles written about the project, and by soliciting and assessing comments received from the public and regulatory agencies on the project.

4.9.1 Review of Published Articles

Numerous articles have been published in various newspapers throughout South Carolina regarding various issues such as site acquisition and budget appropriations for the proposed National Cemetery in the Columbia-Greenville area. A partial listing of the articles and summaries of each article are presented below.

Date: June 27, 2003
Article Title: "State may get new national veterans cemetery through bill"
Newspaper: The Sun News (Myrtle Beach, SC)

> "South Carolina would gain a third national veterans cemetery, possibly at Fort Jackson, under a bill speeding its way through Congress." "…legislation passed the House Veterans Affairs Committee unanimously, and it is scheduled to hit the House floor either the second or third week in July." Fort Jackson is mentioned as a possible site for the cemetery.

Date: February 9, 2004
Article Title: "Veterans hope for military cemetery in Upstate"
Newspaper: The Times and Democrat (Orangeburg, SC)

> "Many military veterans hope they will one day be buried in a new national cemetery in the Upstate, one close enough for relatives to visit."
>
> The article further states that a site between Greenville and Columbia will be selected for the new cemetery, and that it would be the third national veterans cemetery in South Carolina.
>
> "The Florence National Cemetery has casket and cremation space that should last until 2030… Casket-only space in Beaufort National Cemetery should last until 2008."

Date: February 6, 2005
Article Title: "VA to view site for national cemetery in Columbia"
Newspaper: The State (Columbia, SC)

> Three sites are being evaluated by the VA for a new national veteran's cemetery in South Carolina – one at Fort Jackson and others at Union and Whitmire. George Goldsmith,

chairman of the Greater Columbia Chamber of Commerce's military affairs committee, stated that Fort Jackson "is the most logical place for a new national cemetery." He further states that it is important that South Carolina get a new cemetery and that the VA is evaluating two other sites as well as the Fort Jackson site.

"More than 17,600 plots are filled at the 33-acre Beaufort cemetery, according to the VA. About 8,300 plots at the 25-acre Florence site are filled."

Date: March 20, 2005
Article Title: "Upstate potential site for cemetery"
Newspaper: Spartanburg Herald-Journal

"The U.S. Department of Veteran's Affairs is considering building a $20 million national cemetery on a 500-acre plot of land between Cross Keys and Rose Hill State Park near the community of Sedalia."

Two other sites – one near Whitmire in Newberry County and one on Fort Jackson property in Richland County – are also being evaluated. ""Right now they're all equal," said Bruce Borko, an engineer with the VA who has visited each site."

The "while the Union County site may have the best land, the other sites may be better positioned." "A cemetery at Sedalia would overlap coverage areas with the one at Anderson."

Date: April 6, 2005
Article Title: "Government delegation tours proposed national cemetery"
Newspaper: The Union Daily Times

"Property in the Sedalia community has many qualities that would make it a good location for a national veteran's cemetery". Examples of its positive aspects include equal distance to large South Carolina population centers (Greenville/Spartanburg, Rock Hill, and Columbia), good access to two interstates, and "it's fairly flat with gently rolling hills".

"Right now all three sites are equal, each one has good points" according to the VA. A report analyzing the sites is being developed and the VA will use the report, due for completion in August 2005, to select a preferred site.

Date: April 6, 2005
Article Title: "A Place of Honor: Whitmire In the Running For National Cemetery"
Newspaper: The Whitmire News

"The choices have been narrowed down to three sites for the National Cemetery to be located in this region and Whitmire is one of the finalists."

The Mayor of Whitmire and Newberry County Councilmen discussed the benefits of having the National Cemetery in Whitmire. The Town is already planning other positive

developments: "the million dollar revitalization on Main Street and the 10 acre park site planned for the near future."

The Whitmire site would have benefits for the VA: minimal cleanup costs because "it had been well maintained and was clear of debris and signs of dumping"; natural beauty with a grove of hardwoods and "the peaceful, slow moving Duncan Creek"; accessibility to utilities like water, sewer, and electricity; and close access to Interstate 26.

Date: April 6, 2005
Article Title: "Economic impact would be far-reaching"
Newspaper: The Whitmire News

"Should Whitmire be chosen as the site for the National Cemetery, the benefits to the town would be many, most importantly, perhaps, jobs."

According to the VA, the presence of a National Cemetery provides many jobs, "including cemetery operation staff and maintenance crews" and the VA contracts out most of the work including electrical work, fencing, and grading.

The National Cemetery will bring people from across the state to Whitmire, which will benefit the local businesses. "Also benefiting from the cemetery will be the local funeral homes and crematoriums".

"National Cemeteries become a very integral part of the community", said Bruce Borko, Civil Engineer with the U.S. Department of Veterans Affairs. Volunteers will be needed from the community to assist with memorial and burial services.

Date: January 18, 2006
Article Title: "VA awards state $5.2 million for upstate cemetery"
Newspaper: The State (Columbia, SC)

This article primarily focuses on a $5.2 million VA grant "to build a cemetery in Anderson for military veterans". It goes on to mention that "the VA also is planning a fourth S.C. cemetery – in the Midlands. A site has not been picked yet".

"The VA plans to build another S.C. national cemetery and has looked at land on the northwestern edge of Fort Jackson. It also is considering sites in Whitmire and Union. The agency expects to select a site by this spring, Tuerk said."

"Veterans groups have been lobbying for a site in the Columbia area. South Carolina has 413,000 veterans; a third of those veterans live within an hour's drive of Columbia."

4.9.2 VA NCA Issuance of Notices Regarding the Project

The VA NCA issued a Notice of Intent (NOI) to formally announce the project and the VA NCA's intent to prepare an EA, and to invite public comment on the project. A "Notice of Intent

and Request for Comments" notice (Appendix B) was posted in April and May 2005 at numerous locations near each site as follows:

- Union County Library
- Union County Veterans Affairs building
- Union County Courthouse
- Whitmire Library
- Town of Whitmire's website, address: http://www.townofwhitmire.com
- Newberry Library
- Newberry County Courthouse Annex
- Newberry County Zoning Office
- Fort Jackson Library

A "Notice of Intent, Preparation of Environmental Assessment for New National Veterans' Cemetery" was published as a legal ad (Appendix B) in the following local and regional newspapers in mid-April 2005/early May 2005:

- The State (Columbia, SC)
- The Times and Democrat (Orangeburg, SC)
- The Whitmire News
- Spartanburg Herald-Journal
- The Union Daily Times
- The Greenville News

In addition, a "Notice of Availability of Draft Environmental Assessment" is being published in selected newspapers and provided for posting at numerous public locations near each alternative site location. The Draft EA is also being made available for review at one or more public libraries near each site. The VA NCA welcomes the submittal of comments regarding the project and Draft EA. Comments received will be incorporated in the Final EA.

4.9.3 American Indian Coordination

As stated in Section 4.4.1, the VA NCA sent consultation letters to 22 American Indian representatives for federally recognized tribes with ties to South Carolina, in June 2005; the complete listing of the federally recognized tribes with whom the VA consulted is presented in Section 5 of this EA and copies of the correspondence sent and received is presented in Appendix C.

The American Indian Nations that have responded to the VA NCA have requested to be kept informed regarding the site selection and of future archaeological surveys, findings, and cemetery design plans.

Each of the American Indian Nations is being sent one or more copies of this Draft EA. The VA NCA welcomes the submittal of comments regarding the project and Draft EA. Comments received will be incorporated in the Final EA.

4.9.4 Agency Coordination

Starting on May 6, 2005, project coordination letters were sent to numerous federal, state, and local agencies that might have an interest in the project, or have jurisdiction over an aspect of the project or the project sites. Complete listings of the agencies are attached to the coordination letters presented in Appendix C. Copies of the correspondence received are included in Appendix C, and relevant information has been incorporated into the EA.

Agencies were also contacted in person or telephonically for relevant information that was also assessed during the NEPA process and has been incorporated herein.

Numerous agencies and other interested persons are being been sent the Notice of Availability of the Draft EA and/or were sent the Notice of Intent. The VA NCA welcomes the submittal of comments regarding the project and Draft EA. Comments received will be incorporated in the Final EA.

4.9.5 Conclusion

No Action Alternative

The No Action Alternative could result in some controversy concerning veterans desiring interment in a veteran's cemetery, but who do not desire to be buried in the other closest available veterans' cemeteries in South Carolina, Georgia, or North Carolina. These other cemeteries may be located a further distance or be across a state line from their residence. Also, the two closest national cemeteries in South Carolina are running out of capacity.

Proposed Action Alternatives

The construction and operation of a national cemetery at any of the proposed alternative sites in the Columbia-Greenville, South Carolina area is not likely to cause controversy. This is based on the search for published articles and the content of the articles summarized above, all of which indicate communities would like to have the cemetery. No negative press was identified regarding the proposed action or any of the three alternative sites being considered. No negative comments regarding the proposed action have been provided to the VA NCA or URS acting as their agent, in response to the request for comments and agency coordination letters. No comments from the public have been received in response to the NOIs. Furthermore, the VA NCA does not take exception to any of the comments received from regulatory agencies, and relevant information has been incorporated herein.

5.0 AMERICAN INDIAN AND AGENCY COORDINATION

Sections 4.9.3 and 4.9.4 described the process for coordinating with and contacting American Indian representatives and regulatory agencies, respectfully. The following lists the American Indian Nations, federal, state, and local agencies, and persons that were contacted in connection with, or provided information that was assessed during the preparation of, this EA:

American Indian Consultation

Absentee-Shawnee Tribe of Oklahoma; Hon. Kenneth Blanchard

Alabama-Quassarte Tribal Town; Hon. Tarpie Yargee

Catawba Indian Tribe; Hon. Gilbert Blue

Catawba Indian Tribe; Dr. Wenonah Haire, THPO

Chickasaw Nation; Rena Duncan, Director of Cultural Resources

Coushatta Tribe of Louisiana; Hon. Lovelin Poncho

Eastern Band of Cherokee Indians; Russell Townsend, THPO

Muscogee (Creek) Nation of Oklahoma; Hon. A.D. Ellis

Poarch Creek Indians; Robert Thrower, THPO

Seminole Tribe of Florida; Willard Steele, THPO

Shawnee Tribe; Rebecca Hawkins, THPO

Thlopthlocco Tribal Town; Hon. Bryan McGertt

Thlopthlocco Tribal Town; Charles Coleman

Tuscarora Nation; Hon. Stuart Patterson

Mohawk Nation; Curtis Lazore

United Keetoowah Band; Hon. George Wickliffe

Cherokee Nation of Oklahoma; Mary Tidwell

Eastern Shawnee Tribe of Oklahoma; Glen Brock, Director, Environmental Department

Miccosukee Indian Tribe; Billy Cypress, Chairman

Seminole Indian Tribe; James Billie, Chairman

Seminole Nation of Oklahoma; Gary White Deer, HPO

United South and Eastern Federation of Tribes; James T. Martin, Executive Director

In February 2006, Fort Jackson staff notified the VA NCA that Fort Jackson consults with other American Indian Nations in addition to those listed above. A copy of the Draft Environmental Assessment and Notice of Availability is being sent to the Nations and additional representatives listed as presented in the consultation list (Appendix C).

Federal Agencies

Beaufort National Cemetery, Walter Gray, Jr., Director

Federal Emergency Management Agency, Region IV, Administration and Resource Planning Division, Mr. Kenneth O. Burris, Jr.

Florence National Cemetery, Elfrieda Robinson, Director

Florida National Cemetery, David Wells, Assistant Director

National Trust for Historic Preservation South Regional Office, Mr. Joseph McGill

San Joaquin Valley National Cemetery, Carla Williams, Director

The National Marine Fisheries Service

U.S. Army Corps of Engineers, Charleston District - Regulatory Division, Lisa Metheney

U.S. Army Training Center and Fort Jackson (Fort Jackson)

- Mr. Doyle Allen, Soil Conservationist, Environmental and Natural Resources Division
- Mr. Gary Bowling, Civil Engineer
- Mr. Doug Burchett, Director, Department of the Army, Directorate of Logistics & Engineering
- Mr. Ken Burghardt, Environmental and Natural Resources Division Chief, Directorate of Logistics & Engineering
- Mr. Mark Dutton, Natural Resources Specialist, Environmental and Natural Resources Division
- Mr. Roy Dwelley, Architect & Master Planner, Master Planning Division
- Mr. Patrick Green, Environmental Protection Specialist
- Ms. Barbara Kelly, Director of Information Management Office
- Mr. John Maitland, Lead Forester
- Mr. Jim McCracken, Environmental Specialist
- Mr. Ed McDowell, Fort Jackson Environmental Office Team Leader

Mr. Doug Morrow, Fort Jackson Lead Wildlife Biologist

Mr. Jim Olsen, Geographer

Mr. Tom Peel, Fort Jackson Realty and Planning Specialist

Mr. Stanley Rikard, Wildlife Biologist, Fort Jackson Wildlife Office

Mr. Tony Risher, Fort Jackson Director of Directorate Plans, Taskings, Mobilization & Security

Mr. James Wyatt, Directorate of Plans, Training, Mobilization and Security (DPTMS, Range Control

U.S. Department of Agriculture

Newberry Service Center, Newberry County Conservation District

Newberry Service Center, Newberry County Farm Service Agency

Newberry Service Center, Newberry County Natural Resources Conservation Service

Newberry Service Center, Newberry County Rural Development

Orangeburg Service Center, Richland County Rural Development

Spartanburg Service Center, Union County Farm Service Agency

Spartanburg Service Center, Natural Resources Conservation Service, Union County office

Spartanburg Service Center, Union County Rural Development office

St. Matthews Service Center, Richland County Farm Service Agency

St Matthews Service Center, Richland County Natural Resources Conservation Service

U.S. Department of Veterans Affairs, National Cemetery Administration

Bruce Borko, Program Analyst / Civil Engineer, Office of Construction Management

Edison Carlos, Civil Engineer, Office of Construction Management

Frank J. Kawulich, Civil Engineer, Memorial Service Network II

U.S. Department of Veterans Affairs, State Grants Program, Scott Gebhardtsbauer

U.S. Environmental Protection Agency, Region IV

NEPA Program Office, Office of Policy and Management, Mr. Heinz J. Mueller

Mr. Ralph Howard

U.S. Fish and Wildlife Service

Jason Ayres

Tim Hall

U.S. Forest Service, Francis Marion & Sumter National Forests

United States Congress

Senator Lindsey O. Graham

Senator Jim Demint

Congressman Henry E. Brown, Jr.

Congressman Joe Wilson

Congressman J. Gresham Barrett

Congressman Bob Inglis

Congressman John M. Spratt

Congressman James Clyburn

State

African-American Heritage Commission, SC, Ms. Jannie Harriot, Chairman

AMVETS, Mr. Roy L. Massey

Archaeological Society of South Carolina, Mr. Bill Lyles, President

Confederation of South Carolina Local Historical Societies, Mr. Horace Harmon, President

Clinton-Newberry Natural Gas Authority, Lee Ringer, Superintendent

Daughters of the American Revolution, South Carolina State Society, Mrs. S. Perry (Sheila) Davis, Regent

Disabled American Veterans, Mr. Prince Tucker, Jr.

First Families of SC 1670-1700, SC Society, Mr. Kisler Rhodes, President

Historical Society of South Carolina, Mr. Eric Emerson, Director

Sons of Confederate Veterans, South Carolina Division Mr. Robert H. Roper, III, President

Sons of the American Revolution, SC Society, Mr. Jerry Sifford, Jr., President

South Carolina Department of Archives and History, Chad Long, Archaeologist, and Richard Sidebottom, Review and Compliance Coordinator

South Carolina Department of Commerce, Robert Faith, Secretary of Commerce

South Carolina Department of Veterans Affairs, Mr. Phil Butler, Director

South Carolina Department of Health and Environmental Control (SCDHEC), Commissioner C. Earl Hunter

SCDHEC, Bureau of Land and Waste Management

Mr. Art Shrader

Mr. Carroll Burley

Mr. John McCain

Mr. Gerald Shealy

Mr. Marty Lindler

Mr. B. Tom Knight, Manager of Groundwater Quality

SCDHEC, Bureau of Water, Division of Environmental Quality Control

Paul Bristol

Kim Firstin

SCDHEC, District Office, Aubrey Stewart

South Carolina Department of Natural Resources (SCDNR)

John E. Frampton, Director

Ms. Julie Holling Wildlife Diversity Programs Section, Natural Heritage Trust

South Carolina Department of Transportation

Elizabeth S. Mabry, Executive Director

Marshall Bogan, Engineer

South Carolina Emergency Management Division, Ronald C. Osborne

South Carolina Geological Survey, Scott Howard

South Carolina Governor Mark Sanford

South Carolina Office of State Budget, State Clearinghouse, Les Boles, Director

South Carolina State

Senator James H Ritchie, Jr., Dist. No. 13 - Greenville, Spartanburg & Union Counties

Senator Linda H. Short, Dist. No. 17 - Chester, Fairfield, Union & York Counties

Senator Harvey S. Peeler, Jr., Dist. No. 14 - Cherokee, Spartanburg, Union & York Counties

Senator Ronnie W. Cromer, District 18 - Lexington, Newberry & Saluda Counties

Representative Jeff Duncan

State Historic Preservation Office, South Carolina Archives and History, Elizabeth Johnson

The American Legion, Mr. Bobby Gibbons

United Daughters of the Confederacy, SC Division, Ms. Miriam Tucker, President

VFW Department of South Carolina, Mr. Richard Bell, Jr.

City

City of Columbia

Fire Department, Frank Maples

Mayor Bob Coble

Office of Economic Development, Deidre Crow

Public Works Department, Solid Waste Division, Emmanuel Lawson & Missy Gentry

Water Works, Gregory Martin

City of Union Natural Gas Utility, Melody Porter, City Engineer

Greater Columbia Chamber of Commerce

Blake Daniels, Vice-President, Public Affairs & Community Development

Ike McLeese, President

Meansville-Riley Road Water District, Mike Folmer

Town of Whitmire

Mayor Tim Carroll

Jimmy Dunnaway, Public Works Director

County

Central Midlands Council of Governments

Newberry County

Tax Assessor's Office

Anne O. Peters, Zoning Administrator

Tom Brooks, Flood Prevention Administrator

Gary Pope, County Attorney

Auditor's Office, Nancy P. Owen, County Auditor

Chamber of Commerce, Joe Trainor, President

Sheriff's Department, Jerry Wright, Chief Deputy

Treasurer's Office, Karen Lindler

Councilman W. Edgar Baker

Teresa C. Powers, Planning & Economic Development Director

Historical Society, Mr. Gordon Henry, President

Environmental Health Department, Katherine Bennett

Veterans Services

Richland County

Tax Assessor's Office, Mr. John W. (Jay) Begg, Jr.

Department of Public Works, Utilities and Services Division, Larry Brazelle

School District 2

Sheriff's Office

Veterans Services

Union County

Chamber of Commerce, Torance Inman, Director

County Courthouse, Donnie Betbaugh & Linda Jolly

Cross Keys Fire Department, Donald Crawford Jr., Chief

Development Board, Stanley Vanderford

Historical Foundation, Mr. Mike Becknell, President

Sheriff's Department, Roger Gregory, Chief Department Deputy

Supervisor, Mr. Donnie Betenbaugh

Veterans Services Representative, Ms. Cindy Fore

Other

AT&T Telecommunications Company, Peggy Womack & Susan Knox

Bell South, John Moon

Nancy Daves, Owner, Whitmire Site

Donna Doyle, Fort Jackson coordination contact, Fort Jackson VA Cemetery Task Force

Major General (Ret.) George Goldsmith, Chairman, Fort Jackson VA Cemetery Task Force

John Greer, Owner, Sedalia Site

Kahn Construction Company, Alan Kahn, President

Lockhart Power Company

Gerald Garner

Bruce Parker

Mungo Development, Bill Dixon, Vice President of Development

Palmetto Conservation Foundation, Ms. Jennifer Revels (Architectural Historian Consultant to Union County)

Maxie Sanders, Site Contact for Sedalia Site

South Carolina Electric & Gas, a SCANA Company

Bill Eisele

Wesley McIver

South Carolina Pipeline Corporation (SCPC)

Mac Semple, Supervisor ROW Services

Dave Franklin, ROW Administrator

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7.0 LIST OF PREPARERS

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Mr. Allen has over 35 years experience on a variety of civil, geotechnical, and seismic engineering projects, NEPA environmental impact assessments, Phase I and II Environmental Site Assessments, waste stream and pollution prevention projects, environmental permitting, and hazards analysis. He has served as the Independent Technical Reviewer for previous NEPA EAs, a Geophysical Survey Report, and Phase II Soil and Groundwater Investigation Reports for other cemetery development projects for the VA NCA.

Daniel B. Dobry, Jr., P.E., Senior Traffic Engineer

Mr. Dobry has more than 26 years experience managing and performing transportation planning and traffic engineering studies, which include traffic impact studies, traffic modeling and simulation, signal warrant studies, safety studies, parking demand studies, concept plan development, access and circulation studies, production of signal timing plans, and town center master planning. He has worked with a variety of traffic related software, including: CORSIM, Synchro, Highway Capacity Software, VISSIM, and trip generation software.

Lawrence Frank, Senior Planner

Mr. Frank has over 11 years of experience in the floodplain management and water resource fields. Prior to coming to URS, he worked at FEMA Region IV for 10 years where he assisted numerous local and state governments in the development and implementation of flood mitigation projects. He has conducted training sessions and written national guidance concerning issues of development in floodplains. Mr. Frank also has a wide range of experience researching and writing various NEPA documents. In addition, Mr. Frank passed both the Association of State Floodplain Manager's Certified Floodplain Manager's (CFM) exam and the American Planning Association's American Institute of Certified Planner's exam (AICP).

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Mr. Hicks has 5 years experience managing and performing transportation planning and land use studies. Prior to coming to URS, he worked at the Metropolitan Atlanta Rapid Transit Authority (MARTA) where he specialized in short-range service planning. His work responsibilities have included transit feasibility studies, traffic analysis, streetscape design, comprehensive land use plans, local area redevelopment studies, traffic calming studies, real estate studies, market analysis, disaster mitigation and recovery studies, concept plan development, access and circulation studies, and Section 106 environmental permitting work. He has worked with a variety of planning software, including: GIS, HAZUS, and SPSS.

Beau Marshall, Ecologist / Environmental Scientist

Mr. Marshall has over 3 years of experience in environmental science. His background includes development and implementation of water quality regulations and permits, stormwater pollution investigations, erosion and sedimentation control, corrective action evaluation and coordination,

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Ms. McKinney has over 8 years of experience as an environmental scientist. She works on a variety of inter-disciplinary projects, including Phase I ESA investigations, asbestos and lead-based paint surveys, indoor air quality projects, and regulatory compliance projects. She has also prepared NEPA EAs for submittal to multiple federal authorities for proposed development projects.

Larry W. Neal, Senior Ecologist

Mr. Neal has 31 years of experience in the ecology of aquatic and terrestrial ecosystems. As a Senior Scientist, he manages environmental planning programs/projects or serves as principal investigator on projects for industrial and government clients. He provides technical direction, manages, and/or performs environmental studies for site development, permitting, and NEPA assessments, including agency coordination and public involvement programs. He has provided expert testimony on environmental impact and risk assessment issues on behalf of utilities and industry in South Carolina and Florida.

Molly Sheehan, Architectural Historian and Historic Preservation Specialist

Ms. Sheehan has over 5 years of experience as an architectural historian and preservation specialist performing cultural resources surveys and historic structure analysis. She has provided technical support in cultural resources and aesthetic analyses for several federal, state, and local agencies. Further, Ms. Sheehan has managed multiple resource inventories and reconnaissance- and intensive-level historic architectural surveys. Ms. Sheehan has experience researching and writing various NEPA documents and cultural resources reports.

Patricia Slade, Project Manager

Ms. Slade has more than 20 years of experience in NEPA documentation, environmental planning, environmental due diligence, and geological studies. She has served as the NEPA Project Manager for previous VA NCA cemetery development projects. She works on a variety of inter-disciplinary projects, including stormwater/NPDES permitting, Phase I ESAs and Phase II investigations, geotechnical investigations, asbestos and lead-based paint surveys, cultural resources surveys, indoor air quality surveys, county-wide flood damage reduction projects, and regulatory compliance projects. She has performed or managed completion of numerous NEPA documents for a variety of federal and state agencies.

Patrick Smith, RPA, Senior Archaeologist

Mr. Smith has 11 years experience in Cultural Resources Management and the archaeology of

the Southeastern U.S. He has directed survey, testing, and/or mitigation projects for a number of clients, including the Georgia and Alabama departments of transportation, FEMA, Fort McClellan, and Fort Benning Military Reservation in Georgia. In 2001, he directed the excavation of a 40,000 square meter portion of Kasita (9CE1), a Lower Creek town situated on Lawson Army Airfield. He joined the Atlanta office of URS after several years of employment with Panamerican Consultants in Alabama and Georgia.

Betsy Stone, Senior Environmental Scientist

Ms. Stone has over 25 years of experience in managing inter-disciplinary environmental projects. Projects have ranged from Phase I Environmental Site Assessments; environmental restoration including investigation, feasibility studies, remedial design, and remedial action phases under both CERCLA and RCRA; and pollution prevention. She is experienced in managing inter-disciplinary teams, coordinating and scheduling interrelated tasks, and tracking budgets.

Ann Yarnell, Environmental Scientist

Ms. Yarnell is an environmental scientist with a Bachelor's degree in environmental resource management and 5 years of relevant environmental and NEPA experience. She has prepared NEPA EAs for submittal to multiple federal authorities for proposed development projects; and conducted over 200 NEPA screenings to evaluate the potential for significant effects of projects on endangered species and wetlands. Ms. Yarnell has assisted with multiple aspects of regulatory compliance from hazardous waste, air, waste water, stormwater, spill response, and environmental compliance audits.

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