



National Park Service  
U.S. Department of the Interior  
Grand Canyon National Park  
Grand Canyon, Arizona

---

## FINDING OF NO SIGNIFICANT IMPACT AND DECISION DOCUMENT

### North Rim and Roaring Springs Water System Improvements

PEPC 117319

May 2026

#### **Recommended:**

---

Edward T. Keable  
Superintendent, Grand Canyon National Park

Date

#### **Approved:**

---

Herbert C. Frost, Ph.D.  
Acting Regional Director, Interior Regions 6, 7, & 8, National Park Service

Date

*The National Park Service has considered the factors mandated by the National Environmental Policy Act (NEPA). This decision document represents the National Park Service's (NPS) good-faith effort to fulfill NEPA's requirements by prioritizing documentation of the most important relevant considerations within the statutorily mandated page limits and timeline. This prioritization reflects the NPS's expert judgment. The NPS certifies this Finding of No Significant Impact (FONSI) is substantially complete and thoroughly considered all relevant criteria raised in the NEPA process and the NEPA process has concluded. The NPS also certifies that the EA contained analysis adequate to inform and reasonably explain this decision to issue a FONSI regarding the proposed action.*

## Table of Contents

INTRODUCTION .....	1
SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION .....	1
MITIGATION MEASURES .....	2
PUBLIC INVOLVMENT.....	2
AGENCY AND TRIBAL CONSULTATION.....	2
SIGNIFICANCE CRITERIA REVIEW.....	2
Potentially Affected Environment .....	2
Degree of Effects of the Action .....	3
Beneficial and Adverse, and Short-term and Long-term Effects of the Selected Alternative .....	3
Degree to Which the Selected Alternative Affects Public Health and Safety .....	8
Degree to Which the Selected Alternative Affects Economic Activity.....	9
Degree to Which the Selected Alternative Affects the Quality of Life of the American People...9	
CONCLUSION.....	10
APPENDIX A: MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES.....	A-1
Air Quality .....	A-1
Construction, General .....	A-1
Historic, Tribal, and Cultural Resources.....	A-1
Karst and Hydrogeology .....	A-2
Paleontology .....	A-2
Resources, General .....	A-3
Socioeconomics .....	A-4
Soundscapes and Noise.....	A-4
Vegetation and Soils .....	A-5
Visitor Use and Experience .....	A-6
Water Resources .....	A-7
Wildlife, Including Special Status Species .....	A-7
APPENDIX B: ERRATA.....	B-1
APPENDIX C: RESPONSE TO PUBLIC COMMENTS.....	C-1
Business and Economic Considerations. ....	C-2
Fire Recovery.....	C-3
Technical and Engineering Considerations.....	C-3
Trail Access During Construction.....	C-3
Safety and Visitor Experience.....	C-3
APPENDIX D: NON-IMPAIRMENT DETERMINATION .....	D-1
Historic Districts .....	D-2
Karst and Hydrogeology.....	D-2
Soundscapes.....	D-3
Special Status Species.....	D-5
Impacts Considered but Dismissed.....	D-5
Conclusion .....	D-6

---

### Finding of No Significant Impact

North Rim & Roaring Springs Water System Improvements EA (May 2026)

## INTRODUCTION

In accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code 4321 et seq), and the Department of the Interior NEPA regulations (43 CFR Part 46), the National Park Service (NPS) prepared an Environmental Assessment (EA), to evaluate alternative actions and environmental impacts associated with improvements to the North Rim and Roaring Springs water system, including water conveyance, treatment, and storage infrastructure and processes, at Grand Canyon National Park.

The existing water system, particularly the waterline between the North Rim and Roaring Springs, has exceeded its design life, resulting in frequent failures, extended service outages, and the need for continual repairs in a hazardous environment. The purpose of the project is to provide a reliable system to meet water supply needs at the North Rim developed area and in the inner canyon corridor zone from Supai Tunnel to Cottonwood Campground.

The statements and conclusions reached in this Finding of No Significant Impact (FONSI) are based on documentation and analysis presented in the EA, the errata (Appendix B), public comments (Appendix C), and the associated decision file. The EA is incorporated by reference and relevant sections of the EA are summarized below. The EA is available on the NPS Planning, Environment and Public Comment (PEPC) project site at <https://parkplanning.nps.gov/NorthRimWaterSystem>.

## SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION

The NPS analyzed two alternatives in detail in the EA—a No Action alternative and the Proposed Action alternative. Based on this analysis, the NPS selected Alternative B, the Proposed Action, for implementation because it best meets the purpose of and need for action, without causing significant or unacceptable impacts on park resources. The selected alternative is described in detail in Chapter 2 of the EA and is incorporated by reference.

In general, the selected alternative includes the following key actions:

- Replacing or rehabilitating waterline sections between the North Rim and Roaring Springs Pumphouse.
- Drilling two boreholes between the North Rim and Roaring Springs Pumphouse to house potable and raw waterlines.
- Abandoning the existing North Rim waterline.
- Constructing a new water treatment plant (WTP) on the North Rim.
- Installing additional water storage tanks at the North Rim and Roaring Springs Pumphouse.
- Rehabilitating and performing site improvements at Roaring Springs Pumphouse

Alternative B was selected because it best meets the project purpose and need when compared with the No Action alternative, without resulting in significant impacts on park resources. The Purpose and Need and No Action alternative are described in detail in Chapters 1 and 2, respectively, of the EA and are incorporated by reference.

The selected alternative was chosen because it will:

- Improve an aging water system that currently experiences frequent failures, resulting in service disruptions and extended outages.
- Improve the resiliency of the North Rim water system by protecting new raw and potable

waterlines within boreholes.

- Optimize use of water from Roaring Springs Cave.
- Optimize water pumping and treatment operations.
- Address decades of deferred maintenance associated with critical water system components.
- Improve operational efficiency by reducing operations in remote inner canyon locations.

## MITIGATION MEASURES

The NPS has incorporated avoidance and minimization measures into the selected alternative consistent with applicable NPS policies, standard operating procedures, and best management practices. Please refer to Appendix A for a complete list of all mitigation measures and best management practices that will be implemented for the selected alternative.

## PUBLIC INVOLVMENT

The public was provided with the opportunity to comment during the planning process. The NPS held two 14-day civic engagement periods from June 22 through July 5, 2023 and from February 4 through February 17, 2025. Civic engagement was conducted using the PEPC website. The comments received were reviewed by the NPS and considered in developing the EA.

The EA was published for public comment on the PEPC website for 30 days, from March 6, 2026 to April 5, 2026. Ninety-three (93) correspondences were received during the public comment period. A summary of public comments received is included in Appendix C.

## AGENCY AND TRIBAL CONSULTATION

Agency consultation is described in Appendix E of the EA and is incorporated by reference here. Additional consultation has occurred since the publication of the EA and is described here.

On March 23, 2026, the United States Fish and Wildlife Service (USFWS) concurred with the park's determination that the selected alternative *may affect but is not likely to adversely affect* California condors and Mexican spotted owls (MSO). Furthermore, the park determined there will be *no effect* to MSO critical habitat.

A Section 106 Programmatic Agreement (PA) was prepared for the project and issued for public review concurrently with the EA. The Arizona State Historic Preservation Officer (SHPO) signed the PA as a signatory on April 28, 2026. The eleven traditionally associated tribes (Tribes) were invited to participate as concurring parties. The Advisory Council on Historic Preservation (ACHP) declined to participate in consultation and development of the PA. The PA was sent to the ACHP for filing on April 28, 2026.

## SIGNIFICANCE CRITERIA REVIEW

### Potentially Affected Environment

The potentially affected environments are described in Chapter 3 of the EA and are incorporated by reference. The potentially affected environment generally includes the Bright Angel Peninsula, Roaring Springs Canyon, contractor camps and staging areas at the North and South Rims, in-park vehicular hauling routes to the North and South Rims, and helicopter flight paths between the North and South Rims and inner canyon corridor landing zones.

To evaluate the potential for significant impacts, agencies consider the setting, or potentially affected environment in which impacts may occur. As described in the EA, the following resource topics were retained for detailed analysis: historic districts, karst and hydrogeology, soundscapes and noise, special status species, and visitor use and experience. The potentially affected environment often differs depending on the resource topic; see the affected environment discussions in the respective resource topic sections of Chapter 3 of the EA.

### Degree of Effects of the Action

As described in the EA and summarized below, although the selected alternative will have adverse impacts, no significant adverse impacts were identified for the resource topics retained for detailed analysis.

In addition, the Department of Interior (DOI) Handbook of NEPA Implementing Procedures (February 2026) identifies several considerations when determining whether an action will have significant impacts. The NPS reviewed each of these considerations, as documented below, and determined the selected alternative will not result in significant adverse effects.

### **Beneficial and Adverse, and Short-term and Long-term Effects of the Selected Alternative**

Whether considered individually or as a whole, the impacts of the selected alternative, including direct and indirect, do not reach the level of a significant effect because most adverse impacts associated with implementation will be minor, localized, and/or temporary, lasting only as long as construction of the selected alternative is occurring. Best management practices and mitigation measures described in Appendix A will further avoid or minimize any potential adverse impacts.

The sections below summarize the potential beneficial and adverse, and short-term and long-term effects of the selected alternative on the resource topics retained for detailed analysis. Refer to Chapter 3 and Appendix C of the EA for the detailed analyses.

#### *Historic Districts*

The selected alternative will affect multiple historic districts, including the Bright Angel Peninsula Historic District (pending listing in the National Register of Historic Places), Roaring Springs Canyon Historic District, North Rim Headquarters Historic District, North Entrance Road Historic District, North Kaibab Trail Historic District, Cross Canyon Corridor Historic District, and Transcanyon Waterline (TCWL) Historic District.

Short-term adverse effects that will occur during construction include ground disturbance; construction-related noise and visual intrusions; and temporary disruption of the setting and feeling of historic districts. These impacts will be localized to the construction areas and limited to the three-to-five-year construction period. Additionally, many of the temporary impacts occur within previously disturbed corridors and developed areas, thereby minimizing new disturbances and impacts to historic character.

Long-term negative effects<sup>1</sup> include the introduction of new buildings, structures, and appurtenances; incorporation of new materials during structure rehabilitation or repair; removal of buildings; and

---

<sup>1</sup> The term “negative effect” is used in this section to describe effects that would otherwise be termed as “adverse” under NEPA. However, the term “adverse effect” has a specific meaning under the National Historic Preservation

### **Finding of No Significant Impact**

abandonment of utilities. These changes could alter the setting and feeling of historic districts, but will not adversely affect individual contributing resources, with the exception of a historic meter shed that may be removed. These long-term effects will be minor because: the new facilities will occur within developed areas where similar infrastructure is already present and where people should expect to see development; facilities will be designed and constructed to be compatible with the surrounding development and historic character of the districts; and the project will be implemented in accordance with the Secretary of Interior's Standards for the Treatment of Historic Properties. As such, the selected alternative will not diminish historic districts to the point of losing eligibility.

Long-term negative effects also include tree removals, which will result in localized changes to the setting and feeling of historic districts; however, much of the vegetation in the areas that will be affected by the selected alternative has already been substantially altered by the Dragon Bravo Fire, thereby limiting the incremental visual effects of the selected alternative resulting from tree removals. Vegetation removals have been minimized during design to the extent practicable by following existing disturbed corridors where possible and using existing cleared areas for staging and borehole drilling. The contractor will also be directed to further minimize tree removals to the extent possible. Tree removals will be mitigated by replanting; however, depending on the species, regeneration rates can be slow.

The selected alternative will provide a beneficial impact to historic districts and their contributing features by improving fire protection for remaining historic properties through more reliable water delivery and increased water storage capacity for firefighting activities.

Based on the above discussion, negative impacts to historic districts will not be significant because project elements will be compatible with the character of the historic districts, and the selected alternative will not result in the loss of integrity of any historic district or its contributing features such that it would no longer be eligible for listing in the National Register of Historic Places.

#### *Karst and Hydrogeology*

Short-term adverse effects to karst and hydrogeology could include drilling fluids entering underground voids and contaminating groundwater during borehole drilling. However, based on geophysical investigations, no large voids greater than 40 feet in any dimension, nor confined aquifers or groundwater with high confining pressures were identified along the proposed bore paths. This indicates that any void less than 40 feet in any dimension, if encountered, would likely be isolated and not connected to other larger conduits. Based on this, the potential for drilling fluid contaminating groundwater is expected to be low. To minimize potential impacts, non-toxic media will be used when drilling fluids are needed, and monitoring will occur during drilling to detect unintended fluid loss. Based on the above discussion, if drilling fluids were to enter voids and affect groundwater or drinking water sources, these impacts are expected to be short-term, localized, and within applicable regulatory thresholds.

Construction activities also present a low risk of accidental spills that could introduce contaminants into the subsurface and karst features and ultimately the groundwater system. Standard best

---

Act; therefore, when the term "adverse effect" is used in this section, it is used within the meaning of the National Historic Preservation Act.

management practices, such as equipping vehicles with spill kits, will be implemented to minimize potential impacts should vehicle-related spills occur.

These potential short-term adverse effects are low risk, unlikely to occur, and not expected to measurably affect the overall condition of karst and hydrogeology; therefore, the impacts will not be significant.

Long-term adverse effects could result from the need to fill voids or cavities with cement to progress borehole drilling. This could alter or block subsurface flow paths and redirect groundwater flow, and, in some cases, affect spring discharge. If localized blockages occur, groundwater flow is expected to naturally redistribute within the void system, and any such changes will be limited in extent and are not expected to measurably affect overall groundwater flow patterns, spring discharge, or overall karst system function. Therefore, the selected alternative will not measurably degrade karst or hydrogeologic resources and the potential impacts are not significant.

Implementing the selected alternative will improve the resiliency of the water system, which could result in long-term beneficial effects to hydrogeology due to less breaks and leaks in the system, resulting in decreased potential for chronic water loss and associated impacts to hydrogeologic conditions.

### *Soundscapes and Noise*

Short-term adverse effects to soundscapes will occur during the three-to-five-year construction period due to increased noise levels from borehole drilling activities, general construction activities (e.g., heavy equipment use), and helicopter support operations. These short-term adverse effects are summarized below.

Sound levels from typical construction equipment measured at a distance of 50 feet ranges from 72 to 92 dBA, with certain equipment specifically associated with borehole drilling expected to range from 92 to 114 dBA. Noise impacts resulting from general construction will be minimized by limiting construction to daylight hours, with minimal exceptions. Borehole drilling would occur continuously (24/7) over an expected three to five months, resulting in drilling-related noise impacts to the soundscape over this same period. Noise impacts would be minimized by using equipment mitigation, such as enclosures or silencers. Noise from borehole drilling activities is estimated to be 35 dBA or higher throughout most of the North Rim developed area, with higher noise levels occurring generally in the area between the campground and lodge. Noise from drilling would also be expected to impact rim areas across Transept and Roaring Springs Canyons (approximately 25-40 dBA), as well as some inner canyon areas. Modeled sound levels within the inner canyon were generally below 25-30 dBA due to the effects of the terrain. The highest modeled sound levels at visitor use areas include 65 dBA at Transept Trail, 46 dBA at the motels, and 43 dBA at the visitor center parking lot. The modeled sound level at the campground is 28 dBA. For reference, examples of sources producing 60 dB include a normal conversation or air conditioning unit. While increased sound levels will occur during construction, the most perceivable impacts will occur in the North Rim developed area where increased sound levels should be expected and are necessary to provide visitor services. Additionally, humans are generally accustomed to noise intrusions, and the modeled sound levels at visitor use areas are within a range that humans are accustomed to. Furthermore, other locations throughout the North Rim would remain available for visitors to experience quieter environments and more natural soundscapes. Based on the above discussion, the increased construction-related noise levels and associated soundscape impacts are not significant.

Helicopter support required for construction will contribute to increased level and frequency of noise and soundscape impacts within the analysis area. Helicopters are expected to produce noise levels between approximately 30 and 100 dBA depending on the distance between the helicopter and the receiver, as well as other factors. Noise attenuation from helicopters is not expected to extend beyond two to three miles due to the complex terrain and line of sight. Approximately 1,735 round-trip helicopter flights are estimated to be needed over the two-year construction period in the inner canyon, with up to 20 flights occurring per day on busy days, and each flyover (i.e., one-way flight) lasting up to approximately 20 minutes. Helicopter flights would only be allowed from 8 am to 5 pm so soundscape impacts resulting from helicopters would be limited to a nine-hour period each day. Helicopters supporting the project would be required to use existing flight paths to the extent feasible to minimize introducing soundscape impacts outside of existing flight corridors.

Noise from helicopter flights to support construction will also diminish the wilderness quality of “solitude or primitive and unconfined wilderness” and negatively impact wilderness users’ opportunities to experience quiet and solitude in proposed wilderness areas that are in the vicinity of flight paths. However, these impacts would be intermittent, limited to a period of 9 hours each day, localized along existing flight corridors where helicopter-related noise impacts already occur, and would cease upon completion of construction.

In summary, these construction-related activities will temporarily degrade soundscapes and could affect visitors and wildlife in the vicinity of construction zones and helicopter flight paths. Noise impacts will be intermittent, localized (within approximately two miles of project areas and flight paths), and limited to construction periods. Noise impacts will be minimized by limiting helicopter operations to the hours of 8am to 5pm and other construction activities to daylight hours, with the exception of borehole drilling activities and interior work, and using equipment mitigation. Based on this, the short-term adverse impacts to soundscapes are not significant.

Long-term adverse effects to soundscapes resulting from the selected alternative will be negligible. Exterior noise generated from the operation and maintenance of new facilities will contribute to the ambient soundscape; however, these noise contributions will not be readily noticeable or distinguishable by the casual passerby but will instead “blend” with the other noises occurring in the developed area. Based on this, these long-term adverse impacts will be negligible and not significant.

Long-term beneficial effects will result from a reduced need for helicopter support to operate and maintain the new water system. Under the selected alternative, helicopter flights required to operate, maintain, and repair the North Rim water system are expected to be reduced by at least half from the current annual total of approximately 70 to 120 flights. This reduction is largely due to changes in water treatment processes and updated equipment and infrastructure, which will require less recurring maintenance for the foreseeable future and fewer repairs due to reduced risk of breaks as the waterlines will be protected in boreholes. This will decrease the frequency of helicopter-related noise disturbances once the new system is operational and improve soundscape conditions.

Overall, adverse impacts will be temporary and not significant, with the selected alternative providing long-term beneficial impacts to soundscapes resulting from fewer helicopter flights.

### *Special Status Species*

Implementation of the selected alternative will result in short-term negative<sup>2</sup> and long-term negligible to beneficial effects on California condor (*Gymnogyps californianus*) and Mexican spotted owl (*Strix occidentalis lucida*).

Short-term negative effects to California condor and Mexican spotted owl (MSO) include temporary displacement, behavioral changes (e.g., breeding, roosting, foraging), or habitat disturbance resulting from increased noise levels due to construction activities and helicopter support, use of outdoor nighttime lighting for three to five months during drilling activities, and increased human presence and activity in and around construction areas. These impacts will be localized, intermittent, and limited to the three-to-five-year construction period. With the exception of borehole drilling activities and interior work, construction will be restricted to daylight hours, with minimal exceptions. The risk of condors or MSO colliding with helicopters is low because mitigation measures will be implemented to help prevent interactions between wildlife and helicopters.

Long-term effects of the selected alternative range from minor and negative to beneficial. Removal of vegetation and ground disturbance could result in long-term degradation of the quality or quantity of habitat; however, the park, including the locations directly adjacent to the project areas, contains an abundance of condor and MSO habitat. As such, habitat impacts within the project areas are considered minor and will not adversely affect these species. Restoration of disturbed areas will help minimize long-term impacts of habitat disturbance.

Additionally, the selected alternative will result in long-term beneficial effects because the reduced frequency of operation- and maintenance-related disturbances, including halving the amount of helicopter support flights compared to current conditions, will reduce ongoing impacts to wildlife behavior and habitat resulting from helicopter noise.

The park determined and the United States Fish and Wildlife Service (USFWS) concurred that the project *may affect but is not likely to adversely affect* California condor or MSO. This determination reflects that the anticipated effects are discountable, insignificant, or completely beneficial.

Overall, short- and long-term negative effects to special status species would be minor and not significant, with the selected alternative also providing long-term beneficial effects.

### *Visitor Use and Experience*

Short-term adverse effects to visitor use and experience will result from temporary trail closures and reroutes; potentially increased congestion on trail detour routes; restricted access to certain areas and facilities; visible construction-related machinery, ground disturbance, and personnel; and traffic controls, lane restrictions, and increased construction traffic on roads. Noise and visual intrusions resulting from construction activities, including helicopter support, will also temporarily adversely affect visitor experience. These impacts may inconvenience visitors, increase travel times, alter trip planning, reduce opportunities for solitude or quiet, restrict use of certain facilities by visitors, and degrade the quality of visitors' experience; however, they will be localized and limited to the three-to-five-year construction period. The North Rim will remain open to visitors during construction, and

---

<sup>2</sup> The term "negative effect" is used in this section to describe effects that would otherwise be termed as "adverse" under NEPA. However, the term "adverse effect" has a specific meaning under the Endangered Species Act; therefore, when the term "adverse effect" is used in this section, it is used within the meaning of the Endangered Species Act.

recreational opportunities and visitor services will continue to be available at the North Rim and throughout the park. As such, these short-term adverse effects are not significant.

Long-term beneficial effects to visitor use and experience include improved reliability of water availability at visitor facilities at the North Rim and along the North Kaibab Trail, reducing the potential for water restrictions and delayed seasonal openings and supporting consistent services and visitor safety, comfort, and overall experience. The selected alternative will also provide long-term beneficial impacts to visitor experience by decreasing the frequency of helicopter-related noise and visual disturbances resulting from operation, maintenance, and repairs to the existing aged system.

Long-term adverse impacts to visitor use and experience include the construction of new built features on the landscape, which will alter the views experienced by visitors. However, these features will be in developed areas where similar infrastructure is already present, and their materials and finishes will be compatible and blend with the surrounding structures and landscape. Tree removals will also impact visitor use by altering the setting and feeling in the areas affected by construction. Replanting will minimize visual impacts resulting from tree removals but, depending on the species, regeneration rates can be slow. The new structures and tree removals will not overwhelm the broader viewshed and, importantly, will not affect views of the canyon. Based on this, these long-term adverse effects are not significant.

In summary, short-term adverse impacts to visitor use and experience will be temporary, localized, and limited to the construction period, while long-term adverse impacts will be minor and confined to developed areas. These impacts will not substantially diminish opportunities for visitor access, recreation, or enjoyment of park resources. Accordingly, these impacts to visitor use and experience are not significant.

### **Degree to Which the Selected Alternative Affects Public Health and Safety**

During project construction, active work zones will be fenced off to the public during construction and areas closed as necessary, thereby minimizing potential impacts to public health and safety during construction. Trail closures and access restrictions will also occur to protect visitor and worker safety. Implementation of these measures will reduce risks associated with construction hazards. Based on this, impacts to public health and safety from construction activities would be short-term, localized, and negligible to minor.

There is low potential for accidental spills during transport of materials; however, the implementation of standard best management practices, including spill prevention and response measures, will minimize the likelihood and severity of such events. As noted in the *Karst and Hydrogeology* section above, the risk of drilling fluids impacting groundwater or related resources and affecting drinking water supply is also considered low, and any potential impacts will be localized. The use of non-toxic drilling media and monitoring during drilling activities to detect unintended fluid loss further reduces potential risk. No effects are anticipated that would exceed applicable regulatory thresholds or pose substantial risks to public health or safety.

The selected alternative will result in long-term beneficial impacts to public health and safety by modernizing water delivery and treatment and providing a reliable water system to meet water supply needs at the North Rim and inner canyon corridor between Supai Tunnel and Cottonwood Campground. Reliable access to water is critical for the safety of visitors and park staff, particularly in high-temperature and remote environments such as the inner canyon, where water availability is essential for safe travel and emergency response.

---

### **Finding of No Significant Impact**

North Rim & Roaring Springs Water System Improvements EA (May 2026)

The new water treatment process under the selected alternative will eliminate the need for chlorine gas disinfection. Chlorine gas is hazardous, combustible, and toxic if inhaled; therefore, eliminating its use removes the risk of leaks and results in a long-term beneficial effect to public and staff health and safety.

The selected alternative will also reduce operations at remote and rugged inner canyon locations, providing a long-term beneficial impact on staff safety. Additionally, increased water storage capacity will improve fire suppression capabilities, reducing risks to visitors, staff, and infrastructure.

Overall, short-term effects to public health and safety during construction will not be significant, and long-term effects will be beneficial.

### **Degree to Which the Selected Alternative Affects Economic Activity**

Short-term adverse economic effects resulting from construction of the selected alternative may include minor, temporary changes in visitor travel patterns or decreased visitation to the North Rim due to construction activities and associated closures or restrictions, which could affect visitor spending patterns and affect local businesses along common travel routes to the North Rim. For example, some visitors may choose alternate destinations or modify travel plans during construction periods to avoid construction. However, these effects will be temporary, limited to the three-to-five-year construction period, and localized, largely limited to businesses along common travel routes to the North Rim, such as Highways 59/389, 89, and 89A in Arizona and Utah, generally between Flagstaff, AZ and St. George, UT. Although localized closures and access restrictions will occur in the park, the selected alternative will not require large-scale closures of the North Rim; the North Rim will remain open during construction and visitors are expected to continue passing through those areas with local businesses on their way to the park.

North Rim concessioners providing mule rides or backpacking guide services on the North Kaibab Trail will experience temporary impacts to their operations resulting from trail closures associated with project construction, requiring concessioners to suspend their services at this location. However, these impacts will be temporary and cease upon construction completion. Construction of the selected alternative will not require closures to other available commercial services provided by concessioners and other trails would remain open for mule rides and backpacking services. Therefore, impacts to concessioners will be temporary, minor, and will not result in significant effects on the economy.

In the long term, improved water system reliability will reduce service disruptions and support consistent and reliable park operations and visitor services, which contribute to the local tourism economy. By reducing unplanned closures and service disruptions, the selected alternative will help maintain stable visitation levels and associated economic activity.

Overall, adverse economic effects will be minor, temporary, localized and will not significantly affect local, regional, or state economies. The selected alternative will provide long-term beneficial economic effects by supporting reliable and consistent park operations and visitor services.

### **Degree to Which the Selected Alternative Affects the Quality of Life of the American People**

The selected alternative will not meaningfully affect the quality of life of the American people. Construction of the selected alternative will require temporary, localized closures at the North Rim

and in Roaring Springs Canyon. However, large-scale closures of the North Rim will not be required for construction, and the vast majority of the park will remain open and accessible to the public during construction, providing the public with ample opportunities to access and recreate at the park. Closures around construction zones may inconvenience North Rim visitors and North Kaibab Trail users by temporarily restricting visitor access to or use of certain areas or facilities; however, these impacts will be localized, short-term, and will cease upon completion of construction.

These temporary effects may affect the public's experience and access to certain recreational facilities or opportunities; however, they will not substantially affect public services, access to recreation, or overall quality of life at the local, regional, or national level.

Implementation of the selected alternative will have long-term, beneficial impacts to the public who visit the North Rim or use visitor facilities along the upper North Kaibab Trail by providing a reliable water system to support visitor use and park operations.

Overall, adverse effects on quality of life will be temporary and not significant, and the selected alternative will provide long-term beneficial effects.

## **CONCLUSION**

In assessing the potential for significant impacts, the NPS considered the context and intensity of impacts, including the duration, geographic extent, and degree of effects on affected resources. As described above, adverse impacts associated with implementation of the selected alternative will be predominantly short-term, localized, and minor, and will be avoided or minimized through the implementation of mitigation measures and best management practices. Long-term effects will be largely beneficial, particularly regarding water system reliability, consistent visitor services, and reduction in maintenance-related disturbances.

The selected alternative will not result in significant adverse effects to any resource area, including historic districts, karst and hydrogeology, soundscapes, special status species, visitor use and experience, public health and safety, economic conditions, or quality of life. There will be no loss of historic integrity, no substantial degradation of environmental resources, no exceedance of regulatory thresholds, and no highly uncertain or unique risks.

Therefore, the NPS has determined that the selected alternative will not have a significant effect on the human environment within the meaning of Section 102(2)(c) of NEPA nor does it constitute a major Federal action meeting the criteria that normally requires preparation of an environmental impact statement. Based on the foregoing, the National Park Service has determined that an environmental impact statement is not required and will not be prepared.

## **APPENDIX A: MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES**

### **NORTH RIM AND ROARING SPRINGS CANYON WATER SYSTEM IMPROVEMENTS ENVIRONMENTAL ASSESSMENT**

#### **GRAND CANYON NATIONAL PARK**

May 2026

The following mitigation measures and best management practices would be implemented during the project to minimize the degree and/or extent of adverse impacts.

#### **Air Quality**

- The Contractor will control fugitive dust using best practices and other control measures, such as through water application and covering soil stockpiles.

#### **Construction, General**

- The Contractor will rehabilitate all areas disturbed by construction activities, including raking/scarifying compacted soils, repairing ruts/tracks left by vehicles, recontouring soil to pre-disturbance conditions, hydroseeding, mulching or other soil stabilization measures, and removing debris, detritus, spoils, waste, etc.
- The Contractor will clean project sites at the end of each workday, including disposing of/securing trash, debris, scrap materials, etc. Park staff may conduct periodic spot-checks to ensure adequate project clean-up measures are being appropriately undertaken. If deficiencies are noted, the Contractor must address them as soon as feasible.
- The Contractor will follow all backcountry rules and regulations and Leave No Trace principles (<https://lnt.org/why/7-principles/>) for work and construction camps.
- The Contractor is required to have a site-specific safety plan and spill/leakage plan in place prior to construction activities. The Contractor will follow the park's protocol for spills and leaks related to vehicles, equipment, and machinery.

#### **Historic, Tribal, and Cultural Resources**

- All mitigation measures developed as part of the project-specific Section 106 Programmatic Agreement (PA) will be followed in coordination with the park's NHPA Specialist and, as needed, other cultural resource team members.
- The contractor will make all attempts to avoid impacts to historic rock walls, curbing, edging, flagstone, etc. (such as along trails, sidewalks, parking lots, or roads). If these features must be disturbed, the contractor will not perform this work until the Project Lead has coordinated with the park's Cultural Resources Program Manager. The Project Lead will coordinate with the park's Cultural Resources Program Manager well in advance of any disturbance to these historic features to determine if mitigation will be needed, and will also coordinate prior to and during restoration/rehabilitation. Mitigation could include using construction mats to protect the resource, or numbering/mapping rocks so they can be reinstalled at the same locations upon completion of work.
- The Contractor will take appropriate measures to preserve and protect all historic buildings and structures in the project area, except those approved for removal in the project construction document drawings, in accordance with [The Secretary of the Interior's Standards](#)

[for the Treatment of Historic Properties - Technical Preservation Services \(U.S. National Park Service\).](#)

- The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes and Director's Order 28: Cultural Resources Management, will be followed for this project.
- In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act, Agreement and the park's 2022 Monitoring and Discovery Plan, and the park's Memorandum of Agreement Regarding Collections, Inadvertent Discovery, and Intentional Excavation of Native American Human Remains, Funerary Objects, Sacred Objects, and Objects of Cultural Patrimony will be followed. If these remains or objects are encountered, a park cultural resource specialist will be contacted immediately and the Contractor will cease all project activities in the vicinity of the encounter until the remains/objects are evaluated, consultation with the State Historic Preservation Office and/or Tribes are completed, a mitigation plan is in place, and mitigation is completed. The Contractor will not resume project activities in the vicinity of the encounter until authorized by the park's Cultural Resources Program Manager. Depending on the nature and extent of the encounter, work may proceed in other areas free of these remains/objects, as allowed by the park's Cultural Resources Program Manager.
- If a tribe(s) request a tribal resource monitor, the Project Lead, in consultation with the park's NHPA specialist and Tribal Program Office, will coordinate with the tribe(s) to identify what types or locations of work require a tribal monitor. The Project Lead will ensure the tribal monitor is invited to be on site when that work is occurring. The Contractor may be required to adjust their work schedule, as reasonable, to accommodate tribal monitors.
- Archaeologists assigned to the project will meet the Secretary of the Interior Qualification for the profession. Except when environmental conditions, such as bedrock, indicate that monitoring is not necessary, all other ground disturbance, such as excavation or grading, will be monitored.
- The finishes and colors of structures (e.g., buildings, equipment enclosures, tanks, etc.) would be coordinated with and accepted by the park's cultural resources team (Historical Architect, Cultural Resources Program Manager and NHPA Specialist), other applicable park staff, and, if needed, SHPO, to ensure compatibility with their surroundings.
- The Contractor will protect the historic North Rim pump shed (FMSS ID 241476) during construction activities.

### **Karst and Hydrogeology**

- Risks to karsts and hydrogeology will be monitored throughout the drilling process. A park monitor may be required to be onsite during drilling activities.

### **Paleontology**

- The park's Physical Science Program will train contractor staff or other project resource monitors to identify paleontological resources.
- The Contractor will conduct construction activities in a way that will not damage or move inventoried paleontological resources. For any known (inventoried) paleontological occurrences, or when a certain site may yield paleontological resources, the contractor will avoid disturbing the site if feasible, or if necessary, the resources will be moved or collected by a park paleontologist before work in that area begins.

- If previously unknown paleontological resources are encountered during project activities, the Contractor will take all necessary steps to protect them, including potentially pausing construction in the vicinity of the resource, and will immediately notify the park's Physical Sciences Program Manager so that an appropriate mitigation strategy can be developed and implemented.
- A park paleontologist will conduct surface assessments prior to construction in areas identified by the park as potentially containing paleontological resources.
- Paleontological monitoring would occur for ground disturbing activities in the Roaring Springs and Manzanita areas, specifically within the Tapeats, Bright Angel, and Muav geological formations.

### **Resources, General**

- The Contractor will confine all project activities to the construction, staging area, and construction camp boundaries as shown on the project construction document drawings. These project boundaries will be clearly demarcated in the field using appropriate methods (e.g., flagging, fencing, etc.). Any requests by the Contractor to modify the project location (e.g., changes to construction, staging area, or contractor camp boundaries, etc.), scope, or timing (e.g., changing work from non-visitor season to visitor season) of project elements will be subject to additional environmental reviews. The Contractor will not proceed with the proposed modifications until necessary environmental reviews, surveys, permits, etc. are completed and clearance is granted by NPS.
- Any sensitive resource areas (e.g., archaeological sites, paleontological sites, etc.) within or near the project limits will be marked in the field for avoidance by qualified park resource specialists with flagging, fencing, or taping. (Please note that all archaeological sites require a 16 feet (5 meter) buffer, and the flagging, fencing, or taping will reflect that buffer.)
- If additional resource surveys (e.g., archaeological, paleontological, vegetation, etc.) are needed in project areas, the Contractor will not perform work in or otherwise use those areas until the surveys are completed and the park's applicable resource Program Manager gives clearance to proceed.
- When resource monitors (e.g., archeological, paleontological, etc.) are required for certain work, the Contractor will not proceed with that work without the required monitors being present, unless otherwise allowed by the applicable park resource Program Manager. It is the sole discretion of the park's resource Program Managers to determine if certain work may proceed without the applicable resource monitor onsite.
- As directed by the park, any sensitive resource areas, such as archaeological, paleontological, or rare/T&E species sites, within or near the project limits will be marked on design drawings as "Sensitive Resource Area - do not enter or disturb."
- The Contractor will avoid areas marked as sensitive resource areas on the plans or in the field.
- The Contractor will be required, as directed by NPS, to use construction/equipment mats or similar in saturated areas or in sensitive resource areas.
- The Project Lead is responsible for notifying the NEPA Lead and applicable subject matter experts of any proposed project changes, including changes to the project location (e.g., limits of construction), scope, or timing, to determine if further environmental reviews are required. The Project Lead will ensure the Contractor does not proceed with proposed.
- The Project Lead will coordinate with the NEPA Lead and park subject matter experts to ensure that applicable mitigation measures, BMPs, and other stipulations that are the

responsibility of the Contractor are incorporated into the project contract, specifications, drawings, etc. as appropriate.

- The Contractor will implement erosion and sediment control measures to aid in soil stability and prevent runoff and sediment discharges, particularly into wetlands and waterways or other sensitive resource areas. This includes implementing these measures within the limits of construction, as well as at staging areas and contractor camps, as directed by NPS.
- The Contractor must follow all conditions, stipulations, etc. of any Clean Water Act (CWA) Section 404, CWA Section 401, Rivers and Harbors Act Section 10, Endangered Species Act, or other similar environmental permits (e.g., Migratory Bird Treaty Act of 1918) that are required for the project.
- At the conclusion of the project, the Contractor will restore and return areas of ground disturbance, including trails, temporary trails/trail re-routes, sidewalks, roads, trail/sidewalk/road features (e.g., rock walls, curbing, etc.), parking lots, unpaved/undeveloped surfaces (e.g., soils), staging areas, and contractor camps, as close as possible to their pre-disturbance condition or better.

### **Socioeconomics**

- The Contractor, through the Project Lead, will notify the park's Commercial Services Division at least 18 months ahead of any activities that would result in the suspension of concessioners' contractually required services, which consist of lodging, food and beverage, retail, service station, interpretive bus tours, visitor shuttle, and public showers, laundry, vending, and mule rides. The contractor will provide a plan that outlines and assigns timelines for project activities that would result in the suspension of concessioner's contractually required services.

### **Soundscapes and Noise**

- Where practicable, the Contractor will use construction machinery, equipment, tools, etc. that do not exceed 60 dBA at 50 feet per the NPS Audio Disturbances Rule (36 CFR 2.12). The Contractor would use quiet technology equipment, as well as noise enclosures, silencers, and/or other noise-mitigating/attenuation devices for construction equipment/machinery, particularly for generators, pumps, compressors, and shaker/suction tanks. This is particularly important for inner canyon project areas and rim areas in proximity to visitor use facilities/areas.
- To reduce helicopter noise impacts to wildlife, visitors, soundscapes, and natural or wilderness characteristics, helicopters will make every effort to maintain a minimum 2,000-foot altitude where possible, per Federal Aviation Administration (FAA) Advisory Circular 91-36D Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas. Exceptions include during takeoff, landing, picking up/dropping off sling loads, when instructed otherwise by air traffic control, or where an altitude of less than 2,000 feet above ground level (AGL) is considered necessary to operate safely. The 2,000-foot altitude should be set using the highest terrain within 2,000 feet AGL laterally of the route of flight or the uppermost rim of the canyon.
- Project helicopter use will generally not be allowed between 5:00 PM (power off) and 8:00 AM (power on), except in limited circumstances and as approved by NPS. If flights are required between 5:00 PM and 8:00 AM, the project lead and contractor must coordinate with the Park Aviation Manager and the South Rim Helibase in advance.
- Flights will be minimized by combining material transport with other transport missions to the extent possible.

- To the extent possible, all flight loads will be arranged to minimize the total number of flights required.
- To the extent possible, personnel and gear/equipment/tools will be combined on flights to minimize the number of flights.
- The Contractor is required to use a quiet technology (as defined in NPS Aviation Reference Manual 60), light lift helicopter(s) for project operations, unless it can be demonstrated that quiet technology aircraft will not meet the needs of project aviation operations that require light lift helicopters. NPS Aviation Reference Manual 60 defines quiet technology as aircraft utilizing technological improvements that result in a “quieter” aircraft as opposed to the definition used by the Federal Aviation Administration (FAA) which calculates quiet technology based on the overall noise level of the aircraft divided by the number of passenger seats. Medium lift helicopters to be used for project operations will be, to the maximum extent practicable, the quietest aircraft available and/or be quiet technology aircraft.
- Helicopter pilots will be encouraged to use maneuvers that produce less noise, wherever possible, according to the Fly Neighborly training available at <https://go.usa.gov/xQPCW> and <https://www.rotor.org/operations/flyneighborly.aspx>.
- All equipment, machinery, materials, etc. for project components occurring on the North Rim will be trucked directly to the North Rim to minimize helicopter flights and associated noise impacts. Only equipment, machinery, materials, etc. for inner canyon construction will be hauled to the South Rim to be transported by helicopter to the inner canyon project site.

### **Vegetation and Soils**

- The Contractor will mark in the field (e.g., through flagging, fencing, etc.) trees to be removed and protected in place as shown on the project construction documents. The Contractor will attempt to further minimize tree removals to the extent possible.
- The Contractor will adhere to the park's pruning guidelines for any pruning necessary for the project, with the goal of retaining health and integrity of trees and shrubs treated. The Contractor will avoid damage to trees or roots in or adjacent to project areas as much as possible; however, if avoidance is not possible, root pruning guidelines will be followed.
- The Contractor will follow the park's protocol for vehicle, equipment, and machinery washing. In general, prior to entering the park, all vehicles and construction vehicles, equipment, and machinery will be washed to thoroughly remove all dirt, plant, and other foreign material.
- If fill is needed, the Contractor must use clean fill, preferably from an approved site within the park. Any fill materials from outside the park will be obtained from a park-approved source in adherence to Standard Operating Procedure 8213-007 Invasive Plant Free Forage and Construction Materials.
- The park's Vegetation Program will conduct surveys for invasive plant species prior to construction. If invasive plant species are found in or adjacent to the project limits, the park will treat the invasive species prior to ground disturbing activities. The Project Lead will coordinate with the park's Vegetation Program to determine treatment methods. If invasives are unable to be treated onsite, the Contractor will excavate topsoil and vegetation to a depth of four inches and haul to an approved disposal site.
- Invasive plant monitoring and control will occur for 3-5 years following construction completion. Additional mitigations and treatment may be required if invasive species are encountered during monitoring.
- The Contractor will follow the park's protocol for salvaging, storing, and handling topsoil.

- The park's Vegetation Program will conduct surveys for rare, sensitive, special status, and threatened or endangered plant species prior to construction. If rare, sensitive, special status, or threatened or endangered plants are identified within the project limits, the park's Vegetation Program will mark (e.g., through fencing, flagging, taping) these as sensitive resource areas for avoidance during construction.
- The Park will revegetate areas disturbed by construction and will use native seeds and plants.

### **Visitor Use and Experience**

- The following project components would occur during the visitor shoulder season (10/16-11/30) or off season (12/1-5/14): Roaring Springs Pumphouse water system improvements and Roaring Springs Cave to Pumphouse waterline rehabilitation. Any proposed changes to the timing of these project elements may require additional environmental reviews, consultations, and public notices. The Contractor will not proceed with the proposed changes until necessary environmental reviews, consultations, etc. are completed and clearance is given by NPS.
- A trail and sidewalk restoration/rehabilitation plan will be prepared by the contractor and provided to the park for review and acceptance
- The contractor will provide a trail, rest area, campground, and campsite closure plan at least 6 months prior to construction. The plan will be provided to the park for review and acceptance. The plan will be updated regularly. Throughout construction, the Contractor will notify the park at least two months in advance of any needed closures so the public can be notified.
- The contractor will attempt, to the extent possible, to schedule any needed trail, rest area, campground, or campsite closures during lower visitation times (e.g., winter, outside peak rim-to-rim times) to minimize visitor impacts.
- The contractor will attempt, to the extent possible and while considering safety factors, to schedule any needed road restrictions/closures on State Route 67/North Entrance Road during times that would have the least impact to visitors and park operations. Temporary impacts to the traveling public would be mitigated by providing detours, as reasonable, and providing signage and advanced notification at least two weeks prior to closures, detours, and other traffic restrictions.
- The contractor will provide a traffic control and detour plan at least 6 months prior to construction. The traffic control and detour plan will be provided to the park for review and acceptance. Throughout construction, the Contractor will notify the park at least two months in advance of any needed closures so the public can be notified.
- The following trails will be used as a detour for hikers and pedestrians and signed when the Bridle Path is closed during construction: Transept Trail, the unnamed trail that veers northwest from the Bridle Trail just north of the motels and connects with Transept Trail, and the unnamed trail that veers northwest from the Bridle Trail just north of Norton Court and connects to the North Rim Campground parking lot.
- The contractor would install signs, as determined necessary by the park, to alert or inform visitors about construction activities, including closures, restrictions, and detours.
- Construction zones will be properly secured to prevent visitors or other unauthorized personnel from entering.
- All permanent exterior lighting installed by the project will comply with International Dark Skies guidelines and the park's Standard Operating Procedure for Park Outdoor Lighting Guidelines.

- The park would issue alerts, press releases, and/or notifications to inform visitors about construction prior to and throughout the duration of construction. The Project Lead and park Communications staff will strive to notify visitors at least two months, but no less than one month, in advance of any planned closures, such as closures to roads, trails, rest areas, water services, campgrounds, campsites, lodging, or other visitor facilities or amenities.

### **Water Resources**

- The Contractor will not deposit spoils, stockpiles, or other excavated materials in any wash, drainage, channel, or wetland.
- The Contractor will avoid impacts to and not enter or otherwise perform work in wetlands or waterways (e.g., streams, creeks, channels). If work is required in wetlands or waterways, the Contractor, through the Project Lead, will notify the NEPA lead. Additional environmental reviews, consultations, and/or permitting will be necessary, and the Contractor will not proceed with this work until these are completed and clearance is given by NPS. Ample time (at least 1 year) must be provided to complete these reviews, consultations, and permitting.
- Any wetlands or waters within or near the project limits that are not permitted or otherwise authorized to be impacted will be marked on design drawings as avoidance areas.
- The Contractor will install temporary footpath bridges (or similar) spanning Roaring Creek near the Roaring Springs Day Use Area contractor camp and near the Roaring Springs Pumphouse to minimize contractor foot traffic in the creek and adjacent wetlands. The footpath bridge (or similar) will not be within or create impacts to wetlands or waterways.
- Contractor staff using the Roaring Springs Day Use Area contractor camp will minimize foot traffic in Roaring Creek and adjacent wetlands. Silt fencing and other erosion control measures (e.g., wattles) will be installed along wetland and creek boundaries at the Roaring Springs Day Use Area contractor camp to minimize sediment from entering these areas. If the contractor's use of this area degrades the creek or wetlands, the contractor will be required to rehabilitate the degraded aquatic resources, which could require additional environmental reviews and permitting.
- To the extent feasible, any flow changes to Roaring Springs Falls, Roaring Springs Creek, and Bright Angel Creek resulting from the project will be coordinated with natural flow regimes.

### **Wildlife, Including Special Status Species**

- The Contractor will implement all measures, terms, and conditions outlined in the Section 7 Biological Assessment and associated consultations for this project.
- To protect migratory birds, roosting bat species, and other animals using trees and shrubs for forage, nesting, and shelter during the breeding season, the contractor will avoid vegetation clearing to the greatest extent possible during the primary bird nesting season between April 1 and August 31. If this is not feasible, the contractor will follow USFWS Nationwide Avoidance & Minimization Measures for Birds, available at <https://www.fws.gov/media/nationwide-avoidance-minimization-measures-birds>, and surveys by a biologist qualified in nest searching will be required. If the park is unable to provide a qualified biologist to perform nest surveys, the Contractor will be responsible for retaining a qualified biologist, who will document their surveys in a report and provide it to the park for review and acceptance prior to vegetation removal. The surveys will be conducted no more than five days prior to the scheduled activity. If active nests or breeding behavior are detected during these surveys, no vegetation removal or other construction activities will be conducted within 150-feet of the nest until nestlings have fledged, the nest fails, or breeding behaviors

are no longer observed. If vegetation removal is to occur while nests are active or breeding behavior is observed, the Contractor must coordinate with USFWS to determine if a Migratory Bird Treaty Act permit or other avoidance/minimization measures are required.

- If drilling activities, including mobilization at the project site, begin between April 1-August 15, and are not immediately preceded by other work in the immediate vicinity, the Contractor will be required to work with USFWS to determine if a Migratory Bird Treaty Act permit is required. The contractor will follow the USFWS Nationwide Avoidance & Minimization Measures for Birds, available at <https://www.fws.gov/media/nationwide-avoidance-minimization-measures-birds>.
- Building design elements that reduce the risk of bird strikes, such as window treatments or fritted glass, will be incorporated on new or rehabilitated buildings. For examples, see <https://www.fws.gov/story/threats-birds-collisions-buildings-glass> and <https://www.fws.gov/media/reducing-bird-collisions-buildings-and-building-glass-best-practices>.
- All permanent exterior lighting installed by the project will comply with International Dark Skies guidelines and the park's Standard Operating Procedure for Park Outdoor Lighting Guidelines.
- The park's Wildlife Program will train contractor staff to avoid disturbance to any wildlife species that may be found nesting, hibernating, estivating, or otherwise living in, or immediately nearby, work sites.
- Grand Canyon's Parkwide Spill Response Plan will be utilized by contractors to prevent potential poisoning of condors and other wildlife, as well as soil and water contamination.
- The Contractor will not disturb, approach, or feed any wildlife species (e.g., reptiles, migratory birds, raptors, mammals, or bats) found nesting, hibernating, estivating, or otherwise living in, or immediately nearby, worksites. If wildlife must be disturbed or handled, the Contractor, through the Project Lead, will notify and consult with the park's Wildlife Program to assist with relocating wildlife. The Contractor may be required to pause work in the area until wildlife can be relocated.
- Project staff will avoid interactions with condors and immediately contact the park's Wildlife Program or park dispatch if a condor(s) visits a project site. If a condor(s) visits a project site, the Contractor will cease project activities until the condor(s) leave on their own or until permitted park personnel use approved techniques that result in the condor(s) leaving the area.
- If condor nesting activity is known within 0.5 mile of a construction project area, then light and heavy construction equipment (as defined in the Biological Assessment) in the project area will be restricted during the active nesting season from February 1 to September 30. These dates may be modified based on the most current information, in consultation with the park biologist, the park Section 7 Coordinator, and the U.S. Fish and Wildlife Service.
- The Contractor will attempt to conduct flights prior to 10:00 AM when possible, to minimize potential impacts to condors
- Helicopter pilots will attempt to remain at least one mile from active condor nests, but at times this may not be feasible. In instances when condors are actively nesting within 0.5 mile of helicopter flight paths, landing zones, and/or sling zones, the park will assign a wildlife monitor to observe the area and condor behavior when frequent and high numbers of helicopter flights are expected. If condors establish a nest within 0.5 mile of helicopter flight paths, landing zones, and/or sling zones, the Contractor will record helicopter flight numbers by helicopter type and report this information to the park's Wildlife Program and Section 7 Coordinator. The park will report this information to USFWS.

- Certain work locations and helicopter flight paths may be restricted during the condor and Mexican spotted owl nesting seasons. The active condor nesting season is February 1 to September 30. The Mexican spotted owl nesting season is from March 1 to August 31. These dates may be modified based on the current information regarding condor and Mexican spotted owl nesting activities (e.g., roosting and fledging) and coordination with the park's wildlife program manager, Section 7 coordinator, and USFWS.
- Helicopters will stay at least 1,200 feet away from airborne condors, unless human safety concerns override this restriction. If airborne condors approach aircraft, aircraft will give up airspace to the extent possible, as long as this action does not jeopardize human safety.
- To minimize noise disturbance within Mexican spotted owl Protected Activity Centers (PACs), helicopters shall remain at least 1,200 feet from the boundary of any designated PAC during the Mexican spotted owl breeding season (March 1 through August 31).
- Light and heavy construction equipment, as defined within the Biological Assessment, will not be used within 0.5 miles from Mexican spotted owl known nest/roost sites during the owl breeding season (March 1 – August 31).
- The Contractor will provide provisions (generally in the form of ramps with a slope <math><45^\circ</math>) every 20-50' in trenches or excavated holes to allow for the escape of animals that enter these recesses, and/or the trenches/holes must be covered in such a way as to prevent animals (vertebrates) from entering.
- Pilots are required to minimize aircraft use along the rim and cliffs to the greatest extent possible.
- With the exception of borehole drilling activities, night work outdoors is not authorized. However, there may be instances when crews mobilize to/from the work site at dawn or dusk or may need to finish a task at the end of the day. Such instances will be permitted if they are short term, require minimal equipment, and will not occur within 0.25 mile of a Mexican spotted owl Protected Activity Center (PAC) boundary. If the Contractor requests night work outdoors that does not meet the criteria above, the Contractor, through the Project Lead, would submit requests for night work to the park for review and acceptance. Additional environmental reviews may be necessary for night work proposals.
- Following the completion of the project, the park's Fisheries Program will monitor Bright Angel Creek for changes in creek morphology that directly impact habitat availability for fish and other aquatic species, amphibians, and bats. If undesirable changes to creek morphology are identified, the park will develop a plan to address these conditions.
- If culverts are used, they will be designed and installed/retrofitted to maintain animal movement and bank-full width, even in dry washes.
- Prior to UAS flights, Grand Canyon National Park's helibase staff and Project Lead will contact the Wildlife Program Manager concerning the presence/absence of threatened or endangered species utilizing nearby cliffs/canyons.
- Prior to UAS flights, the Project Lead will contact the Wildlife Program Manager, at least two weeks in advance, to schedule a wildlife monitor on site. The monitor will watch for bird activity of all kinds and alert operators of approaching birds. If birds approach the UAS flight area, aircraft will immediately give up airspace and return to the ground.
- To the best of their abilities, aviation staff piloting UAS will provide a buffer of 50-100 feet from areas where birds are present (in trees or on the ground) and airborne aircraft. This may not always be possible at the rim sites during take-off and landing.
- To minimize wildlife disturbance during the breeding season (April 1 – August 31), UAS will maintain a minimum distance from individual animals of 200 feet (vertical and

horizontal). To minimize wildlife disturbance during the non-breeding season (September 1 – March 31), UAS will maintain a minimum distance from individual animals of 100 feet (vertical and horizontal).

**APPENDIX B: ERRATA**  
NORTH RIM AND ROARING SPRINGS CANYON WATER SYSTEM  
IMPROVEMENTS ENVIRONMENTAL ASSESSMENT

GRAND CANYON NATIONAL PARK  
May 2026

These errata are to be considered alongside North Rim and Roaring Springs Canyon Water System Improvements EA dated March 2026 and are intended to correct or clarify statements in the EA other than typographical and minor editorial errors and to address substantive comments received on this document during the public review period.

~~Other changes were also made to the mitigation measures in the EA resulting from public comments or agency review, in order to further clarify, discuss, or make corrections.~~ This section includes all of these changes. EA text to be deleted is shown as ~~red strikeout~~, and revised or new text is shown as *red italicized text*.

---

**Page 50. Historic Districts, Impacts of Alternative A – No Action, Past Present and Reasonably Foreseeable Actions and Collective Impacts**

*Revised Text:*

The No Action alternative would ~~contribute~~ *have a negligible contribution* to the collective adverse impacts on historic districts because, as noted above, recurring/ongoing maintenance and repairs to the existing water system are generally minor, require minimal disturbances to historic districts, and would be designed to minimize impacts to historic properties.

---

**APPENDIX C: RESPONSE TO PUBLIC COMMENTS**  
**NORTH RIM AND ROARING SPRINGS CANYON WATER SYSTEM**  
**IMPROVEMENTS ENVIRONMENTAL ASSESSMENT**

GRAND CANYON NATIONAL PARK  
May 2026

The EA was released for public review from March 6, 2026 to April 5, 2026. The public, media, various agencies, and Grand Canyon's eleven traditionally associated tribes were notified of the EA's availability.

In response to the EA, 93 correspondences were received. Most comments expressed general support for the project or pertained to issues already adequately covered in the EA. The NPS identified five major themes across public comments that are summarized and responded to below. One correspondence providing technical suggestions (design-level details) for potentially improving the project was considered to be substantive; however, it did not affect the overall proposal nor was it considered a separate alternative.

No comments warranted development of an additional alternative, reconsideration of alternatives that were considered but dismissed, or modifications to the EA. Therefore, the alternatives and analyses remain as described in the EA and no changes were made other than minor word-processing edits, as presented in the errata.

One multi-part substantive correspondence was received:

1. **Comment:** What can be done to improve both availability and reliability at Supai Tunnel? The selected alternate does state a new two-inch line will be installed along the present path of the 1928 four-inch line. While that will be helpful. Routing the new line above ground in much the same manner as the 1928 line will make it subject to the same damage potential and fear of freezing that the 1932 line has been. Instead of installing waterline anchors at least every 275 feet, NPS records and Trail Crew members should be consulted to determine the locations between Supai Tunnel and the North Rim where historically the most common failures have occurred. Additional anchors or other restraints should be designed and installed in those locations.

Relative to freeze protection, a design which provides an alternative low flow rate using an orifice should be installed at the North Rim. A simple short segment of parallel path waterline design using manual valves could isolate the main 2-inch line and valve in the orifice line. The reduced flow through the orifice would prevent freezing of the waterline if not during the entire winter, certainly during the peak use periods discussed above.

Please design the use of globe valves not ¼ turn valves to be the faucet controls at the Supai Tunnel and any other water distribution points for filling water containers. ¼ turn valves have blown the water bottle out of the hands of many hikers due to the extremely hard to control action of a ¼ valve.

**Response:** The proposed anchoring was presented to various park staff, including the water utility repair team, during the design process and no concerns or suggestions for additional anchoring were raised.

Providing water at Supai Tunnel required balancing the cost of installation versus the overall benefit. A new two-inch-diameter Flexsteel pipeline will be installed along the existing alignment to provide greater resiliency to potential rockfall compared to the existing pipeline. Additionally, the piping and bottle filling stations at Supai Tunnel will be replaced to improve resiliency. However, as noted, the new pipeline is still subject to freezing and as such will need to shut down and drained during the winter months.

Providing a continuous flow or constant drain to provide water at Supai Tunnel during winter was considered but dismissed during design. Due to the high cost of developing potable water, having a constant drain during the winter months would be a wasteful use of resources. Additionally, because this water would be chlorinated a drain would require de-chlorination treatment.

The valve associated with the bottle filling stations is a multi-turn glove valve. Additionally, there is a secondary pressure reducing valve just prior to the bottle filling station that can be used to adjust the downstream pressure.

- 2. Comment:** Please ensure lessons learned from the GCNP South Rim borehole and other industry's available gas/oil installations are used to obtain the most effective means of ensuring the accuracy of achieving the desired location for the lower terminus. NPS/GCNP records in the Museum Collection clearly state the actual lower terminus location for the 1986 South Rim borehole missed the desired location by over 200 feet.

**Response:** The South Rim and oil/gas industry lessons learned have been incorporated into the North Rim borehole design. This included having one of the original South Rim bore team members as part of the design and having oil and gas industry experts review the design documents. Additionally, the South Rim bore documentation will be included with the solicitation documents to provide as background information.

Five major themes across public comments were developed and responses are as follows:

### Business and Economic Considerations.

**Comment Summary:** Commenters described the importance of reliable North Rim access and infrastructure to local and regional economies, noting that tourism supports small businesses, employment, and gateway communities such as Fredonia and other areas serving the North Rim. Several comments referenced economic disruptions following the 2025 Dragon Bravo Fire and emphasized that prolonged closures, service interruptions, or infrastructure failures can have substantial economic effects on businesses that depend on visitor travel to the North Rim. Several commenters also mentioned future growth, increased visitation, or expressed interest in extending the seasonal availability of North Rim visitor services and access.

**Response:** The project is intended to improve the reliability of essential water infrastructure that supports ongoing park operations and visitor access under current management objectives. By reducing unplanned outages and maintenance-related disruptions, the project would help provide more reliable and consistent park operations and visitor services that indirectly support businesses and gateway communities associated with the park. Decisions related to broader economic policy, funding priorities, visitor capacity, or changes to operating seasons are outside the scope of this project and were not evaluated further.

## Fire Recovery

**Comment Summary:** Commenters discussed the proposed project in the context of recovery and rebuilding following the Dragon Bravo Fire, including coordination with facility reconstruction, fire line construction, service availability, and broader landscape restoration.

**Response:** These comments are outside the scope of this Environmental Assessment. The purpose of the project remains focused on addressing documented deficiencies in existing utility infrastructure that existed under pre-fire conditions continue to persist. The park recognizes the importance of and is actively coordinating activities described under the EA with those necessary for post-Dragon Bravo Fire stabilization and recovery. Fire recovery will be addressed through separate planning and decision-making processes, and the public will be invited to participate in planning processes.

## Technical and Engineering Considerations

**Comment Summary:** Commenters raised questions regarding water efficiency, treatment methods, borehole design, fire protection, and exposure to environmental hazards.

**Response:** These topics did not warrant modifying the proposal because they were considered during engineering design and incorporated as appropriate.

## Trail Access During Construction

**Comment Summary:** Commenters requested that construction activities be planned to minimize effects on peak hiking seasons and expressed concern about potential closures of the North Kaibab Trail during project implementation.

**Response:** As noted in the EA and FONSI, temporary restrictions, including trail or water service interruptions, will be necessary during certain construction activities; however, closures will be minimized to the extent possible while still ensuring the safety of visitors and workers. The NPS will direct the contractor to attempt to schedule closures in a manner that will have the least impact on visitors and operations. Decisions about visitor access to certain facilities during construction will be refined after a contractor is selected and will be based on site conditions, operational or construction constraints, and safety considerations at the time of implementation. The public will be notified in advance of any access restrictions or closures.

## Safety and Visitor Experience

**Comment Summary:** Commenters emphasized that reliable access to potable water on and below the rim is a fundamental safety concern for hikers, visitors, and NPS personnel, and noted that the age and condition of the existing water system results in outages and requires frequent repairs in steep, exposed, and hazardous locations. Concerns were also raised regarding intermittent water reliability at Supai Tunnel, Cottonwood Campground, Manzanita, and other key trail locations during periods of high use and elevated temperatures, which can affect both visitor use and operational conditions. These conditions were described as contributing to increased risk for both visitors and maintenance staff and to recurring unplanned outages and emergency repair needs in remote canyon environments. Commenters further emphasized that reliable water and utility infrastructure is essential to maintaining safe visitor access, supporting recreational use, and sustaining visitor enjoyment, with recurring system failures noted as disruptive to trips and canyon experiences.

**Response:** These comments are consistent with the project’s purpose and need and the issues identified in the EA. The project is intended to reduce system failures, decrease the frequency of emergency repairs in high-risk environments, reduce overall operations in remote inner canyon locations, and improve overall system reliability. By replacing aging infrastructure and improving water system processes and reliability, the project would enhance visitor and employee safety and support safe public access and enjoyment of the park, while improving the consistency of visitor experience under foreseeable operating conditions.

**APPENDIX D: NON-IMPAIRMENT DETERMINATION  
NORTH RIM AND ROARING SPRINGS CANYON WATER SYSTEM  
IMPROVEMENTS ENVIRONMENTAL ASSESSMENT**

**GRAND CANYON NATIONAL PARK  
May 2026**

This non-impairment determination has been prepared for the selected alternative, as described in the Finding of No Significant Impact (FONSI) for the North Rim and Roaring Springs Canyon Water System Improvements Environmental Assessment (EA). As a basis for evaluating the potential impairment of park resources, the NPS relied on the EA, which is incorporated by reference here.

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior and the National Park Service (NPS) to manage units "to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (54 U.S.C. 100101).

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

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

An action constitutes impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values" (NPS 2006, Section 1.4.5). To determine impairment, the NPS must evaluate the "particular resources and values that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact on any park resource or value may constitute impairment, but an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance (NPS 2006, Section 1.4.5)."

Fundamental resources and values for Grand Canyon National Park (park) are identified in the enabling legislation, 1995 General Management Plan, and the 2017 Foundation Document. Based on a review of these documents, the fundamental resources and values for Grand Canyon National Park come from the park's inspirational scenic landscapes, extensive geologic record, dramatic

topography and biodiversity, critical water resources, important human history of over 12,000 years, and providing for the benefit, enjoyment, education, and inspiration of this and future generations.

Resources that were carried forward for detailed analysis in the EA for which a non-impairment determination is made include: historic districts, karst and hydrogeology, soundscapes, and special status species. A non-impairment determination is not made for visitor use and experience because it is not generally considered to be a park resource or value subject to the written non-impairment determination requirement found in NPS Management Policies 2006. Unacceptable impacts were also considered but would not occur.

### Historic Districts

The selected alternative will affect multiple historic districts (HD), including the Bright Angel Peninsula HD (pending listing in the National Register of Historic Places), Roaring Springs Canyon HD, North Rim Headquarters HD, North Entrance Road HD, North Kaibab Trail HD, Cross Canyon Corridor HD, and TCWL HD. Implementation of the selected alternative will result in short-term, localized negative effects to historic districts due to ground disturbance, temporary visual intrusions disrupting the setting and feeling of districts, and general construction-related activities, as well as minor long-term changes to the setting and feeling associated with new or modified infrastructure and tree removals. However, these impacts do not result in an adverse effect under the National Historic Preservation Act (NHPA) because they would not result in the loss of integrity of any district. Additionally, contributing features of the districts would retain integrity, with the exception of a small meter shed which may be removed. The removal of this shed may result in an adverse effect under NHPA. However, continuing consultation will occur with the State Historic Preservation Officer to mitigate impacts.

Project elements, including their massing, colors, and materials, were intentionally designed to be compatible with the historic character of districts and nearby development, and mitigation measures will avoid or minimize adverse effects. At the end of construction, disturbed areas will be restored and revegetated. Impacts will be limited in geographic extent, primarily confined to previously disturbed or developed areas where development is expected, and they will not substantially diminish the overall condition, integrity, or significance of historic districts within the park enough to impact their eligibility for listing on the National Register of Historic Places.

Because historic districts will retain their integrity and eligibility for listing and will still be available for the enjoyment of current and future generations, the selected alternative will not result in impairment of historic districts.

### Karst and Hydrogeology

The North Rim is characterized by a karst-dominated landscape that includes sinkholes, caves, and springs occurring both on the plateau surface and along the canyon walls. Potential impacts to karst and hydrology under the selected alternative are primarily associated with borehole drilling activities and the potential for construction-related fluids to enter karst features and contaminate groundwater.

Geophysical investigations found no substantial risks of large karstic voids (defined as greater than 40 feet in any dimension), faults, other geologic features, or groundwater conditions along the borehole paths. However, some potential faulting was identified but is limited in extent and does not intersect the bore paths, as well as some small-scale stress-related fractures that may represent areas of slightly reduced rock quality with the potential for small-scale karstic solutioning. This indicates

that any void less than 40 feet in any direction, if encountered, would most likely be isolated, rather than connected to other larger conduits. Additionally, surface evidence on the Bright Angel Peninsula shows no major faults or sinkholes, potentially suggesting a lack of interconnected subsurface voids or conduits along the bore paths. Considering the inherent uncertainties associated with geophysical interpretations in a complex karst environment, this investigation indicated that the geology along the bore paths appears coherent and represents a relatively low risk for drilling operations.

Deep drilling activities associated with the selected alternative could result in drilling fluids inadvertently entering underground voids and contaminating groundwater. However, based on geophysical investigations and the above discussion, the potential for drilling fluid contaminating groundwater is expected to be low. To minimize potential impacts, drilling will use non-toxic media when drilling fluids are needed, and monitoring will occur to detect unintended fluid loss. If drilling fluids were to enter voids and affect groundwater or drinking water sources, these impacts are expected to be short-term (limited to the three-to-five-month drilling period), localized, and within applicable regulatory thresholds.

Construction of the selected alternative also presents a low risk of accidental spills during construction that could introduce contaminants into karst features and ultimately the groundwater system; however, these impacts will be minimized through best management practices and limited in duration and extent. Standard best management practices, such as equipping vehicles with spill kits, will be implemented to minimize potential impacts should vehicle-related spills occur.

These potential temporary impacts will be localized and not measurably affect the overall condition of karst or hydrogeology.

Long-term adverse effects to karst and hydrogeology could result from the need to fill voids or cavities with cement in order to progress borehole drilling. This could alter or block subsurface flow paths and redirect groundwater flow, and, in some cases, affect spring discharge. If localized blockages occur, groundwater flow is expected to naturally redistribute within the void system; however, any such changes will be limited in extent and are not expected to measurably affect overall groundwater flow patterns, spring discharge, or overall karst system function. Therefore, the selected alternative will not measurably degrade overall karst or hydrogeologic system function.

In the long term, the selected alternative could improve the condition of hydrogeologic resources by reducing leaks, breaks, and uncontrolled releases from aging infrastructure, thereby potentially decreasing the potential for chronic water loss and associated effects to hydrogeologic conditions.

In summary, the selected alternative will not result in impairment of karst or hydrogeologic resources because there will not be measurable degradation of groundwater flow, spring discharge, or karst system function. Any potential impacts are not expected to measurably affect the overall condition or harm the integrity of karst or hydrogeologic resources, including the opportunities to enjoy these resources.

### Soundscapes

The analysis area for soundscapes is described on page 55 of the EA and is located primarily within developed areas or established helicopter flight paths. The soundscape within the analysis area is currently impacted and does not reflect a natural soundscape due to noise produced by visitor and administrative activities, including helicopter use.

The selected alternative will introduce temporary, localized adverse effects to the soundscape due to increased noise generated from borehole drilling (three to five months), general construction activities (three to five years), and helicopter operations to support inner-canyon construction (two years). These short-term adverse effects are summarized below.

Sound levels from typical construction equipment measured at a distance of 50 feet ranges from 72 to 92 dBA, with certain equipment specifically associated with borehole drilling expected to range from 92 to 114 dBA. Noise impacts resulting from general construction will be minimized by limiting construction to daylight hours, with minimal exceptions. Borehole drilling would occur continuously (24/7) over an expected three to five months resulting in drilling-related noise impacts to the soundscape over this same period. Noise impacts would be minimized by using equipment mitigation, such as enclosures or silencers. Noise from borehole drilling activities is estimated to be 35 dBA or higher throughout most of the North Rim developed area, with higher noise levels occurring generally in the area between the campground and lodge. Noise from drilling would also be expected to impact rim areas across Transept and Roaring Springs Canyons (approximately 25-40 dBA), as well as some inner canyon areas. Modeled sound levels within the inner canyon were generally below 25-30 dBA due to the effects of the terrain. The highest modeled sound levels at visitor use areas include 65 dBA at Transept Trail, 46 dBA at the motels, and 43 dBA at the visitor center parking lot. The modeled sound level at the campground is 28 dBA. For reference, examples of sources producing 60 dB include a normal conversation or air conditioning unit. While increased sound levels will occur during construction, the most perceivable impacts will occur in the North Rim developed area where increased sound levels should be expected and are necessary to provide visitor services. Additionally, humans are generally accustomed to noise intrusions, and the modeled sound levels at visitor use areas are within a range that humans are accustomed to. Furthermore, other locations throughout the North Rim would remain available for visitors to experience quieter environments and more natural soundscapes.

Helicopter support required for construction will contribute to increased level and frequency of noise and soundscape impacts within the analysis area. Helicopters are expected to produce noise levels between approximately 30 and 100 dBA depending on the distance between the helicopter and the receiver, as well as other factors. Noise attenuation from helicopters is not expected to extend beyond two to three miles due to the complex terrain and line of sight. Approximately 1,735 round-trip helicopter flights are estimated to be needed over the two-year construction period in the inner canyon, with up to 20 flights occurring per day on busy days, and each flyover (i.e., one-way flight) lasting up to approximately 20 minutes. Helicopter flights would only be allowed from 8 am to 5 pm so soundscape impacts resulting from helicopters would be limited to a nine-hour period each day. Helicopters supporting the project would be required to use existing flight paths to the extent feasible to minimize introducing soundscape impacts outside of existing flight corridors.

Noise from helicopter flights to support construction will also diminish the wilderness quality of “solitude or primitive and unconfined wilderness” and negatively impact wilderness users’ opportunities to experience quiet and solitude in proposed wilderness areas that are in the vicinity of flight paths. However, these impacts would be intermittent, limited to a period of 9 hours each day, localized along existing flight corridors where helicopter-related noise impacts already occur, and would cease upon completion of construction.

In summary, these construction-related noise increases will temporarily degrade soundscapes in the analysis area; however, impacts will be intermittent, short-term (limited to the construction period), localized (within approximately two miles of project areas and flight paths), and will not

substantially alter the overall condition of soundscapes within the park. Noise impacts will be minimized by limiting helicopter operations to the hours of 8am to 5pm and other construction activities to daylight hours, with the exception of borehole drilling activities and interior work, and using equipment mitigation

In the long term, the selected alternative will require fewer helicopter flights needed to operate and maintain the improved water system as compared to the existing aged system, resulting in fewer noise disturbances and an overall improvement to soundscapes in the analysis area. Under the selected alternative, helicopter flights required to operate, maintain, and repair the North Rim water system are expected to be reduced by at least half from the current annual total of approximately 70 to 120 flights.

While construction activities will temporarily degrade the soundscape, they will not result in long-term impacts that harm the integrity of soundscapes, including opportunities for enjoyment by current and future generations. Therefore, based on the above discussion, the selected action will not result in impairment of soundscapes.

### Special Status Species

Special status species that have the potential to be impacted under the selected alternative include California condor (*Gymnogyps californianus*) and Mexican spotted owl (*Strix occidentalis lucida*). Construction of the selected alternative may result in short-term, localized disturbance to these species due to increased noise, use of nighttime lighting during the three-to-five-month drilling period, and increased human presence and activity in and around the construction areas. These impacts may result in temporary displacement, behavioral changes, or habitat disturbance; however, they will be limited in duration and extent and minimized through mitigation measures and conservation conditions, as described in the EA and Biological Assessment, respectively.

Removal of vegetation and ground disturbance could result in long-term degradation of the quality or quantity of habitat; however, the park, including the locations directly adjacent to the project areas, contains an abundance of condor and Mexican spotted owl habitat so these habitat impacts within the project areas are considered minor, and restoration of disturbed areas will help minimize these impacts.

The selected alternative will result in long-term beneficial effects because the reduced frequency of operation- and maintenance-related disturbances, including fewer helicopter support flights, will reduce ongoing impacts to wildlife behavior and habitat resulting from helicopter noise.

The park determined and the United States Fish and Wildlife Service (USFWS) concurred that the project *may affect but is not likely to adversely affect* California condor or Mexican spotted owl. This determination reflects that the anticipated effects are discountable, insignificant, or completely beneficial.

Based on the above discussion, project disturbances will not meaningfully affect the overall integrity of condor or Mexican spotted owl populations or habitat availability, including the opportunity for current and future generations to enjoy these species; therefore, no impairment to these species or their habitat will occur.

### Impacts Considered but Dismissed

As documented in the EA, certain resource topics were considered but dismissed from detailed analysis because impacts were found to be negligible or minimal, or because issues associated with those resource topics were adequately addressed under related resource topics that were retained for analysis. See Appendix C of the EA for impact topic dismissal rationales.

The impacts to these resources are expected to be minor in magnitude, localized in extent, and not expected to measurably affect their overall condition or integrity. These resources will remain available to be enjoyed by current and future generations. Therefore, implementation of the selected alternative will not result in impairment of these resources.

### Conclusion

In conclusion, based on the analysis presented above and in the EA and FONSI, input from subject matter experts and others who have relevant knowledge and experience, results of public involvement, and best professional judgment, and consistent with NPS Management Policies 2006, the NPS has determined that implementation of the selected alternative will not constitute an impairment of the resources or values of Grand Canyon National Park. This determination is based on consideration of the park's purpose and significance, and fundamental resources and values, as well as the supporting decision file.