# Environmental Assessment
# Blue Ridge Parkway
# Proposed Wastewater Treatment Plant

**Mt Pisgah, North Carolina**

**United States Department of the Interior**
**National Park Service**

---

## September 2006

**On the Cover**: National Park Service photo the existing Mt. Pisgah Wastewater treatment plant, Mt. Pisgah, North Carolina

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

**Proposed Wastewater Treatment Plant for Mt. Pisgah**
**Environmental Assessment**

**Blue Ridge Parkway**
**Buncombe County, North Carolina**

---


**Summary**

The Mt. Pisgah Wastewater Treatment Plant, which is owned and operated by the National Park Service, is out of compliance with State of North Carolina environmental regulations. This has resulted in a notice of violation from the state, and a need for improvements at the facility. In addition to considering the alternative of no action, the National Park Service evaluated two action alternatives to bring wastewater management into compliance:

Construction of a new extended aeration package plant, with discharge to Flat Laurel Creek.

Upgrading the existing facility, with discharge to Flat Laurel Creek.

Unlike the No Action Alternative, both action alternatives would ensure adequate treatment of current and projected future flows of wastewater from the Mt. Pisgah Wastewater Treatment Plant. This would result in moderate, beneficial, long-term impacts to water quality.


**Public Comment**

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days. Please note that names and addresses of people who comment become part of the public record. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations, from businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Please address written comments to:

Suzette Molling
Mt. Pisgah Wastewater Treatment Plant Comments
199 Hemphill Knob Road
Asheville, North Carolina 28803-8686

This page intentionally left blank

## TABLE OF CONTENTS

**TABLE OF CONTENTS**
**(CONTINUED)**



## APPENDICES



**LIST OF FIGURES**



**LIST OF TABLES**

# PURPOSE AND NEED

## PURPOSE OF AND NEED FOR THE PROPOSED ACTION

### Purpose

The National Park Service (NPS) is considering replacing the existing wastewater treatment plant (WWTP) on Mt. Pisgah, North Carolina. Mount Pisgah is located near mile 408 of the Blue Ridge Parkway, approximately 20 miles south of Asheville, NC (see Figure 1, Site Location Map). The existing wastewater treatment plant provides treatment services for the Mt. Pisgah Developed Area, which includes the Mt. Pisgah Inn (51 units), expanded restaurant, the improved country store, a multi-unit employee housing area, a 140-site campground, a 50-site picnic area, and a recreational vehicle waste disposal facility (Figure 2). The plant is owned, operated, and maintained by the National Park Service. The existing wastewater treatment plant near the Mt. Pisgah Developed Area has historically met all North Carolina National Pollutant Discharge Elimination System (NPDES) discharge limits with the exception of ammonia toxicity. Flows are expected to increase in the next several years as the number of visitors coming to the area increases, with a potential for continued and increased numbers of violations of the ammonia toxicity test. The purpose of the proposed project is to provide improved wastewater treatment facilities that will allow the plant to consistently pass the ammonia toxicity test and to have the needed ability to accommodate projected future flows.

### Need

The current WWTP was constructed in the 1950's and has been modified several times since its original construction. These modifications were necessary to keep up with the increased volume of sewage flow as a result of increased area visitation and new state/federal regulations. The current system is antiquated with rapidly deteriorating infrastructure. During the last three years, the Mt. Pisgah treatment plant has violated the effluent discharge requirements of its National Pollutant Discharge Elimination System permit for ammonia toxicity (the Whole Effluent Toxicity test). As a result, the Blue Ridge Parkway received several Notices of Violation from the North Carolina Department of Environmental and Natural Resources Division.

The amount of wastewater treated at the wastewater treatment plant varies seasonally in response to recreational usage of the campground/developed area. During the period May – October when visitor use is at its peak, the wastewater treatment plant receives approximately 20,000 gallons per day on average, with typical peak flows of 30,000 gallons per day. A flow of 35,000 gallons per day was reported on July 4, 2005 (Veltmann 2005).

The plant is closed from November to April when all the facilities in the Mt. Pisgah Developed Area are closed. During the developed area's off-season, the wastewater treatment plant is completely shut down.

For a number of years, the wastewater treatment plant effectively treated incoming wastewater flows. However, as the popularity of the Mt. Pisgah area increased, it was accompanied by an increase in wastewater flow to the wastewater treatment plant.

During periods of peak use, the lagoon has to be drawn down, resulting in the periodic violations of the ammonia toxicity test. Bioassay tests for ammonia toxicity were conducted by HDR (in Veltmann 2005) Olver Incorporated (Olver 2005) reviewed the test reports completed by HDR (Appendix A) for the Pisgah facility and concluded that "the effluent toxicity failures are most likely the result of pH induced ammonia toxicity. Failures have occurred when the wastewater pH has been elevated (around 8) and the toxicity of ammonia is higher. The reported EC20 for Ceriodaphnia dubia, the test species used for toxicity testing, is 15.6 mg/L at a pH of 8.0, and this would suggest that observed ammonia concentrations (> 10 mg/L) are sufficient to cause toxicity. The periodic rise in wastewater pH is probably the result of algae activity. Photosynthesis carried out by the algae will consume alkalinity and cause a rise in wastewater pH."

The NPDES permit does not specify a limit for ammonia, but the plant has been required to conduct Whole Effluent Toxicity Testing in the last two years. In August 2004, the plant received an effluent chronic toxicity violation for failing the Whole Effluent Toxicity test for ammonia. No ammonia toxicity violations occurred in 2005 (NPS 2006b).

The plant has consistently met all other requirements of the state permit, however. Nevertheless, the plant is aging, and requires a significant amount of maintenance during operations to keep it running efficiently and within the limits of the discharge permit. Flows are also expected to increase in the future, as the number of visitors to the area increase over time.

The increased wastewater volumes being treated at the Mt. Pisgah Wastewater Treatment Plant, coupled with periodic violations of the ammonia toxicity tests, demonstrated the need for a wastewater management solution.

The state discharge permit also requires that the temperature above and below the point of discharge in Flat Laurel Creek not vary more than ½ degree centigrade. The objective of this requirement is to protect aquatic life in Flat Laurel Creek and Pisgah Creek, into which Flat Laurel Creek flows. Pisgah Creek is a designated state trout water (NCWRC 2006). To date, the temperature requirement for the discharge has been met. Improved, more efficient facilities are needed to help assure that will continue to be the case.

Based on the problems associated with the existing treatment plant, the preferred alternative will meet the following objectives:

> Provide capacity of at least 35,000 gallons per day to accommodate future maximum daily flow projections.
>
> Meet all state of North Carolina regulations, including the ammonia toxicity test and the requirement for temperature variation above and below the discharge point in Flat Laurel Creek.
>
> Be capable of handling flow volumes that vary widely over a 12-month period.

This environmental assessment analyzes conditions at the site of the existing wastewater treatment plant, describes available alternatives, and assesses the effects of each alternative on the environment.

The environmental assessment has been prepared in accordance with the National Environmental Policy Act of 1969 and implementing regulations, 40 Code of Federal

Regulations Parts 1500-1508; National Park Service Director's Order #12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making; and Section 106 of the National Historic Preservation Act of 1966 as amended, and implementing regulations, 36 Code of Federal Regulations Part 800.

## PURPOSE AND SIGNIFICANCE OF THE PARK

The Blue Ridge Parkway connects the Shenandoah National Park in Virginia with the Great Smoky Mountains National Park in North Carolina via a 469 mile scenic road. The Blue Ridge Parkway is ranked as "America's most scenic drive" by leading travel writers (National Park Service, 2003). This sanctuary of high places encompasses a world of mountain forests, wildlife, and wildflowers thousands of feet above a patchwork of villages, fields, and farms. The toll-free parkway combines awesome natural beauty with the pioneer history of gristmills, weathered cabins, and split rail fences to create our country's most popular national park area. The National Park Service recently reported that annual recreational visitation rose from 16.9 million in 1990 to 19.2 million in 2000 (National Park Service, 2004c).

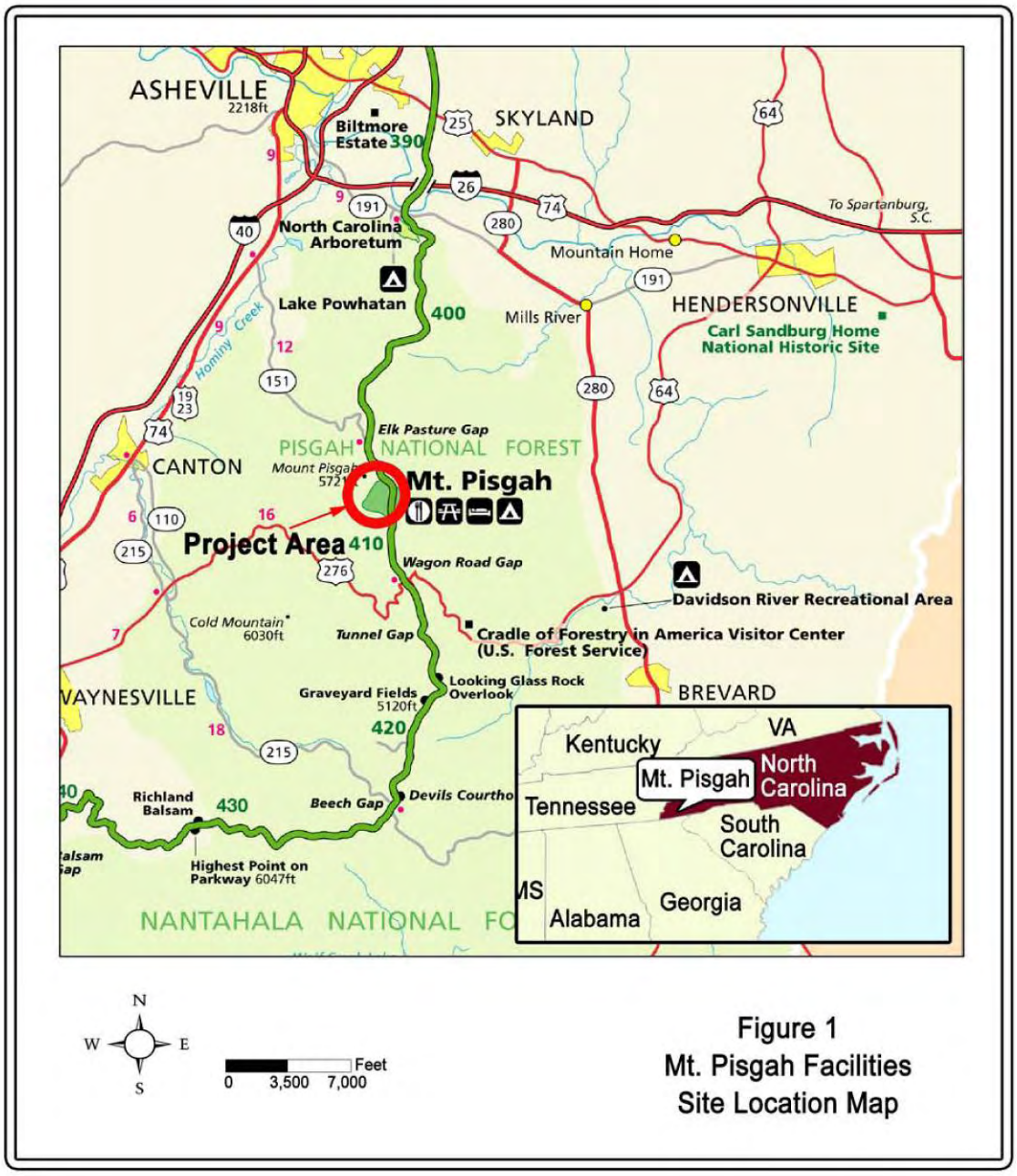


**Figure 1 Location Map**

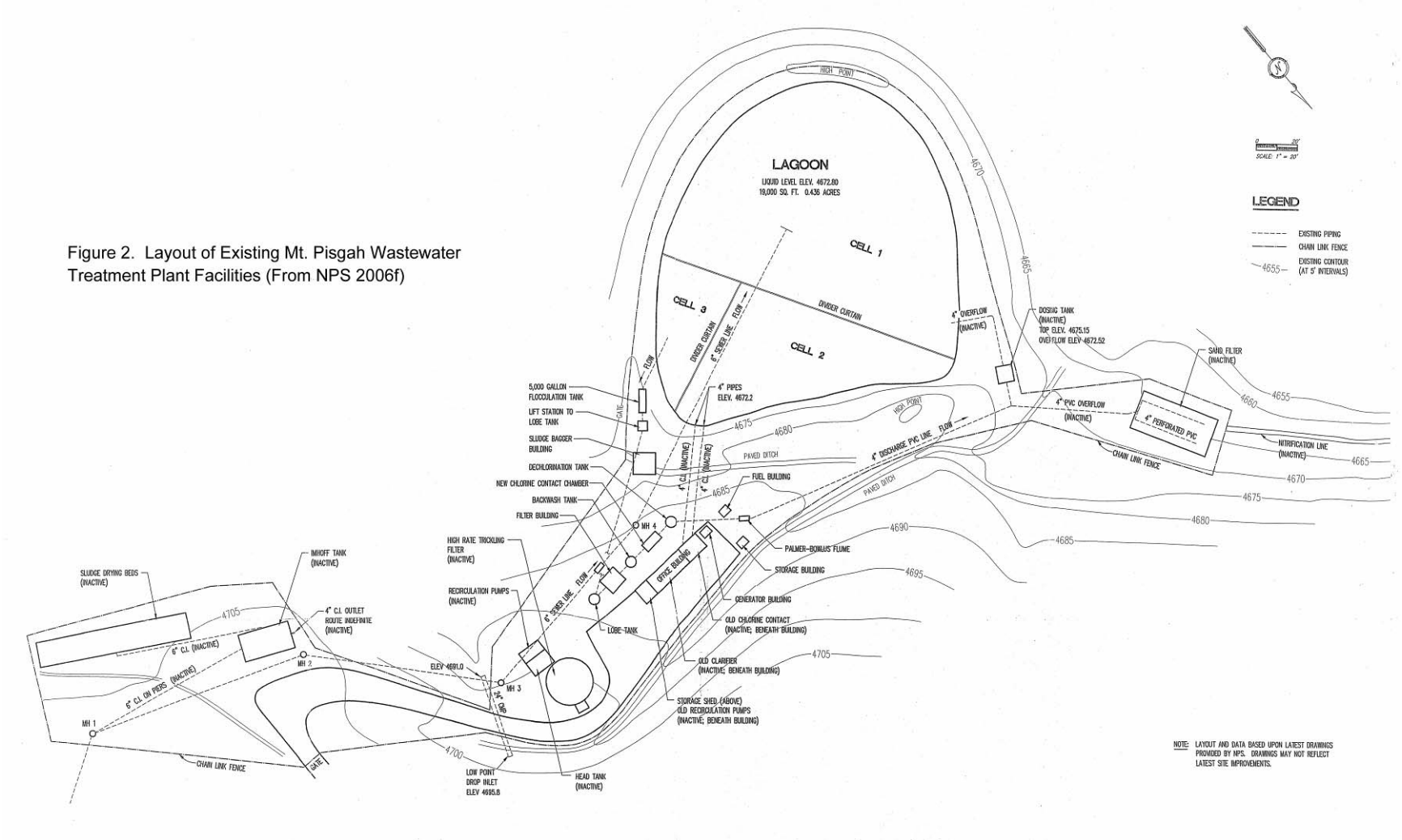


Figure 2. Layout of Existing Mt. Pisgah Wastewater Treatment Plant Facilities (From NPS 2006f)

**Figure 2 Detailed Site Layout**

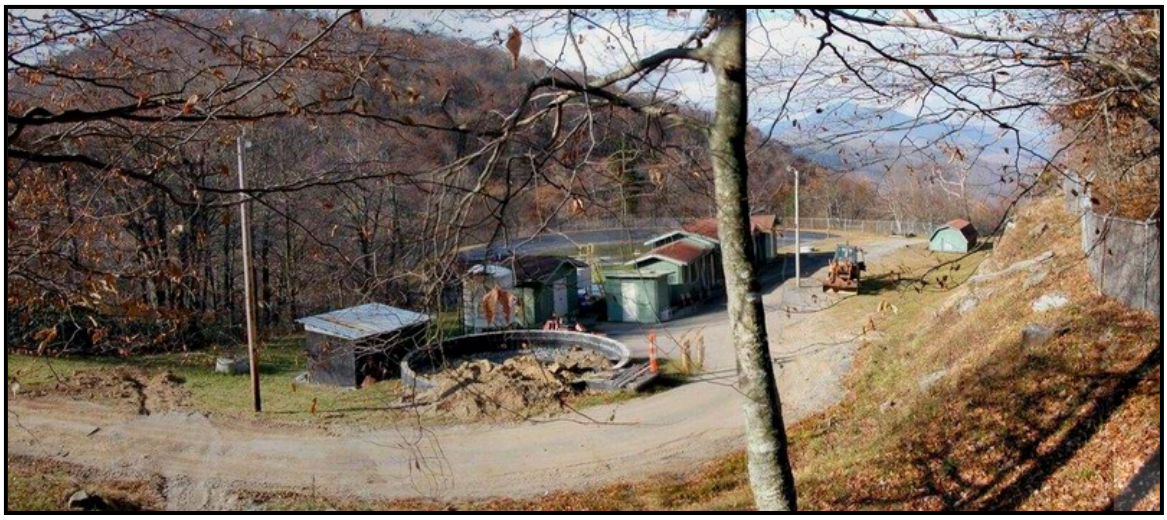

**Figure 3 – Photograph of Existing Mount Pisgah Wastewater Treatment Plant**

The legislated purpose of the Blue Ridge Parkway under a federal action of June 30 1936 is to link Shenandoah National Park in Virginia and the Great Smoky Mountains National Park in North Carolina and Tennessee by way of a recreation-oriented motor road intended for public use and enjoyment. Under the provisions of the Organic Act that created the National Park Service, approved August 25, 1916 (39 Stat. 535), the intended purpose of the Blue Ridge Parkway is to conserve, interpret, and exhibit the unique natural and cultural resources of the central and southern Appalachian Mountains, as well as provide for leisure motor travel through a variety of environments.

The general interpretation of the Blue Ridge Parkway's purpose has been refined into the following more specific purpose statements (National Park Service, undated).

> Physically connect Shenandoah and Great Smoky Mountains National Parks by way of a 'national rural parkway' - a recreational destination-oriented motor road traveling through a variety of scenic ridge, mountainside and pastoral farm landscapes.
>
> Manage the scenic, natural and cultural resources of the Blue Ridge Parkway's designed and natural areas to preserve the integrity of resources and to provide a quality visitor experience.
>
> Influence the protection of the scenic, natural and cultural resources within the corridor composed of those lands that are visible from the Blue Ridge Parkway and/or situated adjacent to the boundary.
>
> Conserve and provide for the enjoyment and understanding of the natural resources and cultural heritage of the central and southern Appalachian Mountains.
>
> Provide opportunities for visitors to experience the scenic qualities, recreational uses and natural and cultural resources of the Blue Ridge Parkway and its corridor.

The route of the Blue Ridge Parkway follows mountain and valley landscapes to link Shenandoah and Great Smoky Mountains National Parks. Its location was selected to provide the best in a variety of scenic, historic, and natural features that evoke the

regional image of the central and southern Appalachian Mountains. In order to maximize scenic views and give Blue Ridge Parkway visitors the impression that they are in a park with boundaries to the horizon, the Blue Ridge Parkway was located in mountainous terrain that normal roads would have avoided. The Blue Ridge Parkway was the first national rural parkway and is widely recognized as an international example of landscape and engineering design achievements with a roadway that lies easily on the land and blends into the existing scene. The Blue Ridge Parkway also was the first national rural parkway to be conceived, designed, and constructed as a leisure-type driving experience.

The Blue Ridge Parkway follows the crests and ridges of the Blue Ridge, Black, Great Craggy, Great Balsam and Plott Balsam Mountains. These five major mountain ranges are part of the central and southern Appalachian Mountains. The 469 mile parkway encompasses several geographic and vegetative zones, with altitudes ranging from approximately 650 feet at the James River in Virginia to nearly 6,050 feet at Richland Balsam in North Carolina. The Blue Ridge Parkway is known for spectacular mountain and valley vistas, quiet pastoral scenes, sparkling waterfalls, colorful flowers and foliage displays, and interpretation of mountain history and culture. Its varied topography and numerous vista points offer easy public access to spectacular views of southern Appalachian rural landscapes and forested mountains. Designed for recreational driving, the Blue Ridge Parkway provides visitors with quiet, leisure travel, free from commercial traffic and the congestion of high-speed highways. As its All-American Road status indicates, it is one of the most diverse and high quality recreational driving experiences in the world.

The park's uninterrupted corridor facilitates the protection of a diverse range of flora and fauna including rare and endangered plant and animal species and areas designated as national natural landmarks. The park preserves and displays cultural landscapes and historic architecture characteristic of the central and southern Appalachian highlands.

**PROJECT BACKGROUND**

The layout of the facilities on the existing wastewater treatment plan site is shown in Figure 2. The plant treats domestic sewage and other wastewater produced by facilities at the Mt. Pisgah Developed Area. The site consists of a five-acre fenced-in area located on a small knoll at the end of a paved access road that connects to the first parking lot on the Blue Ridge Parkway above the plant. The site is located at an elevation of approximately 4,600 feet, approximately ¼ mile downslope of the Blue Ridge Parkway parking lot. The upslope and downslope areas adjacent to the plant are occupied by relatively mature hardwood forests of Mt. Pisgah. Flat Laurel Creek is located approximately a few hundred feet downslope of the site and connects ultimately to Pisgah Creek, a tributary of the East Fork of the Pigeon River (Figure 4).

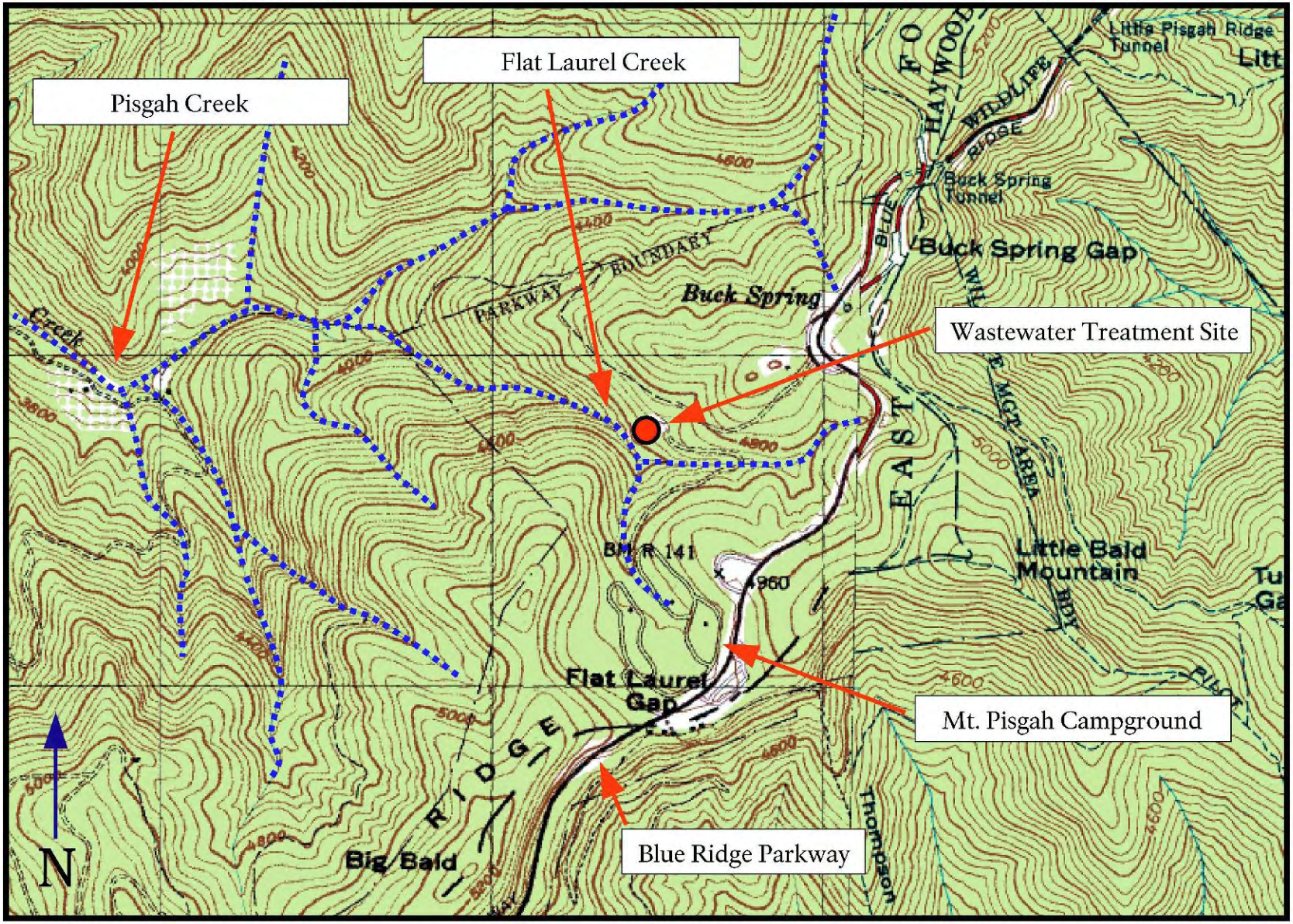


FIGURE 4. DRAINAGE PATTERNS IN THE VICINITY OF THE MT. PISGAH WASTEWATER TREATMENT PLANT.

Except for a narrowly defined seepage slope emergent wetland/intermittent stream located just inside the main gate of the facility between the fence and the main plant road, the site is completely cleared of all natural vegetation and is maintained as a wastewater treatment plant facility. The existing facilities include a wastewater influent pipeline that enters the site from the east, next to the main gate, a 0.46 acre, three-compartment aerated lagoon, a lagoon effluent transfer station, a lobe tank, two effluent transfer (submersible type) pump units, filters, and chlorination and dechlorination units. An abandoned sludge drying bed and Imhoff tank are also located on the east side of the site just inside the entry gate. Treated effluent is discharged through a 4-inch pipe down a seasonally dry channel and into Flat Laurel Creek downslope of the plant.

The wastewater treatment process includes the following steps. Plant influent is conveyed via gravity flow to a 0.46 acre, three-compartment aerated lagoon. The wastewater is pumped from the lagoon effluent transfer station to a lobe tank. Two existing effluent transfer (submersible type) pump units are used for this purpose. Wastewater is pumped through filters, then is chlorinated and de-chlorinated before being discharged to an unnamed tributary of Pisgah Creek. A diaphragm pump is located in a separate concrete chamber for pumping settled sludge out of the lagoon.

A general management plan was initiated in 2002 to establish and guide the overall management, development, and use of the Blue Ridge Parkway in ways that best suit visitors while preserving the park's cultural and natural resources. The objective of the general management plan is to support the purpose for which the park was established and to formalize the park's future direction.

A preliminary engineering feasibility study of potential wastewater treatment alternatives for the Mt. Pisgah facilities was completed by J.F. New & Associates in August, 2001 (J.F. New & Associates, 2001). This study focused on plant capabilities and deficiencies and made recommendations to improve plant operations.

A Value Design Analysis was conducted in 2003 to evaluate the proposed alternative wastewater treatment plant modifications. The final product of this analysis was a Value Design Analysis Report, which included an outline of specifications, site design documents at a level of completion equivalent to 40 percent complete construction documents, and cost estimates (National Park Service, 2003). The major conclusions of the assessment were as follows (as summarized from Veltman 2005):

> Effluent toxicity failures have probably been caused by ammonia toxicity.
>
> The proposed wetland treatment area was at least twice the area proposed by J. F. New & Associates. The proposed site was said to be of inadequate size to support a wetlands treatment system for the Mt. Pisgah facilities.
>
> Construction of a proposed terraced wetland system on the site of the present wastewater lagoon was said to be impractical because it cannot occur until the wetlands have developed.
>
> It was proposed that a wetlands treatment system be ruled out.

Following the initial engineering assessments, an additional assessment regarding the feasibility of wetland treatment systems was prepared by Olver, Inc. (Veltman 2005). This report concluded the following:

The use of a wetland treatment system was discouraged, and a more conservative approach was recommended instead.

Upgrade of the existing treatment facilities was identified as a practical option and it was recommended that this option be explored in more detail. It was also suggested that a more conservative system could be "accompanied by the addition of several wetland treatment units to improve both nitrification and denitrification."

Additional alternatives to upgrading the existing system, including package plants, were also proposed. These systems would take up less space than the existing system and would improve the visual appearance of the site. The assessment also concluded…"If desired, effluent from these alternative processes could be used to feed a series of small vegetated wetlands beds. The use of media filters, MBRs [Membrane Bioreactors] , and SBRs [Sequencing Batch Reactors] should be explored further."

Other projects related to the proposed wastewater treatment system that have been completed include an Environmental Assessment and Finding of No Significant Impact for the Rehabilitation of the Mt. Pisgah Utilities in October 2003 (National Park Service, 2003). The focus of this document was on the upgrade of the supporting infrastructure for the existing wastewater treatment system, including replacement of the leaking water and sewer collection systems in the Mt. Pisgah developed area. The Environmental Assessment also included a partial study of the existing wastewater treatment plant area.

All of the information collected to date was then used by the National Park Service in the fall of 2005 to conduct a Value Analysis and Choosing by Advantage importance process workshop. The objective of the workshop was to determine the most ideal and preferred wastewater treatment plant facility for the Mt. Pisgah area. The product of this effort was summarized in a Value Analysis Report – Mini Value Analysis (NPS 2006f)(Appendix A).

**SCOPING**

The Council on Environmental Quality (CEQ 1978) guidelines for implementing the National Environmental Policy Act and the National Park Service National Environmental Policy Act guidelines contained in *Director's Order # 12: Conservation Planning, Environmental Impact Analysis and Decision Making Handbook* (National Park Service, 2001b) require scoping. Scoping is an early and open process completed by the National Park Service to:

Determine important issues.

Eliminate issues that are not important or relevant.

Identify relationships to other planning efforts or documents.

Define a time schedule of document preparation and decision-making.

Define purpose and need, agency objectives and constraints, and the range of alternatives.

There are two types of scoping – internal and external. Internal scoping is conducted by the National Park Service to determine the types of issues that might be associated with a

proposed project, and forms the basis for the assessment of the effects of the alternatives. Internal scoping involves analyzing the characteristics of construction and operation, and relating these proposed actions to potential environmental effects. External scoping involves early public involvement and can include letters to involved agencies, stakeholder meetings, informal public meetings or open houses, formal public hearings, and newsletters. Scoping letters to the agencies are required for every environmental assessment prepared by the National Park Service. The other forms of external scoping are used in varying degree, depending on the nature of the issues involved for a particular project. The amount of external scoping is determined primarily by the degree of the potential for adverse environmental effects of a proposed project.

The National Park Service has conducted the following scoping activities in conjunction with the proposed wastewater treatment facilities at Mt. Pisgah:

> An internal scoping meeting was held on November 9, 2005 at the Blue Ridge Parkway Headquarters at Hemphill Knob to discuss the potential issues surrounding alternatives for construction and operation of a new wastewater treatment plant. It was determined that primarily due to space and topographic limitations, none of the alternatives that involved wetland treatment would be employed, and that all construction activities for the proposed project would take place entirely within the existing disturbed fenced-in area occupied by the existing treatment plant and lagoon. Therefore, the nature of the potential effects of the proposed project on the environment would be limited.
>
> External scoping has included the following:
>
> > Coordination letters to federal, state and local agencies, including the US Environmental Protection Agency, North Carolina Department of Environmental and Natural Resources, the US Fish and Wildlife Service, and the State Historic Preservation Officer were circulated in April, 2006.
> >
> > Preparation and distribution of a newsletter that summarizes the purpose and need of the project and alternatives. The newsletter was posted on the park website and was also mailed to stakeholders.
> >
> > A copy of the draft environmental assessment was distributed to the review agencies.
> >
> > The draft environmental assessment will be made available to the public at the park website and at park headquarters.
> >
> > For the previous environmental assessment entitled *Environmental Assessment and Finding of No Significant Impact (FONSI) for the Rehabilitation of the Mt. Pisgah Utilities* in October 2003 (National Park Service, 2003), the National Park Service invited stakeholder groups and the public to open meetings to inform the public and identify potential concerns. This project included a brief discussion of the proposed changes in the wastewater treatment plant itself, and a detailed assessment of the effects of infrastructure improvements (including roads and pipelines).

Together, all of these scoping activities assure that potential issues and concerns associated with the construction and operation of the proposed wastewater treatment

plant project have been identified and included in this environmental assessment. Because all of the construction activities would occur entirely within the existing plant site, the environmental effects would be limited.

## ISSUES AND IMPACT TOPICS

Potential issues and concerns affecting the proposed action were identified based on the specific design and operational features of each facility. Issues and concerns affecting this proposal were identified from past National Park Service planning efforts and by input from Blue Ridge Parkway staff, local, state and federal agencies, local and regional organizations, and the general public. The major issues and concerns include:

- Potential effects on a small emergent wetland located just inside the access gate of the existing fenced-in wastewater treatment plant site.
- Potential effects on cultural resources that might exist inside the existing fenced-in wastewater treatment plant site.
- Potential effects on special status species.
- Potential effects of soil disturbance or soil erosion resulting from grading and/or filling of the lagoon.
- Ammonia toxicity issues in the receiving stream below the plant.
- Potential effects of construction and operation on air quality.
- Potential spreading of nuisance plant seeds (especially bittersweet, *Celastrus orbiculatus*) in fill dirt brought onto the site from other areas, especially if an alternative is selected in which the lagoon is filled.
- Potential effects of temperature of the discharge on trout in the receiving stream.

Resources of concern that could be affected by the range of alternatives are defined in the National Park Service National Environmental Policy Act process as impact topics. For this project, a set of impact topics was identified based on the potential environmental effects of the alternatives. Potential impact topics were identified based on federal laws, regulations, and Executive Orders; 2001 National Park Service *Management Policies*; and National Park Service knowledge of limited or easily impacted resources. A list of impact topics and a summary of relevant regulations or policies related to each impact topic are provided in Table 1. Some impact topics were eliminated based on whether they were estimated to have no effect or a negligible effect on the environment. The rationale for the elimination of selected impact topics is summarized in the section that follows.

**Table 1. Derivation of Impact Topics**

| Impact Topic | Relevant Regulations or Policies |
|---|---|
| **Retained** | |
| **Water Quality** | Executive Order 12088; Executive Order 11990; National Park Service Management Policy 4.6.3, 2001; Federal Water Pollution Control Act [The Clean Water Act of 1972 (as amended in 1977]; Title 15 A, Subchapter 4B and Subchapter 06 H of the North Carolina Administrative Code |
| **Aquatic Resources** | National Park Service Management Policy 4.6, 2001; Federal Water Pollution Control Act [The Clean Water Act of 1972 (as amended in 1977]; Magnuson-Stevens Fishery Conservation and Management Act |
| **Special Status Species** | Endangered Species Act of 1973; National Park Service Management Policy 4.4.2.3, 2001; 40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act); North Carolina Department of Environment and Natural Resources |
| **Dismissed** | |
| **Air Quality** | Federal Clean Air Act; Clean Air Act Amendments of 1990; National Park Service Management Policy, 4.7.1, 2001 |
| **Soils** | National Park Service Management Policy 4.8.2.4, 2001 |
| **Socioeconomics** | 40 Code of Federal Regulations 1500 (regulations for implementing National Environmental Policy Act) |
| **Transportation** | National Park Service Management Policy 9.2, 2001 |
| **Wetlands** | Executive Order 11990; Clean Water Act Section 404; National Park Service Director's Order #77-1; Executive Order 11988; National Park Service Management Policy 4.6.4 and 4.6.5 |
| **Wildlife** | Management Policies 2001, Migratory Bird Treaty Act |
| **Public Health and Safety** | National Park Service Management Policy 8.2.5, 2001 |
| **Vegetation – Native Plant Communities** | National Park Service Management Policy 4.4.2, 2001 |
| **Soundscape/Noise** | National Park Service Management Policy 4.9, 2001 |
| **Park Operations** | National Park Service Management Policy 9.1, 2001 |

**Table 1. Derivation of Impact Topics (Continued)**

| Impact Topic | Relevant Regulations or Policies |
|---|---|
| **Ecologically Critical Areas, Wilderness, Wild and Scenic Rivers, or Other Unique Natural Resources** | 36 Code of Federal Regulations 62 (criteria for national natural landmarks); National Park Service Management Policies 2001; Wilderness Act of 1964, National Park Service Management Policy 6.3, 2001 |
| **Floodplains** | Executive Order 11988 (Floodplain Management) |
| **Geologic Resources** | National Park Service Management Policy 4.8, 2001 |
| **Prime and Unique Farmlands** | Council on Environmental Quality 1980 memorandum on prime and unique farmlands; 40 Code of Federal Regulations 1500 (regulations for implementing National Environmental Policy Act, section 1508.27 |
| **Historic and cultural resources, and design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures** | 40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act); National Park Service Director's Order #12; Section 106 of the National Historic Preservation Act |
| **Sacred Sites** | Executive Order 13007; National Park Service Management Policy 5.3.5.3.2, 2001 |
| **Ethnographic Resources** | National Park Service Management Policy 5.0, 2001 |
| **Natural Lightscape (Night Sky)** | National Park Service Management Policy 4.10, 2001 |
| **Visitor Use and Experience and Viewshed** | National Park Service Organic Act; National Park Service Management Policy 8.2, 2001 |
| **Concession Operations and Commercial Services** | National Park Service Management Policy 10.2, 2001 |

### Impact Topics Included in This Document

**Water Quality:** Construction of buildings and associated construction activities could affect water quality during earthmoving activity and through the increase of impervious surfaces for parking areas, piping and buildings, and filling of the lagoon. For this reason, this impact topic was retained.

**Aquatic Resources:** Construction of buildings and associated construction activities could affect water quality and aquatic resources during earthmoving activity and through the increase of impervious surface for parking area, piping and buildings. Pisgah Creek, located downstream of the receiving stream, Flat Laurel Creek, is classified as a trout stream. For this reason, this impact topic was retained.

**Special Status Species:** There is the potential for the endangered flying squirrel and possibly some protected plant species to occur in the vicinity of the proposed wastewater treatment plant and improvements. Therefore, this topic was retained.

**Impact Topics Dismissed From Further Analysis**

Certain potential impact topics were dismissed because these resources would not be affected by the alternatives or the potential for impacts under all alternatives would be negligible and/or minor. These topics are listed below with the reasons they were not addressed.

**Soils:** This impact topic is dismissed because the site is already cleared and all construction activity would involve negligible to minor amounts of soil disturbance under either of the two action alternatives. No adverse effects on soils would result during operation.

Approximately 4,500 cubic yards (a total of a about approximately 30 truckloads) of clean fill dirt would be brought into the site to fill the lagoon under Alternative B during construction. However, this would have negligible to minor short-term effect on soils in the area where this material is obtained (the actual location for the fill dirt has not yet been determined). Filling the lagoon with clean fill dirt, however, would pose a potential for soil erosion. Potential effects of soil erosion during construction, however, are addressed in the section on water quality.

**Air Quality:** The 1963 Clean Air Act, as amended (42 United States Code 7401 et seq.), requires federal land managers to protect air quality, while the 2001 National Park Service *Management Policies* address the need to analyze air quality during park planning. The proposed wastewater treatment plant is located in Buncombe County, North Carolina, which is currently a designated attainment area. This means that concentrations of criteria pollutants are within standards. Should an action alternative be selected, local air quality would be temporarily affected by dust and vehicle emissions. Hauling material and operating construction equipment would result in increased vehicle emissions. Volatile organic compounds, ozone, carbon monoxide and sulfur dioxide emissions would generally disperse quickly from the construction area. This would last only as long as construction activities occurred and would have a negligible effect on regional pollutant levels. Fugitive dust emissions from construction equipment and vehicle traffic would result in short-term minor increases in airborne particulate concentrations in the area near the project site, depending on soil moisture. These emissions would be temporary, highly localized and would have a negligible effect on regional particulate levels. Best management practices to control dust would be required during construction.

In summary, local air quality in the immediate vicinity could be temporarily affected by dust generated from site reconstruction activities and emissions from construction equipment and vehicles. There would also be increased automobile emissions from vehicles using the site. However, these would range from negligible be minor localized effects. For these reasons, air quality is an impact topic that was dismissed in this document.

**Socioeconomics:** Under either of the two action alternatives, construction of the extended aeration package treatment system could have negligible to minor, short term, local, indirect beneficial effects on the economy of the Mount Pisgah area. The company that is hired to construct the package treatment system could be located in the Mount Pisgah area and some of the materials used to construct the package treatment system could be purchased in the Mount Pisgah area. The workers used to construct the system could be residents of the Mount Pisgah area. The operation of the extended aeration package treatment system would have a no long term, local or regional, direct or indirect beneficial or adverse effect on the economy of the Mount Pisgah area. For these reasons, socioeconomics has been dismissed from further analysis.

**Transportation:** Construction vehicles would have negligible to minor direct, indirect and cumulative effects on regional and local transportation along the route to access the site resulting in traffic impacts to public roads in the area. For these reasons, transportation was dismissed from further analysis.

**Noise / Soundscape:** Noise conditions surrounding the wastewater treatment plant would be expected to change under the proposed action. Natural sounds from birds, frogs and other wildlife are evident at the perimeter of the site, but the site itself is entirely disturbed. The construction of the wastewater treatment plant could cause additional disturbance of the site that could result in further reduction in the natural soundscape. However, all of these effects were estimated to be negligible to minor, local and short-term effects. For these reasons, noise is an impact topic that was dismissed from further analysis.

**Park Operations:** The wastewater treatment plant would be constructed and operated to comply with state and federal requirements. The facility would be necessary, appropriate, and consistent with the conservation of park resources and values. The wastewater treatment plant would improve park operations by providing a facility that meets water quality standards. These would be minor long-term beneficial effects. There would be no adverse effects on park operations. For these reasons, park operations were dismissed from further analysis.

**Wildlife:** No wildlife habitat exists on the site, although it is located within a larger prime wildlife area on top of Mt. Pisgah. Because the existing wastewater treatment plant site has been largely cleared, however, and all construction and operation activities would occur inside the fenced area, construction and operation of the proposed project would have no adverse effects on wildlife.

**Wetlands:** A small seepage slope wetland is located along the roadside within the fence line of the wastewater treatment plant boundary. Construction activities such as roadwork or laying of pipeline could affect this wetland. However, this wetland will be delineated and avoided during all construction activities; therefore, there would be no adverse effects on this resource. Therefore, wetlands were dismissed as an impact topic.

**Vegetation – Native Plant Communities**: The majority of the wastewater treatment plant site has been cleared of native vegetation and is maintained either as grassed areas or space for buildings. Fill dirt placed on the proposed construction site could contain seeds of nuisance vegetation, especially bittersweet, *Celastrus orbiculatus*. However,

contractors hauling fill dirt to the site would be required to take clean material from a depth of at least 18 inches. Therefore, the proposed project would not result in the spread of non-native vegetation and there would no adverse effects on native vegetation as a result. Therefore, this impact topic was dismissed from further consideration.

**Ecologically Critical Areas:** No congressionally designated natural resources, such as ecologically critical areas, Wilderness, Wild and Scenic Rivers, or other unique natural resources are located within the project site, and therefore, ecologically critical areas was dismissed as an impact topic.

**Floodplains:** No floodplains are located within the project site. For this reason, floodplains were dismissed as an impact topic.

**Geological Resources:** The geologic features in or near the site would not be affected by implementation of the proposed action. For this reason, geological resources were dismissed as an impact topic.

**Prime or Unique Farmlands:** The Farmland Protection Policy Act and the U.S. Department of the Interior require an evaluation of impacts on prime and unique agricultural lands. These lands require certain soil types and water availability. According to the Natural Resources Conservation Service located in Asheville, there are no prime or unique farmlands within or near the area proposed for the wastewater treatment plant. Because these areas do not exist in the proposed project site, this topic was dismissed from further consideration.

**Lightscape:** Although the wastewater treatment plant would be used at night, minimal outside lighting would be used. The location of the wastewater treatment plant would result in negligible changes in light characteristics created by lighting. Outdoor lights would, however, be shielded to direct the light downward and reduce upward intrusion. For these reasons, lightscape was dismissed as an impact topic.

**Cultural Resources:** Construction of the wastewater treatment plant would occur in a previously disturbed area. The National Park Service Southeast Archeological Center conducted an assessment regarding Section 106 survey needs and determined that a survey was not required. For these reasons, cultural resources is an impact topic that will be dismissed from further evaluation.

**Sacred Sites:** There are no sacred sites, as defined by Executive Order 13007 near the wastewater treatment plant site or within the construction area. For this reason, sacred sites were dismissed as an impact topic.

**Visitor Use and Experience / Viewshed:** Blue Ridge Parkway visitors expected to use facilities in the Mt. Pisgah area would benefit from improved wastewater treatment services. The location of the wastewater treatment plant would not be altered, and is not in an area that is normally visited. Therefore, the viewshed from the Blue Ridge Parkway would not be affected. For these reasons, the visitor use and experience / viewshed impact topic was dismissed from further analysis.

**Concessions and Commercial Services:** The wastewater treatment plant would not be operated by concession or commercial venture. There would be no vending machines or food service at the wastewater treatment plant. Since there would be no new concessions

associated with the wastewater treatment plant, concessions and commercial services was dismissed as an impact topic.

**Public Health and Safety**: The proposed plant would be an improvement over the existing facility and would have no adverse effects on public health and safety. Neither of the two action alternatives would have any adverse direct, indirect or cumulative effects on public health and safety. Public health and safety risks would be under control by the National Park Service and would be managed in compliance with applicable state and federal regulations.

# ALTERNATIVES

## INTRODUCTION

The National Park Service conducted a Value Analysis and Choosing by Advantages workshop for the project alternatives in the fall of 2005 (National Park Service, 2005). A summary of this workshop's proceedings are provided in Appendix A. Eight action alternatives for the existing plant site were evaluated. These were identified as alternatives A through H (these designations are carried through this environmental assessment for consistency). Six of the eight action alternatives were dismissed from further evaluation. These are described in the sections entitled "Other Alternatives Considered but Dismissed." The alternatives carried forward for analysis in this environmental assessment are Alternative B (the preferred alternative), Alternative A (the other action alternative); and Alternative O (the no action alternative).

## THE NO ACTION ALTERNATIVE (ALTERNATIVE O)

Alternative O, the no action alternative, would consist of continuing the present management operations and conditions. Alternative O provides a basis for comparing the environmental consequences of alternative B (Preferred Alternative) and the other alternatives. Should alternative O, no action, be selected, the National Park Service would respond to future needs and conditions associated with the park's objectives without major actions or changes from the present course.

The existing wastewater treatment plant for the Mt. Pisgah area has a capacity to treat 30,000 gallons per day of wastewater. Flows range from 15,000 gallons per day on average days during the operating season (April-November) to 30,000 gallons per day on peak weekends during this same period. Wastewater, or influent, enters the plant via gravity flow to a 0.46 acre, three-compartment aerated lagoon. From the lagoon it is pumped to a lobe tank in the lagoon effluent transfer station. There are two existing effluent transfer (submersible type) pump units. The wastewater is then pumped through filters, chlorinated, and de-chlorinated before being discharged to Flat Laurel Creek. A diaphragm pump is located in a separate concrete chamber for pumping settled sludge out of the lagoon. No more than two 55 gallons drums of chlorine are stored at the WWTP for operational use. Chlorine is transported to the site by maintenance personnel via government vehicles. It is purchased locally in Asheville.

The National Pollutant Discharge Elimination System permit limits for the existing facility are summarized in Table 2 (from Veltman 2005).

**Table 2. National Pollutant Discharge Elimination System Permit Requirements For The Existing Mt. Pisgah Wastewater Treatment Plant (From Veltman 2005)**

| Parameter | Average | Maximum |
|---|---|---|
| Flow (gallons/day) | | 32,000 |
| Biological oxygen demand5 (milligrams/liter) | 30 | 45 |
| Total suspended solids (milligrams/liter) | 30 | 45 |
| Ammonia (milligrams/liter) | No Limit | No Limit |
| Whole Effluent Toxicity biomonitoring excursions (pass/fail) | Pass/Fail @ 25% | Pass/Fail @ 25% |
| Phosphorus (milligrams/liter) | No Limit | No Limit |
| Fecal Coliform (Most Probable Number) | <200 | <400 |
| Dissolved Oxygen (milligrams/liter) | • 2 | • 2 |
| pH (Standard Units) | NA | 6-9 |

The existing aerated lagoon facility meets National Pollutant Discharge Elimination System effluent requirements on a regular basis except during peak flows in the summer when ammonia levels are high and the lagoon levels drop (NPS, 2005b). On these occasions, effluent ammonia toxicity may occur as indicated by whole effluent toxicity biomonitoring excursions. Excessive sludge accumulation in the lagoons over the operating season is the likely cause of the prior whole effluent toxicity excursions. Maintaining the existing plant is not possible because of the continued risk of ammonia toxicity. In addition, the existing plant cannot improve the effluent quality beyond the existing conditions.

The NPDES permit does not have temperature requirements but the State of North Carolina requires that the temperature of the receiving stream does not vary more then ½ degree centigrade above and below the discharge point. This has been maintained during the life of the existing plant. This requirement is designed to protect trout in Pisgah Creek, located several miles downstream of the Mt. Pisgah treatment plant.

## THE OTHER ACTION ALTERNATIVE (ALTERNATIVE A)

### Alternative A: Upgrade Existing Aerated Lagoon Facility

Alternative A would include upgrading the existing lagoon treatment system at Mt. Pisgah. Lagoon systems similar to the one at Mt. Pisgah are in operation throughout the country and comply with similar effluent standards (30 milligrams per liter biological oxygen demand and total suspended solids). The presence of filters downstream of the lagoon at the Mt. Pisgah facility increases the likelihood of meeting the National Pollutant Discharge Elimination System permit requirements considerably. Without the filters, algae in the effluent can cause total suspended solids violations during spring and summer seasons.

The focus of alternative B is primarily on improving the sludge removal system and solids storage treatment capabilities at the existing plant site. According to the July 8, 2005 Technical Memorandum (Bailey 2005), the likely cause of the previous whole effluent toxicity excursions were the excessive sludge accumulation in the lagoons over the operating season. To facilitate more frequent sludge removal from the lagoon, a diesel-driven pump would be installed on a floating barge. The lagoon sludge pump would convey solids to a 25,000 gallon steel sludge storage tank. A 2.5 horsepower progressing cavity sludge transfer pump would be located next to the storage tank so that at the end of the season, sludge could be transferred to a sludge disposal truck. Many other facility improvements would also be incorporated into this project including: sludge drying bed and Imhoff tank demolition, office building improvements, partial plant asphalt drive reconstruction, and a new emergency electrical generator.

## OTHER ALTERNATIVES CONSIDERED BUT DISMISSED

### Alternative C: Polishing Constructed Wetlands Addition

J.F. New and Associates prepared a Preliminary Engineering Study in August 2001 that evaluated a constructed wetlands treatment system to either supplement or replace the existing lagoon system (J.F. New and Associates, 2001). In the Preliminary Engineering Study, it was assumed that the State would issue a more stringent effluent permit in December 2001 and that more stringent effluent ammonia or other nutrients standards would be enforced. However this has not yet occurred.

A Technical Memorandums (Bailey 2005; J.F. New & Associates, Inc., 2001), an independent report by Olver, Inc. (Veltman 2005) and a Value Analysis Report-Mini VA (NPS 2006f) were developed to evaluate the feasibility of replacing the aerated lagoon treatment system with a constructed wetlands waste treatment system. The conclusion of these assessments was that this was not a feasible alternative. Such a system has the following disadvantages in relation to the Mt. Pisgah site (from NPS 2006f):

> Based on preliminary sizing requirements of 20 lbs biological oxygen demand/(acre day), 3.5 acres to 5.0 acres of constructed wetland area would be required to treat the Mt. Pisgah wastewater. This amount of land is not available at the Mt. Pisgah site.
>
> Site constraints at the treatment facility site would severely limit construction of any additional wetlands beyond the site limits without considerable earthwork activities and cost.
>
> Per discussions with North Carolina Department of Natural Resources and Environment, regulatory approval of a constructed wetland system for the Mt. Pisgah site would be challenging.
>
> Vegetation planted in the wetlands would require harvesting in the fall.
>
> In a National Park Service technical memorandum dated July 8, 2005 (National Park Service, 2005), it was reported that the only feasible way to integrate a wetland system at Mt. Pisgah would be via a polishing wetland. A polishing wetland system

of 0.3 acres could be located downstream of the existing filters and the aerated lagoon system would remain in service.

Under this alternative, plant effluent would flow in and out of the wetland via gravity, so no additional mechanical or electrical components would be required. However, this alternative does not remove any of the existing mechanical system components from service.

**Alternative D: Install Recirculating Sand Filtration System**

The National Park Service has had success using recirculating sand filtration systems at other sites. A recirculating sand filtration system would require a minimum 92' by 18' footprint to treat 30,000 gallons per day. Three septic tanks, a recirculating tank, and recirculation pumps would be required for this alternative. Due to the larger area requirements of this alternative, the only feasible sand filter and tank location would be within the aerated lagoon footprint. This option would require a large amount of compacted fill dirt to bring the top of the filter/tank elevations up to existing grade. A concrete containment barrier would also have to be poured around the filter perimeter. Per conversations with a recirculating sand filter manufacturer, the recirculating sand filter can be anticipated to produce biological oxygen demand and total suspended solids effluent quality less than 10 milligrams per liter. In addition, ammonia reduction is expected to be in the 40 to 50% range.

Advantages of the recirculating sand filter system include prior experience with the system at other National Park Service facilities while disadvantages include having a limited filter construction period due to the need to utilize the aerated lagoon area.

**Alternative E: Install Membrane Bioreactor Package Treatment System**

A Membrane Bioreactor package system, an innovative alternative in wastewater treatment, is similar in some respects to the extended aeration package treatment facility. The Membrane Bioreactor uses membrane technology to separate mixed liquor suspended solids in the aeration basin from treated effluent rather than a gravity separation clarifier used in typical activated sludge processes. Similar levels of sludge production would be expected from both systems, however. Membrane Bioreactor systems produce superior effluent quality compared to most other wastewater treatment technologies due to the very small membrane pore space through which the effluent passes. This type of system would be expected to achieve biological oxygen demand and total suspended solids concentrations less than 5 milligrams per liter and ammonia concentration less than 1 milligram per liter.

In this scenario, the lagoon would be taken out-of-service and a new plant influent pumping station wet-well with short-term equalization storage would be constructed. Two submersible pumps would be provided in the pumping station. The Membrane Bioreactor package plant would be mounted to a concrete slab on-grade. The exterior dimensions of the pre-fabricated structure would be approximately 50' (length) by 15' (wide) by 15' (height). Within the structure, the following zones would be present: influent holding tank, anoxic basin, aeration basin, and a membrane basin (two cells). The existing chlorination and de-chlorination facilities would be utilized. A

programmable logic controller (PLC) and process control panel would be provided to control the system and all process components.

Advantages of the Membrane Bioreactor system include the superior effluent quality while disadvantages include higher capital and operating costs (compared to an extended aeration facility).

**Alternative F: Install Membrane Bioreactor Package Treatment System with Ultraviolet (UV) Disinfection**

This alternative is identical to alternative E, Install Membrane Bioreactor Package Treatment System, except that the existing chlorination/de-chlorination equipment would be taken out-of-service and a new in-line ultraviolet disinfection unit would be installed.

The advantages of installing an ultraviolet disinfection system in conjunction with the Membrane Bioreactor system include elimination of chlorine discharge to the environment and elimination of chlorination / de-chlorination chemicals onsite. Disadvantages include higher capital cost associated with purchasing the ultraviolet treatment equipment.

**Alternative G: Install Sequencing Batch Reactor Treatment System**

A Sequencing Batch Reactor treatment system would be constructed to replace the existing aerated lagoon. The National Park Service has used Sequencing Batch Reactor technology successfully at other parks. Two concrete basins would be constructed with minimum dimensions of (Length-Width-Depth)(LWD) 16' (length) by 14' (width) by 19' (depth). The Sequencing Batch Reactor system requires a minimum sidewater depth of 16'. There is a considerable amount of rock on the project site and it is very likely that rock would be encountered while constructing these basins. The anticipated Sequencing Batch Reactor effluent quality would likely be in the range of 20-15 milligrams per liter biological oxygen demand, 20-15 milligrams per liter total suspended solids, and 5 milligrams per liter ammonia concentration. Therefore, it is anticipated that the existing effluent filters would have to remain in service.

Advantages of the Sequencing Batch Reactor system include prior experience with the system at other National Park Service facilities. Disadvantages include excessive sidewater depth requirements and associated higher construction costs, and an effluent quality that would potentially be very similar to the existing aerated lagoon system.

**Alternative H: Install Orenco Advantex Filtration System**

Under this alternative, eight, 5,000 gallons per day Orenco Advantex Filtration system modules would replace the existing aerated lagoon. The National Park Service has used this technology successfully at other parks. The filter modules have dimensions of (LWD) 16' (length) by 8' (width) by 4'(height). The effluent quality would probably be in the range of 20 milligrams per liter biological oxygen demand, 20 milligrams per liter total suspended solids, and 5-10 milligrams per liter ammonia concentration. Based upon these ranges, it is anticipated that the existing effluent filters would have to remain in service.

Advantages of the Orenco system include prior experience with the system at other parks. Disadvantages include the requirement of a proprietary membrane technology for long-term system operation. Replacing the media may cause problems in the future if the filters become unavailable.

## ALTERNATIVES SUMMARY

Table 3 summarizes the features of alternatives O, A and B, the three alternatives that are analyzed in detail in this environmental assessment.

Five goals for wastewater management were identified in the "Purpose and Need" section. The ability of alternatives O, A and B to meet each of these goals is summarized in Table 4. As shown in Table 4, either of the action alternatives would effectively meet all of the project goals. The No Action Alternative would not meet any of the goals.

Table 5 provides a brief summary of the effects alternatives O, A and B on the impact topics that were retained for analysis. More detailed information on the effects of the alternatives is provided in the "Affected Environment and Environmental Consequences" section.

## Table 3. Description of the Alternatives for the Mt. Pisgah Wastewater Management Upgrade

| Feature | Alternative O (No Action) | Alternative B Package Plant | Alternative A Upgrade Existing Plant |
|---|---|---|---|
| **Description** | No action | Construct a new package treatment plant | Upgrade existing extended aeration lagoon treatment facility at the same site |
| **Meet State of North Carolina Department of Environmental and Natural Resources requirements** | No - during peak flows in the summer when ammonia levels are high and the lagoon levels drop. On these occasions, effluent ammonia toxicity may occur as indicated by whole effluent toxicity biomonitoring excursions. Excessive sludge accumulation in the lagoons over the operating season is the likely cause of the prior whole effluent toxicity excursions. | Yes | Yes |
| **Treatment method** | Continued use of existing lagoon treatment system: influent enters three cell aerated lagoon, pumped to a lobe tank, pumped through filters, chlorinated, and de-chlorinated, discharged to Flat Laurel Creek.<br>A diaphragm pump is located in a separate concrete chamber for pumping settled sludge out of the lagoon. | Replace the majority of the existing treatment plant with a completely enclosed extended aeration package treatment plant system. | Maintain existing aerated lagoon treatment; upgrade existing facility to increase solids removal frequency from lagoon; provide onsite solids storage location. |

**Table 3. Description of the Alternatives for the Mt. Pisgah Wastewater Management Upgrade (Continued)**

| Feature | Alternative O (No Action) | Alternative B Package Plant | Alternative A Upgrade Existing Plant |
|---|---|---|---|
| **Disposal method** | Wastewater would continue to be discharged to Flat Laurel Creek.<br>Sludge would continue to be stored in the lagoon, pumped out, and transported offsite approximately twice a year. The same amounts of sludge would be generated under all three alternatives. | Wastewater would continue to be discharge to Flat Laurel Creek.<br>Sludge would be stored in a 25,000 temporary holding tank, and then removed and transported offsite at the end of the year, or as needed. The same amounts of sludge would be generated under all three alternatives. | Wastewater would continue to be discharge to Flat Laurel Creek.<br>Sludge would be stored in a 25,000 temporary holding tank, and then removed and transported offsite at the end of the year, or as needed. The same amounts of sludge would be generated under all three alternatives. |
| **Additional facilities** | None | Pre-engineered, prefabricated extended aeration package plant, fully enclosed.<br>Use new filters or bypass existing filters.<br>Remove lagoon from service.<br>New plant influent pumping station with short-term equalization.<br>Cavity sludge transfer pumps for transferring sludge to trucks at the end of the season.<br>25,000 gallon steel sludge storage tank.<br>Demolish old sludge drying bed and Imhoff tank<br>Office building improvements.<br>Partial plant asphalt drive paving.<br>New emergency generator. | Diesel drive pump on a floating barge to facilitate more frequent sludge removal.<br>Lagoon sludge pump.<br>Sludge storage tank.<br>Cavity sludge transfer pumps for transferring sludge to trucks at the end of the season.<br>Demolish old sludge drying bed and Imhoff tank<br>Office building improvements.<br>Partial plant asphalt drive paving.<br>New emergency generator. |

**Table 3. Description of the Alternatives for the Mt. Pisgah Wastewater Management Upgrade (Continued)**

| Feature | Alternative O (No Action) | Alternative B Package Plant | Alternative A Upgrade Existing Plant |
|---|---|---|---|
| **Agency involvement** | State of North Carolina Department of Environmental and Natural Resources | State of North Carolina Department of Environmental and Natural Resources<br>Alternative B would simplify agency approval of the project | State of North Carolina Department of Environmental and Natural Resources<br>Alternative B would have more complex permitting requirements as compared with Alternative A. |
| **Capacity** | Treatment capacity exceeds that needed to meet maximum projected flows. | | Average approximately 15,000 gallons per day of municipal plus recreational vehicle disposal wastewater during the operating season from April through November with peaks of 30,000 gallons per day during holiday weekends. |
| **Additional land use** | None – all construction would occur within existing 5-acre site. 0.46 acre Lagoon would be filled, graded and seeded with native grasses. | | None |

**Table 4. Project Objectives and the Ability of the Alternatives to Meet Them.**

| Goal | Alternative O (No Action) | Alternative A Upgrade Existing Plant | Alternative B Package Plant |
|---|---|---|---|
| Provide capacity of at least 30,000 gallons per day | No | Yes | Yes |
| Meet all State of North Carolina regulations, including ammonia toxicity in the effluent and temperature in Flat Laurel Creek | No | Yes | Yes |
| Be capable of handling widely varying flow volumes | No | Yes | Yes |

**Table 5. Comparison of the Impacts of the Alternatives**

| Impact Topics | Alternative O--No Action | Alternative B-Preferred Alternative | Alternative A |
|---|---|---|---|
| Water Quality | Since no new construction would occur under the No Action Alternative, this alternative would have no construction-related effects on water quality. During operation, the plant would be expected to continue to experience occasional violations of the ammonia test, however. Nonpoint runoff would also continue to be generated from the existing disturbed site, but would also continue to be filtered by the densely forested areas between the site and Flat Laurel Creek. Overall, the No Action Alternative would therefore have minor, local, long-term, adverse effects on water quality during operation.<br><br>No new construction would occur at the treatment plant under the No Action Alternative, so there would be no cumulative construction-related effects on water quality under the No Action Alternative. During | There would be a potential for soil erosion and reduction in water quality in Flat Laurel Creek during the grading and leveling of the site where the package plant and other new facilities are constructed. These effects would be minimized by implementation of best management practices for soil erosion during and following filling of the lagoon. The project would therefore have minor, local, short-term effects on water quality in Flat laurel Creek during construction.<br><br>During operation, Alternative B would result in improvements of the quality of the effluent during operation of the new plant. These improvements would minimize the potential for problems with ammonia toxicity in the effluent, since the lagoon would be eliminated, and a more efficient treatment system would be used. Overall, operation of the new package plant under Alternative B would therefore result in a moderate, local, short-term | The effects of Alternative A on water quality during construction would be similar to the effects of Alternative B, since land would still be cleared on the site for the new facilities. The extent of disturbed area created under Alternative A would be less than Alternative B. However, there would still be a potential to affect water quality in Flat Laurel Creek during construction. Construction could therefore have minor, local, short-term adverse effects on water quality. These potential adverse effects would be mitigated by implementation of best management practices.<br><br>During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing |

**Table 5. Comparison of the Impacts of the Alternatives (Continued)**

| Impact Topics | Alternative O--No Action | Alternative B-Preferred Alternative | Alternative A |
|---|---|---|---|
| Water Quality (cont'd) | operation, however, low flow toilets installed at the Mt. Pisgah Inn would reduce the amount of wastewater received by the plant. This would result in a minor, local, long-term, beneficial cumulative effect on water quality.<br><br>There would be no impairment of water quality or values as a result of the implementation of Alternative O. | beneficial effect on water quality.<br><br>All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. Because of these factors, Alternative B would have minor, local, long-term beneficial cumulative effects on water quality.<br><br>There would be no impairment of water quality or values as a result of the implementation of Alternative B. | plant. During operation, this alternative would therefore have local, minor and long-term beneficial effects on water quality.<br><br>The cumulative effects of Alternative A would be similar to Alternative B.<br><br>There would be no impairment of water quality or values as a result of the implementation of Alternative A. |
| Aquatic Resources | Since no new facilities would be constructed under the No Action Alternative, this alternative would have no construction-related effects on aquatic life in Flat Laurel Creek.<br><br>During operation, the effects on aquatic life would parallel effects on water quality. The plant would continue to discharge treated effluent to Flat Laurel Creek, but at lower volumes, fewer periodic | There would be a potential for soil erosion and associated minor, local, long-term adverse effects on aquatic life in Flat Laurel Creek during the grading and leveling of any part of the site where the package plant and other new facilities were constructed. These effects would be minimized by implementation of best management practices for soil erosion.<br><br>During operation, a larger area of disturbed soils would exist on the site | The effects of Alternative A on water quality during construction would be similar to the effects of Alternative B, since land would still be cleared on the site for the new facilities. The extent of disturbed area created under Alternative A would be less than Alternative B, but there would still be a potential to affect aquatic life in Flat Laurel Creek. |

**Table 5. Comparison of the Impacts of the Alternatives (Continued)**

| Impact Topics | Alternative O--No Action | Alternative B-Preferred Alternative | Alternative A |
|---|---|---|---|
| Aquatic Resources (cont'd) | excursions of ammonia toxicity would probably occur, and temperature requirements would be met in Flat Laurel Creek. Nonpoint runoff from the existing site would continue to be generated and would continue to be filtered effectively by forested areas. Overall, the No Action Alternative would therefore have minor, local, long-term, adverse effects on aquatic life in Flat Creek during operation.<br><br>Cumulative effects of the No Action Alternative on aquatic life would parallel the cumulative effects on water quality, since the two are related. The No Action Alternative would have minor, local, long-term, beneficial cumulative effects on aquatic life.<br><br>There would be no impairment of aquatic life or values as a result of the implementation of Alternative O. | as compared with the No Action Alternative and Alternative A, but best management practices would be employed to minimize the potential for soil erosion. Effects of nonpoint runoff during operation would therefore have negligible, local, long-term, adverse effects on aquatic life during operation.<br><br>Alternative B would result in improvements of the quality of the effluent during operation of the new plant that would minimize the potential for ammonia toxicity effects on aquatic life. Overall, operation of the new package plant under Alternative B would therefore result in minor, local, short-term beneficial effects on aquatic life.<br><br>All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. No construction-related cumulative effects on water quality would therefore result under | Construction could therefore have minor, local, short-term adverse effects on aquatic life. These potential adverse effects would be mitigated by implementation of best management practices.<br><br>During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing plant. During operation, this alternative would therefore have local, minor and long-term beneficial effects on water quality.<br><br>The cumulative effects of Alternative A would be similar to Alternative B.<br><br>There would be no impairment of aquatic life or values as a result of the implementation of Alternative A. |

**Table 5. Comparison of the Impacts of the Alternatives (Continued)**

| Impact Topics | Alternative O--No Action | Alternative B-Preferred Alternative | Alternative A |
|---|---|---|---|
| Aquatic Resources (cont'd) | | Alternative B. Operation of the new low-flow toilets in the Mt. Pisgah Inn will reduce the amount of wastewater generated. Therefore, Alternative B would result in a minor, local, long-term beneficial cumulative effect on aquatic life during operation.<br><br>There would be no impairment of aquatic life or values as a result of the implementation of Alternative B. | |
| Special Status Species | Construction activities would have no effect on state- or federally-listed species of plants or animals under the No Action Alternative since no listed species occur in the construction area, and no construction would occur under this alternative. Continued operation of the existing plant would have no effect on state- or federally-listed species within upland habitats inside the fenced-in site, because none of these species are present on the plant site. The continued discharge of treated wastewater to Flat Laurel Creek would have no adverse | Construction would have no effect on state- or federally-listed species of plants or animals under Alternative B because the site is completely cleared and no species occur in the upland portion of the site. There is a potential for listed species to occur in the wetland located inside the fence on the existing plant site, but this has yet to be confirmed by an actual survey. Prior to any construction within the fenced-in area, a survey would be completed, and the wetland would be delineated and avoided. Operation of a new package plant under Alternative B would have no effect on state- or federally-listed | The effects of Alternative A on species of special concern would be similar to Alternative B – the proposed project would have no effect on these resources. Operation of an upgraded treatment plant would have no adverse cumulative effect on state- or federally-listed species since no listed species are present on the site or in Flat Laurel Creek.<br><br>Alternative A would not produce major adverse effects to listed species whose conservation is (1) necessary to |

**Table 5. Comparison of the Impacts of the Alternatives (Continued)**

| Impact Topics | Alternative O--No Action | Alternative B-Preferred Alternative | Alternative A |
|---|---|---|---|
| Special Status Species (cont'd) | effect on state- or federally-listed species since these species do not occur in the creek.<br><br>There would be no impairment of listed species or values as a result of the implementation of Alternative O. | species within upland habitats the fenced-in site, since none of these species are present. Operation of the new package plant under the Alternative B would also not adversely affect any listed species on the site. The continued discharge of treated wastewater to Flat Laurel Creek would have no effect on state- or federally-listed species under Alternative B since no listed species are present.<br><br>There would be no impairment of listed species or values as a result of the implementation of Alternative B. | fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents.<br><br>There would be no impairment of listed species or values as a result of the implementation of Alternative A. |

## THE PREFERRED ALTERNATIVE (ALTERNATIVE B)

### Construct Extended Aeration Package Treatment System

Pre-engineered, pre-fabricated extended aeration activated sludge wastewater treatment facilities are commonly used for flow ranges similar to those at the Mt. Pisgah plant. These systems apply the same biochemical technologies frequently used in larger facilities, but can be procured in a fully enclosed system designed for smaller flow ranges. If properly operated and maintained, extended aeration package treatment facilities produce acceptable effluent quality, and low levels of biological oxygen demand, total suspended solids and ammonia. The effluent from the package facility can either be conveyed to the existing filters or bypass the existing filters.

Under this alternative, the lagoon would be taken out-of-service and filled in with compacted dirt and the useable plant site area would be increased by approximately 0.46 acres. A new plant influent pumping station wet well with short-term equalization storage also would be constructed. Two submersible pumps would be provided in the pumping station. The extended aeration package plant would be mounted to a concrete slab on-grade. The exterior dimensions of the pre-fabricated structure would be approximately 70' (length) by 15' (wide) by 15' (height). Within the structure, the following zones are present: sludge thickening/storage zone, aeration zone, clarifier zone, and a disinfection contact zone (if needed). The sludge thickening/storage zone would temporarily hold biosolids generated in the system until solids are conveyed to a new onsite sludge storage / treatment facility. Sludge would be gravity conveyed to a 25,000 gallon steel sludge storage tank. A 2.5 horsepower progressing cavity sludge transfer pump would be located next to the storage tank, so that sludge could be transferred to a sludge disposal truck. Sludge drying bed and Imhoff tank demolition would also be included under this alternative. To facilitate facility reliability, a new 25 kW generator would also be included on-site.

Advantages of the extended aeration package treatment facility would be the relatively low cost, high degree of reliability, and compact footprint. Alternative B would also provide a new treatment facility for relatively the same costs as alternative A (described below). Given the age of the existing system, there would be continued maintenance concerns if alternative A were implemented. Under alternative B, the effluent, or treated wastewater, would be the same quality or slightly better than the existing system. Since extended aeration package plants are a proven wastewater treatment technology, the North Carolina Department of Environment and Natural Resources permitting process should also be simplified.

## THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in the National Environmental Policy Act. The environmentally preferred alternative would cause the least damage to the biological and physical environment, and would best protect, preserve, and enhance historical, cultural, and natural resources.

Section 101(b) of the National Environmental Policy Act identifies six criteria to help determine the environmentally preferred alternative. The act directs that federal plans should:

> Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
>
> Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
>
> Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
>
> Preserve important historical, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment which supports diversity and variety of individual choice.
>
> Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.
>
> Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternatives A and B both meet these goals more effectively than Alternative O, the No Action Alternative. Each of the action alternatives would effectively manage wastewater and protect water quality. In addition, each has environmental advantages compared to the other.

> Both action alternatives would enable the National Park Service to "Fulfill the responsibilities . . . as trustee of the environment."
>
> "Safe, healthful, . . . and esthetically . . . pleasing surroundings" would better be attained by Alternative A. This alternative would eliminate the lagoon, which would be filled, graded, and seeded with native grasses. Otherwise, Alternatives A and B would meet this requirement in a similar manner.
>
> "Productive . . . surroundings" would be better achieved by Alternative A, which would create a grassed field at the site of the filled lagoon.
>
> Both alternatives would provide an equal "range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences." The overall effect of either of the two alternatives would be moderate, beneficial effect on water quality and aquatic life through improved treatment capability.
>
> Using the same criterion, Alternative A would "attain the widest range of beneficial uses of the environment" by creating more grassed area within the existing plant site.
>
> Both alternatives would help "preserve important historical, cultural, and natural aspects of our national heritage" by improving water quality in Flat Laurel Creek. Since all construction would take place within the existing plant site, and no

cultural resources are present, neither alternative would have any effect on historical or cultural resources.

Neither action alternative would provide beneficial reuse of water, but would provide improved treatment.

Of the two action alternatives, Alternative A is environmentally preferred. The deciding factors include:

The lagoon would not have to be filled, which would avoid the need to haul 4,500 cubic yards of fill dirt to the site, with the associated potential for soil erosion and truck traffic to and from the site;

An overall smaller amount of land would be disturbed to upgrade the existing facilities.

## MITIGATION MEASURES FOR THE ACTION ALTERNATIVES

For all action alternatives, best management practices and other mitigation measures would be used to prevent or minimize potential adverse effects associated with the construction and operation of the wastewater treatment plant. These practices and measures would be incorporated into the project construction documents and plans to reduce the magnitude of impacts and ensure that major adverse impacts would not occur. Mitigation measures undertaken during project implementation would include, but would not be limited to those listed below. The impact analysis in the "Environmental Consequences" section was performed assuming that these best management practices and mitigation measures would be implemented as part of all action alternatives.

### Practices to Minimize Effects on Water Quality and Aquatic Life

Implementation of best management practices would result in local, direct, negligible effects on water quality resulting from soil erosion. All appropriate best management practices would be implemented during construction to prevent degradation of local waters and watersheds. These would include:

Only clean fill, preferably from some site on the Parkway, shall be used. Any fill coming from off-site shall be inspected (as well as the site it came from) to reduce the chances for introduction of exotic plant species.

Construction and other debris shall be disposed of according to Superintendent's Order #6, Solid Waste Disposal, dated July 16, 2003.

There should be no large tankers allowed on treatment plant road after construction.

In the event any action is to be considered that could impact concession services in the Mt. Pisgah area, the Concessions Office shall be provided with advance notification of at least 30 days.

Post construction mitigation measures would include sodding or seeding all exposed soils to prevent erosion, performing routine maintenance on all stormwater treatment

facilities, keeping trash and debris cleared up, and avoiding using chemical pesticides and fertilizers on the landscape.

**Practices to Minimize Effects on Special Status Species**

A survey of the wetland inside the fenced-in area will be conducted to delineate the boundaries of this resource more precisely so it can be avoided during construction and operation. In addition, the National Park Service will conduct a survey of the wetland to determine if any listed species of plants or animals are present in this wetland. The wetland will also be marked and avoided during construction and operation.

This page intentionally left blank

# AFFECTED ENVIRONMENT, EVALUATION METHODOLOGY, AND ENVIRONMENTAL CONSEQUENCES

## INTRODUCTION

### Affected Environment and Environmental Consequences

This section describes the features of the affected environment that could potentially be affected by the proposed Mt. Pisgah Wastewater Treatment Plant project, and provides an assessment of the potential environmental consequences of each of the alternatives. The section is organized according to the previously described three impact topics, which allows for a standardized comparison between alternatives based on the most relevant issues. To facilitate the comparison of environmental consequences, the features of the affected environment for each impact topic are first described, followed by an assessment of the potential effects of each alternative. These include, in sequence, the No Action Alternative, Alternative B (the preferred alternative, extended aeration package plant) and Alternative A (upgrade existing plant).

The National Environmental Policy Act requires consideration of context, intensity and duration of environmental impacts, indirect impacts, cumulative impacts, and measures to mitigate impacts. National Park Service policy also requires that "impairment" of natural and cultural resources be evaluated in all environmental documents. These assessments are therefore provided for each impact topic in the discussion that follows.

### Methodology

#### General Evaluation Methodology

For each impact topic, the analysis includes a brief description of the affected environment and an evaluation of the effects of implementing each alternative. The impact analysis is based on information provided by national park service staff, relevant references and technical literature citations, and subject matter experts. The impact analyses involved the following steps.

*Define issues of concern*, based on public scoping.

*Identify the geographic area* that could be affected.

*Define the resources* within that area that could be affected.

*Compare the resources* to the area of potential effect.

*Identify the effects* caused by the alternative, in comparison to the baseline represented by the No Action Alternative, to determine the relative change in resource conditions. Characterize the effects based on the following factors:

*Whether the effect would be beneficial or adverse*.

*The area affected by the alternative, such as local or regional*.

*Duration of the effect, either short-term or long-term*. Unless an impact-topic-specific definition of these terms is provided, the following will be used.

A short-term impact would last only a few days or weeks.

A long-term impact would last several years or more, or would recur periodically over several years.

*The intensity of the effect, either negligible, minor, moderate, or major*. Impact-topic-specific thresholds for each of these classifications are provided in each impact topic methodology section. Threshold values were developed based on federal and state standards, consultation with regulators from applicable agencies, and discussions with subject matter experts. Table 6 summarizes the impact thresholds used in this environmental assessment.

*Potential indirect effects of the proposed action*. An example of an indirect effect would be changes in water quality caused by growth that is induced by a proposed project. However, the proposed project would cause negligible or no indirect effects in all cases. Therefore, analyses of indirect effects are not provided in this environmental assessment.

*Determine whether impairment would occur* to resources and values that are considered necessary and appropriate to fulfill the purposes of the Blue Ridge Parkway.

*Determine cumulative* effects by evaluating the effect in conjunction with the past, current, or foreseeable future actions for the Mt. Pisgah Developed Area, Blue Ridge Parkway, and the region.

If appropriate, identify *mitigation measures* that may be employed to offset potential adverse impacts.

**Table 6. Impact Topic Threshold Definitions**

| Impact Topic | Negligible | Minor | Moderate | Major | Duration |
|---|---|---|---|---|---|
| Water Quality | Impacts would not be detectable. Levels of water quality parameters would be well below all water quality standards for designated uses. No vegetation or wildlife effects associated with altered water quality would be evident. | Impacts would be measurable, but water quality parameters would be well within all water quality standards for designated uses. 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. | 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 antidegradation 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. | Changes in water quality would be readily measurable, and some water quality standards would be periodically approached, equaled, or exceeded. State water quality regulations and antidegradation 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. | Short-term - Following construction, recovery would take less than one year<br>Long-term - Following construction, recovery would take longer than one year. |
| Aquatic resources | 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. | Effects on aquatic resources or habitats would be measurable or perceptible, but localized within a small area. 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. | A change in aquatic populations or habitats would occur over a relatively large area. The change 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. | Effects on aquatic populations or habitats would be readily apparent, and would substantially change aquatic populations over a large area in and out of the national park. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured. | Habitats and populations:<br>Short-term - Recovers in less than a year after project construction.<br>Long-term - Takes more than a year to recover after project is constructed. |

**Table 6. Impact Topic Threshold Definitions (Continued)**

| Impact Topic | Negligible | Minor | Moderate | Major | Duration |
|---|---|---|---|---|---|
| Species of Special Concern[1] | No federally- or territorial-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 small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" USFWS determination. | The action would result in detectable impacts to an individual (or individuals) of a federally or territorially listed species or its critical habitat, but they 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 with a "may affect/not likely to adversely affect" USFWS determination. | An action would result in detectable impacts on individuals or population of a federally or territorially 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 with a "may affect/likely to adversely affect/adversely modify critical habitat" USFWS determination. | Individuals or population of a federally or territorial listed species, critical habitat, or the natural processes sustaining them would be measurably affected. Key ecosystem processes might be permanently altered resulting in long-term changes in population numbers and permanently modifying critical habitat. Major adverse effects would equate with a "may affect/likely to adversely affect/adversely modify critical habitat" USFWS determination. | |

[1]The Endangered Species Act defines the terminology used to assess impacts to listed species as follows:

No effect — When a proposed action would not affect a listed species or designated critical habitat.

May affect / not likely to adversely affect — Effects on special status species are discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or are completely beneficial.

May affect / likely to adversely affect — When an adverse effect to a listed species may occur as a direct or indirect result of proposed actions and the effect either is not discountable or is completely beneficial.

### Cumulative Effects Analysis Method

The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative effects in the decision-making process for federal actions. 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 the no action alternative and the two action alternatives.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions at the Mt. Pisgah Developed Area, within the Blue Ridge Parkway, and in the surrounding region.

Past actions that have the potential to have a cumulative effect in conjunction with this wastewater management project include the rehabilitation of the Mt. Pisgah Developed Area, which was addressed in a previous environmental assessment. This project included the following components:

Replace all water lines in campground Loops A and B. This consists of approximately 3200 feet of pipe that were placed in the existing sewer easement and about 960 feet in new areas. The existing water lines were abandoned in place, and the existing water line easements were allowed to re-vegetate. The rerouted sections would be:

The 160-foot line to a yard hydrant at south end of Loop A rerouted to avoid passing through two campsites.

The main line that runs through Loops A and B rerouted to consolidate all utilities as much as possible into one easement. The new main water line was placed inside of the existing sewer line easements.

Seven drinking fountains in the interior of Loops A and B were removed and replaced with eight new yard hydrants along the loop roads. This required five new sections of water line (approximately 800 feet total) within the loops. The routes of the lines were chosen to follow existing paths where possible and avoid large trees. The social trails to the existing drinking fountains were allowed to revegetate.

Construct approximately 800 feet of new waterline from the restaurant/concessions area to Loop A. Approximately 100 feet of this route would pass through a wooded area. The route was chosen to avoid large trees.

Replace approximately 1000 feet of sewer line and five manholes in the restaurant/lodging area, including a crossing under the Blue Ridge Parkway. All lines were placed adjacent to the existing lines within the existing easement, except for a 250-foot section relocated 10 feet to avoid a building. The existing lines was abandoned in place.

Demolish the existing aboveground sewer line that crosses the wetland. The existing aboveground sewer line, concrete piers and the two sections of metal pipe was removed by crane to allow natural water flow through the current crossing area. Disturbance did extend further into the wetland.

Construct a new 100-foot long steel footbridge over the wetland. The maximum height of the bridge at the top of the railings was approximately 10 feet above the lowest point ground level of the crossing. The bridge railings was approximately 5 feet above ground level at each end of the bridge.

New water and sewer lines were suspended from the bridge. Approximately 200 feet of water line in the existing easement inside Loop C were replaced to connect with the water line that crosses the bridge. All footings for the bridge were constructed outside of the delineated wetland area. Frequent removal of wetland vegetation was required.

Replace approximately 4500 feet of water line on the west side of the Blue Ridge Parkway to the picnic area, and on the west side of the sewage treatment plant access road. This line was installed adjacent to the existing line within the existing easement. The existing asbestos-cement pipe was abandoned in place, except in certain locations where it had to be removed due to space constraints. An additional 400 feet of new water line was constructed in the shoulder of the picnic area access road, replacing a line that runs in an easement. The existing easement was then allowed to re-vegetate.

Replace approximately 2600 feet of sewer line and 16 manholes from Loop C to the sewage treatment plant, and 1000 feet from the picnic area to the sewage treatment plant. The existing lines was removed, but the manholes were reused if possible.

Repave the access road to the sewage treatment plant.

Demolish seven campsites adjacent to the bog. In Loop C, number 131 was removed, and in Loop B, numbers 37, 40, 41, 42, 44, and 46 were removed. This included removal of pavement in parking slips, tent pad materials and edging, picnic tables, grills, trash receptacles, and curbstones. The natural grade of each site was restored and a layer of mulch was placed over the area.

Construction of all of the above projects has been finished, except for some warranty work that is currently ongoing. The warranty work does not involve any construction and would not affect natural or cultural resources in any way.

Future projects in the Mt. Pisgah Developed Area include:

Upgrading and expanding the rooms at the Mt. Pisgah Inn, and installing low-flush toilets. This would reduce the flows to the wastewater treatment plant over what they are currently.

Improvements to the country store. This is a upgrade of an existing facility would have no environmental effects.

Because there would be no land disturbing activities associated with these two projects, it was determined that they would have no adverse construction-related effects on natural or cultural resources. However, the reduction in flow resulting from installation of low-flow toilets in the Mt. Pisgah Inn would have beneficial effects, and these are included in the impact assessment.

**Impairment Analysis Method**

National Park Service *Management Policies 2001* (NPS 2000) require analysis of potential effects to determine whether or not actions would impair national park service resources or values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, actions that would adversely affect park resources and values.

These laws give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

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 NPS 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. Impairment may result from NPS activities in managing the park, from visitor activities, or from activities undertaken by concessionaires, contractors, and others operating in the park.

An impact to any park resource or value may constitute impairment. However, an impact would be most likely to constitute impairment if it affects a resource or value whose conservation is:

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

A determination on impairment is included in the impact analysis section for all impact topics relating to Blue Ridge Park Way Area resources and values. It is based on the impact-topic-specific definition of impairment that is provided in each national recreation area resource and value impact topic methodology section.

## Water Quality

### Affected Environment

The existing wastewater treatment plant discharges treated effluent to Flat Laurel Creek, an intermittent stream located approximately 1/8 of a mile downslope of the plant. Flat Laurel Creek is an upper tributary of Pisgah Creek, a tributary of the East Fork of the Pigeon River (Figure 4). Pisgah Creek is classified as a trout water by the State of North Carolina (NCWRC 2006). Both creeks are located in the French Broad River basin, defined as United States Geological Survey Cataloging Unit 06010105 (EPA 2006). Water quality in this area is good, and none of the streams are listed on the 303(d) list (NC Division of Water Quality 2006).

The discharge to Flat Laurel Creek is permitted under the National Pollutant Discharge Elimination System. The permit does not specify a limit for ammonia, but the plant has been required by the State of North Carolina to conduct Whole Effluent Toxicity Testing in the last two years. In August 2004, the plant received an effluent chronic toxicity violation for failing the Whole Effluent Toxicity text for ammonia. No ammonia toxicity violations occurred in 2005 (NPS 2006b).

The discharge permit does not have a temperature limit, but the State of North Carolina requires that the difference in temperature above and below the discharge in Flat Laurel Creek differ by no more than ½ degree Centigrade. The temperature of the water in Flat Laurel Creek is therefore measured on a regular basis above and below the discharge point from the plant. This requirement has been met.

The plant is located on a small, steep sided knoll above the Flat Laurel Creek drainage. Water quickly reaches Flat Laurel Creek via overland sheet flow during rain events, as well as from intermittent drainages above and below the site. The area surrounding the site is heavily forested, and the abundant vegetation and soil cover provides an effective filter for nonpoint runoff. The plant site contains approximately five acres of impervious and/or disturbed land upslope of Flat Laurel Creek. The rest of the Mt. Pisgah Developed Area also contains paved areas and other types of impervious surfaces such as rooftops at the Mt. Pisgah Inn, country store and other small buildings.

### Impacts of Alternative O: No Action / Continue Current Management

**Analysis**: No new facilities would be constructed under the No Action Alternative. Therefore, levels of soil erosion and potential associated effects on water quality of Flat Laurel Creek would be similar to present conditions. Alternative O would therefore have no adverse construction-related effects on water quality.

During operation under the No Action Alternative, the plant would continue to discharge treated effluent to Flat Laurel Creek, but at lower volumes than it does at present during the year, because of the installation of low flow toilets in the Mt. Pisgah Inn. The discharge limits of the National Pollutant Discharge Elimination System permit would continue to be met, except periodic excursions of ammonia toxicity would probably still occur. These excursions usually occur when the lagoon is drawn down during periods of peak use in late summer and fall, and the water in the lagoon comes into closer proximity to the solids on the bottom. With lower flows, however, these

excursions would be expected to be fewer, since the lagoon would not experience drawdown as frequently as it does currently, and the volume of wastewater would be lower than at the present time.

The temperature of the discharge from the wastewater treatment plant would continue to meet the ½ degree Centigrade requirement in Flat Laurel Creek. With lower discharge volumes, the potential for exceeding the temperature limits would be expected to be reduced.

During operation, nonpoint runoff from the existing site would continue to be generated during rain events through sheet flow and via intermittent streams. Because the area below the site is densely forested, however, runoff from the site would continue to be filtered effectively. Water quality in Flat Laurel Creek and Pisgah Creek would therefore be similar to existing conditions.

Overall, the No Action Alternative would have minor, local, long-term, adverse effects on water quality during operation.

**Cumulative Impacts**: No new construction would occur at the wastewater treatment plant under the No Action Alternative, and all of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. Since construction of these two remaining projects in the Mt. Pisgah Developed Area do not involve any land clearing, they will have no cumulative effects on water quality through soil erosion. Therefore, no construction-related cumulative effects on water quality would result under the No Action Alternative.

Operation of the existing plant would be continued using the current procedures. Low flow toilets installed at the Mt. Pisgah Inn would reduce the amount of wastewater received by the plant. This would result in a minor, local, long-term, beneficial cumulative effect on water quality during operation.

**Conclusion**: Since no new construction would occur under the No Action Alternative, this alternative would have no construction-related effects on water quality. During operation, the plant would be expected to continue to experience occasional violations of the ammonia test, however. Nonpoint runoff would also continue to be generated from the existing disturbed site, but would also continue to be filtered by the densely forested areas between the site and Flat Shoal Creek. Overall, the No Action Alternative would therefore have minor, local, long-term, adverse effects on water quality during operation.

No new construction would occur at the treatment plant under the No Action Alternative, so there would be no cumulative construction-related effects on water quality under the No Action Alternative. During operation, however, low flow toilets installed at the Mt. Pisgah Inn would reduce the amount of wastewater received by the plant. This would result in a minor, local, long-term, beneficial cumulative effect on water quality.

The No Action Alternative would not produce major adverse effects to water resources whose conservation is (1) necessary to fulfill specific purposes identified in the

establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water resources or values as a result of the implementation of the No Action Alternative.

**Impacts of Alternative B: Extended Aeration Package System - Preferred Alternative**

**Analysis**: The potential effects of this alternative during construction on water quality are related to soil erosion. Soils would be disturbed in an approximately 70 x 15 foot area required for construction of the extended aeration package system. The package plant would be constructed in the eastern end of the site just inside the gate, which would require removal of the abandoned Imhoff sludge treatment tanks and sludge beds. Some additional new associated facilities would also be constructed that would result in soil disturbance. These activities would increase the potential for soil erosion and associated effects on water quality in Flat Laurel Creek during the grading and leveling of the site. These effects would be minimized by implementation of best management practices for soil erosion.

A distinct feature of this alternative would be the filling of the 0.46-acre lagoon during construction. This would require hauling approximately 4,500 cubic yards of fill dirt from off site and placing it in the abandoned and drained lagoon. The filled lagoon would then be graded, compacted, and planted with native grasses. During and after the filling of the lagoon with new dirt, there would a potential for soil erosion and a reduction in water quality to occur in Flat Laurel Creek during rain events. These effects would be minimized by implementation of best management practices for soil erosion during and following filling of the lagoon.

Because the lagoon would be filled under Alternative B, but remain in service under Alternative A, a larger area of disturbed soil would occur under Alternative B as compared with Alternative A. However, best management practices would be employed during construction to control soil erosion during filling of the lagoon. With these mitigation measures in place, the project would have minor, local, short-term effects on water quality in Flat laurel Creek during construction.

During operation, a larger area of disturbed soils would exist on the site as compared with the No Action Alternative and Alternative A because the 0.46 acre lagoon would be filled and the surface would be grassed and maintained as an open area. This would increase the potential for erosion and subsequent effects on water quality of Flat Laurel Creek. However, best management practices would be employed to minimize the potential for soil erosion from the site during operation. Effects of nonpoint runoff during operation would therefore have minor, local, long-term, adverse effects on water quality during operation.

Alternative B would result in improvements of the quality of the effluent during operation of the new plant. These improvements would minimize the potential for problems with ammonia toxicity in the effluent, since the lagoon would be eliminated, and a more efficient treatment system would be used. Temperature limits above and

below the discharge point in Flat Laurel Creek would continue to be met. Sludge would be stored in a 25,000 gallon tank prior to removal once or twice a year to an approved facility. Sludge disposal would therefore have no effects on water quality in Flat Laurel Creek or elsewhere.

Overall, operation of the new package plant under Alternative B would therefore result in a moderate, local, short-term beneficial effect on water quality.

**Cumulative Effects**: All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. Since construction of these two remaining projects in the Mt. Pisgah Developed Area does not involve any land clearing, these projects will have no effects on water quality through soil erosion. Therefore, no construction-related cumulative effects on water quality would result under Alternative B.

Operation of the new low-flow toilets in the Mt. Pisgah Inn will reduce the amount of wastewater generated and treated at the new package plant. The operation of the new package plant under Alternative B would also result in an improvement in water quality of the flow that is received from the developed area. The combined effect would therefore be an improvement over existing conditions. Therefore, Alternative B would result in minor, local, long-term beneficial cumulative effects on water quality.

**Conclusion**: There would be a potential for soil erosion and reduction in water quality in Flat Laurel Creek during the grading and leveling of the site where the package plant and other new facilities are constructed. These effects would be minimized by implementation of best management practices for soil erosion during and following filling of the lagoon. The project would therefore have minor, local, short-term effects on water quality in Flat laurel Creek during construction.

During operation, Alternative B would result in improvements of the quality of the effluent during operation of the new plant. These improvements would minimize the potential for problems with ammonia toxicity in the effluent, since the lagoon would be eliminated, and a more efficient treatment system would be used. Overall, operation of the new package plant under Alternative B would therefore result in a moderate, local, short-term beneficial effect on water quality.

All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. Because of these factors, Alternative B would have minor, local, long-term beneficial cumulative effects on water quality.

Alternative B would not produce major adverse effects to water quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water quality or values as a result of the implementation of Alternative B.

### Impacts of Alternative A: Upgrade Existing Aerated Lagoon Facility

**Analysis:** The effects of Alternative A on water quality during construction would be similar to the effects of Alternative B, since land would still be cleared on the site for the new sludge storage tank, demolition of the existing sludge drying beds and Imhoff tanks, office building improvements, and reconstruction of the plant asphalt drive. The extent of disturbed area created under Alternative A, however, would be 0.46 acres less than Alternative B because the lagoon would not be filled in Alternative A. There would still be a potential to affect water quality in Flat Laurel Creek, however, during construction. Construction would therefore have minor, local, short-term adverse effects on water quality. These potential adverse effects would be mitigated by implementation of best management practices.

During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing plant. The discharge limits of the National Pollutant Discharge Elimination System permit would continue to be met, and the potential for periodic excursions of ammonia toxicity would be minimized. The temperature requirements for Flat Laurel Creek would continue to be met. Sludge would be disposed off site in an approved facility. During operation, this alternative would therefore have local, minor and long-term beneficial effects on water quality.

**Cumulative Impacts:** The cumulative effects of Alternative A would be similar to Alternative B.

**Conclusion**: The effects of Alternative A on water quality during construction would be similar to the effects of Alternative B, since land would still be cleared on the site for the new facilities. The extent of disturbed area created under Alternative A would be less than Alternative B. However, there would still be a potential to affect water quality in Flat Laurel Creek during construction. Construction could therefore have minor, local, short-term adverse effects on water quality. These potential adverse effects would be mitigated by implementation of best management practices.

During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing plant. During operation, this alternative would therefore have local, minor and long-term beneficial effects on water quality.

The cumulative effects of Alternative A would be similar to Alternative B.

Alternative A would not produce major adverse effects to water quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water quality or values as a result of the implementation of Alternative A.

## Aquatic Resources

### Affected Environment

Flat Laurel Creek Flat Laurel Creek drains into Pisgah Creek, which in turn connects to the East Fork of the Pigeon River. No detailed information on the aquatic life of Flat Laurel Creek is currently available. However, it is known that Pisgah Creek is managed as trout waters by the State of North Carolina (NCWRC 2006).

A small stream also flows down the slope immediately above the plant where it then flows into a small emergent wetland located just inside the plant fence, near the entrance gate. Based on the soils survey and maps completed by the Natural Resource Conservation Service in 2002, this is an intermittent stream that originates above the plant site. This stream is also the primary water supply for the wetland inside the plant site, which is located along and on either side of the stream. No aquatic surveys of this stream have been conducted to date, but it would be expected to support diverse and abundant populations of benthic invertebrates and possibly, amphibians. The stream flows onto the site from above the plant in a southerly direction, then turns sharply to the east alongside the main plant road inside the fence. At this point the stream is approximately 1-2 feet wide. It then flows underneath the plant road through two culverts, and continues to the east at the end of the abandoned sludge drying beds. The stream then courses south around the end of the sludge drying beds, and then moves off-site and downslope below the plant, where it ultimately connects to Flat Laurel Creek at the bottom of the hill. This stream and associated wetland would be completely avoided during construction.

### Impacts of Alternative O: No Action / Continue Current Management

**Analysis**: The potential effects of the No Action Alternative on aquatic life in Flat Laurel Creek and Pisgah Creek are related to potential effects on water quality from point and nonpoint discharges from the plant, since water quality directly influences the abundance and distribution of fish and benthic invertebrates. Since no new facilities would be constructed under the No Action Alternative, however, this alternative would have no construction-related effects on aquatic life in Flat Laurel Creek.

During continued operation of the existing facility, the plant would continue to discharge treated effluent to Flat Laurel Creek, but at lower volumes, fewer periodic excursions of ammonia toxicity would probably occur, and temperature requirements would continue to be met in Flat Laurel Creek. Nonpoint runoff from the existing site would continue to be generated and would still be filtered effectively by forested areas located down slope of the site. Overall, the No Action Alternative would therefore have minor, local, long-term, adverse effects on aquatic life in Flat Creek during operation. No adverse effects on aquatic life of Pisgah Creek, located several miles downstream of Flat Laurel Creek, are known to occur or are expected to occur in the future as a result of the discharge from the Mt. Pisgah treatment plant.

**Cumulative Impacts**: Cumulative effects of the No Action Alternative on aquatic life would parallel the cumulative effects on water quality, since the two are related. No new construction would occur at the treatment plant under the No Action Alternative, so

there would be no cumulative construction-related effects on aquatic life under the No Action Alternative. During operation, however, low flow toilets installed at the Mt. Pisgah Inn would reduce the amount of wastewater received by the plant. This would result in a minor, local, long-term, beneficial cumulative effect on aquatic life in Flat Laurel Creek.

**Conclusion:** Since no new facilities would be constructed under the No Action Alternative, this alternative would have no construction-related effects on aquatic life in Flat Laurel Creek.

During operation, the effects on aquatic life would parallel effects on water quality. The plant would continue to discharge treated effluent to Flat Laurel Creek, but at lower volumes, fewer periodic excursions of ammonia toxicity would probably occur, and temperature requirements would be met in Flat Laurel Creek. Nonpoint runoff from the existing site would continue to be generated and would continue to be filtered effectively by forested areas. Overall, the No Action Alternative would therefore have minor, local, long-term, adverse effects on aquatic life in Flat Creek during operation.

Cumulative effects of the No Action Alternative on aquatic life would parallel the cumulative effects on water quality, since the two are related. The No Action Alternative would have minor, local, long-term, beneficial cumulative effects on aquatic life.

Alternative O would not produce major adverse effects to aquatic life whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of aquatic life or values as a result of the implementation of Alternative O.

**Impacts of Alternative B: Extended Aeration Package System - Preferred Alternative**

**Analysis**: The potential effects of this alternative during construction on aquatic life are directly related to effects on water quality caused by soil erosion. The primary construction activities that could affect aquatic life under Alternative B are construction of the extended aeration package system, filling of the 0.46-acre lagoon, removal of the abandoned Imhoff sludge treatment tanks and sludge beds and some other minor new associated facilities. However, since best management practices will be implemented to control soils erosion, construction activities associated with Alternative B would only have the potential for producing minor, local, short-term effects on aquatic life.

During operation, erosion of soil from the filled and stabilized lagoon could affect aquatic life in Flat Laurel Creek. However, best management practices would be employed to minimize the potential for soil erosion from the site during operation. Effects of nonpoint runoff during operation would therefore have negligible, local, long-term, adverse effects on aquatic life during operation.

Alternative B would result in improvements in the quality of the effluent during operation of the new plant. These improvements would minimize the potential for

problems with ammonia toxicity affecting aquatic life, since the lagoon would be eliminated, and a more efficient treatment system would be used. Temperature limits above and below the discharge point in Flat Laurel Creek would continue to be met. Sludge would be stored in a 25,000 gallon tank prior to removal once or twice a year to an approved facility. Sludge disposal would therefore have no effects on aquatic life in Flat Laurel Creek.

Overall, operation of the new package plant under Alternative B would therefore result in minor, local, short-term beneficial effects on aquatic life.

**Cumulative Effects**: All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. Since construction of these two remaining projects in the Mt. Pisgah Developed Area do not involve any land clearing, they will have no effects on aquatic life in Flat Laurel Creek. Therefore, no adverse construction-related cumulative effects on aquatic life would result under Alternative B.

Operation of the new low-flow toilets in the Mt. Pisgah Inn will reduce the amount of wastewater generated in the future. Operation of the new package plant under Alternative B would result in an improvement in water quality of the effluent, with associated beneficial effects on aquatic life in Flat Laurel Creek. Alternative B would therefore result in minor, local, long-term beneficial cumulative effects on aquatic life.

**Conclusion**: There would be a potential for soil erosion and associated minor, local, long-term adverse effects on aquatic life in Flat Laurel Creek during the grading and leveling of any part of the site where the package plant and other new facilities were constructed. These effects would be minimized by implementation of best management practices for soil erosion.

During operation, a larger area of disturbed soils would exist on the site as compared with the No Action Alternative and Alternative A, but best management practices would be employed to minimize the potential for soil erosion. Effects of nonpoint runoff during operation would therefore have negligible, local, long-term, adverse effects on aquatic life during operation.

Alternative B would result in improvements of the quality of the effluent during operation of the new plant that would minimize the potential for ammonia toxicity effects on aquatic life. Overall, operation of the new package plant under Alternative B would therefore result in minor, local, short-term beneficial effects on Aquatic life.

All of the other construction projects in the Mt. Pisgah Developed Area are now complete, with the exception of the installation of the low flow toilets and conversion of the gas station to a country store. No construction-related cumulative effects on water quality would therefore result under Alternative B. Operation of the new low-flow toilets in the Mt. Pisgah Inn will reduce the amount of wastewater generated. Therefore, Alternative B would result in a minor, local, long-term beneficial cumulative effect on aquatic life during operation.

**Impacts of Alternative A: Upgrade Existing Aerated Lagoon Facility**

**Analysis:** The effects of Alternative A on aquatic life during construction would parallel the effects on water quality. The effects of Alternative A on aquatic life would be similar to the effects of Alternative B, since land would still be cleared on the site for the new sludge storage tank, demolition of the existing sludge drying beds and Imhoff tanks, office building improvements, and reconstruction of the plant asphalt drive. The extent of disturbed area created under Alternative A, however, would be 0.46 acres less than Alternative B because the lagoon would not be filled in Alternative A, resulting in a lower potential for construction-related nonpoint runoff and associated effects on aquatic life in Flat Laurel Creek. Construction could still result in minor, local, short-term adverse effects on aquatic life. Potential adverse effects of construction would be minimized by implementation of best management practices.

During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing plant. The discharge limits of the National Pollutant Discharge Elimination System permit would continue to be met, and the potential for periodic excursions of ammonia toxicity would be minimized due to the upgraded facilities. The temperature requirements for Flat Laurel Creek would continue to be met. Less nonpoint runoff would be generated from the site as compared with Alternative B since the lagoon would not have to be filled. During operation, the overall effects of this alternative would have minor, local, and long-term beneficial effects on water quality.

**Cumulative Impacts:** The cumulative effects of Alternative A on water quality would be similar to Alternative B.

**Conclusion**: The effects of Alternative A on water quality during construction would be similar to the effects of Alternative B, since land would still be cleared on the site for the new facilities. The extent of disturbed area created under Alternative A would be less than Alternative B, but there would still be a potential to affect aquatic life in Flat Laurel Creek. Construction could therefore have minor, local, short-term adverse effects on aquatic life. These potential adverse effects would be mitigated by implementation of best management practices.

During operation under Alternative A, the upgraded plant would discharge treated effluent to Flat Laurel Creek. The quality of the effluent would be improved as compared with the existing plant. During operation, this alternative would therefore have local, minor and long-term beneficial effects on water quality.

**The cumulative effects of Alternative A would be similar to Alternative B.**

Alternative A would not produce major adverse effects to water quality whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water quality or values as a result of the implementation of Alternative A.

## Special Status Species

### Affected Environment

The previous environmental assessment completed in conjunction with the rehabilitation of the Mt. Pisgah Developed Area (NPS 2003) included an assessment of the actual or potential occurrence of federally and state listed species of plants and animals in the area. Since the proposed wastewater treatment plant site is included within the Mt. Pisgah Developed Area, the information contained in the previous environmental assessment is sufficient for use as a starting point in the present environmental assessment. However, as part of the preparation for the wastewater treatment plant environmental assessment, the information presented previously was reviewed and updated based on personal communications with the park staff and available literature. The previous environmental assessment also included correspondence with the United States Fish and Wildlife Service regarding the actual or potential occurrence of listed species in the Mt. Pisgah Developed Area (Appendix B, from NPS 2003). An updated list of species and their current status is provided in Table 7.

Since the site of the proposed wastewater treatment project is completely cleared of natural upland vegetation, it is highly unlikely that any listed species of plants or animals occur in upland habitats on the site itself within the fenced-in area. A variety of listed species do occur, however, in the Mt. Pisgah Developed area and other areas surrounding the site (Table 7). In addition, a small wetland and an intermittent stream occur in the northeast corner of the site just inside the fence line and has a potential to harbor protected species. However, a qualitative field survey of this wetland by the National Park Service was conducted in December 2005, and it was estimated that the wetland and intermittent stream were unlikely to harbor any listed species. A detailed investigation has not been completed to date, so this area will be avoided during construction of any new wastewater treatment plant facilities. A survey of the wetland and stream will be completed by the National Park Service prior to construction of the new facilities, however.

The previous environmental assessment included consideration of the potential effects of all road and utility work in the developed area, including the access road to the wastewater treatment plant. Construction activities associated with the access road itself have therefore not been included in the present environmental assessment.

The following sections provide a summary of the available information on listed species that could occur on the wastewater treatment site or in the surrounding Mt. Pisgah Developed Area. The information from the previous environmental assessment is described first, followed by an update of the most recent information. Please refer to Table 7 for a summary.

**Table 7. Federal- and State-Listed Species That Could Potentially Occur In The Vicinity Of The Mt. Pisgah Wastewater Treatment Plant Site (North Carolina Heritage Program 2006; USFWS 2006).**

| Major Group | *Scientific Name* | Common Name | State Status | Federal Status | State Rank | Global Rank |
|---|---|---|---|---|---|---|
| Amphibian | *Glyptemys muhlenbergii* | Bog Turtle | N/A | T(S/A) | N/A | N/A |
| Vascular Plant | *Sarracenia jonesii* | Mountain Sweet Pitcher Plant | E-SC | E | S1 | G3T1 |
| Vascular Plant | *Tofieldia glutinosa* | Sticky bog asphodel | SR-P | None | S2 | G5 |
| Vascular Plant | *Solidago uliginosa* | Bog goldenrod | SR | None | S1S2 | G4G5 |
| Vascular Plant | *Prenanthes roanensis* | Roan rattlesnake root | W1 | None | S3 | G3 |
| Vascular Plant | *Chelone cuthbertii* | Cuthbert's turtlehead | SR-L | FSC | S3? | G3 |
| Vascular Plant | *Houstonia longifolia* var. *glabra* | Granite dome bluet | SR-L | None | S2 | G4G5T2Q |
| Vascular Plant | *Helianthemum bicknellii* | Plains sunrose | SR-P | None | SH | G5 |
| Vascular Plant | *Rhododendron vaseyi* | Pinkshell azalea | SR-L | None | S3 | G3 |
| Vascular Plant/Habitat | *Abies fraseri* | Fraser fir (forest) | None | None | S1 | G1 |
| Vertebrate Animal | *Loxia curvirostra pop. 1* | Southern Appalachian Red Crossbill | SC | FSC | S3B,S3N | G5TNR |
| Vertebrate Animal | *Glaucomys sabrinus coloratus* | Carolina Northern Flying Squirrel | E | E | S2 | G5T1 |
| Vertebrate Animal | *Puma concolor couguar* | Eastern Cougar | E | E | SH | G5THQ |
| Vertebrate Animal | *Myotis septentrionalis* | Northern Long-eared Myotis | SC | None | S3 | G4 |
| Vertebrate Animal | *Aegolius acadicus pop.* | Southern Appalachian Northern Saw-whet Owl | T | FSC | S2B,S2N | G5TNR |
| Vertebrate Animal | *Contopus cooperi* | Olive-sided flycatcher | SC | FSC | SUB | G4 |
| Vertebrate Animal | *Dendroica cerulea* | Cerulean warbler | SR | FSC | S2B | G4 |

**Table 7. Federal- and State-Listed Species That Could Potentially Occur In The Vicinity Of The Mt. Pisgah Wastewater Treatment Plant Site (North Carolina Heritage Program 2006; USFWS 2006).**

| Major Group | *Scientific Name* | Common Name | State Status | Federal Status | State Rank | Global Rank |
|---|---|---|---|---|---|---|
| Vertebrate Animal | *Pocile atricapilla practica* | Southern Appalachian black-capped chickadee | SC | FSC | S3 | G5TNR |
| Vertebrate Animal | *Sphyrapicus varius appalachiensis* | Yellow-bellied sapsucker | SC | FSC | S3B,S5N | G5TNR |
| Vertebrate Animal | *Thryomanes bewickii altus* | Bewick's wren | E | FSC | SHB | G5T2Q |
| Vascular Plant | *Lonicera canadensis* | American fly honeysuckle | SR-P | None | S2 | G5 |
| Vertebrate Animal | *Crotalus horridus horridus e* | Timber rattlesnake | SC | None | S3 | G4 |
| Vertebrate Animal | *Coccyzus erythropthalmus* | Black-billed Cuckoo | SR | None | S2B | G5 |

***Federally-Listed Species***

National Park Service staff familiar with the wastewater treatment plant site (NPS 2005a) indicated the following concerning federally-listed species:

> The status of the timber rattler has changed since the previous environmental assessment was written. This species has been observed in the Mt. Pisgah Developed Area recently. It is currently classified as a state species of concern, S3, G4 (Table 7).
>
> Conversations with researchers who use the area, as well as a knowledgeable camper, confirm that bog lemmings (not presently listed), red crossbills and saw whet owls are present. Two saw-whet owls were observed in a 2005 survey by the National Park Service.
>
> The National Park Service has observed red crossbills, northern bobwhite (not presently listed), black-billed cuckoo, and woodcock (not presently listed) in the area in the last two years.
>
> National Park Service surveys of nest boxes throughout the developed area have been positive for northern flying squirrel in 2002 and 2004.
>
> There is a potential for the Carolina northern flying squirrels to occur along the access road leading to the proposed wastewater treatment plant site. No squirrels have been observed along the access road by the National Park service to date, but they do occur on both sides of the treatment plant. Therefore, it is likely that they use the area, and could occupy trees in the vicinity of the access road. No

squirrels have been caught in the nest boxes that the National Park Service has placed closest to the access road.

Bat surveys were conducted using mist-netting in July of 2002. No federally-listed species were collected. One mature northern long-eared myotis (*Myotis septentrionalis*)(State Species of Concern) was caught near the treatment plant and picnic area (not the campground/inn area)(NPS 2005a).

The previous environmental assessment (NPS 2003) presented the following summary of information on federally-listed species:

> "The only federally listed species that is known to occur in the project area is the endangered Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*). According to the USFWS, the Carolina northern flying squirrel 'shows a relict distribution and tends to occupy rather small and potentially vulnerable islands of high elevation habitat.' The Carolina northern flying squirrel has most commonly been captured in conifer-hardwood forests comprised of spruce and fir, with beech, yellow birch, sugar maple, red maple, hemlock, and black cherry (USFWS, 1990). Individuals have also been captured in riparian hemlock-hardwood-rhododendron forests. The Carolina northern flying squirrel is vulnerable to human impacts such as habitat destruction, fragmentation, or alterations associated with the clearing of forests; recreational and residential development; introduced exotic pests; and pollution (USFWS, 1999)."
>
> "All of the above tree species are present in the Mt. Pisgah area. However, there are pockets of habitat that consist primarily of spruce, fir, hemlock, and yellow birch. Northern flying squirrels have been captured primarily from this type of vegetation, especially where this type of vegetation consists of widely spaced mature trees with an abundance of standing and downed snags. Pockets of this type of habitat are located in the picnic area, Loop C of the campground, along the trail between the Mt. Pisgah trail and the picnic area, along the trail between the picnic area and the campground, and on the east side of the Parkway in several sections between the Parkway and the Buck Springs Trail. One northern flying squirrel was captured in a live trap in the picnic area during the summer of 2001. In addition, the acidic cove community in the Mt. Pisgah Developed Area consists primarily of riparian hemlock-hardwood-rhododendron forest, which represents additional potential habitat."
>
> "There are historic records for the endangered eastern cougar (*Felis concolor cougar*) from the Mt. Pisgah area. The cougar's decline has been attributed primarily to pressure from hunting as well as land development. In the late 1800's the cougar was reported as extirpated. In 1910, and again in the 1970's and 80's there have been several unconfirmed sightings and scat in the area of Mt. Pisgah. There have been recent cougar sightings within the Mt. Pisgah Developed Area by Pisgah Inn staff and Parkway maintenance employees. Some biologists suggest that these cougars have been raised in captivity and then released."
>
> "Although the wetland within the [Mt. Pisgah Developed Area campground] site represents potential habitat for the mountain sweet pitcher plant (*Sarracenia*

*jonesii*) (endangered) and the bog turtle (*Glyptemys muhlenbergii*) (threatened due to similarity of appearance///to what?), extensive surveys of the wetland have failed to document the occurrence of either of these species. Surveys of the remainder of the project area conducted by National Park Service biologists have failed to document the occurrence of any additional federally listed species within the project area."

National Park Service staff familiar with the wastewater treatment plant site (NPS, 2005a) indicated the following concerning federally-listed species:

***Federal Species of Concern***

The previous environmental assessment (NPS 2003) presented the following summary of information on federally-listed species:

> "Federal Species of Concern that have been confirmed from the project area include the saw-whet owl (*Aegolius acadius acadius*), Appalachian cottontail (*Sylvilagus obscurus*), olive-sided flycatcher (*Contopus cooperi*), cerulean warbler (*Dendroica cerulea*), southern Appalachian black-capped chickadee (*Pocile atricapilla practica*), and fraser fir (*Abies fraseri*). Fraser fir was apparently planted in the project area and is not established as a natural population at the site (Pittillo and Green 2000). Historical records exist for yellow-bellied sapsucker (YBS) and Appalachian Bewick's wren at Mt. Pisgah. Surveys in 2003 for YBS failed to document the occurrence of this species at the site. The last known breeding site for Appalachian Bewick's wren was at Mt. Pisgah. It is likely extirpated from the site since no observations have been made in recent years."

The current status of each these species was reviewed and the following was concluded:

> The Southern Appalachian northern saw-whet owl has been observed in the Mt. Pisgah Developed Area during National Park Service surveys (NPS 2005a).
>
> Conversations with researchers who use the area as well as a knowledgeable camper, confirm that the northern saw-whet owl is present in the Mt. Pisgah Developed Area (NPS 2005a).
>
> The Southern Appalachian red crossbill (*Loxia curvirostra pop*) has been observed in the Mt. Pisgah Developed Area during National Park Service surveys (NPS 2005a).

***State Listed Species***

The previous environmental assessment (NPS 2003) presented the following summary of information on state-listed species:

> "Additional species listed only by the State of North Carolina that have been confirmed from the project area include the golden-crowned kinglet (*Regulus satrapa*), timber rattlesnake (*Crotalus horridus horridus*), sticky bog asphodel (*Tofieldia glutinosa*), bog goldenrod (*Solidago uliginosa*), roan rattlesnake root (*Prenanthes roanensis*), Cuthbert's turtlehead (*Chelone cuthbertii*), granite dome bluet (*Houstonia longifolia* var. *glabra*), plains sunrose (*Helianthemum bicknellii*), least moonwort (*Botrychium simplex* var. *simplex*), pinkshell azalea

(*Rhododendron vaseyi*), and American fly honeysuckle (*Lonicera canadensis*). In addition, three Watch List species [red-breasted nuthatch (*Sitta canadensis*), tawny cottongrass (*Eriophorum virginicum*), and mountain St. John's-wort (*Hypericum buckleyi*)] also have been confirmed in the project area."

The current status of each these species was reviewed and is was concluded nothing had changed except the status of the timber rattlesnake, which is listed as a North Carolina Species of Concern, S3, G4 (NCHP 2006), and which has been observed in the Mount Pisgah Developed area (NPS 2005a).

The North Carolina Wildlife Resource Commission (NCWRC 2006) were contacted and they stated that no sensitive or rare species occurred in Flat Laurel Creek.

**Impacts of Alternative O: No Action / Continue Current Management**

**Analysis:** New construction would not take place on the existing site under the No Action Alternative and therefore, construction would have no effect on state- or federally-listed species. Also, the site is completely cleared and no state- or federally-listed species of plants or animals occur in upland habitats site. There is a potential for listed species to occur in the wetland located inside the fence on the existing plant site, but this has yet to be confirmed by an actual survey. This area would be delineated and avoided during construction. The northern flying squirrel could occur in trees along the access road to the plant, but no new construction would occur in this area under Alternative O. In conclusion, since there would be no new construction activities on the site under the No Action Alternative and no listed species occur within the construction area, these activities would have no effect on state- or federally-listed species of plants or animals.

Continued operation of the existing plant would have no effect on state- or federally-listed species within upland habitats in the fenced-in site, since none of these species are present in this area. The continued discharge of treated wastewater to Flat Laurel Creek would have no effect on state- or federally-listed species, since no listed species are known to occur in this creek.

**Cumulative Impacts:** Continued operation of the existing wastewater treatment plant would not result in adverse cumulative effects on state- or federally-listed species, since there would be no direct effects on these species on the plant site or surrounding area resulting from construction or operation of the plant.

**Conclusion**: Construction activities would have no effect on state- or federally-listed species of plants or animals under the No Action Alternative since no listed species occur in the construction area, and no construction would occur under this alternative. Continued operation of the existing plant would have no effect on state- or federally-listed species within upland habitats inside the fenced-in site, because none of these species are present on the plant site. The continued discharge of treated wastewater to Flat Laurel Creek would have no adverse effect on state- or federally-listed species since these species do not occur in the creek.

Alternative O would not produce major adverse effects to state- or listed species whose conservation is (1) necessary to fulfill specific purposes identified in the establishing

legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of listed species or values as a result of the implementation of Alternative O.

**Impacts of Alternative B: Extended Aeration Package System- Preferred Alternative**

**Analysis**: A new package plant would be constructed on the existing site under Alternative B, and the lagoon would be filled. However, no state- or federally-listed species of plants or animals occur in upland habitats on the existing plant site because it is completely cleared of all natural vegetation. Therefore, Alternative B would have no adverse effects on upland state- or federally-listed species within the boundaries of the construction area. There is a potential for listed species to occur in the wetland located inside the fence on the existing plant site, but this has yet to be confirmed by an actual survey. Prior to any construction within the fenced-in area, the wetland would be delineated and avoided.

Operation of a new package plant under Alternative B would have no adverse effects on state- or federally-listed species within upland habitats in the fenced-in site, since none of these species are present. The continued discharge of treated wastewater to Flat Laurel Creek would have no adverse effect on state- or federally-listed species since these species do not occur in the creek.

**Cumulative Impacts:** Operation of a new package plant treatment plant would have no adverse cumulative effect on state- or federally-listed species since no listed species are present on the site or in Flat Laurel Creek.

**Conclusion**: Construction would have no effect on state- or federally-listed species of plants or animals under Alternative B because the site is completely cleared and no species occur in the upland portion of the site. There is a potential for listed species to occur in the wetland located inside the fence on the existing plant site, but this has yet to be confirmed by an actual survey. Prior to any construction within the fenced-in area, a survey would be completed, and the wetland would be delineated and avoided. Operation of a new package plant under Alternative B would have no effect on state- or federally-listed species within upland habitats the fenced-in site, since none of these species are present. Operation of the new package plant under the Alternative B would also not adversely affect any listed species on the site. The continued discharge of treated wastewater to Flat Laurel Creek would have no effect on state- or federally-listed species under Alternative B since no listed species are present.

Alternative B would not produce major adverse effects to federally-listed species whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of federally-listed species or values as a result of the implementation of Alternative B.

**Impacts of Alternative A: Upgrade Existing Aerated Lagoon Facility**

**Analysis:** The effects of Alternative A on species of special concern would be similar to Alternative B – the proposed project would have no effect on these resources.

**Cumulative Impacts:** Operation of an upgraded treatment plant would have no adverse cumulative effect on state- or federally-listed species since no listed species are present on the site or in Flat Laurel Creek.

**Conclusion:** The effects of Alternative A on species of special concern would be similar to Alternative B – the proposed project would have no effect on these resources. Operation of an upgraded treatment plant would have no adverse cumulative effect on state- or federally-listed species since no listed species are present on the site or in Flat Laurel Creek.

Alternative A would not produce major adverse effects to listed species whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, or (3) identified as a goal in the park's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of listed species or values as a result of the implementation of Alternative A.

## CONSULTATION AND COORDINATION

Scoping is the effort to involve agencies and the general public in determining the scope of issues to be addressed in the environmental document. Among other tasks, scoping determines important issues and eliminates issues that are not important; allocates assignments among the interdisciplinary team members and other participating agencies; identifies related projects and associated documents; identifies other permits, surveys, and consultations required by other agencies; and creates a schedule which allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. Scoping includes any interested agency or any agency with jurisdiction by law or expertise (including the Advisory Council on Historic Preservation, the State Historic Preservation Officer, and Indian tribes) to obtain early input (see Appendix C).

The National Park Service conducted internal scoping and external scoping for this project. Internal scoping was conducted with appropriate National Park Service staff in November 2006. External scoping included the letters to the agencies, and a newsletter published in May, 2006. A public news release announcing the project and requesting input was also published on April 13, 2006 (Appendix C).

Copies of the responses received from the agencies are included in Appendix C. Scoping letters were mailed to the following agencies (a copy of the scoping letter is included in Appendix C):

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service

North Carolina National Forest Service

North Carolina State Clearinghouse

North Carolina Department of Transportation

North Carolina Historic Preservation Office

North Carolina Department of Environment, Health & Natural Resources

North Carolina Natural Heritage Program

North Carolina Wildlife Resources Commission

North Carolina Department of Cultural Resources

North Carolina Division of Environmental Management

North Carolina Department of Agriculture

### Planning Team Participants

The following is a list of the planning team who prepared this environmental assessment:

| Name | Title | Organization |
|---|---|---|
| Philip Francis | Superintendent | National Park Service, Blue Ridge Parkway |
| Suzette Molling | Environmental Protection Specialist | National Park Service, Blue Ridge Parkway |
| Steven M. Wright | Contracting Officer Representative | Southeast Regional Office |
| John Wilburn | Former Supervisory Civil Engineer | National Park Service, Blue Ridge Parkway |
| Richard Sussman | Chief of Planning | National Park Service, Southern Region |
| Michael Ryan | Pisgah Facility Manager | National Park Service, Blue Ridge Parkway |
| Nathan Epling | Public Health Specialist Engineer | Public Health Service |
| Henry Keefer | Plant ORC | National Park Service, Blue Ridge Parkway |
| Michael Molling | Acting Chief of Maintenance | National Park Service, Blue Ridge Parkway |
| Lillian McElrath | Resource Management Specialist | National Park Service, Blue Ridge Parkway |
| Calvin Clardy | Maintenance Supervisor | National Park Service, Blue Ridge Parkway |
| Steve Bach | Project Manager | Parsons |
| Alyse Getty | Technical Director | Parsons |
| John Martin | Senior Planner | Parsons |
| Toya Campbell | Senior Scientist | Parsons |
| Kathy Rowland | GIS Specialist | Parsons |
| Kathy Kuhlman | Senior Scientist | Parsons |

## BIBLIOGRAPHY


**Asheville Metro Business Research Center**

2004a Asheville Area Economic Indicators - September 2004. Asheville, North Carolina.

2004b Asheville Area Population. Asheville, North Carolina.

**Bailey**

2005 Mt. Pisgah Pre-design Study: Pre-design Analysis of Constructed Wetlands Treatment System. Prepared by Erika L. Bailey, HDR, Inc. July 8, 2005.

**Epodunk**

2006. Website for epodunk.com. Information for Haywood, Henderson, and Transylvania Buncombe Counties, North Carolina. March 6, 2006.

**J.F. New & Associates, Inc., 2001**

2001 Assessment of the Technical Feasibility of Using Constructed Wetland Treatment Systems at Mt. Pisgah. Technical Memorandum.

**National Park Service**

2000 Management Policies – 2001. Washington, D.C. December 2000.

2003 Rehabilitation of Mt. Pisgah Utilities (MP 408), Blue Ridge Parkway, Haywood & Transylvania Counties, North Carolina. Environmental Assessment. October 2003.

2004 Transportation System Data Analysis – Blue Ridge Parkway. Prepared by David Evans and Associates. Denver, Colorado. September, 2004.

2005a E-mail from Lillian McElrath, regarding status of biological surveys in the Mt. Pisgah Developed Area. December 20, 2005.

2005b. Interview with Jim Renfro, Great Smoky Mountain National Park. Gatlinburg, Tennessee. January 4, 2005.

2006a Email correspondence with Suzette Molling, Environmental Protection Specialist for the Blue Ridge Parkway. March 6, 2006.

2006b Personal communications with Henry Keefer, Mount Pisgah wastewater treatment plant operator.

2006c Telephone conversation with Phil Noblitt, Management Assistant for the Blue Ridge Parkway. March 9, 2006.

2006d Campground statistics for 2003, 2004, and 2005 from www2.nature.nps.gov. March 9, 2006.

2006e Statistics for Mount Pisgah Inn and Restaurant for 2003, 2004, and 2005, provided by Lisa Davis, Concession Specialist for the Blue Ridge Parkway. March 14, 2006.

2006f Value Analysis Report – Mini VA. Blue Ridge Parkway, Mt. Pisgah Wastewater Treatment Plant Improvements. BLRI- 081430. October 13, 2005. Prepared by HDR, Inc. Final Version 1/10/06.

No Date Directors Order 12: Handbook for Environmental Analysis. Web Page: http://www.nps.gov/policy/DOrders/RM12.pdf

**North Carolina Department of Environment and Natural Resources**

2006 Telephone conversation with Steve Hensley regarding air quality conditions in Haywood, Henderson, and Transylvania Counties. March 27, 2006.

**North Carolina Department of Transportation**

2006 Traffic counts for Buncombe, Haywood, and Transylvania Counties from www.ncdot.org. March 7, 2006.

**North Carolina State University.**

1996 1995-1996 Economic Impact of Travel to the Blue Ridge Parkway Virginia and North Carolina. Prepared for the Coalition of the Blue Ridge Parkway and the National Park Service. Asheville, North Carolina.

**North Carolina Wildlife Resource Commission**

2006 Personal communication between Suzette Molling (National Park Service), Bob Cherry (North Carolina Wildlife Resource Commission) and Doug Beslar (North Carolina Wildlife Resource Commission), June 2006.

**Parsons**

2006 Telephone interview with Steve Schaefer, Principal Wastewater Engineer. March 9, 2006.

**Redlodge Clearing House**

2005 Clean Air Act – Process Essentials: Protecting Clean Air Areas. From www.redlodgeclearinghouse.org. January 7, 2005.

**Southern Highlands Craft Guild and the National Park Service.**

Undated A Master Plan for the Blue Ridge Parkway's Folk Art Center. Prepared by Surber, Barber, Choate, and Hertlein Architects. Asheville, North Carolina.

**U.S. Department of the Interior, US Fish and Wildlife Service**

2006 Species Information. Threatened and Endangered Species of Animals and Plants. http://endangered.fws.gov/wildlife.html. Internet web page.

**United States Census Bureau**

2006 Information from www.census.gov., 2003 County Business Patterns for Haywood, Henderson, and Transylvania Counties. March 6, 2006.

**U.S. Environmental Protection Agency**

2006 Surf Your Watershed web page: http://cfpub.epa.gov/surf/huc.cfm?huc_code=06010105

**Veltman**

2005 National Park Service Technology Assessment & Review, Wastewater Treatment, Mt. Pisgah Recreation Area, Blue Ridge Parkway. Technical Memorandum prepared by Shawn H. Veltman, August 11, 2005.

**Western North Carolina Regional Air Quality Agency.**

2004 Information from www.wncair.org website. December 30, 2004.

This page intentionally left blank