

# Death Valley National Park

National Park Service  
U.S. Department of the Interior

Death Valley National Park  
California and Nevada



## Environmental Assessment

### Scotty's Castle Waterline Replacement

June 3, 2011





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

**Environmental Assessment  
Scotty's Castle Waterline Replacement**

**Death Valley National Park  
Inyo County, California**

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**Notes to Reviewers and Respondents**

If you wish to comment on the environmental assessment you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. *If you want us to withhold your name and address, you must state this prominently at the beginning of your comment.* We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials or organizations or businesses, available for public inspection in their entirety.

Please address comments to: Superintendent; Death Valley National Park; Attn: Scotty's Castle Waterline EA; PO Box 579; Death Valley, CA 92328 or e-mail: DEVA\_superintendent@nps.gov

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## **INTRODUCTION**

### **PURPOSE AND NEED FOR ACTION**

The National Park Service (NPS) proposes to replace the existing waterline at the Death Valley Scotty Historic District, Death Valley National Park, California.

This action is needed because the existing waterline is original to Scotty's Castle, in poor condition and continuing to deteriorate. Several short sections of the waterline have been replaced over past years due to breakage. The NPS needs to continue providing water to Scotty's Castle for visitors, residents, and fire suppression; therefore, it is proposed that the entire waterline be replaced to avoid a major break that may temporarily shut off water to the site.

This environmental assessment analyzes the no-action alternative, two action alternatives, other alternatives and their impacts on the environment. This environmental assessment has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and regulations of the Council on Environmental Quality (40 *Code of Federal Regulations* (CFR) 1508.9); National Park Service Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*; and the National Historic Preservation Act of 1966 (as amended).

### **PARK PURPOSE, SIGNIFICANCE, AND MISSION**

An essential part of the planning process is to understand the purpose, significance, and mission of the park for which this environmental assessment is being prepared.

#### **Park Purpose**

Death Valley National Park dedicates itself to preserving the unrivaled scenic, geologic, and natural resources of these unique natural landscapes, while perpetuating significant and diverse ecosystems of the California desert in their natural state. The Park will also ensure the maximum protection of wilderness values provided by law.

The purpose and significance of Death Valley National Park are defined in the *General Management Plan* (NPS 2006). According to this document, which is based on the Park's enabling legislation and Presidential Proclamations, the purposes of Death Valley National Park include, among others:

- Preserving the cultural resources of the California desert associated with prehistoric, historic, and contemporary American Indian culture, patterns of western exploration, settlement, and mining endeavors.
- Providing opportunities for compatible public outdoor recreation and promote the public's understanding and appreciation of the California desert by interpreting the natural and cultural resources.

- Retaining and enhancing opportunities for scientific research in undisturbed ecosystems.

### **Park Significance**

Death Valley National Park has many elements that are considered significant across various disciplines in cultural and natural resources. The following list captures the essence of the Park's importance to the natural and cultural heritage of the United States of America.

- Scotty's Castle, with its architectural style, quality, and priceless collection of antiques and art objects, built in a remote, isolated desert location in the early 1900s, is an icon that has immense public appeal.
- Death Valley National Park contains an unusually high number of well-preserved archeological sites, including rock art and alignments.
- Death Valley National Park has an extensive and well-preserved mining history representing over 100 years of mining technology.
- Death Valley has been the continuous home of American Indians from prehistoric cultures to the present day Timbisha-Shoshone Tribe.
- Contrary to many visitors' first impression, Death Valley National Park's natural resources are extremely diverse, containing a large variety of plant species and community types. The area preserves large expanses of creosote bush valleys and other vegetation typical of the Mojave Desert. Extreme conditions and isolation provide habitat for an unusually high number of plant and animal species that are highly adapted to these conditions.
- Death Valley National Park is one of the largest expanses of protected warm desert in the world. Ninety-one percent of the Park is designated wilderness, providing unique opportunities for quiet, solitude, and primitive adventure in an extreme desert ecosystem.

### **Park Mission**

Death Valley National Park, hereafter referred to as the Park, dedicates itself to protecting significant desert features that provide world class scenic, scientific, and educational opportunities for visitors and academics to explore and study.

### **PREVIOUS PLANNING**

The proposed Death Valley Scotty Historic District waterline replacement is consistent with the primary management objectives for the Park, as stated in the approved *General Management Plan* (NPS 2006). The stated objectives include:

- Maintain, preserve, interpret, and perpetuate the aesthetic setting, and the natural and cultural resources of Death Valley National Park (pg. 4).
- Maintain the public use and administrative support facilities and equipment in a manner that will provide visitors safe and enjoyable experiences and prolong the life of the equipment and facilities (pg. 6).





Figure 1. Project Location and Existing Waterline Map

## ISSUES AND IMPACT TOPICS

### Issues

Issues and concerns affecting this proposal were identified from past National Park Service planning efforts and internal and external scoping. The issues and concerns identified in the planning stage allowed this environmental assessment to focus on those impact topics that have the greatest potential to be affected by the proposed project activities. The major issues related to this project include both natural and cultural resources and park operations. Natural resource issues identified were impacts to special-status species. Cultural resource issues identified included impacts to archaeological resources, ethnographic resources, and cultural landscapes. Park operations issues identified were related to water for consumptive use and fire suppression.

Specific impact topics were identified for analysis within the environmental assessment. These impact topics were identified based on Federal laws, regulations, and Executive Orders; NPS Management Policies 2006; and professional judgment of staff on what resources may be impacted by the project. Resources to which it was determined impacts would be negligible or non-existent were dismissed from detailed analysis. Topics dismissed are briefly discussed followed by a brief rationale for dismissing specific topics from further consideration.

### Impact Topics Selected for Detailed Analysis

Cultural Landscapes

Archeological Resources and Historic Structures

Ethnographic Resources

Special-Status Species

Park Operations

### Impact Topics Dismissed from Detailed Analysis

*Water Quality, Wetlands, and Floodplains*

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. *NPS Management Policies* provide direction for the preservation, use, and quality of water in national park units. Executive Order 11988 (*Floodplain Management*) requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. Executive Order 11990 (*Protection of Wetlands*) requires an examination of impacts to wetlands. *NPS Management Policies*, Director's Order – 2: *Planning Guidelines*, and Director's Order – 12 provide guidelines for proposed actions in floodplains.

The project lies within Grapevine Canyon which drains an area of 14,940 acres (23.3 sq mi) and has a relief of 4,000 ft (ranging from 3,000 to 7,000 ft). There is also a perennial spring, its associated springbrook, and delineated wetlands within the project corridor.

There has not been a detailed flood frequency analysis for Grapevine Canyon. However, it is accepted that the project area is in a 100-year flood zone, and the Park Hydrologist estimates that the project area lies within a 50-year flood zone.



The potential for impacts to water quality related to this project are from possible petrochemical spills from machinery or increased sediment loads during flooding. Petrochemical spills are unlikely, but, as described in the project mitigation measures any spills would be immediately contained and any contaminated soil would be removed. Vegetation recovery is expected to restore erosion susceptibility to pre-disturbance levels within one year. Mitigation measures would be implemented for sediment control. With implementation of mitigation measures, there are no anticipated impacts to water quality from this project and water quality is dismissed as an impact topic in this environmental assessment. The impacts of the proposed project would not affect the overall functions of floodplains and wetlands, and any impacts are expected to be minor and temporary. Therefore wetlands and floodplains are dismissed as impact topics in this environmental assessment.

### *Vegetation*

National Park Service policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS 2006 Section 4). Replacing the waterline would have the potential to disturb, remove, and eliminate vegetation; however, due to context and intensity, these impacts would be negligible. Two plant communities would be impacted in the project areas including a Larrea-Atriplex alliance which is widespread and common throughout Death Valley. The other plant community that would be affected is a riparian corridor that is largely composed of Baccharis, Atriplex and Vitis which are locally common species with high growth rates and an expected recovery time of one year. No rare plant species were found in the project area.

With this project there is a potential for the spread of non-native invasive plants that are currently established at both the origin and the terminus of the waterline. All of the proposed actions would result in a high amount of disturbance as well as traffic in and out of the corridor. The area surrounding the water collection tanks at the east end of the waterline is currently infested with a large amounts of Russian thistle (*Salsola sp.*), London rocket (*Sisymbrium irio*) and red brome (*Bromus madritensis ssp. rubens*). The west end of the waterline is infested with more species, although in lower densities, including rabbitsfoot grass (*Polypogon monspeliensis*), five-hook bassia (*Bassia hyssopifolia*), sowthistle (*Sonchus asper*), Russian thistle (*Salsola sp.*), halogeton (*Halogeton glomeratus*) London rocket (*Sisymbrium irio*) and red brome (*Bromus madritensis ssp. rubens*). With use of mitigation measures, the spread of non-native invasive plants would be minimal or non-existent.

### *Soils*

When soil excavation is an unavoidable part of an approved facility development project, the Service will minimize soil excavation, erosion, and off-site soil mitigation during and after the development activity (NPS 2006 Sect. 4.8.2.4). Soils have not been mapped along the Scotty's Castle Waterline Replacement corridor; however, general soils information can be determined based on the geologic formations from which the soils were derived. The topographic lows on either end of the road consist of sedimentary deposits resulting from erosion of higher areas and deposition in alluvial fans and drainage channels. Also included are soils derived from deposits of evaporates carried in by water, principally limestone, gypsum, and salt. There are also volcanically derived soils from erosion of volcanic layers interspersed within the Park (Harris

et al. 1997). The basin soils are thicker in the bottom of the basins and grow thinner as the slope and elevation increase. Soils in the higher elevations are derived from the mountain rocks present in the vicinity and contain rocks and rocky outcrops.

Soils will be disturbed during excavation, but they would be returned to the areas from which they were excavated. Other potential impacts to soils are from possible petrochemical spills from machinery, or increased soil loss if flooding were to occur within one year of construction. Petrochemical spills are unlikely, but any spills would be immediately contained and any contaminated soil would be removed. Vegetation recovery is expected to restore erosion susceptibility to pre-disturbance levels within one year. However, if a flood event occurs within a year following the project, the disturbed areas would be vulnerable to erosion. See the Mitigation Measure Section for detailed descriptions of required mitigations for soils and erosion control. The project's impacts on soils are expected to be minor and temporary. Therefore, soils are dismissed as an impact topic in the environmental assessment.

#### *Terrestrial Wildlife and Migratory Birds*

National Park Service policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS 2006 Section 4). Replacing the waterline would have the potential to disturb, temporarily or permanently displace, wildlife or their habitat; however, due to context and intensity, these impacts would be negligible. Only the special status bird species would have impacts that require detailed analysis (see Affected Environment and Environmental Consequences sections).

Animals that would be impacted in the project area include amphibians, birds, mammals, and reptiles. The amphibians, reptiles, and small mammals would be impacted the most through habitat alteration and mortality. These species are all widespread and common throughout Death Valley, have a high reproduction rate, and an expected recovery time of one year. There is only one amphibian species, *Hyla regila* (Pacific Tree Frog) located within the project area. The reptile community is composed of Squamata (Snakes) and Iguinadae (Lizards). The small mammal community largely composed of four Families: Dipodomys, Neotoma, Peromyscus, and Sciuridae. The medium and large mammal communities utilize areas around the Death Valley Scotty Historic District, rather than these springs due to human activity.

Larger mammals such as Bighorn sheep (*Ovis canadensis nelsoni*) and coyotes (*Canis latrans*) travel through the area but prefer areas further from Scotty's Castle for food, water, and shelter to avoid contact with human activities. Both animals are widespread and common throughout the Park. Coyotes have a higher reproduction rate and this project is expected to have no impact on breeding success. Although Bighorn have a slower reproduction rate, they avoid this area of close contact with humans; therefore, this project is expected to have no impact on the population size of the herd.

The majority of bird species observed in this district are migrants that make use of other breeding grounds. The Grapevine Springs Complex provides suitable habitat where they can rest and feed. Therefore, this project is expected to have no impact on the population size of migrant species. Between 20 -30 bird species breed in areas around Scotty's Castle surveyed in

2005 and 2010 (NPS 2010d). Birds that utilize this area for nesting have opportunities to select other territories for breeding behavior. These species have a moderate reproduction rate; therefore, it is expected that these species have a recovery time of 1-2 years.

#### *Aquatic Wildlife (Macroinvertebrates)*

Aquatic habitats are densely covered with both aquatic plants and riparian vegetation. Openings to the springbrook are limited except near Scotty's Castle where riparian vegetation has been removed or reduced. Aquatic habitats are dominated by several species of springsnails. Several of these springsnail are endemic to the Grapevine Spring complex. These include *Pyrgulopsis micrococcus* and *Pyrgulopsis margae* (Hershler and Liu 2003). At least two other species of springsnails (Physidae and Hydrobiidae) are also found in Grapevine Spring (Hershler and Sada 1987).

An aquatic macroinvertebrate survey conducted in September 2010 (HDR/e<sup>2</sup>M 2011) sampled three different locations from the headwater pumphouse to Scotty's Castle proper. The dominant macroinvertebrates from the three sampled sites were springsnails Hydrabiidae (48%) and net-spinning caddisflies *Hydropsyche* spp. (25%). Other common taxa included amphipods (*Gammarus* spp. and *Hyalella* sp.), dipeterans (Chironomidae, Simuliidae, and Stratiomyidae), and annelids (Oligochaeta).

There are no known threatened or endangered aquatic macroinvertebrates in the project area. If populations exist in the unnatural stream (from existing leaks), the same populations will also exist in adjacent natural streams, and fixing the leak will simply result in more water ending up in the natural stream course. Adverse impacts would only occur if stream channels were disturbed or if the riparian vegetation adjacent to stream channels is affected. Mitigation measures would be in place to reduce disturbance to these habitats. Measures would include but are not limited to reduced removal of vegetation, pipeline being placed over rather than under any portion of the stream channel, and fencing off of stream channels that are near construction zones. With use of mitigation measures impacts to aquatic wildlife would be negligible and therefore this impact topic has been dismissed from further consideration.

#### *Visitor Experience*

The Park Service states in its General Management Policies (2006) that the enjoyment of the park's resources is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitor enjoyment.

The visitor experience would be affected by the project due to construction noise, the altered views within the construction area, and the availability of water. Under the proposed actions, short-term effects to visitor use and experience would be expected during construction in the form of short-term, minor, adverse cumulative effects. The project's impacts are minor and temporary; therefore, this topic is dismissed in the environmental assessment.

#### *Safety*

The NPS Management Policies 2006 state that the NPS will seek to provide a safe and healthful environment for visitors and employees (NPS 2006 Sec 8.2.5.1). The deterioration of the existing waterline is a safety concern for Park visitors and employees.

The action alternatives are specifically designed to provide for public health and safety by ensuring that potable water and water for fire suppression continue to be provided to the Death Valley Scotty Historic District. Water shut-offs during construction would be mitigated by providing alternate sources of water, as described in the Mitigation Measures. The waterline replacement is expected to result in safety improvements. Public safety would not be adversely affected by the selection of either action alternative; therefore, safety is dismissed as an impact topic in this environmental assessment.

#### *Visual Resources*

The National Park Service has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. Accordingly, the Service will seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. Integral vistas have been identified by the Service and are listed in Natural Resources Reference Manual 77. There are no regulations requiring special protection of these integral vistas, but the Service will strive to protect these park-related resources through cooperative means.

Visual resources may temporarily be affected by the proposed project. Overall, there would be a slight and temporary degradation of local visual resources due to dust generated from construction activities and presence of construction equipment. These effects would last only as long as construction occurred. Impacts would be negligible and short-term; therefore, this impact topic was dismissed from detailed analysis.

#### *Designated Critical Habitat, Ecologically Critical Areas, Wild and Scenic Rivers, Other Unique Natural Areas*

The Park Service recognizes that special designations apply to parts or all of some parks to highlight the additional management considerations that those designated areas warrant (NPS 2006 Sec 4.6).

No areas within the project corridor are designated as critical habitat or ecologically critical (NPS 2002), nor are there any existing or potential wild and scenic rivers within the project area (NPS 2004). Death Valley is an important natural area, but the proposed action would not threaten the associated qualities and resources that make the Park unique. Therefore, this topic was dismissed from detailed analysis.

#### *Geology and Geologic Hazards*

The Park Service will preserve and protect geologic resources as integral components of park natural systems (NPS 2006 Sec 4.8.1.3).

Although ground-disturbing activities would occur under the action alternatives, impacts to the geology in the project area are not anticipated. Geologic hazards (e.g., faults and seismic activity such as earthquakes) would not be anticipated to affect the project. Faults do exist within the waterline corridor, but would not be expected to exhibit activity during project construction. Long-term use of the road to the water treatment facilities would be impacted by fault activity under both the no-action and action alternatives. Such impacts are not predictable or manageable. This topic was dismissed from detailed analysis.

### *Air Quality*

The 1963 Clean Air Act, as amended, requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all Federal, state, and local air pollution standards. Section 176(c) of the Clean Air Act requires all Federal activities and projects to conform to state air quality implementation plans to attain and maintain national ambient air quality standards. *NPS Management Policies 2006* (Section 4.7) addresses the need to analyze potential impacts to air quality during park planning.

The project area is located in the Great Basin Unified Air Pollution Control District, as established by the state of California. This district is classified as a California state non-attainment area for particulate matter (fine dust) less than 10 microns in diameter.

The selection of either action alternative would lead to local air quality being temporarily affected by dust and construction vehicle emissions. Hauling material and operating equipment during the construction period would result in increased vehicle exhaust and emissions. Hydrocarbons, nitrogen oxide, and sulfur dioxide emissions would be expected to be rapidly dissipated. Fugitive dust plumes from construction equipment would intermittently increase airborne particulates in the area near the project site, but loading rates are not expected to be considerable or long term. Overall, there would be a slight and temporary degradation of local air quality due to dust generated from construction activities and emissions from construction equipment. These effects would last only as long as construction occurred and impacts would be negligible and short-term; therefore, this topic was dismissed from detailed analysis.

### *Prime and Unique Farmland*

Prime and unique farmlands are protected under the Farmland Protection Policy Act (7 U.S.C. 4201 et seq.). There are no farmland areas or soils where unique crops are produced within the Park boundary; therefore, this topic was dismissed from detailed analysis.

### *Socioeconomic Environment and Land Use*

The project would not change local or regional land use, nor would it appreciably affect local businesses outside The Park. Implementation of any action alternative could provide a negligible beneficial impact to the economies of Inyo and Nye Counties (e.g., increased employment opportunities for the construction work force and revenues for local businesses and government related to construction activity). Benefits to the local economy would be temporary, lasting only during construction, and negligible overall. Improvements in the waterline would not affect concessions within the Park. This topic was dismissed from detailed analysis.

### *Environmental Justice*

Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*), requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative under consideration would have health or environmental effects on minorities or low-income populations or communities as defined in

the Environmental Protection Agency's *Draft Environmental Justice Guidance* July 1996. Therefore, this topic was dismissed from detailed analysis.

#### *Museum Objects*

The National Historic Preservation Act of 1966, NEPA, the 1916 NPS Organic Act, NPS *Management Policies* 2006, and Directors Order-24 (*Museum Collections Management*) require Federal agencies to consider the effects of their proposed actions on cultural resources. Museum collections (historic artifacts, natural specimens, and archival and manuscript material) may be threatened by fire, theft, vandalism, natural disasters, and careless acts. The preservation of museum collections is an ongoing process of preventative conservation, supplemented by conservation treatment when necessary. The primary goal is preservation of artifacts in as stable condition as possible to prevent damage and minimize deterioration.

The proposed activities along the waterline replacement corridor would not affect any designated storage or display areas for museum objects of the Park. Therefore, this topic was dismissed from detailed analysis.

#### *Indian Trust Resources*

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The Federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of Federal law with respect to American Indian and Alaska Native tribes. There are Indian trust resources in the Park.

The Secretary of the Interior holds 313.99 acres of land in trust (Timbisha 2000) within the boundaries of the Park. These lands are located in the Park at Furnace Creek approximately 54 miles from Scotty's Castle. This project will not impact these trust resources. Therefore, Indian trust resources were dismissed from detailed analysis.

#### *Soundscapes*

In accordance with *NPS Management Policies* 2006 and Director's Order – 47: *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. Noise associated with the waterline improvements would be short-term and localized. Consideration of noise impacts on threatened, endangered, and special-concern species are addressed under that impact topic. Therefore, this topic was dismissed from detailed analysis.



## **DESCRIPTION OF THE ALTERNATIVES**

### **NO-ACTION ALTERNATIVE**

This alternative would be the continuation of existing conditions of the waterline at Scotty's Castle. Should the No-Action Alternative be selected, the National Park Service would respond to future needs and conditions associated with the waterline at Scotty's Castle in the Park without major actions or changes in the present course. The existing waterline may fail at sometime in the future. If the line were to fail water would not be available for staff and visitors or for fire suppression. Short-term, minor repair or improvement activities considered part of routine maintenance for functional operation of the waterline would continue under this alternative.

### **ALTERNATIVE TWO: TRENCHING**

Alternative Two proposes to replace the approximately 5,330 foot long water main from the storage tanks to the Death Valley Scotty Historic District with a new 8-inch waterline to protect employees, visitors, and Park resources. The project would follow an existing, sporadically used two-track maintenance road, hereafter referred to as the Spring Access Road, along the pipeline with a trench approximately three feet deep and two feet wide. The original pipeline would be removed and replaced in-kind. The new pipe would connect both storage tanks where their out-flow lines join together and at Scotty's Castle near the Stables. The newly laid pipe would be reburied.

This alternative would require the use of excavators and machines capable of removing vegetation along the entire waterline corridor; excavating a trench wide enough to ensure the pipe is laid safely; and removing the old pipe. It is expected that this corridor would be approximately 25-30 feet wide over the entire waterline and require removal of most or all vegetation along the corridor. This alternative would be limited to a maximum amount of 115,356 square feet of surface disturbance related to vegetation removal and trenching activities.

### **ALTERNATIVE THREE: PIPE-BURSTING**

Alternative Three proposes to replace the 5,330 foot long water main from the storage tanks to the Death Valley Scotty Historic District with a new 8-inch waterline to protect employees, visitors and Park resources. This alternative would follow the Spring Access Road along the original pipeline's footprint. The original pipeline would be burst, left in place, and new piping inserted into the void. Large trenches would be excavated approximately four feet deep and twenty feet wide. Minimally, these trenches would occur every 200 feet, at every elbow joint,

and wherever power max couplers or valves are found. Two power max couplers are installed every 600 feet along the existing pipeline.

The new pipe would connect both storage tanks where their out-flow lines join together and at Scotty's Castle near the Stables. Wherever trenches are excavated, the new pipe would be buried. This alternative could require a more limited use of trenching than Alternative Two. However, the power max coupler positions were not located using GIS technology. It is possible, given unknown locations of the couplers, that trenching would be necessary considerably more often than every 200 feet.

Vegetation removal would occur along the entire waterline corridor in patches, at trench locations and locations necessary to maneuver equipment. If trenches are only required every 200 feet the surface disturbance would be approximately 2,240 square feet. The 2,240 square feet would not include disturbance necessary to move equipment in place to lay the pipe (i.e. vegetation removal, surface disruption from the equipment's blade, tires, or tracks). If power max couplers are found frequently along the existing lines or other barriers are located it is possible that the disturbance corridor would be 25-30 feet wide over the entire waterline with a maximum amount of surface disturbance of 115,356 square feet.

## **ACTIONS COMMON TO ALL ACTION ALTERNATIVES**

There would be no grading or planting of the Spring Access Road following construction of the waterline.

Water supply to Scotty's Castle would be shut off intermittently during construction; potentially every day for 8-10 hours. If water would shut off for more than a four hour period an alternate source of potable water would be provided.

Both action alternatives would be designed for a 20-year service life, meeting current and anticipated future needs during that period.

Fill material excavated during this project would be used in place or recycled. There may be adequate base materials to utilize in-place recycling techniques or sand fill will be trucked in.

Plants may be salvaged from the construction footprint prior to the project's initiation. Yerba mansa (*Anemopsis californica*) is a medicinal plant that may be of interest to the Timbisha-Shoshone and could be easily harvested prior to construction.

A few cacti were also observed in the waterline corridor that may be salvaged for landscaping at the Scotty's Castle cactus garden.

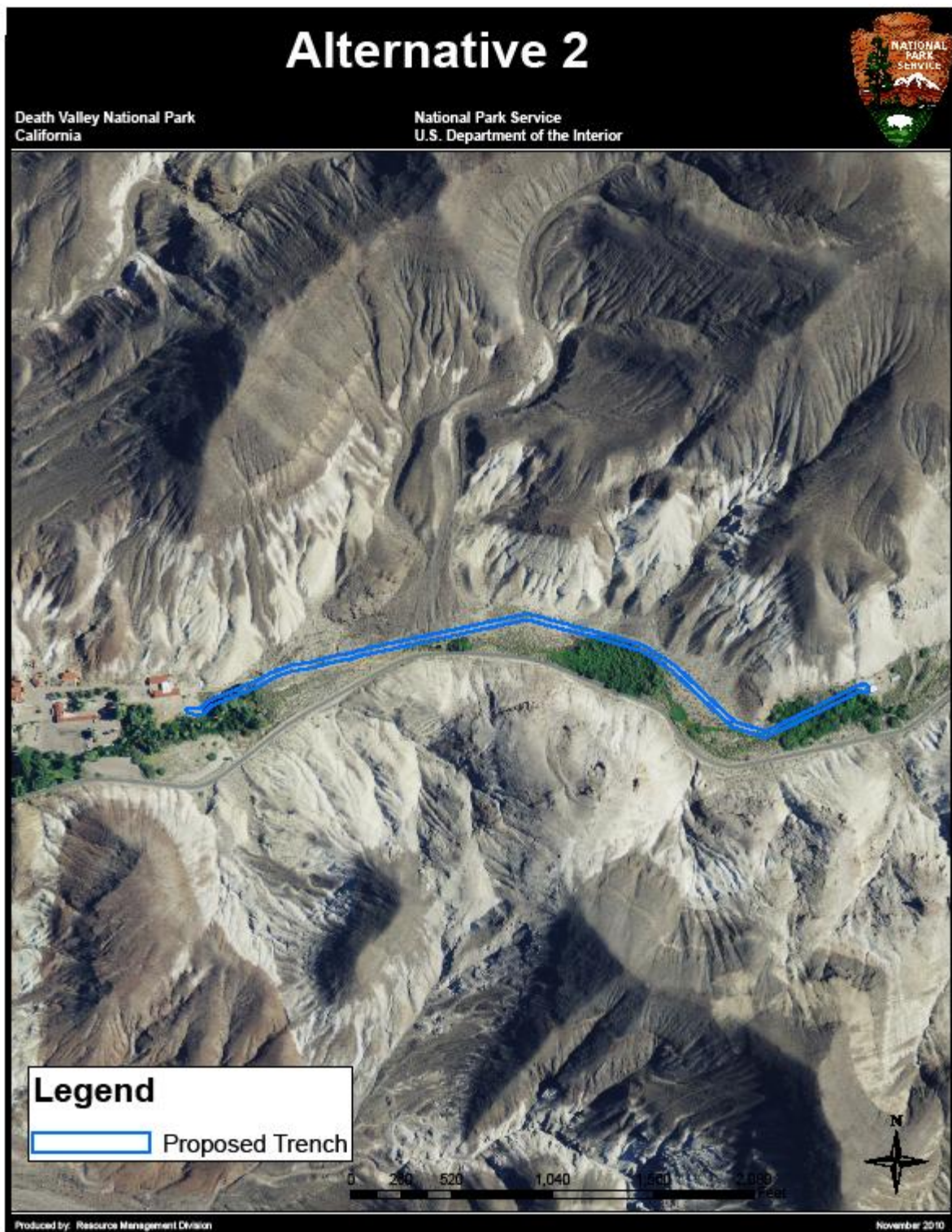


Figure 2. Alternative Two: Trenching Method



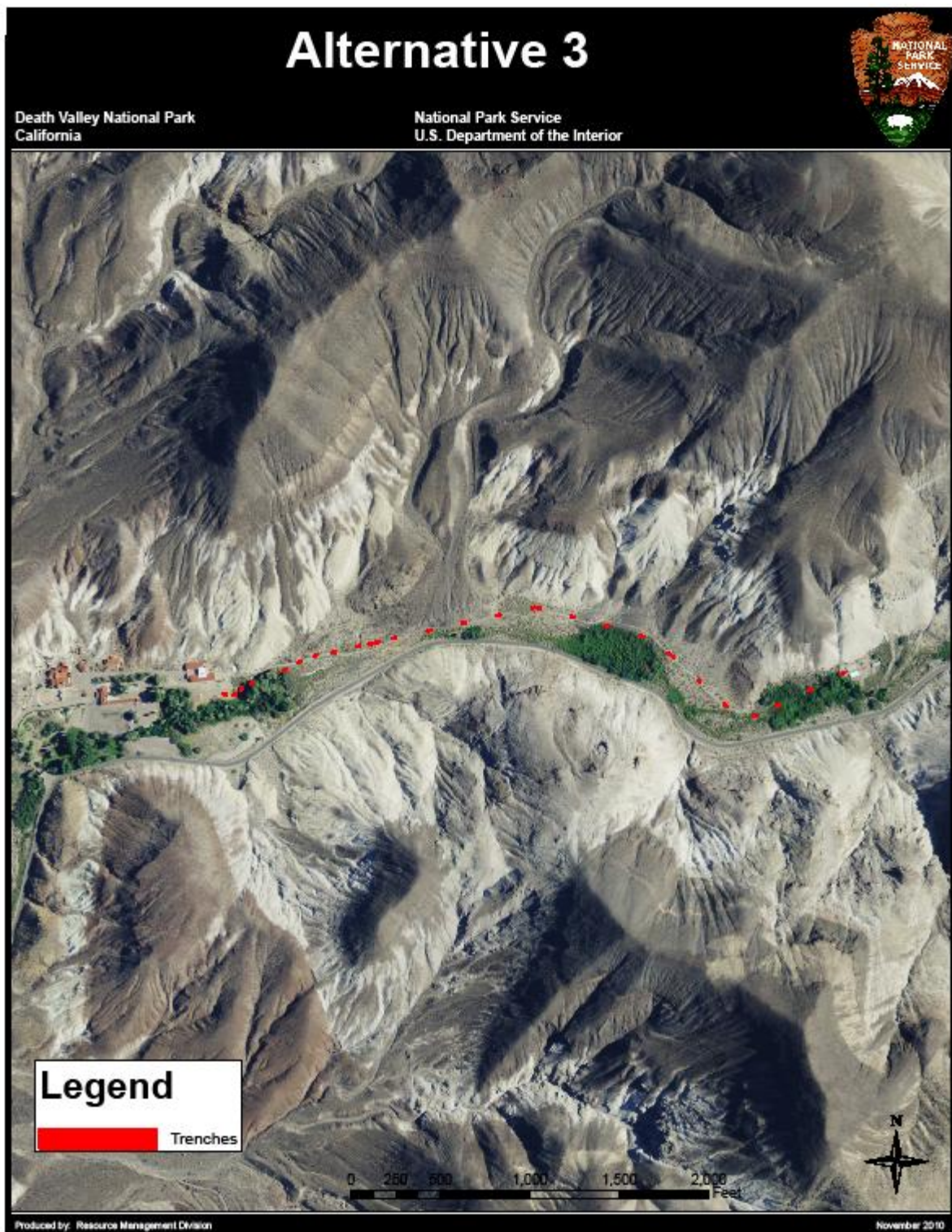


Figure 3. Alternative Three: Pipe-Bursting Method

## ALTERNATIVES CONSIDERED BUT DISMISSED

The first alternative dismissed was that of using an alternate source for potable water by drilling a well. This option is economically unfeasible and would not be consistent with the cultural landscape. It would require additional resources to construct and maintain the proposed well and pipeline infrastructure, removal of the current system's springbox, and would still require removal and replacement of the existing pipeline.

The second alternative dismissed was that of replacing the pipeline in-kind above ground. This option was dismissed because it would be inconsistent with the cultural landscape.

The third alternative considered and dismissed was that of placing a new, larger holding tank upslope from the current tanks. This tank would be situated at an appropriate location so that water could reach pressures necessary for fire suppression. This alternative was dismissed because it is outside of the scope of the purpose and need and is not appropriate for the cultural landscape.

The fourth alternative dismissed was routing the pipeline underneath Bonnie Clare Road. The waterline would have to be routed under an active springbrook in addition to the road. This action would result in a disturbance of approximately 1,600 cubic yards material directly in the springbrook and a loss of 25,800 square feet of surface vegetation along the proposed route. This route would also disturb 0.68 miles of the Bonnie Clare Road. Maintenance of this line would involve excavating and repairing the road. This alternative would potentially disturb Indian Camp, a historically significant site, which is currently being added to the Death Valley Scotty Historic District. Due to elevation changes and curves in the road, the proposed route may reduce the flow (pressure) and possibly require an in-line pump. This alternative was dismissed because it would adversely impact hydrologic functioning of the Grapevine Springs complex, result in habitat loss for endemic macroinvertebrates in this spring complex, and cause maintenance of the waterline to more difficult and costly.

The fifth alternative discussed was combining Alternative Two: Trenching and routing the pipeline underneath Bonnie Clare Road until it reached the area where the Spring Access Road was at its closest; then the pipeline would be routed under the Spring Access Road where it is currently located. This option was dismissed as it would result in new areas of disturbance and would increase maintenance costs.

The sixth alternative discussed was not having potable water at Scotty's Castle. This option would create health and safety hazards for staff, residents and visitors. Fire suppression could not occur in a timely manner which would be inconsistent with the *General Management Plan*. Visitors, staff, and residents would have to transport water for consumption and personal hygiene. This alternative was dismissed because it would not be compatible with the *General Management Plan* as it would threaten personal health and safety.

## **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

In accordance with Director's Order 12, the National Park Service is required to identify the "environmentally preferred alternative" in all environmental documents, including environmental assessments. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the Council on Environmental Quality. The Council on Environmental Quality provides direction that "[t]he environmentally preferred alternative is the alternative that would promote the national environmental policy as expressed in section 101 of NEPA, which considers:

- fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations
- assuring for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings
- attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences
- preserving important historic, cultural, and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice
- achieving a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities
- enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources" (NEPA, section 101)"

The environmentally preferred alternative for this project is the No-Action Alternative. This alternative would protect, preserve, and enhance historic, cultural, and natural resources. Under this alternative there would be damage to natural and cultural resources over time as routine maintenance occurs and breaks in the waterline are repaired. Vegetation and habitat loss may occur and archaeological sites may be disturbed. However, damage to resources would occur intermittently and in small patches allowing for time for natural resources to recover. Cultural resources would not be damaged or removed in the short-term; however, a major break in the waterline may result in the inability to suppress a fire at Scotty's Castle.

While Alternative 2, Trenching, and Alternative 3, Pipe-Bursting, would ultimately result in the same pipeline replacement product in the same location, they are both unattractive in regard to environmental preference. Alternative 3 is more environmentally preferred than Alternative 2, since it minimizes excavation, and has potentially fewer disturbances to vegetation and cultural resources. However, since the extent of required excavation is not known (due to inadequate knowledge of the subterranean pipe layout), and the vehicles that would be used to replace the pipeline would have to traverse the entire pipeline length (disturbing vegetation and cultural resources on the ground surface), this alternative could ultimately result in just as much disturbance as Alternative 2, Trenching.



## MITIGATION MEASURES

Mitigation measures are common to both action alternatives and have been developed to lessen any adverse effects that may occur as a result of Alternative Two and Alternative Three.

| <b>General Measures</b>  | <b>Responsible Party</b>           |
|--|------------------------------------|
| Ensure that the project remains confined within the parameters established in the compliance documents and that mitigation measures are properly implemented.  | Project Manager                    |
| Ensures that the work area boundaries are conspicuously staked, flagged, or marked to minimize surface disturbance to the surrounding habitat. Machinery storage and vehicle parking will only be permitted in designated areas (i.e. existing roadways, parking lots, or access routes).  | Project Monitor                    |
| All protection measures will be clearly stated in the construction specifications and workers will be instructed to avoid conducting activities beyond the work area boundaries. This does not exclude necessary temporary structures such as erosion control fencing.   | Project Manager                    |
| All tools, equipment, barricades, signs, surplus materials, and rubbish will be removed from the project work limits upon project completion. Any asphalt surfaces damaged due to work on the project will be repaired to original condition. Construction debris will be immediately hauled off from the Park or placed in a roll-off container and then taken to an appropriate disposal location. | Project Manager                    |
| All construction equipment (i.e., mufflers) will be required to be properly maintained to minimize noise from use of the equipment. All equipment on the project will be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment will be checked daily.  | Project Manager                    |
| A hazardous spill plan will be in place, stating what actions will be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.  | Project Manager and Safety Officer |
| Erosion control measures will be implemented to minimize minor and short-term impacts to water quality. Use of best management practices in the project area for drainage area protection will include all or some of the following actions, depending on site-specific requirements:  | Project Manager and Hydrologist    |
| <ul style="list-style-type: none"> <li>• keeping disturbed areas as small as practical to minimize exposed soil and the potential for erosion;</li> </ul>  | Project Manager                    |
| <ul style="list-style-type: none"> <li>• locating waste and excess excavated materials outside of drainages to avoid sedimentation;</li> </ul>   | Project Manager                    |
| <ul style="list-style-type: none"> <li>• installing silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) prior to construction;</li> </ul>  | Project Manager                    |
| <ul style="list-style-type: none"> <li>• conducting regular site inspections during the construction period to ensure that erosion-control measures were properly installed and are functioning effectively; and</li> </ul>  | Project Manager                    |

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>storing, using, and disposing of chemicals, fuels, and other toxic materials in accordance with Federal, state and local regulation.</li> </ul>   | Project Manager                                    |
| <b>Soils</b>   | <b>Responsible Party</b>                           |
| Erosion and sediment control will be required (see “General Measures”).  | Hydrologist or Project Manager                     |
| Disturbed areas will be raked perpendicular to the slope. Native vegetative material which was removed during construction will be laid lengthwise across the disturbed areas (perpendicular to the slope).  | Hydrologist  |
| <b>Vegetation</b>  | <b>Responsible Party</b>                           |
| Disturbed areas, along the pipeline will be allowed to return to natural conditions with minor treatments.   | Botanist   |
| Ground surface treatment will include grading to natural contours and vertical mulching to promote natural seeding.  | Botanist or Hydrologist                            |
| Undesirable plant species will be controlled in high-priority areas and other undesirable species will be monitored and controlled, as necessary. To prevent the introduction and minimize the spread of non-native vegetation and noxious weeds, the following measures will be implemented during construction (NPS 2010c).  | Botanist   |
| <ul style="list-style-type: none"> <li>Mapping and pretreatment of noxious weeds (as recognized by the county and/or the state) in addition to the removal and destruction of all standing non-native vegetation that contains propagules will take place prior to construction and will be limited to the designated areas of construction.</li> </ul>  | Botanist, Exotic Plant Specialist                  |
| <ul style="list-style-type: none"> <li>Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering the Park and the project area.</li> </ul>  | Project Monitor                                    |
| <ul style="list-style-type: none"> <li>All construction equipment transporting material outside the construction limits shall be brushed down after every drive.</li> </ul>  | Project Monitor or Botanist                        |
| <ul style="list-style-type: none"> <li>Containment of soil with non-native propagules with the use of impenetrable weed mats and gravel in consultation with the State Historic Preservation Office to maintain the appearance of the cultural landscape or the use of pre-emergent herbicide in consultation with Pacific West Region Integrated Pest Management to control the invasive plant seedbank.</li> </ul> | Botanist, Project Manager, Exotic Plant Specialist |
| <ul style="list-style-type: none"> <li>Monitor disturbed areas for at least 5 years (until the disturbance has subsided) following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation will be completed in accordance with Directors Order–13, <i>Integrated Pest Management Guidelines</i>.</li> </ul>   | Botanist   |
| <b>Wildlife / Special-Status Species</b>   | <b>Responsible Party</b>                           |
| All construction and vegetation removal activities will occur between August 16 and March 14 in order to avoid the nesting season for least Bell’s vireo and willow flycatcher.  | Wildlife Biologist                                 |
| Riparian vegetation adjacent to stream channels will be restored to pre-disturbance conditions. Photographic documentation will be implemented to obtain this goal.  | Botanist, Aquatic Ecologist                        |

|  |  |
|--|--|
| All portions of the stream will be allowed to recover to pre-construction conditions. This may include bank restoration and channel reconstruction.  | Aquatic Ecologist, Wildlife Biologist, Hydrologist, Botanist |
| <b>Air Quality</b>   | <b>Responsible Party</b>                                     |
| Fugitive dust plumes will be reduced to the extent possible by water sprinkling the soil during earth-disturbing activities. Water used during construction will be taken from Scotty's Castle or the Grapevine housing area under limited use guidance.   | Project Manager  |
| <b>Cultural Resources</b>  | <b>Responsible Party</b>                                     |
| An archeologist will be present onsite, monitoring all work in the area of the waterlines corridor to ensure that activities occur within the area of potential effect defined for the project and that no important information is lost.  | Archaeological Monitor                                       |
| Should unknown archeological resources be uncovered during construction, work will be halted in the discovery area, the site secured, and the Park will consult according to 36CFR 800.13.   | Archaeological Monitor                                       |
| In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service will also notify and consult representatives of American Indian tribes likely to be culturally affiliated for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project.                                    | Archaeological Monitor                                       |
| Paleontological remains and archeological specimens found within the construction area will be removed only by the National Park Service or their designated representatives.  | Archaeological Monitor                                       |
| Collect artifacts on the surface and catalog them. Depending upon subsurface deposits partial or complete excavation will occur with collection and analysis of artifacts and features.  | Archaeological Monitor                                       |
| <b>Visitor Experience</b>  | <b>Responsible Party</b>                                     |
| Water outages of 4 hours or more will require a secondary water source to provide potable water to visitors and residents.   | Project Manager  |
| <b>Health and Safety</b>   | <b>Responsible Party</b>                                     |
| Construction will take place during the cool months to avoid excessively high summer temperatures.   | Project Manager  |
| One of the following options will be instigated for fire suppression during construction:  | Fire Safety Officer  |
| <ul style="list-style-type: none"> <li>Maintain a waterline from the storage tanks to the main buildings and tie into the existing waterlines in the area of the Stables. This water line must be capable of maintaining minimum flow of 1,000 GPM (gallons per minute).</li> </ul>  | Project Manager  |
| <ul style="list-style-type: none"> <li>Install an temporary above ground storage tank on the grounds of Scotty's Castle and staff a Type 1 fire engine with a fully qualified crew (with a 4 minute response time) while the water supply from the permanent storage tank is shut off. A fully qualified crew consists of a Fire Officer, an Engineer and 2 firefighters.</li> </ul> | Project Manager  |
| <ul style="list-style-type: none"> <li>Shut off all propane and electricity to the entire Scotty's Castle area and prohibit all sources of heat and flame. Any accidental fire will be suppressed by hand held extinguishers.</li> </ul>   | Project Manager  |

## COMPARASION OF ALTERNATIVES

| Alternative1: No-Action   | Alternative Two: Trenching  | Alternative Three: Pipe-Bursting  |
|---|---|---|
| <p>The Park would continue to use the existing waterline. Current and future needs and conditions associated with this waterline would have to be addressed through means other than either action alternative. Water supply serving the Death Valley Scotty Historic District would continue to be outdated and the system would continue to limit the reliability of water to the District.</p> <p>The No-Action Alternative would not adequately address the project purpose and need of replacing the waterline and providing improved safety for residents and visitors with a more reliable and functional waterline system. The proposed project is needed because the current waterline serving the Death Valley Scotty Historic District is outdated and continues to have small-scale failures. This alternative would not meet the needs of improving reliability and functionality for natural resources, cultural resources, visitors and staff.</p> | <p>The proposed action would include the following elements:</p> <ul style="list-style-type: none"> <li>• Construction, operation, and maintenance of a waterline.</li> <li>• Installation of 3,400 linear feet of buried pipe on the Spring Access Road.</li> <li>• The construction and disturbance corridor would be no more than 30 feet wide.</li> <li>• A trench would be dug the entire length of the waterline.</li> <li>• The maximum project surface disturbance would be 115,356 square feet.</li> </ul> <p>Alternative Two would adequately address the project purpose and need of replacing the outdated waterline and providing improved availability of water for protection of natural resources, cultural resource, staff, and visitors with a more reliable and functional waterline system. The proposed project is needed because the current waterline serving the Death Valley Scotty Historic District is outdated and continues to have small-scale failures. This project would meet the needs of improving reliability and functionality for natural resources, cultural resources, visitors and staff</p> | <p>The proposed action would include the following elements:</p> <ul style="list-style-type: none"> <li>• Construction, operation, and maintenance of a waterline.</li> <li>• Installing 3,400 linear feet of buried pipe on the Historic Spring Access Road.</li> <li>• The construction and disturbance corridor would be no more than 30 feet wide.</li> <li>• Trenches would be dug approximately every 200 feet along the entire waterline and potentially the entire length of the waterline.</li> <li>• The area of the trenches (if only needed every 200 feet) is estimated at 2,240 square feet. There may be additional disturbance for equipment maneuvering and additional trenches.</li> <li>• The maximum project surface disturbance would be 115,356 square feet.</li> </ul> <p>Alternative Three would adequately address the project purpose and need of replacing the outdated waterline and providing improved availability of water for protection of natural resources, cultural resource, staff, and visitors with a more reliable and functional waterline system. The proposed project is needed because the current waterline serving the Death Valley Scotty Historic District is outdated and continues to have small-scale failures. This project would meet the needs of improving reliability and functionality for natural resources, cultural resources, visitors and staff</p> |

## COMPARASION OF POTENTIAL ENVIRONMENTAL IMPACTS

| Potential Environmental Impacts                            |  |  |  |
|--|--|--|--|
| Impact Topic   | No-Action Alternative  | Alternative Two:<br>Trenching  | Alternative Three:<br>Pipe-Bursting  |
| <b>Cultural Landscape</b>                                  | Minor to Major<br>Direct and Indirect<br>Adverse<br>Short and Long-Term  | Minor<br>Direct and Indirect<br>Beneficial<br>Short and Long-Term  | Minor<br>Direct and Indirect<br>Beneficial<br>Short and Long-Term  |
| <b>Archeological Resources<br/>and Historic Structures</b> | <i>Historic Structures:</i><br>Minor to Major<br>Direct and Indirect<br>Adverse<br>Long-Term<br><br><i>Archeological Resources:</i><br>Minor to Moderate<br>Direct<br>Adverse<br>Long-Term | <i>Historic Structures:</i><br>Moderate<br>Indirect<br>Beneficial<br>Long-Term<br><br><i>Archeological Resources:</i><br>Minor to Moderate<br>Direct<br>Adverse<br>Long-Term | <i>Historic Structures:</i><br>Moderate<br>Indirect<br>Beneficial<br>Long-Term<br><br><i>Archeological Resources:</i><br>Minor to Moderate<br>Direct<br>Adverse<br>Long-Term |
| <b>Ethnographic Resources</b>                              | Minor<br>Direct<br>Adverse<br>Long-Term  | Moderate<br>Direct<br>Adverse<br>Short-Term  | Moderate<br>Direct<br>Adverse<br>Short-Term  |
| <b>Special-Status Species</b>                              | Minor to Moderate<br>Direct<br>Adverse<br>Short-Term   | Minor<br>Indirect<br>Adverse<br>Short-Term   | Minor<br>Indirect<br>Adverse<br>Short-Term   |
| <b>Park Operations</b>                                     | Minor to Moderate<br>Direct and Indirect<br>Adverse<br>Short-Term  | Moderate<br>Direct and Indirect<br>Beneficial<br>Long-Term   | Moderate<br>Direct and Indirect<br>Beneficial<br>Long-Term   |

## **AFFECTED ENVIRONMENT**

### **LOCATION AND GENERAL DESCRIPTION OF THE PARK**

Death Valley National Park is the largest national park unit in the contiguous 48 states. The majority of park lands are located in the California counties of Inyo and San Bernardino, but a small portion of the Park is located in the Nevada counties of Nye and Esmeralda (Fig. 1). California State Highway 190 crosses the Park east to west, and Highway 95 parallels the Park north to south on the eastern boundary (NPS 2002).

Death Valley National Park encompasses 3,396,192 acres in the Mojave Desert, a zone of overlap between the Great Basin Desert to the north and the Sonoran Desert to the south. The Park includes all of Death Valley, a 156-mile long, north/south trending trough that formed between two major block-faulted mountain ranges: the Amargosa Range on the east and the Panamint Range on the west. Telescope Peak, the highest peak in the Park and in the Panamint Range, rises 11,049 feet above sea level and lies only 15 miles from the lowest point in the Western Hemisphere in the Badwater Basin salt pan, 282 feet below sea level (NPS 2002).

### **LOCATION AND GENERAL DESCRIPTION OF THE PROJECT**

The 1,529.83-acre Scotty's Castle Historic District is comprised of two fenced parcels of land separated by a small mountain range. The smaller but more prominent eastern parcel is the location of Scotty's Castle Complex and was long known as the Upper Grapevine Ranch. This parcel is historically significant for its architecture, art, invention, social history, folklore, and the current and potential archaeological record. This project would encompass most of the historic Spring Access Road (NPS 2009). It would begin at the holding tanks and proceeds along the Spring Access Road, in a westerly direction, down Grapevine Canyon and ends near the stables.

### **CULTURAL LANDSCAPES**

According to the National Park Service's *Cultural Resource Management Guideline* (Director's Order – 28), a cultural landscape is “a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values.”

A cultural landscape study is ongoing at Scotty's Castle (NPS 2009). NPS is currently writing a Historic Resources Study for Scotty's Castle for listing in the National Register of Historic Places (Livingston 2009). The Park has a Historic Structures Report (1989) for Scotty's Castle Historic District. The Park also has a Roads Systems Evaluation that was finished in 1996.



The Spring Access Road is completely contained within the Scotty's Castle Historic District and is considered to be an important part of the Park's historical and cultural landscape. The waterline was initially designed and built by Albert Johnson to supply water to the Death Valley Scotty's Historic District. Its functionality is an important part of the cultural landscape for the district. Both of these resources are being discussed individually in the Archaeological Resources and Historic Structures sections of the EA.

## **ARCHAEOLOGICAL RESOURCES AND HISTORIC STRUCTURES**

Park archeologists have identified several prehistoric archeological resources and historic structures in the project area that will be affected by the proposed alternatives. The archaeological sites are low density artifact scatters with above ground features, with the total artifacts mapped and discovered during subsurface testing usually averaging 100 to 200 artifacts per site. The sites have been disturbed previously by natural erosion, waterline construction and maintenance, powerline construction and maintenance, the Spring Access Road (a historic road alignment), and portions of the area were used historically as agricultural fields. Additionally, one of the sites was documented and artifacts collected in 1964, without proper archeological mapping of those finds. The archeological data potential for these sites has been exhausted during the archeological documentation and testing phases. The three sites have been recommended "Not Eligible" for listing on the National Register of Historic Places under criteria D (that have yielded, or may be likely to yield, information important in prehistory or history) due to past disturbances. Timbisha Shoshone Tribal representatives have concurred with the finding that the sites were greatly disturbed by the past construction.

There is still potential for undiscovered archeological resources in areas that could not be surveyed due to high vegetation density. Additionally, one buried historic site is known to exist in the area, but its locational information has been lost. It is not expected to be close to the waterline project area.

Two historic structures have been identified in the project area. The Spring Access Road (List of Classified Structures Number 461566) has been determined eligible by the California SHPO as part of the Cultural Landscape for Death Valley Scotty Historic District (NPS 2005). It was constructed between 1922 and 1931 for use in the historic landscape, and may have at one time been part of Bonnie Clare Road (that part of the alignment was later adjusted to run on the outside of the property). As historically intended, it continues to provide a link between the main Castle complex and the water supply and conveyance system. The road remains intact and contributes to the overall character of the cultural landscape and site circulation.

The pipeline itself was constructed as part of the Scotty's Castle over 80 years ago. The pipeline is still the primary conduit for water to Scotty's Castle, and has been maintained and repaired during its lifespan. Deteriorated sections have been replaced with PVC pipe. The pipeline is not listed in the NRHP as part of the cultural landscape or a contributing element.

## **ETHNOGRAPHIC RESOURCES**

Ethnographic resources are defined by the National Park Service as “subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users” (Director’s Order – 28). American Indian tribes traditionally associated with project area are the Timbisha Shoshone Tribe.

Grapevine Canyon has been identified through ethnographic research as a prehistoric travel corridor, the location of an important village, "*Maahunu*," and is a place of importance for the Timbisha-Shoshone Tribe. An ethnographic study has been authored for this area (Johnson 2006), and continued documentation of the area is occurring as part of this project and others. The Tribe also occupied the area during the historic period as laborers during the construction of Scotty's Castle, and "Indian Camp," their historic village is located close to the project area.

## **SPECIAL-STATUS SPECIES (THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN)**

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. National Park Service policy also requires examination of the impacts on Federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. Such species could be affected by the proposed action through increased noise and human activity, temporary or permanent relocation, and outright kills or increased predation or competitive stress.

Two federally listed species have potential to be present in the project area; the least Bell's vireo and the southwestern willow flycatcher. Both species utilize multi-storied riparian habitat for nesting and foraging.

Least Bell's vireo (*Vireo bellii pusillus*) is one of four geographically isolated subspecies of Bell's vireo. It was federally listed as endangered 1986 after being state listed by California as endangered in 1980; there is no designated critical habitat in Death Valley. Least Bell's vireo was historically common and abundant in riparian communities in central California. Due to loss of habitat and habitat fragmentation, and cowbird nest parasitism it experienced severe decline in numbers. At the time of listing there was estimated to be only 300 pairs remaining in California. Since its listing, numbers have increased and it is expanding into historic range (Kus 2002).

Least Bell's vireo is a migratory songbird that winters in southern Baja Mexico and migrates north to California for breeding and rearing of young. Least Bell's vireos are small, gray birds, lacking distinguishing marks and commonly described as drab. Food source is insects that they primarily glean off of vegetation. Nests are generally constructed in dense riparian vegetation and are usually about 3' above ground (Kus 2002).

Due to the geographic isolation of the four subspecies, it is presumed that all Bell's vireo documented in Death Valley are of the least Bell's subspecies. Bird surveys have not been

conducted in all suitable habitat in Death Valley but Bell's vireo has been documented in Furnace Creek Ranch, Furnace Creek Wash, Johnson Canyon, Mesquite Spring, Saratoga Spring, West Side Road, Monarch Canyon, and Scotty's Castle (NPS 2001), (Great Basin Bird Observatory 2010). Territorial males were heard singing east of Scotty's Castle 1993 and 1995 (Heindel, personal communication) and there were likely two breeding pairs in this area both years. In 1996 patches of vegetation in the area was removed as part of maintenance activities on the water system. Vegetation has grown back since then but there have been no subsequent sightings of Bell's vireo in the project area. Surveys were conducted in 1998, 2002, and 2005.

Southwestern willow flycatcher (*Empidonax traillii extimus*) is one of four subspecies willow flycatchers, genus *Empidonax*. It was federally listed as endangered in 1995, there is no designated critical habitat in Death Valley. Southwestern willow flycatcher continues to occupy the majority of its historic range but due to loss of habitat and brood parasitism by brown-headed cowbirds numbers have been reduced. Trends in recovery have been difficult to establish (U.S. Fish and Wildlife Service 2002).

Southwestern willow flycatcher is a small migratory songbird that winters in Mexico, Central and South America and migrates north for breeding and rearing of young. Southwestern willow flycatchers are small greyish olive birds with wingbars and a faint eye ring. They are difficult to identify in the field but are genetically distinct from other willow flycatcher subspecies. They are insectivorous and use all areas of the habitat for foraging, primarily catching insects in air. This bird is a late arrival to the breeding grounds, usually arriving between May and June. Nesting is generally in dense riparian vegetation with flowing surface water present. Vegetation patches are usually mixed species and can include willow, cottonwoods, arrowweed and saltcedar; patches vary in size and patchiness both vertically and horizontally. Mean size of breeding patches is 21 acres, although patches less than 1 acre in size have been used (U.S. Fish and Wildlife Service 2002).

Due to the difficulty in field identification of the subspecies it is not possible to determine if many of the sightings of willow flycatcher are of the southwestern subspecies. The willow flycatcher has been documented from several locations in Death Valley, including Furnace Creek Ranch, Saratoga Springs, and Scotty's Castle and Mesquite Springs (NPS 2001). Many of these birds were likely migrants. Breeding ranges are geographically isolated and should a breeding willow flycatcher be confirmed, it would likely be the southwestern subspecies. Surveys of the Scotty's Castle area in 1998, 2002, and 2005 detected a willow flycatcher in 2002 (Heindel 2002).

Species of Management Concern are species that may be state listed, former Category 2 species for federal listing, appear on sensitive or rare lists maintained by states or other entities, are endemic, or are listed in management documents or otherwise identified as important. Within the Scotty's Castle area, a few of the species of management concern that have been documented include; Cooper's hawk, common yellowthroat, loggerhead shrike, Lucy's warbler, MacGillivray's warbler, orange-crowned warbler, olive-sided flycatcher, phainopepla, sharp-shinned hawk, Wilson's warbler, and yellow warbler (NPS 2001 and Heindel 2002). These species rely on these desert riparian habitats for breeding and foraging; some may breed and

forage exclusively in riparian systems while others may utilize habitat within and outside of the riparian systems.

## **PARK OPERATIONS**

The Park operates and maintains several facilities within the Death Valley Scotty Historic District. These facilities include (among others) the main structure, Scotty's Castle, which is used daily for living history tours given by park interpreters; the hacienda that contains two resident apartments used for Park staff and offices for interpretive staff; the cookhouse that contains offices and public space; and a visitor center.

All of these facilities contain Heating, Ventilating, and Air Conditioning units (HVACs). These units require water to run and must be shut down when water is unavailable. HVACs provide for the comfort and safety of staff and visitors during hot summer months. They also maintain and protect the museum collection in a stable temperature and humidity range.

Water for the site is provided by area springs. There are holding tanks located east of Scotty's Castle and the waterline runs from the tanks along the Spring Access Road, in a westerly direction, down Grapevine Canyon and ends near the stables. The waterline is original to the site. There is no alternate water source currently available in the Historic District.

Several renovations have been conducted on the existing waterline since its original installation. During the winter of 1968-69 a flash-flood extensively damaged the water system and extensive repairs were made. In 1982, it was connected to a new, temporary Resources Management trailer which was removed in 2005. A sharp decrease in pressure led to the attempted cleanout of accumulated travertine in the waterline during 2005 and the repair of the overflow line in 2008. Following the decreased water pressure noticed in 2005, the number of work orders related to the waterline has increased from 10 during the three year period from 2002-2005 to 88 from the five year period from 2005-2010. Maintenance of the waterline in recent years has become a time and labor intensive.

## ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

This section describes the potential environmental consequences associated with the no-action and action alternatives. The methodologies and assumptions for assessing environmental consequences are discussed, including consideration of context, intensity, and duration of impacts; cumulative impacts; and measures to mitigate impacts. As mandated by National Park Service policy, resource impairment is explained and then assessed for each alternative. Subsequent parts of this section are organized by impact topic, first for the no-action alternative and then for the three action alternatives.

### METHODOLOGY

The National Park Service based these impact analyses and conclusions on the review of existing literature and Park studies, information provided by experts at the Park and in other agencies, professional judgments and park staff insights, the California SHPOs, input from interested local tribes, and public input.

#### Context, Duration and Intensity, and Type of Impact

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

##### *Context*

Context is the setting within which an impact is analyzed such as local, parkwide, or regional. The Council on Environmental Quality requires that impact analyses include discussions of context. For this environmental assessment, local impacts would occur within the general vicinity of Scotty's Castle, while parkwide impacts would affect a greater portion of the Park and regional impacts would extend outside the limits of the Park.

##### *Duration*

The duration of an impact is the time period for which the impacts are evident and are expressed in the short-term or in the long-term. A short-term impact would be temporary in duration and would be associated with waterline improvements, as well as the period of site restoration. Depending on the resource, impacts may last as long as construction takes place, or a single year or growing season, or longer. Impact duration for each resource is unique to that resource. Impact duration for each resource is presented in association with impact intensities in the following "Methodologies" section.

### *Intensity*

Impact intensity is the degree to which a resource would be beneficially or adversely affected. The criteria that were used to rate the intensity of the impacts for each resource topic are presented later in this section under each topic heading.

### *Type of Impact*

Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions while adverse impacts would deplete or negatively alter resources.

## **IMPACT INTENSITY THRESHOLDS**

### **Cultural Landscape**

All available information on the cultural landscape potentially impacted in the Park was compiled from *Historic Resource Study: Death Valley Scotty Historic District*, Carey & Company (Livingston. 2009) and the *Draft Cultural Landscape Report: Scotty's Castle Cultural Landscape Management*, National Park Service, PWRO (NPS. 2010). Predictions about short- and long-term site impacts were based on previous investigations by DEVA archaeologists and recent studies by Livingston and an intensive survey completed by park service personnel. The thresholds of change for the intensity of an impact to cultural resources are defined as follows:

| <b>Impact Intensity</b> | <b>Intensity Definition</b>   |
|-------------------------|---|
| Negligible              | Cultural resources would not be affected or the effects to these resources would be below or at the lower levels of detection. Any effects to cultural resources would be slight.   |
| Minor                   | The effects to cultural resources would be detectable. Effects to these resources would be small and localized. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.  |
| Moderate                | The effect on cultural resources would be readily apparent and result in a change to the character or the resource over a relatively large area. Mitigation measures would be necessary to offset adverse effects and likely be successful.   |
| Major                   | The effect on cultural resources would be readily apparent and substantially change the character of the Historic District over a large area, potentially resulting in large amount of loss. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed. |

Impacts to cultural landscapes are considered permanent when affected by construction or when data recovery is necessary.

### **Archaeological Resources and Historic Structures**

All available information on archaeological resources and historic structures potentially impacted in the Park was compiled from *Historic Resource Study: Death Valley Scotty Historic District*, Carey & Company (Livingston. 2009); *DRAFT Cultural Landscape Report: Scotty's Castle Cultural Landscape Management*, (NPS. 2009); and from archaeological clearance



reports based on previous rehabilitations and investigations on the waterline. Predictions about short- and long-term site impacts were based on previous investigations by DEVA archaeologists and recent studies by Livingston and an intensive survey completed by park service personnel in the waterline area of potential effect. The thresholds of change for the intensity of an impact to archaeological resources and historic structures are defined as follows:

| <b>Impact Intensity</b> | <b>Intensity Definition</b>  |
|-------------------------|--|
| Negligible              | Archaeological resources and historic structures would not be affected or the effects to archaeological resources and historic structures would be below or at the lower levels of detection. Any effects to archaeological resources and historic structures would be slight.   |
| Minor                   | The effects to archaeological resources and historic structures would be detectable. Effects to archaeological resources and historic structures would be small and localized. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.  |
| Moderate                | The effect on archaeological resources and historic structures would be readily apparent and result in a change to the archaeological resources and historic structures character over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely be successful.  |
| Major                   | The effect on archaeological resources and historic structures would be readily apparent and substantially change the character of the archaeological resources and historic structures over a large area, substantial damage would occur resulting in large amount of archaeological resources and historic structures loss. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed. |

Impacts to archeological resources are considered permanent if affected by construction or data recovery is necessary.

### **Ethnographic Resources**

All available information on ethnographic resources potentially impacted in the Park was compiled from *Residence without Reservation* (Fowler, et al. 1996); *Ethnographic Report: Rehabilitate Bonnie Clare/Ubehebe Roads* (Johnson 2006), and *Assessment of Effect: Scotty's Castle Waterline Replacement Testing*, (NPS 2010b). Predictions about short- and long-term site impacts were based on these previous studies concerning ethnographic resources in the Death Valley Scotty Historic District. The thresholds of change for the intensity of an impact to ethnographic resources are defined as follows:

| <b>Impact Intensity</b> | <b>Intensity Definition</b>  |
|-------------------------|--|
| Negligible              | Ethnographic resources would not be affected or the effects to ethnographic resources would be below or at the lower levels of detection. Any effects to ethnographic resources would be slight.   |
| Minor                   | The effects to ethnographic resources would be detectable. Effects to ethnographic resources, including floral and faunal resources would be small and localized. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful. |
| Moderate                | The effect on ethnographic resources would be readily apparent and result in a change to the overall landscape over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely be successful.   |

|       |   |
|-------|---|
| Major | The effect on ethnographic resources would be readily apparent and substantially change the character of the ethnographic resources over a large area, substantial loss of ethnographic resources would occur resulting in permanent loss. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed. |
|-------|---|

Ethnographic resources impacts would be considered short-term if the ethnographic resources are recovered in less than 3 years and long-term if the recovery takes longer than 3 years.

### **Special-Status Species (Threatened and Endangered Species and Species of Concern)**

All Federal agencies are mandated to consider the potential effects of their actions on species listed as threatened or endangered under The Endangered Species Act of 1973 (16 USC 1531 *et seq.*), as amended,. If the National Park Service determines that an action may adversely affect a federally listed species, consultation with the U.S. Fish and Wildlife Service is required to ensure that the action would not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. *NPS Management Policies 2006* states that potential effects of agency actions would also be considered for state or locally listed species.

It is the policy of the National Park Service to manage critical habitat of such species and to perpetuate the natural distribution and abundance of these species, as well as the ecosystems upon which they depend. The U.S. Fish and Wildlife Service was contacted for a list of special-status species and designated critical habitats that may be within the project area or affected by any of the alternatives (Appendix B). Information on possible threatened, endangered, and candidate species, as well as species of special concern, was gathered from published sources. Information from prior research at the Park was also incorporated. Known impacts caused by development and human use were also considered. The thresholds of change for the intensity of an impact are defined as follows:

| Impact Intensity | Intensity Definition   |
|------------------|--|
| Negligible       | The action could result in a change to a population or individuals of a species but the change would be so small that it would not be of any measurable or perceptible consequence and would be well within natural variability. This impact intensity equates to a U.S. Fish and Wildlife Service "may affect, not likely to adversely affect" determination.   |
| Minor            | The action could result in a change to a population or individuals of a species. The change would be measurable, but small and localized and of little consequence. Mitigation measures, if needed to offset the adverse effects, would be simple and successful. This impact intensity equates to a U.S. Fish and Wildlife Service "may affect, likely to adversely affect" determination.  |
| Moderate         | Impacts on special-status species, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful. This impact intensity equates to a U.S. Fish and Wildlife Service "may affect, likely to adversely affect" determination.   |
| Major            | The action would result in a noticeable effect to viability of a population or individuals of a species or resource. Impacts on a special-status species or the natural processes sustaining them would be detectable, both in and out of the park. Loss of habitat might affect the viability of at least some special-status species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed. This impact intensity equates to a U.S. Fish and Wildlife |

|  |  |
|--|--|
|  | Service “may affect, likely to jeopardize the continued existence of a species determination”. |
|--|--|

Special-status species’ impacts are considered short-term if the species recovers in less than one year and long-term if it takes longer than one year for the species to recover.

### **Park Operations**

Information on park operations was taken from park documents and records. Park staff also provided information. Predictions about short- and long-term site impacts were based on previous work and personal knowledge. The thresholds of change for the intensity of an impact to park operations are defined as follows:

| <b>Impact Intensity</b> | <b>Intensity Definition</b>   |
|-------------------------|---|
| Negligible              | Park operations would not be affected or the effects to Park operations would be below or at the lower levels of detection. Any effects to Park operations would be slight.   |
| Minor                   | The effects to Park operations would be detectable. Effects would be small and localized. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.  |
| Moderate                | The effect on Park operations would be readily apparent and result in a change to the amount of man-hours to maintain the system. Mitigation measures would be necessary to offset adverse effects and likely be successful.  |
| Major                   | The effect on Park operations would be readily apparent and substantially change the character of the Park operations over the entire Death Valley Scotty Historic District. Extensive mitigation measures would be needed to offset adverse effects and their success could not be guaranteed. |

Park operations impacts would be considered short-term if they last fewer than eight weeks and long-term if it takes longer than eight months.

### **DIRECT VERSUS INDIRECT IMPACTS**

The following definitions of direct and indirect impacts are considered:

*Direct* – an effect that is caused by an action and occurs at the same time and in the same place.

*Indirect* – an effect that is caused by an action that is later in time or farther removed in distance, but is still reasonably foreseeable.

### **CUMULATIVE EFFECTS**

Cumulative effects are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such action. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time.

The Council on Environmental Quality regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for Federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

Cumulative impacts are considered for all alternatives and are presented at the end of each impact topic discussion analysis.

### **Projects that Make Up the Cumulative Impact Scenario**

To determine potential cumulative impacts, projects within the Park were identified. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

These cumulative actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to determine if they would have any additive effects on a particular natural resource, cultural resource, visitor use, or the socioeconomic environment. Because some of these cumulative actions are in the early planning stages, the evaluation of cumulative effects was based on a general description of the project.

#### *Past Actions*

The following past actions could contribute to cumulative effects:

Several larger-scale renovations were conducted on this waterline since its installation. During the winter of 1968-69 a flash-flood extensively damaged the water system and extensive repairs were made. In 1982, it was connected to a new, temporary Resources Management trailer which was removed in 2005. A sharp decrease in pressure led to the attempted cleanout of accumulated travertine in the waterline during 2005 and the repair of the overflow line in 2008. Following the decreased water pressure noticed in 2005, the number of work orders related to the waterline has increased from 10 during the three year period from 2002-2005 to 88 from the five year period from 2005-2010.

Other site improvements in the Death Valley Scotty Historic District projects include renovation of the Cook House, fire suppressions systems, and replacement of fire hydrants.

#### *Current and Future Actions*

Current actions and those projected for the future could also contribute to cumulative effects. These include: renovation of the Long Shed, Stables, and Garage and resurfacing/grading of the Bonnie Clare Road.

## **IMPAIRMENT OF DEATH VALLEY NATIONAL PARK RESOURCES OR VALUES**

In addition to determining the environmental consequences of the action and other alternatives, the 2006 *NPS Management Policies* and Director's Order – 12, require analysis of potential effects to determine if actions would impair Death Valley National Park resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park and monument resources and values. However, the laws do give National Park Service management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given National Park Service management discretion to allow certain impacts within parks, that discretion is limited by statutory requirements that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely 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
- identified as a goal in the Park *General Management Plan* or other relevant National Park Service planning documents

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. In this “Environmental Consequences” section, a determination on impairment is made in the conclusion statement of the appropriate impact topics for each alternative. The National Park Service does not analyze recreational values / visitor experience (unless impacts are resource based), socioeconomic values, health and safety, or park operations for impairment.

## **ENVIRONMENTAL CONSEQUENCES—NO-ACTION ALTERNATIVE**

### **Cultural Landscapes**

The deteriorated condition of the existing waterline often requires expedient repairs in case of breaks and leaks. These often result in work being done without proper monitoring and may have minor, direct, adverse effects on the cultural landscape within the Death Valley Scotty Historic District as a result of vegetation removal and equipment use. Under the No-Action

Alternative the waterline would not be replaced and therefore regular emergency repairs would likely continue. Further, the event of a major break to the waterline would greatly reduce or eliminate fire suppression capabilities, which would threaten the Scotty's Castle Complex in the event of a fire. Damage to the complex would have major adverse impacts to the cultural landscape.

Past, present and reasonably foreseeable future projects with the potential to affect the cultural landscape include the Bonnie Clare Road rehabilitation, Cookhouse reconstruction, and the Long Shed and Garage maintenance projects. The Cookhouse reconstruction and Long Shed and Garage projects are designed to improve and maintain the features of the cultural landscape and therefore these projects would have minor beneficial impacts to the Cultural Landscape.

Conclusion: Minor, direct, adverse impacts would continue to occur as a result of emergency repairs to the waterline. There would be temporary reductions in water flow or complete outage when the waterline leaks or break. In the event that a fire should break out during an outage it may result in permanent, major, indirect, long-term adverse impacts to the cultural landscape (NPS 2009).

Impairment of Park Resources and Values: Worsening conditions to the waterline are considered unacceptable, however, under the no-action alternative; the waterline would continue to be repaired piecemeal when breaks occur. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

### **Archaeological Resources and Historic Structures**

While the waterline itself was constructed in the 1920s, it has undergone replacement and repairs over the years that have left it a mixture of materials and fittings. The proposed replacement therefore would not cause a direct impact to historic structures. However, the event of a major break to the waterline would greatly reduce or eliminate fire suppression capabilities and threaten the Scotty's Castle Complex in the event of a fire. If the complex were to catch fire during a major waterline outage the Castle may be indefensible.

Past, present and reasonably foreseeable future projects with the potential to affect the Archeological Resources and Historic Structures include the Bonnie Clare Road rehabilitation, Cookhouse construction, and the Long Shed and Garage maintenance projects. The cumulative impacts of these projects pose only a minor impact to the Archeological Resources and Historic Structures.

The No-Action Alternative would have on-going contributions (constant repair) to cumulative effects in the short and long-term. These expedient repairs would threaten known and unknown cultural resources along the pipeline. There are three identified archeological sites along the waterline itself, which have been recommended "Not Eligible" for the National Register under Criteria D. However, as there is potential for unidentified cultural resources in

the waterline Area of Potential Effect, the ongoing vehicle activity, excavation, and other maintenance activity that would be conducted to repair the waterline would pose a threat to these resources.

Continuing repairs to the waterline and ongoing use of the spring access road must also be considered under the no-action alternative. As the waterline has been repaired and replaced with PVC in many sections, the overall replacement of this 80 year old waterline is not expected to impact the resource. Additionally, the Spring Access Road is still in use as historically intended, providing a link between the main Castle complex and the water supply and conveyance system. Ongoing use of this road in its original alignment is not expected to have an impact on this historical resource

The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No-Action Alternative, would have minor to moderate, direct impacts on archaeological resources.

Conclusion: The deteriorating condition of Scotty's Castle waterline constitutes a moderate impact to archaeological resources. The threat of a non-functioning fire suppression system would leave the entire complex vulnerable to complete destruction. Furthermore, the waterline's functionality represents the inventiveness of Albert Johnson and was a critical component to the atmosphere of the complex. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No-Action Alternative, would have minor to moderate, direct effects on the archaeological and historic structures resources of the Scotty's Castle Complex. In the event that a fire should break out during a major water outage it may result in major permanent, in-direct, long-term adverse impacts to historic structures.

Impairment of Park Resources and Values: Worsening conditions to the waterline are considered unacceptable, however, under the no-action alternative; the waterline would continue to be repaired piecemeal when breaks occur. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

### **Ethnographic Resources**

Grapevine Canyon has been identified through ethnographic research as a prehistoric travel corridor, the location of an important village, "*Maahunu*," and is a place of importance for the Timbisha-Shoshone Tribe. An ethnographic study has been authored for Grapevine Canyon (Johnson 2006), and continued documentation of the area is occurring as part of this project and others. The Tribe also occupied the area during the historic period as laborers during the construction of Scotty's Castle, and "Indian Camp," their historic village is located close to the project area.

The Tribe has indicated that they would rather the park abandon the current waterline alignment and drill a well closer to Scotty's Castle. Under the No-Action Alternative ethnographic resources would continue to be affected by ongoing maintenance of the area, and the park would need to continue coordinating with the Tribe and maintenance staff to ensure that repairs would not impact the known and unknown archeological sites and ethnographic resources in the area. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No-Action Alternative, would have minor, direct impacts on ethnographic resources.

Conclusion: The No Action Alternative would result in minor, direct, adverse long-term impacts to ethnographic resources.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

#### **Special-Status Species (Threatened and Endangered Species and Species of Concern)**

Emergency repairs to the waterline would continue under the No-Action Alternative and may result in digging, trampling and loss of vegetation. Waterline breaks could occur at any time and repairs would need to be completed, even during times when special-status species are at their most sensitive, i.e. breeding, nesting, and rearing young. Repairs to the system may involve greater loss of vegetation if the breaks and repairs are not able to be easily located or completed.

Past, present, and reasonably foreseeable future projects with the potential to affect special-status species include other roadway-related projects (e.g., the rehabilitation of the Bonnie Clare Road, the rehabilitation Cookhouse, Long Shed, or Garage) or water projects (e.g. Furnace Creek water system update). Construction noise, as well as temporary or permanent displacement and habitat disturbance/loss associated with construction activities such as pipeline installation, culvert replacements/ extensions, and facility improvement/construction, would have negligible to minor impacts on special-status species. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the No-Action Alternative, would have minor to moderate impacts on special-status species.

Conclusion: The deteriorating water line has no effect upon special status species, but repair of this pipeline does. As the line provides potable water to visitors and staff, as well as life safety needs through the fire protection system, the pipeline would be repaired in event of a break or blockage. The subsequent loss of riparian habitat would have a localized, long-term, minor to moderate, adverse impact on special-status species.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to



opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

### **Park Operations**

Under the No-Action Alternative, there would be no scheduled waterline maintenance activities with the potential to affect park operations. Ongoing waterline maintenance could adversely affect park operations; however, such effects would be short-term and would vary in intensities and types of impacts. There would be no changes in the current status of park operations.

Conclusion: The No-Action Alternative would have negligible to moderate effects on park operations.

## **ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE TWO: TRENCHING**

### **Cultural Landscapes**

Alternative Two would require extensive trenching up the entire length of the pipeline across Grapevine Canyon. Trenching would follow the Spring Access Road for the majority of the waterline. Trenching would require removal of vegetation, which would have a short-term benefit to the cultural landscape by bringing the setting more into line with the conditions during the period of historic significance. Vegetation is expected to recover within one-year, so benefits would be short lived.

The waterline was initially designed and built by Albert Johnson to supply water to the Death Valley Scotty's Historic District. Its functionality is an important part of the cultural landscape for the district. Therefore, replacing the waterline to ensure a continued supply of water to the Death Valley Scotty Historic District would have a minor long-term benefit on the cultural landscape.

Past, present, and reasonably foreseeable future projects with the potential to affect the cultural landscape include the Bonnie Clare Road rehabilitation project, the Cook House reconstruction, and the Long Shed/Garage maintenance projects. All of these projects may slightly modify the cultural landscape. All except for the Bonnie Clare Road project are specifically designed to restore and improve the area. These in turn with Alternative Two would have minor impacts on the cultural landscape of the area.

Conclusion: Implementation of Alternative Two would have minor, beneficial, short and long-term impacts to the cultural landscape.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources and values.

### **Archaeological Resources and Historic Structures**

While the waterline itself was constructed in the 1920s, it has undergone replacement and repairs over the years that have left it a mixture of materials and fittings. The proposed replacement therefore would not cause a direct impact to historic structures. However, the waterline provides water to the Scotty's Castle Complex and is the primary source of water for fire suppression. Replacement of the waterline would ensure that water for fire suppression can continue to be provided, protecting the Complex in the event of a fire. This would have a moderate, long-term beneficial impact on historic structures.

Alternative Two would involve excavation of a trench running the entire length of the pipeline. Heavy equipment would have to traverse the length of the line, along with other maintenance trucks and personnel. There are three archeological sites that lay along the course of the waterline. These sites have already been affected by past activity, including the initial construction of the pipeline and the nearby powerline, vehicular traffic, visitation and re-occurring maintenance. Archeological testing was conducted by the park in December 2010 and January 2011. The archeological sites were found to be relatively low density artifact scatters which have been greatly impacted by the past disturbances, and are recommended ineligible for the National Register of Historic Places under Criterion D. The park believes that the adverse effect to these resources occurred in the past during the construction and maintenance of the waterline and other infrastructure.

Continuing repairs to the waterline and ongoing use of the spring access road must also be considered under as well. As the waterline has been repaired and replaced with PVC in many sections, the overall replacement of this 80 year old waterline is not expected to impact the resource. Additionally, the Spring Access Road is still in use as historically intended, providing a link between the main Castle complex and the water supply and conveyance system. Ongoing use of this road in its original alignment is not expected to have an impact on this historical resource.

Past, present, and reasonably foreseeable future projects with the potential to affect the archeological resources and historic structures include the Bonnie Clare rehabilitation project, the cook house reconstruction, and the Long Shed/Garage maintenance projects. The Bonnie Clare Road project may impact other archeological sites in the area. The other projects would improve and restore historic structures within the Scotty's Castle Complex. When considered with Alternative Two, these projects would have a minor impact to historic structures and archeological sites.

Conclusion: Overall there would be a moderate, long-term beneficial impact to historic structures as a result of improved ability to provide water for fire suppression. As the known archeological resources in the project area have been identified and recommended "Not Eligible" for listing on the National Register of Historic Places, Alternative Two would have a minor to moderate, direct effects on archeological resources as a result of trenching the length of the pipeline, including through areas that are covered with vegetation and where undiscovered archeological resources may still be present. Impacts to archeological resources would be mitigated through the use of the previously described Mitigation Measures.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources and values.

### **Ethnographic Resources**

This region was important to historic and pre-historic peoples for subsistence. Under Alternative Two the ethnographic resources of the project would be impacted by clearing of vegetation, redirection of water, and the impacts to the archeological resources in the area. The grapevine, reeds and wildlife that were drawn to the vegetation and springs are all resources were invaluable to prehistoric and historic peoples who occupied the area, and are still held sacred to native peoples of the Timbisha-Shoshone. Trenching would require removal of vegetation along the waterline corridor, adversely impacting ethnographic resources. Vegetation is anticipated to recover within one-year, resulting in short-term, moderate impacts.

Past, present, and reasonably foreseeable future projects with the potential to affect ethnographic resources in the area include the Bonnie Clare rehabilitation and future fuels reductions projects proposed for the area. These projects also propose to remove vegetation, impacting the resources that historic and pre-historic peoples used for subsistence and that the modern Timbisha-Shoshone Tribe hold sacred. When considered with Alternative Two, these projects would still cumulatively have only moderate impacts to ethnographic resources.

Conclusion: Alternative Two would result in adverse, short-term, moderate impacts to ethnographic resources as a result of vegetation removal.

### **Special-Status Species (Threatened and Endangered Species and Species of Special Concern)**

Under Alternative Two, trenching and removal of vegetation would result in a short-term loss of nearly 6% of the habitat for resident special status species, including the least Bell's vireo and the Southwestern willow flycatcher. Vegetation would be allowed to grow back once the pipeline is replaced and is anticipated to recover within one year of project implementation. Use of seasonal restrictions, as described in the Mitigation Measures, would avoid disturbance to special status species during their nesting season. Impacts would be localized, short-term, minor, and adversely impact special-status species.

Past, present, and reasonably foreseeable future projects with the potential to affect special-status species include other roadway-related projects (e.g., the rehabilitation of Badwater Road, the rehabilitation of Mud Canyon/Daylight Pass Road, and improvements to California State Route 374), the waterline replacement in the Cow Creek area, the Furnace Creek water system update, and the Phase II DEVA 500 project at Furnace Creek. Construction noise, as well as habitat disturbance/loss associated with construction activities such as re-grading and resurfacing roads, shoulder reconstruction, culvert replacements/extensions, pipeline installation, and facility improvement/construction, would have short- and long-term, negligible to minor, adverse impacts on threatened and endangered species and species of special concern.

The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with Alternative Two, would have minor impacts on special-status species.

Conclusion: Impacts to special status species as a result of vegetation removal would be localized, short-term, minor, and adverse.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources and values.

### **Park Operations**

Replacement of the waterline would improve the Park's ability to consistently supply the Scotty's Castle Complex with potable water for consumption and water for fire suppression. After replacement there would be a decrease in need for emergency repairs to respond to leaks. This would improve operations by reducing the amount of time Park staff spend repairing the waterline and better allowing the Park to schedule out work activities. Emergency repairs often take time away from other projects.

Past, present and reasonably foreseeable future projects with the potential to have cumulative impacts on park operations include ongoing, routine maintenance of Park facilities; Long Shed/Garage rehabilitation and the Bonnie Clare Road rehabilitation project. All of these projects will require labor and have the potential to temporarily close certain areas to visitors. All projects would improve the condition of Park facilities leading to a long-term decrease in maintenance needs. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with Alternative Two, would have short and long-term, negligible to minor, beneficial impacts on park operations for the duration of the construction activities.

Conclusion: Overall, Alternative Two would have moderate, long-term, beneficial impacts on park operations as a result of decreased need for emergency maintenance and the continued ability to provide water to the Death Valley Scotty Historic District.

## **ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE THREE: PIPE-BURSTING**

### **Cultural Landscapes**

Impacts to cultural landscapes would be the same as described under Alternative Two.

### **Archaeological Resources and Historic Structures**

Alternative Three would involve a combination of pipe-bursting and trenching the entire length of the pipeline. The pipe-bursting has the potential to reduce impacts to archeological impacts, as fewer trenches may be required. However, since the locations are not known for all power

max couplers, it is likely that trenching will be necessary near or on archeological sites. Additionally, heavy machinery will be driven on the Spring Access Road through the archaeological sites. The three archaeological sites that are in the waterline project area have already been affected by past activity, including the initial construction of the pipeline and the nearby powerline, vehicular traffic, visitation and re-occurring maintenance. Archeological testing was conducted by the park in December 2010 and January 2011. The archeological sites were found to be relatively low density artifact scatters which have been greatly impacted by the past disturbances, and are recommended ineligible for the National Register of Historic Places under Criterion D. The park believes that the adverse effect to these resources occurred in the past during the construction and maintenance of the waterline and other infrastructure.

Past, present, and reasonably foreseeable future projects with the potential to affect the archeological resources and historic structures include the Bonnie Clare rehabilitation project, the cook house reconstruction, and the Long Shed/Garage maintenance projects. The Bonnie Clare Road project may impact other archeological sites in the area. The other projects would improve and restore historic structures within the Scotty's Castle Complex. When considered with Alternative Three, these projects would have a minor impact to historic structures and archeological sites.

Impacts to historic structures would be the same as described under Alternative Two.

Conclusion: Overall there would be a moderate, long-term beneficial impact to historic structures as a result of improved ability to provide water for fire suppression. Alternative Two would have a minor to moderate, direct effects on archeological resources as a result of driving heavy equipment on the Spring Access Road, and trenching in certain areas, including through areas that are covered with vegetation and where undiscovered archeological resources may still be present. It is anticipated that the impacts to archaeological resources would be slightly less under this alternative than under Alternative Two. Impacts to archeological resources would be mitigated through the use of the previously described Mitigation Measures.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources and values.

### **Ethnographic Resources**

Impacts to ethnographic resources would be the same as described under Alternative Two.

### **Special-Status Species (Threatened and Endangered Species and Species of Special Concern)**

Alternative Three involves pipe-bursting where possible, and trenching where pipe is not able to be burst. If fully successful, this alternative would have 40% of the vegetation removal of Alternative Two. If it is unsuccessful, it may have up to 100% of the vegetation removal of Alternative Two. Pipe-bursting, trenching and removal of vegetation would result in a short-

term loss of approximately 3 - 6% of the vegetation and habitat for special status species. Vegetation would be allowed to grow back once the pipeline is replaced. Use of seasonal restrictions, as described in the Mitigation Measures, would avoid disturbance to special status species during their nesting season. Impacts would be localized, short-term, minor to moderate, and adversely impact special-status species.

Past, present, and reasonably foreseeable future projects with the potential to affect special-status species include other roadway-related projects (e.g., the rehabilitation of Badwater Road, the rehabilitation of Mud Canyon/Daylight Pass Road, and improvements to California State Route 374), the waterline replacement in the Cow Creek area, the Furnace Creek water system update, and the Phase II DEVA 500 project at Furnace Creek. Construction noise, as well as habitat disturbance/loss associated with construction activities such as regrading and resurfacing roads, shoulder reconstruction, culvert replacements/extensions, pipeline installation, and facility improvement/construction, would have short- and long-term, negligible to minor, adverse impacts on threatened and endangered species and species of special concern. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with Alternative Three, would have minor to moderate impacts on special-status species.

Conclusion: Impacts to special status species as a result of Alternative Three would be localized, short-term, minor, and adverse as a result of loss of approximately 3-6% of the special status species habitat within the Historic District.

Impairment of Park Resources and Values: Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the Park's establishing legislation, (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park, or (3) identified as a goal in the Park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources and values.

### **Park Operations**

Impacts to park operations would be the same as described under Alternative Two.

## **CONSULTATION AND COORDINATION**

### **SCOPING**

A press release initiating public scoping and describing the proposed action was issued on June 29, 2010. A letter initiating scoping was mailed or emailed to a total of 39 recipients or viewing locations. One comment was received during the scoping period on the proposed project, and it was supportive of the park writing an Environmental Assessment.

The following agencies, organizations and libraries received notice of the public scoping period and will receive a notice of the availability of this environmental assessment:

Amargosa Conservancy  
Amargosa Valley Library  
Beatty Chamber of Commerce  
Bishop Branch Library  
Bureau of Land Management  
California Department of Fish and Game  
California Desert Protection League  
California Native Plant Society  
Center for Biological Diversity  
Death Valley '49ers  
Death Valley Conservancy  
Death Valley Natural History Association  
Desert Protective Council  
Desert Research Institute  
Furnace Creek Inn and Ranch Resort  
High Desert Multiple Use Coalition  
Inyo County Board of Supervisors  
Lone Pine Branch Library  
Lone Pine Chamber of Commerce  
National Parks Conservation Association  
Native American Rights Fund  
Pahrump Community Library  
Ridgecrest Branch Library  
Sierra Club, Nevada Desert Committee  
State Water Resources Control Board

Hardcopies of this environmental assessment will be available for public viewing at the library locations listed above and at the Furnace Creek, Scotty's Castle and Stovepipe Wells visitor contact stations.

### **AGENCY CONSULTATION AND COORDINATION**

The undertakings described in this document are subject to section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*). The National Park Service

conducted an archaeological survey in the waterline area of potential effect in March and April 2010, and conducted archeological site testing in December 2010 and January 2011. Consultations with the California SHPO and the Timbisha-Shoshone Shoshone Tribe were initiated on June 29, 2010. A copy of the archaeological testing plan was provided to the Timbisha Shoshone THPO on December 14, 2010.

The park has continued to discuss the project with the Timbisha THPO and Tribal Historic Preservation Committee. Park archeologist Leah Bonstead and Cultural Resources Manager Blair Davenport met with the Timbisha Shoshone THPO and Tribal elders on February 9, 2011, and discussed the project and the condition of the archeological sites in the area of potential effect. The THPO agreed that the disturbance to the sites had been in the past, and that the future work, while it would continue to disturb the sites in the historical area of disturbance, they did not believe it would be an adverse effect. The Timbisha recommended that Grapevine Canyon and associated sites be documented as a resource in order to better protect the area, and provide NPS and Tribal members with a better knowledge of the area and its importance. The park will be working on this documentation with the Timbisha and an outside ethnographer in order to better document this important resource.

A report detailing the results of the archaeological testing project was sent to the California SHPO and Timbisha Shoshone THPO on March 25, 2011. As of the time this environmental assessment was released, no comments had been received. The park requested in the March 25 consultation letter that the California SHPO and Timbisha Shoshone THPO provide comments on the project impacts and site determination of eligibility during review of the Environmental Assessment. Therefore, a copy of this environmental assessment will be sent to the SHPO and Tribal Historic Preservation Officer upon completion.

In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*), it is the responsibility of the Federal agency proposing the action (in this case the National Park Service) to determine whether the proposed action would adversely affect any listed species or designated critical habitat. The Park initiated consultation with the U.S. Fish and Wildlife Service on June 29, 2010. A biological assessment was sent to the Service for consultation on April 8, 2011. Results of consultation will be disclosed in the decision document.

## **REGULATORY CITATIONS**

- Act of August 25, 1916 (National Park Service Organic Act), PL 64-235, 16 USC § 1 *et seq.* as amended.
- National Historic Preservation Act, as amended, PL 89-665, 80 Stat. 915, 16 USC § 470 *et seq.* and 36 CFR 18, 60, 61, 63, 68, 79, 800.
- Native American Graves Protection and Repatriation Act, PL 101-601, 104 Stat. 3049, 25 USC §§ 3001-3013.
- Presidential Memorandum of April 29, 1994 Government-to-Government Relations with Native American Tribal Governments, 59 FR 85.
- Clean Air Act, as amended, PL Chapter 360, 69 Stat. 322, 42 USC § 7401 *et seq.*
- Endangered Species Act of 1973, as amended, PL 93-205, 87 Stat. 884, 16 USC § 1531 *et seq.*



- Executive Order 11988: Flood Plain Management, 42 FR 26951, 3 CFR 121 (Supp 177).
- Executive Order 11990: Protection of Wetlands, 42 FR 26961, 3 CFR 121 (Supp 177).
- Executive Order 11991: Protection and Enhancement of Environmental Quality.
- Executive Order 13007, Indian Sacred Sites (61 CFR 26771)
- Farmland Protection Policy Act of 1982, PL 97-98.
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act), PL 92-500, 33 USC § 1251 *et seq.*, as amended by the Clean Water Act, PL 95-217.
- Fish and Wildlife Coordination Act of 1958, as amended, PL 85-624, 72 Stat. 563, 16 USC § 661 *et seq.*
- National Environmental Policy Act of 1969, PL 91-190, 83 Stat. 852, 42 USC § 4321 *et seq.*
- Protection and Enhancement of Environmental Quality, Executive Order 11514, as amended, 1970, Executive Order 11991, 35 *Federal Register* 4247; 1977, 42 *Federal Register* 26967.
- Resource Conservation and Recovery Act, PL 94-580, 30 Stat. 1148, 42 USC § 6901 *et seq.*
- Secretarial Order 3175, Departmental Responsibility for Indian Trust Resources.
- Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (36 CFR 68).
- Soil and Water Resources Conservation Act of 1977.
- Watershed Protection and Flood Prevention Act, PL 92-419, 68 Stat. 666, 16 USC § 100186.

## **LIST OF PREPARERS**

This environmental assessment was prepared under the direction of and by the Park staff. The following DEVA employees provided invaluable assistance in the development, information gathering, writing, and technical review of this environmental assessment:

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## **APPENDIX A: PROJECT SCOPING MATERIALS**

## **APPENDIX B: CONSULTATION AND COORDINATION LETTERS**