

National Park Service  
U.S. Department of the Interior

Cumberland Gap National Historical Park



# Cumberland Gap National Historical Park

Renew Wilderness Road Campgrounds Wastewater System

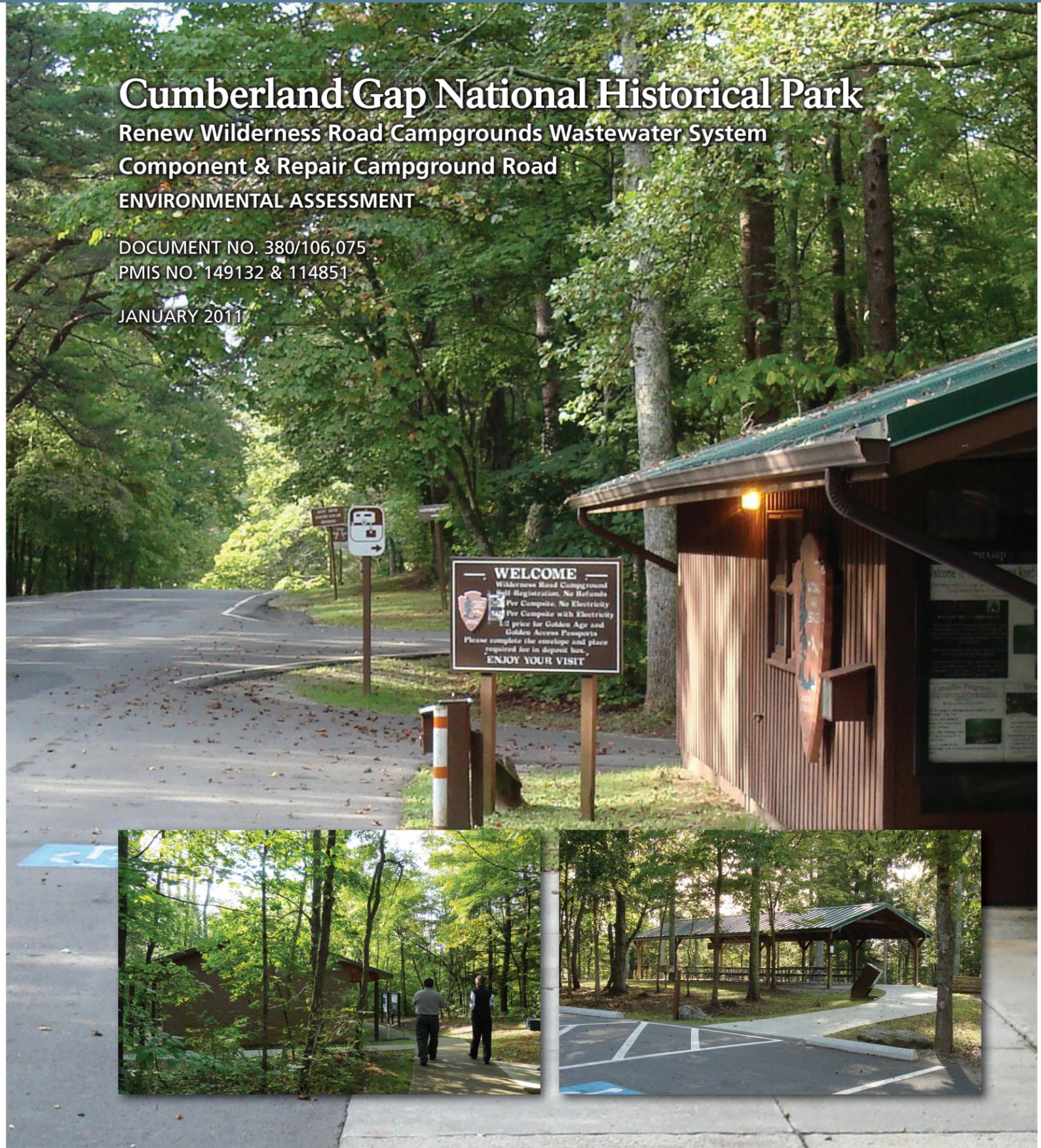
Component & Repair Campground Road

ENVIRONMENTAL ASSESSMENT

DOCUMENT NO. 380/106,075

PMIS NO. 149132 & 114851

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**U.S. Department of the Interior  
National Park Service**

**Cumberland Gap National Historical Park  
Kentucky, Tennessee, and Virginia**

**Renew Wilderness Road Campground Wastewater System  
Component & Repair Wilderness Campground Road  
Environmental Assessment**

**January, 2010**

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**Proposed Action:** The Wilderness Road campground is located in the Lee County, Virginia portion of Cumberland Gap National Historical Park. Replacement and rehabilitation of the campground's overall sewer and water systems are needed due to the deteriorated condition of their components, which provide service for visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems at the campground was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. Disruptions in sanitary sewer service and water supply have implications for visitor use and experience/recreation and park operations. The National Park Service (NPS) proposes to replace and rehabilitate the sewer system components and replace the water supply lines serving those facilities of the Wilderness Road campground which produce wastewater, including three comfort stations, the Fire Use Module building, the Volunteer in Park (VIP) campsite, the Entrance Station, and a recreational vehicle (RV) dump station. Actions needed to achieve these goals include installation of the new sewer system components, relocation of the water supply lines near new leach fields, and appropriate abandonment of old sewer system components when they are disconnected from the wastewater system. Implementation of the NPS preferred alternative would result in adverse impacts on geologic resources, soils, water quality, vegetation, and special status species, and long-term beneficial impacts on water quality, floodplains, wildlife, special status species, visitor use and experience/recreation, infrastructure and park operations, and public health and safety.

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**Note to Reviewers and Respondents:**

If you wish to comment on this Environmental Assessment, you may post them electronically at <http://parkplanning.nps.gov/cuga> or you may mail comments within 30 days to the name and address below. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your

comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so.

Superintendent  
Cumberland Gap National Historical Park  
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# ACRONYMS AND ABBREVIATIONS

**AD** – anno domini  
**ADA** – Americans with Disabilities Act  
**APE** – Area of Potential Effect  
**BC** – Before Christ  
**CEQ** – Council on Environmental Quality  
**col/100 ml** – colonies of *Escherichia coli* bacteria per 100 ml  
**DCR** – Virginia Department of Conservation and Recreation  
**DEQ** – Virginia Department of Environmental Quality  
**DGIF** – Virginia Department of Game and Inland Fisheries  
**DHR** – Virginia Department of Historic Resources  
**DO** – Director’s Order  
**DWPC** – Division of Water Pollution Control (Tennessee)  
**DSS** – Data Sharing System  
**EA** – environmental assessment  
**EPA** – Environmental Protection Agency  
**FEMA** – Federal Emergency Management Agency  
**FUM** – Fire Use Module  
**GMP** – general management plan  
**HDPE** – high-density polyethylene  
**IPAC** – Information, Planning, and Conservation System  
**IPCC** – Intergovernmental Panel on Climate Change  
**LUP** – Land Use Permit  
**National Register** – National Register of Historic Places  
**NEPA** – National Environmental Policy Act  
**NHPA** – National Historic Preservation Act  
**NOI** – Notice of Intent  
**NPS** – National Park Service  
**NRCS** – Natural Resources Conservation Service  
**park** – Cumberland Gap National Historical Park  
**PEPC** – Planning, Environment and Public Comment  
**RM** – Reference Manual  
**RV** – recreational vehicle  
**SHPO** – state historic preservation officer  
**SWCB** – State Water Control Board  
**SWPPP** – Stormwater Pollution Prevention Plan

**TNC** – transient non-community water system  
**US 58** – U.S. Highway 58  
**USCOE** – U.S. Army Corps of Engineers  
**USFWS** – U.S. Fish and Wildlife Service  
**USGS** – United States Geological Survey  
**VAFWIS** – Virginia Fish and Wildlife Information Service  
**VDOT** – Virginia Department of Transportation  
**VIP** – Volunteer in Park  
**VSMP** – Virginia Stormwater Management Permit

# 1

## **INTRODUCTION: PURPOSE AND NEED**

Cumberland Gap National Historical Park (the park) was authorized by Congress in 1940 to commemorate the story of the first doorway to the west. The park is authorized by Congress not to exceed 50,000 acres, and presently includes 24,531 acres, most of which straddles Cumberland Mountain. The ridgeline of Cumberland Mountain also constitutes the boundary between Virginia and Kentucky (Figure 1). Large portions of the park lie in both states, with a lesser amount located in Tennessee.

Included within the 24,531 acres of the park are 14,091 acres of Recommended Wilderness as well as portions of the Fern Lake watershed. Hiking trails and combined hiking and bicycle trails stretch along the park from west to east and commence at various trailheads. These trails link both drive-in and primitive campgrounds with picnic areas, caves, and historic areas with the Wilderness Road campground. It is located within Lee County, Virginia, just north of US 58 between Gibson Station and Cumberland Gap (Figure 1).

The Wilderness Road campground and neighboring picnic area was built in the early 1960s. The campground is the only developed campground within the park. These facilities lie in the western and most developed area of the park, which includes the Visitor Center, the Daniel Boone Visitor Contact Center, and the Pinnacle Overlook (Figure 1). The campground provides 160 woodland campsites for tent, trailer, and recreational vehicle (RV) campers. Of this total, 41 have 50-amp electrical hookups. Facilities also include three comfort stations with hot showers and potable water, a group shelter, and an RV dump station. Wilderness Road campground serves multiple purposes, acting as a destination campground for individuals or families on vacation, as a means of accommodation for visitors exploring the history of the Cumberland Gap area, and as a marshalling point for backcountry hikers at the beginning or end of their journeys.

Over the last 10 years (2000-2009), the Wilderness Road campground has hosted an average of 103,395 visitors per year. Peak visitation is typically in the month of July. Over the same 10-year period, attendance in July averaged 14,675 visitors (NPS 2010a).

The sanitary sewer systems that currently serve the campground are comprised largely of the original components. The aged condition of the sewer system has resulted in increasingly frequent sewer pipe blockages and periodic overflows of sewage onto ground surfaces adjacent

to manholes. These events pose a risk to visitor health and safety and the water quality of nearby Station Creek. The system of water pipes is similarly aged. Pipes also have broken spontaneously and at an increasing rate. The deteriorated condition of both the sewer and water system requires costly and routine maintenance to restore services that are essential to the campground experience.

This Environmental Assessment (EA) evaluates two alternatives to address the sewer and water system issues at the Wilderness Road campground: a no-action alternative and the action alternative. The action alternative is the National Park Service (NPS) preferred alternative. The EA further analyzes the potential impacts these alternatives would have on the natural, cultural, and human environment. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; and NPS Director's Order (DO) 12: Conservation Planning, Environmental Impact Analysis, and Decision-Making.

## **PURPOSE OF AND NEED FOR ACTION**

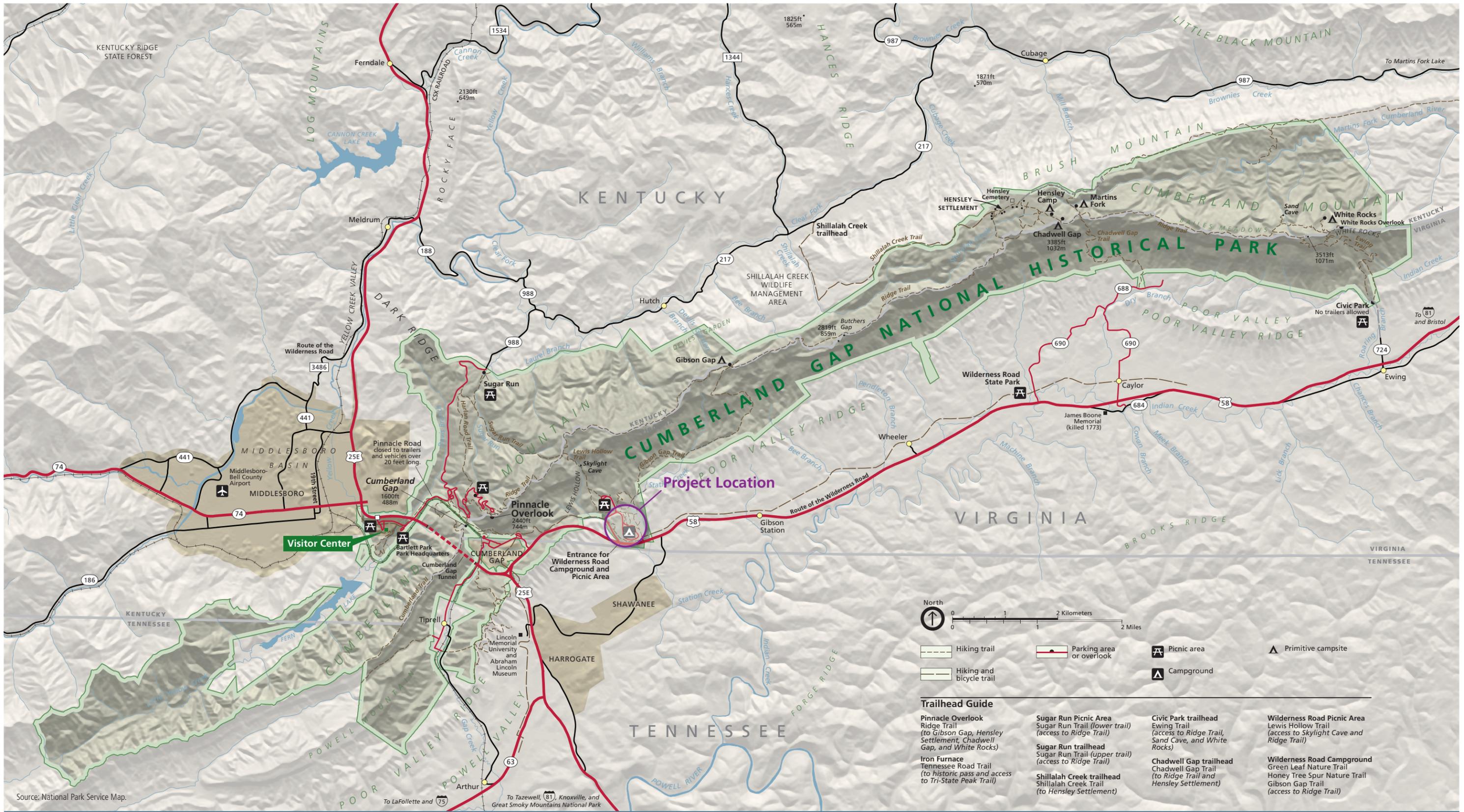
The purpose of the proposed action is to rehabilitate and replace components of failing sanitary sewer systems and the existing water line servicing the Wilderness Road campground. The proposed sewer system improvements would provide a safer experience for park visitors and staff, and would reduce threats to park resources by reducing the potential for accidental sewage overflows. Replacing the water line would minimize service interruptions and water loss via pipe leakage, which occurs in localized fashion during pipe breakages but may also be happening at a lesser and undetected rate below the ground surface. The proposed project also would reduce long-term maintenance costs.

The objectives of the proposed project are as follows:

- 1) Improve the efficiency of park operations by reducing maintenance costs and costs related to deficiencies in the condition of the systems
- 2) Provide a safe and healthy environment for both visitors and park staff
- 3) Remove a potential source of surface water contamination
- 4) Protect park natural and cultural resources and values

The Wilderness Road campground is the only campground in the park that allows vehicular access and provides bathroom and shower facilities. There are 160 campsites and three comfort stations. Components of the sanitary sewer system to which these comfort stations are connected are roughly 50 years old and have exceeded their useful lifespan. The service capacity of the sewer system is exceeded during times of peak visitation.

A comprehensive review of the existing sanitary sewer system using a remote-controlled video camera determined that the connectivity within the network of pipes has been compromised by segments of broken pipe, offset pipe unions, and tree roots. Localized sags in the pipeline also were observed. As the sanitary sewer system is gravity fed and because the septic tank is located an appreciable distance down gradient of the comfort stations at the location of the leach fields,



Source: National Park Service Map.



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Figure 1  
Project Location Map



waste solids preferentially settle in these sags. This further reduces the ability of the system to transfer waste and enhances the likelihood of pipe blockages. The remote camera study helped assess the degree of system degradation and determined that no existing pipes are suitable for continued use.

Material deterioration of the sewer lines, encroachment by roots, localized failures in pipe bedding, and the positioning of septic tanks at the leach field location as opposed to nearer the comfort stations have contributed to frequent blockages and periodic overflows of untreated sewage. These events represent a potential health concern for park visitors and park staff and may threaten down gradient resources such as Station Creek. These events also require ongoing maintenance at unpredictable intervals, causing a drain on park resources. The water lines servicing the comfort stations and other park buildings at the campground also are prone to failure. In the period between October 2009 and September 2010, six such failures have occurred.

Rehabilitating and repairing both the sanitary sewer system and water lines at the Wilderness Road campground is needed to:

- address potential threats to public health and natural resources
- to curtail maintenance costs
- to limit service interruptions
- to enhance sanitary sewer service capacity
- to improve the efficacy of the water delivery system and thereby conserve water resources

## **PARK PURPOSE AND SIGNIFICANCE**

The park was authorized by Congress on June 11, 1940 to commemorate the importance of Cumberland Gap in the westward expansion during the late 1700s and early 1800s. The gap represents a major natural break in the Appalachian Mountain chain, one that provided settlers with an opportunistic means of accessing the interior of the country. In 1750, Dr. Thomas Walker, surveyor of the Loyal Land Company, became the first to document the route to the Gap. Dr. Walker named the route in honor of William, Duke of Cumberland, brother of King George II. In 1775, Daniel Boone was commissioned to blaze a road through the Gap. Boone's Trace evolved into Wilderness Road, establishing his place in history as a frontiersman and pathfinder. Cumberland Gap was the primary route to the west until 1810 and was of strategic importance during the Civil War. In the 1920s, major segments of the Wilderness Road became U.S. Highway 25E and U.S. Highway 58. These persisted until they were relocated to the twin-bore Cumberland Gap Tunnel system in 1996. This allowed for the rehabilitation of Wilderness Road, the park's primary historic feature, to its natural and historic topography.

Cumberland Gap Historic District was listed on the National Register of Historic Places in 1980. The nomination form lists 20 historic structures within the district, including the Wilderness Road; various Civil War forts, structures, batteries, and roads; an iron furnace dating to the early

1800s; and Pinnacle Road and the Overlook Complex. Other historic and natural resources in the park include Hensley Settlement (a community of 12 scattered farmsteads situated on an isolated plateau on Brush Mountain and established in 1904), 24 known caves, and a major portion of the watershed of Fern Lake in the southwestern end of the park. Fern Lake is the drinking water source for nearby Middlesboro, Kentucky.

## **PROJECT BACKGROUND**

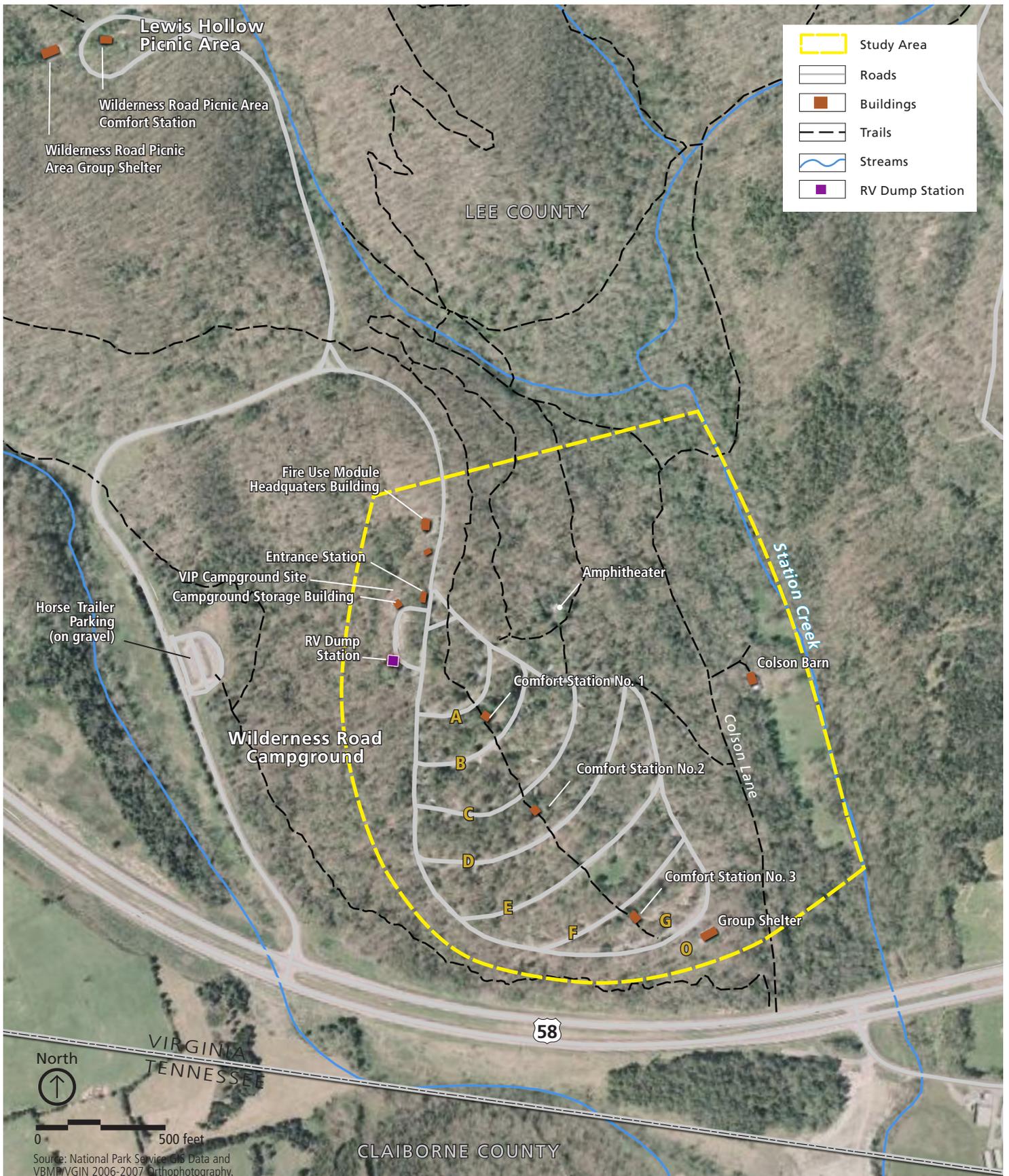
The Wilderness Road campground is located in close proximity to the Cumberland Gap Historic District and to the most developed and heavily trafficked area of the park. The campground is accessed via US 58, a four-lane highway with an annual average daily traffic count of 6,100 vehicles at the location of the campground entrance. The campground is purposefully connected to the park's network of hiking trails, including the Lewis Hollow Trail leading to Skylight Cave and the Boone Trail leading to the gap. Small, local trails offer visitors the opportunity to enjoy shorter hikes. Campground amenities include three comfort stations, an amphitheatre, a picnic area, and a group shelter (Figure 2). The Cumberland Gap Fire Use Module (FUM) has its headquarters within the campground, located in the northernmost building. The FUM is a highly skilled, seven-person professional and technical resource for prescribed fire, wildland fire use, and wildland fire suppression assignments.

Because the campground is accessible by both foot travelers and motorists, it caters to a broad demographic of potential park visitors. Campground visitation is highest in the month of July and lowest in February. Though camping operations are reduced in the wintertime, the campground is open year-round. From the end of November through March, comfort stations #2 and #3 are closed while comfort station #1 remains open. Station #1 services loops A, B, and C (Figure 3). Loops B and C include 41 sites with 50 amp electrical hook-ups catering to campers with RVs. RV campers represent the majority of wintertime visitors.

The Wilderness Road campground is a particularly important park resource. This is in part due to its unique status as the only campground within the park with vehicular access and its year-round availability when remote primitive camp sites may be inaccessible. Offering campers comfortable and well functioning facilities enhances the visitor experience.

## **GENERAL MANAGEMENT PLAN**

The *Final General Management Plan* (GMP) for the park (NPS 2010b) represents a long-term planning document that establishes and articulates a management philosophy and framework for decision making and problem solving. Published in 2010, the GMP provides management direction for the next 15 to 20 years. The Wilderness Road campground lies within the park's Developed Zone, which focuses on providing visitor access, information, structured activities, and other visitor services. This zone also provides opportunities for visitors to gather and learn about the varied cultural and natural resources in the park, engage in interpretive activities, and have access to park facilities. Recognizing the importance of the Wilderness Road campground within the Developed Zone, the GMP targets the campground for continued improvement in the



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Figure 2  
Study Area Map



future. Loop D would receive additional electrical hookups to allow increased RV usage. Two to four of the campground's RV sites would be modified to accommodate horse trailers and thus encourage horse use in the park

## **SCOPING**

Scoping is an early and open process to determine the breadth of environmental issues and alternatives to be addressed in a NEPA document. Scoping is used to identify which issues need to be analyzed in detail and which can be eliminated from in-depth analysis. It also allocates assignments among the NPS' interdisciplinary team members and/or other participating agencies; identifies related projects and associated documents; identifies permits, surveys, consultation, and other requirements; and creates a schedule that allows adequate time to prepare and distribute the EA for public review and comment before a final decision is made. Scoping efforts may include any public, staff, interested agency, or any agency with jurisdiction by law or expertise such as the State Historic Preservation Officer (SHPO), the U.S. Fish and Wildlife Service (USFWS), and other state and local agencies.

Internal scoping was conducted with an interdisciplinary team of environmental resource, historic resource, and facilities management specialists from the park. Interdisciplinary team members met on September 9, 2010 to discuss the purpose and need for the project; the project boundaries; various alternatives; planning issues and potential environmental impacts; existing information and resources; and past, present, and reasonably foreseeable projects that may have cumulative effects.

External scoping was initiated with the distribution of a scoping letter to inform the public of alternatives under consideration and to generate input relevant to the preparation of this EA. Scoping letters, dated September 24, 2010, were mailed to interested parties including local, state, and federal agencies as well as various American Indian tribes. These letters are included in "Appendix A: Scoping Letters." Scoping information was also posted on the park's website on this same date, and a press release notifying the public of the scoping period was issued to several media outlets. A 30-day public comment period was initiated with the mailing to solicit input on the proposed action, ending on October 25, 2010. A total of 3 public comments were received from private citizens (1 was provided by mail and two were directly entered into the NPS Planning, Environment, and Public Comment (PEPC) database). Comments received from the public were unanimously positive. For additional details on scoping and public participation information, see "Chapter 5: Consultation and Coordination" and "Appendix B: Relevant Correspondence."

## **PLANNING ISSUES AND CONCERNS**

During the scoping process, specific considerations and concerns were identified as critical to the rehabilitation and repair of the Wilderness Road campground sanitary sewer and water line systems. The following were identified as most important to the planning process: floodplain encroachment, archeological resources, Indiana bat habitat, construction phasing, and past sewer

system performance. Along with the purpose and need for the proposed action, these topics guided the development of alternatives and contributed to the selection of impact topics, as identified in the next section.

### ***Floodplain Encroachment***

The septic tank and dual leach fields that receive sanitary wastewater from the three comfort stations are currently located in a bottomland setting in the valley of Station Creek and in close proximity to the stream (Figure 3). A portion of the southern leach field is located within the floodplain as mapped by the Federal Emergency Management Agency (FEMA).

### ***Avoidance of Known Archeological Resources***

Archeological resources are known to be present within the study area and may occur in bottomland areas west of Station Creek. Surveying for archeological resources was conducted to assist in the positioning of the proposed leach fields.

### ***Protection of Indiana Bat Habitat***

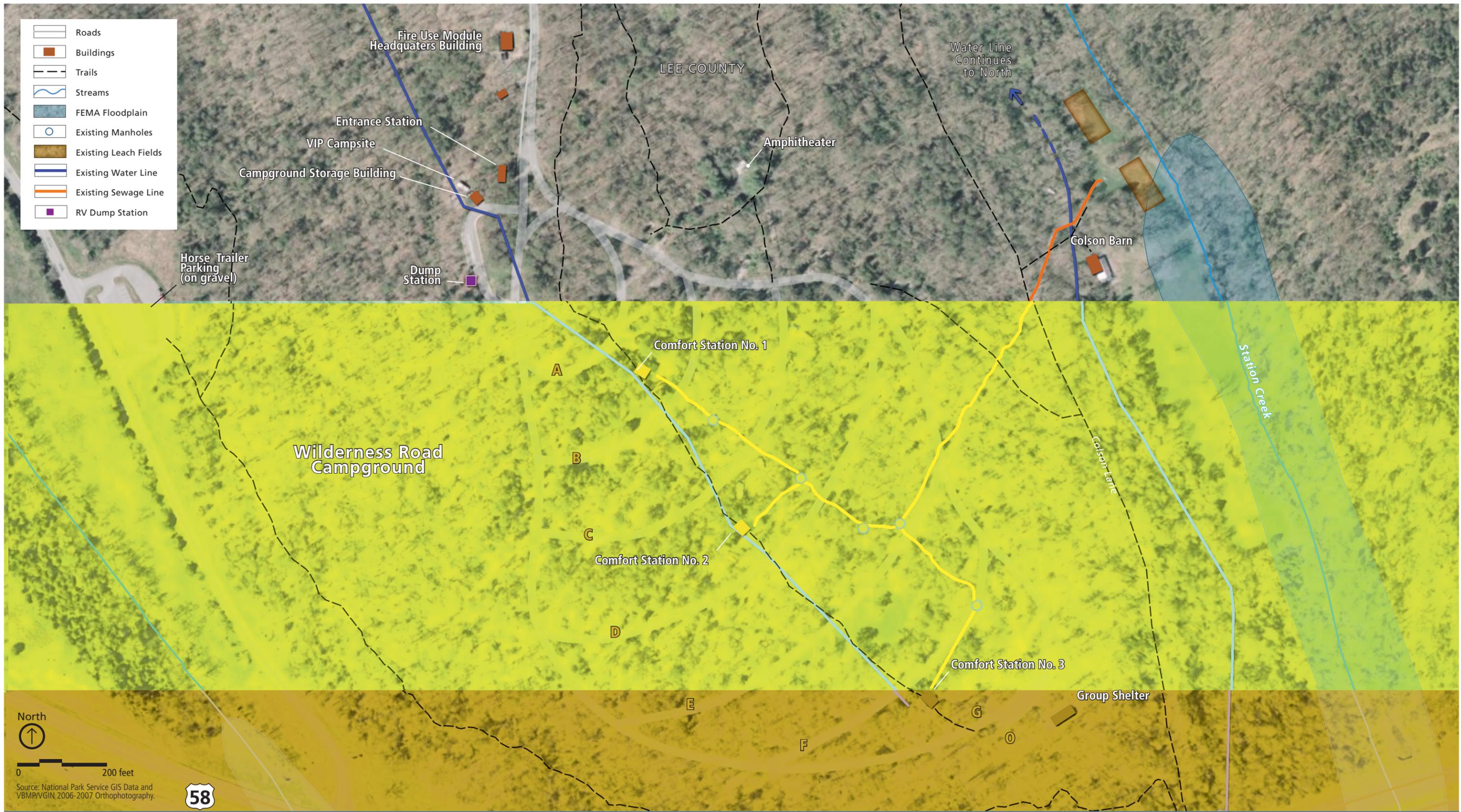
The Information, Planning, and Conservation System (IPAC) maintained by the USFWS indicates that the gray bat (*Myotis grisescens*) and Indiana bat (*Myotis sodalis*) are known to occur within the vicinity and therefore may be present within the project boundary. Both of these bats are federal and state listed endangered species. Most gray bats live almost exclusively in caves located near rivers. Indiana bats hibernate in caves over the winter and spend summers outside caves. The forested areas near Station Creek may provide summer roosting and foraging habitat for these species. For this reason, a tree survey was conducted within the proposed leach field area in September 2010 to assist in the determination as to whether or not the area represents suitable summer habitat for the Indiana bat.

### ***Construction Phasing and Visitor Use***

Potable water and sanitary facilities are considered essential services for those staying at the Wilderness Road campground. While the campground is open year-round, the construction of the rehabilitated sanitary system, its replacement leach fields, and the new water lines would require a period of campground closure. Such a closure would affect visitor use and experience / recreation. Project planning and design considered the implications of such potential impacts. Opportunities to phase the project construction to coincide with the fall and winter months were evaluated as a means of minimizing the impacts of campground closure.

### ***Past Sewer System Performance***

The performance of the existing system was used to inform the decision making process with regards to the design of the proposed sanitary sewer rehabilitation and leach field replacement. For example, the septic tank that receives wastewater from the comfort stations is located at the end point of the system, immediately adjacent to the existing leach fields. This configuration means that solid waste travels a considerable distance from the comfort stations through the sewer pipes via gravity. The longest distance is from the northernmost comfort station #1, measuring roughly 1,250 feet (Figure 3). This arrangement presents opportunities for solids to settle within the pipes or be trapped behind pipe obstructions such as roots, reducing system efficiency and increasing the likelihood of system overflows. Such overflows and pipe



Renew Wilderness Road Campground Wastewater System Component - Environmental Assessment

Figure 3  
Existing Conditions



obstructions can affect visitor use and experience / recreation and park infrastructure and operations. Planning for and design of the proposed system recognized and avoided the inclusion of such potentially deficient design elements and was informed by a remote camera survey of the entire sewer pipe system. This survey determined that while all existing pipes were severely compromised, a number of the manholes were observed to be suitable for future use.

## **REGULATORY ISSUES AND MANAGEMENT CONCERNS**

Certain agency consultations, approvals, and/or permits would be required prior to the construction of the sanitary sewer system and water line improvements at the Wilderness Road campground. These include the following:

1. As the area of proposed disturbance would likely exceed 1.0 acre in size, a Virginia Stormwater Management Program (VSMP) Permit would be required to authorize land disturbance and construction of the project. The permit also would require a Stormwater Pollution Prevention Plan (SWPPP).
2. Section 7 of the Endangered Species Act mandates that all federal agencies consider the potential impacts of their actions on species listed as threatened or endangered. While the proposed action is not expected to adversely impact a federally listed species or its critical habitat, consultation with the USFWS would continue regardless to keep the agency informed of project status and to invite commentary and recommendations on mitigation approaches, if applicable. Similarly, coordination with the Virginia Department of Game and Inland Fisheries (DGIF) would continue regarding the possible presence of state-listed rare, threatened, or endangered species within the study area.
3. In order to comply with Section 106 of the National Historical Preservation Act (NHPA), the park would consult with the SHPO, as represented by the Virginia Department of Historic Resources to determine the effect of the proposed action on archeological resources.
4. Before installing the new sanitary sewer system, the park would have to obtain a permit for On-Site Sewage Disposal from the Lee County Health Department, which administers Virginia Department of Health (VDH) regulations at a local level. No permit is required to abandon the existing system.
5. A Land Use Permit and Work Zone Traffic Control Certification Verification from the Virginia Department of Transportation (VDOT) may be required should the delivery of construction equipment or materials require improvements to the Colson Lane / US 58 intersection and/or temporary parking on the shoulder of US 58. Appropriate signage may be required if construction vehicles are entering and exiting from this intersection.

A more detailed discussion of the anticipated regulatory permits is included in “Chapter 5: Consultation and Coordination” and “Appendix B: Relevant Correspondence.”

## **IMPACT TOPICS RETAINED FOR ANALYSIS**

Impact topics are resources of concern within the study area that could be affected, either beneficially or adversely, by the range of alternatives presented in this EA. They were identified based on the issues raised during scoping; site conditions; federal laws, regulations, Executive Orders; NPS *Management Policies 2006* (NPS 2006), and Director's Orders; related park planning documents; and staff knowledge of the park's resources.

Impact topics are listed below along with a brief rationale for the selection of each impact topic. They include geologic resources and soils, water quality, floodplains, vegetation, wildlife, archeological resources, special status species, visitor use and experience / recreation, infrastructure and park operations, and public safety. Each impact topic is further discussed in detail in "Chapter 3: Affected Environment" and Chapter 4: Environmental Consequences" of this document.

### **Geologic Resources & Soils**

NPS *Management Policies 2006* (NPS 2006) state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. These policies further state that "[m]anagement action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils." Furthermore, the NPS will "protect geologic features from the unacceptable impacts of human activity while allowing natural processes to continue." Geologic features include karst systems, which are known to occur within the study area. Therefore, the impact topic of geologic resources and soils is considered in the EA.

### **Water Quality**

NPS *Management Policies 2006* (NPS 2006) states that the NPS will "take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations." Therefore, this impact topic is considered in the EA.

### **Floodplains**

Executive Order 11988, "Floodplain Management," and NPS DO-77-2: *Floodplain Management* (NPS 2003a), require an examination of potential impacts on floodplains and potential risk involved in placing facilities within floodplains. Available mapping from FEMA indicates that all components of the proposed action lie outside the 100-year flood zone. As such, no adverse impacts on floodplains would occur as a result of this project. However, this impact topic remains within the EA to document potential beneficial impacts associated with decommissioning the existing leach fields in the valley of Station Creek just north of Colson Barn.

## **Vegetation**

NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. NPS *Management Policies 2006* (NPS 2006) and other NPS and park policies provide general direction for the protection of vegetation. Vegetation in the study area consists primarily of upland forest with some grassy areas of pastureland. The proposed action would include tree clearing to establish a new leach field area and to install sanitary sewer and water lines. Therefore, the impact topic of vegetation is considered.

## **Wildlife and Wildlife Habitat**

NPS policy is to protect the natural abundance and diversity of all naturally occurring communities. The NPS *Management Policies 2006* (NPS 2006), NPS DO-77: *Natural Resources Management*, and other NPS policies provide general direction for the protection of wildlife and wildlife habitat. The study area includes predominantly forested uplands with some occurrences of pastureland. Some forested and pastured areas lie within the Station Creek floodplain. While many of the wildlife species found in the region have ample habitat throughout the park, construction of the new leach fields and replacement of sanitary sewer and water lines would result in tree removal and land disturbance. This may have impacts on wildlife habitat. Additionally, the decommissioning of the existing leach fields in the bottomland west of Station Creek may have potentially beneficial impacts on aquatic wildlife. Therefore, the impact topic of wildlife is addressed.

## **Special Status Species**

State and federally listed threatened and endangered plant and animal species are present within Cumberland Gap National Historical Park. Output from the IPAC database maintained by the USFWS indicates that a number of listed clam and fish species, two threatened plant species, and two endangered mammals may occur within the study area. Because the database is primarily a coarse mapping resource as opposed to a detailed one, this output captures potential occurrences at a larger scale. In other words, most of the species noted are unlikely to be present within the study area but may be present in other areas of the park. However, habitat for the two mammals: the gray bat (*Myotis grisescens*) and Indiana bat (*Myotis sodalis*), may be present within the study area. While the gray bat typically resides year-round within the cave environment, the Indiana bat uses wooded areas near streams for summer roosting and rearing habitat. As this habitat type may be present within the study area, the impact topic of special status species is addressed.

## **Archeological Resources**

Archeological resources are the material remains of past human activity. These material remains are analyzed using several methods including, but not limited to, scientific tests, oral interviews, and ethnographic data. An archeological survey has been performed within the study area and resources were recovered (Des Jeans 2010). For this reason, the impact topic of archeological resources is addressed.

## **Visitor Use and Experience / Recreation**

Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. The visitor experience encompasses interpretation, understanding, enjoyment, safety, circulation, and accessibility of the study area. The Wilderness Road campground is a park facility that is both a destination campground and a means to provide visitors with accommodations that encourage a more involved exploration of the history of the Cumberland Gap and the interior of the park. Therefore, the impact topic of visitor use and experience / recreation is addressed.

## **Infrastructure and Park Operations**

The park currently operates and routinely maintains the facilities at the Wilderness Road campground. These include the Entrance Station, the VIP campsite, the three comfort stations, the RV dump station, the FUM headquarters building, the group shelter, and the campsites themselves. Park maintenance at the campground includes ensuring an appropriate level of service via routine inspection, repair, and cleaning of facilities (including annual pump outs at septic tanks). Park staff also is responsible for alternating the flow of liquid waste between the dual leach fields north of Colson Barn. This switch occurs on a monthly basis. In addition to routine and scheduled activities, park staff also must address accidental disruptions in sanitary sewer or water service via timely repairs.

Under both the no-action alternative and the alternative action, park operations and maintenance activities would continue. The proposed action would result in changes to infrastructure and park operations. These changes include the decommissioning of septic tanks and leach fields, replacement and installation of new septic tanks at new locations, and the possible expansion of horse pasturing to include the area above the proposed new leach fields. During leach field construction, the water supply line from US 58 and leading to the reservoir near the picnic area would be temporarily disconnected. The no action alternative also would have consequences for infrastructure and park operations, primarily related to ongoing maintenance of the failing sanitary sewer system. Therefore, the impact topic of infrastructure and park operations is addressed.

## **Public Health and Safety**

*NPS Management Policies 2006* (NPS 2006) instructs NPS staff to consider public safety in all proposed actions. The pipes of the existing sanitary sewer system are prone to obstruction and because of its age, the capacity of the system itself is inadequate to address current use during periods of peak visitation. This has led to periodic overflows of sanitary waste onto ground surfaces adjacent to manholes from which it could potentially flow into visitor areas, posing a threat to public health and safety. Also, breakages in water supply lines may lead to contamination of public drinking water. Therefore, the impact topic of public health and safety is addressed.

## **IMPACT TOPICS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS**

The following impact topics are not forward carried for detailed analysis within the EA because they would not be noticeably impacted by the proposed rehabilitation and repair of the sanitary sewer system and water lines at the Wilderness Road campground or they do not exist within the study area.

### **Wetland Resources**

Executive Order 11990, “Protection of Wetlands” and NPS DO-77-1: *Wetland Protection* (NPS 2002a) require an examination of impacts on wetland resources. No mapped wetlands are present within the proposed limits of construction nor are they present within the footprint of the current sanitary sewer or water line systems. Therefore, the impact topic of wetland resources was dismissed from further analysis.

### **Cultural Landscapes**

A cultural landscape is a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person exhibiting other cultural or aesthetic values. There are four kinds of cultural landscapes, which are not mutually exclusive: historic site, historic designed landscape, historic vernacular landscape, and ethnographic landscape (NPS 2002b). As noted below, there are no historic structures or ethnographic resources in the area of potential effects. The topography and land use patterns of the campground would be unaltered, and neither the spatial organization nor circulation patterns of the campground are significant features or patterns of the landscape. Therefore, cultural landscapes was dismissed as an impact topic.

### **Historic Structures**

A historic structure is defined by the NPS as “a constructed work, usually immovable by nature or design, consciously created to serve some human act” (NPS 2002b). In order for a structure or building to be listed on or eligible for listing on the National Register of Historic Places (National Register), it must possess historic integrity of those features necessary to convey its significance, particularly with respect to location, setting, design, feeling, association, workmanship, and materials. The National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation* (NPS 1990) provides a comprehensive discussion of these characteristics. NPS staff has determined that no historic structures are present within or near the study area (Des Jean 2010). Therefore, the impact topic of historic structures was dismissed from further analysis.

### **Museum Collections**

A museum collection is an assemblage of objects, works of art, historic documents, and/or natural history specimens collected according to a rational scheme and maintained so that they can be preserved, studied, and interpreted for public benefit (NPS 2002b). No museum collections are present within the study area, nor would existing collections be affected by

proposed work. Therefore, the impact topic of museum collections was dismissed from further analysis.

### **Ethnographic Resources**

An ethnographic resource is defined as any “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (NPS 2002b). Ethnographic resources are associated with cultural practices, beliefs, the sense of purpose, or existence of a living community that is rooted in that community’s history or is important in maintaining its cultural identity and development as an ethnically distinctive people.

No ethnographic studies have been conducted for the park. During scoping, the American Indian tribes traditionally associated with park lands were informed by letter of the proposed project. These include the Cherokee Nation of Oklahoma, the Chickasaw Nation, the Eastern Shawnee Tribe of Oklahoma, the Shawnee Tribe, the Shawnee Tribe of Oklahoma, and the United Keetoowah Band of Cherokee Indians. The tribes were requested to respond with any issues or concerns. The Chickasaw Tribe was the only tribe to respond. The tribe accepted the recommendation of the park that a cultural resources specialist or archeologist be present during the excavation of the proposed leach field. Furthermore, they asked that construction activities cease and the tribe be notified should inadvertent discoveries be made. Copies of the EA will be forwarded to each tribe for review and comment. If subsequent issues or concerns are identified, appropriate consultations will be undertaken. Therefore, ethnographic resources was dismissed as an impact topic.

### **Indian Trust Resources**

Secretarial Order 3175 requires that any anticipated impacts on Indian Trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal laws with respect to Native American tribes. There are no Indian Trust resources in the park. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian Trust resources were dismissed as an impact topic.

### **Prime Farmland**

Prime farmland is one of several designations made by the U.S. Department of Agriculture to identify important farmlands in the United States. It is important because it contributes to the nation’s short- and long-range needs for food and fiber. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, few to no rocks, and permeable soils (designated as prime farmland soils). Prime farmland soils are present within the study area. However, since the creation of the park, these

soils have been under protection of the NPS and have not been used for farming activities. Therefore, prime farmland was dismissed as an impact topic.

### **Climate Change**

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality, storm frequency, etc.) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC) provide clear evidence that climate change is occurring and will accelerate in the coming decades. There is strong evidence that global climate change is being driven by human activities worldwide, primarily the burning of fossil fuels and tropical deforestation. These activities release carbon dioxide and other heat-trapping gases, commonly called “greenhouse gases,” into the atmosphere (IPCC 2007).

There are two aspects of climate change that must be considered in an environmental impact analysis:

- our impact on climate change: i.e., through our actions, the potential to increase or decrease emissions of greenhouse gases that contribute to climate change
- the impact of climate change on us: i.e., how are the resources that we manage likely to change in response to changing climate conditions, and how does that change or otherwise affect our management actions and the impacts of those actions on the resource

The proposed action does not include the construction of carbon-emitting infrastructure. It is unlikely that the project improvements would directly result in an increase in visitor use (and hence vehicular activity). Improving system components may somewhat lessen emissions related to construction equipment deployed to carry our repairs on failing sewer line and water line infrastructure. However, as the need for such repairs is unpredictable, quantifying the potential benefits would be speculative. Climate change is not anticipated to have an impact on the proposed project. Therefore, climate change was dismissed as an impact topic.

### **Energy Requirements and Conservation Potential**

The CEQ guidelines for implementing NEPA require an examination of energy requirements and conservation potential as a possible impact topic in environmental documents [40 CFR 1502.16(e)]. The park strives to incorporate the principles of sustainable design and development into all facilities and operations. The objectives of sustainability are to design structures to minimize adverse impacts on natural and cultural values; to reflect their environmental setting; to maintain and encourage biodiversity; to construct and retrofit facilities using energy efficient materials and building techniques; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is living within the environment with the least impact on the environment.

The setting of the Wilderness Road campground and the nature of the project do not offer many opportunities for using energy efficient materials or building techniques. Rather, the proposed action aims to reuse the existing footprint and components of the current sanitary and water line system to the greatest degree possible. Furthermore, the planning process took into account and corrected intrinsic deficiencies in the original sanitary sewer design in an effort to enhance system longevity and minimize maintenance.

The proposed action is not expected to result in noticeable changes to energy requirements or the ability to conserve energy resources. The installation of a new water line would result in the conservation of water resources currently being lost by subsurface water line leaks, if these are indeed occurring. Updating the sanitary sewer and water line infrastructure may conserve energy that would otherwise be spent by mobilizing construction equipment for iterative and localized repairs under the no action alternative. Consequently, any adverse impacts caused by the proposed action relating to energy use, availability, or conservation would be negligible. Therefore, the impact topic of energy requirements and conservation potential is dismissed from further analysis.

### **Socioeconomic Resources and Adjacent Land**

Implementation of the proposed action would neither change local and regional land use or zoning nor appreciably impact local businesses or other agencies. Implementation of the proposed action would provide a negligible beneficial impact to the local economy, e.g. an increase in employment opportunities for the construction workforce and a modest increase in revenues for local businesses and government generated from construction activities and workers. Any increase, however, would be temporary, lasting only as long as construction. Therefore, the topic of socioeconomic resources and adjacent land was dismissed.

### **Environmental Justice**

Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low income populations and communities. According to the Environmental Protection Agency (EPA), environmental justice is the “...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.”

The goal of “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse impacts and identify alternatives that may mitigate these impacts. Environmental justice is dismissed from further analysis for the following reasons:

- Implementation of the proposed action would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect adverse impacts on any minority or low-income population.
- The impacts associated with implementation of the proposed action would not disproportionately affect any minority or low-income population or community.
- Implementation of the proposed action would not result in any identified impacts that would be specific to any minority or low-income community.

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# 2

## ALTERNATIVES

Chapter 2 describes the alternatives for the rehabilitation and repair of the Wilderness Road campground sanitary sewer system and water lines. Alternatives were developed to address current system inadequacies and not in response to any anticipated increase in demand for either water or sewer services. Inadequacies include the ongoing deterioration of both sewer and water lines, which limits their ability to effectively convey sanitary water and potable water, respectively; the diminished capacity of the sewer pipes due to obstruction by solid waste and root materials; and the insufficient capacity of the current leach fields. Each of the alternatives for the proposed action was designed to minimize sewer line leakages and blockages by abandoning the current sewer lines and installing new ones and by providing adequate capacity in both septic tank and leach field sizing. Water line leakages would be similarly addressed by wholesale replacement of the pipes servicing the comfort stations. Implementing these approaches would improve sanitary sewer and water service, help maintain a high quality visitor experience for all campers and work environment for park staff, and limit operational expenses associated with maintaining the aged sewer and water systems.

The description and evaluation of the no-action alternative provides a baseline to which the action alternatives can be compared. The EA examines two alternatives: Alternative A (the No-action Alternative) and one action alternative: Alternative B (the NPS preferred alternative).

### DEVELOPMENT OF ALTERNATIVES

Problems associated with the aged and failing sanitary sewer system and water lines have been documented for a number of years. The development of potential alternatives to repair and replace the sewer and water lines began with a comprehensive evaluation of condition and a capacity assessment. Park staff worked with design contractors to provide background information regarding the performance of the existing sanitary and water system components. This included specific details regarding locations and types of failure and their frequency. Available mapping of system components and other pertinent information were provided to the contractor and additional information was gathered via field investigations and survey. In April 2010, the park, via contract, performed a remote camera survey of the sewer system to gather additional information on system condition and to determine if any existing infrastructure was suitable for reuse.

Sanitary waste generated by each of the facilities at the Wilderness Road campground is currently treated in the same manner; using gravity-based systems that consist of sanitary sewer pipes connected to a septic tank which is subsequently connected to a leach field. Solid waste is separated from the waste stream to collect within the septic tank, with liquid waste continuing on into a system of distribution pipes within the leach field. This simple and cost-effective system is commonplace in rural settings where soil conditions are suitable for the treatment of liquid waste.

While the components of the current sanitary sewer system are aged, the fundamental principles of its original design remain valid. The topographic setting of the campground is highly suitable to a gravity-based system. Moreover, there is sufficient park property in the area within which to install the necessary leach field(s). Nevertheless, as one of the objectives of the project is to improve the efficiency of park operations by reducing maintenance costs, the development of alternatives considered simplifying the sanitary sewer system by routing waste from multiple sources to a single leach field. These sources include not only the comfort stations, but those facilities that currently have dedicated septic tanks and leach fields. These include the FUM Headquarters Building, the Entrance Station, the RV dump station, and the VIP campsite (Figure 3). The size of the leach field required to serve these facilities was the principal constraint on system design.

### **ACTIONS COMMON TO ALL ALTERNATIVES**

There are a number of actions that are common to all considered action alternatives. These are the sewer line and water line placement, road crossings, routine maintenance and inspection.

***Sewer Line and Water Line Placement.*** As maintaining a gravity-based sanitary sewer system was determined to be the most suitable approach, the locations of the existing sewer lines also represent the optimal location for the proposed replacement lines. Therefore, alternative locations for sewer lines were not evaluated. Each alternative considered abandoning the current pipes in place and installing new lines in close proximity. All manholes deemed to be serviceable based on the remote camera survey and field inspections were incorporated in the alternatives. The positioning of the exiting water lines also was considered to be largely optimized. Therefore, the replacement water lines were located in immediately adjacent to existing lines in each alternative.

***Road Crossings.*** As the road surfaces within the campground have been resurfaced within the last two years, each alternative was constrained by the need to avoid disturbance to roads. All sewer pipes and water lines for the action alternatives considered emplacement by directional drilling under roads.

***Routine Maintenance and Inspection.*** All alternatives employ the use of septic tanks that must be routinely pumped out and cleaned to ensure system performance. This is currently performed on an annual basis and would continue as such for all alternatives. The type and frequency of sewer and water line inspection and water testing also would be common to all alternatives.

## **ALTERNATIVE A: NO-ACTION**

Under Alternative A, the no-action alternative, the existing sanitary sewer system and water lines serving the facilities at the Wilderness Road campground would continue to remain in service and would not be repaired or replaced. The degree of service currently provided to park visitors would remain unchanged. The four dedicated leach fields at the FUM Headquarters Building, the Entrance Station, the VIP campsite, and the RV dump station would remain operational. The dual leach fields north of Colson Barn that treat sanitary waste from the three comfort stations also would remain in service. The five septic tanks associated with these leach fields would continue to be pumped out on an annual basis. Park staff would continue to visit the dual leach fields north of Colson Barn on a monthly basis in order to regulate the distribution of liquid waste from the septic tank between the two component fields. This is accomplished by manually switching a valve.

The potential for periodic sewer overflow and water line breakages would remain, prompting non-routine maintenance such as reaming obstructed sewer lines, cleaning up waste from sewer overflows, and repairing broken water pipes. Between October 2009 and September 2010, six water line breakages required repair, or roughly one repair every two months. This frequency of repair is likely to continue. The frequency with which sewer line blockages would need to be relieved is less clear, as it depends on a variety of unpredictable factors such as intrusion by tree roots and ground subsidence. However, the potential for sewer line blockages is proportional to system usage. Therefore, blockages, service disruptions, and repairs are more likely to occur during periods of high visitation. Broken water lines and obstructed sewer lines can usually be repaired within a few hours and typically take no longer than 24 hour from their occurrence to correct.

The existing layout of the sanitary sewer system and water distribution lines is provided on Figure 3.

## **ALTERNATIVE B: ACTION ALTERNATIVE (NPS PREFERRED)**

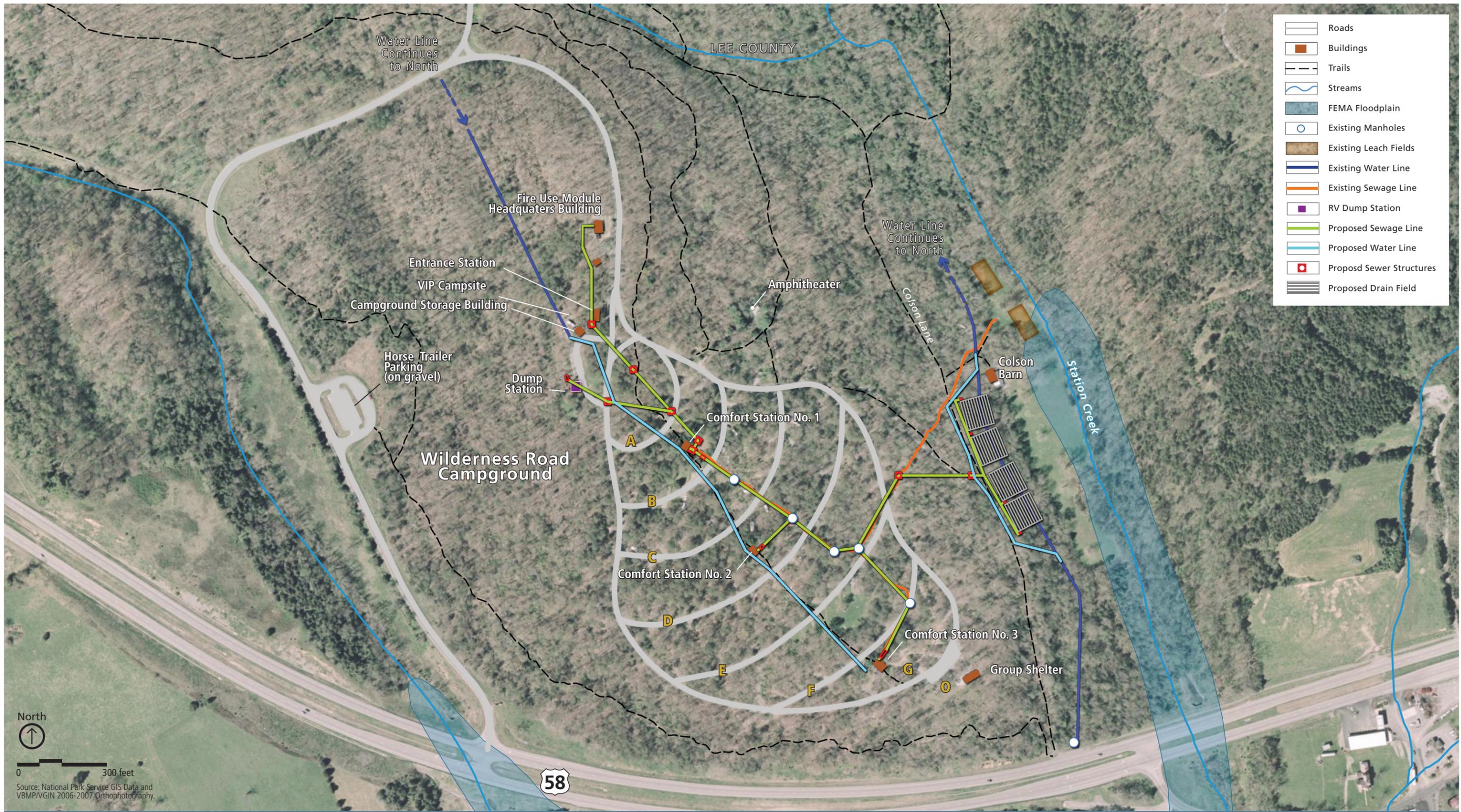
Under the action alternative, each of the separate sanitary sewer components at the Wilderness Road campground would be improved. The proposed system is depicted on Figure 4. The septic tanks and leach fields associated with the FUM Headquarters Building, Entrance Station, and VIP campsite would be decommissioned. The leach fields would be abandoned in situ. The septic tanks for the FUM Headquarters Building and Entrance Station would be pumped out and backfilled with clean sand and would remain in place. Their access ports would be removed below ground level and the void space filled with soil and revegetated using an appropriate seed mix. The septic tank at the VIP campsite would be removed and properly disposed. The septic tank for the RV dump station would remain and be connected to the new sanitary sewer system. The leach field associated with the RV dump station would be abandoned in situ. below ground level and the void space filled with soil and revegetated with an appropriate seed mix. The leach fields would be abandoned in place. Sanitary waste from these facilities would be routed via a new pipeline to a 6,000-gallon septic tank at the location of comfort station #1.

A linear construction corridor, not exceeding a width of 25-feet, would be rough graded during installation of the new pipeline. All pipeline installation procedures, which primarily include clearing, trenching, pipe preparation and assembly, and backfilling, would be confined to this construction corridor. Clearing would be the minimum necessary to affect the installation. Construction vehicles and equipment also would be confined to the construction corridor and existing roads, and vehicle and equipment movement over the project area would be minimized. Staging and stockpiling for construction would only occur within the corridor to the greatest extent possible with some materials and equipment likely stored within the footprint of existing nearby campsites.

In addition to waste delivered from facilities to the north, waste from comfort station #1 would also be pretreated in the septic tank immediately adjacent to the station, with liquid waste continuing down gradient to comfort station #2. Both comfort stations #2 and #3 would also have dedicated septic tanks with capacities of 6,000 gallons and 12,000 gallons, respectively. The proposed pipeline from comfort station #1 through comfort station #3 and to the first manhole east of the intersection of loop road E and the outer loop road would be installed in close proximity to the existing sewer lines, which would be abandoned in place. East of this location, the sewer line would pursue a new course due east to the location of the leach fields. The width of the proposed construction corridor along both the existing sewer alignment and the new alignment would be 25 feet, and activities would be carried out within this corridor as described above. The only components of the existing sanitary sewer system that would remain are the five manholes.

Liquid waste would be distributed via a distribution box to four separate leach fields. Each leach field would consist of 12 leach lines roughly 100 feet in length and spaced on 6-foot centers. These would be installed in trenches with 3-foot bottom widths that would be backfilled with suitably coarse material to insure the perforated leach lines remain open. The trenches would then be top dressed with stockpiled native soil material. The construction corridor for pipeline installation would be similarly restored to preconstruction conditions, including recontouring and revegetation using an NPS approved seed mix and park native plants if available. All restoration would follow guidelines approved by park staff. Any fill material needed beyond that produced from construction activities would be taken from approved sources outside the park. Any excess material generated from construction activities would be stockpiled in park storage areas for future use in approved projects or disposed of at approved sites outside the park.

During leach field construction, equipment and materials could be staged and stockpiled at a variety of different locations. The area outside and adjacent to the paddock area at Colson Barn and the road leading to the barn may be suitable for staging and stockpiling. The shoulder of Colson Lane also may be suitable for these purposes. The grassy area atop the existing leach fields may represent an ideal storage area. However, to prevent damage to the underlying leach field, any use would be restricted to lightweight materials. The future use of the grassy area above the abandoned leach fields may include expansion of horse pasturing or replanting to augment the riparian buffer of Station Creek.



Renew Wilderness Road Campground Wastewater System Component - Environmental Assessment

Figure 4  
Alternative B: NPS Preferred Alternative



The new water line within the campground proper would begin at the location of an existing water valve just north of the VIP campsite. All existing pipes from this point south would be replaced. The new water line would occupy the existing alignment in close proximity to the current pipeline, which would be abandoned in its entirety in place. A section of the water supply line that runs along Colson Lane would be removed to install the proposed leach fields. The water line would be rerouted around and upgradient of the leach fields via the installation of new pipes.

The new trunk line would be upgraded from 2-inch galvanized to 4-inch high-density polyethylene (HDPE) pipe. Existing spigots and water fountains at the comfort stations would remain. Distribution lines from the trunk lines to sinks, showers, toilets, and spigots would be replaced and would consist of 2-inch HDPE pipe. The width of the construction corridor required for the new water pipes, the activities performed therein, and the means of post-construction recontouring and revegetation would be similar to that discussed above for the sewer line easement. Upon completion of the pipe installation, the system would be pressure tested and purged. Water would be tested to meet NPS standards before being made available for general consumption.

## **MITIGATION MEASURES**

To minimize environmental impacts related to the action alternatives, the NPS would implement mitigation measures whenever feasible. Although the exact mitigation measures to be implemented would depend upon the final design and approval of plans by relevant agencies, the following is a list of actions that could take place:

- Construction zones would be identified and fenced with construction tape or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the fencing. No materials would be moved off site or out of the park during this project with the exception of excess cut material, which could be disposed of at approved sites outside the park if necessary. In addition, the NPS would ensure that all contractors and subcontractors are informed that damage to resources outside the scope of work is subject to prosecution, fine, restitution costs, and other penalties.
- Water and sewer lines would be replaced in close proximity to existing lines so as to minimize the level of disturbance.
- Existing sanitary sewer manholes would be reincorporated in the new system to the degree feasible based on condition and location.
- A cultural resources specialist or archeologist would be present during the excavation of the proposed leach field area. If previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if the resources cannot be preserved in situ, an appropriate mitigation strategy developed in consultation with the SHPO and, as

- necessary, American Indian tribes. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.
- Erosion and sediment control measures would be installed as required by Virginia Stormwater Management Permit Regulations. The principal measure would likely be silt fencing installed around the perimeter of excavated areas and stockpiles. Silt fencing would be inspected weekly or after every major storm.
  - Fueling of all construction equipment would be conducted only in equipment staging areas. During the operation of equipment, some petrochemicals could seep into the soil. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.
  - Signs could be placed at key locations within the campground, informing visitors of the scope of the project and its intended benefits. Signs also could indicate the time of day when construction is active, the overall construction period, and forewarn of potential construction noise.
  - Project construction would be phased so as to minimize campground closure.

## **ALTERNATIVES/ELEMENTS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS**

As previously discussed, the size of the leach field required to treat liquid waste from sources within the Wilderness Road campground was the principal constraint on system design. Moreover, the continued use of a gravity sewer system further limited the potential leach field locations to a relatively low landscape position with gentle relief. Based on these criteria, the area between the campground and Station Creek is the only suitable area. During the development of alternatives for the proposed action, two alternatives for leach field positioning were considered in this area. Both options were located closer to the Station Creek than the NPS preferred alternative. These alternate locations were dismissed for a two primary reasons. First, they were either located within the 100-year floodplain as determined by FEMA or in flood-prone bottomland areas. Second, the likelihood of encountering archeological resources may increase in these bottomland settings (Des Jean 2010). Additionally, the area north of Colson Barn contains a dry creek bed and also consists of a more mature forest community than do other bottomland areas between the campground and Station Creek.

## **SUMMARY COMPARISON OF THE ALTERNATIVES**

Table 1 provides a summary of the alternatives presented above. Table 2 provides a summary of the environmental consequences related to each alternative. A more detailed explanation of the impacts is presented in “Chapter 4: Environmental Consequences.”

<b>Table 1: Summary of Alternatives</b>		
<b>Alternative Element</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Sanitary Sewer Lines</b>	Existing sanitary sewer lines would remain in place and continue to be used. No sanitary sewer lines would be replaced. Obstructions in sewer lines would be addressed via pipe reaming. Cracks in pipes may need to be addressed via slip lining. Pipe fractures, joint failures, and offsets may require localized pipe replacement.	The entire network of sewer pipes would be replaced. New lines would be installed to link the FUM Headquarters Building, the Entrance Station, the RV dump station, and the VIP campsite with the comfort stations. Replacement lines connecting the comfort stations would be installed in close proximity to existing pipes, which would be abandoned in place.
<b>Septic Tanks</b>	The current complement of 5 septic tanks would remain in place and continue in service. These would be pumped out and cleaned annually and the waste removed for treatment offsite.	Septic tanks at the FUM Headquarters Building, the Entrance Station, and the VIP campsite would be decommissioned. The tank at the VIP campsite would be removed for proper disposal offsite. The other tanks would be pumped out, filled with clean sand, and abandoned in situ. The septic tank at the RV dump station would remain and be connected to the overall sanitary sewer system. New septic tanks would be installed at each comfort station to trap solid waste at the source.  All septic tanks would be pumped out and cleaned annually and the waste removed for treatment offsite.
<b>Leach Fields</b>	The 6 leach fields currently in use would remain. Park staff would be responsible for alternating the discharge between the two septic fields north of Colson Barn on a monthly basis.	Dedicated leach fields for the FUM Headquarters Building, the Entrance Station, the RV dump stations, and the VIP campsite would be abandoned in situ. Liquid waste from these facilities would be integrated with that generated at the comfort stations and would be treated via four interconnected leach fields located south of Colson Barn.
<b>Water Lines</b>	The existing system of water lines would remain in service, as would water-dependent facilities at or near the comfort stations (e.g., showers, sinks, toilets, spigots, and fountains). Pipe leakages would be addressed on an as-needed basis via localized repairs.	The existing trunk line running through the campground would be abandoned in place and a new water line installed in close proximity. The trunk water line would be upgraded from 2-inch galvanized to 4-inch HDPE pipe. Existing distribution lines from the trunk line to the comfort stations would be abandoned in place, replaced by 2-inch galvanized pipe. The suite of water-dependent facilities at or near the comfort stations would remain in service (e.g., showers, sinks, toilets, spigots, and fountains).

**Table 1: Summary of Alternatives**

<b>Alternative Element</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Comfort Stations</b>	No changes are proposed at the comfort stations. They would continue to operate under current conditions. Periodic disruptions in service may occur as a result of failures in the sanitary system and/or water supply lines.	No changes are proposed at the comfort stations. However, the replacement of sanitary sewer and water lines would result in more dependable systems, improving the level of service for campground visitors.
<b>RV Dump Station</b>	No changes are proposed at the RV dump station. The station would continue to operate under current conditions, with sanitary waste being stored / treated by the existing septic tank and leach field.	The septic tank at the RV dump station would remain in service and be connected to the new sanitary sewer pipe system, routing wastewater to the new leach fields. The current leach field there abandoned in situ.
<b>Campsites</b>	No changes are proposed for campsites. Some campsite visitors may experience periodic interruptions in water and sewer services or campsites may be affected by periodic sewer discharges and be temporarily inaccessible during repairs.	No changes are proposed for campsites. However, the replacement of sanitary sewer and water lines would result in more dependable systems, improving the level of service for campground visitors.
<b>Vehicular Access, Pedestrian Access, and Hiking Trail Access</b>	No changes are proposed for vehicular access, pedestrian access, or hiking trail access. Access may be temporarily restricted or rerouted during periods when sanitary sewer or water line repairs are underway.	No changes are proposed for vehicular access, pedestrian access, or hiking trail access.

**Table 2: Summary of Environmental Consequences**

**For a complete description of impacts, see “Chapter 4: Environmental Consequences”**

<b>Resource</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Geologic Resources and Soils</b>	<p>Localized soil disturbances would occur during sanitary sewer and water line repairs. Due to the unpredictable nature of karst subsidence, damages to campground infrastructure, including the sewer system and water lines, may occur in the future.</p> <p><b>Overall Impact:</b> soils: short-term, site specific, minor and adverse</p> <p>geologic resources: short-term, negligible to minor, site specific, and adverse.</p> <p><b>Cumulative Impact:</b> contributes a short-term, noticeable adverse increment to local, long-term, minor and adverse cumulative impacts</p>	<p>Installation of the new sewer and water lines and the septic field would result in soil disturbances. All disturbed areas would be stabilized in accordance with an erosion prevention and sediment control plan. By installing sewer and water lines along pre-existing alignments, soil disturbance is minimized.</p> <p>Construction would likely not be carried out to a depth where it would impinge on geologic resources. However, due the unpredictable nature of karst subsidence, damages to existing park infrastructure (e.g., roads, campsites) as well as the new system may occur in the future.</p> <p><b>Overall Impact:</b> soils: short-term, site specific, and minor adverse</p> <p>geologic resources: short-term, site specific, negligible to minor, and adverse</p> <p><b>Cumulative Impact:</b> contributes a short-term, noticeable adverse increment to local, long-term, minor and adverse cumulative impacts</p>
<b>Water Quality</b>	<p>The septic field located north of Colson Barn would continue to represent a potential seasonal source of pollutants to Station Creek.</p> <p><b>Overall Impact:</b> short-term, moderate, and local adverse</p> <p><b>Cumulative Impact:</b> contributes a noticeable adverse increment to local, long-term, moderate, and adverse cumulative impacts</p>	<p>The installation of a new sanitary sewer system and leach field and the decommissioning of the existing field north of Colson Barn and adjacent to Station Creek would resulting in water quality improvements in Station Creek</p> <p><b>Overall Impact:</b> short-term, minor, site specific adverse (construction); long-term, moderate, and local beneficial impacts (post-construction implementation)</p> <p><b>Cumulative Impact:</b> contributes a short-term, imperceptible adverse increment and a long-term, noticeable beneficial increment to local, long-term, negligible, and adverse cumulative impacts</p>

**Table 2: Summary of Environmental Consequences**

For a complete description of impacts, see “Chapter 4: Environmental Consequences”

Resource	Alternative A: No-action	Alternative B: NPS Preferred
<b>Floodplains</b>	<p>There are no permanent, aboveground structures present within the 100-year floodplain or in flood prone portions of the study area. The existing leach field is an allowed use in this setting. Maintenance and repair vehicles and equipment may need to temporarily access the existing leach field which is located in a flood prone area adjacent to Station Creek.</p> <p><b>Overall Impact:</b> short-term, site specific, negligible and adverse</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on floodplains. Therefore, there would be no cumulative impact under Alternative A.</p>	<p>There are no permanent, aboveground structures present within the 100-year floodplain or in flood prone portions of the study area. The decommissioning of the leach field currently located in a flood prone area adjacent to Station Creek would preclude the need for maintenance and repair vehicles and equipment to periodically enter the area.</p> <p><b>Overall Impact:</b> long-term, site specific, negligible and beneficial</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on floodplains. Therefore, there would be no cumulative impact under Alternative B.</p>
<b>Vegetation</b>	<p>Vegetation would be thinned and/or removed as necessary to perform repairs to damaged or malfunction sanitary sewer system or water line components.</p> <p><b>Overall Impact:</b> short-term, site specific, negligible and adverse</p> <p><b>Cumulative Impact:</b> contributes a short-term, imperceptible adverse increment to short-term, negligible and adverse cumulative impacts</p>	<p>Vegetation would be cleared along sanitary and sewer lines and within the proposed leach field area. The leach field area would be maintained as a grassy area and potentially as pastureland. By installing sewer and water lines along pre-existing alignments, impacts on vegetation are minimized. Natural revegetation of these alignments would be allowed to proceed.</p> <p><b>Overall Impact:</b> long-term, site specific, minor and adverse</p> <p><b>Cumulative Impact:</b> contributes a long-term and noticeable adverse increment to long-term, minor and adverse cumulative impacts</p>

**Table 2: Summary of Environmental Consequences**

**For a complete description of impacts, see “Chapter 4: Environmental Consequences”**

<b>Resource</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Wildlife and Wildlife Habitat</b>	<p>Terrestrial wildlife habitat would be affected by localized tree removal as required to effect sanitary sewer line and water line repairs. However, such disturbances would be almost negligible in comparison to the remaining and contiguous forested areas. Migratory birds would likely be unaffected, as most of those noted in the vicinity of the campground prefer peripheral or disturbed settings.</p> <p>Aquatic habitat in Station Creek would continue to be affected on a seasonal basis by leachate from the nearby leach field.</p> <p><b>Overall Impact:</b> long-term, site specific, negligible adverse impacts (terrestrial); short-term, minor to moderate, local and adverse (aquatic)</p> <p><b>Cumulative Impact:</b> contributes a short-term and noticeable adverse increment to long-term, minor and adverse cumulative impacts</p>	<p>Terrestrial wildlife habitat would be impacted by the removal of trees for the installation of the sewer and water lines and for the leach field installation. However, such disturbances would be almost negligible in comparison to the remaining and contiguous forested areas. Migratory birds would likely be unaffected, as most of those noted in the vicinity of the campground prefer peripheral or disturbed settings.</p> <p>Aquatic habitat in Station Creek would be improved by the decommissioning of the existing leach field and cessation of contributions of leachate to creek waters.</p> <p>Construction activities would implement BMPs in order to minimize sediment running off into aquatic habitats during soil exposure and grading.</p> <p><b>Overall Impact:</b> long-term, regional, moderate and beneficial</p> <p><b>Cumulative Impact:</b> contributes a long-term and noticeable to appreciable beneficial increment on long-term, moderate and beneficial cumulative impacts</p>

**Table 2: Summary of Environmental Consequences**

**For a complete description of impacts, see “Chapter 4: Environmental Consequences”**

<b>Resource</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Special Status Species</b>	<p>Localized tree removal required to effect sanitary sewer line and water line repairs would likely have a negligible impact on summer roosting or foraging habitat for the Indiana bat.</p> <p><b>Overall Impact:</b> long-term, site specific, negligible, and adverse</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on special status species. Therefore, there would be no cumulative impact under Alternative A.</p>	<p>Localized tree removal required to effect sanitary sewer line and water line installation would likely have a negligible impact on summer roosting habitat for the Indiana bat. The forest composition and condition at the proposed leach field area does not represent particularly suitable summer roosting habitat.</p> <p>Foraging habitat for the Indiana bat would be potentially improved by the addition of a meadow-like area at the leach field location.</p> <p>Noise and disturbance during construction would result in local short-term negligible adverse impacts. Measures, such as prohibiting night construction and limiting tree removal to the minimum area necessary, and revegetating disturbed area would reduce potential for disturbance to special status wildlife species. Tree removal would be limited to the minimum amount necessary to install sewage system components.</p> <p>Alternative B would not affect Indiana bat activity and would have a negligible long-term adverse effect from conversion of forest cover to herbaceous cover. There would be no effect to Indiana Bat.</p> <p><b>Overall Impact:</b> long-term, site specific, negligible and adverse (bat roosting sites); long-term, site specific, negligible to minor beneficial (bat foraging)</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on special status species. Therefore, there would be no cumulative impact under Alternative B.</p>

**Table 2: Summary of Environmental Consequences**

**For a complete description of impacts, see “Chapter 4: Environmental Consequences”**

<b>Resource</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Archeological Resources</b>	<p>Repairs to sanitary sewer system components and water lines may require excavation and the potential to intersect archeological resources. However, such repairs would be carried out in areas previously disturbed during the original installation of these systems and any subsequent park operations and maintenance.</p> <p><b>Overall Impact:</b> no effect</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on archeological resources. Therefore, there would be no cumulative impact under Alternative A.</p>	<p>The proposed leach field was sited based on the results of a Phase I archeological survey, thereby minimizing the likelihood of encountering archeological resources. A park archeologist would be present during site construction to monitor the progress of work and collect any resources that are uncovered.</p> <p><b>Overall Impact:</b> no adverse effect on archeological resources</p> <p><b>Cumulative Impact:</b> No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on archeological resources. Therefore, there would be no cumulative impact under Alternative B.</p>

**Table 2: Summary of Environmental Consequences**

**For a complete description of impacts, see “Chapter 4: Environmental Consequences”**

<b>Resource</b>	<b>Alternative A: No-action</b>	<b>Alternative B: NPS Preferred</b>
<b>Visitor Use and Experience / Recreation</b>	<p>The aged and unreliable condition of sanitary sewer system and water lines would continue to adversely affect visitor use and experience / recreation. Impacts include the potential for accidental discharge of foul-smelling wastewater into common areas (e.g., campsites, roads) during periods of peak use, temporary disruptions in water supply or comfort station amenities during repair periods, evacuation of campsites, and vehicular and pedestrian interactions with construction equipment.</p> <p>Depending on the location of a water line failure(s), services may remain available at one or more comfort stations during repairs. At water line break north of comfort station #1 would temporarily suspend services to all comfort stations while repairs are completed.</p> <p><b>Overall Impact:</b> short-term, site specific, moderate and adverse</p> <p><b>Cumulative Impact:</b> contributes a short-term and noticeable to appreciable adverse increment to long-term and moderate beneficial cumulative impacts</p>	<p>Improvements to the sanitary sewer system and water lines would result in more dependable visitor amenities and diminish the likelihood of adverse experiences that would occur under Alternative A.</p> <p>The campground would be closed to public access during the installation of the sewer and water lines. This would occur during the fall when visitor use begins to wane and would be completed in time for the following spring.</p> <p><b>Overall Impact:</b> long-term, site specific, minor to moderate and beneficial</p> <p><b>Cumulative Impact:</b> contributes a long-term and noticeable to appreciable beneficial increment to long-term, moderate to major beneficial cumulative impacts</p>

**Table 2: Summary of Environmental Consequences**

For a complete description of impacts, see “Chapter 4: Environmental Consequences”

Resource	Alternative A: No-action	Alternative B: NPS Preferred
<p><b>Infrastructure and Park Operations</b></p>	<p>Repairs to failing sanitary sewer and water-line infrastructure would continue as required to maintain campground services for visitors. Park staff may be called upon in unpredictable fashion to assist in or oversee such repairs and/or manage visitor use and access as necessary to ensure public safety.</p> <p>Water sampling would continue to be carried out in accordance with the provisions of Regional Manual 83A1: Drinking Water (NPS 2008). Bacteriological monitoring must be carried out by taking samples at least twice a month at equally spaced intervals.</p> <p>Routine maintenance of the existing sanitary sewer system would be carried out in accordance with the guidelines presented in Regional Manual 83B1: Wastewater Systems (NPS 2003b). This would consist of annual pumping out and cleaning of the septic tanks and regulation of the flow at the dual leach fields north of Colson Barn. All leach fields would be surveyed annually during a period of peak use to identify system failures such as odors or surfacing wastewater.</p> <p><b>Overall Impact:</b> long-term, local to parkwide, moderate and adverse</p> <p><b>Cumulative Impact:</b> contributes a noticeable adverse increment to long-term and moderate beneficial cumulative impacts</p>	<p>Improved sanitary sewer and water systems would result in more effective park operations as staff would be less likely to be engaged in unpredictable and frequent management of the problems arising from aged and undependable facilities</p> <p>Mitigation measures would include having a park archeologist present to oversee excavation of the proposed leach field. Also, park staff would be responsible for monitoring construction activities and ensuring that park visitors are adequately forewarned of the construction schedule, informed about the purpose and need for the project, and remain outside restricted construction zones.</p> <p>Water sampling and routine maintenance of the new sanitary system would be carried out as detailed for Alternative A.</p> <p><b>Overall Impact:</b> short-term, site specific, minor and adverse (construction); long-term, parkwide, moderate and beneficial (post-construction implementation)</p> <p><b>Cumulative Impact:</b> contributes an imperceptible adverse and a noticeable beneficial increment to long-term and moderate beneficial cumulative impacts</p>

**Table 2: Summary of Environmental Consequences**

For a complete description of impacts, see “Chapter 4: Environmental Consequences”

Resource	Alternative A: No-action	Alternative B: NPS Preferred
<b>Public Health and Safety</b>	<p>Overflows of untreated waste from the sanitary sewer would be expected to continue in the future. Campground visitors may inadvertently come into contact with potentially hazardous bacteria.</p> <p>The suitability of the water for public consumption would be monitored via bacteriological monitoring. If water quality does not meet established guidelines, a comfort station(s) may be temporarily closed until the issue is resolved. The park would follow all appropriate regulations to ensure public safety and would post notices forewarning visitors regarding any unavailable services.</p> <p><b>Overall Impact:</b> long-term, local, moderate and adverse</p> <p><b>Cumulative Impact:</b> contributes a short-term and noticeable adverse increment to long-term and moderate beneficial cumulative impacts</p>	<p>The comprehensive upgrade of the sanitary sewer system would greatly diminish the frequency of accidental discharges of wastewater in common areas and thus present less risk to public health and safety.</p> <p><b>Overall Impact:</b> long-term, local, moderate and beneficial</p> <p><b>Cumulative Impact:</b> contributes a long-term and noticeable beneficial increment to long-term and moderate beneficial cumulative impacts</p>

### ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Environmentally Preferred Alternative is defined by the CEQ as “the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act [Section 101 (b)].” Section 101 (b) goes on to define the Environmentally Preferred Alternative through the application of six criteria listed below. Generally, these criteria define the Environmentally Preferred Alternative as the alternative that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources. Each criterion is presented below, followed by a discussion of how well the proposed alternatives meet each one.

1. ***Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.*** The goal of the NPS at all units is to serve as trustees of the environment for future generations. Under the No-action Alternative, the NPS would not repair and rehabilitate the sanitary sewer system and water lines at the Wilderness Road campground. This would not address a known source of contamination to Station Creek nor releases of untreated wastewater that are occurring below ground surface through pipe fractures and above ground surface as overflows. Alternative B would address these

- uncontrolled discharges via the installation of a new sewer pipeline and adequately sized leach field.
2. ***Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.*** Under the No-action Alternative, the park would strive to provide a safe, healthful, productive, and aesthetically pleasing campground experience for its visitors. However, unpredictable overflows of sewage present a health concern and detract from the visitor experience and aesthetics of the campground and surroundings. Water line breakages can result in a disruption of service to comfort stations, further diminishing the visitor experience and posing a potential safety concern. Alternative B would address deficiencies in both the sanitary sewer system and the water delivery system and result in more dependable services.
  3. ***Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.*** The Wilderness Road campground is the park's only campground with vehicular access. It also is connected to a network of hiking trails. While the No-action Alternative would continue to provide these uses and promote exploration of the park's interior, Alternative B would improve the park's ability to meet this criterion by providing a dependable sanitary system and water supply.
  4. ***Preserve important historical, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.*** The Wilderness Road campground has been in operation since the early 1960s, offering park visitors a convenient location to stay at the park. It includes facilities for RV campers, trailer and car campers, and backcountry hikers. Under either alternative, the park would maintain this land use and a variety of opportunities to enjoy and explore the park. Under the No-action Alternative, sanitary sewer and/or water system failure may result in the potential disruption of services at comfort stations, thereby diminishing choices for park visitors. Alternative B would result in more dependable systems. Alternative B would locally enhance the natural aspects of the park by addressing a source of surface water contamination. Alternative B deliberately avoids affecting known archeological resources identified in the Station Creek bottomland (Des Jean 2010) by positioning the leach fields in an area where encountering such resources is far less likely. A cultural resources specialist or archeologist would be present during the leach field excavation to provide guidance should any resources be encountered.
  5. ***Achieve a balance between population and resource use that will permit high standards of living and wide sharing of life's amenities.*** Neither the No-action Alternative nor Alternative B would cause an imbalance between population and resource use. However, Alternative B would conserve resources that would otherwise be spent or lost under the No-action Alternative. These include consumption of fuel in vehicles and heavy machinery that must be mobilized to carry out system repairs and water lost during pipe breakages and via pipe leakage underground. Therefore, improvements to the sanitary

sewer and water line systems proposed under Alternative B would result in potentially less consumption of resources than would the No-action Alternative.

- 6. *Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.*** Under the No-action Alternative, no improvements to the sanitary sewer system or water lines would be carried out. Rather, failures in either system would be addressed on an as-needed basis via localized repairs. This may entail the occasional removal of trees to provide for equipment access. Conversely, Alternative B would involve the clearing of roughly 1.3 acres of forest in order to install the new leach field. Additional tree cutting would likely be required at some locations to install the new and replacement water and sewer lines. Neither the No-action Alternative nor Alternative B would offer opportunities to recycle depletable resources, though Alternative B could potentially result in less consumption of such resources as discussed in criterion 5 above.

The No-action Alternative fails to satisfy many of the criteria outlined in NEPA Section 101(b), whereas Alternative B largely fulfills the criteria with the exception of criterion 6. Therefore, Alternative B best meets the criteria for the environmentally preferred alternative, enhancing the reliability and efficiency of campground services and promoting sustainability by reducing water loss and the expenditure of resources that would otherwise be lost during the more frequent repairs required of the No-action Alternative (e.g., fuel, redirected park staff). Alternative B was also identified as the NPS Preferred Alternative.

# 3

## AFFECTED ENVIRONMENT

The Wilderness Road campground is located in Lee County, Virginia, approximately 7 miles by road southeast of Middlesboro, Kentucky. It is located in the western and most heavily visited area of the park in close proximity to the Cumberland Gap, Pinnacle Overlook, and visitor center (Figure 1). All of these park attractions are readily accessible from the campground via US 58 and internal park roads. The other five park campgrounds are primitive campgrounds that can only be accessed by hiking trails. The Wilderness Road campground consists of 160 campsites in a woodland setting, catering to tent, trailer, and RV campers alike. Campsites are arranged along a series of loop roads labeled “A” through “F,” with the southernmost loop road having “G” campsites on the inner (northern) portion of the road and “O” campsites on the outer (southern) part of the loop (Figure 2). Of the total 160 campsites, 41 have 50-amp electrical service. These are located at the northern loop roads A, B, and C. Group camping is available on loop road G/O.

Restroom and shower facilities and potable water are provided at three comfort stations that are equally spaced from north to south within the campground. Comfort station #1 is located between loop roads A and B; station #2 is between loop roads C and D; and station #3 is between loop roads F and G/O. The water system at the Wilderness Road campground is classified as a transient non-community system (TNC).

Other campground amenities include an RV dump station at loop road A and a group shelter at the southern tip of loop road G/O. An amphitheatre is located a short walk north from the intersection of loop road C and the outer loop road along the Green Leaf Trail. A variety of hiking trails of varying length intersect the Wilderness Road campground, offering opportunities for short hikes in gentle to moderate terrain or more involved explorations of the park interior.

The Wilderness Road campground is open year-round, though operations are seasonal. Comfort stations #2 and #3 are closed from the end of November through March while comfort station #1 remains open. Comfort station #1 services loop roads A, B, and C. Amenities in and around the Wilderness Road campground have been recently improved. Comfort stations #1 and #2 were upgraded three to six years ago; comfort station #3 in April of 2010. Road surfaces within the campground were repaved two years ago. The concrete pad and roof for the campground’s group shelter are recent improvements. The nearby amphitheatre was rehabilitated roughly five years ago. Seating, lighting and other improvements have been enhanced in the last two years. The preferred alternative described within the park’s GMP (NPS 2010b) targets continued

improvement of the Wilderness Road campground. Loop D would receive additional electrical hookups to allow increased RV usage. Two to four of the campground's RV sites would be modified to accommodate horse trailers and thus encourage horse use in the park.

The proposed action for this EA is confined to the study area, defined as the area south of the campground's FUM Headquarters Building (i.e., the northernmost building), the interior portions of the outer loop road, and the lands immediately east of the outer loop road and west of Station Creek. Organized by resource topic, this chapter describes the resources that could be impacted by the proposed action. Resources examined in detail include geologic resources and soils, vegetation, water quality, floodplains, vegetation, wildlife and wildlife habitat, special status species, archeological resources, visitor use and experience / recreation, infrastructure and park operations, and public health and safety. Resources dismissed from further consideration are discussed in "Chapter 1: Purpose and Need."

## **GEOLOGIC RESOURCES & SOILS**

Geologic resources within Cumberland Gap National Historical Park include caves, cliffs, and karst formations. Twenty-four caves have been identified along the south face of Cumberland Mountain in the Virginia portion of the park, ranging from 20 feet to over sixteen miles in length. These caves occur in the Greenbrier Limestone geologic formation. Cliffs, such as the White Rocks in the eastern end of the park near Ewing, Virginia, are located at higher elevations and were formed where resistant sandstone is capped with hematite conglomerate. Caves and cliffs are not known to exist within the study area.

Karst formations can occur in areas where carbonate rocks such as limestone and dolomite are present. Typical formations include sinkholes, disappearing streams, caves, and springs. This assemblage of physical features creates a landscape commonly referred to as "karst topography." Karst features such as sinkholes and caves occur when naturally occurring, slightly acidic water infiltrates into and dissolves carbonate rock. Over long periods of time, ongoing dissolution can result in large underground openings. Landscapes where such features are present are characterized by underground drainage networks that commonly bypass surface drainage divides and can provide and support habitat for rare animal and plant species. Because of their porous nature, carbonate rocks can be prodigious aquifers. The public water supplies for many municipalities in southwestern Virginia are derived from wells intersecting carbonate rock formations (DCR 2010; USGS 1997).

Multiple counties in southwestern Virginia possess areas of karst topography. Nearly all of Lee County is mapped with karst topography, including the study area (DCR 2010). Known karst features exist within the park, including several limestone sinks located along Cumberland Mountain as well as the caves and springs for which the park is famous. Several open vertical karst pits, up to 100 feet in depth and 3 feet in diameter, can also be found in the park. The karst geology of the park creates large amounts of groundwater that originate on top of Cumberland Mountain from rain events. Rainwater percolating downward enters a vast karst system of caves

and crevices. Water emerges at various locations along the base of the mountain where it enters surface streams.

Within the study area, karst sinkholes have spontaneously occurred within the past 10 years. A sinkhole that developed at the northeast end of Loop E and between Loops D and E required approximately 3 dump truck loads to restore ground surface. This area remains somewhat depressed to this day. Another sinkhole developed at the northeast end of Loop D between Loops C and D, requiring 2 to 3 dump truck loads to fill back to level. The last sinkhole reported occurred in the southwest end of Loop B, requiring less than one dump truck load of fill material to restore the site. Locations of karst resources have yet to be mapped for the study area or the park, though areas of subsidence are known just east of the campground on the Green Leaf Trail.

Soils within the study area have been mapped by the Natural Resource Conservation Service (NRCS 2010) and are shown on Figure 5. These include the Berks-Poplimento complex, the Carbo-Beech Grove complex, the Lobdell-Orrville complex, and Tumbling loam. Of these, the Lobdell-Orrville complex coincides approximately with the floodplain of Station Creek. This complex is rated by NRCS as partially hydric and subject to occasional, brief flooding. The Lobdell and Orville soil series are moderately well drained and somewhat poorly drained, respectively. Permeability in the upper portions of the soil is moderate for both soil series, and slope ranges from 0 to 3 percent. The potential for surface runoff ranges from low to very low and water table depth is approximately 24 inches (NRCS 2010). The Lobdell and Orville soils are classified by NRCS as prime farmland; however, since the creation of the park, these soils have been under protection of the NPS and have not been used for farming activities. Approximately 8.48 acres of the Lobdell-Orrville complex is present within the study area.

The Tumbling loam soil series lies adjacent to the Lobdell-Orrville complex and comprises the majority of the study area. These soils are found on slopes that occur from 7 to 25 percent. The soils are well drained with moderate permeability, and surface runoff potential ranges from low to high. The water table of this soil series is typically greater than 80 inches. It is not classified by NRCS as prime farmland. Portions of this soil type within the study area are covered with impervious surface associated with the infrastructure of the Wilderness Road campground.

The small remainder of the study area is comprised of the Berks-Poplimento in the northeast portion of the study area, and the Carbo-Beech Grove complex toward the southern limits of the study area. The Berks-Poplimento complex is found on slopes that occur from 35 to 55 percent, and the Carbo-Beech Grove complex is found on slope ranging from 15 to 25 percent. Soils of these complexes are well to excessively drained, have low to moderate permeability, and very deep water tables at depths greater than 80 inches. None of these soil series are classified by NRCS as prime farmland.

## **WATER QUALITY**

The park is located within the Powell and Upper Cumberland watersheds, which correspond to U.S. Geological Survey Cataloging Unit: 05130101. These watersheds encompass Bell, Harlan,

and Letcher counties in Kentucky; Campbell, Claiborne, Hancock, and Union counties in Tennessee; and Lee, Norton, Scott, and Wise Counties in Virginia (EPA 2007). The study area is located in Lee County, Virginia. Watersheds located in Lee County include Upper Cumberland, Upper Clinch, and Powell. Water quality in the park is protected and managed under the Federal Water Pollution Control Act Amendments of 1972 and the Clean Water Act of 1977. NPS *Management Policies 2006* (NPS 2006) also require the protection and conservation of water quality in the park. Water quality is primarily the net result of overall watershed characteristics and the effects of point-source and nonpoint-source discharges of pollutants (NPS 2010b).

As the park straddles the ridgeline of Cumberland Mountain, the majority of streams in the park are first order headwater streams and second order streams. During dry weather, these smaller streams commonly dry up, and flows in major streams and rivers may be attributed to base flow contribution from groundwater (OSM 1996). Surface and groundwater from the southeastern side of Cumberland Mountain drains into Station Creek, which serves as the easternmost boundary of the study area. Station Creek drains southward and into Tennessee just south of US 58, where it joins Indian Creek. Indian Creek is a tributary to the Powell River (Hydrologic Unit Code 06010206). Like many other streams in the park, Station Creek has been observed to dry up during the summer months.

Water quality in any stream is affected by land uses within its watershed, the geology of the area, occurrences of land disturbance and soil erosion, vegetation, and soil nutrients. The study area lies within the Station Creek watershed. Lewis Hollow, a tributary to Station Creek, runs parallel to and just west of the campground access road (Figure 2). The watershed divide separating these two drainages is approximated by the hiking trail that joins the three comfort stations along the center of the campground outer loop road. With the exception of Station Creek, surface drainage features are largely absent within the study area. No large drainage ditches are present. The majority of the study area within both watersheds is forested. However, portions of the Station Creek watershed east of Colson Lane are presently cleared and in use as pastureland for park horses. Based on historic aerial photographs, this area has a long history of use for agricultural purposes. From the time of the earliest available photo (1939) through at least 1962, the entire study area east of Colson Lane was maintained as a cleared field. After this point, shrubs and trees were apparently allowed to recolonize the area in a patchwork fashion, with the exception of the area immediately above the leach fields. The present distribution of forestland and pastureland came to be between 1978 and 1990.

The upper reaches of the Station Creek watershed lie entirely within the park and consist of relatively undisturbed forest. Surface water originating in areas upstream of the Wilderness Road campground has very few potential sources of potential pollutants. Station Creek is not listed as impaired by the Virginia Department of Environmental Quality as part of the state's obligations under Section 303(d) of the Clean Water Act. Furthermore, neither Station Creek nor Indian Creek are listed as impaired within the state of Tennessee (DWPC 2010). Station Creek is listed as a Class VI stockable trout stream within the Virginia Water Quality Standards (SWCB 2010). This designation means that while it does not contain a significant number (if any) trout, water quality is adequate and temperature is good for summer carryover of stocked trout.



	Roads
	Buildings
	Trails
	Streams
	FEMA Floodplain
	Existing Manholes
	Existing Leach Fields
	Existing Water Line
	Existing Sewage Line
	RV Dump Station

**Soil Survey Mapping Unit**

- 4E - Berks-Poplimento complex, 35 to 55 % slopes
- 4F - Berks-Poplimento complex, 55 to 65 % slopes
- 7C - Carbo silt loam, 7 to 15 % slopes
- 7D - Carbo silt loam, 15 to 25 % slopes
- 8D - Carbo-Beech Grove complex, 15 to 25 % slopes, rocky
- 8E - Carbo-Beech Grove complex, 25 to 60 % slopes, rocky
- 9E - Carbo-Rock outcrop complex, 25 to 35 % slopes
- 13D - Frederick silt loam, 15 to 25 % slopes
- 16E - Gilpin silt loam, 35 to 55 % slopes
- 21A - Gilpin silt loam, 35 to 55 % slopes
- 28B - Shottower silt loam, 2 to 7 % slopes
- 28C - Shottower silt loam, 7 to 15 % slopes
- 29B - Timberville silt loam, 2 to 7 % slopes, frequently flooded
- 29C - Timberville silt loam, 7 to 15 % slopes
- 30C - Tumbling loam, 7 to 15 % slopes
- 30D - Tumbling loam, 15 to 25 percent slopes

North  
  
 0 300 feet

Source: National Park Service GIS Data and VBMP/VGIN 2006-2007 Orthophotography.



There are no park-designated uses for Station Creek, though hiking trails cross it at numerous locations. With the exception of these trails and NPS roads, the Wilderness Road campground represents the uppermost area of developed land in the Station Creek watershed. The leach fields that receive wastewater generated by the comfort stations at the Wilderness Road campground are located in close proximity to Station Creek (Figure 3). Recognizing the potential threat to water quality posed by this arrangement, park staff began routine water sampling at Station Creek in 2003 and tested for fecal coliform, *E. coli*, and fecal streptococcus (NPS 2010c). Monitoring stations were established just upstream (Station 5) and downstream of the leach fields (Stations 9 and 10).

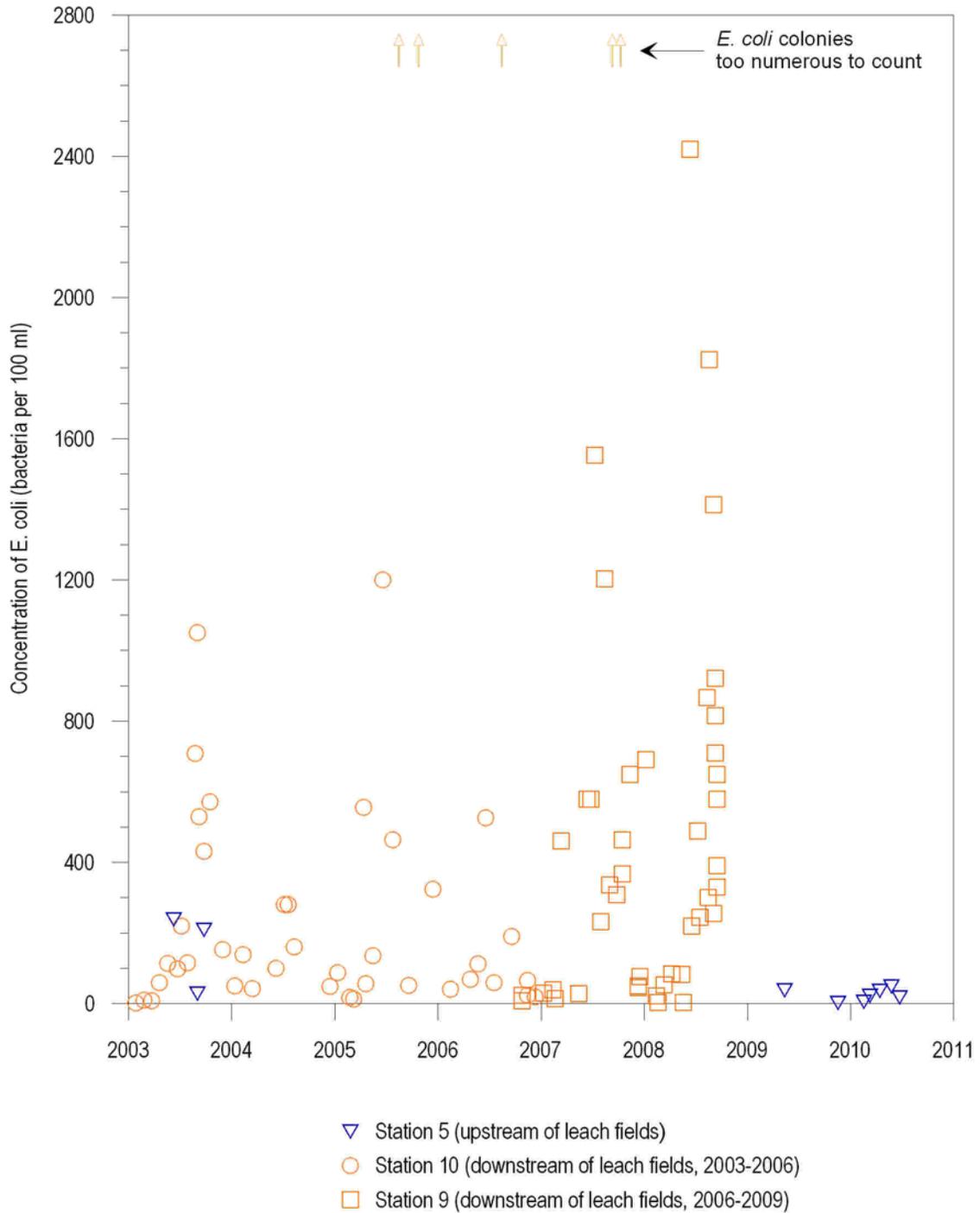
The results for *E. coli* are presented graphically in Figure 6. This indicator was selected for presentation, as it represents the most complete data set over the seven year monitoring period. Station 10 was located just south of where Station Creek passes under US 58. This station was discontinued in 2006 and replaced by Station 9, located approximately 200 feet north of US 58. Samples were generally collected on a monthly basis, though inclement weather and lack of stream flow occasionally precluded sampling.

*E. coli* levels in Station Creek were observed to be far higher at Stations 9 and 10 than at Station 5, which is located roughly 500 feet upstream of the existing leach fields. Gaps in the data record make trend identification problematic. However, *E. coli* levels were generally higher in the summer months at Stations 9 and 10. Occurrences where *E. coli* readings were too numerous to count occurred in August and October of 2005, August 2006, and September and October of 2007. Conversely, during the period from fall through spring (November through April) wherein visitation is lower, the average *E. coli* level was roughly 115 colonies per 100 ml (col/100 ml).

The highest recorded level of 2,520 col/100 ml was recorded on June 11, 2008 at Station 10. Notable spikes were also recorded the day after Labor Day in 2003 (1,050 col/100 ml) and two days after Labor Day in 2008 (1,414 col/100ml). The average of all samples collected at Stations 9 and 10 is approximately 366 col/100 ml. This does not include those samples for which colonies were too numerous to count. By contrast, the highest recorded instantaneous *E. coli* reading at Station 5 is 238 colonies per 100 ml and average of all available readings is 64 col/100 ml. Virginia Water Quality Standards for primary contact recreational uses (i.e., human contact) in freshwater streams state that the mean value of two or more samples in a calendar month cannot exceed 126 colonies per 100 ml and no single sample can exceed 235 colonies per 100 ml. For secondary contact recreational uses (e.g., boating) the respective values are 630 and 1,173 colonies per 100 ml (SWCB 2010). While the thresholds for both primary and secondary contact recreational uses has been documented as being exceeded in Station Creek, the park has no designated use for its waters. Various hiking trails intersect the stream, meaning that park visitors may come into contact with it waters while exploring the park. Secondary recreational activities are neither prohibited nor promoted, but boating is not possible due to the shallow depth of the water. Furthermore, these exceedances typically do not persist throughout the year but are correlated with periods of peak campground usage.

While laboratory results did not distinguish the source of the *E. coli* as human fecal matter or otherwise (such as horse manure), the apparent timing of *E. coli* spikes suggests that the leach

Figure 6. *E. coli* Levels at Various Locations in Station Creek, 2003-2010.



Source: NPS 2010c

field is chiefly responsible for the elevated *E. coli* readings in Station Creek. Park staff attempted to verify this hypothesis using a field test wherein additional sites were sampled in closer proximity to the horse pasture and the leach fields, one at each location. Of the 11 sampling events carried out between August 14, 2008 and September 16, 2008, *E. coli* levels were higher at the leach field site on 8 occasions and higher at the horse pasture on 3 occasions (NPS 2010c). Although periodic sewage overflows have affected water quality, Station Creek is not on the Virginia list of impaired waters.

## FLOODPLAINS

The 100-year floodplain of Station Creek as mapped by FEMA is presented on Figure 3. No base flood elevation has been determined for this zone. Within the study area, land cover within the 100-year floodplain includes both pastureland and forested riparian zones adjacent to the creek and a portion of the southernmost of the two leach fields located north of Colson Barn. Besides the septic tanks and leach field, no park infrastructure or visitor attractions are located in the floodplain area. However, it is not a restricted area for park visitors. Horse pasturing does not occur within the existing leach field area.

## VEGETATION

The study area generally consists of woodland and fields reflective of the different land use practices over time associated historically with livestock and the current Wilderness Road campground. Cover types include a mature, open, mixed deciduous forest, which encompass the majority of the study area and surrounds much of the campground infrastructure itself. Pastureland is also present at the bottom of the slope within the floodplain terrace of Station Creek near Colson Barn toward the eastern project limits.

The woodland community is made up of a mixture of deciduous and evergreen trees common to the region. A survey of all trees greater than 8 inches in diameter at breast height (dbh) was performed in the proposed leach field area in September, 2010. Species identified during this survey include American elm (*Ulmus americana*), black cherry (*Prunus serotina*), black walnut (*Juglans nigra*), dogwood (*Cornus spp.*), eastern hemlock (*Tsuga canadensis*), eastern red cedar (*Juniperus virginiana*), eastern white pine (*Pinus strobus*), honey locust (*Gleditsia triacanthos*), mulberry (*Morus rubra*), northern red oak (*Quercus rubra*), red maple (*Acer rubrum*), sassafras (*Sassafras albidum*), sourwood (*Oxydendrum arboretum*), sugar maple (*Acer saccharum*), sweet gum (*Liquidambar styraciflua*), sycamore (*Plantanus occidentalis*), tulip tree (*Liriodendron tulipifera*), Virginia pine (*Pinus virginiana*), and white ash (*Fraxinus americana*). This survey is included as Appendix C.

Understory shrub and herbaceous species in the proposed leach field area and immediate surroundings include plants that are indicative of second and perhaps third growth and/or occasional disturbance. Species include princess tree (*Paulownia tomentosa*), Japanese honeysuckle (*Lonicera japonica*) and multiflora rose (*Rosa multiflora*). The presence of these opportunistic and nonnative plants is consistent with the aerial photographic record, which shows

the area as completely cleared from the earliest available photo (1939) through at least 1968, with areas of open canopy thereafter.

The pastureland generally consists of an open field maintained by horse grazing and occasional mowing. Species composition is dominated primarily by grass and forb species. Typical species may include fescue (*Festuca* spp.) and bluegrass (*Poa* spp.), as well as horsenettle (*Solanum carolinense*), curled dock (*Rumex crispus*), plantain (*Plantago* spp.), buttercup (*Ranunculus* spp.), clover (*Trifolium* spp.), chickweed (*Stellaria media*), and dandelion (*Taraxacum officinale*).

## **WILDLIFE AND WILDLIFE HABITAT**

Across the entire park, habitats primarily consist of a diverse grouping of montane and submontane hardwood/pine/hemlock communities with stream coves and small field openings scattered throughout. To date, park employees have documented a total species of 33 mammals, 29 amphibians, 15 reptiles, 27 fish, and 178 insects. A more recent survey of avifauna documented 145 species utilizing the park during the migration, nesting, and wintering periods (Monroe 2005). Mammalian species common to the region include the cottontail rabbit, gray squirrel, opossum, striped skunk, bobcat, white-tailed deer, raccoon, gray fox, black bear, and various bats. Avifauna include passerines such as warblers, sparrows, woodpeckers, wild turkeys, ruffed grouse, hawks, and vultures.

The park contains numerous warm water and cold water streams that are tributaries to the Cumberland and Powell Rivers. A fish survey of park streams conducted by Remley (2005) found that the vast majority of fish were observed in warm water streams. Station Creek, a warm water perennial stream approximately 200 feet from the study area, is a riffle/pool, cobble dominated complex occupied by a variety of minnows, suckers, darters, and mollusks. The survey conducted by Remley (2005) found the blacknose dace, banded sculpin, and fantail darter as the dominant fish inhabitants in Station Creek.

The Wilderness Road campground is comprised primarily of upland woodland habitat with an open, maintained understory. Resident wildlife species using the campground area are those typical of park-like settings where animals are generally habituated to human presence. Bird species commonly observed include the northern cardinal, eastern chickadee, tufted titmouse, and downy woodpecker, while the gray squirrel is a regularly seen mammal in and around the campground. Undisturbed sections of forests around the perimeter of the campground provide multi-layered vegetative layers that may be used by bird species preferring this habitat such as the rufous-sided tohee and wood thrush. The pasture adjacent to Station Creek provides habitat diversity for species that prefer fields as part of their home range. Such species include sparrows, finches, foxes, wild turkeys, hawks, cottontail rabbits, and white-tailed deer.

A bird inventory for the park (Monroe 2005) noted that the park as a whole is an outstanding location for migratory birds, especially during the fall migration when the ridgeline seems to be the preferred migration corridor. No inventory specific to the Wilderness Road campground is

available, though fieldwork for the parkwide inventory did sample two locations in close proximity to the study area. Migratory songbirds noted in the inventory as being present in the vicinity of the campground include the great crested flycatcher, white-eyed vireo, gray catbird, brown thrasher, yellow-throated warbler, common yellowthroat, and yellow-breasted chat. The migratory nightjar the Chuck-will's-widow was also observed to be common at the campground area, though it is considered rare on the Cumberland Plateau. Almost all of the migratory species noted above occur along the periphery of the park and/or in disturbed settings. None of these species are state or federally listed.

## SPECIAL STATUS SPECIES

The Virginia Ecological Services Field Office of the USFWS cites 13 freshwater mollusks, 1 crustacean, 3 fish, 2 plants, and 2 mammals as potential inhabitants in the vicinity of the study area (see "Appendix B: Relevant Correspondence"). Virginia natural resources agencies also point to the potential presence of two listed species within the study area, which are the same two mammalian species cited by the USFWS: the Indiana bat (*Myotis sodalis*) and the gray bat (*Myotis grisescens*) (see "Appendix B: Relevant Correspondence"). Of the many species cited by the agencies, three species are documented as occurring within the park. These include the Indiana bat, gray bat, and the blackside dace (*Phoxinus cumberlandensis*).

A study of the plant life of the park by White (2006) found that the most highly ranked plant observed was the non-listed Ovate catchfly (*Silene ovata*), ranked as G2 (globally imperiled). Two plants listed by the USFWS as potential inhabitants of the park are the small whorled pogonia (*Isotria medeoloides*) and the Virginia spiraea (*Spiraea virginiana*), although these two plants have not been confirmed within park boundaries.

A review of the three confirmed listed species is provided below.

**Indiana bat (*Myotis sodalis*)** – Cumberland Gap National Historical Park provides important year-round habitat for the federally endangered Indiana bat due to the presence of numerous caverns. The park is especially important habitat for the Indiana bat due to the presence of priority hibernation area. The number of bats that use the priority hibernation area within the park is monitored biannually by the USFWS (NPS 2007). When not hibernating or roosting in area caves, female Indiana bats will roost in trees under loose bark formed from decomposing snags or heavy crevassed, exfoliating bark on live trees. Bats may roost in any tree greater than six inches in diameter (they have occasionally been seen in smaller trees) (Britzke, Harvey and Loeb 2003). They prefer open canopy areas with high solar exposure and also may prefer roosting in riparian forest as opposed to upland areas (Timpone et al. 2009).

The cave hibernation areas are gated to prevent human disturbance during hibernation (NPS 2007). Bats emerge from roosting areas at dusk to feed on moths and flying insects over woodlands and open-canopy areas associated with rivers and lakes. No caverns occur within the Wilderness Road campground study area, and there are no confirmed sightings of Indiana bats roosting within the study area.

**Gray bat (*Myotis grisescens*)** – Almost the entire population of the federally endangered gray bat migrate to only nine caves for wintering hibernation, none of which occur in Cumberland Gap National Historical Park. Other caves scattered throughout its range are used for summer roosting and broad rearing. There is historic evidence of gray bat usage within a cave in the park, though such usage has not been confirmed. Caves used by gray bats for summer roosting are always near open water where bats feed on insects (Smithsonian National Museum of Natural History 2010). Unlike Indiana bats, gray bats do not roost in trees and prefer exclusively caverns for winter hibernation and summer roosting (Tuttle 1979, Stevenson and Tuttle 1981).

**Blackside dace (*Phoxinus cumberlandensis*)** – The blackside dace is a small fish that has been documented as occurring within Davis Branch, a stream that is a tributary to Little Yellow Creek found on the northern side of the park. A fish survey within Station Creek, a tributary to the Powell River on the southeastern side of the park, did not yield any blackside dace individuals (Remley 2005).

Additional information on listed plant species as cited by the USFWS are worth noting. These include the small whorled pogonia (*Isotria medeoloides*) and the Virginia spiraea (*Spiraea virginiana*). Neither one of these species have been documented as inhabitants of the park, although the park falls within the range of the species. The small whorled pogonia is a threatened herbaceous plant found in mature forests of exclusively deciduous composition on level to gently sloping land that is absent of ground vegetation and a heavy understory. Further observation of known habitat is the presence of speckled patches of ground-level sunlight (Ware 1991). This plant has a preference to north and east facing aspects and moist soils having organic humus accumulation. The study area comprises a mixture of deciduous and coniferous trees within the campground and surrounding area containing a dense understory. The high percentage of Virginia pines (*Pinus virginiana*) and eastern red cedars (*Juniperus virginiana*) coupled with the heavy understory deems the habitat unsuitable for this plant species.

The Virginia spiraea is a shrub found in the southern Appalachian Mountains that has a very specialized habitat niche of scoured banks, point bars, levees, and other fluvial formations free of other woody competition (Ogle 1991). Station Creek has a cobble streambed with little to no sandy point bars or fluvial depositional features. In addition, the banks of Station Creek are fully occupied by woody vegetation, deeming habitat for the species as being unavailable.

## **ARCHEOLOGICAL RESOURCES**

A phase I archeological survey performed within a portion of the study area assisted the park in siting the proposed new leach fields (Des Jean 2010). Due to the potentially sensitive nature of archeological resources, the findings of this report are not included in this EA.

## **VISITOR USE AND EXPERIENCE / RECREATION**

Park management objectives focus on the protection of park resources while providing an enjoyable experience for all its visitors. Recreational visitation at the park increased from 85 to

93 percent during each decade of the 1960s, 1970s, and 1980s. Between 1990 and 2000, the visitation increase lowered slightly to 69 percent. Park visitation peaked in 2000, when the annual total topped over 1.5 million recreational visitors. The count procedure was refined in 2000 to eliminate potential double counting, resulting in a count of 887,488 recreational visitors in 2001(NPS 2010a). Over the last ten years, park attendance has remained strong, with 883,633 recreational visitors enumerated in 2009.

The western and most developed portions of the park experience the highest visitation. The Wilderness Road campground lies in close proximity to the visitor center, Pinnacle Overlook, the Cumberland Gap, and other attractions in this area. The campground is the primary land use within the study area and hosts tent, trailer, and RV campers year-round. In 2009, the number of tent and RV campers recorded in the campground was 4,970 and 9,530, respectively. Visitation increases markedly in April and tapers off greatly in November. Peak visitation in the campground typically occurs in the month of July. The campground includes 160 woodland sites located along a series of loop roads labeled A through F, and G/O (Figure 3). The loop roads B and C have 41 sites with 50 amp electrical hook ups. Campsites tailored to group camping are located on loop road G/O, and a group shelter is located in a grassy area at the southeast corner of the campground's outer loop road. The shelter can house group events and consists of a suite of reconfigurable picnic tables resting on a roofed concrete slab. Three comfort stations are located on loop roads B, D, and G and provide campers with access to hot showers and potable water. All comfort stations are Americans with Disabilities Act (ADA) compliant. An RV dump station is located at the western end of loop A where sanitary waste can be offloaded.

For the recreating public, the campground is accessible by road solely from US 58. Parking for horse trailers is provided on the access road near the intersection with the Boone Trail. Backcountry hikers can access the campground from a variety of hiking trails. These include the Lewis Hollow Trail, which by virtue of its connection to the Ridge Trail, effectively connects the campground with every other hiking trail within the park. Other trails include the Colson Trail and the Mischa Mokwa Adventure Trail. Shorter loop trails include the Honey Tree Spur Trail (1.1 miles) and the Green Leaf Nature Trail (0.7 miles). Details regarding the campground facilities are provided in the following section, "Infrastructure and Park Operations."

## **INFRASTRUCTURE AND PARK OPERATIONS**

Within the study area, the park operates and maintains a number of buildings (Figure 3). The FUM Headquarters Building houses staff that plan, carry out, and monitor the effects of prescribed burns parkwide. Related equipment is also stored in this building. The Entrance Station is a staffed resource where visitors can check into the campground and obtain information about the facilities present and general information about the park, ranger guided activities, and upcoming events. The VIP campsite is a facility near the entrance station that is separate from the other campsites and consists of a concrete slab atop which an RV or trailer can park. It also features a dedicated septic facility for RVs and an electrical hookup. The three comfort stations described in the preceding section are operated and maintained by the park, as

are all roads and hiking trails within the study area. Colson Barn and the adjacent paddock area provide shelter and pasturing for the horses used by park rangers in carrying out their duties.

The access road to the campground is not gated and visitors have unrestricted in/out privileges. Campers must observe quiet hours between 10:00 PM and 6:00 AM. The campground is open year-round, though comfort stations #2 and #3 are shut down for the winter months. Camping is restricted accordingly to the sites on loop roads A, B, and C. Medical facilities are not provided by the park and are available in the towns of Middlesboro, Kentucky, and Harrogate and Tazewell, Tennessee. The campground is served by emergency dispatch via telephoning 911. Visitors may stay at the campground for a maximum of 14 consecutive days.

All septic tanks within the study area are pumped out and cleaned annually by private contractors and their contents disposed of offsite. The park occasionally hires private contractors to address maintenance issues related to clogged sanitary sewer lines and water line leakages. Six water line failures have occurred at the campground since October 2009.

## **PUBLIC HEALTH AND SAFETY**

The primary public health and safety concern within the study area is the unpredictable discharge of sanitary waste onto ground surfaces adjacent to manholes. There are five manholes located inside the outer loop road (Figure 3). As park visitors can move freely in all areas within the outer loop road, they may unexpectedly come into contact with untreated sanitary waste that has overflowed from manholes. Clothing, footwear, or body parts tainted by contact with such materials can pose a health risk, particularly if accidentally ingested or if the affected person has open wounds on exposed body parts.

As noted in the preceding section “Water Quality,” the levels of *E. coli* in Station Creek downstream of the leach fields occasionally exceeds the Virginia Water Quality Standards for primary contact recreational uses. However, while access to this portion of Station Creek is unrestricted, it is nevertheless difficult to access due to the presence of the adjacent and fenced horse pasture and strip of riparian forest. Furthermore, there are no park-designated uses for Station Creek. Secondary recreational activities are neither prohibited not promoted, but boating is not possible due to the shallow depth of water. Hiking trails that intersect the stream do so at locations upstream of the leach fields.

Blockages in the sanitary sewer lines and breakages in water lines can temporarily disrupt services at comfort stations while repairs are carried out. Such occurrences can inconvenience campground visitors. In rare instances, the lack of potable water may present a minor safety issue. For example, a lack of potable water may hinder timely cleaning of minor and accidental cuts and scrapes sustained by campground visitors. Lack of potable water may also compound a case of dehydration being experienced by a backcountry hiker who was planning on recovering at the campground.

# 4

## ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences associated with the alternatives presented in “Chapter 2: Alternatives.” It is organized by impact topic, which distills the issues and concerns into distinct subjects for discussion analysis. DO-12 requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect, and cumulative) and measures to mitigate for impacts. NPS policy also requires that impairment of resources be evaluated in all environmental documents; therefore, an impairment determination is made in the “Appendix D: Conclusions and Findings on Impairment” section for each applicable impact topic.

### GENERAL METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts are described in terms of type (beneficial or adverse), context (site specific, local, or regional), duration, and level of intensity (negligible, minor, moderate, or major). Both indirect and direct impacts also are described; however, they may not be identified specifically as direct or indirect. These terms are defined below. Overall, these impact analyses and conclusions were based on the review of existing literature and studies, information provided by on-site experts and other government agencies, professional judgments, and insight provided by park staff.

For the purposes of this impact assessment, the following assumptions are considered common to both the No-action and Action Alternative:

- 1) There is no increase in the demand/supply for the sewer or water supply/service systems.
- 2) There would be no structural improvements or changes in service capacity with respect to road surfaces, buildings, hiking trails, campsites, and associated facilities (e.g., group shelter, RV dump station).
- 3) Routine maintenance and inspection of the sewer system and water lines.

### TYPE OF IMPACT

Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions, while adverse impacts would deplete or negatively alter resources.

- Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- Adverse:** A change that moves the resource away from a desired condition or detracts from its appearance or condition.
- Direct:** An impact that is caused by an action and occurs at the same time and place.
- Indirect:** An impact that is caused by an action but is later in time or farther removed in distance, but still reasonably foreseeable.

## **CONTEXT**

Context is the setting within which an impact occurs and can be site specific, local, parkwide, or regional. Each of these categories is defined below.

- Site specific:** The impact would occur within project area.
- Local:** The impact would occur within the general vicinity of the project area.
- Parkwide:** The impact would affect a greater portion outside the project area yet within the park.
- Regional:** The impact would affect localities, cities, or towns surrounding the park.

## **DURATION**

Impacts can be either short term or long term. A short-term impact would be temporary in duration and would be associated with the construction process. Depending on the resource, impacts would last as long as construction was taking place, or up to one year after construction is completed. Long-term impacts last beyond the construction period, and the resources may need more than one year after construction to resume their previous condition. Impact duration for each resource may differ and is presented for each resource topic, where applicable.

- Short-term:** Impacts that occur only during construction or last less than one year.
- Long-term:** Impacts that last longer than one year.

## **LEVEL OF INTENSITY**

Level of intensity means the severity or magnitude of an impact. Because the levels of intensity definitions (negligible, minor, moderate, major) vary by resource, separate definitions are provided for each impact topic analyzed.

## **CUMULATIVE IMPACT METHODOLOGY**

The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as impacts which result when the impact of the proposed action is added to the impacts of other present and

reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

### **Cumulative Impact Contribution Methodology**

In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

- Imperceptible:** The incremental effect contributed by the alternative to the overall cumulative impact is such a small increment that it is impossible or extremely difficult to discern.
- Noticeable:** The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impact.
- Appreciable:** The incremental effect contributed by the alternative constitutes a large portion of the overall cumulative impact.

To determine the potential cumulative impacts, existing and anticipated future projects in the vicinity of the study area were identified. Based on the limited study area and scope of the project, these included lands within Cumberland Gap National Historical Park and the immediate vicinity of the campground only. Potential projects identified as cumulative actions include planning or development activity currently being implemented or expected to be implemented in the reasonably foreseeable future. For the purpose of this EA, the reasonably foreseeable future is three years from the publication of this document. The projects identified as contributing to cumulative impacts on the resources addressed by this EA include the park's program of prescribed burning, the planned installation of a lockable gate at the campground entrance, the tree hazard program, the rehabilitation of Colson Barn and the potential expansion of horse pasturing areas, campground schedule and seasonal operations, recent upgrades to campground and nearby infrastructure including the comfort stations, group shelter, road surfaces, amphitheatre, and potential future plans for facilities to accommodate horses at the campground.

### ***Prescribed Burning***

The goal of the FUM is to provide a highly skilled professional and technical resource for prescribed fire, wildland fire use, and wildland fire suppression assignments. The park's FUM was established in 2001 and consists of seven team members. A total of 29 burn units are located within the park boundaries. Two units encircle the Wilderness Road campground, designated as "Wilderness Road Campground Unit A" and "Wilderness Road Campground Unit B," shown on Figure 7. Prescribed burning initiated in 2005 and the proposed schedule extends through the year 2020. To date, burns have been carried out in 14 units. Wilderness Road Campground Unit

A was burned for the first time in 2005; Unit B in 2008. Both are scheduled to be burned again in 2012.

### ***Installation of Entrance Road Gate***

A lockable gate is to be installed at the entrance to the Wilderness Road campground in the spring of 2011. This gate would enable road closure during winter storms to restrict access and protect park visitors.

### ***Tree Hazard Program***

The park contracted a certified arborist to assess tree health and potential tree hazards within the Wilderness Road campground, the Lewis Hollow picnic area, and along the access roads linking these facilities. Recommendations were made for a total of 180 trees, the majority of which are located within the limits of the outer loop road within the campground proper. A total of 171 trees are to be removed entirely, 5 trees pruned, and 4 trees cabled to provide additional support.

### ***Construction of Colson Barn and Horse Pasturing***

Colson Barn is located just east of the Wilderness Road campground. It was rehabilitated less than six years ago to provide stabling for horses used by park rangers and to provide storage for related equipment. A fenced paddock area connects to the barn, wherein horses can pasture. Colson Barn lies immediately northeast of the leach field area proposed under Alternative B. Once the leach fields are installed, this area would be maintained with herbaceous cover in order to protect the underlying leach field from intrusion by the roots of woody plants and to provide access for repairs as needed. Park staff has been informed by a soil scientist contracted by the NPS that horses can safely pasture in the lands above the leach fields.

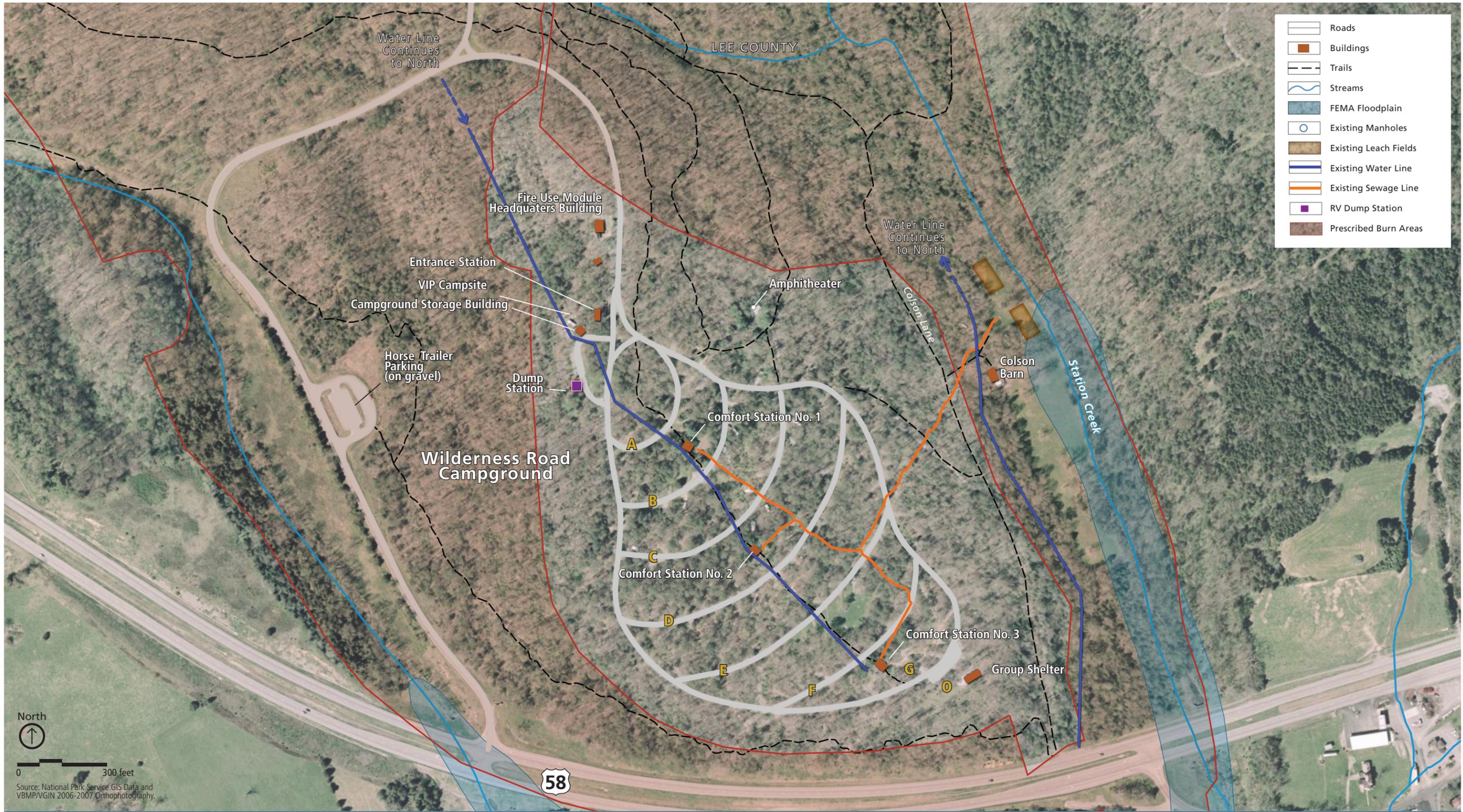
### ***Future Horse Camping in the Park***

Horse camping is currently under consideration within the Wilderness Road campground. However, any areas currently pastured or proposed for pasturing would not be used for horse camping.

### ***Impairment of Park Resources***

In addition to determining the environmental consequences of the proposed action and the No-action alternative, NPS *Management Policies 2006* and DO-12 require analysis of potential impacts to determine if actions would impair a park's resources.

The fundamental purpose of the NPS, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable adverse impacts on park resources and values. However, the laws do give NPS management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is limited by statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional



Renew Wilderness Road Campground Wastewater System Component - Environmental Assessment

Figure 7  
Fire Management Plan: Locations of Prescribed Burns



judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact on any park resource or value may constitute an impairment. However, an impact would more likely constitute an impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's master plan or GMP or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination of impairment for the NPS preferred alternative is contained in Appendix D.

## **GEOLOGIC RESOURCES AND SOILS**

### **METHODOLOGY**

In order to assess impacts on geologic resources and soils within the study area, information on local soil classification was gathered from the NRCS. General descriptions of the geology of the area were reviewed and anecdotal information regarding karst-related subsidence within the campground was provided by park staff. Predictions about short- and long-term site impacts were based on recent studies and on projects of a similar nature and on state and local requirements for the stabilization and revegetation of disturbed surfaces. The thresholds for the intensity of an impact are defined below.

**Negligible:** Impacts on karst features and soils would be below or at the lower levels of detection.

**Minor:** The impacts on karst features and soils would be detectable and small. Mitigation may be needed to offset adverse impacts and would be relatively simple to implement and likely be successful.

**Moderate:** The impacts on karst features and soils would be readily apparent and result in a change to soils a relatively wide area. Mitigation measures would be necessary to offset adverse impacts and likely be successful.

**Major:** The impacts on karst features and soils would be readily apparent and would substantially change the character of these resources over a large area in and out of the park. Mitigation measures to offset adverse impacts would be needed, extensive, and their success could not be guaranteed.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Under Alternative A, current conditions impacting geologic resources and soils would continue. Impacts on soils would occur as required to perform repairs on failed components of the sanitary sewer and water line systems. They would consist of localized excavation to expose and repair and/or replace affected infrastructure. Excavated areas would be backfilled and stabilized with standard erosion and sediment control measures and reseeded. Overall, impacts on soils for Alternative A would be short-term, site specific, minor and adverse.

Sinkholes are present along the Greenleaf Trail just east of the campground and the amphitheatre is located within a shallow subsidence depression. However, insufficient information is available with respect to the distribution of karst features under the campground. Impacts on geologic resources under Alternative A would not be detectable by current park operations or monitoring programs and thus are difficult to ascertain.

As the campground area is underlain by carbonate rocks and episodes of subsidence have been documented by park staff, it is possible future subsidence or sinkhole development could cause damage to park infrastructure. This would include not only the sanitary sewer and water line systems, but road surfaces and park facilities. However, direct impacts on karst features would likely not occur as repairs to sewer lines and water lines would be restricted to the soil column. Overall, impacts on geologic resources for Alternative A may be considered short-term, negligible to minor, site specific, and adverse.

### **Cumulative Impacts**

Past and reasonably foreseeable actions that would potentially impact soils include horse pasturing and equestrian activities and the construction of roads, trails, and buildings adjacent to the campground. These activities, coupled with ongoing maintenance activities, may result in soil disturbance. Planned future prescribed burns and brush clearing to reduce fire risk in the surrounding area would potentially result in soil erosion that could temporarily affect soils. These actions, combined with Alternative A, would result in a local, long-term, minor, and adverse cumulative impact on soils. No cumulative impacts have been considered for geologic resources.

### **Conclusion**

Because impacts on soils would be detectable to park staff and visitors, Alternative A would result in a short-term, site specific, minor and adverse impact on soils. While future subsidence may impact park infrastructure, impacts on karst features would not occur directly as a result of Alternative A with the possible exception of during repairs to the sewer or water line systems. Therefore, impacts on geologic resources may be considered short-term, negligible to minor, site specific and adverse.

The cumulative impact to soils from the Alternative A in combination with past, present, and reasonably foreseeable future actions would be local, long-term, minor, and adverse. Alternative A would contribute a short-term and noticeable adverse increment to these cumulative impacts. No cumulative impacts have been considered for geologic resources.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, soils would be disturbed during construction to install the replacement sanitary sewer system and water lines. This would be carried out in close proximity to the existing lines and previously disturbed areas, thereby minimizing soil impacts. The location of the proposed leach field is currently forested. It would be cleared and grubbed prior to excavation to install the distribution boxes and perforated distribution pipes. Native materials excavated during construction would be stockpiled and used as backfill after the new system is installed.

All construction activities would adhere to Virginia Erosion and Sediment Control Law and Regulations. The sequence of construction would be such that trenching and pipe installation would occur in a timely manner, thus limiting the area of exposed soil at any given time. Disturbed surfaces would be stabilized immediately after system installation and reseeded with an appropriate seed mix. Proposed erosion and sediment control measures would be subject to inspection by Lee County staff and would be maintained by the contractor, remaining in place until the finished surfaces have been deemed stable.

It is possible future subsidence or sinkhole development could cause damage to park infrastructure. This would include not only the newly installed sanitary sewer and water line systems, but road surfaces and park facilities. However, like the No-action Alternative, direct impacts on karst features would likely not occur as the construction required to install the new sewer lines, leach fields, and water lines would be restricted to the soil column. Overall, impacts on geologic resources would be considered short-term, site specific, negligible to minor and adverse and impacts to soils would be considered short-term, site specific, minor, and adverse.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable actions that would potentially impact soils include horse pasturing and equestrian activities and the construction of roads, trails, and buildings adjacent to the campground. These activities, coupled with ongoing maintenance activities, may result in soil disturbance. Planned future prescribed burns and brush clearing to reduce fire risk in the surrounding area would potentially result in soil erosion that could temporarily affect soils. These actions, combined with Alternative B, would result in a local, long-term, minor, and adverse cumulative impact on soils. No cumulative impacts have been considered for geologic resources.

## **Conclusion**

Since impacts on soils would be detectable to park staff and visitors, Alternative B would result in a short-term, site specific, minor and adverse impact on soils. Impacts on geologic resources would be unlikely, as installation of the new systems would be restricted to the soil column. Therefore, they may be considered short-term, site specific, negligible to minor and adverse.

The cumulative impact to soils from Alternative B in combination with past, present, and reasonably foreseeable future actions would be local, long-term, minor, and adverse. Alternative B would contribute a short-term, noticeable adverse increment to these cumulative impacts. No cumulative impacts have been considered for geologic resources.

## **WATER QUALITY**

### **METHODOLOGY**

The NPS *Management Policies 2006* state that the NPS will “take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations (sec. 4.6.3).”

A water quality standard defines the water quality goals of a water body by designating uses of the water, by setting minimum criteria to protect the uses, and by preventing degradation of water quality through anti-degradation provisions. Part of this policy (40 CFR 131.12 (a) (2)) strives to maintain water quality at existing levels if it is already better than the minimum criteria. The anti-degradation policy however is only one portion of a water quality standard. Anti-degradation should not be interpreted to mean that “no degradation” can or will occur, as even in the most pristine waters, degradation may be allowed for certain pollutants as long as it is temporary and short term.

Given the above water quality issues, methodology, and assumptions, the following impact thresholds were established in order to describe the relative changes in surface waters and water quality under the various alternatives.

**Negligible:** Impacts are chemical, physical, or biological impacts that would not be detectable, would be well below water quality standards or criteria, and would be within historical or desired water quality conditions.

**Minor:** Impacts (chemical, physical, biological) would be detectable, but would be well below water quality standards or criteria and within historical or desired water quality conditions.

**Moderate:** Impacts (chemical, physical, biological) would be detectable, and may occasionally exceed water quality standards or criteria but not be consistently altered from the historical baseline or desired water quality conditions.

**Major:** Impacts (chemical, physical, biological) would be detectable, and would be consistently and permanently altered from the historical baseline or desired water quality conditions.

For the impact topic of water quality, the context and duration have been modified somewhat from the general categories provided at the beginning of this chapter. These are described below.

**Site specific:** The impact would occur within the project area.

**Local:** The impact would occur within the general vicinity of the project area.

**Parkwide:** The impact would affect a greater portion outside the project area yet within the park.

**Regional:** The impact would affect water quality at a regional scale, contributing measurably to water quality impairments beyond the park boundaries.

**Short-term:** Impacts that occur only during construction or last less than one year.

**Long-term:** Impacts occur in a persistent manner throughout the year and occur over successive years.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Under Alternative A, sanitary sewer blockages would continue to occur in unpredictable fashion and may result in the discharge of untreated sewage into public areas where it can come into contact with campers or discharge to Station Creek, periodically impacting water quality in the stream. However, neither Station Creek nor the stream to which it discharges (Indian Creek) are listed as impaired waters by either the state of Virginia or Tennessee. Overall, Alternative A would result in a short-term, moderate, and local adverse impact on water quality.

### **Cumulative Impacts**

Past and reasonably foreseeable actions that would potentially impact water quality include horse pasturing and equestrian activities, mining, and the construction of roads, trails, and buildings adjacent to (and upstream of) the campground. These actions, along with maintenance activities, have contributed sediment, nutrients, and other contaminants into the natural stream system in the project area. Planned future prescribed burns and brush clearing to reduce fire risk in the surrounding area would potentially result in soil erosion that could temporarily affect water quality. These actions, combined with Alternative A, would result in a local, long-term, and moderate adverse cumulative impact.

## **Conclusion**

Because Alternative A does not address documented inadequacies in the sanitary sewer system at the Wilderness Road campground, there would be a short-term, moderate, and local adverse impact on water quality in Station Creek. There would remain an ongoing need to affect repairs and maintain the sanitary sewer system so as to reduce the potential for long-term contributions to water quality impacts in the stream. The cumulative impact to water quality from Alternative A in combination with past, present, and reasonably foreseeable future actions would be long-term, moderate, local, and adverse. Alternative A contributes a noticeable adverse increment to this cumulative impact.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, virtually every component of the existing sanitary sewer system at the Wilderness Road campground would be abandoned in place. Select manholes would remain and be incorporated into the new system. The new system of sanitary sewer pipes would convey water to septic tanks and the proposed leach field in a reliable fashion, limiting the likelihood of overflows at manhole locations and subsurface discharges.

Alternative B would result in the decommissioning of all leach fields. This would consolidate the treatment of liquid waste at one principal location south of Colson Barn and thereby minimize the inherent risk associated with a more disseminated and complex system. More importantly, the leach field currently contributing to documented water quality contamination in Station Creek would be taken offline.

Construction related impacts on water quality such as the mobilization of soil from disturbed surfaces would be minimized via the use of approved erosion and sediment control measures. Chemical discharges from construction equipment would be addressed with all due haste as required by VSMP program regulations. The efficacy of these measures would be evaluated on a routine basis by county inspectors and the contractor responsible for the project construction. Accordingly, Alternative B would have potential short-term, minor, site specific adverse impacts on water quality during construction, and long-term, moderate, and local beneficial impacts on water quality in Station Creek following project implementation due to improvements in the transport and treatment of wastewater.

### **Cumulative Impacts**

Past and reasonably foreseeable actions that would potentially impact water quality include horse pasturing and equestrian activities, mining, and the construction of roads, trails, buildings adjacent to (and upstream of) the campground. These actions, along with maintenance activities, have contributed sediment, nutrients, and other contaminants into the natural stream system in the project area. Planned future prescribed burns and brush clearing to reduce fire risk in the surrounding area would potentially result in soil erosion that could temporarily affect water

quality. These actions, combined with Alternative B, would result in a long-term, local, and negligible adverse cumulative impact.

## **Conclusion**

Overall, Alternative B would have short-term, minor, and site specific adverse impacts on water quality (construction related) and long-term, moderate, and local beneficial impacts on water quality related to the wholesale improvement of the sanitary sewer system. The cumulative impact to water quality from Alternative B in combination with past, present, and reasonably foreseeable future actions would be long-term, negligible, local and adverse. Alternative B contributes a short-term, imperceptible, adverse increment and a long-term, noticeable, and beneficial increment to this cumulative impact.

## **FLOODPLAINS**

### **METHODOLOGY**

Neither Alternative A nor B propose any permanent structural improvements within the 100-year floodplain as designated by FEMA or in flood-prone areas known to park staff. Nevertheless, this impact topic is included to consider potential impacts caused by maintenance of the existing leach field north of Colson Barn under Alternative A and those posed by the decommission of this same field under Alternative B. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** There would be no change in the ability of a floodplain to convey floodwaters, or its values and functions. Projects would not contribute to enhancing flood events.
- Minor:** Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and local. Project would not contribute to the flood. No mitigation would be needed.
- Moderate:** Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and local. Project could contribute to the flood. The impact could be mitigated by modification of proposed facilities in floodplains.
- Major:** Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and regional. Project would contribute to the flood. The impact could not be mitigated by modification of proposed facilities in the floodplains.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Under Alternative A, the existing septic tank and dual leach fields located north of Colson Barn would remain within the flood-prone area west of Station Creek. The ability for this area to store and convey floodwaters is currently unimpeded. Ventilation pipes composed of polyvinylchloride have been installed vertically in both leach fields. These pipes measure 3 to 4 inches in diameter and stand roughly 3 feet in height. The size of these pipes is inconsequential with respect to the storage capacity of the floodplain. Flood-borne debris may collect on the upstream side of these pipes during extreme events, but this would do little to diminish floodwater conveyance or floodplain storage.

Should repair of the septic tank, distribution boxes, of the leach field piping be required, construction equipment may be positioned within the floodplain. However, this would occur in temporary fashion and equipment would be removed should a potential flood event be forecasted. Overall, Alternative A would have short-term, site specific, negligible and adverse impacts on floodplains.

### **Cumulative Impacts**

No past, present, and reasonably foreseeable future actions have or continue to contribute to the cumulative impact on floodplains in and around the study area.

### **Conclusion**

Under Alternative A, occasional maintenance and repair of the existing leach fields north of Colson Barn may be required. This would result in the temporary placement of equipment and personnel in flood prone areas. Impacts would be expected to be short-term, site specific, negligible and adverse. No cumulative impacts have been considered.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, the septic tank and leach field north of Colson Barn would be abandoned in situ. Therefore, there would be no change in the flood storage capacity of this area. With the sanitary sewer infrastructure no longer present at this location, construction equipment would no longer enter this area to affect repairs. The proposed leach fields would be located outside of the floodplain to the west. No septic tanks would be present at this location. They are proposed farther upstream in the sewer system at the comfort stations. Overall, impacts on floodplains for Alternative B would be considered long-term, site specific, negligible and beneficial.

### **Cumulative Impacts**

No past, present, and reasonably foreseeable future actions have or continue to contribute to the cumulative impact on floodplains in and around the study area.

## **Conclusion**

Under Alternative B, plans for the area above the existing leach fields after their decommissioning have yet to be made. However, the flood-prone setting would likely preclude the installation of above-ground infrastructure. The area may be suitable for horse pasturing or replanting to enhance the riparian buffer of Station Creek. Impacts related to the decommissioning of the sanitary sewer system would be expected to be long-term, negligible, site specific and beneficial. No cumulative impacts have been considered.

## **VEGETATION**

### **METHODOLOGY**

Available information on plants and vegetative communities potentially impacted by the Wilderness Road campground was provided by park staff and is summarized in Chapter 3, Affected Environment. Predictions about short- and long-term site impacts were based on design conceptual design plans and previous projects with similar vegetation. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** No vegetation would be affected, or some individual plants could be affected as a result of the alternative, but there would be no impact to native species populations. The impacts would be on a small scale.
- Minor:** The alternative would affect some individual plants and would also affect a relatively small portion of that species' population. Mitigation to offset adverse impacts could be required and would likely be successful.
- Moderate:** The alternative would affect some individual plants and would also affect a sizeable segment of the species' population over a relatively large area. Mitigation to offset adverse impacts could be extensive but would likely be successful.
- Major:** The alternative would have a considerable impact on plant populations and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse impacts would be required and extensive, and success of the mitigation measures would not be guaranteed.

### **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

#### **Impact Analysis**

Alternative A would involve no planned alterations to the project area that would affect vegetation. The operation of the existing sewer treatment facilities would continue, and no land disturbance activities would be necessary with the exception of unscheduled repair work. Depending on the location of these repairs, such work may or may not involve disturbance to

vegetated areas. Therefore, impacts associated with Alternative A would be considered short-term, site specific, negligible and adverse.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions affecting vegetation may occur to nearby private properties associated with roadways, timber activities, or other land uses unassociated with park operations. Trees within the study area would be pruned, supported or removed as part of the park's tree hazard program and as part of other precautionary operations where trees and/or snags pose threats to visiting campers. As many of the trees to be removed as part of the tree hazard program reside within the campground area proper, these activities and their results may be apparent to park visitors. However, the overall forested community would remain, and the impacts would be imperceptible. These actions, combined with Alternative A, would result in a short-term, negligible and adverse cumulative impact.

### **Conclusion**

Alternative A would result in no planned impacts on vegetation due to park service operations. Though sanitary system and water line repairs may require the removal of vegetation, these impacts would be short-term, site specific, negligible and adverse. Coupled with Alternative A, the tree hazard program, emergency tree removal, and by land uses just outside of park boundaries would result in short-term, negligible and adverse cumulative impacts. Alternative A would contribute a short-term and imperceptible adverse increment to this cumulative impact.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Alternative B would involve the clearing of approximately 1.3 acres of natural forest to make room for the proposed leach field south of Colson Barn. Heavy equipment would be used to clear away felled trees and grub the area, and an excavator would be used to remove soil for the placement of the drain fields. Once the drain fields are installed, the area would be backfilled with porous soil around the drain field pipes and covered with topsoil stockpiled during the initial excavation. Grass seed would be sowed to quickly re-establish vegetation cover. Site specific vegetation removal would be necessary to install the new sewer and water lines.

The conversion of the 1.3 acre forested area to a grassy meadow associated with the leach field installation would most affect various species of oak, yellow poplar, Virginia pine, and eastern red cedar. However, these species occur in abundance locally and parkwide and impacts on the overall population levels of the vegetative species would be negligible. Vegetation impacts associated with the installation of the new sewer and water lines would be temporary, as new woody vegetation would be allowed to re-establish over the disturbed areas. Overall, Alternative B would result in long-term, site specific, minor and adverse impacts on forested and understory, shade tolerant species vegetation.

## **Cumulative Impacts**

Past, present, and reasonably foreseeable future impacts on vegetation under this alternative are identical to those for Alternative A and include the tree hazard program and emergency removal of vegetation that threatens park visitors or infrastructure. When combined with Alternative B, these actions would result in a long-term, minor and adverse cumulative impact.

## **Conclusion**

Alternative B would result 1.3 acres of tree clearing required for the installation of the proposed leach fields, resulting in a long-term conversion from forestland to a maintained grassy area. Relatively minor vegetative disturbance would occur along the proposed sanitary sewer and water lines as they would largely occupy existing alignments. Therefore, impacts on vegetation associated with Alternative B would be considered long-term, site specific, minor and adverse. When combined with Alternative B, cumulative impacts on vegetation such as those incurred by the tree hazard program, emergency tree removal, and by land uses just outside of park boundaries would result in long-term, minor and adverse cumulative impacts. Alternative B would result in a long-term and noticeable adverse increment to this cumulative impact.

# **WILDLIFE AND WILDLIFE HABITAT**

## **METHODOLOGY**

Available information on known wildlife and wildlife habitat was compiled and analyzed and is summarized in Chapter 3, Affected Environment. The thresholds for the intensity of an impact are defined as follows:

- Negligible:** There would be no observable or measurable impacts on the abundance and diversity of native species and/or the quality of their habitat. Impacts would be of short duration and well within natural fluctuations.
- Minor:** Impacts would be detectable, but would not be outside the natural range of variability. Small changes to population numbers, number of species present, habitat quality, and other factors might occur. Occasional responses to disturbance by some individuals could be expected, but without interference to factors affecting population levels. Sufficient habitat would remain functional to maintain viability of all species. Impacts would be outside critical reproduction periods for sensitive native species. Mitigation measures, if needed to offset adverse impacts, would be simple and very likely successful.
- Moderate:** Impacts on the abundance and diversity of native species and/or the quality of their habitat would be detectable and could be outside the natural range of variability. Changes to population numbers, number of species present, habitat quality, and other factors would occur, but species would remain stable and viable. Frequent responses to disturbance by some individuals could be expected,

with some negative impacts to factors affecting population levels. Sufficient habitat would remain functional to maintain the viability of all native species. Some impacts might occur during critical periods of reproduction or in key habitat. Mitigation measures, if needed to offset adverse impacts, would be extensive and likely successful.

**Major:** Impacts on the abundance and diversity of native species and/or the quality of their habitat would be detectable, would be expected to be outside the natural range of variability, and would be extensive. Population numbers, number of species present, habitat quality, and other factors might experience large declines. Frequent responses to disturbance by some individuals would be expected, with negative impacts to factors resulting in a decrease in population levels. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse impacts, and may not be successful.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Alternative A would largely retain existing terrestrial forested wildlife habitat, with habitat disturbance potentially occurring as a result of sanitary sewer system and water line maintenance and repair. Wildlife populations preferring forested habitats under this alternative would continue to benefit from the shelter and food resources supplied by the wealth of trees and understory that would remain. Most of the migratory birds identified within the vicinity of the campground prefer disturbed settings, and would likely be unaffected by selective clearing. Alternative A would be expected to result in long-term, site specific, negligible adverse impacts on terrestrial wildlife populations.

The operation of the existing septic tanks and drain fields would continue under this alternative. This leach field is a source of pollution affecting water quality in Station Creek, especially during periods of peak use at the campground. This condition would continue under this alternative, thereby threatening aquatic life in the creek. Alternative A also calls for the continued operation of the degraded sewer line network. This existing system could result in a continuation of sewage backups and periodic wastewater leakages from manholes that could reach the ground surface and flow directly to Station Creek, affecting fish habitat. Wastewater leachate laterally transmitted through the soil from the drain fields to Station Creek and overflows from septic tanks and manholes could be considered as having a short-term, minor to moderate, local adverse impact on aquatic habitat.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions affecting wildlife and wildlife habitat are similar to those for the preceding impact topic (vegetation). Habitat may be removed as a result of the implementation of the tree hazard program or when precautionary measures are carried out

to address trees and/or snags that pose threats to visiting campers. However, overall wildlife habitat would remain within the study area and local area. These actions, combined with Alternative A, would result in long-term, minor and adverse cumulative impacts.

## **Conclusion**

Alternative A would result in no planned impacts on wildlife or wildlife habitat due to park service operations. Though sanitary system and water line repairs may require the removal of vegetation and thus disturbance of habitat used by small mammals and various species of bird (including migratory birds), these impacts would be selective and disseminated within the campground area. Moreover, the degree of disturbance would be minimal in comparison to the remaining and contiguous forest both within and surrounding the Wilderness Road campground. Accordingly, impacts on terrestrial wildlife would be long-term, site specific, negligible and adverse. Impacts on aquatic wildlife would be expected to be short-term, minor to moderate, local and adverse. Coupled with Alternative A, cumulative impacts on overall wildlife and wildlife habitat including those incurred by the tree hazard program and by emergency tree removal would be long-term, minor and adverse. Alternative A would result in short-term and noticeable adverse increment to this cumulative impact. This assessment is based primarily on the impact to aquatic resources posed by the No-action Alternative.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Alternative B would result in the permanent removal of approximately 1.3 acres of mature oak (*Quercus* spp.), poplar (*Lireodendron tulipifera*), black cherry (*Prunus serotina*), and Virginia pine (*Pinus virginiana*) forest to make room for the proposed leach fields. Habitat for arboreal and mid-story canopy species such as the gray squirrel and passerine birds would be reduced. However, the direct and long-term impact to arboreal species habitat is considered minor given the overwhelming surplus of similar forested habitat in the region. A tree survey conducted in September of 2010 revealed no dead trees or snags within the area of disturbance. Thus, wildlife that utilize snags such as eastern flying squirrels, woodpeckers, and cavity-using songbirds would incur negligible long-term impacts.

Conversion of the 1.3-acre forested habitat to an open field would be perceived as having long-term beneficial impacts on other species that prefer habitat diversity, forest edges, and young successional vegetative stages. Species such as the cotton-tailed rabbit, gray fox, striped skunk, meadow lark, song sparrow, wild turkey, and white-tailed deer would gain this opening as part of their normal home range that otherwise is proportionately lacking within the park. As the majority of migratory birds identified in close proximity to the campground prefer open or disturbed habitats, clearing for the proposed leach field would likely not affect their habitat. Many are noted as being species residing on the periphery of the park and outside the study area, where habitat is abundant.

Alternative B calls for the abandonment of all leach fields. The proposed primary leach field south of Colson Barn would be right-sized to treat the waste generated at the campground. Furthermore, it would be located farther from Station Creek relative to the existing leach field and outside of flood-prone areas. Thus, the potential for wastewater leaching into the stream is greatly reduced. Ground disturbance would be necessary to install the drain fields, sewer lines, and water lines. Exposed soil during construction has the potential to erode into local waters affecting fish and mollusk populations. Impacts would be mitigated through an approved erosion and sedimentation control plan that utilizes silt fences and other approved measures.

Overall, Alternative B would expect to result in long-term, regional, moderate and beneficial impacts on wildlife and wildlife habitat. This is primarily attributable to the expected improvement in water quality in Station Creek, both within and beyond the park boundaries.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions affecting wildlife and wildlife habitat are identical to those for the preceding impact topic (vegetation). Habitat may be removed as a result of the implementation of the tree hazard program or when precautionary measures are carried out to address trees and/or snags that pose threats to visiting campers. However, overall wildlife habitat would remain within the study area and local area. These actions, combined with Alternative B, would result in long-term, moderate and beneficial cumulative impact on wildlife and wildlife habitat.

### **Conclusion**

To install the new sanitary system components and replacement water lines, Alternative B would result in a minor degree of tree clearing relative to the surrounding forest area and thus would cause negligible impacts on associated wildlife habitat. Conversion of the proposed leach field area from wooded to herbaceous may have beneficial impacts on certain terrestrial and bird species. The installation of a dependable sanitary sewer system would diminish the likelihood of wastewater being released to Station Creek, resulting in beneficial impacts on aquatic habitat. Overall, Alternative B would expect to result in long-term, regional, moderate and beneficial impacts on wildlife and wildlife habitat. Coupled with Alternative B, cumulative impacts on wildlife and wildlife habitat including those incurred by the tree hazard program and by emergency tree removal would be long-term, moderate and beneficial. Alternative B would result in long-term and noticeable to appreciable beneficial increment to this cumulative impact. This assessment is based primarily on the expected improvements in water quality and aquatic habitat arising from Alternative B.

## **SPECIAL STATUS SPECIES**

### **METHODOLOGY**

The Endangered Species Act (16 USC 1531 et. seq.) mandates that all federal agencies consider the potential impacts of their actions on species listed as threatened or endangered. If the NPS

determines that an action may adversely impact a federally listed species, consultation with the USFWS is required to ensure that the action would not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. NPS *Management Policies 2006* (NPS 2006) states that potential impacts of agencies actions would also be considered on state or locally listed species.

The USFWS, DCR, and DGIF were contacted for a list of rare, threatened, and endangered species and designated critical habitats that may be within the study area or affected by any of the alternatives. Information on possible threatened or endangered candidate species, and species of special concern was gathered from past studies and literature.

The habitats associated with threatened, endangered, candidate species, and species of special concern were compared with that of the proposed developments and existing facilities. The thresholds of change for the intensity of an impact are as follows:

- Negligible:** There would be no observable or measurable impacts on federally listed species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
- Minor:** Impacts on federally listed species would be detectable, but would not be outside the natural range of variability. Occasional responses by some individuals to disturbance could be expected, and may result in minimal interference to feeding, reproduction, resting, or other factors affecting population levels, but would not be expected to result in changes to local population numbers, population structure, and other demographic factors.
- Moderate:** Impacts on federally listed species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses by some individuals to disturbance could be expected, with some negative impacts on feeding, reproduction, resting, or other factors affecting local population levels. Small changes to local population numbers, population structure, and other demographic factors may occur. Some impacts might occur during critical periods of reproduction or in key habitats and result in harassment, injury, or mortality to one or more individuals. However, sufficient population numbers and habitat would remain functional to maintain a sustainable population.
- Major:** Impacts on federally listed species, their habitats, or the natural processes sustaining them would be detectable and would be expected to be outside the natural range of variability. Frequent responses by some individuals to disturbance would be expected, with negative impacts on feeding, reproduction, or other factors resulting in a decrease in population levels or a failure to restore levels that are needed to maintain a sustainable population. Impacts would occur during critical periods of reproduction or in key habitats and result in direct

mortality or loss of habitat. Local population numbers, population structure, and other demographic factors might experience large declines.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Because no listed terrestrial species are known to occur within the study area, Alternative A would have negligible adverse impacts on such listed species. The forested community within the study area would remain intact and thus represent potential roosting and foraging habitat for the Indiana bat. Localized tree removal to carry out sanitary sewer system and water line repairs would be performed on an as-needed basis but would be inconsequential relative to the density of the surrounding forestland. Trees within the campground area consist primarily of healthy stand of Virginia pine. These trees do not constitute particularly desirable roosting habitat for the Indiana bat. Moreover, it is not likely that trees within the campground are being used by roosting Indiana bats due to consistent daytime disturbances from campers. Therefore, impacts on Indiana bat summer roosting habitat would be long-term, site specific, negligible, and adverse. Alternative A would likely not result in an adverse effect on the Indiana bat or its habitat.

### **Cumulative Impacts**

No past, present, and reasonably foreseeable future actions have been identified that may affect the Indiana bat or its habitat. The park's tree hazard program and other precautionary operations requiring tree pruning or removal would not appreciably change the overall forested community and the impacts on bat habitat would be imperceptible. There would be no cumulative impacts on special status species under Alternative A.

### **Conclusion**

Under Alternative A, sanitary system and water line repairs may require the removal of potential Indiana bat summer roosting habitat. These habitat impacts would be long-term, site specific, negligible and adverse. There would be no cumulative impacts on special status species under Alternative A. Alternative A would likely not result in an adverse effect on the Indiana bat or its habitat.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Alternative B would require the removal of 1.3 acres of mature forested habitat. The condition of the forest at this location is not well suited as summer roosting habitat for foraging Indiana bats. The bats strongly prefer roosting in snags and under loose tree bark on dead or dying trees in areas with little canopy cover and high solar exposure. A forest survey carried out within the footprint of the proposed leach field (Appendix C) found a young stand of trees with virtually each individual specimen being categorized as in good condition. Of the 229 trees assessed, just

2 were observed to be dying; 4 were stressed; and 1 was hollow. Female Indiana bats congregate in roosting colonies of up to 100 bats or more. The very low number of potential roost trees would not seem ideal for this level of usage, nor is it contiguous with potentially more suitable habitat.

Indiana bats roost in the exfoliating bark of live trees to a far lesser extent than they do the snags and bark of dead trees (Timpone et al. 2009). Of the species present within the proposed leach field area, only sycamore can have flakey bark on the lower portions of the trunk. However, Indiana bats typically roost at higher elevations. Moreover, just one sycamore tree was enumerated in the survey. A live shagbark hickory was observed outside the proposed limits of clearing. This tree represents a more likely roost and would remain in place. The removal of neighboring trees would likely have no effect on its suitability. The fact that Indiana bats prefer to roost along forest edges and in areas of high solar exposure and (i.e., open canopy) may in fact increase the suitability of this tree for roosting. Lastly, because Indiana bats may prefer riparian woods over upland areas for roost sites, the closed-canopy, upland setting of the proposed leach field area further diminishes its candidacy as a summer roosting area.

Indiana bats may use the proposed leach field area for foraging, though the percentage of available roosting habitat to be removed is extremely small as to be deemed negligible. Current maternity roosting or foraging in this area has not been documented. Relative to other potential roosting habitats in the park, impacts resulting from the proposed leach field installation would thus be expected to be long-term, site specific, negligible and adverse.

Alternately, the park is dominated primarily by forested habitats that are typically not used for foraging bats, and the availability of open fields that could be used for such purposes is sparsely scattered throughout the park. Pastureland currently exists as riparian areas along the west flank of Station Creek within the study area. Alternative B would expand this pasture by an additional 1.3 acres once the forested habitat is removed for the leach fields. The addition of open habitat would be perceived as a long-term, site specific, negligible to minor beneficial impact to listed bat species that may utilize the area for foraging. Therefore, Alternative B may affect but is not likely to adversely affect the Indiana bat or its habitat.

### **Cumulative Impacts**

No past, present, and reasonably foreseeable future actions have been identified that may affect the Indiana bat or its habitat. The park's tree hazard program and other precautionary operations requiring tree pruning or removal would not appreciably change the overall forested community and the impacts on bat habitat would be imperceptible. There would be no cumulative impacts on special status species under Alternative B.

### **Conclusion**

Under Alternative B, tree clearing to install the new sanitary sewer and water lines as well as the proposed new leach fields would result in long-term, site specific, negligible and adverse impacts on Indiana bat summer roosting habitat. Alternately, the conversion of forested areas to maintained grassy cover at the proposed leach fields could result in beneficial impacts on Indiana

bat habitat by increasing foraging opportunities. Therefore, Alternative B would likely not result in an adverse effect on the Indiana Bat or its habitat. There would be no cumulative impacts on special status species under Alternative B. Alternative B may affect but is not likely to adversely affect the Indiana bat or its habitat.

## ARCHEOLOGICAL RESOURCES

### METHODOLOGY

Archeological resources are the remains of past human activity and records documenting the scientific analysis of the remains (NPS 2002b). For purposes of analyzing potential impacts on archeological resources, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. An assessment of effect according to Section 106 of the NHPA would result in a determination of *no adverse effect*.
- Minor:** Disturbance of a site(s) results in little, if any, loss of integrity. An assessment of effect according to Section 106 of the NHPA would result in a determination of *no adverse effect*.
- Moderate:** Disturbance of a site(s) results in loss of integrity. An assessment of effect according to Section 106 of the NHPA would result in a determination of adverse effect.
- Major:** Loss of a site(s) results in loss of integrity. An assessment of effect according to Section 106 of the NHPA would result in a determination of *adverse effect*.

### IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE

#### Impact Analysis

Under Alternative A, land disturbance would be limited to the minimum necessary to affect repairs to failing components of the sanitary sewer system and water lines. This would occur in areas that were originally disturbed during the original installation these systems. There would be no effect on archeological resources under Alternative A.

#### Cumulative Impacts

No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on archeological resources in and around the study area. There would be no effect on archeological resources under Alternative A.

## **Conclusion**

There would be no effect on archeological resources under Alternative A. There would be no cumulative impacts on archeological resources under Alternative A.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

A phase I archeological survey was performed within a portion of the study area to assist the park in siting the proposed new leach fields and to help determine the area of potential effect (APE). To avoid impacting archeological resources, the results of the phase I survey were used to locate routes for new pipelines, those not placed parallel or proximate to existing lines, and leach fields. Although ground disturbance is expected, implementation of Alternative B would avoid known archeological resources to the greatest extent possible and no adverse effects to archeological resources are anticipated.

### **Cumulative Impacts**

No past, present, and reasonably foreseeable future actions have contributed or continue to contribute to the cumulative impact on archeological resources in and around the study area. Prior to the rehabilitation of Colson Barn, the area was subjected to a Phase I survey that produced no evidence of archeological resources (Des Jeans 2010). Therefore, there would be no cumulative impacts on archeological resources under Alternative B.

### **Conclusion**

No adverse effect on archeological resources is anticipated under Alternative B. Per the recommendations of the Phase I survey, an archeologist would be present during the construction of the leach field to monitor the progress of the work and to document and collect any resources that are uncovered. There would be no cumulative impacts on archeological resources under Alternative B.

## **VISITOR USE AND EXPERIENCE / RECREATION**

### **METHODOLOGY**

NPS *Management Policies 2006* (NPS 2006b) states that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for the public to enjoy parks. Past planning documents, park statistics, and input from park staff provided background on changes to visitor use and experience / recreation over time. Anticipated impacts on public use and experience were analyzed using anecdotal information on sewer and water line failures and repairs and on preliminary information regarding the planned phased construction that would be incorporated in Alternative B. Based on this evaluation, the following intensity levels were developed:

- Negligible:** Changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the impacts associated with the alternative.
- Minor:** Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be slightly aware of the impacts associated with the alternative.
- Moderate:** Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the impacts associated with the alternative and would likely be able to express an opinion about the changes.
- Major:** Changes in visitor use and/or experience would be readily apparent and would be severely adverse. The visitor would be aware of the impacts associated with the alternative and would likely express a strong opinion about the changes.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Under Alternative A, the current visitor use and experience / recreation opportunities would continue. The Wilderness Road campground and attendant facilities would remain open per the established schedule. RV, trailer, and tent camping would continue and the recreating public could embark on hiking trails from various points within the campground. The seasonal availability of certain loop roads and comfort stations would continue as described in Chapter 3.

Without any modification or upgrades to the aged sanitary sewer or water systems, visitor use and experience /recreation would be affected by unpredictable failures in both systems. Sewer pipes would continue to be periodically obstructed, resulting in unpleasant overflows of untreated septic waste from manholes and onto ground surfaces in public areas or road surfaces where it may be visible to pedestrians and motorists. Unpleasant odors would accompany such discharges, potentially impacting visitor use and experience / recreation at locations some distance from the actual overflow site. Aesthetic impacts may be exacerbated by the presence of repair crews and equipment, which may distract from visitor experience. System failures may require that certain campsites be evacuated or temporarily closed during repair, inconveniencing campers. Unpredictable disruption in services could be particularly problematic for backcountry hikers planning to stay at the campground and arrive unaware that key services are unavailable or diminished.

Both water line failures and sewer systems repairs may necessitate the temporary suspension of services at one or more comfort stations (sinks, showers, and toilets), water fountains, and spigots in the campground. Reparations to broken water lines can generally be completed within a short period of time after the failure is recognized, and typically no longer than 24 hours. If the failure occurs north (upstream) of comfort station #1, water supply to all comfort stations would

be affected during repairs. A breach between stations #1 and #2 would affect only stations #2 and #3. A breach between stations #2 and #3 would affect station #3 only. Therefore, depending on the location of the pipe breach, services may still be available to campers at other comfort stations. Similarly, certain comfort stations may remain available for use depending on the location of sewer line obstructions. Clearing such obstructions and cleaning up any discharged waste materials would typically take a few hours to up to 24 hours to complete.

Because services may be unavailable during repair periods, this would further diminish visitor experience and limit the use of park resources. The unavailability of such services may prompt potential park visitors to explore other camping options. Because the Wilderness Road campground is the only one of its kind within the park, this may mean potential park visitors are lost.

Considering the possible detractions to visitor use and experience / recreation, impacts associated with Alternative A would be expected to be short-term, site specific, moderate and adverse.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions that may impact visitor use and experience / recreation include recent upgrades to the comfort stations, road surfaces, group shelter, and amphitheatre; potential upgrades to campsites on loop road D; and potential modification of campsites to accommodate horse trailers. Each of these actions represents beneficial impacts on visitor user and experience. These actions, combined with Alternative A, would result in long-term and moderate beneficial cumulative impacts on visitor use and experience / recreation.

### **Conclusion**

Alternative A would result in short-term, site specific, and moderate adverse impacts on visitor use and experience / recreation. This would be attributed to relatively brief but readily apparent adverse impacts on the recreating public and park staff caused by sanitary system failure and overflow and disruptions in the delivery of potable water. However, because these impacts would be short-term and unpredictable, when coupled with the beneficial impacts of past, present and reasonably foreseeable actions, the cumulative impacts on visitor use and experience / recreation would be long-term, moderate, and beneficial. Alternative A would result in a short-term and noticeable to appreciable adverse increment to this cumulative impact.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, the sanitary sewer system would be upgraded in a comprehensive manner such that the likelihood of accidental discharges of untreated sewage would be greatly diminished. The replacement of water lines would result in a more dependable supply of water and thus a lesser threat of service disruption at the comfort stations. Impacts on visitor use and

experience / recreation would be accordingly improved under Alternative B. However, short-term impacts would nevertheless occur during project construction.

The conceptual plans for Alternative B include a phased construction approach. The leach field may be constructed first, during the spring and summer months. The more extensive work to install the sewer lines, septic tanks, and replacement water lines would be performed in the fall when campground attendance begins to wane. Leach field construction would not require the campground schedule to be altered in any way nor require any disruption of service at campground facilities. Construction vehicles would likely access the work site from US 58 and Colson Lane, thereby avoiding shared road use between campground visitors and contractors. However, hiking along Colson may be restricted during leach field construction. Hikers would still have access to the park's network of eastern trails through a number of other trails that intersect the campground, including the Green Leaf Trail that leads to the amphitheatre.

As the leach field site is currently accessible to the recreating public, the construction site would be cordoned off and signage posted to indicate that the active work zone is a restricted area. Signage would also inform visitors of the nature and importance of the project and provide information on how to learn more about the work being performed. Construction-related noise may be audible from locations within the campground and along Colson Lane.

The installation of the other sewer system and water line components would require the campground to be closed to the public for a period of time. An estimated duration has not yet been determined and so the number of potential visitor trips lost has not been estimated. Impacts would be minimized by carrying out the work during an off-peak season. Nevertheless, some visitors may be potentially inconvenienced by the closure and visit other public or private campgrounds. Other park visitors may appreciate the importance of the project and thereby not feel inconvenienced by the temporary closure. Overall, short-term, construction-related impacts required to realize the Alternative B would be outweighed by the proposed enhancements to visitor use and experience / recreation. Therefore, impacts on visitor used and experience / recreation attributable to Alternative B would be long-term, site specific, minor to moderate and beneficial.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions that may impact visitor use and experience / recreation include recent upgrades to the comfort stations, road surfaces, group shelter, and amphitheatre; potential upgrades to campsites on loop road D; and potential modification of campsites to accommodate horse trailers. Each of these actions represents beneficial impacts on visitor user and experience. These actions, combined with Alternative B, would result in a long-term and moderate to major beneficial cumulative impacts on visitor use and experience / recreation.

### **Conclusion**

Alternative B would result in long-term, site specific, and minor to moderate beneficial impacts on visitor use and experience / recreation. When combined with past, present, and reasonably

foreseeable actions, the result would be a long-term and moderate to major beneficial cumulative impacts on visitor use and experience / recreation. Alternative B would result in a long-term and noticeable to appreciable beneficial increment to this cumulative impact.

## **INFRASTRUCTURE AND PARK OPERATIONS**

### **METHODOLOGY**

Operations, for the purpose of this analysis, refer to the quality of effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of Wilderness Road campground in order to adequately protect and preserve vital resources and provide for an enhanced visitor experience. This includes an analysis of the condition and usefulness of the facilities and developed features used to support campground operations. The thresholds of change for the intensity of this impact are defined as follows:

- Negligible:** Operations and infrastructure would not be affected, or the impacts would be at low levels of detection and would not have a noticeable impact on operations and infrastructure.
- Minor:** The impact would be detectable but would be of a magnitude that would not have an appreciable impact on operations and infrastructure.
- Moderate:** The impacts would be readily apparent and would result in a substantial change in operations and infrastructure in a manner noticeable to staff and the public.
- Major:** The impacts would be readily apparent, would result in a substantial change in campground infrastructure in a manner noticeable to staff and the public, and be markedly different from existing operations and infrastructure.

### **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

#### **Impact Analysis**

Under Alternative A, the park would continue to maintain the existing infrastructure at the Wilderness Road campground. The campground would continue to be open year-round, with periodic and temporary closures imposed during periods of inclement weather such as snow storms when park staff cannot insure safe conditions and typically available services within the campground. Access to hiking trails and pedestrian access along Colson Lane would be maintained per current conditions. General information regarding campground operations is communicated to the public via the park webpage and via signs posted at the Entrance Station. Information and reservations are also available via telephone.

NPS *Management Guidelines* (NPS 2006) note that water supply and wastewater systems and their operators are subject to state and federal health standards. Guidelines further state that

“Superintendents must ensure that operators are certified and that operations are inspected and conducted in accordance with all laws, regulations, and policies.” In accordance with the provisions of Regional Manual (RM) 83A1: *Drinking Water* (NPS 2008), the park must sample drinking water on a regular basis. The TNC water system at Wilderness Road campground serves less than 2,500 people. For a system of this kind, bacteriological monitoring must be carried out by taking samples at least twice a month at equally spaced intervals (NPS 2008). Sampling is also required prior to utilization of the system after a period of seasonal disuse. Tests for various chemicals are also required. Tests required following a water line repair are discussed in the following section “Public Health and Safety.”

Routine maintenance of the existing sanitary sewer system is carried out in accordance with the guidelines presented in RM-83B1 *Wastewater Systems* (NPS 2003b). Maintenance at the Wilderness Road campground currently consists of annual pumping out and cleaning of the septic tanks and regulation of the flow at the dual leach fields north of Colson Barn. Park staff manually switches the flow path for liquid waste between these two fields on a monthly basis to avoid overtaxing a single field and allow the offline leach field time to recover. All leach fields are surveyed annually during a period of peak use to identify system failures such as odors or surfacing wastewater. Park staff also maintains records of septic tank measurements, inspections, and pumping.

The current and deficient sanitary sewer system would continue to require periodic maintenance to clear obstructions and to clean up waste from affected areas during periodic and accidental overflows from manholes. Instances of pipe breakage or offset that cannot be remedied by slip lining would require localized replacement. Localized and unpredictable water line failures would also continue, requiring spot reparations. Required repairs to sewer and water lines may require temporarily closure of a comfort station(s). These system failures may require that certain campsites and roads be closed temporarily, requiring park staff to cordon these areas off and manage visitor circulation around affected areas. Park staff may be required to post signage at the Entrance Station and at comfort stations forewarning campground visitors about potential interruptions in sanitary services and water supplies and directing them to comfort stations where services remain available.

Impacts on infrastructure and park operations are attributable to both system-wide deficiencies in both the sanitary sewer and water systems and the fact that failures that warrant repair occur in an unpredictable nature. This complicates operational planning and may draw park staff away from scheduled activities in other areas of the park to resolve unexpected problems. Overall, Alternative A would result long-term, local to parkwide, and moderate adverse impacts on infrastructure and park operations.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions have and continue to contribute to cumulative impacts on park operations and maintenance. Actions include fire management and prescribed burning; controlled access to the campground via a gate at the entrance on US 58; tree thinning and removal associated with the tree hazard project; and the rehabilitation of Colson

Barn and installation of fencing around the horse paddock. In contrast to the No action Alternative, these past, present, and reasonably foreseeable actions are aimed at increasing safety and efficiency in park operations and protecting infrastructure. When considered together, these actions would nevertheless outweigh the detractions of the No-action Alternative and result in long-term and moderate beneficial cumulative impacts on park operations and maintenance.

## **Conclusion**

Alternative A would result in long-term, local to parkwide, and moderate adverse impacts on infrastructure and park operations. Other past, present, and reasonably foreseeable future actions would have long-term, parkwide and beneficial cumulative impacts on operations and infrastructure. By failing to address ongoing deterioration in the sanitary sewer and water line systems, Alternative A would contribute a noticeable adverse increment to this cumulative impact.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, the park would rehabilitate the sanitary sewer system and water lines at the Wilderness Road campground. The installation of new system components would have a considerable effect on system reliability and curtail the frequency of routine maintenance such as sewer line reaming and unplanned reparations to address broken water lines or clogged sewer lines. Less frequent maintenance and fewer emergency reparations would have a direct effect on park resources by allowing park staff to focus efforts on other park needs and maintain scheduled activities. However, routine water sampling, septic tanks pump outs, and leach field surveys would remain as standard operating procedure in accordance with NPS guidelines.

More dependable sanitary and water systems would also diminish the likelihood of service disruptions, comfort station closures, and potential damages to buildings, campsites, and roadways caused by the accidental release of untreated wastewater or by water escaping from water line leakages. Potential damages to park infrastructure caused by the reparation activities required to correct these situations would similarly be reduced.

A staff archeologist or historian would be required to be present during leach field construction to monitor the progress and document and possibly collect any archeological resources that are unearthed by construction activities. Oversight would be required primarily during the excavation phase and may not be required once subgrade is achieved. Park staff would maintain proper signage informing visitors of the nature of the project and of the restricted nature of the work zone. During the installation of the sewer and water lines and associated infrastructure, access to the campground would be restricted to park staff and contractors. Notifications of campground closure would be posted at various locations, such as on the park's webpage, at the visitor center, and at the campground entrance. Signage may also be required at appropriate locations along backcountry trails and where they intersect with the campground so that hikers can make alternate plans for accommodation. Park staff would need to routinely monitor the

campground to ensure that visitors remain outside of restricted areas. Park facilities managers may be required to be present on a more regular basis to provide construction oversight and provide appropriate guidance to contractors.

Overall, Alternative B would have a short-term, site specific, and minor adverse impact on infrastructure and park operations associated with the construction period. Alternative B would also result in a long-term, parkwide, and moderate beneficial impact on infrastructure and park operations.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions have and continue to contribute to cumulative impacts on park operations and maintenance. These actions would be identical to those discussed for Alternative A and would be aimed at increasing safety and efficiency in park operations and protecting infrastructure. A reasonably foreseeable action that may arise as a result of Alternative B would be the possibility of future expansion of horse pasturing into new leach field area and potentially into the area of the decommissioned fields north of Colson Barn. When considered with Alternative B, these actions would result in long-term and moderate beneficial cumulative impacts on park operations and maintenance.

### **Conclusion**

Alternative B would result in a long-term, parkwide, and moderate beneficial impact on infrastructure and park operations. Other past, present, and reasonably foreseeable future actions would have long-term and moderate beneficial cumulative impacts on infrastructure and park operations. By addressing ongoing deterioration in the sanitary sewer and water line systems, Alternative B would contribute an imperceptible adverse and a noticeable beneficial increment to this cumulative impact.

## **PUBLIC HEALTH AND SAFETY**

### **METHODOLOGY**

The NPS *Management Policies 2006* state that, “while recognizing that there are limitations on its capability to totally eliminate all hazards, the Service . . . will seek to provide a safe and healthful environment for visitors and employees.” The policies also state, “the Service will reduce or remove known hazards and apply other appropriate measures, including closures, guarding, signing, or other forms of education” (NPS 2006b). In addition, NPS Unit Managers are responsible for “...providing safe drinking water to employees, the visiting public, and park partners by assuring that drinking water systems are properly operated, maintained, monitored and deficiencies promptly corrected” (NPS 2008).

The purpose of this impact analysis is to identify the level of impact that implementing each of the proposed alternatives would have on the safety of users at the Wilderness Road campground.

The impact scenarios considered are exposure to contaminated drinking water or sanitary waste or waters contaminated by such waste.

The impact thresholds for public safety are defined below.

- Negligible:** There would be no discernible impact on public safety.
- Minor:** The impact would be detectable but would be of a magnitude that would not have an appreciable impact on public safety.
- Moderate:** The impacts would be readily apparent and would result in a potentially serious impact in public safety in a manner noticeable to staff and the public.
- Major:** The impacts would be readily apparent and require complete campground closure.

## **IMPACTS OF ALTERNATIVE A: NO-ACTION ALTERNATIVE**

### **Impact Analysis**

Under Alternative A, current public safety conditions within the study area would continue. Periodic breakages in the water lines would continue to occur. These events may allow contaminants in the surrounding soil to enter the water supply. After a water line is repaired, the system is would be purged thoroughly. The suitability of the water for public consumption may need to be ascertained via bacteriological monitoring. Bacteriological thresholds for drinking water are included in RM-83A1 (NPS 2008). If the water supply is returned to service before such testing is complete, park staff would inform campground visitors of the situation via a posted notice which may include a boil order or instructions on obtaining alternative water supplies.

Current issues are related to the discharge of untreated sewage from manholes or potential sewer pipe breakages into common areas such as campsites, road surfaces, and hiking trails. Such instances present a risk that campground visitors may come into contact with and subsequently ingest unknowingly potentially harmful bacteria such as fecal coliform, fecal streptococcus, and *E. coli*. Guidance provided in RM-83B4 *Raw Sewage Spill Notification and Cleanup* (NPS 2003c) would be followed to ensure potentially contaminated areas and equipment are cleaned satisfactorily.

At present, access to Station Creek is unrestricted. Though the depth of water in Station Creek is unsuitable for swimming, human contact with its waters can occur should visitors wade into the creek channel, touch the water surface, or handle materials in the channel. As documented in “Chapter 3: Affected Environment,” instantaneous *E. coli* levels in Station Creek have occasionally exceeded the state guidelines for both primary and secondary contact recreation on a seasonal basis. The primary source of this contamination is thought to be the failing leach fields north of Colson Barn.

Overall, Alternative A would have a long-term, local, and moderate adverse impact on public health and safety. This is because accidental discharges of untreated sewage would be readily apparent and would result in a potentially serious impact in public safety in a manner noticeable to staff and the public.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable future actions that may contribute to the cumulative impact on public health and safety in and around the Wilderness Road campground include the tree hazard program. Removal of potential hazardous trees would enhance visitor safety. This action, when combined with Alternative A, would result in long-term and moderate beneficial cumulative impacts on public health and safety. This is because the tree hazard program would address a campground-wide risk to visitors in a comprehensive fashion, whereas the risk presented to visitors caused by sanitary sewer failure would likely be restricted to a smaller area.

### **Conclusion**

Alternative A would result in long-term, local, and moderate adverse impacts on public health and safety. This would be attributed to relatively brief but readily apparent and potentially severe adverse impacts on the recreating public and park staff caused by sanitary system failure and periodic overflow and disruptions in the delivery of potable water. When coupled with the beneficial impacts of the cumulative action, the cumulative impacts on public health and safety would be long-term, moderate and beneficial. Alternative A would result in a short-term and noticeable adverse increment to this cumulative impact.

## **IMPACTS OF ALTERNATIVE B: NPS PREFERRED ALTERNATIVE**

### **Impact Analysis**

Under Alternative B, the park would address current public safety conditions by upgrading the sanitary sewer system in a comprehensive manner such that the likelihood of accidental discharges of untreated sewage would be greatly diminished. The decommissioning of the principal leach field north of Colson Barn would eliminate a known source of water quality impairment in Station Creek and should result in a notable lessening in the levels of fecal coliform, fecal streptococcus, and *E. coli*. Impacts on public health and safety would be accordingly improved under Alternative B.

By implementing proper signage around the leach field construction area and restricting access to park staff and contractors, risks to public safety would be minimized. Alternative B would thus result in long-term, local, and moderate beneficial impact on public health and safety.

### **Cumulative Impacts**

As per Alternative A, past, present, and reasonably foreseeable future actions that may contribute to the cumulative impact on public health and safety in and around the Wilderness Road campground include the tree hazard program. This action, when combined with Alternative B,

would result in long-term and moderate beneficial cumulative impacts on public health and safety.

### **Conclusion**

Alternative B would result in long-term, local, moderate beneficial impacts on public health and safety. When coupled with the reasonably foreseeable action of the tree hazard program, the cumulative impacts on public health and safety would be long-term, moderate and beneficial. Alternative B would result in a long-term and noticeable beneficial increment to this cumulative impact.

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# 5

## CONSULTATION AND COORDINATION

NPS DO-12 requires the NPS to make “diligent” efforts to involve the interested and affected public in the NEPA process. This process, known as scoping, helps to determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. This chapter documents the scoping process for the proposed action, identifies future compliance needs and permits, and includes the list of preparers for the document.

### THE SCOPING PROCESS

The scoping process is initiated at the beginning of a NEPA project to identify the range of issues, resources, and alternatives to address in the EA. Typically, both internal and public scoping is conducted to address these elements. State and federal agencies also were contacted in order to uncover any additional planning issues and to fulfill statutory requirements. The planning process for the proposed action was initiated during the internal, agency, and public scoping in the fall of 2010. This process introduced the purpose and need of the project.

### INTERNAL SCOPING

Internal scoping for the proposed action was initiated as part of the NEPA process. An internal scoping meeting was held at the park on September 9, 2010. Park staff and other NPS personnel met with their consultants to conduct a site visit, review the purpose and need for the project and potential project constraints, and discuss potential impact topics and cumulative impacts to consider within the EA. During the development of this EA, park and other NPS staff provided planning documents, technical reports, natural resource inventories, and other information to the consultants.

## **PUBLIC SCOPING**

The public scoping process for the proposed action began on September 24, 2010 when the park issued a press release announcing the public scoping period (see “Appendix A: Scoping Letters”). The scoping period was 30 days in length, terminating on October 25, 2010. Three comments were received from private citizens: two entered directly into PEPC and one sent by mail. All three comments expressed strong support for the proposed action. One comment was received by email from a representative of the Pineville Utility Commission, providing technical input on potential solutions for wastewater treatment at the Wilderness Road campground. The correspondence is included in “Appendix B: Relevant Correspondence.”

## **AGENCY CONSULTATION**

Agencies contacted via letter during the planning process included the USFWS, the DCR, the DGIF, the Lee County Administrator, the Lee County Environmental Health Department, and the SHPO. Scoping letters are included in “Appendix A: Scoping Letters.” The agency consultation is discussed by statutory category below.

### **Section 7 of the Endangered Species Act**

Responses regarding special status species were received from the USFWS (email dated October 20, 2010), the DCR (letter dated October 26, 2010), and the DGIF(email dated October 29, 2010). The USFWS provided a list of species that may occur in the vicinity of the proposed project and requested that the park use an on-line project review process to help provide information, expedite project review, and as a resource for further informal consultation and NEPA review. The response from the USFWS and the IPAC report of the federally listed species that may occur within the study area is included in “Appendix B: Relevant Correspondence.” The state-listed species are summarized under “Other Consultation” below.

### **Section 106 of the National Historic Preservation Act**

The park sent a letter to the Virginia SHPO on September 24, 2010 (see “Appendix A: Scoping Letters”). In a letter dated October 24, 2010, the SHPO requested that a Data Sharing System (DSS) form be completed to document the results of the recent Phase I archeology study of the potential leach field area (Des Jean 2010) and requested additional information regarding the proposed relocation of the water line around the new leach field area. The park provided the SHPO with a copy of this document along with an Assessment of Effect. In a letter dated December 21, 2010 the SHPO requested additional information regarding the location of the new leach field. In order to avoid the potential for adverse affects the NPS would take the following measures:

- to ensure avoidance, a qualified archaeologist would monitor construction in the area
- the NPS would continue to coordinate with the agency as the project moves forward

### **Other Consultation**

In correspondence received from the DCR and DGIF, both agencies remarked about the potential for the state and federally listed Indiana bat to be present within the study area. The DCR recommended a time of year restriction on tree removal for the period April 1 through September 30. The park would coordinate with the DCR regarding project details and construction timing and would provide a copy of this document as part of this process.

### **TRIBAL CONSULTATION**

The park sent letters to the Cherokee Nation of Oklahoma, Chickasaw Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Shawnee Tribe, Shawnee Tribe of Indians of Oklahoma, and the United Keetoowah Band of Cherokee Indians. The letters sent out by the park are included in “Appendix A: Scoping Letters.” The Chickasaw Nation was the only tribe to respond. The correspondence indicates that the tribe accepts the park’s recommendation to have a cultural resource specialist or archeologist present during the excavation of the proposed leach field and requested that work be ceased immediately should any resources be inadvertently uncovered. Copies of the EA will be forwarded to each tribe for review and comment.

## **FUTURE COMPLIANCE NEEDS/PERMITS**

### **OVERVIEW OF STATE AND FEDERAL COMPLIANCE**

The proposed action has been evaluated for consistency with applicable federal laws, regulations, and programs. A brief description of the project’s compliance with state and federal governing items is provided in Tables 3 and 4 below.

<b>Table 3: Consistency with Applicable Federal Laws, Regulations, and Programs</b>	
<b>Law, Regulation, or Program</b>	<b>Brief Description of Compliance</b>
Executive Order 11988 – Floodplain Management	The project would result in no impact on floodplains in accordance with Executive Order 11988 and NPS DO-77-2.
Executive Order 11990 – Protection of Wetlands	The project would result in no impact on wetlands in accordance with Executive Order 11990 and NPS DO-77-1.
National Historic Preservation Act of 1966 as amended (16 USC 470 et seq.)	The project would result in no adverse effect to historic properties or to National Register eligible or listed cultural or archeological resources. Section 106 coordination has been initiated with the Virginia SHPO. The NPS would continue to coordinate with the SHPO as the project moves forward.
Endangered Species Act of 1973, as amended (16 USC 1531 et seq.)	Correspondence from the USFWS indicates that habitat for federally listed threatened and endangered species may occur within the study area. This EA has determined that the Indiana bat is the only such species that is likely to be present within the study area. No adverse impacts on listed species or its habitat are anticipated.
Migratory Bird Treaty Act (16 U.S.C. 703-712)	The study area is owned and protected by the federal government. No adverse impacts on bird species are anticipated.

**Table 4: Consistency with Applicable State Laws, Regulations, and Programs**

<b>Law, Regulation, or Program</b>	<b>Brief Description of Compliance</b>
<p>DCR is responsible for the issuance, denial, revocation, termination and enforcement of individual and general Virginia Stormwater Management Permits for the control of stormwater discharges from construction activities through the Virginia Stormwater Management Program and as authorized by the Virginia Stormwater Act, Article 1.1 (§ 10.1-603.1 et seq.) of Chapter 6 of Title 10.1 of the Code of Virginia.</p> <p>The Construction General Permit requires the construction site operator to develop and implement a site specific Stormwater Pollution Prevention Plan (SWPPP). Those seeking the permit must thoroughly read and understand its requirements. The SWPPP must be prepared prior to submitting a registration statement for permit coverage to DCR.</p>	<p>The project would disturb over 1.0 acre of land and therefore a Construction General Permit must be obtained. The project would comply with the Virginia stormwater regulations through best management design considerations and the implementation of a sedimentation and erosion control program during construction. The project would not be anticipated to result in an exceedance of any surface water quality standard.</p>
<p>The Virginia Endangered Species Act (§29.1-563 - §29.1-570) provides that DGIF is the state regulatory authority over federally or state listed endangered or threatened fish and wildlife in the Commonwealth of Virginia.</p>	<p>Correspondence from DGIF indicates state protected species may be present within or in the vicinity of the project. No adverse impacts on listed species are anticipated.</p>
<p>The Virginia State Board of Health regulates onsite sewage handling and disposal in accordance with 12 VAC 5-610-10 et seq., adopted July 1, 2000 under statutory authority §§ 32.1-12 and 32.1-164 of the Code of Virginia. Based on state regulations, the proposed system would qualify as a Type II sewage disposal system.</p>	<p>The project would comply with the Virginia State Board of Health Regulations for an onsite sewage</p>
<p>Per 24 VAC 30-151, Land Use Permit Regulations establish the rules that individuals, localities, and companies must meet in order to conduct any work, other than travel, on the systems of state highways that are under VDOT jurisdiction.</p> <p>Any party that wishes to complete work on a VDOT highway, park-and-ride lot, or rest area must have written permission from VDOT. Written permission is granted by a land use permit or a contract let by VDOT.</p>	<p>Correspondence with Mr. Jeffrey Sams of VDOT determined that, should the delivery of construction equipment or materials require improvements to the Colson Lane / US 58 intersection and/or temporary parking on the shoulder of US 58, the park may require a Land Use Permit and Work Zone Traffic Control Certification Verification from VDOT. The necessary forms are LUP-A and LUP-WZTCV, respectively. A surety bond would also be required (form LUP-SB). Forms can be obtained at:</p> <p><a href="http://www.virginiadot.org/business/bu-landusepermits.asp">http://www.virginiadot.org/business/bu-landusepermits.asp</a></p> <p>Mr. Sams indicated that there is a base permit fee of \$100. Appropriate signage may be required if construction vehicles are entering and exiting from this intersection. Mr. Sams was reached at (276) 398-9331.</p>

## **REQUIRED PERMITS AND APPROVALS**

Prior to the implementation of the proposed action, the NPS would obtain appropriate land disturbance permits and abide by local and state erosion and sediment control standards where required. In addition, several approvals would be required from local, state, and federal authorities prior to construction.

A Virginia Stormwater Management Program (VSMP) Permit would be required to authorize land disturbance and construction of the project. Regulations require that a Stormwater Pollution Prevention Plan (SWPPP) must be prepared prior to submitting a registration statement for permit coverage under the VSMP.

The park would have to complete an “Application for an On-Site Sewage Disposal and/or Water Supply Permit” and secure the permit from the Lee County Department of Environmental Health before proceeding to construction.

Additional agency consultations would be required in the following areas:

- Section 106 of the National Historic Preservation Act requires consultation with the Virginia SHPO
- Tribal legislation may require further consultation with recognized and relevant tribes
- The Virginia Endangered Species Act may require additional coordination with the DGIF

## **DOCUMENT REVIEW**

The EA will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the internet at <<http://parkplanning.nps.gov/cuga>>, and hard copies are available at the park’s visitor center.

## **LIST OF PREPARERS AND CONTRIBUTORS**

<b>Vanasse Hangen Brustlin, Inc.</b>		
Tricia Wingard	Project Manager	Guidance of NEPA process; document review; and project management
Brad Ketterling	Senior Environmental Scientist	Document preparation; resources review and analysis
Tim Davis	Senior Environmental Scientist	Document preparation, natural resources review and analysis
Michelle Tugman	Environmental Planner	Document preparation
Margaret Beavers	Environmental Scientist	Graphics and GIS analysis
Christopher Senfield	Environmental Scientist	Document preparation

<b>Cumberland Gap National Historical Park</b>	
Mark Woods	Superintendent
Bill Brumbach	Facilities Manager
Joe Finchum	Maintenance Supervisor
Gary Ramsey	Assistant Facilities Manager
Jenny Beeler	Biologist
Martha Wiley	Historian
Amy Wilson	Biological Science Technician

<b>NPS Denver Service Center</b>	
Connie Chitwood	Natural Resource Specialist
Lydia Creager	Project Manager
Greg Cody	Cultural Resource Specialist
Robert Bennett	Project Specialist

<b>NPS Southeast Regional Office</b>	
Timothy Pinion	Wildlife Biologist

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## REFERENCES

### SELECTED BIBLIOGRAPHY

- Britzke, E. R., M. J. Harvey, and S. C. Loeb  
2003 "Indiana bat, *Myotis sodalis*, maternity roosts in the southern United States." *Southeastern Naturalist* 2:235-242.
- Department of Conservation and Recreation (DCR)  
2010 Virginia Natural Heritage Karst Program: Cave and Karst Protection. Available online at: < [http://www.dcr.virginia.gov/natural\\_heritage/karsthome.shtml](http://www.dcr.virginia.gov/natural_heritage/karsthome.shtml) >. Accessed on November 4, 2010.
- Department of Environmental Quality (DEQ)  
2010 Telephone conversation between David C. Whitehurst and Brad Ketterling, contractor, December 29, 2010, regarding Department of Game and Inland Fisheries stream class designation in the Virginia Water Quality Standards.
- Department of Game and Inland Fisheries (DGIF)  
2010 E-mail message from Amy M. Ewing, Environmental Services Biologist, to Brad Ketterling, contractor, November 8, 2010, regarding wild trout water designation.
- Department of Mines, Minerals, and Energy (DMME)  
2006. Sinkholes and Karst Terrain. Available online at: < <http://www.dmme.virginia.gov/DMR3/sinkholes.shtml> >. Accessed on November 4, 2010.
- Division of Water Pollution Control (DWPC)  
2010 Year 2010 303(d) List, Tennessee Department of Environment and Conservation
- Des Jean, T.  
2010 *Results of Section 106 Compliance at the Wilderness Road Campground, Leach Field Construction Location.*
- Environmental Protection Agency (EPA)  
2007 Powell watershed profile. Available on the Internet at < [http://cfpub.epa.gov/surf/huc.cfm?huc\\_code=06010206](http://cfpub.epa.gov/surf/huc.cfm?huc_code=06010206) >. Accessed on November 4, 2010.

Fernald, M. L.

1950 *Gray's Manual of Botany*, 8th Edition. Dioscorides Press, Portland, Oregon.

Hubbard, D. A. Jr.

2006 Selected Karst Features of the Southern Valley and Ridge Province, Virginia. Virginia Department of Mines, Minerals, and Energy. Division of Mineral Resources. Richmond, VA.

Intergovernmental Panel on Climate Change (IPCC)

2007 *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Cambridge University Press, Cambridge, United Kingdom.

Monroe, M. S.

2005 *Bird Inventory for Cumberland Gap National Historic Park*. National Park Service. Cumberland Piedmont Network, Cumberland Gap National Historical Park, Middlesboro, KY.

National Park Service (NPS)

1990 National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation*.

2001 Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*.

2002a Director's Order #77-1: *Wetland Protection*

2002b Director's Order #28: *Cultural Resource Management*.

2003a Director's Order #77-2: *Floodplain Management*

2003b Reference Manual 83B1: *Wastewater Systems*.

2003c Reference Manual 83B4: *Raw Sewage Spill Notification and Cleanup Guidance*.

2006 *Management Policies 2006*.

2007 *Biological Assessment: Fiscal Year 2007 Prescribed Fire Plan*. Mammoth Cave National Park.

2008 Reference Manual 83A1: *Drinking Water*.

- 2010a NPS Stats. Available online at: < <http://www.nature.nps.gov/stats/> >. National Park Service Public Use Statistics Office. Accessed on November 4, 2010.
- 2010b *Final General Management Plan / Environmental Impact Statement*. Cumberland Gap National Historical Park.
- 2010c Station Creek Water Quality Sampling Data. Cumberland Gap National Historical Park.
- National Resource Conservation Service (NRCS)  
2010 Web Soil Survey. Available online at: < <http://websoilsurvey.nrcs.usda.gov/> >. Accessed on November 4, 2010.
- Nelms, D.L., G.E. Harlow, Jr., L.N. Plummer, and E. Busenberg.  
2003 *Aquifer Susceptibility in Virginia*. U.S. Geological Survey Water-Resources Investigations Report 03-4278. U.S. Department of the Interior. Richmond, Virginia.
- Office of Surface Mining Reclamation and Enforcement (OSM)  
1996 *Draft Environmental Impact Statement Fern Lake Watershed, Tennessee*. Lands Unsuitable for Surface Coal Mining and Reclamation Operations.
- Ogle, D. W.  
1991 *Virginia Spiraea*. Pages 117-119, in Virginia's Endangered Species (ed. Karen Terwilliger). Virginia Department of Game and Inland Fisheries. The McDonald and Woodward Publishing Company. Blacksburg, VA.
- Remley, A. W., Jr.  
2005 *Fish Inventory of Cumberland Gap National Historic Park*. National Park Service. Southeast Region Office, Atlanta, GA.
- Smithsonian National Museum of Natural History  
2010 *Gray Myotis*. Available online at < [http://www.mnh.si.edu/mna/image\\_info.dfm?species\\_id=192](http://www.mnh.si.edu/mna/image_info.dfm?species_id=192) >. Accessed on November 4, 2010.
- State Water Control Board (SWCB)  
2010 9VAC 25-260 Virginia Water Quality Standards. Effective February 1, 2010.
- Stevenson, D. E., and M. D. Tuttle  
1981 "Survivorship in the endangered gray bat (*Myotis grisescens*).” *Journal of Mammalogy* 62:244-257.

- Timpone, J.C., J.G. Boyles, K.L. Murray, D.P. Aubrey, and L.W. Robbins  
2009 *Overlap in roosting habits of Indiana bats (Myotis sodalis) and northern bats (Myotis septentrionalis)*. *The American Midland Naturalist* 163:115-123.
- Tuttle, M. D.  
1979 *Status, causes of decline, and management of endangered gray bats*. *Journal of Wildlife Management* 43:1-17.
- United States Fish and Wildlife Service (USFWS)  
2010 *Natural Resources of Concern*. Available online at  
<<http://www.fws.gov/northeast/virginiafield/>>
- United States Geological Survey (USGS)  
1997 *Ground Water Atlas of the United States: Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia*. Available online at  
< <http://pubs.usgs.gov/ha/ha730/gwa.html> >. Accessed on November 4, 2010.
- Ware, D. M. E.  
1991 “*Small Whorled Pogonia*.” Pages 95-97, in *Virginia’s Endangered Species* (ed. Karen Terwilliger). Virginia Department of Game and Inland Fisheries. The McDonald and Woodward Publishing Company. Blacksburg, VA.
- White, R. D.  
2006 *Vascular Plant Inventory and Ecological Community Classification for Cumberland Gap National Historic Park*. Durham, NC. NatureServe.

# **Appendix A: Scoping Letters**

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# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 24, 2010

Re: Public Scoping for Wilderness Road Campground Wastewater System Renewal  
Environmental Assessment, Cumberland Gap National Historical Park

Dear Friends and Neighbors:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

Replacement and rehabilitation of the overall sewer system is needed due to the deteriorated condition of the current components, which serve visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems in the park was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. The sewer system components proposed for replacement and rehabilitation would serve all the components of the Wilderness Road Campground, including three comfort stations, the fire use building, the host campsite, the entrance station, and an RV dumpsite.

An environmental assessment will be prepared in compliance with NEPA to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet project objectives, 2) evaluates issues and impacts to park resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts.

The park encourages public participation throughout the planning process. There will be two opportunities to comment formally on the project—once during initial project scoping and again following release of the Environmental Assessment. The park is currently in the scoping phase of this proposed project, and invites the public to submit written suggestions, comments, and concerns regarding the proposed project online at the NPS Planning, Environment, and Public Comment (PEPC) website at: <http://parkplanning.nps.gov/>.

If you are not able to submit comments electronically through this website, you may submit written comments at the address on this letterhead. Please provide comments by October 25, 2010. These comments will be considered during preparation of the Environmental Assessment.

It is the practice of the NPS to make all comments, including names and addresses of respondents who provide that information, available for public review following the conclusion of the environmental assessment process. Individuals may request that the NPS withhold their name and/or address from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commenters using the website can make such a request by checking the box "keep my contact information private." NPS will honor such requests to the extent allowable by law, but you should be aware that NPS may still be required to disclose your name and address pursuant to the Freedom of Information Act. We will make all submissions from organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 24, 2010

Roberta Hylton  
Field Office Supervisor  
Southwestern Virginia Field Office  
U.S. Fish and Wildlife Service  
330 Cummings Street  
Abingdon, Virginia 24210

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Hylton:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

Replacement and rehabilitation of the overall sewer system is needed due to the deteriorated condition of the current components, which serve visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems in the park was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. The sewer system components proposed for replacement and rehabilitation would serve all the components of the Wilderness Road Campground, including three comfort stations, the fire use building, the host campsite, the entrance station, and an RV dumpsite.

This letter serves as notification that we have begun the NEPA compliance process and are proposing to have the EA available for public and regulatory review in January, 2011. This letter also serves as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the 1973 Endangered Species Act, as amended, and NPS Management Policies. As part of the scoping for this project, we request any information regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project

vicinity, and any special management considerations for such species. The project area is depicted on the enclosed 7.5-minute USGS quadrangle map for Middlesboro South, Kentucky.

We appreciate your input on this project and will provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 24, 2010

Rene Hypes  
Environmental Review Coordinator  
Virginia Natural Heritage Program  
Department of Conservation & Recreation  
217 Governor Street, Third Floor  
Richmond, VA 23219

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Hypes:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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This letter serves as notification that we have begun the NEPA compliance process and are proposing to have the EA available for public and regulatory review in January, 2011. This letter also serves as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the Virginia Endangered Plant and Insect Species Act, and NPS Management Policies. As part of the scoping for this project, we request any information regarding listed or proposed threatened or endangered species or critical habitats that might

occur in the project vicinity, and any special management considerations for such species. The project area is depicted on the enclosed 7.5-minute USGS quadrangle map for Middlesboro South, Kentucky.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 24, 2010

Ray Fernald, Manager  
Nongame and Environmental Programs  
Wildlife Diversity Division  
Virginia Department of Game & Inland Fisheries  
4010 West Broad Street  
P.O. Box 11104  
Richmond, VA 23230-1104

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Mr. Fernald:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

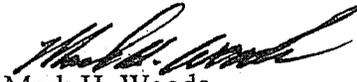
Replacement and rehabilitation of the overall sewer system is needed due to the deteriorated condition of the current components, which serve visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems in the park was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. The sewer system components proposed for replacement and rehabilitation would serve all the components of the Wilderness Road Campground, including three comfort stations, the fire use building, the host campsite, the entrance station, and an RV dumpsite.

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regarding listed or proposed threatened or endangered species or critical habitats that might occur in the project vicinity, and any special management considerations for such species. The project area is depicted on the enclosed 7.5-minute USGS quadrangle map for Middlesboro South, Kentucky.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 23, 2010

Ethel Eaton  
Archaeologist and Senior Policy Analyst  
Division of Resources Services and Review  
Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Eaton:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

Replacement and rehabilitation of the overall sewer system is needed due to the deteriorated condition of the current components, which serve visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems in the park was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. The sewer system components proposed for replacement and rehabilitation would serve all the components of the Wilderness Road Campground, including three comfort stations, the fire use building, the host campsite, the entrance station, and an RV dumpsite.

I invite your participation in the scoping for the proposed project, to assist us in defining the area of potential effects and to ensure that any concerns your office has regarding potential impacts to historic properties are raised and addressed early in the planning process. Scoping has also been initiated with the American Indian tribes traditionally associated with park lands, other federal and state agencies, and the general public.

National Park Service archeologist Tom des Jean conducted archeological investigations at the proposed construction site earlier this summer. A memo stating his finds is enclosed, as is a map detailing location of test pits.

My staff will continue to keep you informed as the planning effort progresses, and we would appreciate receiving any preliminary comments you may have by October 25, 2010. If you have any questions, or if you would like to schedule a meeting to further discuss the proposed project, please contact me at (606) 246-1050 or via email at Mark\_Woods@nps.gov. I look forward to continued consultations with your office and believe that it will help ensure that historic properties are adequately considered and protected throughout the planning and implementation of the project.

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:  
L-7617

## United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

Ref # 34032.00

September 24, 2010

Rodney Neece  
Environmental Health Specialist  
Lee County Environmental Health Department  
P.O. Box 763  
Jonesville, Virginia 24263

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Mr. Neece:

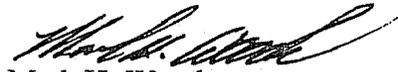
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This letter serves as notification that we have begun the NEPA compliance process and are proposing to have the EA available for public and regulatory review in January, 2011. As part of the scoping for this project, we request any information you might consider providing to assist with the planning process for this project, including but not limited to the decommissioning of existing facilities and permitting the new system. For your convenience, we have provided a map of the project area using the 7.5-minute USGS quadrangle map for Middlesboro South, Kentucky.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
~~Brad Ketterling, VHB~~



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 24, 2010

D. Dane Poe  
County Administrator  
Lee County Courthouse, Room 111  
P.O. Box 367  
Jonesville, VA 24263

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Mr. Poe:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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The purpose of this letter is to inform you of the initiation of this project, provide a vicinity map showing the project area, and provide contact information should you have any questions regarding this project. This letter also serves as notification that we have begun the NEPA compliance process and are proposing to have the EA available for public and regulatory review in January, 2011.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

Cherokee Nation of Oklahoma  
Attn: Dr. Richard Allen  
P.O. Box 948  
Tahlequah, OK 74465

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Dr. Allen:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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This letter serves as notification that we have begun the NEPA compliance process and are proposing to have the EA available for public and regulatory review in January, 2011. We are interested in any information you may wish to provide or concerns you may have and whether you are aware of any resources of interest within the project area. For your convenience, we have provided a map of the project area based on the 7.5-minute USGS quadrangle map for Middlesboro South, Kentucky.

National Park Service archeologist Tom des Jean conducted archeological investigations at the proposed construction site earlier this summer. A memo stating his finds is enclosed, as is a map detailing location of test pits.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

## United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

Chickasaw Nation  
Attn: Kirk Perry  
P.O. Box 1548  
Ada, OK 74821

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Mr. Perry:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

## United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

Eastern Band of Cherokee Indians  
Attn: Russell Townsend  
P.O. Box 455  
Cherokee, NC 28719

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Mr. Townsend:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

Eastern Shawnee Tribe of Oklahoma  
Attn: Robin Dushane  
P.O. Box 350  
Seneca, MO 64865

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Dushane:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

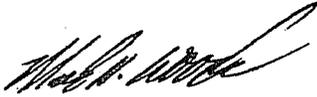
Replacement and rehabilitation of the overall sewer system is needed due to the deteriorated condition of the current components, which serve visitors from the campground's 160 campsites as well as supporting park buildings. The oldest of the existing sanitary sewer systems in the park was built in the late 1960s. Problems associated with the failing system include periodic overflow and increased maintenance requirements. If left unaddressed, these problems may present health and environmental issues for park visitors and nearby Station Creek, respectively. The sewer system components proposed for replacement and rehabilitation would serve all the components of the Wilderness Road Campground, including three comfort stations, the fire use building, the host campsite, the entrance station, and an RV dumpsite.

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National Park Service archeologist Tom des Jean conducted archeological investigations at the proposed construction site earlier this summer. A memo stating his finds is enclosed, as is a map detailing location of test pits.

We appreciate your input on this project and can provide a copy of the draft EA for your review as soon as it is available. If you have any initial input or questions regarding the project, please contact me at (606) 246-1050 or via email at [Mark\\_Woods@nps.gov](mailto:Mark_Woods@nps.gov).

Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

## United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

United Keetoowah Band of Cherokee Indians  
Attn: Lisa Stopp  
P.O. Box 189  
Parkhill, OK 74451

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Stopp:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



# United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

IN REPLY REFER TO:

L-7617

Ref # 34032.00

September 23, 2010

Shawnee Tribe of Indians of Oklahoma  
Attn: Karen Kaniatobe  
2025 S Gordon Cooper Dr.  
Shawnee, OK 74801

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Kaniatobe:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB



IN REPLY REFER TO:

## United States Department of the Interior

NATIONAL PARK SERVICE  
Cumberland Gap National Historical Park  
P.O. Box 1848  
Middlesboro, Kentucky 40965-1848

L-7617

Ref # 34032.00

September 23, 2010

Shawnee Tribe  
Attn: Belinda Pryor  
P.O. Box 189  
Miami, OK 47355

Re: Wilderness Road Campground: Wastewater System Renewal  
Cumberland Gap National Historical Park

Dear Ms. Pryor:

The National Park Service (NPS) is initiating the preparation of an Environmental Assessment (EA) for the proposed replacement and rehabilitation of five failing sewer systems and the existing waterline within the Wilderness Road Campground at Cumberland Gap National Historical Park (the park). The document is being prepared under the provisions of the National Environmental Policy Act (NEPA).

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Sincerely,



Mark H. Woods  
Superintendent

cc: Connie Chitwood, NPS-DSC  
Bill Brumbach, NPS-CUGA  
Tricia Wingard, VHB  
Brad Ketterling, VHB

## **Appendix B: Relevant Correspondence**

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From: Tylan\_Dean  
Sent: 10/20/2010 08:30 AM AST

To: Mark Woods

Subject: Species List - Wilderness Campground Wastewater System Renewal project, Cumberland Gap NHP, Lee Co., VA

Greetings.

We have reviewed your request for information on federally listed endangered and threatened species and designated critical habitat for the referenced project. The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended.

A list of species that may occur in the vicinity of your proposed project is attached. Our office has recently developed an on-line project review process that we are asking applicants and Federal Action Agencies to use. This process was developed to help provide information and expedite reviews of projects. The attached species list was generated through the process.

We ask that you use the process for further informal consultation and NEPA review. The process may allow you to self-certify that your project is not likely to adversely affect listed species, and will provide an official record of review and compliance. If your project may adversely affect listed species, the process will help us to gather information to allow us to expedite consultation. For this project and all future projects that you have for review, please use our on-line review process. You can find a link to the review process on our office web site, or at:

[http://www.fws.gov/northeast/virginiafield/endspecies/Project\\_Reviews.html](http://www.fws.gov/northeast/virginiafield/endspecies/Project_Reviews.html)

(See attached file: 20101020 draft species list Wilderness Campground wastewater System Renewal, NPS, Lee County.pdf)

If you have any questions or need any additional information, please feel free to contact me.

Tylan Dean  
Assistant Supervisor  
Endangered Species & Conservation Planning Assistance U.S. Fish and Wildlife  
Service Virginia Field Office  
6669 Short Lane  
Gloucester, Virginia 23061  
phone - 804-693-6694 x 166  
fax - 804-693-9032  
visit us at: <http://www.fws.gov/northeast/virginiafield/>

(See attached file: 20101020 draft species list Wilderness Campground wastewater System Renewal, NPS, Lee County.pdf)



U.S. Fish and Wildlife Service

## Natural Resources of Concern

**This resource list is to be used for planning purposes only — it is not an official species-list.**

Endangered Species Act species-list information for your project is available online and listed below for the following FWS Field Offices:

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE  
6669 SHORT LANE  
GLOUCESTER, VA 23061  
(804) 693-6694  
<http://www.fws.gov/northeast/virginiafield/>

***Project Name:***

Wilderness Road Campground Wastewater System Renewal



U.S. Fish and Wildlife Service

## Natural Resources of Concern

### *Project Location Map:*



### *Project Counties:*

Lee, VA

### *Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):*

```
MULTIPOLYGON((( -83.63701868057251 36.60459482357297, -83.63047409057617  
36.60697662517819, -83.62753438949585 36.603414651606414, -83.62641859054565  
36.60169803783688, -83.62665462493896 36.600668069575164, -83.62822103500366  
36.60000288173947, -83.63090324401855 36.59998142406735, -83.63345670700073  
36.60008871242795, -83.63455104827881 36.60094701931271, -83.63701868057251  
36.60459482357297)))
```



## Natural Resources of Concern

### ***Project Type:***

Wastewater Pipeline

### ***Endangered Species Act Species-list***

There are a total of 25 species in your species-list

### **Species that may be affected by your project:**

Clams			
Appalachian monkeyface ( <i>Quadrula sparsa</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Birdwing pearl mussel ( <i>Conradilla caelata</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Cracking pearl mussel ( <i>Hemistena lata</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Cumberland bean ( <i>Villosa trabalis</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Cumberland monkeyface ( <i>Quadrula intermedia</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Cumberlandian combshell ( <i>Epioblasma brevidens</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Dromedary pearl mussel ( <i>Dromus dromas</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Finerayed pigtoe ( <i>Fusconaia cuneolus</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office



## Natural Resources of Concern

Fluted kidneyshell ( <i>Ptychobranhus subtentum</i> )	Candidate	<a href="#">species info</a>	Virginia Ecological Services Field Office
Littlewing pearl mussel ( <i>Pegias fabula</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Oyster mussel ( <i>Epioblasma capsaeformis</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Purple bean ( <i>Villosa perpurpurea</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Rough rabbitsfoot ( <i>Quadrula cylindrica</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Sheepnose Mussel ( <i>Plethobasus cyphus</i> )	Candidate	<a href="#">species info</a>	Virginia Ecological Services Field Office
Shiny pigtoe ( <i>Fusconaia cor</i> ) Population: Entire Range; Except where listed as Experimental Populations	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Slabside pearl mussel ( <i>Lexingtonia dolabelloides</i> )	Candidate	<a href="#">species info</a>	Virginia Ecological Services Field Office
Crustaceans			
Lee County Cave isopod ( <i>Lirceus usdagalun</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Fishes			
Blackside dace ( <i>Phoxinus cumberlandensis</i> )	Threatened	<a href="#">species info</a>	Virginia Ecological Services Field Office
Slender chub ( <i>Erimystax cahni</i> )	Threatened	<a href="#">species info</a>	Virginia Ecological Services Field Office
Yellowfin madtom ( <i>Noturus flavipinnis</i> ) Population: except where EXPN	Threatened	<a href="#">species info</a>	Virginia Ecological Services Field Office
Flowering Plants			
Small Whorled pogonia ( <i>Isotria medeoloides</i> )	Threatened	<a href="#">species info</a>	Virginia Ecological Services Field Office



## Natural Resources of Concern

Virginia spiraea ( <i>Spiraea virginiana</i> )	Threatened	<a href="#">species info</a>	Virginia Ecological Services Field Office
White Fringeless orchid ( <i>Platanthera integrilabia</i> )	Candidate	<a href="#">species info</a>	Virginia Ecological Services Field Office
Mammals			
Gray bat ( <i>Myotis grisescens</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office
Indiana bat ( <i>Myotis sodalis</i> )	Endangered	<a href="#">species info</a>	Virginia Ecological Services Field Office

### ***FWS National Wildlife Refuges***

There are no refuges found within the vicinity of your project.

### ***FWS Migratory Birds***

Not yet available through IPaC.

### ***FWS Delineated Wetlands***

Not yet available through IPaC.



# COMMONWEALTH of VIRGINIA

## Department of Historic Resources

Douglas W. Domenech.  
*Secretary of Natural Resources*

2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick  
*Director*

Tel: (804) 367-2323  
Fax: (804) 367-2391  
TDD: (804) 367-2386  
[www.dhr.virginia.gov](http://www.dhr.virginia.gov)

October 24, 2010

Mark H. Woods, Superintendent  
National Park Service  
Cumberland Gap National Historical Park  
US 25E South  
P. O. Box 1848  
Middlesboro, KY 40965-1848

RE: Wilderness Road Campground – Wastewater System Renewal  
Cumberland Gap National Historical Park  
VDHR File No. 2010-1812

Dear Mr. Woods:

Thank you for your letter of September 23, 2010 inviting our participation in the scoping for the proposed project.

We are pleased to see that an archaeological survey has already been conducted for the proposed Campground leachfield construction site. We note that an archaeologist will monitor the initial trenching for the leachfield to ensure that a recently discovered archaeological site is not impacted by construction. Our DSS records indicate that there are three sites in the project vicinity, 44LE145, 44LE146 and 44LE0211. We request that a DSS form be completed for the newly discovered site and included in the final technical report, which we assume will be prepared after the monitoring is complete. We look forward to reviewing it once it is available.

We wonder whether the replacement of the water line will involve removing the existing water line and replacing a new line in the same trench or whether the replacement line will be emplaced in a trench adjacent to the old line, or perhaps have a new alignment. It is not clear from the summary of the archaeological work whether the water line corridor was also tested.

We look forward to learning more about this project as the planning efforts progress. If you have any questions concerning our comments, or if we may provide any further assistance, please do not hesitate to contact me at (804) 367-2323, ext. 112.

Sincerely,

Ethel R. Eaton, Ph.D., Senior Policy Analyst  
Division of Resource Services and Review

Administrative Services  
10 Courthouse Ave.  
Petersburg, VA 23803  
Tel: (804) 862-6416  
Fax: (804) 862-6196

Capital Region Office  
2801 Kensington Office  
Richmond, VA 23221  
Tel: (804) 367-2323  
Fax: (804) 367-2391

Tidewater Region Office  
14415 Old Courthouse Way  
2<sup>nd</sup> Floor  
Newport News, VA 23608  
Tel: (757) 886-2807  
Fax: (757) 886-2808

Roanoke Region Office  
1030 Penmar Avenue, SE  
Roanoke, VA 24013  
Tel: (540) 857-7585  
Fax: (540) 857-7588

Northern Region  
Preservation Office  
P.O. Box 519  
Stephens City, VA 22655  
Tel: (540) 868-7029  
Fax: (540) 868-7033

Douglas W. Domenech  
Secretary of Natural Resources



David A. Johnson  
Director

**COMMONWEALTH of VIRGINIA**  
**DEPARTMENT OF CONSERVATION AND RECREATION**

Division of Natural Heritage  
217 Governor Street  
Richmond, Virginia 23219-2010  
(804) 786-7951

October 26, 2010

Mark Woods  
National Park Service  
Cumberland Gap National Historical Park  
PO Box 1848  
Middlesboro, KY 40965-1848

Re: #34032, Wilderness Road Campground Wastewater Renewal, Cumberland Gap National Historical Park

Dear Mr. Woods:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Cumberland Gap Slopes Conservation site has been documented within and immediately adjacent to the project area. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Cumberland Gap Slopes Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is:

*Myotis sodalis*

Indiana bat

G2/S1/LE/LE

The Indiana bat ranges from the western Ozarks north and east to Michigan and New England, and south to Alabama and Arkansas (NatureServe, 2009). In Virginia, there are records in mountainous regions of the western part of the state. Male and female Indiana bats congregate in the fall to hibernate in caves and mine tunnels in dense clusters. While many males continue to use these underground roosts in the summer, females form maternity colonies under the loose bark of trees such as shagbark hickory, oaks and maples. These bats emerge in the evenings to feed on moths, flies and other insects over tree-lined streams and upland woods.

Indiana bats are sensitive to flooding, pesticide poisoning, and disturbance by human beings, such as vandalism, spelunkers, cave commercialization, and research (Dalton & Handley, 1991; Harvey, 1992). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF)

Due to the legal status of the Indiana bat, DCR recommends coordination with VDGIF and USFWS to ensure compliance with protected species legislation. If tree removal is proposed for the project, DCR also recommends a time of year restriction from April 1 through September 30 to protect bats roosting in trees.

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

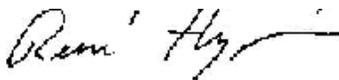
Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,



S. Rene' Hypes  
Project Review Coordinator

Cc: Ernie Aschenbach, VDGIF  
Rick Reynolds, VDGIF  
Tylan Dean, USFWS

### Literature Cited

Dalton, V.M. and C.H. Handley. 1991. Social Myotis. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia.

Harvey, M.J. 1992. Bats of the United States. Published by the Arkansas Game and Fish Commission in cooperation with the U.S. Fish and Wildlife Service. P. 16.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: April 27, 2010 ).

From: "Ewing, Amy (DGIF)" [Amy.Ewing@dgif.virginia.gov]  
Sent: 10/29/2010 02:42 PM AST

To: Mark Woods  
Cc: "Reynolds, Rick (DGIF)" <Rick.Reynolds@dgif.virginia.gov>; "Kittrell, Bill (DGIF)" <Bill.Kittrell@dgif.virginia.gov>

Subject: ESSLog# 31308\_EA scoping\_Wilderness Road Campground

Mr. Woods,

We received a request from the National Park Service to provide information regarding unique wildlife resources known from the area of Wilderness Road Campground located in Lee County. We offer the following information for consideration during the development of the Environmental Assessment addressing proposed replacement and rehabilitation of the sewer systems at the campground.

Federal Endangered state Endangered Indiana bats have been documented from the project area. This species is known to inhabit caves, particularly during winter hibernation, but females may form large maternity colonies under the loose bark of trees, such as shagbark hickory, along stream and rivers during summer months. Males typically remain in underground roosting sites. We recommend the EA address any possible impacts upon this species and/or its habitats. We also recommend coordination with the USFWS regarding impacts upon this species.

A tributary to Station Creek that runs to the east of the Campground is designated a wild trout water. We recommend the EA address any impacts upon this stream and/or its tributaries.

Thank you.

Amy

Amy M. Ewing  
Environmental Services Biologist  
Virginia Dept. of Game and Inland Fisheries  
804-367-2211



RECEIVED NOV 08 2010

the Chickasaw Nation

Bill Anoatubby, Governor  
Jefferson Keel, Lt. Governor

Headquarters

November 3, 2010

Mark H. Woods, Superintendent  
National Park Service  
Cumberland Gap National Historical Park  
P. O. Box 1848  
Middlesboro, KY 40965-1848

Dear Mr. Woods:

Thank you for notification of the proposed leach field construction, as well as the replacement/rehabilitation of five failing sewer systems and the existing waterline located within the Wilderness Road Campground, Cumberland Gap National Historical Park, Lee County, Virginia. We accept the recommendation by Tom Des Jean, cultural resources specialist/archaeologist, that an archaeologist should be present during the initial trenching of the campground leach field due to this area being very near a multi-component site.

This area is within the aboriginal hunting and trading lands of the Chickasaw Nation and is important to us. Therefore, we ask that in the event of inadvertent discoveries, all construction activities cease and we be immediately notified according to all applicable federal and state laws.

If you have any questions, please contact Ms. Gingy Nail, historic preservation officer at (580) 559-0817, [gingy.nail@chickasaw.net](mailto:gingy.nail@chickasaw.net) or Ms. Julie Ray, historic preservation and repatriation manager at (580) 559-0825, [julie.ray@chickasaw.net](mailto:julie.ray@chickasaw.net).

Sincerely,

Handwritten signature of Jefferson Keel.  
Jefferson Keel, Lt. Governor  
The Chickasaw Nation

jar

# **Appendix C: Tree Survey – Proposed Leach Field Area**

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engineering and constructing a better tomorrow

October 8, 2010

Mr. Robert Bennett  
National Park Service  
Denver Service Center  
12795 W. Alameda Parkway  
Denver, Colorado 80228

**TREE SURVEY REPORT**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**  
**MACTEC Project No. 4666-10-0001**

Dear Mr. Bennett:

MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to submit this Tree Survey Report to support the Environmental Assessment being prepared by the National Park Service for the installation of a new wastewater disposal system (i.e., leach field) at the Wilderness Road Campground in Cumberland Gap National Historical Park (Site).

On September 29, 2010, Matthew Bowling, a Senior Environmental Scientist employed by MACTEC, conducted a tree survey at the above referenced Site. Amy Wilson and Beth Ridens of the National Park Service accompanied Matthew Bowling in the field and assisted with data collection.

The tree survey was performed in the location of the proposed leach field and proposed pipe connecting to the existing sanitary sewer system; the Limit of Tree Survey is presented on Figure 1 (attached). [Note: Some additional trees outside the Limit of Tree Survey were also assessed.] The tree survey consisted of documenting the tree species, circumference at breast height (nearest full inch), diameter at breast height (DBH), estimated height (nearest 10-foot interval), and general condition of health (e.g., good, poor) for trees with DBH > 8 inches. The results of the tree survey are presented in Table 1 (attached). Documented trees (DBH > 8 inches) were located using a Trimble GPS unit and are shown on Figure 1.

Please contact Matthew Bowling at (865) 218-1985 if you require further information regarding this tree survey.

Sincerely,

**MACTEC Engineering and Consulting, Inc.**

A handwritten signature in black ink that reads "John W. Peterson".

John W. Peterson  
Principal Professional

A handwritten signature in black ink that reads "Matthew W. Bowling".

Matthew W. Bowling, CWB, CPESC  
Senior Environmental Scientist

October 8, 2010  
Mr. Robert Bennett  
Page 2

cc: Lydia Creager (NPS)  
Bill Brumbach (NPS)  
Jenny Beeler (NPS)  
Kendall Dalton (MACTEC)  
Rex Pepler (MACTEC)  
Ralph Oulton (MACTEC)  
Karie Sensus (MACTEC)  
File (MACTEC)

Enclosures: Table 1: Tree Survey Results  
Figure 1: Tree Survey Plan

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
1	3420086.170	9978227.438	eastern red cedar	27	8.6	70	good
2	3420070.229	9978228.338	yellow poplar	30	9.6	70	good
3	3420078.350	9978244.488	Virginia pine	47	15.0	70	good
4	3420066.618	9978184.858	black cherry	30	9.6	70	good
5	3420072.158	9978173.358	yellow poplar	60	19.1	80	good
6	3420050.897	9978149.458	mulberry	29	9.2	30	good
7	3420035.866	9978143.689	yellow poplar	57	18.2	90	good
8	3420024.075	9978123.189	American elm	37	11.8	60	good
9	3420015.815	9978122.249	northern red oak	37	11.8	60	good
10	3419979.104	9978135.340	northern red oak	72	22.9	90	good
11	3419979.554	9978139.510	northern red oak	64	20.4	90	good
12	3419959.983	9978135.670	northern red oak	103	32.8	90	good
13	3419959.583	9978145.960	black cherry	44	14.0	80	good
14	3419924.082	9978164.871	mulberry	30	9.6	40	good
15	3419926.012	9978170.371	black cherry	30	9.6	70	dying
16	3419910.762	9978163.111	black cherry	32	10.2	70	dying
17	3419894.881	9978175.611	American elm	30	9.6	60	good
18	3419886.351	9978176.491	black cherry	29	9.2	40	good
19	3419879.811	9978189.211	mulberry	43	13.7	30	good
20	3419873.671	9978188.452	black cherry	40	12.7	50	good
21	3419830.889	9978206.112	black cherry	32	10.2	40	good
22	3419829.769	9978211.282	black walnut	37	11.8	70	good
23	3419822.779	9978214.562	northern red oak	37	11.8	70	good
24	3419821.809	9978215.873	honey locust	37	11.8	60	good
25	3419805.168	9978219.093	black cherry	38	12.1	70	stressed
26	3419782.788	9978226.683	black cherry	38	12.1	70	stressed
27	3419772.267	9978242.943	black cherry	35	11.1	70	stressed
28	3419752.547	9978251.684	black cherry	44	14.0	70	stressed

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
29	3419731.096	9978251.134	eastern red cedar	98	31.2	50	hollow
30	3419701.815	9978286.295	eastern red cedar	40	12.7	50	good
31	3419706.695	9978270.285	eastern red cedar	43	13.7	50	good
32	3419699.015	9978272.765	sugar maple	30	9.6	60	good
33	3419683.345	9978289.085	black cherry	28	8.9	50	good
34	3419655.194	9978291.446	eastern red cedar	40	12.7	50	good
35	3419667.644	9978293.845	red maple	27	8.6	40	good
36	3419662.394	9978295.866	eastern red cedar	52	16.6	60	good
37	3419645.383	9978300.086	eastern red cedar	41	13.1	60	good
38	3419639.603	9978305.836	red maple	47	15.0	60	good
39	3419635.113	9978307.446	white ash	37	11.8	50	good
40	3419616.913	9978319.296	eastern red cedar	45	14.3	60	good
41	3419808.374	9977961.792	red maple	30	9.6	40	good
42	3419818.184	9977975.762	white pine	39	12.4	50	good
43	3419836.885	9977979.581	yellow poplar	27	8.6		good
44	3419838.255	9977998.201	Virginia pine	39	12.4	60	good
45	3419849.046	9978006.961	sweetgum	27	8.6	50	good
46	3419852.106	9978005.361	sweetgum	26	8.3	50	good
47	3419894.798	9978033.201	yellow poplar	40	12.7	50	good
48	3419916.159	9978041.110	eastern hemlock	33	10.5	50	good
49	3419925.310	9978032.810	white pine	50	15.9	50	good
50	3419934.531	9978061.050	yellow poplar	35	11.1	50	good
51	3419969.512	9978065.809	white pine	34	10.8	50	good
52	3419997.504	9978083.489	sweetgum	37	11.8	60	good
53	3420004.514	9978104.479	black cherry	39	12.4	60	good
54	3420021.755	9978104.729	eastern red cedar	42	13.4	50	good
55	3420040.828	9978251.559	eastern red cedar	32	10.2	50	good
56	3420030.068	9978254.229	Virginia pine	42	13.4	60	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
57	3420031.538	9978273.349	yellow poplar	28	8.9	50	good
58	3420030.999	9978277.239	Virginia pine	58	18.5	60	good
59	3420017.458	9978279.019	eastern red cedar	27	8.6	50	good
60	3420004.578	9978289.750	sweetgum	29	9.2	50	good
61	3419995.567	9978281.980	dogwood	26	8.3	30	good
62	3419978.507	9978304.250	yellow poplar	56	17.8	60	good
63	3419969.616	9978296.450	yellow poplar	58	18.5	60	good
64	3419938.685	9978301.501	Virginia pine	45	14.3	60	good
65	3419927.515	9978302.121	Virginia pine	47	15.0	50	good
66	3419930.605	9978308.461	yellow poplar	26	8.3	50	good
67	3419925.625	9978315.851	yellow poplar	36	11.5	60	good
68	3419920.505	9978315.221	yellow poplar	36	11.5	60	good
69	3419912.125	9978318.941	Virginia pine	47	15.0	60	good
70	3419903.014	9978326.022	Virginia pine	33	10.5	60	good
71	3419897.804	9978323.322	Virginia pine	36	11.5	60	good
72	3419880.653	9978313.242	yellow poplar	42	13.4	70	good
73	3419880.713	9978307.352	eastern red cedar	33	10.5	50	good
74	3419877.063	9978318.152	eastern red cedar	37	11.8	50	good
75	3419874.333	9978325.522	Virginia pine	33	10.5	50	good
76	3419859.212	9978319.402	Virginia pine	35	11.1	60	good
77	3419861.233	9978326.572	Virginia pine	37	11.8	60	good
78	3419852.992	9978317.252	sweetgum	40	12.7	60	good
79	3419838.372	9978327.673	Virginia pine	35	11.1	60	good
80	3419836.202	9978341.433	Virginia pine	34	10.8	60	good
81	3419814.091	9978349.103	yellow poplar	54	17.2	60	good
82	3419797.430	9978347.603	eastern red cedar	35	11.1	50	good
83	3419792.120	9978355.874	eastern red cedar	32	10.2	50	good
84	3419796.781	9978366.713	eastern red cedar	37	11.8	50	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
85	3419769.810	9978368.314	yellow poplar	74	23.6	60	good
86	3419764.879	9978356.004	eastern red cedar	25	8.0	50	good
87	3419749.179	9978359.864	northern red oak	44	14.0	60	good
88	3419748.579	9978380.704	black cherry	46	14.6	60	good
89	3419763.630	9978384.694	eastern red cedar	32	10.2	50	good
90	3419728.988	9978382.865	northern red oak	62	19.7	60	good
91	3419728.049	9978395.705	northern red oak	88	28.0	70	good
92	3419733.609	9978391.125	northern red oak	41	13.1	60	good
93	3419721.018	9978391.095	black cherry	42	13.4	60	good
94	3419720.208	9978384.945	white ash	41	13.1	60	good
95	3419718.748	9978379.665	northern red oak	27	8.6	60	good
96	3419715.268	9978379.305	black cherry	30	9.6	50	good
97	3419723.788	9978382.885	black walnut	29	9.2	50	good
98	3419723.128	9978383.745	eastern red cedar	60	19.1	60	good
99	3419692.007	9978389.785	yellow poplar	29	9.2	50	good
100	3419712.298	9978416.755	eastern red cedar	60	19.1	60	good
101	3419685.468	9978441.606	yellow poplar	55	17.5	60	good
102	3419687.097	9978426.176	eastern red cedar	33	10.5	50	good
103	3419684.087	9978421.556	eastern red cedar	29	9.2	50	good
104	3419671.077	9978429.946	black cherry	60	19.1	60	good
105	3419666.477	9978434.366	eastern red cedar	28	8.9	50	good
106	3419658.567	9978444.836	eastern red cedar	28	8.9	50	good
107	3419648.166	9978443.026	eastern red cedar	37	11.8	50	good
108	3419639.585	9978423.846	eastern red cedar	31	9.9	50	good
109	3419626.565	9978431.237	eastern red cedar	27	8.6	50	good
110	3419611.275	9978448.347	eastern red cedar	30	9.6	50	good
111	3419622.746	9978462.907	black cherry	55	17.5	60	good
112	3419611.735	9978470.307	eastern red cedar	29	9.2	50	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
113	3419596.575	9978464.677	yellow poplar	40	12.7	60	good
114	3419593.775	9978478.807	yellow poplar	60	19.1	60	good
115	3419975.664	9978180.130	eastern red cedar	29	9.2	50	good
116	3419986.495	9978185.560	yellow poplar	44	14.0	60	good
117	3419960.204	9978207.890	yellow poplar	35	11.1	60	good
118	3419955.095	9978238.400	eastern red cedar	36	11.5	50	good
119	3419944.834	9978219.270	northern red oak	50	15.9	60	good
120	3419929.113	9978224.931	eastern red cedar	33	10.5	50	good
121	3419925.534	9978240.221	Virginia pine	45	14.3	60	good
122	3419944.964	9978247.511	Virginia pine	58	18.5	60	good
123	3419931.354	9978255.361	Virginia pine	45	14.3	60	good
124	3419926.954	9978243.981	Virginia pine	35	11.1	60	good
125	3419908.733	9978224.211	yellow poplar	37	11.8	60	good
126	3419894.592	9978228.391	Virginia pine	36	11.5	60	good
127	3419869.701	9978219.372	yellow poplar	39	12.4	60	good
128	3419866.571	9978212.002	yellow poplar	34	10.8	60	good
129	3419858.171	9978225.302	yellow poplar	34	10.8	60	good
130	3419852.391	9978243.382	sycamore	34	10.8	60	good
131	3419836.710	9978248.422	black cherry	32	10.2	60	good
132	3419829.420	9978257.053	Virginia pine	26	8.3	50	good
133	3419833.910	9978257.862	eastern red cedar	26	8.3	50	good
134	3419819.319	9978248.933	yellow poplar	32	10.2	60	good
135	3419811.989	9978244.153	yellow poplar	54	17.2	60	good
136	3419790.368	9978242.533	northern red oak	80	25.5	70	good
137	3419788.929	9978273.053	yellow poplar	40	12.7	60	good
138	3419787.459	9978277.313	black cherry	30	9.6	60	good
139	3419805.710	9978290.943	Virginia pine	37	11.8	60	good
140	3419797.629	9978289.643	eastern red cedar	34	10.8	60	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
141	3419788.159	9978300.933	American elm	27	8.6	50	good
142	3419755.848	9978302.724	yellow poplar	35	11.1	60	good
143	3419748.687	9978281.024	yellow poplar	42	13.4	60	good
144	3419725.736	9978291.464	black cherry	45	14.3	60	good
145	3419723.137	9978321.685	eastern red cedar	58	18.5	50	good
146	3419728.347	9978337.985	sassafras	29	9.2	50	good
147	3419721.627	9978328.665	sassafras	29	9.2	50	good
148	3419747.328	9978341.314	black cherry	36	11.5	60	good
149	3419727.468	9978344.595	black cherry	44	14.0	60	good
150	3419735.868	9978359.124	black cherry	32	10.2	60	good
151	3419689.666	9978320.695	yellow poplar	29	9.2	60	good
152	3419677.215	9978303.445	American elm	39	12.4	60	good
153	3419672.005	9978320.515	yellow poplar	31	9.9	50	good
154	3419671.845	9978326.235	northern red oak	70	22.3	70	good
155	3419660.835	9978334.036	Virginia pine	44	14.0	60	good
156	3419645.514	9978339.226	black cherry	33	10.5	60	good
157	3419631.084	9978367.926	Virginia pine	39	12.4	60	good
158	3419650.735	9978370.746	Virginia pine	37	11.8	60	good
159	3419645.505	9978380.686	eastern red cedar	30	9.6	50	good
160	3419642.325	9978388.126	Virginia pine	30	9.6	50	good
161	3419640.985	9978395.456	Virginia pine	52	16.6	60	good
162	3419637.475	9978406.606	Virginia pine	30	9.6	50	good
163	3419625.593	9978345.596	Virginia pine	40	12.7	60	good
164	3419614.963	9978346.937	Virginia pine	40	12.7	60	good
165	3419606.663	9978353.347	Virginia pine	31	9.9	50	good
166	3419594.042	9978322.307	Virginia pine	64	20.4	60	good
167	3419588.392	9978331.097	black cherry	48	15.3	60	good
168	3419582.852	9978334.617	Virginia pine	34	10.8	60	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
169	3419567.241	9978345.157	eastern red cedar	48	15.3	50	good
170	3419562.091	9978347.067	sassafras	37	11.8	60	good
171	3419552.181	9978346.828	black cherry	37	11.8	60	good
172	3419544.180	9978342.718	eastern red cedar	35	11.1	60	good
173	3419537.060	9978363.428	Virginia pine	30	9.6	60	good
174	3419527.180	9978366.938	Virginia pine	60	19.1	60	good
175	3419554.651	9978379.358	Virginia pine	43	13.7	60	good
176	3419572.342	9978363.887	Virginia pine	40	12.7	60	good
177	3419584.382	9978361.437	sweetgum	29	9.2	60	good
178	3419589.782	9978364.757	Virginia pine	36	11.5	60	good
179	3419603.583	9978381.077	Virginia pine	40	12.7	60	good
180	3419579.802	9978386.007	yellow poplar	32	10.2	60	good
181	3419585.443	9978399.727	Virginia pine	50	15.9	60	good
182	3419596.473	9978403.927	Virginia pine	50	15.9	60	good
183	3419559.812	9978412.478	Virginia pine	50	15.9	60	good
184	3419562.603	9978434.318	black cherry	31	9.9	50	good
185	3419557.683	9978454.728	black cherry	75	23.9	60	good
186	3419631.455	9978426.017	eastern red cedar	30	9.6	50	good
187	3419693.166	9978353.375	black walnut	29	9.2	50	good
188	3419710.087	9978357.605	eastern red cedar	28	8.9	50	good
189	3419803.270	9978318.133	eastern red cedar	27	8.6	50	good
190	3419825.551	9978302.123	eastern red cedar	40	12.7	50	good
191	3419834.831	9978297.173	Virginia pine	30	9.6	50	good
192	3419842.151	9978292.342	eastern red cedar	27	8.6	50	good
193	3419865.112	9978275.782	yellow poplar	46	14.6	60	good
194	3419913.394	9978262.201	Virginia pine	58	18.5	60	good
195	3419921.294	9978254.531	Virginia pine	45	14.3	60	good
196	3419977.726	9978244.430	Virginia pine	57	18.2	60	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

Tree Identifier	Northing <sup>1</sup>	Easting <sup>1</sup>	Species	Circumference (inches)	Diameter at Breast Height (inches)	Estimated Height <sup>2</sup> (feet)	Condition
197	3420001.067	9978238.790	yellow poplar	70	22.3	60	good
198	3420018.927	9978233.979	Virginia pine	38	12.1	60	good
199	3420019.408	9978258.199	Virginia pine	46	14.6	60	good
200	3420033.718	9978251.769	eastern red cedar	32	10.2	60	good
201	3420034.158	9978220.129	Virginia pine	46	14.6	60	good
202	3419711.434	9978213.014	Virginia pine	39	12.4	60	good
203	3419695.514	9978213.995	Virginia pine	38	12.1	60	good
204	3419691.724	9978209.495	northern red oak	27	8.6	60	good
205	3419682.533	9978206.525	Virginia pine	32	10.2	60	good
206	3419708.233	9978163.014	eastern red cedar	47	15.0	50	good
207	3419695.633	9978156.234	yellow poplar	60	19.1	70	good
208	3419699.713	9978153.794	yellow poplar	28	8.9	60	good
209	3419701.003	9978139.664	sweetgum	26	8.3	50	good
210	3419705.253	9978135.264	yellow poplar	49	15.6	70	good
211	3419706.863	9978127.094	yellow poplar	56	17.8	70	good
212	3419700.442	9978125.974	yellow poplar	43	13.7	60	good
213	3419730.433	9978095.434	yellow poplar	29	9.2	50	good
214	3419747.823	9978074.413	sourwood	27	8.6	50	good
215	3419757.973	9978055.673	yellow poplar	40	12.7	60	good
216	3419783.384	9978027.602	yellow poplar	43	13.7	60	good
217	3419776.084	9978030.463	yellow poplar	30	9.6	50	good
218	3419792.144	9978021.612	yellow poplar	40	12.7	60	good
219	3419822.555	9978005.652	Virginia pine	46	14.6	60	severely leaning
220	3419828.655	9978004.082	Virginia pine	38	12.1	50	good
221	3419765.523	9978000.533	black cherry	37	11.8	60	good
222	3419727.232	9978037.003	yellow poplar	51	16.2	60	good
223	3419729.942	9978045.713	sourwood	26	8.3	50	good
224	3419714.582	9978071.384	yellow poplar	37	11.8	60	good

**TABLE 1: TREE SURVEY RESULTS**  
**Cumberland Gap National Historical Park**  
**Renew Wilderness Road Campgrounds Wastewater System Component, CUGA-149132**

<b>Tree Identifier</b>	<b>Northing <sup>1</sup></b>	<b>Easting <sup>1</sup></b>	<b>Species</b>	<b>Circumference (inches)</b>	<b>Diameter at Breast Height (inches)</b>	<b>Estimated Height <sup>2</sup> (feet)</b>	<b>Condition</b>
225	3419700.161	9978082.014	red maple	32	10.2	60	good
226	3419701.292	9978095.094	eastern hemlock	30	9.6	50	good
227	3419686.472	9978120.694	yellow poplar	40	12.7	60	good
228	3419670.652	9978146.115	yellow poplar	46	14.6	60	good
229	3419672.222	9978160.465	eastern red cedar	41	13.1	50	good

**Notes:**

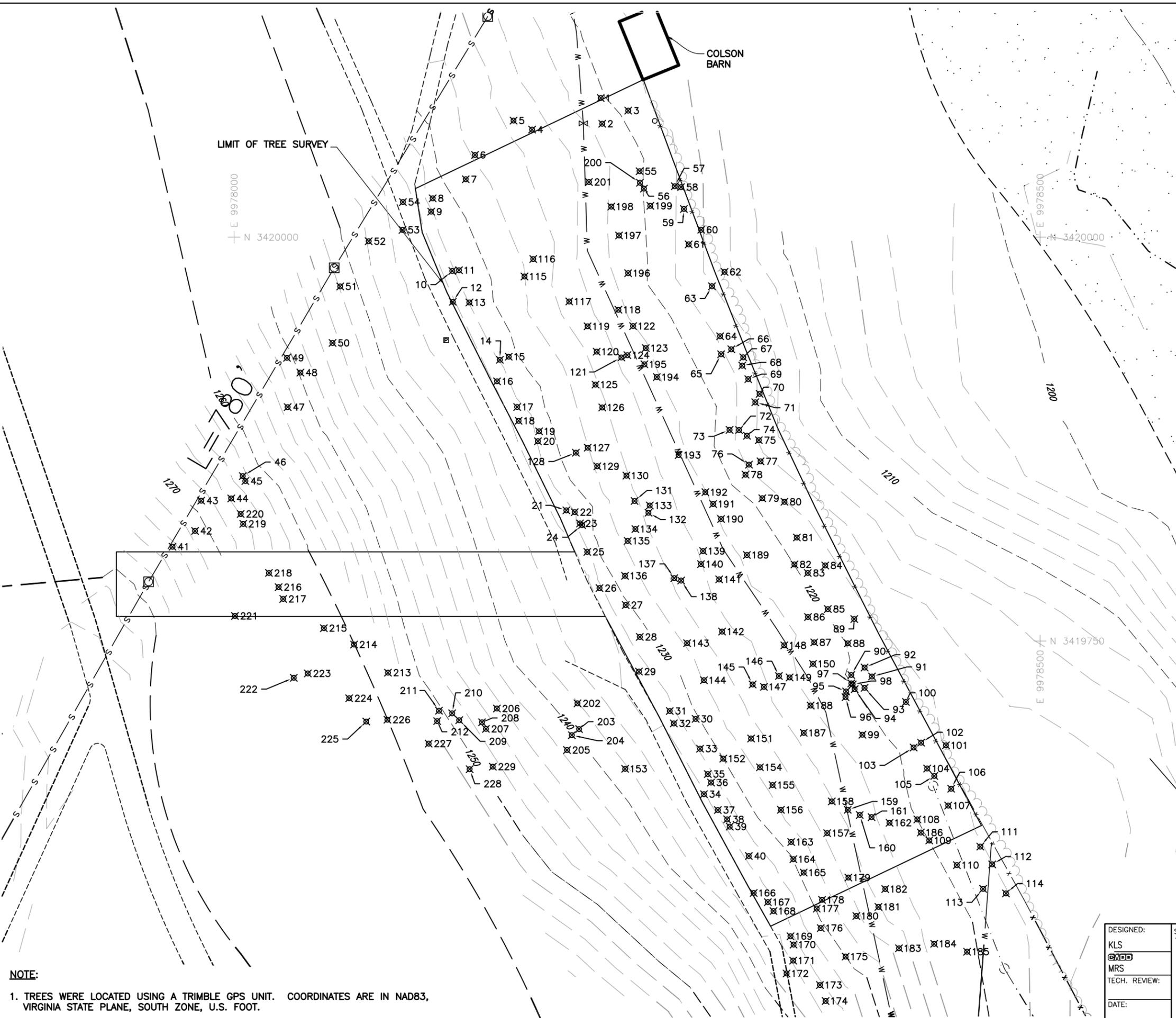
1. Trees were located using a Trimble GPS unit. Coordinates are in NAD83, Virginia State Plane, South Zone, U.S. foot.
2. The heights provided are very rough estimates due to the thickness of the canopy.

Prepared by: MWB, KLS, MJS 10/5/2010

Reviewed by: JWP 10/6/2010

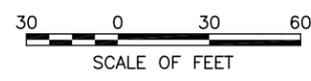


10/7/10 14:32 MRSTACEY R18 M:\PROJECTS\NPS\CUGA\CUGA\149132\DRAWINGS\SURVEY\TREE SURVEY.DWG XREFS: \BASES\XC-SITE-DESIGN.DWG; \BASES\XC-SITE-SRKY.DWG; \BASES\XC-SITE-DIG.DWG; \BASES\XC-SITE-SRKY.DWG; \BASES\XC-SITE-SRKY.DWG; \BASES\XC-SITE-DIG.DWG



LEGEND	
	PARK BOUNDARY
	CENTER LINE OF RIVER/CREEK
	EDGE OF CREEK
	PARK TRAIL
	GRAVEL PARK ROADS
	CONTOURS (SURVEY)
	NO DIG AREA
	FENCE
	LIMIT OF VEGETATION
	100-YEAR FLOOD PLAIN
	WATER LINE
	APPROX WATER LINE
	SANITARY SEWER MANHOLE
	POWER BOX
	WATER VALVE
	WATER SPIGOT
	TREE (DBH ≥ 8 INCHES)
	TREE IDENTIFIER

**NOTE:**  
 1. TREES WERE LOCATED USING A TRIMBLE GPS UNIT. COORDINATES ARE IN NAD83, VIRGINIA STATE PLANE, SOUTH ZONE, U.S. FOOT.



DESIGNED: KLS GADD MRS	SUB SHEET NO.	TITLE OF SHEET <b>TREE SURVEY PLAN</b>	DRAWING NO. C-1
TECH. REVIEW:		CUMBERLAND GAP CAMPGROUND	PMIS/PKG NO.
DATE:			SHEET OF



# Appendix D: Impairment Determination

## THE PROHIBITION ON IMPAIRMENT OF PARK RESOURCES AND VALUES

NPS *Management Policies 2006*, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

## WHAT IS IMPAIRMENT?

NPS *Management Policies 2006*, Section 1.4.5, *What Constitutes Impairment of Park Resources and Values*, and Section 1.4.6, *What Constitutes Park Resources and Values*, provide an explanation of impairment.

Impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Section 1.4.5 of *Management Policies 2006* states:

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per Section 1.4.6 of *Management Policies 2006*, park resources and values that may be impaired include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structure, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park, but this would not be a violation of the Organic Act unless the NPS was in some way responsible for the action.

## **HOW IS AN IMPAIRMENT DETERMINATION MADE?**

Section 1.4.7 of *Management Policies 2006* states, "[i]n making a determination of whether there would be an impairment, an NPS decision maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act (NHPA); relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision."

*Management Policies 2006* further define "professional judgment" as "a decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker's education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relation to the decision."

## **IMPAIRMENT DETERMINATION FOR THE PREFERRED ALTERNATIVE**

This determination on impairment has been prepared for the preferred alternative described on pages 20-22 of this EA. An impairment determination is made for all resource impact topics analyzed for the preferred alternative. An impairment determination is not made for visitor use and experience/recreation, infrastructure and park operations, and public health and safety because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

## **GEOLOGIC RESOURCES AND SOILS**

Overall, Alternative B would result in a short-term, site specific, and minor adverse impact on soils related to the installation of the proposed sanitary sewer lines, septic tanks, distribution boxes, and leach fields. These impacts would be mitigated by use of construction best management practices (BMPs) and erosion and sediment control measures are required by state law. With respect to geologic resources, impacts may be short-term, site specific, negligible to minor, and adverse. The intensity and context of the potential impacts are difficult to establish as the extent to which karst features underlie portions of the campground is not well understood. The depth at which the new sewer and water systems would be installed would likely not encounter karst features, though future subsidence may affect campground infrastructure.

Because construction impacts would be temporary and mitigated and because sanitary sewer system improvements would diminish the potential for accidental discharges of untreated waste to karst features (if present), Alternative B would not result in impairment of soils and topography.

## **WATER QUALITY**

Overall, Alternative B would have long-term, local, and moderate beneficial impacts on water quality because of the wholesale improvement of the sanitary sewer system. The decommissioning of the existing leach fields adjacent to Station Creek would remove the primary source of documented impairment by fecal coliform, fecal streptococcus, and *E. coli*.

Construction of the new sanitary sewer system and water line replacement would have short-term, site specific, and minor adverse impacts on water quality. These potential impacts would be minimized by the use of BMPs. Because these construction impacts would be temporary and mitigated and because sanitary sewer improvements would enhance water quality in Station Creek, Alternative B would not result in impairment of water quality.

## **FLOODPLAINS**

Overall, Alternative B would result in long-term, site specific, and negligible beneficial impacts on floodplains. This would be related to the decommissioning of the leach field north of Colson Barn which would result in the cessation of maintenance or reparations of the septic tank and

leach field at this location. As the impact is beneficial, Alternative B would not result in an impairment of floodplains.

## **VEGETATION**

Overall, Alternative B would result in long-term, site specific, and minor adverse impacts related to tree removal for the new septic drain fields and the installation of the new sewer lines and water lines. Approximately 1.3 acres of forested area would be converted to open field for future maintenance of the drain field. Given the expanse of forested habitat in the park, this impact is considered negligible. The removal of individual stems to install the new sewer and water lines would not change the overall character of the forested area within the campground. This impact, too, is considered negligible.

Alternative B would not result in impairment of vegetation. Trees to be removed to make room for the new drain field consist of species very common throughout the park, which is comprised almost extensively of forested vegetative communities.

## **WILDLIFE AND WILDLIFE HABITAT**

Alternative B would result in long-term, negligible, adverse impacts on terrestrial wildlife that prefer forested habitats. Alternately, the removal of trees to create the proposed leach field would result in long-term, beneficial impacts on wildlife species that prefer meadows and fields as part of their home range. With the elimination of the aging sewer treatment system that is contributing to water quality degradation in Station Creek, Alternative B would improve water quality of the channel, thus resulting in an improvement to habitat conditions for fish and macro invertebrates. Impacts on aquatic life are considered long-term and beneficial.

Alternative B would not result in impairment of terrestrial wildlife because the loss of forested habitat to install the new drain fields constitutes such a small percentage of the overall forested habitat available in the park. Some wildlife species that prefer fields and meadows would potentially benefit with the created opening. Furthermore, Alternative B would not result in an impairment to aquatic species in Station Creek and downstream waters. Aquatic species would likely experience long-term beneficial impacts from the implementation of Alternative B as wastewater leachate would cease entering Station Creek.

## **SPECIAL STATUS SPECIES**

Overall, Alternative B would result in long-term, site specific, negligible and adverse impacts on special status species. This impact would be related to the removal of trees for the installation of the new sewer and water lines and the removal of forested habitat for the septic drain field. The opening to be created with the new drain fields would likely have long-term, beneficial impacts on endangered bats that may forage in the area.

Alternative B is intended to improve environmental conditions for fish and wildlife by eliminating periodic and accidental wastewater overflows and surface-water contamination

caused by clogged sewer pipes and leaching wastewater entering Station Creek. While the removal of trees to make room for the septic drain field and new sewer and water lines may reduce summer roosting habitat for listed bats, the 1.3 acres of forested habitat is but a tiny fraction of the forested habitat in the park that would be available for roosting bats. Furthermore, the age structure and condition of the trees at the proposed leach field area do not represent particularly desirable habitat for roosting bats. No listed plant species have been identified within the proposed leach field area or within other areas proposed for disturbance. Accordingly, Alternative B would not result in impairment of special status species and would have no effect on the Indiana bat.

### **ARCHEOLOGICAL RESOURCES**

No adverse effects to archeological resources are anticipated. The proposed leach field location was sited based in part of the recommendations of the Phase I survey. Therefore, effects on archeological resources have been a planning issue since project inception. During construction of the leach field, an archeologist would be present to monitor the progress of the work and to document and collect any resources that are uncovered. As such, impacts on potential resources would be mitigated and Alternative B would not constitute an impairment to archeological resources.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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