2
ALTERNATIVES

This chapter describes alternatives for rehabilitation of the David Walker Farmstead and Evans buildings for MCHVF. Alternatives for the proposed action are intended to preserve historic structures and provide a pre-school facility. Each alternative includes a discussion of the following elements: rehabilitation or re-use of existing buildings, provision of exterior play spaces, provision of pedestrian circulation, changes to existing parking and circulation; improvements to utilities; landscape elements; and stormwater management. This EA/AOE examines three alternatives: a No-Action Alternative (Alternative A) and two action alternatives (Alternatives B and C).

ALTERNATIVE A (NO-ACTION)

Alternative A, the No-Action Alternative, would continue present management operations and maintain existing facilities at the David Walker Farmstead and Evans property. Consideration of a No-Action Alternative is required by NEPA and provides a baseline for comparing the environmental consequences of the action alternatives. Should the No-Action Alternative be selected, the NPS would respond to future needs and conditions associated with facilities at the project site without major actions or changes in the present course (Figure 2). This alternative would include the following elements:

- The primary entrances off Thomas Road and the parking areas at the David Walker Farmstead and Evans property would remain in their current locations and configurations;
- The cultural landscape of the David Walker Farmstead and Evans property would be preserved as is. The lawn and field patterns would be unchanged. Trees, shrubs, and other ground cover would remain unchanged. Maintenance of the landscape would occur on an ad hoc basis as funds were available;
- No new internal circulation patterns would be created;
- The David Walker Farmstead buildings and the Evans property buildings would remain as is. No rehabilitation work would take place, and the buildings would continue to remain closed to the public. No fire protection system or security would be added to the buildings. Maintenance of the buildings would occur on an ad hoc basis as funds were available;
- There would be no changes in use of the buildings, structures, or lands.
- There would be no increase in impervious surface and no modifications to stormwater management.

This Page Intentionally Left Blank.

See Figure 2.

This Page Intentionally Left Blank.

ELEMENTS COMMON TO THE ACTION ALTERNATIVES

Within each action alternative, several elements would remain constant. These include development of the barn as the main school facility, development of the tenant house as a meeting space and/or library for the school, rehabilitation of the main house and root cellar, development of the site with play spaces and utilities, and stormwater management actions. These common elements are depicted on Figures 3, 4, and 5.

Non-Historic Structures

David Walker Barn

Under the action alternatives, the barn would be developed as the main school facility. Except for the masonry walls, all current features of the structure date from the mid- to late-twentieth century. New development would respect the scale, form, and materials of the existing barn, but would not attempt to replicate it. Development would comprise the following actions:

- Exterior timber framing would be removed and replaced with new exterior sheathing and/or windows:
- A new roof would be installed:
- Loose parging on the masonry walls would be removed and replaced;
- The modern interior and floors would be removed, and two stories of classrooms would be built within the masonry walls;
- Windows would be removed and replaced with energy-efficient windows;
- Electricity and water service would be upgraded and HVAC would be installed;
- Some openings would be made in the masonry walls to meet code-required natural light standards and to admit utilities; and
- The earthen bank on the north side of the barn would be modified as required to develop entries and egress from the structures. Depending on the elevation of the door, the bank may be raised or lowered, to meet requirements of the Life Safety Code.

Shed

The existing one-story 2,000 square-foot shed on the back of the barn would be demolished. In its place, a two-story 9,400 square-foot (+/- 4,700 square-foot footprint) addition to the barn would be constructed to house classrooms. This location was selected in order to have the least visual impact from Thomas Road. In the future, the footprint could be extended by approximately 1,000 square feet in order to add classroom space.

Tenant's House

The interior of the tenant's house would be modified to serve as a meeting space and library for the school. This work would take place during Phase I if budget allows, or would be deferred until a subsequent phase if necessary. Minimal exterior changes are proposed:

- A new roof may be installed if required;
- Windows would be removed and replaced with energy-efficient windows as necessary;

- Exterior sheathing would be removed and replaced; and
- An accessible entry ramp and door may be installed as required to meet code, which would require removal and replacement of the exterior porch.

Wagon Shed
The wagon shed would be used to screen trash and recycling storage, and/or as an area to screen mechanical or utility fixtures. A gated fence would be added to further screen the storage from the school's drop-off space.

Corn Crib
Under both action alternatives, the corn crib would be demolished.

Historic Structures

David Walker Main House
The main house would be rehabilitated for future use by the school or for lease as a residence or professional office. The interior, unlike the exterior, lacks cohesive integrity to any one period, with the exception of the interior masonry bearing walls and floor structure. Any interior work not affecting these features would be accomplished with sensitivity to the compartmentalization of the building. Any other interior, minor, feature modifications would not be subject to the Secretary of the Interior's Standards for Historic Preservation since the interior features do not possess the level or scope of integrity represented by the contributing status of the National Register Nomination of the exterior envelope. Rehabilitation would take place in two phases. Phase I would comprise:

- basic stabilization to arrest deterioration
- incidental repairs to the existing roof, or addition of a new roof, if repairs prove to be ineffective or cost prohibitive;
- removal of ivy from the walls; and
- potential demolition of derelict, non-historic sections of the building, such as the small entry vestibule, kitchen, screened porch, and Florida room, if the cost of rehabilitation exceeds the perceived value of maintaining the sections.

Subsequent phases would include the following actions:

- Windows would be removed and replaced with energy-efficient windows;
- The exterior walls would be patched and repainted;
- Electricity, water service, and HVAC would be upgraded;
- One section of the current main house is purported to contain a fragment of a late 18th century structure. Although not supported by known evidence, this section of the main house will not be altered until sufficient analysis is conducted; and
- Other sections of the building would be rehabilitated to accommodate new uses.

Root Cellar
The above-ground portion of the root cellar would be stabilized in Phase I and rehabilitated in future phases. In Phase I, the below-ground vault would be filled with sand or similar material to prevent collapse.

Site

Utilities
Sewage service and a new water line to the barn would be laid from Thomas Road to the barn in the previously disturbed area of the driveway to the barn. The sewage and water lines to the main house and the tenant house would remain as is if the current capacity is adequate. Otherwise new sewage and water lines would be run in the location of the existing lines. All new electric lines would be placed underground. Existing overhead electric lines would be placed underground. Exterior lighting would comprise “cut-off” luminaires, which would prevent artificial light from reaching beyond the boundary of the site and from interfering with the night sky. An open 4” conduit would be installed below ground between each of the structures on the site to allow for security and information technology lines to be run at a future date. The conduit would be installed in previously disturbed areas.

Play Space
A 7,500-square foot yard located north of the proposed barn addition would contain play equipment and a combination of grass, resilient surface, and pavement. Additional play spaces would be located at the western edge of the site, as shown on the site plans, Figures 4 and 5. If needed for the safety of the children, the play spaces could be fenced in the future.

Signage
A non-lighted sign not exceeding 50 square feet in size would be placed at the entrance to the site to identify the school. If the main house were leased to another tenant, this sign also would identify that tenant.

Stormwater Management
The 3.55-acre immediate project site lies near the bottom of a sub-watershed of Trout Creek. 180.71 acres of park land lie uphill of the site. The park land within the sub-watershed comprises the following:

▪ Immediate project site	3.55 acres	1.96% of sub-watershed
▪ Tall grass meadows	110.16 acres	60.96%
▪ Woodlands	30.87 acres	17.08%
▪ Mown grass	29.25 acres	16.19%
▪ Impervious surfaces	6.88 acres	3.81%

Also located uphill of the site is the Pennsylvania Turnpike. The impervious surface comprised by the turnpike within the sub-watershed is 14.4 acres. Because the road was constructed prior to implementation of modern stormwater runoff controls, runoff is dumped from point sources into the park, and makes its way downhill to the immediate project site. This large, uncontrolled volume has contributed to urban flooding on the immediate project site and on local roads beyond the site. The Pennsylvania Turnpike Commission plans to widen and modernize the turnpike, and the discharge of stormwater runoff into the park will end in approximately 2010. Rehabilitation of the

David Walker Farmstead and its use as a pre-school will be completed before the turnpike project, however, and interim protection from flooding is necessary.

Any stormwater runoff that is not naturally infiltrated into the highly pervious limestone soils of the park runs through the immediate project site and into the Tredyffrin Township stormwater system, ultimately discharging into Trout Run. An existing inlet on the project site on Thomas Road feeds into a 30" reinforced concrete pipe (RCP) cross drain under the road at a slope of 2.63%. This pipe feeds into a 30" RCP outfall pipe to Richards Road at a slope of 0.65%. The outfall pipe to Richards Road drains into a piping system along Richards Road, with eventual discharge into Trout Creek. Due to the flat slope of the 30" RCP outfall pipe to Richards Road, the capacity of the 30" cross drain in Thomas Road is approximately 34 cubic feet per second (cfs). The constraints of the existing municipal pipe system mean that in certain storms, runoff from the site that is not intercepted by the Thomas Road drainage system drains onto to the surface of Thomas Road, with eventual surface drainage discharge onto Richards Road. The existing piping system in Thomas and Richards Roads is adequate to convey runoff from the site for storms with 24-hour rainfall amounts up to a maximum of two inches.

In late fall 2005, NPS removed an irreparable swimming pool from the immediate project site for reasons of public safety. The pool had been constructed by filling in the former natural swale that was the outlet for sheet flow runoff from the sub-watershed. Removal of the pool allowed restoration of the original grades and topography of the area between the pool site and the existing inlet adjacent to Thomas Road. Observation since this work was completed suggests that elimination of the pool's inadvertent function as a dam, and restoration of the storage and infiltration capacity of the pool site, have lessened urban flooding on the immediate project site and at the intersection of Thomas and Richards Road.

To address not only the additional runoff generated by the addition of new impervious surfaces on the immediate project site, but also a portion of the existing runoff from the park and the adjacent Pennsylvania Turnpike, the following is proposed for both action alternatives.

The immediate project site (the area associated with the buildings that will be leased from the NPS by MCHVF) comprises 3.55 acres. Current impervious surfaces on the site total 21,958 square feet. After demolition and removal of some current impervious surfaces, development would add approximately 23,000 square feet, for a proposed total of 45,000 square feet of impervious surfaces.

Stormwater management will follow the requirements of Tredyffrin Township Ordinance HR-315 (Code), as amended. Analysis was performed using the Urban Hydrology for Small Watersheds Manual (NRCS TR-55 SCS method), as required by the Code. Additional Code requirements for this jurisdictional area include the implementation of the following Best Management Practices (BMP):

- Infiltration

- Water quality
- Peak rate reduction
- Conveyance channels
- Erosion and sedimentation control

Infiltration
Preliminary analysis of proposed development of the 3.55-acre site indicates that approximately 5,100 cubic feet (c.f.) of stormwater runoff will need to be infiltrated, in compliance with the Code, Article III, Section 301, B.1.a.

Water Quality
All remaining and new impervious areas will be disconnected from direct discharge to closed conduit piping systems and permitted to discharge into drywells or across grassed swales, lawn, or landscaped areas before discharge to waters of the Commonwealth of Pennsylvania. The final water quality design may include the use of drywells for building downspouts, and grass filter strips/infiltration beds for filtering of driveway and parking lot impervious areas. The final design of water quality features will follow the guidelines established in the Pennsylvania Handbook of Best Management Practices for Developing Areas (PA DEP, final draft, 2006).

Peak Rate Reduction
Preliminary analysis of proposed development of the 3.55 acre site indicates that approximately 20,000 cf of stormwater runoff will need to be detained in accordance with the Code, Article III, Section 301, B.1b and Section 302 D. Management of this volume will effectively reduce the post-development 100-year storm peak flow rate to the pre-development 100-year storm peak flow rate. Approximately 16,500 cf of this storage volume is necessary to reduce the post-development 10-year peak flow rate to the pre-development two-year peak flow rate per the Code, Article III, Section 301.B.1.b.

Preliminary analysis indicates that the most economical, efficient, and safest design for infiltration and detention of stormwater is in a location uphill of the immediate project site. Four low earthen berms and a 12” high diversion berm will be constructed to provide not only the required stormwater storage of approximately 20,000 cf but also approximately 180,023 cf of excess storage, which will help to lessen urban flooding in the Thomas Road/Richards Road vicinity. The berms also will provide for infiltration of stormwater. See Figure 3 for a diagram of the approximate locations of these features.

The approximate height and storage capacity of the four earthen berms are as follows:

	Height (inches)	Storage capacity (cf)
Berm 1	24	31,000
Berm 2	24	5,900
Berm 3	24	17,000
Berm 4	30	147,123
Total storage		201,023 cf

This Page Intentionally Left Blank.

See Figure 3.

This Page Intentionally Left Blank.

A single 4“diameter outlet pipe would be added in Berms 1 to 3 and a 6” diameter outlet pipe would be added in Berm 4. The outlet pipe inverts will be set 6” above the bottom elevation of the berms to facilitate the infiltration of runoff, yet prevent long-term detention. The maximum flow through the 4” diameter pipes at a water height of 24” behind Berms 1 through 3 will be 0.5 cfs. The maximum flow through the 6” diameter pipes at a water height of 30” behind Berm 4 will be 1.3 cfs.

The 12” high diversion swale will direct offsite runoff to an area behind Berm 4. The swale will direct runoff away from the proposed playground.

Conveyance
Stormwater runoff from the Pennsylvania Turnpike and the parkland that is uphill of the immediate project site will be infiltrated behind the proposed berms. Some 100-year storm runoff from those sources, as well as the runoff from the immediate project site, will be conveyed through the site to the Thomas Road storm sewer system. The existing channel through the site will be modified. The existing inlet on the west side of Thomas Road will be modified by enlarging the opening in the back of the inlet to better accommodate incoming flows. A bridge over the channel will allow the new driveway to pass from the Evans property to the David Walker Farmstead.

Erosion and Sedimentation Control
Erosion and sedimentation control will follow the requirements and standards presented in the Commonwealth of Pennsylvania Department of Environmental Protection Office of Water Management’s Erosion and Sediment Pollution Control Manual, dated March 2000, as revised. A Post-Construction Stormwater Management Control Plan will accompany the final design.

Existing Thomas and Richards Roads Drainage Systems
The existing piping system in Thomas Road to which the project site runoff drains consists of a 30” reinforced concrete pipe (RCP) cross drain in Thomas Road at a slope of 2.63% and a 30” RCP outfall pipe to Richards Road at a slope of 0.65%. The outfall pipe to Richards Road drains into a piping system along Richards Road, with eventual discharge into Trout Creek. Due to the flat slope of the 30” RCP outfall pipe to Richards Road, the capacity of the 30” cross drain in Thomas Road is approximately 34 cfs. The existing piping system in Thomas and Richards Roads is adequate to convey runoff from the site for storms with 24-hour rainfall amounts up to a maximum of 2”.The constraints of the existing municipal pipe system, however, mean that in some storms, current runoff from the site that is not intercepted by the Thomas Road drainage system drains onto the surface of Thomas Road with eventual surface drainage discharge onto Richards Road. This situation could continue to some extent, although the operation of the system will be improved because of the anticipated infiltration and reduction in rate of runoff due to the proposed stormwater management facilities. In summary, it is anticipated that incorporation of the proposed stormwater management improvements will meet the intent of the Code and improve the drainage conditions at Thomas Road.

Park Operations

Under both action alternatives, the tenant would be responsible for maintenance and security within the 3.55-acre immediate project site. Park staff would manage the lease, consult with the tenant on facility and landscape management issues, and maintain the proposed stormwater management facilities.

Mitigation

Stormwater Management

As part of the mitigation for the action alternatives, new stormwater management facilities, or BMPs, would be developed in the immediate project site and uphill of it, as described above. Facilities would meet or exceed Tredyffrin Township requirements for Infiltration, water quality, peak rate reduction, conveyance, and erosion and sedimentation control.

The proposed stormwater management improvements would lessen the runoff that ultimately flows to Thomas Road for 1- to 100-year storms. The reduction in flows varies from 46.2% for a 1-year storm to 1.2% for a 100-year storm, based upon the pre-site in a meadow condition. It is anticipated that approximately 143,297 cf of runoff will be infiltrated during the 2-year storm, based upon an assumed infiltration rate of 1” per hour. The infiltrated volume will reduce the post development volume of runoff. The proposed channel modifications across the immediate project site would improve the conveyance of runoff to Thomas Road. The proposed improvements to the existing inlet on the west side of Thomas Road would improve the collection of runoff into the Thomas Road stormwater piping system. The collection of more runoff into the existing piping system in Thomas Road, would decrease the amount of runoff directed to the surface of both Thomas and Richards Roads. With less runoff directed to the surface of Thomas and Richards Roads, urban flooding will be reduced.

In summary, incorporation of the proposed stormwater management improvements will meet the intent of the Code and improve the stormwater conditions at Thomas and Richards Roads.

ALTERNATIVE B

In addition to the "Elements Common to the Action Alternatives," described above, Alternative B would encompass the following actions, as shown on Figure 4:

Cultural Landscape

Under Alternative B, the hedgerow north of the barn would be removed to enable construction of a parking lot. Although it would be replaced, it would take a number of years for the plantings to reach the same size as the current plants. Construction of a new entrance drive and parking area at the northern end of the project site would break the existing strong, visual line of this old boundary. Although a new hedgerow would be planted to serve as a screen, it would be in a different location.

Some large and/or specimen trees would be removed to enable construction, including the fern-leaved beech adjacent to the barn. Some of these would be replaced. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care.

Most existing trees and shrubs except those that are in poor condition would be retained. Existing bamboo, which is an exotic, invasive species, would be removed throughout the site, except where needed for screening.

Parking and Circulation

A new driveway, 200' north of the existing David Walker Farmstead driveway, would be constructed to serve as the entrance to the school. Although one-way in direction, this driveway would be two lanes wide in order to accommodate vehicles waiting to drop off or pick up children. Because it is the school's practice to stagger drop-off and pick-up times, no vehicles would line up on Thomas or Richards Roads. This driveway also would serve 18 new parking spaces. To the degree possible, this lane and parking would be screened from view of Thomas Road and from the interior of the park. The existing parking lot between the barn and the main house would serve as handicapped-accessible parking, and a sheltered drop-off area would be constructed adjacent to it. A new 20-vehicle parking lot would be constructed north of the barn, between the barn and the existing hedgerow. No school-related parking would take place on Thomas or Richards Roads. The existing David Walker Farmstead driveway would serve as the vehicular exit from the site. Three parking spaces, including two that are handicapped-accessible, would be located in the existing parking lot.

Evans House and Garage

In this alternative, the house and garage would not be leased by MCHVF, and would be demolished by the NPS. The building foundations and driveway would be removed; original grades would be restored; and turf would be established on the disturbed areas. The site would be managed as lawn and would be used as an informal play space.

This Page Intentionally Left Blank.

See Figure 4.

This Page Intentionally Left Blank.

ALTERNATIVE C—NPS PREFERRED ALTERNATIVE

In addition to the "Elements Common to the Action Alternatives," described above, Alternative C would encompass the following actions, as shown on Figure 5:

Cultural Landscape

Under Alternative C, a drive and small parking lot would be constructed in the rear yard of the David Walker main house. Although the form and enclosed nature of the yard would be preserved, the change in use would modify a character-defining feature of the site. Some large and/or specimen trees would be removed to enable construction, including the fern leaved beech adjacent to the barn. Some of these trees would be replaced, although it would take some years for them to achieve the same size as the original trees. Other important trees, including the Kentucky Coffee Trees along Thomas Road, would receive needed horticultural care.

Most existing trees and shrubs except those that are in poor condition would be retained. Existing bamboo, which is an exotic, invasive species, would be removed, except where needed for screening. Trees and shrubs would be added adjacent to the new driveway and parking lot on the Evans property in order to screen them from Thomas Road.

Parking and Circulation

The existing driveway to the Evans property would be widened to 16' to serve as the entrance to the school. Although one-way in direction, this driveway would be two lanes wide in order to accommodate vehicles waiting to drop off or pick up children. Because it is the school's practice to stagger drop-off and pick-up times, no vehicles would line up on Thomas or Richards Roads. The Evans house and garage would be demolished, and a 34-vehicle parking lot would be constructed in this area. The parking lot would be fully screened from view from Thomas Road and from the interior of the project site. No school-related parking would take place on Thomas or Richards Roads. From the parking lot, a new 190'-long drive would be constructed northward to the David Walker Farmstead. A series of culverts would be constructed over the drainage swale to allow vehicular and pedestrian traffic to pass over the depressed grade. Five parking spaces would be constructed adjacent to the main house. A sheltered drop-off area would be constructed north of the house. The existing David Walker Farmstead parking lot would be used as a visitor and handicapped-accessible parking. The existing David Walker Farmstead driveway would be used as the exit from the site.

Evans House and Garage

In this alternative, the Evans house and garage would be demolished by MCHVF and would be used as the site of staff and visitor parking (see above).

This Page Intentionally Left Blank.

See Figure 5.

This Page Intentionally Left Blank.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

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

1. ***Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations****.* The goal of the NPS at all units is to serve as a trustee of the environment for future generations. Under the No-Action Alternative, the NPS would continue to have difficulty fulfilling this role, since the project site ranks low as a priority for maintenance and rehabilitation of buildings and landscapes. Under Alternatives B and C, historic buildings would be rehabilitated and the site would be maintained.

2. ***Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings****.* Under the No-Action Alternative, the project site would become increasingly unsafe and unattractive, as conditions continued to deteriorate. Both action alternatives would address safety and would ensure that the project site is well maintained. Alternative C would better meet this criterion since new parking would be well screened on the Evans site, and would not intrude into an area that is more difficult to screen--north of the barn. Alternative B would require removal of the mature trees in the hedgerow north of the barn; Alternative C would preserve those trees.

3. ***Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.*** Under Alternative A, the project site would continue to be unused. Both action alternatives would open the site to use by school children and their families. As described in the EA/AoE, health and safety risks, as well as other undesirable and unintended consequences were addressed during the development of the action alternatives, in order to avoid and minimize potential impacts to the extent possible.

4. ***Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice****.* Under the No-Action Alternative, historic resources would continue to deteriorate. Both action alternatives preserve historic resources and preserve the aesthetic values of the site. Alternative C would better meet this preservation criterion since new parking would be well screened on the Evans site, and would not intrude into a more visually sensitive area that is more difficult to screen--north of the barn. Under

Alternative A the project site would continue to be unused. Both action alternatives would return the site to use.

5. ***Achieve a balance between population and resource use that will permit high standards of living and wide sharing of life's amenities****.* Under the No-Action Alternative, the resource would continue to deteriorate and could be lost. Under the action alternatives, the resource would be preserved in a way that is not consumptive.

6. ***Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources***. The No-Action Alternative does not contribute to this criterion. Under the action alternatives, historic and non-historic buildings would be rehabilitated in a manner that uses best management practices for sustainable design, construction and operation.

Although both of the action alternatives meet the above criteria to some degree, Alternative C better meets the criteria of Section 101(b). Alternative C would take advantage of an opportunity to screen new parking and internal circulation from the neighborhood and from the park interior. Taking this into consideration, and balancing the impacts to natural and cultural resources and the population, Alternative C best meets the criteria for the environmentally preferred alternative. Alternative C also was chosen as the NPS Preferred Alternative.

Summary of Environmental Consequences

Table 1: Summary of Environmental Consequences

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

	Alternative A (No-Action Alternative)	Alternative B	Alternative C (NPS Preferred Alternative)
Geologic Resources	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, minor, adverse cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, minor, adverse cumulative impact
Soil	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute a noticeable, adverse increment to a long-term, minor, adverse cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute a noticeable, adverse increment to a long-term, minor, adverse cumulative impact
Topography	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, negligible and adverse *Cumulative impact:* Would contribute a negligible adverse increment to a long-term, minor and adverse cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute a negligible adverse increment to a long-term, minor and adverse cumulative impact
Air Quality	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Short-term, negligible and adverse; Long-term, negligible and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, major, adverse cumulative impact	*Overall impact:* Short-term, minor and adverse; Long-term, negligible and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, major, adverse, cumulative impact

	Alternative A (No-Action Alternative)	Alternative B	Alternative C (NPS Preferred Alternative)
Soundscape	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Short-term, negligible and adverse; Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, major, adverse cumulative impact	*Overall impact:* Short-term, negligible and adverse; Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, major, adverse cumulative impact
Visual Resources	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible, adverse increment to a long-term, moderate to major, adverse impact	*Overall impact:* Long-term, minor and adverse; long-term, minor and beneficial *Cumulative impact:* Would contribute imperceptible, adverse and beneficial increments to a long-term, moderate to major, adverse cumulative impact	*Overall impact:* Long-term, minor and adverse; long-term, minor and beneficial *Cumulative impact:* Would contribute imperceptible, adverse and beneficial increments to a long-term, moderate to major, adverse cumulative impact
Archeological Resources	*Overall impact:* No Impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, minor and adverse *Cumulative impact:* Would contribute an imperceptible adverse increment to a long-term, minor, adverse cumulative impact	*Overall impact:* Long-term, moderate and adverse *Cumulative impact:* Would contribute a noticeable adverse increment to a long-term, minor, adverse cumulative impact
Historic Structures	*Overall impact:* Long-term, moderate to major and adverse *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, moderate and beneficial *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, moderate and beneficial *Cumulative impact:* No cumulative impact
Cultural Landscapes	*Overall impact:* Long-term, moderate and adverse *Cumulative impact:* Would contribute an imperceptible adverse increment to a long-term, moderate, adverse cumulative impact	*Overall impact:* Long-term, minor to moderate and adverse; long-term, minor, beneficial *Cumulative impact:* Would contribute an imperceptible adverse increment to a long-term, moderate, adverse cumulative impact	*Overall impact:* Short-term to long-term, minor to moderate and adverse; long-term, minor and beneficial *Cumulative impact:* Would contribute an imperceptible adverse increment to a long-term, moderate, adverse cumulative impact
Safety, Accessibility, Circulation	*Overall impact:* No impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term, moderate and adverse *Cumulative impact:* Would contribute a noticeable, adverse increment to a long-term, major, adverse impact	*Overall impact:* Long-term, moderate and adverse *Cumulative impact:* Would contribute a noticeable, adverse increment to a long-term, major, adverse impact

	Alternative A (No-Action Alternative)	Alternative B	Alternative C (NPS Preferred Alternative)
Park Operations	*Overall impact:* No impact *Cumulative impact:* No cumulative impact	*Overall impact:* No impact *Cumulative impact:* No cumulative impact	*Overall impact:* No impact *Cumulative impact:* No cumulative impact
Game Animal Hunting	*Overall impact:* No impact *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term and adverse *Cumulative impact:* No cumulative impact	*Overall impact:* Long-term and adverse *Cumulative impact:* No cumulative impact