ENVIRONMENTAL ASSESSMENT

SLOPE STABILIZATION PROJECT – GEORGETOWN UNIVERSITY ARCHBOLD PARKWAY

United States Department of the Interior
National Park Service
Rock Creek Park
Summary:

The National Park Service (NPS) has prepared this Environmental Assessment (EA) in order to evaluate Georgetown University's (University) proposal to improve the integrity and scenic character of the slope supporting the University's West Perimeter Road. As proposed, all project improvements will occur on the University's property. However, by virtue of a Deed of Easement dated September 15, 2003, the University conveyed to the United States certain scenic easement interests in a 2.5-acre wooded parcel within which the project is planned. The proposed project involves the following actions: demolition of a segment of the existing roadway, clearing the existing vegetation along an approximately 300-foot long segment of the supporting slope, removal of previously deposited unsuitable fill material along the disturbed portion of the slope, placement of new fill and engineered geo-textile fabric, installation of new storm water drainage system designed to channel run-off from the roadway to a new water quality dissipation device to be constructed at the base of the slope, re-contour the slope to better control storm water run-off, construction of new stone-faced retaining wall at the base of the slope, construction of a new segment of the roadway to include new curbing and catch basin, and implementation of a new landscape plan. This EA addresses the potential impacts associated with the Preferred Alternative (stabilization of a segment of the supporting slope immediately adjacent to the University's West Perimeter Road), as well as, the impacts of the No-Action Alternative, in accordance with the National Environmental Policy Act of 1969, as amended (NEPA). The Preferred Alternative would impart short-term adverse impacts to the cultural landscape and visitor use of the adjacent Archbold Parkway, and to vegetation and wildlife habitat within the project footprint resulting from initial construction-related activities. However, long-term moderate to major beneficial impacts are projected for the cultural landscape and visitor use of Archbold Parkway and to vegetation and wildlife habitat within the project footprint as a result of the mitigation measures associated with the Preferred Alternative.

Note to Reviewers and Respondents: If you wish to comment on the EA, you may mail or Email comments to the respective addresses listed below.

Comments can be sent via Email by following the appropriate links at:
http://parkplanning.nps.gov/rocr.

Mailed comments can be sent to:
Adrienne Applewhaite-Coleman, Superintendent
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PURPOSE OF AND NEED FOR THE ACTION

The NPS proposes to authorize the University's implementation of certain improvements to an approximately 300-foot long segment of the supporting slope immediately adjacent to the University's West Perimeter Road. All improvements and construction activities would take place entirely on University property in a location currently encumbered by a scenic easement held by the United States. However, to avoid the loss of a mature Beech tree located at the base of the slope, the temporary construction access road will enter onto NPS property within an area measuring approximately 70' long by 6' wide. West Perimeter Road provides a vehicular connection for service vehicles only between the north and south portions of the University campus. Historically, there has been no curbing or catch basins along the western edge of the roadway which has allowed storm water to cascade over the edge of the roadway and down the adjoining slope. This run-off has created significant erosion along portions of the slope and threatens to undermine the roadway. The shoulder along the western edge of the roadway is deteriorating as the base material continues to erode. Moreover, portions of the slope have lost vegetative cover causing large sections of the slope to fracture and slide toward the base of the slope and onto NPS property, exposing additional bare soil to further erosion. In addition to the lack of adequate storm water management along the roadway, composition of the existing slope's subsurface materials is believed to be a significant factor in the cause of the slope's past failures. Further discussion of the slope's subsurface materials is provided in a subsequent section of this EA.

The terms of the aforesaid Deed of Easement (Appendix B) allow for the construction of a road for service vehicles and the cutting of trees for the building of such a road within the 2.5 acre easement area. As certain slope stabilization related activities associated with the proposed project are not specifically permitted by the provisions of the Deed of Easement, subsequent authorization from NPS is required to carry out the University's proposed construction activities. The proposed project provides a comprehensive package of slope stabilization and erosion control actions, installation of storm water management devices and the implementation of a series of mitigation measures. Specific actions include the following: demolition of a segment of the existing roadway, clearing of existing vegetation within an approximately 300-foot long segment of the supporting slope, removal of the previously deposited unsuitable fill material along the disturbed portion of the slope, placement of new stable fill material and geo-grid textile fabric, re-contouring the disturbed portion of the slope, installation of a new storm water drainage system designed to channel run-off from the roadway to a new water quality dissipation device to be constructed at the base of the slope, construction of a new stone-faced retaining wall at the base of the slope, re-construction of the damaged section of the roadway that includes new curbing detail and catch basin, and implementation of a new landscape design. As an additional mitigation measure, the University will remove an assortment of construction rubble, solid waste and organic waste that has been previously discarded along the face of the slope.

This EA has been prepared in accordance with NEPA, the regulations of the Council on Environmental Quality (CEQ) for implementing NEPA, and the National Park Service Director's Order #12 (Conservation Planning, Environmental Impact Analysis, and Decision-making), and NPS Management Policies, 2001.

Purpose of the Action

The purpose of this project is to make much needed improvements to the slope supporting the existing service roadway connecting the north and south portions of the University's campus. To accomplish this desired result, the University has proposed a plan intended to 1) stabilize the slope through construction of a retaining wall at the base of the slope, installation of a geo-grid fabric and the introduction of engineered fill materials, and 2) address the existing erosion problems adversely affecting the future viability of the roadway and the integrity of the adjacent supporting slope through the proper management of storm water run-off. Erosion of the slope continues to occur, threatening the integrity of the slope and thus, the future viability of the roadway and possibly the neighboring structures. Portions of the existing roadway's western edge have begun to show signs of fracture as the underlying base material erodes. Left unaddressed, failure of the roadway is perceived as imminent in those sections currently experiencing fracture. The slope stabilization project addresses the weaknesses of the existing slope, remedies the ongoing erosion problem by properly capturing and channeling storm flows, and includes a series of mitigation measures intended to enhance the natural environment of the slope and its scenic characteristics. Project activities are proposed to occur entirely within a portion of the University's property that is encumbered by a Deed of Easement previously conveyed by the University to the United States. Thus, prior to the commencement of the project as currently designed, NPS must provide the University with written authorization to proceed. Such authorization would take the form of a short-term Special Use Permit issued by NPS subject to a series of prescribed conditions regarding construction methodologies and restoration requirements.

Need for the Action

The slope stabilization project is needed to protect the integrity of the slope, adjacent structures and the roadway that connects the north and south portions of the University's campus. The adjacent slope is encumbered by a scenic easement held by the United States. The purpose of the easement is to preserve and protect trees greater than 6 inches in diameter at breast height (dbh). The protected trees comprise a vegetative screen that serves to shield University buildings and operational facilities from the view of visitors using the Foundry Branch Trail located within Archbold Parkway which adjoins the University's property to the west. However, instability of the slope caused by unsuitable fill materials and erosion from unabated storm water run-off continues to undermine existing trees and other vegetation along the slope as well as threaten the future viability of the roadway. The effects of continued erosion along the slope have materialized in the form of slumping along the roadway's western edge, sloughing of sizable portions of the slope resulting in the loss of a number of mature trees. Unaddressed, erosion will continue to exacerbate the current status of the slope and will likely result in the collapse of a large segment of the roadway.

Location of Project Site

The slope stabilization project will occur entirely on University property immediately adjacent to the western border of the Yates Athletic Complex. The specific location of the proposed project is more particularly depicted on Appendix A.

History and Background

The University's West Perimeter Road was constructed in 1977 for the purpose of providing vehicular access for service vehicles between the north and south portions of the campus. The slope is currently in a deteriorated condition and repairs are necessary to prevent a catastrophic failure of portions of the adjacent roadway and possibly the neighboring structures. Two factors are believed to be equally responsible for the current state of the roadway. First, the western edge of the roadway is unfinished. No curbing or catch basins are in place along the western edge of the roadway to collect and channel storm water runoff from the buildings and roadway to a managed release facility. Consequently, unabated storm water run-off continues to spill over the western edge of the roadway resulting in significant erosion in portions of the supporting slope as well as to the roadway's base material. The second critical factor impacting the roadway's viability concerns the composition of the roadway's supporting slope. Fill material has historically been deposited along portions of the slope. Clearly evident from the slope's existing appearance, the existing fill material is failing. In addition, construction rubble, solid waste and organic matter has in the past been inappropriately disposed of along the slope further exacerbating erosion. A more detailed discussion of the slope' subsurface materials and the recommended slope stabilization plan are contained within a subsequent section of the EA devoted to soils.

Recognizing that simply repairing the roadway surface without addressing the underlying problems associated with the supporting slope's degradation would be short sighted, NPS and the University have jointly pursued a permanent solution. During the past 18-months, University representatives and its consultants, and NPS have negotiated a comprehensive slope stabilization plan that accomplishes a number of long term goals of both the University and NPS.

In 2003, the University conveyed to the United States a scenic easement interest in a 2.5-acre portion of the University's property. The impetus for this conveyance was the University's obligation to satisfy the twenty percent State or local matching of Federal funds pursuant to section 149(a)(14) of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Pub. L. 100-17; 101 Stat. 132, 183; April 2, 1987) as amended by Section 338 of the Department of Transportation and Related Agencies Appropriations Act of 1990 (Pub. L. 101-164; 103 Stat. 1069, 1099; November 21, 1989). The purpose of the easement is to preserve and protect the vegetation within the easement area which serves to screen the University's buildings and other improvements from visitors to Archbold Parkway, located immediately adjacent to the University's western border. The construction of a roadway for service vehicles only and the cutting of trees to allow for the roadway's construction are permitted under the terms of the easement.

Compliance with Regulations

The *National Environmental Policy Act of 1969* (Title 42 U.S. Code §4321 to 4370) requires detailed and documented environmental analysis of proposed Federal actions that may affect the quality of the human environment. The preparation and public review of this EA satisfies the requirements of this Federal law.

The *National Historic Preservation Act of 1966*, as amended, (16 U.S.C. §470 et seq.) recommends that Federal agencies proposing action consult with the State Historic Preservation Officer regarding the existence and significance of cultural and historical resource sites. An Assessment of Effects form will be submitted for review by the District of Columbia Historic Preservation Officer.

The *Endangered Species Act of 1973* (ESA), as amended (16 U.S.C. §1531-1544) prohibits Federal actions from jeopardizing the existence of federally listed threatened or endangered species or adversely affecting designated critical habitat. Federal agencies must consult with the U.S. Fish and Wildlife Service (FWS) to determine the potential for adverse effects. There are two known federally listed species within or near the project area. The Hay's Spring Amphipod (Stygobromus hayi) and the Bald Eagle (Haliaecetus leucocephalus) (fly over only, no breeding) are listed species that occur in or near to the project area and currently under the protection by NPS. A letter has been sent to FWS identifying the above mentioned listed species and requesting FWS's concurrence that these are in fact the only listed species in or near the project location.

Executive Order 13112 requires that Federal agencies act to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Issues and Impact Topics

The NPS staff who developed the issues and concerns, and the impact topics for this EA include cultural and natural resource specialists, and program management staff.

Issues

The existing West Perimeter Road is in a deteriorated condition and is in need of immediate repair. Repairing the roadway without addressing the current lack of an adequate storm water drainage system and the unstable fill material of which the existing slope is comprised would not be prudent. However, in light of the scenic easement held by the United States, entering onto a portion of the supporting slope to clear existing vegetation, excavate and remove the existing unsuitable fill material, bring in new, stable fill, install a new storm water drainage system, re-contour the slope, and implement a new landscape plan requires prior NPS approval. To ensure the stabilization of the slope, adequate repair of the roadway and the resolution of the existing erosion problem, NPS is willing to authorize the following activities within the easement area: 1) clearing of an approximately 300-foot long portion of the slope, including the removal of a maximum of 18 mature trees (18" or greater dbh), 2) excavation and removal of the existing

unstable fill material, 3) placement of new fill material, geo-grid textile fabric and topsoil along the disturbed portion of the slope, 4) install a new storm water drainage system, 5) re-grade the slope to ensure its long-term viability, and 6) implement a new landscape plan. In return for NPS's authorization of the aforementioned activities, the University has agreed to undertake a number of mitigation measures. Specific mitigation measures include the installation of a concrete curb and catch basin along the improved roadway's western edge, installation of a storm drain pipe beneath the re-contoured slope connected to a water quality dissipation device at the base of the slope, erection of a 8-foot tall vinyl-clad chain-link fence at the top of the slope, construction of an 8-foot tall stone-faced retaining wall at the base of the slope, and implementation of a landscape plan approved by NPS for the newly graded slope. In addition, the University will remove an assortment of construction rubble, solid waste and organic waste that has been previously discarded along the face of the slope. The foregoing mitigation measures are intended to enhance the scenic character of the slope encumbered by the scenic easement, and preclude further erosion and the resultant loss of vegetation. Implementing these mitigation measures is believed to ultimately enhance the visitor's experience of Archbold Parkway.

Impact Topics Included in this Document

Impact topics are areas of concern that could be affected by the alternatives. Each proposed alternative has been evaluated in relation to several impact topics. The impact topics that have been assessed in this EA include:

1. Cultural Landscape – Potential impacts to cultural landscapes have been assessed in terms of the affects the proposed alternatives will impart on the cultural landscape of Archbold Parkway. Archbold Parkway, a wooded expanse that encompasses the stream valley of Foundry Branch, extends north from the intersection of Canal Road, N.W., and Foxhall Road, N.W., to Whitehaven Parkway, lies immediately adjacent to the western border of the University. Foundry Branch Trail, which traverses Archbold Parkway along its north-south axis, is popular with hikers and bikers. The project area lies well within the view of users of the trail.

2. Vegetation – The supporting slope adjacent to the roadway is populated by a mixture of native mature hardwood trees and an understory of younger mixed hardwood trees, shrubs and groundcovers. In addition, the presence of a number of exotic species of trees and shrubs are also found along the slope. Impacts to existing vegetation within the project area and the adjacent parkland imparted by the proposed alternatives have been assessed. In addition, the future viability of the scenic character of the easement area was also assessed.

3. Wildlife – Occasional surveys of wildlife present within Glover Archbold Park are performed by means of field observation. Potential impacts to existing wildlife populations and habitat were assessed relative to each of the two proposed alternatives. The supporting slope within the project area provides food and cover for resident and migratory bird species, and nesting sites for breeding species. The slope also provides habitat for small mammals such as raccoons, opossum, red and gray

fox, gray squirrel, white-footed mouse and short-tailed shrew. White-tailed deer have also been seen feeding on the slope. Down logs provide living space and wildlife habitat for several species of reptiles including the worm snake, the ring-neck snake, the brown snake, the common garter snake as well as the red-backed salamander. Two springs, which contain a species of spring snail as well as other macro-invertebrates, are located approximately 100 yards west of the project area immediately adjacent to the west side of the Foundry Branch Trail.

4. Soils – The soils comprising the slope are a major contributing factor in the past failure of the roadway's supporting slope. An understanding of the composition of these soils is integral to properly assessing the impacts the proposed alternatives would impart to the slope's soils. The findings of a Geotechnical Engineering Report prepared by the consulting firm Schnabel Engineering North, LLC provides an in-depth evaluation of the soils found along the slope and outlines a slope stability plan to remediate the slope's "marginal stability."

5. Visitor Use and Experience – The project area is located entirely on private property. Although the United States holds a scenic easement interest in that portion of the University's property within which the proposed project is located, visitor access to the University's property is precluded. Thus, potential impacts to visitor use and experience resulting from the implementation of the proposed alternatives was assessed in terms of impacts to visitor use of the adjacent Archbold Parkway.

Impact Topics Dismissed From Further Analysis

Air Quality - The NPS has a responsibility to protect air quality pursuant to the 1916 Organic Act, the Clean Air Act of 1970, and Federal, state and local air pollution standards. The NPS will seek to perpetuate the best possible air quality within the boundaries of parkland through (1) the preservation of existing natural systems, (2) preservation of existing cultural resources and (3) sustaining visitor enjoyment, scenic vistas, and cultural landscapes. Construction activities such as clearing and grading, hauling materials, operating equipment, and vehicular exhaust would be temporary and localized. Air quality was therefore dismissed as an impact topic.

Water Resources (including Executive Order 11990 and Executive Order 11988) - NPS policies require protection of water quality consistent with the Clean Water Act of 1972. The subject property is located along the face of an upland slope some 100 yards east of Foundry Branch, and above the 100-year floodplain of the Potomac River as identified on Flood Emergency Management Maps. The U.S. Fish and Wildlife Service National Wetland Inventory Maps show there are no wetlands within the project area, thus no impact to wetlands or other water resources will occur. Therefore, a statement of findings for wetlands will not be prepared.

Soundscape Management - In accordance with NPS Management Policies (2001) and Director's Order #47 (Sound Preservation and Noise Management), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of

all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. The soundscape surrounding the project area is composed of both manmade and natural sounds. The project location is situated adjacent to the University's West Perimeter Road and several University facilities, including its waste disposal facilities, in addition to being within relative proximity to Canal Road, a major roadway from which vehicular traffic noise can be readily heard. Construction-related noise will be generated during the term of the project. However, since the proposed action does not produce or promote long-term existing unnatural sounds, it is dismissed as an impact topic.

Lightscape Management - In accordance with NPS Management Policies (2001), NPS strives to preserve to the extent possible the quality of natural ambient landscapes and the night sky. Because the project area does not require artificial lighting, lightscape management was dismissed as an impact topic.

Socioeconomic Environment - The proposed action would neither change local and regional land use nor impact local businesses. The proposed project will have a short-term, minimal beneficial impact to local economies resulting from the minimal increase in temporary employment and acquisition of local products. Any benefits would be short-term and negligible; therefore, this impact topic was dismissed.

Environmental Justice - Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local and tribal programs and policies. The proposed action would not impart health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore, this topic was dismissed from further review.

Ethnographic Resources - The NPS defines ethnographic resources as any "site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (DO-28). Because no ethnographic resources are known to exist in or in proximity to the project area, this topic was dismissed.

ALTERNATIVES

Alternatives considered were those that can be implemented in a timely and cost-effective manner, produce the desired resolution and impart the fewest impacts to existing resources. Several proposals were considered as a means of stabilizing the existing slope. Initial proposals ranged from applying a geo-grid textile webbing material to the portion of the slope most

damaged by the ongoing erosion action to the clearing and re-grading of an approximately 300-foot long segment of the slope. Upon further evaluation of the slope's composition by means of collecting and analyzing soil samples taken from atop and at the base of the slope, it was determined that options focusing on small scale spot-remedies did not provide long-term resolution to the larger erosion and slope instability problems. Thus, a more comprehensive solution was sought. This EA evaluates two alternatives. The first alternative is the no-build alternative. The second and the "environmentally preferred" alternative is a comprehensive proposal that addresses the core of the erosion problem and provides a long-term solution to the failing slope, continued loss of vegetation and the endangered roadway.

Alternative 1: No-Action Alternative

Under the no-action alternative, the supporting slope would continue to experience the affects of unabated erosion caused by unregulated storm flows. As a result, slumping of the roadway's western edge is expected to accelerate as would sloughing of the slope surface whereby large sections of fill material break free and slide toward the base of the slope. In these instances where portions of the slope have failed, all vegetation is lost, including several mature hardwood trees. An additional effect of the ongoing slope failure is the loss of support to the roadway. Continued disintegration of the supporting slope will subject the roadway, and possibly the neighboring structures, to an increased threat of a catastrophic collapse. As it is not reasonable to ignore the current situation, this alternative was not considered practicable.

Alternative 2: Preferred Alternative

It is widely acknowledged that improvements must be undertaken in the very near future in order to avoid a significant failure of the roadway, and the further and more widespread degradation of the vegetation within the scenic easement area. To that end, University and NPS representatives have negotiated the provisions of a proposed comprehensive plan to provide a long term solution to the existing erosion and slope stability problems. The major actions that would be undertaken under this alternative are listed below.

- Clear existing vegetation from an approximately 300-foot long segment of the existing slope.

- Excavate and remove all existing unsuitable fill material within the cleared area down to the layer of previously undisturbed soil.

- Remove the assortment of construction rubble, solid waste and organic matter that has been deposited along the slope in the past.

- Install a new 12-inch diameter concrete pipe perpendicular to the slope that will extend from a new catch basin to be incorporated in the shoulder of the rehabilitated roadway to an endwall with a level spreader storm water dissipater located at the base of the slope.

- Construct a new 8-foot tall and approximately 230-foot long concrete retaining wall with stone veneer at the base of the slope.

- Placement of new fill material and geo-grid textile (20-foot lengths at 2-foot intervals), and re-contour the slope.

- Re-construct the existing variable width roadway at the top of the slope to include a 5-foot wide shoulder within which will be located a 6-inch combination curb and gutter, an 8-foot high chain link fence with black vinyl coated fabric and a 2.5-foot high wooden timber guardrail.

- Implement a new landscape plan along the disturbed portion of the slope and install a new 6-foot high chain link fence on the property line between the University and NPS.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested by NEPA, which is guided by CEQ. The CEQ provides direction that the environmentally preferable alternative is the alternative that will promote "[t]he national environmental policy as expressed in Section 101 of NEPA, "which considers:

1. Fulfilling the responsibility of each generation as trustee of the environment for succeeding generations;

2. Assuring for all generations, safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

3. Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;

4. Preserving important historic, cultural and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;

5. Achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and

6. Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources.

Alternative 1 fails to meet several of the above listed evaluation factors. The “no action” alternative will result in the further degradation of existing resources and provides no reasonable plan to preserve or protect these resources for the future.

Alternative 2 is the environmentally preferred alternative because it best addresses the six criteria listed above. Although the initial stages of Alternative 2 impact existing resources, the net result of the actions associated with this alternative provide several enhancements to park resources and the future enjoyment of these resources for successive generations. Specific enhancements

include the construction of a new storm water drainage system as a component of the roadway re-construction design, the installation of fencing at the top of the slope to screen roadway traffic and the University's waste disposal operation, and the implementation of a new landscape plan that provides a palette of native species to be planted at a density of 40 plants\1,000-square feet. In addition, the retaining wall to be located at the base of the slope, which is a fundamental element of the project, will be finished with a natural stone veneer. Alternative 2 is also viewed as striking a balance between the University's current and future need for the roadway, and NPS's stewardship of a valued scenic easement interest in the University's property along the slope.

AFFECTED ENVIRONMENT

Cultural Landscapes

The project area is located along a sloped portion of the University's property. The slope lies adjacent to the eastern edge of Archbold Parkway and has historically been covered with mixed woodland vegetation. In 2003, NPS acquired a scenic easement interest in approximately 2.5 acres of the University's property of which the project area is a part. The easement was acquired as a means of preserving and protecting the vegetation along the sloped portion of the University's property that in the past has served to screen several University structures and operational facilities from the view of hikers/bikers using Foundry Branch Trail in Archbold Parkway.

Archbold Parkway was established by Public Law 68-469, approved February 25, 1925, wherein the Chief of Engineers of the United States, a predecessor of NPS, was authorized and directed to accept lands "donated by Mrs. Anne Archbold to the United States for park purposes in accordance with the terms of her dedication" and provides that the park shall be known as "Archbold Parkway." As a result of the initial donation of land by Mrs. Archbold and through the subsequent purchases of adjoining property by the United States, the stream valley of Foundry Branch, which traverses the north-south axis of Archbold Parkway, has been preserved and protected for the use and enjoyment of current and future generations. The NPS has recently nominated Glover-Archbold Parkway for inclusion on the National Register of Historic Places and is awaiting the results of the formal review by the Keeper of the National Register.

Vegetation

Vegetation within the project area is typical of that found in mature, protected woodlands throughout northwest Washington, D.C., such as the adjacent Archbold Parkway. Appendix E of this EA provides a listing of existing plant species within or in proximity to the project area. The project area contains a mixture of hardwoods, including oak, beech, sycamore, maple, gum, tulip poplar and locust in addition to native shrubs and groundcovers. The overall health and future viability of the vegetation within the project area is threatened by the existing erosion problem. Several mature trees have recently toppled from the affects of unabated erosion which continues to adversely impact the stability of the roadway's supporting slope.

There is no known state or Federal threatened or endangered species of vegetation located within or in proximity to the project area. Non-native species are prevalent and include tree-of-heaven, honeysuckle, and garlic mustard.

Wildlife

The NPS has inventoried the fauna within the adjacent Archbold Parkway as well as Glover Parkway to the north and has identified 24 species of mammals, 72 species of birds, 7 species of reptiles, and 4 species of amphibians present within the adjoining parklands. Appendix F of this EA provides a listing of existing animal species within or in proximity to the project area. No aquatic habitat is located within the project area. However, two springs exist on NPS property in proximity to the project area. Both springs contain a species of spring snail as well as other macro-invertebrate species. Due to the proximity of the project area to the adjoining NPS property, it is believed that many of the fauna identified within Archbold Parkway and Glover Parkway are common to the project area.

There are two Federally listed threatened and endangered species located within the project area. The Hay's Spring Amphipod (Stygobromus hayi) and the Bald Eagle (Haliaecetus leucocephalus) (fly over only, no breeding) occur in or near to the project area and are currently under the protection by NPS. A letter has been sent to FWS identifying the above mentioned listed species and requesting FWS's concurrence that these are in fact the only listed species in or near the project location.

Soils

An evaluation of the subsurface materials along the slope adjacent to West Perimeter Road was conducted by Schnabel Engineering North, LLC on behalf of the University. The findings of Schnabel's investigations and analyses are presented in Schnabel's February 28, 2007, "Geotechnical Engineering Report, Slope Stability Evaluation, West Perimeter Road, Georgetown University, Washington, D.C."

Based on the subsurface investigations performed along the top and bottom of the slope abutting West Perimeter Road, the geologic stratigraphy consists of residual materials derived from the weathering of phylittes and schists of the Wissahickon Formation. The materials consist predominantly of sandy silt and silty sand. In the immediate vicinity of the project site, some of the surface strata have been eroded or excavated and have evidently been replaced with fill. It is believed that the origin of the majority of these fill materials is excavated spoil resulting from past construction activities, possibly the adjoining Yates Athletic Complex. A visual inspection of the slope within the project area reveals the presence of construction debris, trash and tires indicating that the slope may have served as an unofficial dump site in the past.

In order to gain a comprehensive understanding of the slope's current level of stability, the various causes for the slope's past failures, and to assist in developing a plan for the future stabilization of the slope, it was essential to undertake an evaluation of the slope's soil composition. To that end, six soil borings were conducted whereby a series of soil samples were obtained at various depths and submitted for laboratory analysis. Each of the borings was

advanced to the point of auger refusal, the depth where the boring equipment was unable to further penetrate the subsurface materials. Due to the steepness of the slope and the difficulty in gaining access to the slope by soil boring equipment, the borings were conducted atop the slope and along the toe of the slope.

The analysis of the soil samples illustrates the strata and composition of the soils within the project area, and provides considerable insight into the current status of the slope. From the laboratory analysis of the soil borings, the following subsurface soil stratigraphy was developed:

- ***Stratum A: Existing Fill***

  Below the ground surface to depths of 38.5 feet, the borings encountered fill materials consisting of sandy silt, silty sand, lean clay with brick, asphalt and glass fragments, mica, sand, rock fragments, organics and clay lenses. This stratum exhibits predominantly loose density.

- ***Stratum B: Residual Soil***

  Below the ground surface and fill soils of Stratum A to a depth of 38.5 feet, the borings encountered residual materials consisting of brown silt, silty sand, silty gravel, and sandy silt with varying amounts of mica and rock fragments. This stratum exhibits a range of densities from loose to very compact.

- ***Stratum C: Residual-Disintegrated Rock***

  Below Stratum A and Stratum B to a depth of 67.0 feet, the borings encountered brown and gray disintegrated rock with varying amounts of mica and weathered rock fragments. This stratum is generally very compact.

Visitor Use and Experience

As NPS holds only a scenic easement interest in the property upon which the project is proposed, there is no direct visitor use of the project area. The pertinent visitor experience associated with this project is that of the visitor using Foundry Branch Trail which is located within the adjoining Archbold Parkway. As a point of reference, the project area is located approximately 100 yards east and up gradient of Foundry Branch Trail.

The purpose of the scenic easement is to provide a permanent means of natural screening of University structures and operational facilities located along the escarpment adjacent to the eastern edge of Archbold Parkway. The protections afforded by the vegetation found along the sloped portion of the University's property covered by the scenic easement serve to enhance the visitor experience of Archbold Park.

ENVIRONMENTAL CONSEQUENCES

Impacts on Cultural Landscapes

In conducting this EA, impacts to cultural landscapes have been evaluated and described in terms of type, context, duration, and intensity, which is consistent with the regulations of the CEQ that implement NEPA. This impact analysis is intended to comply with requirements of both NEPA and Section 106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to cultural landscapes were identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Definitions of Intensity Levels: In order for a cultural landscape to be listed on the National Register, it must meet one or more of the following criteria of significance: A) associated with events that have made a significant contribution to the broad patterns of our history; B) associated with the lives of persons significant in our past; C) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; D) have yielded, or may be likely to yield, information important in prehistory or history. The landscape must also have integrity of those patterns and features - spatial organization and land forms; topography; vegetation; circulation networks; water features; and structures/buildings, site furnishings or objects - necessary to convey its significance. For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

Negligible Adverse Impacts are at the lowest levels of detection - barely perceptible and not measurable.

Minor Adverse Impacts would not affect the character defining patterns and features of a National Register of Historic Places eligible or listed cultural landscape.

Minor Beneficial Impacts preserve the character defining patterns and features of the landscape in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes.

Moderate Adverse Impacts alter a character defining pattern(s) or feature(s) of the cultural landscape but would not diminish the integrity of the landscape to the extent that its National Register eligibility is jeopardized.

Moderate Beneficial Impacts involve rehabilitation of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.

Major Adverse Impacts alter a character defining pattern(s) or feature(s) of the cultural landscape, diminishing the integrity of the landscape to the extent that it is no longer eligible to be listed in the National Register.

Major Beneficial Impacts involve the restoration of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.

Alternative 1 – No-Action Alternative

Under the No-Action Alternative, the slope would continue to suffer the effects of unchecked erosion. Scouring along the face of the supporting slope caused by storm water run-off that spills over the edge of the roadway and cascades down the slope has created deep incisions immediately adjacent to the roadway. These incisions have undermined portions of the roadway along the western edge of paving. In addition, the scouring has caused sections of the slope to fracture whereby large volumes of soil and accompanying vegetation have slumped toward the base of the slope and onto NPS property exposing bare fill material to the further effects of storm water erosion.

Taking into account the visual presence of discarded materials within the project area and that portions of the slope have previously failed creating large, detectable gaps in the existing tree canopy, minor adverse impacts have already been imparted to the cultural landscape of Archbold Parkway. Further, the existing erosion problem has been exacerbated through the exposure of bare soil to the continuing forces of erosion, which, in turn, has accelerated the undermining of root systems and the roadway's base material. Left unabated, continued erosion could potentially impart moderate to major adverse impacts to the Parkway's cultural landscape in the event of a major failure of the slope.

Cumulative Effects – The no action alternative would not produce any measure of correction to the existing erosion problem and, as a result, serve to accelerate the damage caused by continued uncontrolled storm water run-off and slope instability.

Conclusion - Implementation of Alternative 1 would not address the minor adverse impacts currently experienced and would set the stage for the expected occurrence of moderate to major adverse impacts as a result of continued erosion.

Alternative 2 – Preferred Alternative

The proposed actions associated with Alternative 2 would impart short-term, negligible adverse impacts to the cultural landscape of Archbold Parkway. These adverse impacts will be incurred as a result of initial construction activities such as the clearing of the slope, excavation of existing unsuitable fill material, placement of new fill and re-grading. Although initial construction activities are substantial, the project's limits are confined to a limited land area of approximately 25,000-square feet. Presently, the affects of past erosion of the slope have created

a significant gap in the tree canopy within the project area. As a result, only sporadic vegetation currently exists along the slope within the limits of the project.

As a means of off-setting the initial impacts of construction and providing long-term enhancements to the scenic easement area, Alternative 2 incorporates a series of mitigation measures. These mitigation measures are expected to impart long-term moderate to major beneficial impacts to the cultural landscape of Archbold Parkway. The anticipated benefits of the project are attributed to two central elements of the project. First, is the comprehensive series of erosion control measures incorporated within the scope of the project. Of no less importance is the proposed landscape plan that will be implemented upon completion of construction activities.

Cumulative Effects – This project would be implemented in a manner so as to provide enhancements on two fronts. Aside from providing the means to ensure the slope's stability and that the University's West Perimeter Road remains a viable north-south, cross-campus access route for service vehicles, the project also includes a series of mitigation measures, including the implementation of a new landscape plan, designed to enhance the scenic character of the immediate project area. Upon their implementation, these proposed mitigation measures would provide major, long-term, beneficial impacts to the cultural landscape of the adjacent Archbold Parkway.

Conclusion – In light of the current conditions that exist along the face of the slope, the construction activities associated with Alternative 2 would impart short-term negligible adverse impacts to the cultural landscape of Archbold Parkway. However, it is the mitigation measures associated with Alternative 2 that impart the greatest impacts. The benefits that will be realized by means of correcting the long-standing erosion and slope instability problems and through restoring the slope's vegetative cover. Together, these measures will undoubtedly enhance the scenic character of the project area thereby improving the integrity of the cultural landscape of the adjacent Archbold Parkway.

Impacts on Vegetation

Definition of Intensity Levels

Analysis of the potential intensity of impacts to vegetation was derived from the available information regarding natural systems and vegetation within the adjacent Archbold Parkway. The thresholds of change for the intensity of impacts to vegetation are defined as follows:

Negligible: Impacts are localized and not measurable or at the lowest level of detection;

Minor: Impacts are localized and slight but detectable;

Moderate: Impacts are readily apparent and appreciable; or

Major: Impacts are severely adverse and highly noticeable.

Alternative 1 – No-Action Alternative

The no-action alternative is anticipated to impart further long-term moderate to major adverse impacts to the vegetation within the project area. The existing sporadic vegetation along the slope would remain susceptible to loss from further erosion of the slope. Several mature native trees along the slope have toppled recently as erosion continues to undermine root systems. Understory trees, shrubs and ground covers have also been lost as sections of the slope have fractured and slid toward the base of the slope. Exotic species continue to gain a foothold along the slope throughout those areas where native species have been lost as a result of continued erosion and slope instability. It is very possible that these exotic species will expand their domain as additional bare soil becomes exposed by continued erosion and through the opportunity created by openings in the tree canopy. Due to the ongoing erosion and past sloughing of the slope, portions of the slope are incapable of supporting plant growth of any kind.

Cumulative Effects – The effects of past and current inaction have adversely impacted the vegetation along the slope. Erosion is likely to continue at the current level or perhaps at an accelerated pace if left unchecked, resulting in further degradation of the slope and the loss of additional vegetative cover. An expansion of exotic species along the slope is anticipated as a direct consequence of continued erosion and the resultant loss of native vegetative cover.

Conclusion – Selection of the no-action alternative would result in long-term moderate to major adverse impacts to existing vegetation within the project area and on neighboring NPS property. The effects of unchecked erosion will become increasingly evident as more of the slope's existing fill material fractures and slides toward the base of the slope. As the slope continues to erode, root systems of existing trees and other vegetation will become undermined, resulting in more toppled trees and unearthed shrubs and ground covers. The loss of native vegetation due to slope failure and the introduction of invasive and exotic species as bare soil is exposed would impart long-term moderate to major adverse impacts to the vegetative cover within the project area as well as to the surrounding landscape.

Alternative 2 - Preferred Alternative

Implementation of Alternative 2 would impart short-term moderate adverse impacts and long-term moderate beneficial impacts on the existing vegetation. Such adverse impacts will be realized through initial construction activities that would include the clearing of the slope within the project limits, excavation of existing unsuitable fill material, installation of a new underground drainage system and geo-grid textile fabric, the placement of new fill material and re-grading the slope. Initial clearing activities would result in the loss of a maximum number of 18 mature trees (18-inches or greater dbh) in addition to the existing under-story trees, shrubs and ground covers. However, the loss of mature trees and other vegetation will be subject to additional on-site scrutiny by NPS representatives prior to the initiation of construction activities. As mitigation for the loss of vegetation caused by project activities, a proposed new landscape plan will be implemented that reflects a palette of native trees, shrubs and ground covers at a density designed to promote rapid stabilization of the slope and significantly limit the introduction of exotic species. As a small portion of NPS property will be disturbed to re-route

the temporary construction access road away from a mature Beech tree, the University will be required to make necessary reparations, including but not limited to the replacement of all trees and shrubs impacted.

Cumulative Effects: Implementation of Alternative 2 would provide long-term moderate beneficial impacts to the vegetation within the project area and the surrounding woodland. The proposed landscape plan associated with Alternative 2 provides a re-planting of the slope with native species that will provide several long term benefits. These benefits include stabilization of the slope, improved health and diversity of plantings and enhanced screening of University structures located atop the slope.

Conclusion: Alternative 2 will impart short-term moderate adverse impacts to existing vegetation as a result of construction related activities. However, mitigation measures associated with implementing Alternative 2 provide numerous beneficial impacts that far outweigh the adverse impacts caused by initial construction activities.

Impacts on Wildlife

Definition of Intensity Levels

Analysis of the potential intensity of impacts to wildlife was derived from the available information regarding wildlife in the adjoining Archbold Parkway. The thresholds of change for the intensity of impacts to wildlife are defined as follows:

Negligible: Impacts are localized and not measurable or at the lowest level of detection;

Minor: Impacts are localized and slight but detectable;

Moderate: Impacts are readily apparent and appreciable; or

Major: Impacts are severely adverse and highly noticeable.

Alternative 1 – No-Action Alternative

The no-action alternative is anticipated to impart long-term moderate adverse impacts to wildlife and wildlife habitat within the project area and the immediately adjacent NPS property as continued slope failure and the resultant loss of vegetative cover is expected to proceed unabated at the current rate or at an accelerated pace as newly exposed soil is subjected to the forces of erosion. To date, minor to moderate adverse impacts have adversely effected wildlife habitat within the project area as erosion of the slope and the loss of vegetation have increased in scope and intensity. It is evident that the adjoining Archbold Parkway is serving as replacement habitat for several species formerly feeding and taking shelter within the area impacted by erosion and vegetation loss.

Cumulative Effects – As erosion of the slope continues, and vegetative cover is lost, wildlife habitat is destroyed affecting numerous species. Fracturing of the slope continues causing large

sections of the slope to break free and slide to the base of the slope. The result of this ongoing process of slope failure is anticipated to cause irreparable damage to existing and potential habitat of ground dwelling species. The loss of vegetation serving as either a food source or as cover/shelter to other wildlife would also impart long-term moderate adverse impacts to numerous species that populate the project area and the immediate surrounding woodland. If not addressed, the scope of the erosion problem will continue to expand along the face of the slope affecting a larger expanse of habitat.

Conclusion – There would be moderate adverse impacts to habitat and to wildlife within the project area upon selecting the no-action alternative. Slope failure resulting in the continued loss of vegetation would impart the greatest impacts on wildlife and wildlife habitat. This trend would not be halted or reversed other than by intervention intended to remedy the existing erosion problem.

Alternative 2 - Preferred Alternative

There are two federally listed threatened and endangered species located within the project area. The Hay's Spring Amphipod (Stygobromus hay) and the Bald Eagle (Haliaecetus leucocephalus) (fly over only, no breeding) occur in or near to the project area and are currently under the protection of NPS. A letter has been sent to FWS identifying the above mentioned listed species and requesting FWS's concurrence that these are in fact the only listed species in or near the project location.

Alternative 2 would impart short-term minor adverse impacts to wildlife and wildlife habitat within the project area as a direct result of initial construction related activities. The effects of past and current erosion have severely impacted portions of the slope and the vegetation along the slope. However, implementation of the landscape plan, which is a mitigation measure of Alternative 2, would provide long-term major beneficial impacts to wildlife and wildlife habitat within the project area and the surrounding woodland.

As the project limits encompass a relatively small land area, approximately 25,000 square feet, the adjacent woodlands within Archbold Parkway will provide suitable replacement habitat for most if not all species currently found within the project area. The term of potential adverse impacts on wildlife and wildlife habitat within the project area will coincide with construction activities, which are anticipated to be completed in approximately six months. Mitigation of adverse impacts generated by initial construction activities would be expected to become evident upon the implementation of the proposed landscape plan which is an element of Alternative 2.

Cumulative Effects – Upon the implementation of Alternative 2, major beneficial impacts to wildlife and wildlife habitat would be anticipated. The containment of erosion, stabilization of the slope and installation of new native plantings along the slope, all of which are elements of Alternative 2, will negate the short-term adverse impacts created by initial construction activities. Implementing the proposed landscape plan is anticipated to create an enhanced wildlife habitat in perpetuity.

Conclusion – Although initial construction activities will impart short term minor adverse impacts to wildlife and wildlife habitat within the project area, mitigation measures associated with Alternative 2 intended to enhance wildlife habitat will provide major beneficial impacts.

Impacts on Soils

Definition of Intensity Levels

Analysis of the potential intensity of impacts to soils was derived from the findings contained within the aforementioned Geotechnical Engineering Report dated February 28, 2007, prepared by Schnabel Engineering North, LLC. Thresholds of change for the intensity of impacts to soils are defined as follows:
Negligible: Impacts are localized and not measurable or at the lowest level of detection;

Minor: Impacts are localized and slight but detectable;

Moderate: Impacts are readily apparent and appreciable; or

Major: Impacts are severely adverse and highly noticeable.

Alternative 1 – No-Action Alternative

Subsurface investigations of the slope's composition have concluded that the existing slope consists of excavated spoil from previous University construction activities, construction debris, and an assortment of solid waste. Soil borings taken from atop and at the base of the slope have been submitted for laboratory analysis and indicate that due to its composition, the slope is considered "marginally stable."

The no-action alternative provides no means of modifying the soil conditions along the slope and as a result would impart long-term major adverse impacts to the soils within the project area. Subjecting the existing soils to the continued forces of erosion is certain to increase the intensity and frequency of sloughing along the face of the slope. Slope instability will continue to manifest in widespread adverse impacts to the cultural landscape, vegetation, wildlife and wildlife habitat and visitor use and experience. In addition, it is very possible that the slope's instability could also result in the collapse of a portion of the adjacent roadway.

Cumulative Effects – Composition of the slope is a major factor contributing to the slope's instability. As the forces of erosion are allowed to scour the face of the slope, continued sloughing will occur. The tenuous nature of the slope due to its soil composition has already imparted adverse impacts to existing resources and could quite possibly lead to a collapse of a portion of the roadway.

Conclusion – There would be moderate to major adverse impacts to soil composition within the project area upon selecting the no-action alternative. Slope failure caused by the unsuitable fill materials that comprise the slope will continue to impart collateral adverse impacts to existing resources. This trend is expected to accelerate without some means of intervention.

Alternative 2 – Preferred Alternative

Based upon subsurface investigations and slope stability analysis, the geotechnical engineering consulting firm Schnabel Engineering North, LLC characterized the existing slope as "marginally stable." Schnabel's investigations also provided the means necessary to develop a slope stabilization plan. Initially, several different methods of stabilizing the slope were considered. These early approaches to slope stabilization ranged from temporary repairs along the upper portions of the slope adjacent to West Perimeter Road to a comprehensive stabilization incorporating significant grading operations and construction of a retaining wall at the base of the slope. Deciding to stabilize the slope by means of a permanent measure, the University, in consultation with NPS, proposes a final solution as described below:

- A drilled shaft-supported, 8-ft. (maximum exposed height) retaining wall at the toe of the slope.

- A geo-grid-reinforced soil slope (RSS), up to 20 ft. in height, constructed at a slope of 1H:1V from the top of the retaining wall to a bench in the slope.

- A 10-ft. wide bench.

- A re-graded slope extending from the 10-ft. wide bench to the West Perimeter Road and constructed of select fill at a slope of approximately 2H:1V.

At the behest of NPS, the maximum exposed height of the proposed retaining wall was limited to 8 feet. As a result, the proposed re-graded slopes are steeper than had the retaining wall been designed at a greater height. Initial discussions concerning the re-planting of the slope included a design incorporating native trees, shrubs and ground covers throughout the entire slope. However, due to the concern that the roots systems of trees planted along the geo-grid-reinforced 1H:1V slope would penetrate into the geo-grids, compromising the integrity of this essential stabilization component, the planting of trees is recommended only for the 2H:1V portion of the slope. The species of trees to be planted within the 2H:1V portion of the slope should be selected such that the root systems of these trees will not grow to penetrate the geo-grids.

To avert any future slope failures due to unstable fill materials, re-grading of the slope will employ the use of the aforementioned geo-grid and engineered fill materials. The backfill material used to create the 1H:1V geo-grid-reinforced slope will consist of granular fill placed in maximum 8-inch thick loose lifts, compacted to 95 percent dry density. More stringent criteria may be applied to this fill material if warranted by field conditions. In creating the 2H:1V slope located immediately up-gradient from the 1H:1V slope and 10-foot wide bench, structural fill materials comprised of pre-determined soil classifications are to be placed in maximum 8-inch lifts and compacted to 95 percent dry density. The material is to be free of rock or gravel larger than 3-inches in any dimension, debris, waste, vegetation or other deleterious matter.

Additional borings will be performed prior to the start of any excavation in order to obtain supplemental subsurface information including depth to rock, and will allow refinement of the slope stability and caisson design.

Cumulative Effects – The existing soils are a major contributing factor to the current situation found along the slope. Implementation of the proposed comprehensive slope stability plan will provide a wide range of major beneficial impacts. The multi-faceted mitigation measures associated with the plan will extend significant benefits to the existing vegetative cover along the slope, wildlife and wildlife habitat, the cultural landscape and to visitor use and experience.

Conclusion – There would be moderate to major beneficial impacts to soil composition within the project area upon implementing the proposed slope stabilization plan. Aside from eliminating the continued degradation of the existing slope and collateral resources, a wide range of specific benefits will be realized through the plan's mitigation measures.

Impacts on Visitor Use and Experience

Definition of Intensity Levels

The methodology employed to evaluate potential impacts to visitor use and experience was an assessment of how each of the following described alternatives would affect visitor use and experience, including safety considerations, within the context of NPS's mandate to preserve and protect existing resources for the enjoyment of future generations.

As the project area is located on private property and is not open to public access, analysis of the potential intensity of impacts to visitor use and experience resulting from the implementation of either alternative was assessed in relation to the adjoining Archbold Parkway. The thresholds of change for the intensity of impacts to visitor use and experience are defined as follows:

Negligible: Impacts are localized and not measurable or at the lowest level of detection;

Minor: Impacts are localized and slight but detectable;

Moderate: Impacts are readily apparent and appreciable; or

Major: Impacts are severely adverse and highly noticeable.

Alternative 1 – No-Action Alternative

The no-action alternative would impart minor to moderate long-term adverse impacts on visitor use and experience. The ongoing erosion problem has severely affected the integrity and scenic character of the supporting slope adjacent to West Perimeter Road as mature vegetation continues to be lost. As the fill material comprising the slope becomes saturated and fails, large sections of the slope have slumped toward the base of the slope. This ongoing process of slope instability has denuded significant sections of the slope of all vegetation, including several mature trees. A collateral effect of continued slope failure is the exposure of root systems of other trees and shrubs. As these root systems become further undermined, additional vegetation will be lost. The end result of these processes is an incised slope devoid of vegetation that no longer serves to screen the various University structures and facilities located at the top of the

slope. The visual intrusions of the slope's current condition and the exposure of University buildings and operational facilities impart an appreciable adverse impact to visitors using Foundry Branch Trail within Archbold Parkway.

Cumulative Effects: The no-action alternative provides no corrective action that would address the current erosion problem or the lack of adequate storm water management Thus, the visual intrusions imparted as a result of this ongoing situation will only worsen over time. More vegetation would be lost, and, as a direct result, more visual intrusion of University buildings and operations would be introduced into the view of those using Foundry Branch Trail.

Conclusion: Continued uncontrolled erosion of the slope will result in the significant loss of vegetative cover. As mature trees and other vegetation continue to be lost through slope failure or the continued undermining of root systems, certain structures and operational facilities located along the University's western perimeter, heretofore screened from view, have become more visible from the Foundry Branch Trail. Additionally, erosion has begun to transform the former wooded slope into a scoured landscape devoid of standing trees and cluttered with downed trees. These visual intrusions already adversely impact visitor use and are anticipated to impart moderate long-term adverse impacts to the visitor's experience of the adjacent Archbold Parkway into the future.

Alternative 2 – Preferred Alternative

Implementing Alternative 2 would provide long-term, moderate beneficial impacts to visitor use and experience. Alternative 2 consists of a comprehensive plan to implement an adequate storm water management system to correct the ongoing erosion problem, and provides a series of mitigation measures intended to enhance the scenic character of the slope. Several mitigation measures incorporated within the Alternative 2 plan have been included specifically to enhance visitor use and experience. These measures include, but are not limited to, a stone veneer applied to the retaining wall to be constructed at the base of the re-contoured slope, a fabric-clad chain-link fence located at the top of the slope intended to contain and screen University waste disposal activities and vehicular traffic using the roadway, and a landscape plan to provide a natural screen of the structures located just beyond the top of the slope.

Cumulative Effects: Long-term benefits to visitor use and experience are anticipated to be realized from implementing Alternative 2. Several existing processes adversely impacting the visitor's experience will be corrected as a result of construction activities associated with Alternative 2. In addition, several improvements to the visual screening of University buildings and facility operations will be undertaken. The affects on visitor use and experience realized by means of implementing the proposed landscape plan associated with Alternative 2 are intended to provide beneficial impacts in perpetuity.

Conclusion: Implementation of Alternative 2 would impart moderate, long-term, beneficial impacts on visitor use and experience. Beneficial cumulative effects in the form of improved visual quality of the visitor experience would be realized through enactment of the comprehensive package of construction activities and mitigation measures associated with Alternative 2.

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