

SECTION 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section describes the environmental consequences associated with each of the alternatives. The assessment is organized by impact topic and focuses on presentation of environmental consequences, allowing a comparison between alternatives. The analysis is presented according to the requirements of the National Environmental Policy Act and National Park Service *Director's Order 12*, which require consideration of context, intensity, and duration of impacts, as well as an identification of cumulative impacts and measures to mitigate for impacts. General mitigation measures are described in Chapter 1, "Mitigation Measures of the Action Alternatives." National Park Service policy also requires that impairment of resources be evaluated in all environmental documents (NPS 2006e). The method used to evaluate effects of the alternatives is also described.

METHOD

General Evaluation Method

The National Park Service based the impact analyses and conclusions in this document on a review of existing literature, including studies completed by the Great Smoky Mountains National Park and Tremont, and information provided by experts within the National Park Service. The analysis includes an evaluation of effects of each alternative for each impact topic described in Section 1.

The impact analyses involved the following steps:

- Identify the area that could be affected.
- Compare the area of potential effect with the types and extent of resources present.
- Identify the intensity (negligible, minor, moderate, or major), context (site specific, local, park-wide, regional), and duration (short- or long-term) of effect, both as a result of this action and from a cumulative effects perspective.
- Identify whether effects would be beneficial or adverse.

The criteria used to define the intensity and duration of impacts associated with the analyses are presented in the methods section for each impact topic. The impact analysis also includes proposed mitigation measures that would be taken to avoid, minimize and reduce potentially adverse effects on resources. Many of these measures were also defined in the "Mitigation Measures of the Action Alternatives" section of Chapter 1.



General Definitions

The following definitions were used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives:

Context is the setting in which an impact is analyzed, such as local, park-wide, or regional. Council on Environmental Quality (1978) guidelines requires that impact analyses include discussions of context.

Impact Intensity is defined in the impact topic threshold definitions for each impact topic in the analysis. Intensity describes the severity of the environmental effect and is defined as negligible, minor, moderate, or major effects. These terms are consistent with the regulations of the Council on Environmental Quality (1978) that implement the National Environmental Policy Act.

Impact Duration is also defined in the impact topic threshold definitions for each impact topic in the analysis. Duration describes the length of time the resource or impact topic will be affected, and is either short-term (usually during construction or lasting up to a year after construction is completed) or long-term (beyond construction or beyond a year after construction, depending on the resource being analyzed). These terms are consistent with the regulations of the Council on Environmental Quality (1978) that implement the National Environmental Policy Act.

Beneficial or Adverse Impact identifies whether the effect on the resource or impact topic would result in an improvement to the resource or something that would cause degradation.

Cumulative Effects Analysis Method

The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act requires assessment of cumulative effects in the decision making process for federal projects. Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7).

Cumulative effects are considered for both no action and action alternatives. They are presented at the end of each impact topic analysis.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. The context for this analysis is defined in the method section for each impact topic as appropriate. To complete the analysis, other past, ongoing, or reasonably foreseeable future actions in defined areas were identified, and the combined effect with the proposed National Park Service alternatives were estimated.

Actions that have the potential to have a cumulative effect in conjunction with this project include the projects described below.



Resurfacing of Laurel Creek Road: The resurfacing of Laurel Creek Road was completed in 2003. The project resurfaced 6.5 miles of Laurel Creek Road from 100 feet east of the tunnel to the gate on Cades Cove Loop Road. The work included partial-depth reconstruction of the roadway for the entire length of the road; milling and overlaying the pavement in parking areas and pulloffs; resurfacing parking areas and roadways within the Cades Cove Developed Area; replacement of undersized and deteriorated culverts; and miscellaneous work, including ditch reconditioning, shoulder work, striping, and replacement of road signs.

The Tremont Road resurfacing project: The Tremont Road resurfacing project was also completed in 2003. Approximately 2.2 miles of Tremont Road was resurfaced, including milling and overlaying the entire roadway; milling and overlaying the pavement in parking areas and pulloffs; resurfacing parking areas and roadways within Tremont; replacement of undersized and deteriorated culverts and installation of drop inlets; and miscellaneous work, including ditch reconditioning, shoulder work, striping and replacement of road signs.

Elkmont Management Program: Elkmont is an historic area in the Great Smoky Mountains National Park located approximately 7 miles east of Tremont. The park General Management Plan Amendment for the Elkmont Historic District will guide future management of this district for the next 15-20 years. The impact statement outlines seven management alternatives and seven distinct management prescriptions for the historic district, including the preferred alternative, Alternative C. The preferred alternative represents an enhanced opportunity for visitor experiences within the district while achieving a balance between natural and cultural resource preservation and restoration. Under the preferred alternative, some of the most important cultural resources would be preserved in the original core of the vacation community and the most sensitive natural resources within the study area would be protected and restored where buildings are removed.

Cades Cove Infrastructure Improvements: Cades Cove is one of the most visited areas in the Great Smoky Mountains National Park. It is home to abundant wildlife and rare plants, and also blends in history, pioneer culture, and scenic beauty. The park has undertaken a study to develop a long range management vision for Cades Cove that will enhance the visitor experience, preserve cultural heritage and natural resources, and manage traffic congestion. Additional restroom facilities are being considered, as well as limiting the maximum occupancy at the Cove and options for moving visitors with mass transportation. Five alternatives are under consideration.

The Cades Cove Loop Road Project: The Cades Cove Loop Road Project is planned for the future by the National Park Service, but is not formally scheduled at this time. This project proposes to resurface the 10-mile loop road at Cades Cove, including repaving all pullouts and parking areas along the loop road; replacing low water crossings; replacing wood decking and railings on Abrams Creek Bridge; replacing damaged/deteriorated culverts; and repaving roadside ditches.



Cherokee Orchard Road and Roaring Fork Motor Nature Trail: These two roads adjoin each other and are located to the southeast of Gatlinburg, Tennessee. Cherokee Orchard Road is a 3.7-mile paved road that includes both a one-way roadway section and a two-way roadway section. This roadway is open year-round. Roaring Fork Motor Nature Trail is a 5.3-mile one-way roadway, with eight bridges, open from mid-March through October. Both roads are deteriorating due to age, weather conditions, and poor drainage. Roaring Fork Motor Nature Trail has sections of very steep grade, sharp and narrow curves, and no shoulder in many locations. One 1,500-foot section of Roaring Fork Motor Nature Trail needs widening. The bridges along Roaring Fork Motor Nature Trail are over 25 years old, and are in need of repair and/or replacement. Improvements to the roads are needed to better accommodate park visitors and protect existing resources within the park. The preferred alternative calls for milling and resurfacing both roads, replacement of all eight bridge superstructures, realignment of two bridge approaches, the widening of one bridge, the widening of 1,500 feet of the motor nature trail, and associated miscellaneous work. Construction was programmed to begin in 2009

Development in the greater Townsend area: The greater Townsend area has some development planned for construction in the near future (Townsend Planning Commission 2006). Kinzel Springs is a 150-dwelling unit retirement/second home development under construction on U.S. 321 to the west of Townsend. A 30-dwelling unit town home development is under construction on U.S. 321 near Tuckalaheechee Road. A 5-acre retail complex is also under construction on U.S. 321 near Wares Valley Road.

Extension of the Pellissippi Parkway: The extension of the Pellissippi Parkway between State Road 33 and State Road 73 (U.S. 321) is still in the planning phase by the Federal Highway Administration and Tennessee Department of Transportation. This roadway extension will connect to Interstate Highway 140 and would essentially provide direct access between Lamar Alexander Highway to the north of Townsend and Interstate Highway 40 to the west of Knoxville.

The Foothills Parkway extension: The Foothills Parkway extension is a proposed extension that would connect two existing National Park Service-owned roadways bordering the north side of the park. The western segment of the road is located in Blount County and extends from U.S. 129 at Lake Chilowee to U.S. 321 in Walland (AARoads 2007). The eastern segment of the road is located in Cocke County and extends from I-40 to U.S. 321 in Cosby. The parkway will be 70 miles long once this 16-mile project is completed. Construction is anticipated for 2020 (Knoxville Regional Transportation Planning Organization 2006a).

Air emissions from outside the park. Emissions carried into the park by wind and air currents have significantly impacted park resources, visitor satisfaction and public health. The primary source of emissions is burning of fossil fuels such as coal, oil and gas that produce sulfur dioxide and nitrogen oxides. Those primary pollutants chemically react with other compounds in the environment to produce secondary pollutants that



include sulfates, nitrates and ozone (NPS 2006a). This will continue to be the major factor affecting air quality in the park, including Tremont.

Impairment Analysis Method

In addition to determining the environmental consequences of implementing the preferred and other alternatives, National Park Service Management Policies 2006 (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair Great Smoky Mountains National Park resources and values.

The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act (NPS 2006e).

“The impairment that is prohibited by the Organic Act and the General Authorities Act 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. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.” (NPS Management Policies 2006, section 1.4.5). An impact on any park resource or value may constitute an 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 National Park Service planning documents.

Impairment may result from NPS administrative activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park (NPS 2006e).



A determination on impairment is made in the conclusion section for each impact topic related to resources and values of the Great Smoky Mountains National Park. An evaluation of impairment is not provided for topics related to visitor use and experience and visual quality/viewshed (unless the impact is resource based), National Park Service operations, or the socioeconomic environment since these topics are not considered park resources.

AIR QUALITY

Method

The impact intensity thresholds for Air Quality are as follows:

Negligible: No changes in air quality would occur or changes would be below or at the level of detection, and if detected, would have effects that would be considered slight.

Minor: Changes in air quality would be measurable. No air quality mitigation measures would be necessary.

Moderate: Changes in air quality would be measurable and would have consequences. Air quality mitigation measures would be necessary and the measures would likely be successful.

Major: Changes in air quality would be measurable and would have substantial consequences. Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed.

Duration: Short-term – Occurs only during the duration of project construction. Long-term – persists beyond the duration of project construction.

Context: The area of effect analyzed for air quality is both local (Tremont and immediate surroundings) and regional. The region for the effects of air quality is defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina. National level effects on air quality also result from emissions from power plants and other sources in the midwestern United States.

Alternative A: No Action Alternative

No construction activity would be associated with Alternative A. Therefore, there would be **no adverse effects** on air quality associated with construction activity under Alternative A.

Under Alternative A, sustainable design features would not be implemented at Tremont. As a result, there would be no change in energy consumption and associated emissions by the existing buildings and no associated reductions in air emissions related to sustainable design.

Under the No Action Alternative, visitation is anticipated to remain at approximately 5,000 students per year. It is assumed that the model share of vehicles utilized to transport the students and visitors would remain similar to current conditions. This includes full-sized buses as well as cars and small trucks. In addition to students,



approximately 10,000 visitors travel to the visitor center each year at Tremont to obtain information about Tremont or the park. Most of these visitors arrive via automobile or light trucks. The number of these visitors and their mode of travel are not anticipated to change under Alternative A. Therefore, no changes in air emissions from vehicles used by students or visitors would occur under the No Action Alternative.

Annually, approximately 20,000 hikers park at Tremont to access the trailheads in the area. Most of these visitors arrive via automobile or light truck. The number of hikers parking at Tremont and their mode of travel are not anticipated to change under Alternative A. Therefore, there would no increases in air emissions from vehicles used by hikers under the No Action Alternative.

Large semi-tractor trucks would continue to deliver food to Tremont. Smaller trucks would also continue to deliver supplies. The number of trucks would remain approximately the same under Alternative A. Air emissions associated with these deliveries would also remain approximately the same. Continued use of vehicles by students, visitors, hikers and delivery trucks under Alternative A would therefore have **long-term, minor adverse effects** on air quality in the Tremont area.

Cumulative Effects

Local effects on air quality would continue to be caused by traffic on Tremont Road, and from traffic on the Tremont site itself, including cars, large trucks, and buses. Air emissions originating outside the park would also continue to be an important factor affecting air quality at Tremont. These would include regional effects from traffic and industrial emissions sources in the counties surrounding the park, as well as national level effects on air quality from emissions from power plants and other sources in the Midwestern United States.

When combined with the effects of the other past, present, and future actions that could affect air quality in the Tremont area, the cumulative effects of Alternative A on air quality would be **long-term, moderate and adverse**.

Conclusion

No construction would occur under Alternative A. Therefore, construction would have no effects on air quality. Continued use of vehicles by students, visitors, hikers and delivery trucks under Alternative A would have **long-term, minor adverse effects** on air quality in the Tremont area. Local, regional and national sources of air emissions would continue to be an important factor affecting air quality at Tremont under Alternative A. When combined with the effects of the other past, present, and future actions that could affect air quality in the Tremont area, the cumulative effects of Alternative A on air quality would be **long-term, moderate and adverse**.

There would be no impairment of air quality or values as a result of park management actions under Alternative A.



Alternative B: Modifications to Existing Facilities (Limited)

Potential effects on air quality under Alternative B would be primarily associated with vehicle emissions during construction. Alternative B would include minor upgrades, modifications, additions and spatial reconfiguration to existing facilities and infrastructure to optimize functionality and potential utilization. No construction of new buildings or other major structures would occur under Alternative B other than a new wastewater treatment package plant. Construction activities would be relatively minor and would involve equipment such as a tractor-trailer to deliver materials and possibly a crane to place the wastewater treatment package plant, as well as the heating, ventilation, and air conditioning systems. It is estimated that approximately two to three additional heavy truck trips would be made to the site per week, less than one truck trip per week would be made to remove debris, an approximately 20-25 daily auto/light truck trips would be made during a 12-18 month construction period.

During operation, Alternative B would have limited sustainable design features that would reduce air emissions from buildings at Tremont. In addition, the minimal changes at Tremont would not attract additional students or visitors. Continued use of vehicles by students, visitors, hikers and delivery trucks under Alternative B would result in emissions similar to Alternative A.

Overall, Alternative B would have **short-term, minor adverse effects** on air quality during construction, and **long-term, minor adverse effects** on air quality in the Tremont area during operation.

Cumulative Effects

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate and adverse**.

Conclusion

Alternative B would have **short-term, minor adverse effects** on air quality during construction, and **long-term, minor adverse effects** on air quality in the Tremont area during operation. The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate and adverse**.

There would be no impairment of air quality or values as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Potential effects on air quality under Alternative C would be primarily associated with vehicle emissions during construction. Alternative C would include moderate upgrades, modifications, additions and spatial reconfiguration to the infrastructure and existing facilities to optimize classroom and office space efficiency, utilization, functionality, energy conservation and visual quality. Alternative C involves no construction of new facilities, other than a wastewater treatment package plant and a new dormitory, if that option is selected. Construction activities would be relatively minor and would include



tractor-trailers to deliver materials and possibly a crane to set the wastewater treatment package plant, the roof trusses, and the heating, ventilation, and air conditioning systems. It is estimated that approximately 3.5 to 4 additional heavy truck trips would be made to the site per week, 1 to 1.3 truck trips per week would be made to remove debris, and approximately 30-35 daily auto/light truck trips would be made during an 18 to 24-month construction period. If the option of a new dormitory is selected, the effects on air quality would be of similar duration and intensity.

Alternative C proposes more extensive sustainable design features than Alternatives A and B. The modest improvements would not greatly reduce air emissions from buildings at Tremont, however. In addition, the minimal changes at Tremont would not attract additional students or visitors, and there would be no increase in vehicle emissions. The effects of vehicle emissions during operation on air quality would therefore be similar to Alternative B.

Overall, Alternative C would have **short-term, minor and adverse** effects on air quality in the Tremont area during construction. Alternative C would have **long-term, minor adverse effects** on air quality in the Tremont area during operation.

Cumulative Effects

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate and adverse**.

Conclusion

Overall, Alternative C would have **short-term, minor adverse** effects on air quality in the Tremont area during the construction period. Alternative C would have a **long-term, minor adverse effects** on air quality in the Tremont area during operation, since the modest improvements would not greatly reduce air emissions from buildings at Tremont, and vehicle traffic would remain about the same.

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate and adverse**.

There would be no impairment of air quality or values as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Potential effects on air quality under Alternative D would be primarily associated with vehicle emissions during construction. Alternative D would include moderate site redevelopment and major modifications, additions and spatial reconfiguration to the site and existing facilities to increase facility function, utilization, energy conservation and visual appearance, as described in Section 2. Bulldozers would also be used for site preparation, as well as the use of cranes to place structures, and tractor trailers to deliver materials. It is estimated that approximately 5 to additional heavy truck trips would be made to the site per week, 1.8 to 2.2 truck trips per week would be made to remove



debris, and approximately 40-45 daily auto/light truck trips would be made during a 12 to 28-month construction period.

Alternative D has more extensive sustainable design features than Alternatives A, but would result in somewhat reduced air emissions from the majority of the buildings at Tremont over the long-term. Alternative D would include sustainable features that are absent under Alternative A, which have a potential to attract additional students and traffic to Tremont; however, traffic and associated vehicle emissions on Tremont Road should not increase substantially.

Overall, Alternative D would have **short-term, minor, adverse** effects on air quality in the Tremont area during the construction period. Alternative D would have **long-term, minor adverse effects** on air quality in the Tremont area during operation.

Cumulative Effects

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate, and adverse**.

Conclusion

Alternative D would have **short-term, minor, adverse** effects on air quality in the Tremont area during construction. Alternative D would have **long-term, minor, adverse effects** on air quality in the Tremont during operation.

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate and adverse**.

There would be no impairment of air quality or values as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Potential effects on air quality under Alternative E would be primarily associated with vehicle emissions during construction. Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. Construction activities would be considered heavy and would involve tractor-trailers to deliver building materials; a crane to set the heating, ventilation, and air conditioning systems, the wastewater treatment package plant, and roof trusses; and bulldozers for site preparation. It is estimated that approximately five additional heavy truck trips would be made to the site per week, 3.5 to 4.6 truck trips per week would be made to remove debris, and approximately 45 daily auto/light truck trips would be made during a 36 to 48-month construction period.

Because the site would be reconstructed, Alternative E would have **short-term, minor, adverse effects** on air quality in the Tremont area during the construction period. Alternative E has more extensive sustainable design features than Alternative A since the entire campus would be reconstructed. The reduction in energy consumption and associated emissions at Tremont would be modest, however. The added sustainable design features and improvements to provide a sense of place is expected to attract an



additional 1,000 students and visitors per year to Tremont (Section 2). However, traffic on Tremont Road should not increase substantially due to the additional students. The overall effect of operation on local air quality is therefore expected to be **long-term, minor, and adverse**.

Cumulative Effects

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate, and adverse**.

Conclusion

Because the entire site would be reconstructed, Alternative E would have **short-term, moderate, adverse effects** on air quality in the Tremont area during the construction period.

Alternative E has more extensive sustainable design features than Alternative A since the entire campus would be reconstructed. The added sustainable design features and improvements to provide a sense of place are expected to attract an additional 1,000 students and visitors per year to Tremont. However, the overall effect of operation on local air quality is therefore expected to be **long-term, minor, and adverse**.

The cumulative effects on air quality in the Tremont area would be the same as those described for Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of air quality or values as a result of park management actions under Alternative E.

SOIL

Method

The impact intensity thresholds for soil are:

Negligible: Soil would not be affected, or the effects on soil would be below or at levels of detection. There would be no discernable effect on the rate of soil erosion and/or the ability of the soil to support native vegetation.

Minor: There would be detectable effects on the rate of soil erosion and/or the ability of the soil to support native vegetation. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.

Moderate: The rate of soil erosion and/or the ability of the soil to support native vegetation would be appreciably changed. Mitigation measures would be necessary to offset adverse effects and likely be successful.

Major: The actions would have substantial, highly noticeable influence on the rate of soil erosion and/or the ability of the soil to support native vegetation. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.



Duration: Short-term - Following completion of the project, recovery would take less than a year. Long-term - Following completion of the project, recovery would take more than a year.

Context: The area of effects analyzed for soil is the approximately 10-acre Tremont site. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

Under Alternative A, no new construction would occur on the approximately 10-acre existing site. Therefore, construction-related effects on soil would not occur under Alternative A.

Under Alternative A, during continued operation of Tremont, storm water runoff from the existing campus would erode soil on the site. Because the site is heavily vegetated, however, these effects are limited, and would be **long-term, negligible, and adverse**.

Cumulative Effects

No new construction would occur on the Tremont campus, and continued operation of the facility would result in negligible amounts of soil erosion caused by storm water runoff on the approximately 10-acre, heavily vegetated site. Construction of highways, roads, and private developments in the surrounding area has resulted and would continue to cause soil erosion and storm water runoff in the region. All construction projects are required by law to control soil erosion by proper site design and best management practices, which are assumed to be effective. When the beneficial and adverse effects of other past, ongoing, and future plans, projects, and activities affecting soil are combined with actions under Alternative A, the resulting cumulative effects are estimated to be **long-term, moderate, and adverse**.

Conclusion

Construction would have no adverse effects on soil under Alternative A, since no new soil-disturbing projects are planned. Storm water runoff from operation of Tremont would continue to erode soil on the heavily vegetated site, and would have **long-term, negligible, adverse effects** on soil.

Construction of highways, roads, private developments in the surrounding area have affected and will continue to affect a relatively large area. Mitigation effects will be employed to minimize effects of soil erosion, and would be effective. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting soil are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

There would be no impairment of soil resources or values as a result of park management actions under Alternative A.



Alternative B: Modifications to Existing Facilities (Limited)

Construction of a new extended aeration package plant and new dormitory restroom additions (expansions on the ends of the existing building) would result in the disturbance of less than 4 acres of the existing 10-acre site at Tremont. This would result in an increased potential for soil erosion during construction. Best management practices would be implemented to minimize effects on soil, and these measures would be effective. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. During construction, Alternative B would have **short-term, minor, adverse effects on soil**.

During operation, there would be an increased potential for soil erosion caused by additional storm water runoff from the new wastewater treatment package plant and two new dormitory restrooms constructed on the outside of the existing building. Storm water runoff would also continue to occur from the rest of the heavily vegetated site, similar to Alternative A. Best management practices would minimize the effects on soil. During operation, Alternative B would have **long-term, minor, adverse effects on soil**.

Cumulative Effects

Cumulative effects of Alternative B on soil would be similar to Alternative A, since the amount of soil disturbance and storm water runoff on the Tremont site would still be limited in comparison with other projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects, and activities affecting soil are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Construction and operation of a new extended aeration package plant and new dormitory restrooms would result in the disturbance of less than 4 acres of the existing 10-acre site at Tremont. During construction, Alternative B would have **short-term, minor, adverse effects on soil**. During operation, increased storm water runoff under Alternative B would have **long-term, minor, adverse effects on soil**.

Cumulative effects of Alternative B on soil would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of soil resources or values as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Construction of a new extended aeration package plant; trail head improvements, and a new storm water drainage system between the dormitory and activity center would result in soil disturbance of less than 4 acres of the existing 10-acre site. If a new dormitory is constructed, this would result in disturbance of soil during demolition. Construction activities may trigger the need for a Aquatic Resource Alteration



Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects on soil during construction of any new or rehabilitated facilities. Construction would therefore have **short-term, minor, adverse effects** on soil.

During operation, increased amounts of impervious surface on the site from the new wastewater treatment plant, additional dormitory restrooms and trail head improvements would create additional storm water runoff and potential for soil erosion. Best management practices, including a new storm water drainage system, would help to minimize the effects of runoff from the area between the activity center and dormitory. Alternative C is therefore estimated to have **long-term, minor, adverse effects** on soil during operation.

Cumulative Effects

Cumulative effects of Alternative C on soil would be similar to Alternative A, since the amount of soil disturbance and storm water runoff on the Tremont site would still be very limited in comparison with other projects in the surrounding area, and mitigation measures on the site for controlling soil erosion would be effective. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting soil are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Construction of new facilities would cause soil erosion. Best management practices would be implemented to minimize effects on soil during construction. Construction would, therefore, have **short-term, minor, adverse effects** on soil.

Alternative C would have **long-term, minor, adverse effects** on soil during operation as a result of increased storm water runoff.

Cumulative effects of Alternative C on soil would be **long-term, moderate, and adverse**, similar to Alternative A.

There would be no impairment of soil resources or values as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Soil disturbance of less than 4 acres of the 10-acre site would result from demolition of a portion of the existing facilities, construction of two new dormitories, a new standard extended aeration package plant, new roads, walkways, and parking areas and a new storm water drainage/treatment system. Soil disturbance would also result from construction associated with upgrading of new buildings. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects of construction on soil, and would measures taken would be effective.



Increased amounts of impervious surface on the 10-acre site from the new facilities (less than 4 acres total) would create a potential for increased soil erosion during operation. These effects would be minimized by construction of a new storm water drainage / treatment system for the entire site that would minimize adverse effects of storm water runoff on soil.

Alternative D is estimated to have short-term, minor, adverse effects on soil during construction. Best management practices would be implemented to minimize effects on soil, and would be effective. During operation, Alternative D would have long-term, minor, adverse effects on soil that would be minimized by using best management practices, including implementation of a new storm water control system.

Cumulative Effects

Cumulative effects of Alternative D on soil would be similar to Alternative A, since the amount of soil disturbance and storm water runoff on the Tremont site would still be limited in comparison with other projects in the surrounding area, and mitigation measures on the site for controlling soil erosion would be effective. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting soil are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Alternative D is estimated to have short-term, minor, adverse effects on soil during construction. Best management practices would be implemented to minimize effects on soils, and these measures would be effective. During operation, Alternative D would have long-term, minor, adverse effects on soil as a result of construction of a new storm water control system that would minimize soil erosion.

Cumulative effects of Alternative D on soil would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of soil resources or values as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Alternative E would affect less than 4 acres of the of the existing 10-acre site due to demolition and replacement of the majority of the existing facilities on the site, construction of a new storm water drainage / treatment system; and construction of an advanced technology system wastewater treatment plant (Section 2). Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects of construction on soil, and these measures would be effective.

Increased amount of impervious surface on the site would occur from replacement of the majority of the existing buildings. This would create increased storm water runoff



and soil erosion. Implementation of best management practices, including a new storm water management system, would help minimize soil erosion.

Alternative E is therefore estimated to have **short-term, minor, adverse effects** on soil during construction. Best management practices would be implemented to minimize effects on soil, and would be effective. During operation, Alternative E would have **long-term, minor, adverse effects** on soil during as a result of increased amounts of impervious surfaces on the site. These would be minimized by implementation of best management practices, including a new storm water control system.

Cumulative Effects

Cumulative effects of Alternative E on soil would be similar to Alternative A, since the amount of soil disturbance and storm water runoff on the Tremont site would still be limited in comparison with other projects in the surrounding area, and mitigation measures on the site for controlling soil erosion would be effective. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting soil are combined with actions under Alternative E, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Alternative E is estimated to have **short-term, minor, adverse effects** on soil during construction. Best management practices would be implemented to minimize effects on soil, and these measures would be effective. During operation, Alternative E would have **long-term, minor, adverse effects** on soil as a result of increased amounts of impervious surfaces on the site. These would be minimized by implementation of best management practices, including a new storm water control system.

Cumulative effects of Alternative E on soil would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of soil resources or values as a result of park management actions under Alternative E.

WATER QUALITY

Method

The impact intensity thresholds for water quality are as follows:

Negligible: Impacts would not be detectable. Water quality parameters would be well below all water quality standards for the designated use of the water. No vegetation or wildlife effects associated with altered water quality would be evident.

Minor: Impacts would be measurable, but water quality parameters would be well within all water quality standards for the designated use. State water quality and anti-degradation policy would not be violated. Changes in vegetation or wildlife use and health associated with water quality would be slight but measurable.



Moderate: Changes in water quality would be measurable and readily apparent, but water quality parameters would be within all water quality standards for the designated use. State water quality and anti-degradation policy would not be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent. Mitigation would be necessary to offset adverse effects, and would likely be successful.

Major: Changes in water quality would be readily measurable, and some parameters would periodically be approached, equaled, or exceeded. State water quality regulations and anti-degradation policy may be violated. Changes in vegetation and/or wildlife use and health associated with water quality would be measurable and readily apparent, even to a casual observer. Extensive mitigation measures would be necessary and their success would not be assured.

Duration: Short-term - following implementation activities, recovery would take less than one year. Long-term - following implementation activities, recovery would take longer than one year.

Context: The area of effect analyzed for water quality is the Middle Prong of the Little River immediately adjacent to and downstream of the Tremont site. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

No new construction would occur on the 10-acre Tremont site. Therefore, there would be no adverse construction-related effects on water quality under Alternative A. Under Alternative A, during continued operation of Tremont, storm water runoff from the existing campus would continue to erode soil on the site and could affect water quality of the Middle Prong. Under Alternative A, continued operation of the existing aging wastewater treatment system would continue. Alternative A is estimated to have **long-term, minor, adverse effects** on water quality.

Cumulative Effects

No new construction would occur on the Tremont campus, and continued operation of Tremont would result in negligible amounts of soil erosion and degradation of water quality of the Middle Prong of the Little River caused by storm water runoff and wastewater discharges. Construction of highways, roads, private developments in the surrounding area would continue to result in a far greater amount of soil disturbance, storm water runoff, and degradation of water quality. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.



Conclusion

There would be no new construction under Alternative A, and therefore, **no adverse effects** on water quality associated with construction. Storm water runoff and wastewater discharges from operation of Tremont would continue to have **long-term, minor, adverse effects** on water quality of the Middle Prong.

The degradation of water quality in the Middle Prong at and below the Tremont site would be limited in comparison with other projects proposed in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

There would be no impairment of water quality as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Construction of a new extended aeration package plant and new dormitory restrooms would result in the disturbance of less than 1 acre of the existing 10-acre site at Tremont. This would result in an increased potential for soil erosion and degradation of water quality in the Middle Prong during construction. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects on water quality and would be effective. Operation of the new extended aeration package plant would eliminate the problems with the existing pond wastewater treatment system.

Overall, Alternative B is estimated to have **short-term, minor, adverse effects** on water quality during construction and **long-term, minor, beneficial effects** on water quality during operation.

Cumulative Effects

Cumulative effects of Alternative B on water quality would be similar to Alternative A, since the potential for degradation of water quality in the Middle Prong on Tremont site would still be limited in comparison with roadway and development projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative B, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Construction and operation of a new extended aeration package plant and new dormitory restrooms would result in the disturbance of less than 1 acre of the existing 10-acre site at Tremont, with increased potential for soil erosion and effects on water quality. Best management practices for controlling erosion during construction would be employed and these measures would be effective. Operation of the new extended



aeration package plant would eliminate the problems with the existing pond wastewater treatment system, and would result in an improvement in water quality of the Middle Prong. Overall, Alternative B is estimated to have **short-term, minor adverse effects** during construction and **long-term, minor, beneficial effects** on water quality during operation.

Cumulative effects of Alternative B on water quality would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of water quality as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Construction of a new extended aeration package plant, trail head improvements, and a new storm water drainage system between the dormitory and activity center would result in disturbance of soil on less than 4 acres of the existing 10-acre site. If a new dormitory is constructed, this would result in disturbance of a soil during demolition. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. However, best management practices would be implemented to minimize effects on water quality during construction, and these measures would be effective. Construction would, therefore, have **short-term, minor, adverse effects** on water quality.

During operation of Tremont under Alternative C, increased amount of impervious surface on the site would create increased storm water runoff and an increased potential for degradation of water quality in the Middle Prong. The new storm water drainage system would help to improve the quality of storm water runoff from the area between the activity center and dormitory once it is installed, however. Other best management practices would also be implemented to minimize effects on water quality of the Middle Prong during operation, and these measures would be effective. Operation of the new extended aeration package plant would eliminate the problems with the existing aging wastewater treatment system..

In summary, Alternative C is estimated to have **short-term, minor adverse effects** on water quality during construction and **long-term, minor, beneficial effects** on water quality during operation.

Cumulative Effects

The cumulative effects of Alternative C on water quality would be similar to Alternative A, since the amount of soil disturbance and sedimentation would still be very limited in comparison with other projects in the surrounding area. However, many roadway and development projects would be constructed in the region as a whole. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative C, the resulting cumulative effects would be **long-term, moderate, and adverse**.



Conclusion

Construction of a new extended aeration package plant, trail head improvements, and a new storm water drainage system between the dormitory and activity center would result in soil disturbance of less than 4 acres of the existing 10-acre site. Operation of the new extended aeration package plant would eliminate the problems with the existing aging wastewater treatment system. Overall, Alternative C is estimated to have **short-term, minor, adverse effects** during construction and **long-term, minor, beneficial effects** on water quality during operation.

Cumulative effects of Alternative C on water quality would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of water quality as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Soil disturbance of less than 4 acres of the 10-acre site would result from demolition of a portion of the existing facilities, construction of two new dormitories, a new standard extended aeration package plant, new roads, walkways, parking areas, a new storm water drainage/treatment system, and upgrading of new buildings. These soil disturbing activities would result in an increased potential for degradation of water quality of the Middle Prong associated with erosion during demolition and heavy equipment use during construction. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects of demolition and site preparation on soil, and these measures would be effective. Construction would, therefore, have **short-term, minor, adverse effects** on water quality.

During operation, less than 2 acres of additional impervious surface would be created on the campus under Alternative D (the total amount of impervious surface would be less than 4 acres). Increased amounts of impervious surface on the site from the new facilities would create a potential for increased storm water runoff and soil erosion that could affect the water quality of the Middle Prong. However, these effects would be minimized by implementation of best management practices, and these would be effective. A new storm water drainage/treatment system for the 10-acre site would also be constructed and operated, and this would minimize effects of storm water runoff on water quality during operation. Operation of the new extended aeration package plant would eliminate the existing aging wastewater treatment system.

Overall, Alternative D is estimated to have **short-term, minor, adverse effects** on water quality associated with demolition and construction; and **long-term, minor, beneficial effects** on water quality during operation. Effective best management practices would be implemented during construction, and would be effective.



Cumulative Effects

The cumulative effects of Alternative D on water quality resulting from soil erosion during construction would be similar to Alternative A, since the amount of soil disturbance would still be limited in comparison with other projects in the surrounding area. However, many roadway and development projects would be constructed in the region as a whole. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative D, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Alternative D would affect less than 4 acres of the 10-acre site through new construction. Alternative D is estimated to have **short-term, minor, adverse effects** on water quality associated with demolition and construction on less than 4 acres of the site. Best management practices would also be implemented during construction, and would be effective. During operation, Alternative D would have **long-term, minor, beneficial effects** on water quality. Cumulative effects of Alternative D on water quality would be similar to Alternative A, **long term, moderate, and adverse**.

There would be no impairment of water quality as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Alternative E would affect less than 4 acres of the of the existing 10-acre site due to demolition and replacement of the majority of the existing facilities on the site, construction of a new storm water drainage/treatment system, and construction of an advanced technology system wastewater treatment plant. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects of construction on water quality resulting from soil erosion, and these measures would be effective. Construction would have **short-term, minor, adverse effects** on water quality.

During operation, increased amount of impervious surface on the site from replacement of the majority of existing buildings would create increased storm water runoff and soil erosion. However, a completely new sustainably designed storm water management system would minimize storm water runoff and potential effects on water quality of the Middle Prong. Operation of the new extended aeration package plant would eliminate the problems with the existing pond wastewater treatment system, and would result in an improvement in the reliability of wastewater treatment for Tremont. Operation would therefore have **long-term, minor, beneficial effects** on water quality.

In summary, Alternative E is therefore estimated to have **short-term, adverse effects** on water quality associated with demolition and construction, and **long-term, minor, beneficial effects** on water quality during operation.



Cumulative Effects

The cumulative effects of Alternative E on water quality would be similar to Alternative A, since the amount of soil disturbance would still be very limited in comparison with other projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative E, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

In summary, Alternative E is estimated to have **short-term adverse effects** on water quality associated with demolition and construction, and **long-term, minor, beneficial effects** on water quality during operation. Cumulative effects of Alternative E on water quality would be similar to Alternative A, since the amount of soil disturbance and potential for water quality degradation would still be very limited in comparison with other projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative E, the resulting cumulative effects would be **long-term, moderate, and adverse**.

There would be no impairment of water quality as a result of park management actions under Alternative E.

AQUATIC RESOURCES

Method

It is assumed that the effects of the alternatives on aquatic resources are related directly to the effects of construction and operation of existing or proposed facilities on water quality as described in the “Water Quality” section. Construction of new facilities could potentially affect water quality via soil erosion. Operation of existing or new facilities could affect water quality and aquatic resources through storm water runoff or direct discharges from the wastewater treatments plant. These types of changes in water quality could affect aquatic organisms by increasing levels of sedimentation and turbidity in the Middle Prong (covering benthic habitat and eliminating food for fish or habitat for benthic invertebrates or clogging fish gills) or by lowering levels of dissolved oxygen. Because of the relationship between water quality and the health and condition of aquatic resources, the assessments of effects on water quality therefore are not repeated in this section.

Construction a new wastewater treatment plant under Alternatives B, C, D, and E would also result in filling of the two man-made ponds located on the east side of the Middle Prong of the Little River. These effects are also described.

The impact intensity thresholds for Aquatic Resources are as follows:

Negligible: Aquatic resources and their habitats would not be affected or the effects would be at or below the level of detection and would not be measurable or of



perceptible consequence to aquatic populations.

Minor: Effects on aquatic resources or habitats would be measurable or perceptible. While the mortality of individual plants and animals might occur, the viability of aquatic populations would not be affected and the community, if left alone, would recover.

Moderate: A change in aquatic populations or habitats would occur and would be readily measurable in terms of abundance, distribution, quantity, or quality of populations. Mitigation measures would be necessary to offset adverse effects, and would likely be successful.

Major: A change in aquatic populations or habitats would occur and would be readily measurable in terms of abundance, distribution, quantity, or quality of populations. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.

Duration: Short-term: Recovers within one year after project completion. Long-term: Takes more than one year after project completion to recover.

Context: The area of effect analyzed for aquatic resources is the Middle Prong of the Little River adjacent to and downstream of the Tremont site. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

The effects of Alternative A on aquatic life would parallel the effects on water quality. No new construction would occur, and minor amounts of storm water and treated wastewater from the existing wastewater treatment plant would continue to be discharged to the Middle Prong. Effects of Alternative A on aquatic life of the Middle Prong would be the same as those described for water quality. Since a new wastewater treatment plant would not be constructed under Alternative A, aquatic life associated with the ponds (frogs, turtles, and other forms of aquatic life, including the arrow-leaved tearthumb) would not be affected.

Overall, Alternative A is estimated to have **long-term, minor, adverse effects** on aquatic life.

Cumulative Effects

The degradation of aquatic life in the Middle Prong at and below the Tremont site would be limited in comparison with other projects proposed in the surrounding area. However, many roadway and development projects would be constructed in the region as a whole. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting aquatic life are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.



Conclusion

No new construction would occur, and minor amounts of storm water and treated wastewater from the existing wastewater treatment plant would continue to be discharged to the Middle Prong. Alternative A is estimated to have **long-term, minor, adverse effects** on aquatic resources.

Degradation of aquatic life in the Middle Prong at and below the Tremont site would be limited in comparison with other projects proposed in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting aquatic life are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

There would be no impairment of aquatic resources as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Construction of a new extended aeration package plant and new dormitory restrooms would result in the disturbance of less than 1 acre of the existing 10-acre site at Tremont. This would result in an increased potential for soil erosion, degradation of water quality, and associated adverse effects on aquatic life in the Middle Prong during construction. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects on water quality and aquatic life and these measures would be effective. Since a new wastewater treatment plant would be constructed under Alternative B, aquatic life associated with the ponds (frogs, turtles and other forms of aquatic life, including the arrow-leafed tearthumb) would be eliminated.

Operation of the new extended aeration package plant would eliminate the problems with the existing pond wastewater treatment system, and would result in an improvement in the reliability of wastewater treatment for Tremont with beneficial effects on water quality and aquatic life of the Middle Prong.

Overall, Alternative B is therefore estimated to have **short-term, minor, adverse effects** on aquatic life during construction and **long-term, minor, beneficial effects** on aquatic life during operation.

Cumulative Effects

Cumulative effects of Alternative B on aquatic resources would be similar to Alternative A, since the potential for degradation of water quality in the Middle Prong on Tremont site would still be limited in comparison with roadway and development projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting aquatic resources are combined with actions under Alternative B, the resulting cumulative effects would be **long-term, moderate, and adverse**.



Conclusion

Construction and operation of a new extended aeration package plant and new dormitory restrooms would result in the disturbance of less than 1 acre of the existing 10-acre site at Tremont. Operation of the new extended aeration package plant would eliminate the problems with the existing pond wastewater treatment system, and would result in an improvement in the reliability of wastewater treatment for Tremont. Overall, Alternative B is estimated to have **short-term, minor, adverse effects** during construction and **long-term, minor, beneficial effects** on aquatic life during operation.

Cumulative effects of Alternative B on aquatic resources would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of aquatic resources as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Construction of a new extended aeration package plant, trail head improvements, and a new storm water drainage system between the dormitory and activity center would have a potential to adversely affect aquatic resources of the Middle Prong during construction. If the option of constructing a new dormitory is selected, there would also be additional but minor effects on aquatic resources resulting from soil erosion during construction. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. However, best management practices would be implemented to minimize effects on water quality during construction, and these measures would be effective.

Since a new wastewater treatment plant would be constructed under Alternative C, aquatic life associated with the ponds (frogs, turtles, and other forms of aquatic life, including the arrow-leafed tearthumb) would be eliminated.

During operation of Tremont under Alternative C, increased amount of impervious surface on the site from the new extended aeration package plant and trail head improvements, and (possibly) a new dormitory would create increased storm water runoff and an increased potential for degradation of water quality and the condition of aquatic resources in the Middle Prong. The new storm water drainage system would help to improve the quality of storm water runoff from the area between the activity center and dormitory once it is installed, however. Other best management practices would also be implemented during operation to minimize effects on water quality and aquatic life of the Middle Prong, and these measures would be effective. Operation of the new extended aeration package plant would eliminate the problems with the existing pond wastewater treatment system, and would result in an improvement in the reliability of wastewater treatment for Tremont.

In summary, Alternative C is therefore estimated to have **short-term, minor, adverse effects** on aquatic resources during construction and **long-term, minor, beneficial effects** on aquatic resources during operation.



Cumulative Effects

The cumulative effects of Alternative C on aquatic resources would be similar to Alternative A, since the amount of soil disturbance and sedimentation would still be limited in comparison with other projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting aquatic resources are combined with actions under Alternative C, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Construction of new facilities would have a potential to have a **short-term, adverse affect** on aquatic resources. Best management practices would minimize these effects. During operation, runoff from the facilities could affect aquatic resources. Operation of the new storm water drainage system would help minimize these short-term effects, however. In summary, Alternative C is estimated to have **short-term, minor, adverse effects** on aquatic resources during construction and **long-term, minor, beneficial effects** on aquatic resources during operation.

The cumulative effects of Alternative C on aquatic resources would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of aquatic resources as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Soil disturbance of less than 4 acres of the 10-acre site would result from demolition of a portion of the existing facilities, construction of two new dormitories, a new standard extended aeration package plant, new roads, walkways, parking areas, a new storm water drainage / treatment system, and upgrading of new buildings. These soil disturbing activities would result in an increased potential for degradation of water quality and conditions for aquatic life of the Middle Prong associated with erosion during demolition and heavy equipment use during construction. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to minimize effects of demolition and site preparation on soil, and these measures would be effective.

Since a new wastewater treatment plant would be constructed under Alternative D, aquatic life associated with the ponds (frogs, turtles, and other forms of aquatic life, including the arrow-leafed tearthumb) would be eliminated.

During operation, less than 2 acres of additional impervious surface would be created on the campus under Alternative D (the total amount of impervious surface would be less than 4 acres). Increased amounts of impervious surface on the site from the new facilities would create a potential for increased storm water runoff and soil erosion that could affect the water quality and aquatic life of the Middle Prong. However, these effects would be minimized by implementation of best management practices, and these



would be effective. A new storm water drainage/treatment system for the approximately 10-acre site would also be constructed and operated, and this would minimize effects of storm water runoff on water quality and aquatic during operation. Operation of the new extended aeration package plant would eliminate the existing aging wastewater treatment system.

Overall, Alternative D is estimated to have **short-term adverse effects** associated with demolition and construction, and **long-term, minor, beneficial effects** on aquatic life during operation.

Cumulative Effects

The cumulative effects of Alternative D on aquatic resources would be similar to Alternative A, since the amount of soil disturbance would still be limited in comparison with other projects in the surrounding area. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality are combined with actions under Alternative D, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Alternative D is estimated to have **short-term, minor, adverse effects** on water quality and conditions for aquatic resources associated with demolition and construction on less than 4 acres of the site. Effective best management practices would also be implemented during construction. During operation, Alternative D would have **long-term, minor, beneficial effects** on water quality and conditions for aquatic resources, since a new storm water drainage control system would be constructed for the whole site.

Cumulative effects of Alternative D on water quality would be similar to Alternative A, **long term, moderate, and adverse**.

There would be no impairment of aquatic resources as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Alternative E would involve replacement of all the facilities on the existing site, and disturbance of less than 4 acres of land. Construction activities may trigger the need for a Aquatic Resource Alteration Permit/general permit from the State of Tennessee for erosion control. Best management practices would be implemented to control erosion and they would be effective.

Since a new wastewater treatment plant would be constructed under Alternative E, aquatic life associated with the ponds (frogs, turtles and other forms of aquatic life, including the arrow-leafed tearthumb) would be eliminated.

During operation, an increased amount of impervious surface on the site would result from replacement of the existing buildings. However, a completely new storm water management system would minimize storm water runoff and effects on water quality



and aquatic resources of the Middle Prong. Operation of the new advanced technology wastewater treatment plant would result in an improvement in water quality and improve conditions for aquatic life of the Middle Prong.

Overall, construction under Alternative E is estimated to have **short-term, minor, adverse effects** on aquatic resources. During operation, Alternative E would have a **long-term, minor beneficial effects** on aquatic resources.

Cumulative Effects

Cumulative effects of Alternative E on aquatic resources would be similar to Alternative A, **long-term, moderate and adverse**.

Conclusion

Overall, construction under Alternative E is estimated to have **short-term, minor, adverse effects** on aquatic resources. During operation, Alternative E would have a **long-term, minor beneficial effect** on aquatic resources.

Cumulative effects of Alternative E on aquatic resources would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of aquatic resources as a result of park management actions under Alternative E.

VEGETATION – NATIVE PLANT COMMUNITIES

Method

The impact intensity thresholds for Vegetation – Native Plant Communities are as follows:

Negligible: Individual native plants may occasionally be affected, but measurable or perceptible changes in plant community size, integrity, or continuity would not occur.

Minor: Effects on native plants would be measurable or perceptible. The natural function and character of the plant community would not be affected and, if left alone, would recover.

Moderate: A change would occur in the natural function and character of the plant community in terms of basic properties (e.g., growth, abundance, reproduction, distribution, structure, or diversity) but not to the extent that the basic properties of the plant community change.

Major: Effects on native plant communities would be readily apparent and would substantially and permanently change the natural function and character of the plant types.

Duration: Short-term – Short-term: recovers within one year. Long-term: takes more than one year to recover.



Context: The area of effects for vegetation – native plant communities is the approximately 10-acre Tremont site and the immediate surrounding area. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

No new construction would occur on the site under Alternative A. Alternative A would have **no adverse effects** on vegetation on the site.

Cumulative Effects

Projects involving land clearing and disturbance in the region would be expected to continue to have effects on vegetation. Non-native species would be introduced in the surrounding communities as not all individual developments or residential areas use native species in their landscape plans. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting vegetation are combined with actions under Alternative A, the resulting cumulative effects are therefore estimated to be **long-term, moderate, and adverse**.

Conclusion

No new construction would occur on the site under Alternative A. Alternative A would have **no adverse effects** on vegetation on the site.

Projects in the surrounding area have had and would continue to have effects on vegetation, and non-native species would continue to be introduced in the areas outside the park. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting vegetation are combined with actions under Alternative A, the resulting cumulative effects are therefore estimated to be **long-term, moderate, and adverse**.

There would be no impairment of vegetation as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Alternative B would disturb less than an acre of vegetation during construction of the wastewater treatment plant (forested habitat) and the two new restrooms at the dormitory (open maintained grassed areas). Operation would have no effects on vegetation. The effects of Alternative B on vegetation are therefore estimated to be **short- and long-term, minor, and adverse**.

Cumulative Effects

The cumulative effects of Alternative B on vegetation would be the same as Alternative A, **long-term, moderate and adverse**.



Conclusion

Alternative B would disturb less than an acre of vegetation during construction of the wastewater treatment plant (forested habitat) and the two new restrooms at the dormitory (open maintained grassed areas). Operation would have no effects on vegetation. The effects of Alternative B on vegetation are therefore estimated to be **short- and long-term, minor, and adverse**.

The cumulative effects of Alternative B on vegetation would be the same as Alternative A. There would be no impairment of vegetation as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Construction of two new dormitories would have **no adverse effects** on forested areas, but would affect a portion of a maintained and mowed open field habitat. Construction of a new wastewater treatment plant would result in the elimination of less than 0.5 acre of vegetated habitat. Maintenance operation activities would have **short- and long-term, negligible, adverse effects** on vegetation. The overall effect of Alternative C on vegetation would be **short- and long-term, minor, and adverse**.

Cumulative Effects

The cumulative effects of Alternative C on vegetation would be the same as Alternative A, **long-term, moderate, and adverse**.

Conclusion

Construction and operation of two new dormitories would have no effects on forested areas, and would only affect a portion of a maintained and mowed open field habitat. Construction of a new wastewater treatment plant would result in the elimination of less than 0.5 acre of vegetated habitat. Maintenance operation activities would have **short- and long-term, negligible, adverse effects** on vegetation. The overall effect of Alternative C on vegetation would be **short- and long-term, minor, and adverse**.

The cumulative effects of Alternative C on vegetation would be the same as Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of vegetation as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Alternative D would result in the removal of less than 0.5 acre of Appalachian Montane Alluvial Forest on the site. All other areas affected would either be previously disturbed, existing paved areas, existing buildings, or maintained and mowed open fields. Alternative D would have **short- and long-term, moderate, adverse effects** on vegetation.



Cumulative Effects

The cumulative effects of Alternative D on vegetation would be the same as Alternative A, **long-term, moderate, and adverse**.

Conclusion

Alternative D would result in the removal of less than 0.5 acre of Appalachian Montane Alluvial Forest. All other areas affected would either be previously disturbed, existing paved areas, existing buildings, or maintained and mowed open fields. Alternative D would have a **short- and long-term, moderate, adverse effect** on vegetation.

The cumulative effects of Alternative D on vegetation would be the same as Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of vegetation as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

The effects of construction and operation of Alternative E on vegetation would be the same as Alternative A, **short- and long-term, moderate, and adverse**.

Cumulative Effects

The cumulative effects of Alternative E on vegetation would be similar to Alternative A, **long-term, moderate, and adverse**.

Conclusion

The effects of construction and operation of Alternative E on vegetation would be the same as Alternative D.

The cumulative effects of Alternative E on vegetation would be similar to Alternative D, **long-term, moderate and adverse**.

There would be no impairment of vegetation as a result of park management actions under Alternative E.

SPECIAL STATUS SPECIES

Method

The impact intensity thresholds for Special Status Species are as follows:

Negligible: No federal-listed species would be affected, or the action would affect an individual of a listed species or its critical habitat, but the change would be so limited that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate to a “no effect” determination by the U.S. Fish and Wildlife Service.

Minor: The action would result in detectable impacts to an individual (or individuals) of a federal-listed species or its critical habitat, but would not be expected to result in



substantial population fluctuations and would not be expected to have any measurable long-term effects on species, habitats, or natural processes sustaining them. Minor effects would equate to a “**may affect/not likely to adversely affect**” determination by the U.S. Fish and Wildlife Service.

Moderate: An action would result in detectable impacts on individuals or population of a federal-listed species, critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside the range of natural variation (but would return to natural conditions). Moderate level adverse effects would equate to a “**may affect/likely to adversely affect / adversely modify critical habitat**” determination by the U.S. Fish and Wildlife Service.

Major: Individuals or population of a federal-listed species, critical habitat, or the natural processes sustaining them would be measurably affected. Key ecosystem processes might be permanently altered resulting in changes in population numbers that could affect the vitality of the population and permanently modifying critical habitat. Major adverse effects would equate to a “**may affect / likely to adversely affect/adversely modify critical habitat**” determination by the U.S. Fish and Wildlife Service.

Duration: Short-term: Recovers within one year after project completion. Long-term: Takes more than one year after project completion to recover.

Context: The area of effects for special status species is the 10-acre Tremont site and the Middle Prong of the Little River at and immediately downstream of the site. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

No construction would occur under Alternative A, and therefore no adverse effects on special status species would occur. Continuation of existing maintenance and operation practices would have **no adverse effects** on special status species. For federally listed species, the equivalent Section 7 finding would be “**no effect.**”

Cumulative Effects

Alternative A would have **no adverse effects** on special status species since no construction would occur on the site. Other projects in the region could potentially have effects on special status species, but are unknown at the present time. It is assumed that appropriate surveys would be conducted to determine if effects on special status species are expected to occur, and that suitable avoidance and mitigation measures would be taken. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting special status species are combined with actions under Alternative A, the resulting cumulative effects are estimated to be **long-**



term, minor and adverse. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Conclusion

No construction would occur under Alternative A, and therefore no adverse effects on special status species would occur. Operation under Alternative A would have no adverse effects on special status species. For federally listed species, the equivalent Section 7 finding would be “**no effect.**”

When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting special status species are combined with actions under Alternative A, the resulting cumulative effects are estimated to be **long-term, minor, and adverse.** For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

There would be no impairment of special status species as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Alternative B would have **no adverse effects** on special status species since the majority of site improvements would occur inside existing buildings. The only ground-disturbing activities would include construction of two new restrooms on the ends of the existing dormitory and construction a new wastewater treatment package plant in previously disturbed areas. Construction activities would be relatively minor and would involve use of equipment such as a tractor-trailer to deliver materials and possibly a crane to place the package plant and to install the heating, ventilation, and air conditioning systems. Since no special status species occur on the main area of the Tremont site or the existing wastewater treatment plant site, it is not likely that these activities **would affect** federal-listed species. However, it is possible that such effects could occur. Prior to construction, surveys for the Butternut (*Juglans cinerea*) (federal species of concern) and the Indiana Bat would be conducted to confirm that these species are not present. Continuation of existing maintenance and operation practices would have **no adverse effects** on special status species. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Cumulative Effects

The cumulative effects of Alternative B would be similar to Alternative A, **long-term, minor and adverse.** For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Conclusions

Alternative B is not likely to have adverse effects on special status species since the majority of site improvements would occur inside existing buildings. The only ground-disturbing activities would include construction of two new restrooms on the ends of the dormitory, and a new wastewater treatment package plant in previously disturbed areas.



However, it is possible that such effects could occur, and surveys will be conducted to determine whether federal-listed species are present. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**” The cumulative effects of Alternative B would be to the same as Alternative A, **long-term, minor, and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

There would be no impairment of special status species as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Construction of two new dormitories would not affect forested habitat or adversely affect water quality and is therefore not likely to affect special status species.. However, prior to construction, surveys for the Butternut (federal species of concern) and the Indiana Bat would be conducted to confirm that these species are not present. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**” Maintenance and operation practices would have **no adverse effects** on special status species under Alternative C, similar to Alternative A. For federally listed species, the equivalent Section 7 finding would be “**no effect.**”

Cumulative Effects

The cumulative effects of Alternative C would be similar to Alternative A, **long-term, minor, and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Conclusion

Construction of two new dormitories would not affect forested habitat or adversely affect water quality and is therefore not likely to affect special status species. However, prior to construction, surveys for the Butternut (federal species of concern) and the Indiana Bat would be conducted to confirm that these species are not present. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**” The cumulative effects of Alternative C on species of special concern would be similar to Alternative A, **long-term, minor and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

There would be no impairment of special status species as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Removal of less than 0.5 acre of forest and less than 4 acres of total disturbed land are unlikely to affect any of the special status species because of apparent lack of habitat. The Indiana bat hibernates and has maternity colonies in the park. Tremont is within a 5-mile radius of principal hibernacula in the park. This species is sensitive to loss of maternity roost trees if felled in summer. Surveys for roost trees would therefore be



conducted prior to construction and if identified, would be avoided during the summer months. However, prior to construction, surveys for the Butternut (federal species of concern) would also be conducted to confirm that this species is not present. **No adverse effects** on special status species are therefore likely to occur. For federally listed species, the equivalent Section 7 finding would be “**no effect.**”

Increased levels of storm water runoff resulting from disturbance of less than 4 acres of land during construction would have a potential to adversely affect special status species such as the Hellbenders in the Middle Prong. These potentially adverse effects would be mitigated by implementation of best management practices for sedimentation and erosion control, and these measures would be successful.

During operation, additional impervious surface on the Tremont site would cause increased runoff of storm water into the Middle Prong. However, these effects would be mitigated by installation of a new sustainable design storm water treatment system that would control the amount and quality of storm water leaving the site. In addition, installation of a new package wastewater treatment plant would have a long-term beneficial effect on water quality.

Under Alternative D, some additional lighting would be proposed. Light that reflects upward to the sky could have a negative impact on the rare species of moths listed in Table 13. The lights may disrupt their mating period, and if attracted to the lights they would be eaten by bats (GSMIT 2007c). Any reduction in light pollution in the proposed project would be a positive factor for these rare moths. During design of the site modifications, this would be taken into consideration, and the design would be developed to minimize these types of effects.

Under Alternative D, construction, maintenance and operation are estimated to have **long-term, negligible, adverse effects** on special status species. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Cumulative Effects

The cumulative effects of Alternative D on species of special concern would be similar to Alternative A, **long-term, minor and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Conclusion

Under Alternative D, construction and operation are estimated to have **long-term, negligible adverse effects** on special status species. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely effect.**” The cumulative effects of Alternative D on species of special concern would be similar to Alternative A, **long-term, minor and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”



There would be no impairment of special status species as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Alternative E would result in removal of less than 0.5 acre of forest and would affect less than 4 acres of total disturbed land. Alternative E would therefore have **long-term, negligible adverse** effects on special status species because of lack of habitat, similar to Alternative D. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Effects of operation would be similar to Alternative D, but higher level of sustainable design as compared with Alternative D and others would further minimize potential effects on special status species associated with the Middle Prong by providing an even higher levels of control and treatment of runoff from the site. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Cumulative Effects

The cumulative effects of Alternative E on species of special concern would be similar to Alternative A, **long-term, minor and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

Conclusion

Under Alternative E, construction and operation are estimated to have **long-term, negligible adverse effects** on special status species. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

The cumulative effects of Alternative E on species of special concern would be similar to Alternative A, **long-term, minor and adverse**. For federally listed species, the equivalent Section 7 finding would be “**may affect, not likely to adversely affect.**”

There would be no impairment of special status species as a result of park management actions under Alternative E.

WILDLIFE

Method

The impact intensity thresholds for Wildlife are as follows:

Negligible: Impacts would be barely detectable, measurable, or observable.

Minor: Adverse Impacts would be detectable, but not expected to have an overall effect on the natural community. Impacts generally affect less than one-half acre vegetation or would not be expected to influence the population of any wildlife species, or may influence a small number of individuals of a species. Beneficial impacts would enhance the ecology for a small number of individuals.



Moderate: Impacts would be clearly detectable, but could have short-term appreciable effects on the local ecology. Impacts may affect up to one-acre of vegetation, but would not threaten the continued existence of any natural community. Impacts would have short-term effects. Beneficial impacts would enhance the population of any species at the park.

Major: Long-term or permanent, highly noticeable effects on the population of a species, natural community, community ecology, or natural processes. Impacts may affect over one-acre of vegetation or may affect the continued existence of any natural community or species. Beneficial impacts would enhance the population of more than one species over the long-term.

Duration: Short-term - Occurs only during the duration of the project construction. Long-term – Persists beyond the duration of the project construction.

Context: The area of affect for wildlife resources is the Tremont area within a half mile radius. For cumulative effects, the area of affect is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee and Graham, Haywood, and Swain Counties in North Carolina.

Alternative A: No Action

The adverse effects of Alternative A on wildlife resources would be negligible. No new construction would occur, and negligible disturbance of wildlife would be noted in association with existing programs at Tremont. There may be minor localized trampling of vegetation and soil compaction associated with Tremont educational programs but those would be associated with developed areas of the facility and result in negligible impacts to wildlife in the long-term. Since the wastewater system would not be built under the No Action Alternative, there would no disturbance of the wastewater ponds which are utilized by many wildlife species including birds, reptiles and amphibians.

Overall, Alternative A is estimated to have **long-term negligible adverse effects** on wildlife.

Cumulative Effects

Degradation of wildlife habitat or populations would be limited in comparison with other project work in the surrounding area largely outside the Park as Alternative B does not involve any construction. Many roadway and development projects would be constructed in the area and would result in habitat fragmentation and disturbance; however, they are within a distance which would not likely impact wildlife populations in the Park. Thus, the cumulative effects associated with Alternative A would be **long-term, negligible, and adverse**.

Conclusion

No new construction would occur associated with this alternative. Alternative A is estimated to have **long-term, negligible, adverse effects** on wildlife. Similarly, cumulative effects would be **long-term, negligible and adverse**.



Alternative B: Modifications to Existing Facilities (Limited)

The adverse effects of Alternative B on wildlife resources would be moderate adverse in the short-term as a result of construction of the aeration package plant and the new dormitory restrooms and likely negligible, adverse in the long-term. New construction would occur and would include up to 1 acre of disturbance, which would result in soil erosion, noise, and disruption of prey base in the area. Construction of the aeration package plant would affect the existing ponds and would result in disruption of that section of the property. During operation, long-term adverse negligible disturbance of wildlife would be noted in association with programs at Tremont. There may be minor localized trampling of vegetation and soil compaction associated with Tremont educational programs but those would be associated with developed areas of the facility and result in negligible impacts to wildlife in the long-term. The construction of the new wastewater system would effectively eliminate the aquatic life from the ponds and thus this disturbance would alter long-term effects additively by disrupting species that are dependent or codependent on the species that utilize that pond system such many wildlife species including birds, reptiles and amphibians.

Limited new construction would occur associated with this alternative. Alternative B is estimated to have **long-term, minor, adverse effects** on wildlife while construction related impacts would result in a **short-term moderate impacts**. Similarly, cumulative effects would be **long-term, negligible, and adverse**.

Cumulative Effects

Degradation of wildlife habitat or populations would be limited in comparison with other project work in the surrounding area largely outside the Park as Alternative B does not involve any construction. Many roadway and development projects would be constructed in the area and would result in habitat fragmentation and disturbance; however, they are within a distance which would not likely impact wildlife populations in the park. Thus, the cumulative effects associated with Alternative B would be **long-term, negligible and adverse**.

Conclusion

Limited new construction would occur associated with this alternative. Alternative B is estimated to have **long-term, minor, adverse effects** on wildlife during operation while construction related impacts would result in a **short-term moderate impact**. Similarly, cumulative effects would be **long-term, negligible and adverse**.

Alternative C: Modifications to Existing Facilities (Moderate)

The adverse effects of Alternative C on wildlife resources would be moderate adverse in the short-term as a result of elimination of the ponds at the wastewater treatment site, trailhead improvements and a new storm water drainage system between the dormitory and activity center and the new dormitory and likely minor, adverse in the long-term. New construction would occur and would include up to 1 acre of disturbance, which would result in soil erosion, noise, increase in impervious surfaces and disruption of prey



base in the area. The aeration package plant would not affect the existing ponds and thus would not result in further disruption of that section of the property. Long-term adverse negligible disturbance of wildlife would be noted in association with programs at Tremont, post construction. There may be minor localized trampling of vegetation and soil compaction associated with Tremont educational programs but those would be associated with developed areas of the facility and result in negligible impacts to wildlife in the long-term. The construction of the new wastewater system would effectively eliminate the aquatic life from the ponds and thus this disturbance would alter long-term effects additively by disrupting species that are dependent or codependent on the species that utilize that pond system such many wildlife species including birds, reptiles and amphibians.

Overall, Alternative C is estimated to have **short-term moderate adverse effects and long-term minor adverse effects** on wildlife.

Cumulative Effects

Degradation of wildlife habitat or populations would be limited in comparison with other project work in the surrounding area largely outside the Park as Alternative C does not involve any construction in those areas. Many roadway and development projects would be constructed in the area and would result in habitat fragmentation and disturbance; however, they are within a distance which would not likely impact wildlife populations in the Park. Thus, the cumulative effects associated with Alternative C would be **long-term, negligible, and adverse**.

Conclusion

Limited new construction would occur associated with this alternative. Alternative C is estimated to have **long-term, minor, adverse effects** on wildlife while construction related impacts would result in a **short-term moderate adverse impact**. Similarly, cumulative effects would be long-term, negligible and adverse.

Alternative D: Moderate Redevelopment

The adverse effects of Alternative D on wildlife resources would be moderate adverse in the short-term in association with the demolition of the portion of the existing facilities, construction of two dormitories, a new standard extended aeration package plant, new roads walkways and parking areas and upgrading of new buildings. New construction would occur and would include less than 4 acres of disturbance, which would result in soil erosion, noise, and disruption of prey base in the area. However, long-term effects on wildlife associated with construction would likely be **minor and adverse**. During operation, long-term adverse minor disturbance of wildlife would occur in association with programs at Tremont. There would be minor localized trampling of vegetation and soil compaction associated with Tremont educational programs, but those would be associated primarily with developed areas of the facility and result in negligible impacts to wildlife in the long-term. The construction of the new wastewater system would effectively eliminate the aquatic life from the ponds and thus this disturbance would



alter long-term effects additively by disrupting species that are dependent or codependent on the species that utilize that pond system such many wildlife species including birds, reptiles and amphibians.

Overall, Alternative D is estimated to have **short-term moderate adverse effects** and **long-term minor adverse effects** on wildlife.

Cumulative Effects

Degradation of wildlife habitat or populations would be limited in comparison with other project work in the surrounding area largely outside the park as Alternative D does not involve any construction. Many roadway and development projects would be constructed in the area and would result in habitat fragmentation and disturbance; however, they are within a distance that would not likely impact wildlife populations in the park. Thus, the cumulative effects associated with Alternative D would be **long-term, negligible, and adverse**.

Conclusion

Limited new construction would occur associated with this alternative. Alternative D is estimated to have long-term, minor, adverse effects on wildlife while construction related impacts would result in a **short-term, moderate impact**. Similarly, cumulative effects would be **long-term, negligible, and adverse**.

Alternative E: Major Redevelopment

The adverse effects of Alternative E on wildlife resources would be **moderate and adverse in the short-term** in association with construction of an entire new campus. However, the effects on wildlife would be similar to Alternative D, since construction would affect less than 4 acres of land and habitat. Long-term effects on wildlife associated with construction would likely be **negligible and adverse**. During operation, long-term adverse minor disturbance of wildlife would occur in association with programs at Tremont. There would be minor localized trampling of vegetation and soil compaction associated with Tremont educational programs, but those would be associated primarily with developed areas of the facility and result in negligible impacts to wildlife in the long-term. The construction of the new wastewater system would effectively eliminate the aquatic life from the ponds and thus this disturbance would alter long-term effects additively by disrupting species that are dependent or codependent on the species that utilize that pond system such many wildlife species including birds, reptiles and amphibians.

Overall, Alternative E is estimated to have **short-term moderate adverse effects** and **long-term minor adverse effects** on wildlife.

Cumulative Effects

Degradation of wildlife habitat or populations would be limited in comparison with other project work in the surrounding area largely outside the park as Alternative E does not involve any construction outside the site. Many roadway and development projects



would be constructed in the area and would result in habitat fragmentation and disturbance; however, they are within a distance which would not likely impact wildlife populations in the Park. Thus, the cumulative effects associated with Alternative D would be **long-term, negligible, and adverse**.

Conclusion

Limited new construction would occur associated with this alternative. Alternative E is estimated to have **long-term, minor, adverse effects** on wildlife while construction related impacts would result in a **short-term moderate impact**. Similarly, cumulative effects would be **long-term, negligible and adverse**.

ECOLOGICALLY CRITICAL AREAS, WILDERNESS, WILD AND SCENIC RIVERS, OR OTHER UNIQUE NATURAL RESOURCES

Method

The Middle Prong of the Little River is an ecologically critical area located adjacent to the Tremont site. The Middle Prong is classified as a Tier III Waters of the State of Tennessee, and is under the highest degree of protection of any stream or river in the state. The impact assessment therefore concerns possible effects of the alternatives on the Middle Prong.

The impact intensity thresholds for Ecologically Critical Areas are as follows:



Negligible: The impact is barely detectable and/or would affect a minimal area of upland, riparian, or wetlands habitat, but no individuals or populations of important plant and/or animal species and/or plant communities within an ecologically critical area. Impacts to the composition and function of ecosystems at key organizational levels are not detectable in the short-term and are not expected in the long-term.

Minor: The impact is slight, but detectable, but no individuals or populations of important plant and/or animal species and/or plant communities occur within an ecologically critical area. The severity and timing of changes to parameter measurements are not expected to be outside the natural variability and not expected to have any long-term effects on biological, abiotic, or ecosystem resources. Certain common patterns may have short-term disruptions on a broad spatial scale. Key ecosystem processes may have short-term disruptions that are within natural variability, and habitat for all species remains functional.

Moderate: The impact is readily apparent and/or would affect a large area of upland, riparian, or wetlands habitat and individuals or populations of important plant and/or animal species and/or plant communities within an ecologically critical area. The severity and timing of changes to parameter measurements are expected to be outside the natural variability for short periods and changes within the natural variability may be long-term in nature. Ecosystem patterns may experience permanent disruption or loss on a limited spatial scale. Key ecosystem processes may have short-term disruptions that are outside natural variability, and habitat for all species remains functional.

Major: The impact is severely adverse or exceptionally beneficial and/or would affect a substantial area of upland, riparian, or wetlands habitat and/or many individuals or populations of important plant and/or animal species and/or plant communities within an ecologically critical area. The severity and timing of changes to parameter measurements are expected to be outside the natural variability for short to long periods or to be permanent. Changes within natural variability may be long-term or permanent in nature. In extreme cases, species may be extirpated from the park and ecological patterns simplified, key ecosystem processes may be disrupted, or habitat for any important species is rendered not functional.

Duration: Short-term: Recovers within one year after project completion. Long-term: Takes more than one year after project completion to recover.

Context: The area of effects for ecologically critical areas is the Middle Prong of the Little River adjacent to and downstream of the 10-acre Tremont site. For cumulative effects, the area of effects is the surrounding region, defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

Under Alternative A, no construction would occur on the Tremont site. Construction would therefore have **no short- or long-term adverse effects** on the ecologically critical area, the Middle Prong.



Operation of the existing facilities at Tremont results in contribution of storm water runoff to the Middle Prong from the existing paved and unpaved areas. The existing wastewater treatment plant does not discharge directly to the Middle Prong, but has had occasional technical problems (for example, a pipe breakage) that contributed small amounts of wastewater to the stream through accidental leakage from pipe breakages or other types of problems. Under Alternative A, these small sources of wastewater would continue to have **long-term, minor, adverse effects** on the Middle Prong, an ecologically critical area.

Cumulative Effects

No new construction would occur on the Tremont campus, and continued operation of Tremont would result in negligible amounts of soil erosion and degradation of water quality of the ecologically critical area, the Middle Prong, caused by storm water runoff and wastewater discharges. Construction of highways, roads, and private developments in the surrounding area would continue to result in a far greater amount of soil disturbance from storm water runoff and degradation of water quality. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting this ecologically critical area are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

Conclusion

Under Alternative A, no construction would occur on the Tremont site. Construction would therefore have **no short-term adverse effects** on the Middle Prong. Under Alternative A, storm water and small amounts wastewater associated with leakages from the existing wastewater treatment system would continue to have **long-term, minor, adverse effects** on water quality and aquatic life of the Middle Prong.

Construction of highways, roads, and private developments in the surrounding area would continue to result in a far greater amount of soil disturbance from storm water runoff, and degradation of water quality than actions proposed under Alternative A. When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting water quality and aquatic life are combined with actions under Alternative A, the resulting cumulative effects would be **long-term, moderate, and adverse**.

There would be no impairment of ecologically critical areas, wilderness, wild and scenic rivers, or other unique natural resources as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Effects of construction and operation on the Middle Prong would parallel the effects described in the section on “Water Quality” and “Aquatic Resources,” **short-term, minor adverse effects** during construction, and **long-term, minor beneficial effects** during operation.



Cumulative Effects

Cumulative effects of Alternative B on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

Conclusion

Effects of construction and operation on the Middle Prong would parallel the effects described in the section on “Water Quality” and “Aquatic Life,” **short-term, minor adverse effects** during construction, and **long-term, minor beneficial effects** during operation.

Cumulative effects of Alternative B on the Middle Prong would be similar to Alternative A, **long-term, minor and adverse**.

There would be no impairment of ecologically critical areas, wilderness, wild and scenic rivers, or other unique natural resources as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Effects of construction and operation on the Middle Prong under Alternative C would parallel the effects described in the section on “Water Quality” and “Aquatic Life,” and would have **short-term, minor, adverse effects** during construction and **long-term, minor, beneficial effects** during operation.

Cumulative Effects

Cumulative effects of Alternative C on the Middle Prong would be similar to Alternative A, **long-term, moderate and adverse**.

Conclusion

Effects of construction and operation on the Middle Prong under Alternative C would parallel the effects described in the section on “Water Quality” and “Aquatic Resources,” and would have **short-term, minor adverse effects** during construction and **long-term, minor, beneficial effects** during operation.

Cumulative effects of Alternative C on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of ecologically critical areas, wilderness, wild and scenic rivers, or other unique natural resources as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Effects of construction and operation on the Middle Prong under Alternative D would parallel the effects described in the section on “Water Quality” and “Aquatic Resources,” and would have **short-term, minor, adverse effects** during construction and **long-term, minor, beneficial effects** during operation.



Cumulative Effects

Cumulative effects of Alternative D on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

Conclusion

Effects of construction and operation on the Middle Prong under Alternative D would parallel the effects described in the section on “Water Quality” and “Aquatic Resources,” and would have **short-term, minor adverse effects** during construction and **long-term, minor, beneficial effects** during operation.

Cumulative effects of Alternative D on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of ecologically critical areas, wilderness, wild and scenic rivers, or other unique natural resources as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Effects of construction and operation on the Middle Prong under Alternative E would parallel the effects described in the section on “Water Quality” and Aquatic Resources,” and would have **short-term, minor, adverse effects** during construction and **long-term, minor, beneficial effects** during operation.

Cumulative Effects

Cumulative effects of Alternative E on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

Conclusion

Effects of construction and operation on the Middle Prong under Alternative E would parallel the effects described in the section on “Water Quality” and Aquatic Resources,” and would have **short-term, minor, adverse effects** during construction and **long-term, minor beneficial effects** during operation.

Cumulative effects of Alternative E on the Middle Prong would be similar to Alternative A, **long-term, moderate, and adverse**.

There would be no impairment of ecologically critical areas, wilderness, wild and scenic rivers, or other unique natural resources as a result of park management actions under Alternative E.

SOCIOECONOMICS

Method

The effects of the alternatives on economic conditions were assessed by estimating the effects of construction and operation proposed under each alternative on the local and regional economy, defined below. The effects of the alternatives on the amount of



energy consumption (electrical and gas), water use, and volumes of solid waste produced are assessed by making qualitative comparisons with Alternative A.

The impact intensity thresholds for socioeconomics are as follows:

Negligible: No effects would occur or the effects to socioeconomic conditions would be below the level of detection. Changes in costs of utilities/waste management would not be detectable.

Minor: The effects to socioeconomic conditions would be detectable. If mitigation were needed to offset potential adverse effects, it would be simple and successful. Changes in costs of utilities/waste management would be detectable.

Moderate: The effects to socioeconomic conditions would be readily apparent. If mitigation is needed to offset potential adverse effects, it could be extensive, but would likely be successful. Changes in costs of utilities/waste management would be detectable.

Major: The effects to socioeconomic conditions would be readily apparent and would cause substantial changes to socioeconomic conditions. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed. Changes in costs of utilities/waste management would be detectable.

Duration: Short-term: effects last one year or less. Long-term: effects last longer than one year.

Context: The area of effect analyzed for socioeconomics is both local (Tremont site) and regional. The region for the effects on socioeconomics is defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina. For cumulative effects, the area of effects is the region.

Alternative A: No Action Alternative

There would be no construction associated with Alternative A. No building products would be purchased locally and no local workers would be utilized. Therefore, there would be **no effects** on the local or regional economy associated with construction under Alternative A.

Under the No Action Alternative, visitation is anticipated to remain at approximately 5,000 students per year. Annually, approximately 10,000 visitors also go to Tremont to obtain information about Tremont or the park. While at Tremont, many visitors purchase books, food, or souvenir items. The number of visitors at the visitor center is not anticipated to change under Alternative A. Annually, approximately 20,000 hikers park at Tremont to access the trailheads in the area. The number of hikers parking at Tremont is not anticipated to change under Alternative A. Alternative A would therefore not result in any increased visitation or associated local economic benefits. Alternative A would therefore have **no long- or short-term, beneficial, or adverse effects** on the economy of the Blount County area.



There would be no demolition of existing buildings and no landfill debris under Alternative A. Alternative A would not include sustainable design features that would reduce consumption of water, gas and electricity. The existing wastewater treatment plant, which is old and experiences periodic mechanical problems, would continue to be operated. Overall, Alternative A would have **short-term and long-term, minor, adverse effects** on energy consumption (electrical and gas), water use, and solid waste.

Cumulative Effects

The projects listed in the section entitled “Cumulative Effects Analysis Method” would have varying types of beneficial and adverse effects on economic conditions in the local and regional area. Planning efforts such as the Elkmont General Management Plan and the Cades Cove planning effort could result in additional goods and services purchased locally as plans are implemented, and could also result in additional visitors in the park and the Townsend area. Road projects such as the Foothills Parkway project and the Pellissippi Parkway extension could result in increased traffic in the Townsend area, and more visitors that could purchase goods and services in the Townsend area. Construction of the developments proposed in the Townsend area could result in additional goods and services purchased locally to construct these developments, with accompanying local economic benefits. These actions would result in long-term, minor, beneficial effects on the economy of the Blount County area.

Actions proposed under the Elkmont General Management Plan Amendment could result in additional demolition debris that would be disposed at local landfills, which would require additional waste management services in Blount County. Construction of the developments in the Townsend area could result in additional demand for electrical power from area utility providers in the area. These actions would result in **long-term, minor, adverse effects** on the economy of the Blount County area.

When the effects of other past, ongoing, and future plans, projects, and activities affecting the economy, energy consumption (electrical and gas), water use, and solid waste are combined with actions under Alternative A, the resulting effects would be **long- and short-term, minor, and both beneficial and adverse**.

Conclusion

There would be no construction associated with Alternative A, and therefore **no construction-related effects** on the economy under Alternative A. Under the Alternative A, no change in visitation is anticipated. Overall, Alternative A would therefore have **no long- or short-term, beneficial and adverse effects** on socioeconomics in Blount County.

No construction waste that would have to be disposed and no sustainable design features would be implemented that reduce energy or water consumption at Tremont. Overall, Alternative A would have **short-term and long-term, minor, and adverse effects** on energy consumption (electrical and gas), water use, and solid waste.



When the effects of other past, ongoing, and future plans, projects, and activities affecting the economy, energy consumption (electrical and gas), water use, and solid waste are combined with actions under Alternative A, the resulting cumulative effects would be **long- and short-term, minor, and both beneficial or adverse**.

Alternative B: Modifications to Existing Facilities (Limited)

Alternative B would include minor upgrades, modifications, additions, and spatial reconfiguration to existing facilities and infrastructure to optimize functionality and potential utilization. Alternative B involves no construction of new facilities other than a wastewater treatment package plant and additions of two restrooms on either end of the dormitory. Construction activities for existing facilities would occur, however, and would be relatively minor. These would include modifications to the activity center and the dormitory. The River House would continue to be operated. Materials and labor may be contracted locally, which could help to stimulate the economy in Blount County. It is estimated that construction improvements under Alternative B are estimated to range from \$3.1 million to \$6.6 million (2009 dollars). Approximately 20-25 workers would be employed for a period of 12 to 18 months. Alternative B would have limited sustainable design features that could potentially attract additional students or visitors to Tremont. No new employees would be hired at Tremont or the park as a result of Alternative B, and there would be no additional residents or businesses in Blount County as a result of Alternative B. Alternative B would have **short term, negligible, beneficial effects** on the economy in Blount County and the region.

The replacement of heating, ventilation, and air conditioning systems; windows; bathroom fixtures, dormitory fixtures; and roofing materials would result in a limited amount of debris that would be disposed in local landfills. Alternative B would have limited sustainable design features that would reduce energy and water consumption at Tremont. The existing aging wastewater treatment plant would be replaced. Alternative B would have a **short-term, negligible, adverse effect** on waste management on the campus, and a **long-term, minor, beneficial effect** on utilities in the Tremont area.

Cumulative Effects

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse**.

Conclusion

Alternative B would have **short term, negligible, beneficial effects** on the economy in the Blount County and the region as a result of construction of new facilities on the site.

Alternative A would have a **short-term, negligible, adverse effect** on waste management on the site, and a **long-term, minor, beneficial effect** on utilities in the Tremont area.



The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse**.

Alternative C: Modifications to Existing Facilities (Moderate)

Alternative C would include moderate upgrades, modifications, additions and spatial reconfigurations to the infrastructure and existing facilities to optimize classroom and office space efficiency, utilization, functionality, energy conservation, and visual quality. Alternative C involves no construction of new facilities other than a new extended aeration package plant. A minor amount of construction associated with making improvements to existing facilities would be made. This would include more extensive modifications to the activity center and the dormitories as compared with Alternative B. The River House and administration building would not be renovated. It is estimated that construction improvements (assuming a rehabilitated dormitory) are estimated to range from \$5.9 million to \$12.6 million (2009 dollars). Approximately 30-35 workers would be employed for a period of 18-24 months. It is estimated that construction improvements (assuming a new dormitory) are estimated to range from \$8.0 million to \$17.1 million (2009 dollars). Alternative C would have limited sustainable design features that could potentially attract additional students or visitors to Tremont. No new employees would be hired at Tremont or the park as a result of Alternative C and there would be no additional residents or businesses created in Blount County. Alternative C would have **short-term, negligible, beneficial, effects** on socioeconomics in Blount County and **long-term, negligible, beneficial effects** on socioeconomics in Blount County and **no long-term effects** on socioeconomics in the region.

The replacement of heating, ventilation, and air conditioning systems; windows; bathroom fixtures; dormitory fixtures; siding; and roofing materials would result in a small amount of debris that would be disposed in local landfills. No heavy equipment other than tractor-trailers would be required to deliver materials and possibly a crane would be required to install the new extended aeration package plant, and the roof trusses, heating, ventilation, and air conditioning systems.

Alternative C would feature more extensive sustainable facilities than Alternative A, but would still be relatively limited. The reduction in energy and water consumption at Tremont would therefore also be relatively limited under Alternative C.

Alternative C would have a **local, short-term, minor, adverse effect** on solid waste and wastewater management, and a **local, long-term, minor, beneficial effect** on utilities in the Tremont area and Blount County and the region.

Cumulative Effects

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse**.



Conclusion

Alternative C would have **short-term, negligible beneficial, effects** on socioeconomics in Blount County and **no effects** on socioeconomics in the region.

Overall, Alternative C would have a **local, short-term, minor, adverse effect** on solid waste and wastewater management, and a **local, long-term, minor, beneficial effect** on utilities in the Tremont area and the Blount County area.

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse**.

Alternative D: Moderate Redevelopment

Alternative D would include moderate site redevelopment and major modifications, additions and spatial reconfiguration to the site and existing facilities to increase facility function, utilization, energy conservation and visual appearance. Alternative D involves the construction of two new dormitories, the demolition of the River House, and a major renovation of one existing dormitory to convert it to the new maintenance building. The existing administration/maintenance building would also receive major renovations. The entryway and site configuration would be improved to create a “sense of place.” Construction activities would be moderate to heavy. It is estimated that construction improvements under the Alternative D are estimated to range from \$15.4 million to \$33.1 million (2009 dollars). Approximately 40-45 workers would be employed for a period of 24-28 months. Alternative D has more extensive sustainable design features than Alternatives A, B and C.

The added sustainable design features and improvements to provide a “sense of place” could attract additional students and visitors if Tremont and the park advertise these features. No new employees would be hired at Tremont or the park as a result of Alternative D, however, and there would be no additional residents or businesses in Blount County as a result of Alternative D. Alternative D would have **short-term, minor, beneficial effects** on the economy of Blount County.

Alternative D has more extensive sustainable design features than Alternative A, and would result in a reduction in energy and water consumption at Tremont. This would have a **long-term, moderate, beneficial effect** on overall energy and water use at Tremont.

Construction of the new dormitories and other site work associated with Alternative D would create solid waste that would have to be disposed in local landfills. Alternative D would have a **short-term, minor, adverse effect** on solid waste management during construction.

Cumulative Effects

Past, ongoing, and future plans, projects and activities affecting are estimated to have **short- and long-term, minor, beneficial effects** on economic conditions in the Blount



County area. There could also be a **long term, minor, adverse effect** on the economy in Blount County due to the redirection of traffic from the Townsend area to the Foothills Parkway extension. When the beneficial and adverse effects of other past, ongoing, and future plans, projects, and activities affecting socioeconomic conditions are combined with actions under Alternative D, the overall resulting cumulative effects are estimated to be **short-term, minor, and adverse**.

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial or adverse**.

Conclusion

Alternative D would have **short-term, minor, beneficial effects** on the economy of Blount County.

Alternative D has more extensive sustainable design features than Alternatives A through C, and would result in a reduction in energy consumption at Tremont. This would have a **long-term, moderate, beneficial effect** on overall energy use at Tremont.

Construction of the new dormitories and other site work associated with Alternative D would create solid waste that would have to be disposed in local landfills. Alternative D would have a **short-term, minor, adverse effect** on waste management during construction.

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse**.

Alternative E: Major Redevelopment

Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. All site development, facility design and construction would become a model of sustainable design principles and development. Alternative E involves the construction of two new dormitories, a new activity center/dining center/administration facility, the rehabilitation of the Oasis House, a new pavilion, a new environmentally friendly parking area, and the demolition of River House. The entryway and site configuration would be improved. The infrastructure would be upgraded with a new high-technology wastewater treatment facility that could also be used as a teaching tool, and a new sustainable-designed storm water drainage collection and treatment system for the entire site that could be used for the same purpose. It is estimated that construction improvements under the Alternative E are estimated to range from \$24.2 million to \$51.8 million (2009 dollars).. Approximately 40-45 workers would be employed for a period of 36-48 months. Alternative E has more extensive sustainable design features than Alternatives A, B, C, and D.



The added sustainable design features and improvements to provide a sense of place could attract an estimated 1,000 additional students and visitors per year if Tremont and park advertise these features. There would be no new employees hired at Tremont or the park as a result of Alternative E and there would be no additional residents or businesses in Blount County as a result of Alternative E. Alternative E would have a **short-term, minor, beneficial effect** on the economy of the local area and a **long-term, negligible, beneficial effect** on the economy in the region.

Tremont intends to remain in operation during construction, so the students and the visiting public would still remain in the Tremont area under Alternative E. However, construction could cause a decrease in the numbers of visitors and students who use the campus or visit the bookstores. This could result in a decrease in spending at Tremont and a **short-term, minor adverse effect** on the economy of Tremont.

Under Alternative E all new buildings and other facilities would have sustainable design features. Alternative E would therefore have a **long-term, major, beneficial effect on energy and water consumption at Tremont, via reduction in consumptive use.**

Even using sustainable principles, Alternative E would feature relatively large amounts of demolition debris because the entire existing campus would be demolished. Alternative E would have a **short-term, moderate, adverse effect** on local waste management capabilities.

Cumulative Effects

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse.**

Conclusion

Alternative E would have a **short-term, minor, beneficial effect** on the economy of the Blount County and a **long-term, negligible, and beneficial, effect** on the economy in the larger region.

During construction, Alternative E would have a **short-term, minor, adverse effect** on the numbers of visitors and students who use the campus or visit the bookstores. Alternative E would also feature relatively large amounts of construction debris because the entire existing campus would be demolished.

During operation under Alternative E, all new buildings and other facilities would feature sustainable designs. Alternative E would, therefore, have a **long-term, major, beneficial effect on energy and water consumption at Tremont.** Alternative E would have a **short-term, minor, adverse effect** on local waste management capabilities.

The cumulative effects on the economy, energy consumption (electrical and gas), water use, and solid waste would be the same as those described for Alternative A, **long- and short-term, minor, and both beneficial and adverse.**



TRANSPORTATION

Method

The impact intensity thresholds for transportation are as follows:

Negligible: No effects would occur or the effects to transportation would be below the level of detection.

Minor: Effects to transportation would be detectable. If mitigation measures were needed to offset potential adverse effects, it would be simple and successful.

Moderate: The effects to transportation would be readily apparent. If mitigation measures were needed to offset potential adverse effects, it could be extensive, but would likely be successful.

Major: The effects to transportation would be readily apparent and would cause substantial changes. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed.

Duration: Short-term: effects last less than one year. Long-term: effects last more than one year.

Context: The area of effect analyzed for transportation is both local (Tremont site) and regional. The region for the effects on transportation is defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina. For cumulative effects, the area of effects is the region.

Alternative A: No Action Alternative

Under Alternative A, existing traffic patterns and problems at Tremont would continue to occur, since no new roads or parking areas would be constructed. Existing problems with bus and car congestion in the main parking lot would continue to occur. Delivery of food to the activity center would continue to result in deliveries by large truck to the site, and associated traffic logistics and congestion issues would continue to occur. The main road between the administration building and the staff quarters at the south end of the site would continue to be congested. Traffic flow within the site would continue to be hampered by an inefficient road design configuration. Overall site access by vehicles would continue to be inefficient and traffic problems would continue to occur.

There would be no construction activity under Alternative A. Consequently, no additional trucks would deliver building products to the Tremont site and no construction workers would have to access the site. No trucks would access the site to transport debris from demolition activity.

Alternative A would have no sustainable design features or features that could attract additional students or visitors to Tremont, with the potential to cause associated additional traffic. The number of visitors at the visitor center and students attending Tremont is not anticipated to change under Alternative A, and traffic patterns and



volumes at the site would be expected to remain about the same. The number of hikers parking at Tremont is not anticipated to change under Alternative A.

Overall, Alternative A would result in continued traffic congestion at the site, but would cause no increase in traffic problems over these existing conditions since no new construction would occur. Alternative A is therefore estimated to result in **long-term, moderate, adverse effects** on transportation.

Cumulative Effects

Construction activities associated with the implementation of actions proposed under the Elkmont General Management Plan Amendment could result in additional trucks delivering building supplies and vehicles transporting construction workers in the south Blount County area. Construction of the developments in the Townsend area could result in additional heavy truck and auto/light truck traffic in southern Blount County to construct these developments. The construction of the extension of the Pellissippi Parkway would primarily occur in northern Blount County. This could result in increased traffic in the Townsend area. Once constructed, the extension of the Foothills Parkway would provide a bypass to the Townsend area for travelers going between Sevier County and western Blount County. This could result in decreased traffic in the Townsend area. Together, these actions would result in **short-term and long-term, minor, adverse effects** on local transportation in south Blount County.

Construction activities associated with the Cades Cove planning effort could result in additional heavy truck and light truck/auto traffic in the south Blount County area. The recent resurfacing of Laurel Creek Road and Tremont Road has resulted in additional heavy trucks and light trucks/autos in the south Blount County area due to the construction activity. These actions could result in **short-term, minor, adverse effects** on local transportation in southern Blount County during construction. However, these projects would also result in **long-term, moderate, beneficial effects** on traffic due to the road improvements once construction was completed.

Construction of the proposed improvements to Cades Cove Loop Road could result in **short-term, negligible, adverse effects** on local transportation due to temporary closing of the road. However, the more pleasant driving experience could result in **long-term, moderate, beneficial effects** on transportation in Cades Cove.

When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting transportation are combined with actions under Alternative A, the resulting cumulative effects on transportation associated with construction are estimated to be **short-term and long-term, moderate, and adverse**. In contrast, the resulting cumulative effects on transportation associated with operation of the new roadways are estimated to be **short-term and long-term, moderate, and beneficial**.

Conclusion

Under Alternative A, existing traffic patterns and problems at Tremont would continue to occur. Overall, Alternative A would result in continued traffic congestion at the site,



but would not cause an increase in traffic problems over these existing conditions since no new construction would occur. Alternative A is therefore estimated to result in **long-term, moderate, adverse effects** on transportation.

When the beneficial and adverse effects of other past, ongoing, and future plans, projects and activities affecting transportation are combined with actions under Alternative A, the resulting cumulative effects on transportation associated with construction are estimated to be **short-term and long-term, moderate, and adverse**. In contrast, the resulting cumulative effects on transportation associated with operation of the new roadways are estimated to be **short-term and long-term, moderate, and beneficial**.

Alternative B: Modifications to Existing Facilities (Limited)

Under Alternative B there would be some additional traffic generated by construction activities. Trucks carrying building materials must travel approximately three miles on park roads from Townsend to access Tremont. Tremont Road has two, 10 foot lanes with a center stripe and numerous sharp curves; therefore, a tractor-trailer or large multi-axle truck would probably be required to cross the center line to negotiate some of the curves. Although tractor-trailers currently deliver goods to Tremont via Tremont Road without significant traffic problems, there would be a few more trucks on the roadway due to construction activity. It is estimated that approximately 2 to 3 additional heavy truck trips would be made to the site per week, less than one truck trip per week would be made to remove debris, an approximately 20-25 daily auto/light truck trips would be made during a 12-18 month construction period. This would result in **short-term, minor, adverse effects** on transportation at Tremont during construction.

Alternative B would have limited sustainable design features, but would not be expected to attract additional students or visitors and associated vehicle traffic to Tremont. There would be no new employees hired at Tremont or the park as a result of Alternative B, and no associated increase in vehicle traffic. After construction is completed, traffic should resume normal characteristics, since Tremont does not anticipate significantly more visitors and students. Similar to Alternative A, the existing problems with traffic congestion on the site would continue to occur. Alternative A is therefore estimated to result in **long-term, moderate, adverse effects** on transportation during operation.

Cumulative Effects

The cumulative effects of Alternative B on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse and beneficial**.

Conclusion

During construction, Alternative B would result in **short-term, minor, adverse effects** on transportation due to increased traffic on the site and along Tremont Road. After construction is completed, traffic should resume normal characteristics as Tremont does not anticipate significantly more visitors and/or students. However, existing problems with traffic congestion on the site would continue to occur since no major changes in site



layout and roads would occur under Alternative B. The overall effect of Alternative B on transportation during operation is therefore estimated to be **long-term, moderate, and adverse**.

The cumulative effects of Alternative B on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse and beneficial**.

Alternative C: Modifications to Existing Facilities (Moderate)

Under Alternative C, some additional traffic would be generated by construction of the upgrades, modifications, additions and spatial reconfiguration to the infrastructure and existing facilities. It is estimated that approximately 3.5 to 4 additional heavy truck trips would be made to the site per week, 1 to 1.3 truck trips per week would be made to remove debris, and approximately 30-35 daily auto/light truck trips would be made during a 18-24 month construction period. Trucks carrying building materials must travel approximately 3 miles on park roads from Townsend to access Tremont.

Tremont Road has two 10-foot lanes with a center stripe and numerous sharp curves; therefore, a tractor-trailer or large multi-axle truck would probably be required to cross the center line to negotiate some of the curves. Although tractor-trailers currently deliver goods to the site via Tremont Road without significant traffic problems, there would be more trucks on the roadway due to the construction activity. This would result in **short-term, moderate, adverse effects** on transportation at Tremont during construction.

Alternative C would have limited sustainable design features that could potentially attract additional students or visitors to Tremont. There would be no new employees hired at Tremont or the park as a result of Alternative C, which would cause increased traffic. After construction is completed, traffic should resume normal characteristics as Tremont does not anticipate significantly more visitors and/or students. However, existing problems with traffic congestion on the site would continue to occur since no major changes in site layout and roads would occur. Alternative C would therefore have **long-term, moderate, adverse effects** on transportation during operation.

Cumulative Effects

The cumulative effects of Alternative C on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse and beneficial**.

Conclusion

Alternative C would result in **short-term, moderate, adverse effects** on transportation at Tremont during construction. Alternative C would have **long-term, moderate adverse effects** on transportation during operation.

The cumulative effects of Alternative C on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse, and beneficial**.



Alternative D: Moderate Redevelopment

Under Alternative D, construction activities associated with moderate site redevelopment and major modifications, additions, and spatial reconfiguration to the site would be moderate to heavy. Demolition of buildings at Tremont would require trucks to transport the debris to local landfills. Building materials and workers would be transported to Tremont during the construction period, increasing traffic along Tremont Road. It is estimated that approximately five additional heavy truck trips would be made to the site per week, 1.8 to 2.2 truck trips per week would be made to remove debris, and approximately 40-45 daily auto/light truck trips would be made during a 12-28 month construction period. Trucks carrying the debris and building materials must travel approximately three miles on park roads from Townsend to access Tremont. Tremont Road has two 10-foot lanes with a center stripe and numerous sharp curves; therefore, a tractor-trailer or large multi-axle truck would probably be required to cross the center line to negotiate some of the curves. Although tractor-trailers currently deliver goods to Tremont via Tremont Road without significant traffic problems, there would be considerably more trucks on the roadway due to demolition and construction activity. Alternative C would result in **short-term, moderate, adverse effects** on transportation at Tremont during construction.

Alternative D includes more extensive sustainable design features than Alternatives A. The added sustainable design features and improvements that could attract additional students and/or visitors if Tremont and park advertise these features. This could cause an increase in traffic on the site and along Tremont Road. No new employees would be hired at Tremont or the park as a result of Alternative D. The addition of a roundabout and improved internal traffic routing in the site, but congestion would still occur. The overall effects of Alternative D during operation are estimated to be **long-term, moderate and adverse**.

Cumulative Effects

The cumulative effects of Alternative D on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse, and beneficial**.

Conclusion

Alternative D would result in **short-term, moderate, adverse effects** on transportation at Tremont during construction. Because congestion would still occur on the campus, the effects of Alternative D during operation are estimated to be **long-term, moderate, and adverse**.

The cumulative effects of Alternative D on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse, and beneficial**.



Alternative E: Major Redevelopment

Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. All site development, facility design and construction would become a model of sustainable design principles and development, which would attract an estimated 1,000 students to the campus each year, with an associated increase in traffic. Construction activities and associated transportation needs would be considered heavy. The demolition of the buildings at Tremont would require numerous heavy trucks to transport the debris to local landfills. Building materials and workers would be transported to Tremont during the construction period. Trucks carrying the debris and building materials must travel approximately three miles on park roads from Townsend to access Tremont. Although tractor-trailers currently deliver goods to Tremont via Tremont Road without significant traffic problems, there would be considerably more trucks on the roadway due to the demolition and construction activity under Alternative E as compared Alternative A. It is estimated that approximately five additional heavy truck trips would be made to the site per week, 3.5 to 4.6 truck trips per week would be made to remove debris, and approximately 45 daily auto/light truck trips would be made during a 36-48 month construction period.

Alternative E has more extensive sustainable design features than Alternatives A through D. Overall, Alternative E would have a **short-term, moderate, adverse effect** on local transportation in southern Blount County during construction and a **long-term, minor, adverse effect** on local transportation in southern Blount County during operation. Complete reconstruction of the site, including a turnabout and other rerouting of traffic in the new campus, would have a **long-term, moderate, beneficial effect** on transportation on the site

Cumulative Effects

The cumulative effects of Alternative E on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse, and beneficial**.

Conclusion

Alternative E would have a **short-term, moderate, adverse effect** on local transportation in southern Blount County during construction and a **long-term, minor, adverse effect** on local transportation in southern Blount County during operation. Complete reconstruction of the site, including a turnabout and other rerouting of traffic in the completely new campus, would have a **long-term, moderate, beneficial effect** on transportation on the site.

The cumulative effects of Alternative E on transportation in the Tremont area would be similar to those described for Alternative A, **short-term and long-term, moderate, adverse, and beneficial**.



VISITOR USE AND EXPERIENCE AND VISUAL QUALITY/VIEWSHED

Method

The impact intensity thresholds for Visitor Use and Experience and Visual Quality/Viewshed are as follows:

Negligible: Visitors would not be affected, or changes in visitor experience and/or understanding would be below or at the level of detection. Visitors would not likely be aware of the effects associated with the alternative. Accessibility for individuals with disabilities would not be affected, or effects would not be noticeable or measurable. Effects on the scenic resources and visual quality of the landscape would be at or below the level of detection; changes would be so slight that they would not be of any measurable or perceptible consequence to the visitor experience.

Minor: Changes in visitor experience and/or understanding would be detectable, although the changes would be slight. Visitors could be aware of effects associated with the alternative, but only slightly. Changes to reduce or increase accessibility would be noticeable, but would affect only a limited portion of the individuals with mobility-related disabilities who use the park. Effects to the scenic resources and visual quality of the landscape would be of little consequence to the visitor experience.

Moderate: Changes in visitor experience and/or understanding would be readily apparent. Visitors would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes. Changes to reduce or increase accessibility would be readily apparent to many individuals with mobility-related disabilities who use the park. Effects on the scenic resources and visual quality of the landscape would be readily detectable.

Major: Changes in visitor experience and/or understanding would be readily apparent and would have important consequences. Visitors would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. The effects on accessibility would be readily apparent to most individuals with mobility-related disabilities who use the park and would substantially change their ability to access and experience park features and resources. Effects on the scenic resources and visual quality of the landscape would be obvious, with substantial consequences to the visitor experience.

Duration: Short-term: changes would be recognized for less than one year. Long-term: Changes would be recognized for more than one year.

Context: The area of effect analyzed for transportation is local (Tremont site). For cumulative effects, the area of effects is the region. The region is defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.



Alternative A: No Action Alternative

Under Alternative A, the visitor experience at Tremont would not change compared to existing conditions. Students, researchers and others who utilize Tremont resources directly would continue to be affected by the deteriorating facilities. Disabled students and visitors would continue to have difficulty accessing the following buildings:

- River House
- Information/gift shop/office/shop
- Gaylor Lodge dormitory (restroom only is inaccessible)
- Dining hall/activity center/classrooms (restrooms and second floor)

Problems with poor ventilation, cooling and heating, and crowded conditions in the dormitories and activity center would continue. Poor indoor air quality would continue to be a problem for students and researchers who stay at Tremont for prolonged periods of time. Traffic congestion on the site caused by large trucks making deliveries of students and food supplies, as well as congestion caused by the large numbers of casual visitors to the site, would continue to have an adverse effect on the quality of the visitor experience at Tremont. Under Alternative A, visitors would continue to use the existing deteriorated facilities and would not have any sustainable design features or features to provide a “sense of place.” These factors would therefore have a **long-term, major, adverse effect** on visitor experiences.

Tremont would continue to implement the same programs currently delivered at Tremont and which are highly valued by visitors. This would have a **long-term, negligible, beneficial effect** on visitor experience.

The viewshed and visual quality would not change at Tremont. The site would continue to be surrounded by trees with a limited view of the Great Smoky Mountains to the south and a view of the Middle Prong of the Little River to the west. The single paved road that currently bisects the site in a north-south direction would continue to reduce the quality of the viewshed on the site. The presence of the parking lot below the visitor center also contributes to a reduction in the quality of the viewshed in the center of the site. Alternative A would therefore have a **long-term, major, adverse effect** on the quality of the viewshed and visual quality on the site.

Under Alternative A, requirements of the Americans with Disability Act would continue not to be fully met at Tremont.

Cumulative Effects

Except for the resurfacing of Tremont Road, none of the other projects listed in the section entitled “Cumulative Effects Analysis Method” would have adverse or beneficial effects on visitor experience on the viewshed and visual quality at Tremont. Paving of Tremont Road has had a **long-term, minor, beneficial effect** on the visitor experience by improving the quality of the road itself, and by improvement of the visual quality of the approach to Tremont. When combined with the effects of the other past, on-going,



and future actions that could affect visitor experience and viewshed, the cumulative effects of Alternative A would be **long-term, negligible and beneficial**.

Conclusion

Under Alternative A, problems with existing deteriorating facility conditions would have a **long-term, major, adverse effect** on visitor experiences at Tremont. Tremont would continue to implement the same programs and this would have a **long-term, negligible beneficial effect** on visitor experience.

The viewshed and visual quality would not change at Tremont and the single paved road that currently bisects the site in a north-south direction and the parking lot below the visitor center would continue to reduce the quality of the viewshed. This would have a **long-term, major, adverse effect** on the quality of the viewshed and visual quality of the site.

Under Alternative A, requirements of the Americans with Disability Act would continue not to be fully met at Tremont.

When combined with the effects of the other past, present, and future actions that could affect visitor experience and viewshed/visual quality, the cumulative effects of Alternative A would be **long-term, negligible, and beneficial**.

Alternative B: Modifications to Existing Facilities (Limited)

Alternative B would include minor upgrades, modifications, additions, and spatial reconfiguration to existing facilities and infrastructure to optimize functionality and potential utilization, which would result in an improvement in the quality of the visitor's experience. Construction activities would be relatively minor, but would include modifications to the activity center and dormitories and a new wastewater treatment plant. A new heating, ventilation, and air conditioning system would be installed in the activity center, as well as larger windows, a larger science lab, and the building would become fully compliant with the Americans with Disability Act. The restrooms in the dormitories would be reconstructed for Americans with Disabilities Act compliance, and would also receive new larger windows. Indoor air quality would be improved in the dormitories with better ventilation and the use of low emission materials. The landscaping at Tremont would be improved with native plants. All these features would result in **long-term, minor, beneficial effects** on the visitor's experience by improving indoor air quality, access, and site aesthetics.

Tremont intends to remain operational for student programs and visitors during construction. There would be construction workers working at the site each day for a period of one to two years. In addition, trucks would have to carry building materials on approximately 3 miles of park roads from Townsend to access Tremont, including narrow Tremont Road. It is estimated that approximately two to three additional heavy truck trips would be made to the site per week, less than one truck trip per week would be made to remove debris, an approximately 20-25 daily auto/light truck trips would be



made during a 12-18 month construction period. This would have a **short-term, adverse effect** on visitor experience.

Quality of the visitor's experience would continue to be adversely affected by traffic congestion on the site since no changes in the existing roads or parking areas would be implemented under Alternative B. These problems would continue to have a **long-term, adverse effect** on visitor access and movement between buildings and outdoor teaching areas on the site, similar to Alternative A.

Alternative B would have limited sustainable design features that could potentially attract additional students or visitors to Tremont. There would be no new employees hired at Tremont or the park as a result of Alternative B. Tremont would continue to implement the same excellent programs they currently offer, resulting in a continued **long-term, moderate, beneficial effect** on visitor experience

Alternative B would have a **long-term, negligible beneficial effect** on the visual quality of the site through some of the building improvements and improved landscaping. The basic viewshed and visual quality would remain essentially the same as Alternative A, however, since all the roads and parking lots would remain in place.

Under Alternative B, improvements in the dormitory and activity center would improve the degree to which the facilities meet the requirements of the Americans with Disability Act.

In summary, during construction, Alternative B would have a **short-term, negligible, adverse effect** on visitor experience and a **short-term, moderate, adverse, effect** on the viewshed and visual quality. During operation, Alternative B would have a **long-term, minor, beneficial, effect** on visitor experience and a **long-term negligible, beneficial effect** on the viewshed and visual quality of the site.

Cumulative Effects

The cumulative effects on visitor experience and viewshed and visual quality in the Tremont area would be similar to those described above for Alternative A, **long-term, negligible and beneficial**.

Conclusion

During construction, Alternative B would have a **short-term, negligible, adverse effect** on visitor experience and a **short-term, moderate, adverse, effect** on the viewshed and visual quality. During operation, Alternative B would have a **long-term, minor, beneficial, effect** on visitor experience and a **long-term negligible, beneficial effect** on the viewshed and visual quality of the site. Under Alternative B, improvements in the dormitory and activity center would improve the degree to which the facilities meet the requirements of the Americans with Disability Act.

The cumulative effects on visitor experience and viewshed and visual quality in the Tremont area would be similar to those described above for Alternative A, **long-term, negligible and beneficial**.



Alternative C: Modifications to Existing Facilities (Moderate)

Alternative C would include changes on the site similar to those described for Alternative B. However, there would be more extensive modifications to the activity center and the dormitories than with Alternative B, as described in Section 2.

Effects of construction on visitor experience would be similar to those described for Alternative B, but would extend over a longer period of time because a greater number of modifications would be made. Tremont intends to remain operational for student programs and visitors during construction. Construction workers would be working at the site each day for a period of one and a half to two years. In addition, trucks would be carrying building materials traveling on approximately 3 miles of park roads from Townsend to access Tremont, including narrow Tremont Road. It is estimated that approximately three and a half to four additional heavy truck trips would be made to the site per week, 1 to 1.3 truck trips per week would be made to remove debris, and approximately 30-35 daily auto/light truck trips would be made during a 18-24 month construction period. There would be no new employees hired at Tremont or the park as a result of Alternative C. During construction, these improvements would have a **short-term, minor, adverse** effect on the quality of the visitor's experience.

During operation, the rehabilitated facilities would improve the quality of the visitor's experience, similar to Alternative B. In addition, under Alternative C, the activity center would become fully accessible in accordance with the Americans with Disabilities Act, with the exception of access to the second floor classroom area. Accessible restrooms fully compliant with the Americans with Disabilities Act would also be provided for the nearby tent platform campers. The facilities associated with Alternative C would also improve learning opportunities by fostering a greater sense of place and would provide greater flexibility for serving varied user groups than Alternative A. The overall effect of Alternative C on visitor experience would therefore be **long-term, moderate, and beneficial**.

The viewshed and visual quality of Tremont after construction would be similar to Alternative A, except the exterior of several of the buildings would be improved to be more compatible with the National Park Service goals and policies. This would result in a **long-term, minor beneficial** effect on the viewshed and visual quality of Tremont. However, the basic viewshed and visual quality along the north and south axis of the site would remain the same, split in half by the access road between the administration building and the staff quarters. This would constitute a **long-term, moderate, adverse** effect on viewshed and visual quality.

Overall, during construction, Alternative C would have a **short-term, minor, adverse** effect on visitor use and experience and **short-term, moderate, adverse** effect on viewshed and visual quality during construction. During operation, Alternative C would have a **long-term, minor, beneficial**, effect on visitor use and experience and a **long-term, moderate, beneficial** effect on the viewshed and visual quality of Tremont.



Cumulative Effects

The cumulative effects on visitor use and experience and viewshed and visual quality would be similar to those described for Alternative A, **long-term, negligible and beneficial**.

Conclusion

Overall, during construction, Alternative C would have a **short-term, minor, adverse effect** on visitor use and experience and **short-term, moderate, adverse effect** on viewshed and visual quality during construction. During operation, Alternative C would have a **long-term, minor, beneficial, effect** on visitor use and experience and a **long-term, moderate, beneficial effect** on the viewshed and visual quality of Tremont.

The cumulative effects on visitor use and experience and viewshed and visual quality would be similar to those described above for Alternative A, **long-term, negligible and beneficial**.

Alternative D: Moderate Redevelopment

Alternative D would include moderate site redevelopment and major modifications, additions and spatial reconfiguration to the site and existing facilities to increase facility function, utilization, energy conservation and visual appearance. These would be similar to the improvements under Alternative C, except Alternative D would feature two new sustainable designed dormitories. Other improvements on the site would also be made as described in Section 2, would include improvements in the internal circulation patterns on the site, improved Americans with Disabilities Act access, and a new entry way to the campus.

Effects of construction on visitor experience and viewshed and visual quality would be similar to those described for Alternative C, except because of the construction of additional improvements; visitors would be affected by increased traffic and construction activity over a longer period of time. It is estimated that approximately 3.5 to 4 additional heavy truck trips would be made to the site per week, 1.8 to 2.2 truck trips per week would be made to remove debris, and approximately 40-45 daily auto/light truck trips would be made during a 12-28 month construction period. During construction, these improvements would have a **long-term, moderate, adverse effect** on the quality of the visitor's experience.

During operation, the new improvements would all have a **long-term, moderate beneficial effect** on the quality of the visitor experience. These would result from improved indoor air quality, improved landscaping, improved traffic and pedestrian circulation on the site and improved Americans with Disabilities Act access.

During operation, no new employees would be hired at Tremont or the park under Alternative D. Tremont would not change its programs, but would continue with the same excellent programs it currently offers.



The viewshed and visual quality at Tremont after construction would be similar to current conditions, but the exterior of many of the buildings would be improved to be more compatible with the National Park Service policies. Changes in the circulation patterns created by the new site entryway and roundabout would improve the quality of the viewshed and visual quality. The main viewshed and along the north-south axis of the site would still be dominated by the access road and parking lot, however. The overall effect on the viewshed and visual quality would therefore be **long-term, minor, and beneficial**.

The facilities associated with Alternative D would improve learning opportunities as compared to Alternative A. Alternative D would foster a greater sense of place and would provide greater flexibility for serving varied user groups than the Alternative A. This would result in a **long-term, moderate, beneficial effect** on visitor experience.

Overall, Alternative D would have a **short-term, minor, adverse, effect** on visitor use and experience and a **short-term, moderate, adverse effect** on viewshed and visual quality during construction. During operation, Alternative D would have a **long-term, moderate, beneficial effect** on visitor use and experience and a **long-term minor, beneficial effect** on the viewshed and visual quality at Tremont.

Cumulative Effects

The cumulative effects on visitor use and experience and viewshed and visual quality would be similar to those described for Alternative A, **long-term, negligible, and beneficial**.

Conclusion

Overall, Alternative D would have a **short-term, minor, adverse effect** on visitor use and experience and a **short-term, moderate, adverse effect** on viewshed and visual quality during construction. During operation, Alternative D would have a **long-term, moderate, beneficial effect** on visitor use and experience and a **long-term minor, beneficial effect** on the viewshed and visual quality at Tremont.

The cumulative effects on visitor use and experience and viewshed and visual quality would be similar to those described for Alternative A, **long-term, negligible and beneficial**.

Alternative E: Major Redevelopment

Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. All site development, facility design, and construction would become a model of sustainable design principles and development. Site development would become an integral part of the educational opportunities at Tremont. Section 2 summarizes all the changes that would occur on the site. The effects of construction on visitor use and experience would be slightly greater than Alternative D, but would occur over a longer time period because of the more extensive construction activities. It is estimated that approximately five



additional heavy truck trips would be made to the site per week, 3.5 to 4.6 truck trips per week would be made to remove debris, and approximately 45 daily auto/light truck trips would be made during a 36-48 month construction period.

The effects of operation on visitor use and experience would be similar to Alternative D, except visitors would have a greater intensity of exposure to more examples of sustainable design because the entire campus would be reconstructed. Other benefits would include improvements in landscaping, traffic, and pedestrian circulation on the site and improved Americans with Disabilities Act access.

The viewshed and visual quality at Tremont after construction would be much different than current conditions, with new buildings that would be more compatible with the National Park Service setting. The main viewshed and visual quality of the site would not be affected by the main access road splitting the site along the north-south access road. Instead, these features would be eliminated and replaced with the natural viewshed of restored habitat facing south from the proposed new activity building. Alternative E would provide a facility that would foster a sense of place with visitors and would create greater flexibility for serving varied user groups. The facility would provide a premier site for meetings regarding parks and environmental education. The facility would maximize the opportunity and enhance the experience of living within a national park setting to learn about the Great Smoky Mountains and sustainability. Alternative E would provide an opportunity to enhance abilities to serve the local community and foster partnerships.

Overall, Alternative E would have a **short-term, moderate, adverse effect** on visitor use and experience during construction. During operation, Alternative E would have a **long-term, major, beneficial effect** on visitor use and experience and viewshed/visual quality.

Cumulative Effects

The cumulative effects on visitor use and experience/viewshed would be the same as those described above for Alternative A, **long-term, negligible, and beneficial**.

Conclusion

Alternative E would have a **short-term, moderate, adverse effect** on visitor use and experience and visual quality viewshed during construction. During operation, Alternative E would have a **long-term, major beneficial effect** on visitor use and experience visitor use and experience and visual quality/viewshed .

The cumulative effects on visitor use and experience/viewshed would be the same as those described above for Alternative A, **long-term, negligible, and beneficial**.

There would be no impairment of the visitor use and experience and visual quality/viewshed as a result of park management actions under Alternative E.



PUBLIC HEALTH AND SAFETY

Method

The impact intensity thresholds for Public Health and Safety are as follows:

Negligible: Public health and safety would not be affected; effects on employee and visitor health or safety would not be appreciable or measurable.

Minor: Effects on employee and/or visitor health and safety would be detectable; however, they would not produce an appreciable change in public health or safety.

Moderate: Effects would be readily apparent, and would result in significant, noticeable effects on employee and/or visitor health and safety. Changes in rates or severity of injury or illness could be measured.

Major: Effects would be readily apparent, and would result in substantial, noticeable effects on staff and/or visitor health and safety, and could lead to staff or visitor mortality. Changes in rates or severity of injury or illness could be measured.

Duration: Short-term: effects last less than one year. Long-term: effects last more than one year.

Context: The area of effect for public health and safety is the Tremont site. For cumulative effects, the area of effects is the region.

Alternative A: No Action Alternative

Under Alternative A, traffic on the site would continue to be congested as a result of car, bus, and truck traffic, posing a safety concern for some pedestrians as well as those driving and parking onsite. However, since there would be no construction associated with Alternative A, and no increase in visitation is expected in the future, no increase in safety issues over existing conditions is projected. Construction would have **negligible adverse effects** on public health and safety.

Under Alternative A, the activity center of existing dormitory would continue to contain hazardous materials, including lead based paint and asbestos floor tile; however, these materials would not pose a health issue unless they were disturbed. All buildings with asbestos and lead based paint would be demolished and disposed in accordance with the proper procedures to reduce health risks. The River House would continue to need repairs.. Dampness and musty smelling conditions would continue to plague the dormitory and activity center. The wastewater treatment plant would continue to work inefficiently and could experience additional operational problems .

Alternative A would result in **long-term, minor, adverse effects** on public health and safety during operation of Tremont.

Cumulative Effects

The various road improvements described in the “Cumulative Impacts Analysis Method” section would provide smoother, safer roadways for the local area and



Tremont Road itself. When combined with the effects of the other past, ongoing, and future actions that could affect public health and safety at Tremont, the cumulative effects of Alternative A would be **long-term, moderate, and beneficial**.

Conclusion

Under Alternative A, traffic on the site would continue to be congested as a result of car, bus, and truck traffic, posing a safety issue for visitors. Under Alternative A, disabled students and visitors would have difficulty accessing the some of the campus buildings. The activity center of existing dormitory would continue to materials that contain asbestos and lead based paint materials; however, these would not pose a health issue unless they were disturbed, and all buildings with asbestos and lead based paint would be demolished and disposed in accordance with the proper procedures to reduce health risks. Dampness and musty smelling conditions would continue to plague the dormitory and activity center. The wastewater treatment plant would continue to work inefficiently and could experience additional operational problems. Continued operation of the existing campus under Alternative A would result in **long-term, moderate, adverse effects** on public health and safety.

The various road improvements described in the “Cumulative Impacts Analysis Method” section would provide smoother, safer roadways for the local area and Tremont Road. When combined with the effects of the other past, ongoing, and future actions that could affect public health and safety at Tremont, the cumulative effects of Alternative A would be long-term, moderate and beneficial.

Alternative B: Modifications to Existing Facilities (Limited)

Limited construction would occur under Alternative B that would result in additional vehicles traveling to the site as described in the transportation section. This would have a **short term, minor, adverse effect** on public safety on roadways during the construction period. Following construction, safety conditions on the site caused by traffic congestion would be similar to Alternative A. Under Alternative B, the activity center would become fully accessible in accordance with the Americans with Disabilities Act, with the exception of access to the second floor. The River House would continue to be used but would not be renovated. The dormitory restrooms would be reconstructed to become accessible to disabled persons. New windows that operate more efficiently would be added to the dormitory, which could help relieve the dampness and musty conditions. Under Alternative B, there would be **short-term minor, adverse effects** on public health and safety on the campus during construction.

Operation would have a **long-term, minor, beneficial effect** on public health and safety due to site improvements as compared to Alternative A.

Cumulative Effects

The cumulative effects on public health and safety would be the same as those described for Alternative A, **long-term moderate and beneficial**.



Conclusion

Limited construction would occur under Alternative B that would result in additional vehicles traveling to the site as described in the transportation section. This would have a **short term, minor adverse effect** on public safety during construction. During operation, safety conditions on the site caused by traffic congestion would be similar to Alternative A. This would result in **short-term, minor, adverse effects** on public health and safety. The cumulative effects on public health and safety would be the same as those described for Alternative A, **long-term, moderate and beneficial**.

Alternative C: Modifications to Existing Facilities (Moderate)

The effects of Alternative C on public health and safety would be similar to those described for Alternative B, except there would be additional traffic on the site and increased safety risks during the construction phase, since more modifications to the site would be made under Alternative C. However, these changes would be limited to moderate upgrades, modifications, additions and spatial reconfiguration to existing facilities and infrastructure as described in Section 2.

Under Alternative C, there would be a greater number of vehicles, including heavy trucks, accessing Tremont to perform the construction as compared with Alternative B. It is estimated that approximately 3.5 to 4 additional heavy truck trips would be made to the site per week, 1 to 1.3 truck trips per week would be made to remove debris, and approximately 30-35 daily auto/light truck trips would be made during a 18-24 month construction period. Precautionary measures would be in place to reduce the potential for accidents during the construction process. Other than a crane to lift the wastewater treatment plant into place and some of the roofing materials, there would be no heavy equipment required.

The River House would continue to be used but would not be renovated, as in Alternative B. The dormitory restrooms would be reconstructed to become accessible to disabled persons. New windows would be added to the dormitory that would help to relieve the dampness and musty conditions. New locally constructed furnishings would be installed that would be composed of materials that emit low quantities of harmful emissions. The restrooms in the administrative office would be reconfigured to become compliant with Americans with Disabilities Act requirements and additional ventilation would be added. The office space would be reconfigured for more efficiency. Access to the trailheads would also be improved to reduce conflicts with Tremont's activities.

If the option of building a new dormitory is selected, the overall effects of Alternative C on public health and safety would be similar to rehabilitation of the existing dormitory.

During operation, traffic congestion on the site would be similar to Alternative A, since no new roads would be constructed under Alternative C. Safety issues associated with traffic congestion would be similar to Alternative A.



Overall, Alternative C would have **short-term, minor, adverse effects** on public health and safety during construction. During operation, Alternative C would have **long-term, minor, beneficial effects** on public health and safety at Tremont.

Cumulative Effects

The cumulative effects of Alternative C on public health and safety would be the same as those described for Alternative A, **long-term, moderate, and beneficial**.

Conclusion

Overall, Alternative C would have **short-term, minor, adverse effects on public health and safety during construction**. During operation, Alternative C would have **long-term, minor beneficial effects** on public health and safety at Tremont.

The cumulative effects of Alternative C on public health and safety would be the same as those described for Alternative A, **long-term, moderate and beneficial**.

Alternative D: Moderate Redevelopment

Alternative D would include moderate site redevelopment and major modifications, additions and spatial reconfiguration to the site and existing facilities to increase facility function, utilization, energy conservation and visual appearance, as described in Section 2.

During construction, there would be a greater number of vehicles, including heavy trucks, accessing Tremont to perform construction as compared with Alternative A. Precautionary measures would be taken to reduce the potential for harm to the public and Tremont students during construction.

Tremont would remain operational for student programs and visitors during construction. It is estimated that approximately five additional heavy truck trips would be made to the site per week, 1.8 to 2.2 truck trips per week would be made to remove debris, and approximately 40-45 daily auto/light truck trips would be made during a 12-28 month construction period. These activities would increase safety risks for visitors to Tremont.

During operation, the two new dormitories would be feature sustainable design features and would be accessible for disabled persons. The new buildings would be constructed with operational windows and would also be fitted with a high efficiency heating, ventilation, and air conditioning system. The superior ventilation and humidity control would eliminate the dampness and musty smell, which would improve safety conditions for students and faculty.

Improvements to the activity center would be the same as those specified for Alternative C, with resulting improvements in indoor air quality and access for visitors. The administration building would become fully compliant with Americans with Disabilities Act requirements, resulting in improved access and safety for visitors.

A roundabout with a drop off location would be constructed near the entrance that would improve safety conditions for cars and pedestrians. Internal traffic circulation



would be modified to reduce pedestrian/vehicular conflicts. A dedicated pedestrian crossing would be constructed over the Middle Prong of the Little River, thus improving safety conditions for pedestrians.

Overall, Alternative D would have **short-term, minor, adverse effects** on public health and safety on roadways during construction. Alternative D would result in **long-term, moderate, beneficial effects** on public health and safety during operation.

Cumulative Effects

The cumulative effects of Alternative D on public health and safety would be the same as those described for Alternative A, **long-term, moderate and beneficial**.

Conclusion

Overall, Alternative D would have **short-term, minor, adverse effects** on public health and safety during construction. Alternative D would result in **long-term, moderate, beneficial effects** on public health and safety during operation.

The cumulative effects of Alternative D on public health and safety would be the same as those described for Alternative A, **long-term, moderate and beneficial**.

Alternative E: Major Redevelopment

Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. All site development, facility design and construction would become a model of sustainable design principles and development, as described in Section 2. Tremont intends to remain operational for student programs and visitors during construction. There would be construction workers working at the site each day for a period of approximately one to two years. Precautionary measures would be in place to reduce the potential for harm to the public and Tremont students during the construction process. This alternative would involve complete reconstruction of the entire site and would require a large amount of construction equipment and trucks hauling building materials and debris. In addition, trucks would carry building materials on approximately 3 miles of park roads from Townsend to access Tremont, including narrow Tremont Road. It is estimated that approximately five additional heavy truck trips would be made to the site per week, 3.5 to 4.6 truck trips per week would be made to remove debris, and approximately 45 daily auto/light truck trips would be made during a 36 to 48-month construction period. This would result in a higher level of safety risk for visitors on roadways during construction as compared with all the other alternatives.

During operation, Alternative E would feature many improvements in site safety and health because the entire campus would be reconstructed. An improved entryway and site configuration, roundabout, and dedicated pedestrian crossing over the Middle Prong of the Little River would improve the “sense of place” on the campus. Internal circulation would be modified to reduce pedestrian/vehicular conflicts. All buildings would be constructed to comply with Americans with Disability Act requirements and all



areas would be accessible. All buildings with asbestos and lead based paint would be demolished and disposed in accordance with the proper procedures, and replaced with buildings containing environmentally friendly materials. All buildings would contain operational windows, as well as new high efficiency heating, ventilation, and air conditioning systems that would help to prevent dampness and musty smells, thereby improving indoor air quality.

Overall, Alternative E would have a **short-term, minor adverse effect** on public health and safety during construction. During operation, Alternative E would have a **long-term, moderate, beneficial, effect** on public health and safety as a result of complete redesign and construction of the entire campus.

Cumulative Effects

The cumulative effects of Alternative E on public health and safety would be the same as those described for Alternative A, **long-term, moderate, and beneficial**.

Conclusion

Overall, Alternative E would have a **short-term, minor, adverse effect** on public health and safety during construction. During operation, Alternative E would have a **long-term, moderate, beneficial, effect** on public health and safety as a result of complete redesign and construction of the entire campus.

The cumulative effects of Alternative D on public health and safety would be the same as those described for Alternative A, **long-term, moderate, and beneficial**.

SOUNDSCAPE

Method

The impact intensity thresholds for soundscape are as follows:

Negligible: Human-caused or project-specific sounds do not compete with ambient sounds. Where noise is audible, it is for short duration, with significantly lengthy periods of time that are noise free.

Minor: Human-caused or project sounds are detectable above ambient sounds; however, there are frequent periods of time that are noise free.

Moderate: Human-caused or project sounds compete with ambient sounds. The noise generated is perceptible; however, there are periods of time that are noise free.

Major: Human-caused sounds dominate the soundscape and replace natural sounds. Natural sounds in the project area are commonly impacted by noise from management or recreational activities for most of the day without periods of time that are noise free.

Duration: Short-term: intermittent or subsides in months; occurs only during an event or isolated activity. Long-term: persistent; continues to occur over a long period of time.

Context: The area of effect for soundscape is the 10-acre Tremont site and Tremont Road adjacent to the site. For cumulative effects, construction and development sites



where development and highway projects in the region are considered to be the areas of effect. For purposes of this analysis, the region is defined as Blount, Cocke, and Sevier Counties, Tennessee, and Graham, Haywood, and Swain Counties, North Carolina.

Alternative A: No Action Alternative

There would be no construction activity and therefore no adverse effects on soundscape under Alternative A. Under Alternative A, visitation is anticipated to remain at approximately 5,000 students per year. It is assumed that the modal share of vehicles utilized to transport the students and visitors would remain similar to current conditions, and that levels of vehicle noise would not change. Annually, approximately 10,000 visitors go to the visitor center at Tremont to obtain information about Tremont or the park. Most of these visitors arrive via automobile or light truck. Annually, approximately 20,000 hikers also park at Tremont to access the trailheads in the area. Most of these visitors arrive via automobile or light truck. The number of hikers parking at Tremont and their mode of travel and associated noise levels are also not anticipated to change under Alternative A.

Alternative A would continue to utilize conventional compressors for air conditioning and propane for heating Tremont facilities. The propane heating systems are generally silent, while the aging air conditioning compressors are relatively noisy.

Overall, Alternative A would have **no short- or long-term adverse effects** on soundscape.

Cumulative Effects

Soundscape would be affected by construction activities associated with the implementation of actions proposed under the Elkmont General Management Plan Amendment, that could result in additional trucks and associated noise in the south Blount County area. Soundscapes would also be affected by construction of the developments in the Townsend area that could result in additional heavy truck and auto/light truck traffic in southern Blount County. The construction of the extension of the Pellissippi Parkway would primarily occur in northern Blount County. This could result in increased traffic and associated vehicle noise in the Townsend area. Once constructed, the extension of the Foothills Parkway would provide a bypass to the Townsend area for travelers going between Sevier County and western Blount County. This would result in decreased traffic and vehicle noise levels in the Townsend area. Together, these actions would result in **short-term and long-term, minor, adverse effects** on local soundscapes in south Blount County.

Construction activities associated with the Cades Cove planning effort could result in additional heavy truck and light truck/auto traffic and associated noise levels in the south Blount County area. The recent resurfacing of Laurel Creek Road and Tremont Road has resulted in additional heavy trucks and light trucks/autos and elevated noise levels in the south Blount County area due to the construction activity. These actions could result in **short-term, , adverse effects** on local soundscapes in southern Blount



County. However, these projects would also result in **long-term, moderate, beneficial effects** on soundscapes due to the road improvements.

The soundscape on the Tremont site would remain at current levels, as previously described, since no new construction would occur, and no changes in traffic patterns and volumes during operation are expected.

When combined with the effects of the other past, present, and future actions that could affect soundscape at Tremont, the cumulative effects of Alternative A on soundscape would be **short-term, minor, and adverse**.

Conclusion

The soundscape on the Tremont site would remain at current levels, as previously described, since no new construction would occur, and no changes in traffic patterns and volumes during operation are expected. No changes in the soundscape on the Tremont site would occur under Alternative A. Alternative A would have **no short- or long-term adverse effects** on soundscape.

Local soundscapes would be affected by construction projects in the region along with varying traffic levels. When combined with the effects of the other past, present, and future actions that could affect soundscape at Tremont, the cumulative effects of Alternative A on soundscape would be **short-term, minor, and adverse**.

There would be no impairment of soundscapes as a result of park management actions under Alternative A.

Alternative B: Modifications to Existing Facilities (Limited)

Alternative B would include minor upgrades, modifications, additions and spatial reconfiguration to existing facilities and infrastructure to optimize functionality and potential utilization. These features are described in Section 2. These activities would result in short-term increases in noise on the campus and Tremont Road during construction. During operation, use of more efficient and less noisy air conditioners and other facilities on the site would result in a reduction in ambient noise levels as compared with Alternative A. Overall, Alternative B would have a **short-term, negligible, adverse effect** on soundscape during construction and a **long-term negligible, beneficial effect** on the soundscape in the Tremont area during operation.

Cumulative Effects

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

Conclusion

Alternative B would have a **short-term, negligible, adverse, effect** on soundscape during construction and a **long-term, negligible, beneficial effect** on the soundscape in the Tremont area during operation.



Cumulative effects on the soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

There would be no impairment of the soundscapes as a result of park management actions under Alternative B.

Alternative C: Modifications to Existing Facilities (Moderate)

Alternative C would include moderate upgrades, modifications, additions and spatial reconfiguration to the infrastructure and existing facilities to optimize classroom and office space efficiency, utilization, functionality, energy conservation, and visual quality. The features of Alternative C are described in Section 2. These activities would result in a certain degree of increased noise levels during construction. Alternative C has more extensive sustainable design features than Alternative B, but the visitation and associated vehicle and human-associated noise levels are not anticipated to increase substantially over Alternative B.

During construction, Alternative C would have a **short-term, minor, adverse effect** on soundscape. During operation, use of more efficient and less noisy air conditioners and other facilities on the site would result in **long-term, negligible, beneficial effects** on soundscape as compared with Alternative B.

Cumulative Effects

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

Conclusion

During construction, Alternative C would have a **short-term, minor, adverse effect** on soundscape. During operation, use of more efficient and less noisy air conditioners on the site would result in a **long-term, negligible, beneficial effect** on soundscape as compared with Alternative A.

The cumulative effects on soundscape in the Tremont area would be the same as those described for Alternative A, **short-term, minor, and adverse**.

There would be no impairment of soundscapes as a result of park management actions under Alternative C.

Alternative D: Moderate Redevelopment

Alternative D would include moderate site redevelopment and major modifications, additions and spatial reconfiguration to the site and existing facilities to increase facility function, utilization, energy conservation and visual appearance. The features of Alternative are described in Section 2. These actions would result in increased noise levels during construction.

During operation, Alternative D has more extensive sustainable design features and improvements to provide a “sense of place” as compared with Alternative A, and this could help to attract additional students and visitors if Tremont and park advertise these



features. Additional students and visitors would add more noise to Tremont, both from the standpoint of transportation and increased activity level at Tremont. In contrast, use of more efficient and less noisy air conditioners on the site would result in a reduction in noise levels as compared with Alternative A.

Overall, during construction, Alternative D would have a **short-term, minor, adverse effect** on soundscape. During operation, attraction of additional visitors and students to the site would result in a **long-term, negligible adverse effect** on soundscape in the Tremont area and campus. Use of more efficient facilities would result in a **long-term, negligible, beneficial effect** on soundscape.

Cumulative Effects

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

Conclusion

Overall, during construction, Alternative D would have a **short-term, minor, adverse effect** on soundscape. During operation, attraction of additional visitors and students to the site would result in a **long-term, negligible adverse effect** on soundscape in the Tremont area and campus. Use of more efficient facilities would result in a **long-term, negligible, beneficial effect** on soundscape.

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

There would be no impairment of soundscapes as a result of park management actions under Alternative D.

Alternative E: Major Redevelopment

Alternative E would consist of complete site redevelopment, including new and upgraded facilities that meet the current and future needs of Tremont. These actions would result in increased noise levels during construction. The features of Alternative E are described in Section 2. Heavy construction would result in increased noise during the reconstruction of the new campus. Additional students and visitors would add more noise to Tremont, both from the standpoint of transportation and increased levels of activities at Tremont. During construction, Alternative E would have a **short-term, moderate to major adverse effect** on soundscape on the Tremont campus. Attraction of additional visitors and students to the campus during operation would result in a **long-term, minor adverse effect** on soundscape. In contrast, use of more efficient facilities would result in **long-term, negligible, beneficial effects** on soundscape.

Cumulative Effects

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.



Conclusion

Due to heavy construction activities, Alternative E would have a **short-term, moderate to major adverse effect** on soundscape on the Tremont campus. Attraction of additional visitors and students to the campus during operation would result in a **long-term, minor adverse effect** on soundscape. Use of more efficient facilities would result in **long-term, negligible, beneficial effects** on soundscape.

The cumulative effects on soundscape in the Tremont area are the same as those described for Alternative A, **short-term, minor, and adverse**.

There would be no impairment of soundscapes as a result of park management actions under Alternative E.

