National Park Service
U.S. Department of the Interior

Death Valley National Park
California and Nevada

Abandoned Mine Lands Safety Installations Environmental Assessment

Keane Wonder Mine Complex

Mine Openings

February 2010

PUBLIC COMMENT

If you wish to comment on the environmental assessment, you may mail comments to the name and address below or post comments online at http://parkplanning.nps.gov/deva. This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we would be able to do so. We would make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspections in their entirety.

Please address written comments to:

Sarah Craighead, Superintendent

ATTN: AML EA Comments
Death Valley National Park
P.O. Box 579
Death Valley, California 92328

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PURPOSE AND NEED FOR ACTION

PURPOSE AND NEED

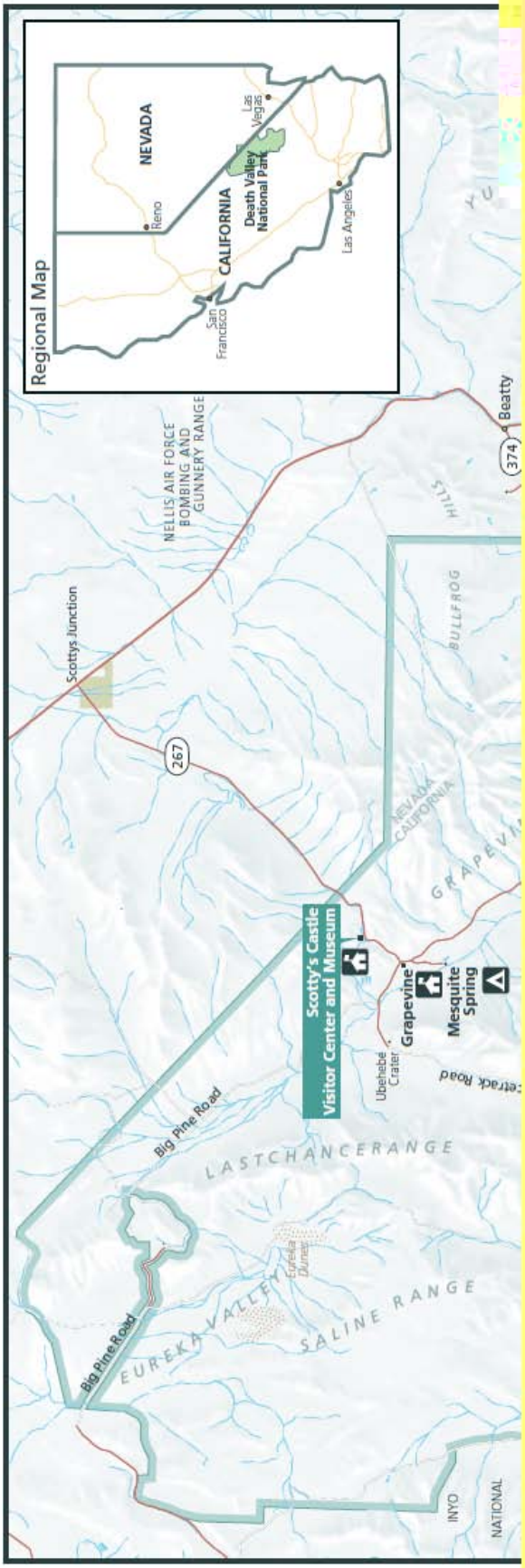
This environmental assessment has been prepared to assess mine safety options and environmental impacts to mitigate human and physical safety hazards at the Keane Wonder Mine complex abandoned mine lands in Death Valley National Park (figure 1). Abandoned mine lands are defined as any physical feature previously used for the extraction of minerals for which no responsible party can presently be identified (National Park Service 2009). Abandoned mine land features in Death Valley National Park include adits, drifts, glory holes, inclines, outcrops, portals, raises, shafts, stopes, sumps, tunnels, veins, winzes, prospect pits, cuts, and trenches. Figure 2 provides a glossary and illustrates these features.

The environmental assessment meets the requirements of the National Environmental Policy Act of 1969 and implementing regulations, 40 *Code of Federal Regulations* parts 1500-1508, and *Director's Order #12 and Handbook, Conservation Planning, Environmental Impact Analysis and Decision Making* (National Park Service 2001).

PROPOSED ACTION AND OBJECTIVES

The purpose of the proposed project is to improve visitor and staff safety at the Keane Wonder Mine complex while accommodating the use of abandoned mine land sites by wildlife (principally bats), minimize impacts on historic fabric and the visual character of the historic landscape, and minimize and offset potential adverse effects on natural resources using mitigation measures. The idea is, simply, to minimize opportunity for human exposure to risk of hazardous mine conditions while providing for protection of natural and cultural resources and minimizing potentially adverse effects on visitor experience.

Preventing human access to mine features may involve permanent installation of safety features, including non-reversible methods such as earthen backfill, blasting to collapse mine features, constructing rock and mortar walls into mine features, and re-contouring the landscape. The National Park Service, in consideration of wildlife and/or historic resources, may also employ less permanent measures, including reversible methods such as bat gates, cupolas, grates, nets, polyurethane foam plugs with a surface layer of earthen backfill, or fencing (chain-link or barbed). Mine safety installation methods that consider the needs of wildlife have been extensively researched (Vories and Throgmorton 2002; Sherwin *et al*. 2009;), and the National Park Service would rely on mine safety installation techniques developed to allow wildlife use for those mine openings where such methods are required.


Regional Map
NEVADA
Reno
CALIFORNIA
San Francisco
Death Valley National Park
Las Vegas
Las Angeles
NELLIS AIR FORCE BOMBING AND GUNNERY RANGE
Scottys Junction
267
374
Beatty
BULLFROG
HILLS
NEVADA
CALIFORNIA
GRAPEVINE
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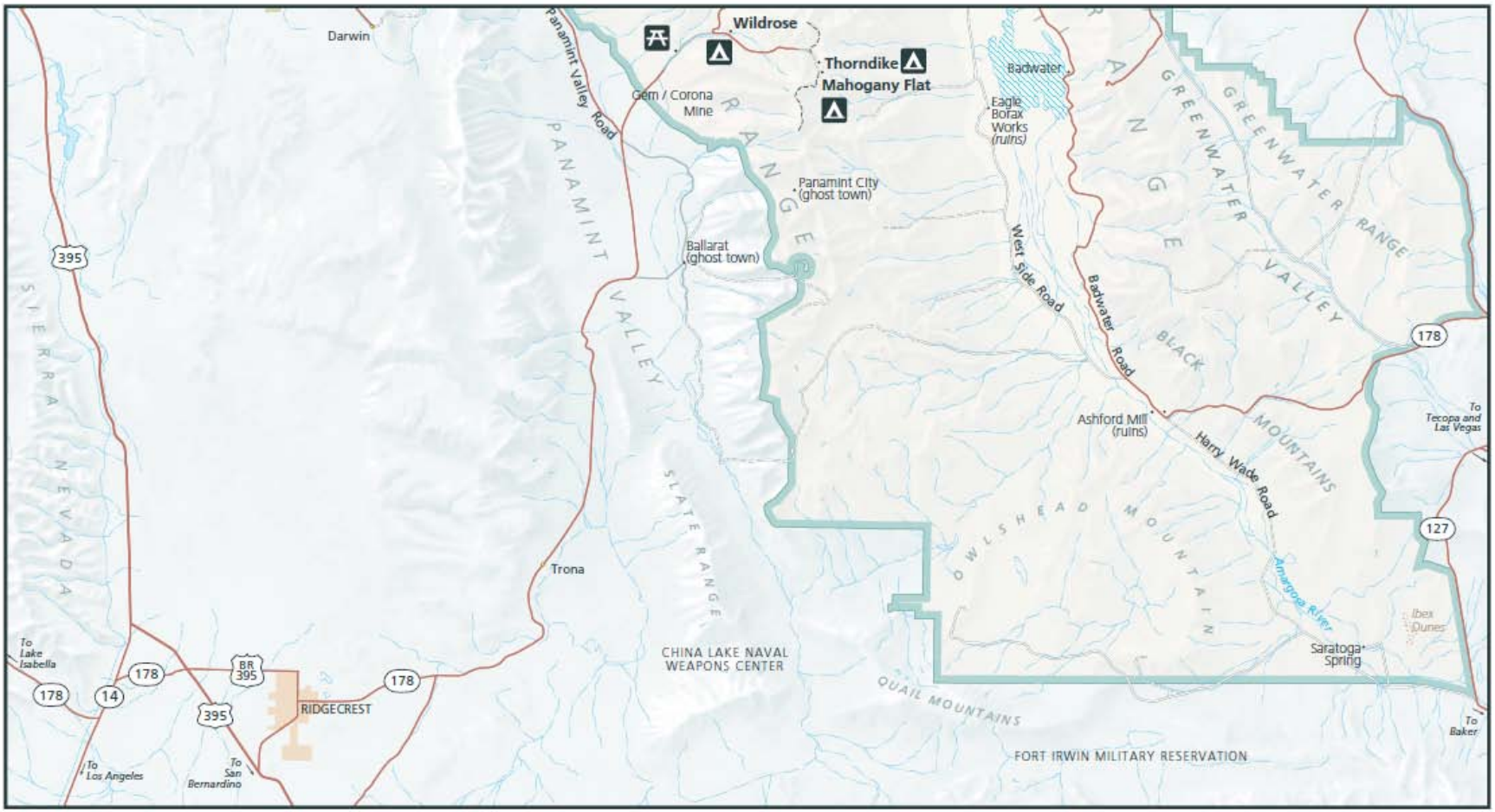
Grapevine
Mesquite Spring
Ubehebe Crater
Big Pine Road
LASTCHANCERANGE
EUREKA VALLEY
Eureka Dunes
SALINE RANGE
INYO
NATIONAL



North

0 1 10 Kilometers

0 1 10 Miles

Paved road
Unpaved road
High clearance recommended
Four-wheel-drive road
Salt flat
Hiking trail
Area below sea level
Authorized park boundary
Ranger station
Campground
Picnic area
Mine area

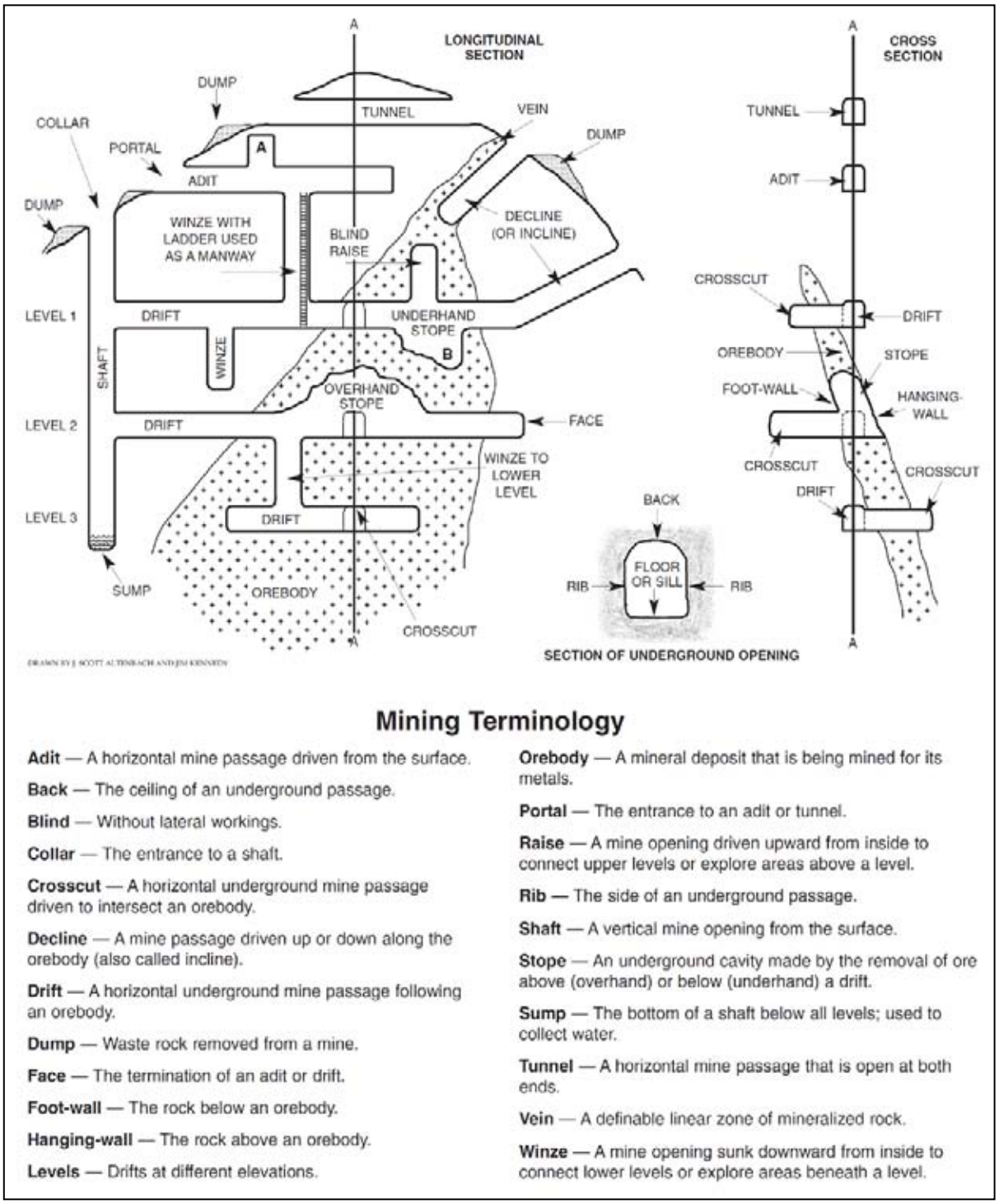
Figure 1.

Park Map

Death Valley National Park

United States Department of the Interior / National Park Service

December 2009



Mining Terminology

Adit — A horizontal mine passage driven from the surface.

Back — The ceiling of an underground passage.

Blind — Without lateral workings.

Collar — The entrance to a shaft.

Crosscut — A horizontal underground mine passage driven to intersect an orebody.

Decline — A mine passage driven up or down along the orebody (also called incline).

Drift — A horizontal underground mine passage following an orebody.

Dump — Waste rock removed from a mine.

Face — The termination of an adit or drift.

Foot-wall — The rock below an orebody.

Hanging-wall — The rock above an orebody.

Levels — Drifts at different elevations.

Orebody — A mineral deposit that is being mined for its metals.

Portal — The entrance to an adit or tunnel.

Raise — A mine opening driven upward from inside to connect upper levels or explore areas above a level.

Rib — The side of an underground passage.

Shaft — A vertical mine opening from the surface.

Stope — An underground cavity made by the removal of ore above (overhand) or below (underhand) a drift.

Sump — The bottom of a shaft below all levels; used to collect water.

Tunnel — A horizontal mine passage that is open at both ends.

Vein — A definable linear zone of mineralized rock.

Winze — A mine opening sunk downward from inside to connect lower levels or explore areas beneath a level.

Figure 2. Typical Types of Mine Openings and Features
(used with permission from Bat Conservation International - http://www.batcon.org/)

The objectives of the proposed multiple mine safety installations are as follows:

- **Protect visitors and park staff from abandoned mine safety hazards and minimize potentially adverse effects on visitor experience**: Properly designed mine safety structures protect visitors from unsafe conditions at abandoned mine land sites.
- **Protect natural resources from construction and operation of abandoned mine lands safety structures.** Wildlife, including federally and state-listed species, use mine openings as shelter and for nesting and denning.
- **Protect cultural resources from construction and operation of abandoned mine lands safety structures**: The Keane Wonder Mine complex represents a remnant of the region's rich history and was a popular destination for visitors before its recent closure.
- **Maintain a good working relationship between the National Park Service and stakeholders and partners associated with Death Valley National Park and the Keane Wonder Mine complex**: In addressing abandoned mine lands safety issues, the objective of the National Park Service is to achieve good working relationships with stakeholders and partners, and implement a balanced approach for resolving issues.

Figure 3. Collapsing Adit Opening at Keane Wonder Mine in Early 2008

Figure 4. Conditions at the Same Adit Opening in October 2009.

NEED FOR PROPOSED ACTION

The need for the proposed mine safety installations is related to safety hazards created by a large number of old and deteriorated abandoned open mine shafts, declines, and stopes, and horizontal openings such as adits and tunnels that exist at the Keane Wonder Mine complex. These types of hazards were recently documented in five national parks and selected Bureau of Land Management areas in a report by the Office of the Inspector General (2008). The report concluded that because abandoned mine land sites in the West represent a remnant of the region's rich history, they are popular destinations for park visitors, and an associated safety risk is created. To assure abandoned mine land sites are secured for visitor safety, each NPS region is directed to identify and implement quick response measures for high-risk abandoned mine land features (National Park Service 2009). Parks were directed to identify those abandoned mine land features that pose a high-risk for visitor safety and to develop initial cost estimates for mitigation or safeguarding of those features. Parks were also directed to fulfill needed compliance responsibilities and implement plans for quick response measures (for example, fences and warning signs) on a prioritized basis (National Park Service 2009).

PURPOSE AND SIGNIFICANCE OF THE PARK

Park purpose and significance are important components of the basis for management decisions and planning. Decisions about the management of resources are generally measured against these factors to determine activities that may be acceptable in a unit.

DESCRIPTION OF THE PARK

Death Valley National Monument was established by presidential proclamation under the Antiquities Act of 1906 on February 11, 1933. The monument was subsequently enlarged and changed to Death Valley National Park by Congressional action on October 31, 1994, with the passage of the California Desert Protection Act. Over 1.3 million acres of new lands were added, bringing the total acreage to 3,396,192. Nearly 91 percent of the park is designated wilderness, and it is the largest national park unit in the lower 48 states. Death Valley National Park contains the lowest point in North America and is one of the hottest places in the world. The diversity of Death Valley's seven plant communities is reflected in three biotic life zones: the lower Sonoran, the Canadian, and the Arctic/Alpine in portions of the Panamint Range. Three vegetation types are represented: scrub, desert woodland, and coniferous forest.

Located in southeast California and Nevada (figure 1), the park contains a landscape of contrasts, from scorching valleys to sand dunes, and snow-covered peaks. Death Valley National 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, rises 11,049 feet above sea level only 15 miles from the lowest point in North America in the Badwater Basin salt pan, 282 feet below sea level. The California Desert Protection Act added most of Saline, Eureka, northern Panamint, and Greenwater valleys to the park.

Death Valley sits along the California – Nevada state line and is near both Los Angeles and Las Vegas with easy accessibility from several major interstate highways.

Many historic properties and landscapes exist in the park, and a multitude either qualify to be or are listed on the National Register of Historic Places. Death Valley is unique in its display of a continuum of mining activities from at least the 1860s to the present day. Many historic mining resources are of particular significance either because similar resources are not found elsewhere in the national park system or because they are in a better state of preservation than examples found elsewhere, as evidenced by the unique standing tramway at Keane Wonder Mine.

PARK PURPOSE

The park purpose includes the reasons why Congress set the area aside for protection as a unit of the national park system. As a unit of the national park system, Death Valley must be managed in accordance with the National Park Service preservation mission as provided in the Organic Act of 1916; 16 USC 1, which provides that the primary purpose of park units is:

> ... to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.

In 1978, Congress amended the General Authorities Act in the Redwood National Park Act to further clarify the importance of park resources system wide:

Congress provides more specific direction for the new and/or expanded California desert parks and wilderness areas in section 2 (b)(1) of the California Desert Protection Act:

- Preserve unrivaled scenic, geologic, and wildlife values associated with these unique natural landscapes;

- Perpetuate in their natural state significant and diverse ecosystems of the California desert;
- Protect and preserve the historical and cultural values of the California desert associated with ancient Indian cultures, patterns of western exploration and settlement, and sites exemplifying the mining, ranching, and railroading history of the Old West;
- Provide opportunities for compatible public outdoor recreation; protect and interpret ecological and geological features and historic, paleontological, and archeological sites; maintain wilderness resource values; and promote public understanding and appreciation of the California desert; and
- Retain and enhance opportunities for scientific research in undisturbed ecosystems.

The specific purposes for Death Valley National Park, as derived from the Organic Act and the California Desert Protection Act, can be summarized as follows:

- Preserve 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. Ensure the maximum protection of wilderness values provided by law.
- Preserve the cultural resources of the California desert associated with prehistoric, historic, and contemporary American Indian culture, patterns of western exploration, settlement, and mining endeavors.
- Provide 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.
- Retain and enhance opportunities for scientific research in undisturbed ecosystems.

SIGNIFICANCE

Park significance statements tell why the park is special and deserves to be a part of the national park system. Statements of significance clearly define the importance of the park's resources as they relate to the park purpose. These statements help set resource protection priorities, identify primary interpretive themes, and develop desirable visitor experiences.

Significance in this context is the importance of a feature or an outstanding value. It may be locally, regionally, nationally, or globally significant or important to our national and cultural heritage. It may be a feature that is unique or extraordinary.

Significance is not used here in a legal sense, such as with the National Environmental Policy Act or the National Historic Preservation Act. The following significance statements were developed for Death Valley National Park and serve as the basis for management actions:

- Death Valley National Park contains the lowest point in North America at 282 feet below sea level. The valley floor receives the least precipitation in the United States (average 1.9 inches per year) and is the site of the nation's highest and the world's second highest recorded temperature (134 degrees Fahrenheit or 57 degrees Celsius).
- Death Valley National Park is world renowned for its exposed, complex, and diverse geology and tectonics, and for its unusual geologic features, providing a natural geologic museum that represents a substantial portion of the earth's history.
- The extremely colorful, complex, and highly visible geology and steep, rugged mountains and canyons provide some of the most dramatic visual landscapes in the United States.
- Death Valley National Park contains one of the nation's most diverse and significant fossil records and most continuous volcanic histories.

- Death Valley National Park contains five major sand dune systems representing all types of dune structures, making it one of the only places on earth where this variety of dune types occurs in such close proximity. It also contains the highest dunes in California – Eureka Sand Dunes.
- 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.
- Contrary to the first impressions of many visitors, 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 (as epitomized by the Devils Hole pupfish) that are highly adaptable to these conditions.
- Death Valley has been the continuous home of American Indians, from prehistoric cultures to the present day Timbisha Shoshone Tribe.
- Death Valley National Park contains an unusually high number of well-preserved archeological sites, including rock art and alignments.
- 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 with immense public appeal.
- Death Valley National Park has an extensive and well-preserved mining history representing over 100 years of mining technology.
- Since the 1930s there has been a continuous presence of the U.S. military in the region for a host of test and training activities involving aircraft. Historic crash sites are reminders of the commitment and sacrifices military personnel have made in the defense of this country.

LIST OF ISSUES AND IMPACT TOPICS

Internal and external scoping comments were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this environmental assessment. Table 1 presents the impact topics; the reasons for retaining the topic; and the relevant laws, regulations, and policies. The section located near the end of this document entitled Consultation and Coordination provides information on the organizations and agencies contacted during scoping, and a summary of the public scoping efforts that helped identify relevant issues and impact topics.

Table 1
Impact Topics Retained for Further Evaluation and Relevant Laws, Regulations, and Policies

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Public health and safety	Existing mine openings and structures pose a safety hazard for visitors. The proposed project would result in a long-term beneficial improvement because of the safety installations in mine openings and other improvements. However, this has the potential to adversely affect the experience of visitors who place a high value on directly observing mines. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Management Policy 8.2.5 (NPS 2006)
Visitor experience	There is a potential for construction and operation of mine safety installations to have beneficial and adverse effects on visitor use and experience, depending on the point of view and values of the visitor. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Organic Act; National Park Service Management Policy 8.2 (NPS 2006)
Special-status species	Construction and operation of mine safety installations have a potential to affect state-listed bats by preventing access to mines that are currently used as habitat. Therefore, this topic will be further analyzed in the environmental assessment.	Endangered Species Act of 1973; National Park Service Management Policy 4.4.2.3 (NPS 2006); 40 Code of Federal Regulations 1500 (regulations for implementing the National Environmental Policy Act)
Wildlife	Construction and operation of mine safety installations have a potential to affect other, non-listed forms of wildlife by preventing access to mines that are currently used as habitat. Therefore, this topic will be further analyzed in the environmental assessment.	National Park Service Management Policy 4.4.2 (NPS 2006); Migratory Bird Treaty Act

IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

Scoping issues or impact topics considered, but not evaluated further, are discussed below.

CULTURAL RESOURCES

A "Programmatic Agreement between the National Park Service (U.S. Department of the Interior) and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands within the National Parks in California" was developed in anticipation of funding under the American Recovery and Reinvestment Act of 2009. It was signed by both parties on August 18, 2009 (appendix B). The purpose of this programmatic agreement is to establish a program for compliance with section 106 of the National Historic Preservation Act and set forth a streamlined consultation process when agreed upon criteria are met and procedures are followed in the installation of physical safety mitigation treatments at abandoned mine lands sites. As part of the development of the programmatic agreement, the National Park Service has established guidelines, standards, and technical information applicable to the treatment of these physical hazards in ways that would, to the extent possible, minimize the impacts of such treatments on the historic fabric and historic character of abandoned mine lands features at these sites.

The park would adhere to the programmatic agreement in implementing this project and would treat all the mine structures as potentially eligible for lisd (r 31.852 0 Td(A)-1(i)(o) 4)2(1)19(s)(oti)94(ice)7(n)2(l)Rctm)16(-1)av193 o-19(rl)(e ,21(r(l)1(e)19()-(e (l)1(z)2(o)2e ,21(ro-19(12)9 (l)1((u)2(ig)4(ic(me)9(n)8(t4(i)-8(ng)16.25.009 Tw e-10(t)-

structures to each other or the spaces between them that define the landscape and how it is experienced. In some cases, new visible elements, such as fences or structures over shafts, would be added or conversely, some openings would be buried so they are no longer visible to visitors. However, the impact would be minimized by the use of materials that would blend into the mining landscape, such as non-reflective metal and recessing installations where possible. Most mine safety installation options would be reversible and impacts to historic structures would be negligible or less. All mine openings to be closed would be photo documented before and after the work is completed. The photographs would sufficiently illustrate the historic construction/engineering features and techniques of the treated portions of each site as well as provide an overview depicting its setting within the historic property. Permanent abandoned mine safety techniques would be limited to mine openings where other techniques were not applicable and therefore would be few in number and would not be expected to disrupt the overall integrity of the mining landscape, or be noticeable to most visitors. As a result, the project would result in negligible impacts to cultural landscapes that would be further mitigated by documentation and the closure techniques described above. Because greater than negligible impacts would not occur, this topic is dismissed from further analysis.

Ethnographic Resources

Native American groups traditionally associated with the park were consulted on June 12, 2009 regarding this project and agreed that the project would not affect traditional sites or resources and that the protections outlined in the programmatic agreement developed for this project are adequate. Because the project would not impact ethnographic resources, this topic is dismissed from further analysis.

Historic Structures

A wide variety of historic structures are present at the Keane Wonder Mine complex, including cabins, dugouts, aerial tramways, etc. Many of these structures have been found to be contributing elements to National Register eligibility, and work to these structures would involve substantial involvement with the State Historic Preservation Officer prior to any project activities. No work would be done on the tramway or mining buildings as part of this project and any work would be limited to minor on historic structures located at the mine openings, such as entrance ways, doors, and wooden supports and collars that have been addressed by the programmatic agreement already negotiated with the state historic preservation officer. Abandoned mine lands safety installations would avoid adverse impacts to these types of historic structures by recessing installations. In some cases, structural elements would be dismantled and then reconstructed after installations are complete or stabilized prior to installation of mine safety techniques. Where recessing is not possible, mine safety installations would be worked into and around historic structures so their visual presence is minimized to the extent possible. In all cases involving historic structures, the work would be reversible and follow the Secretary of Interior's Standards for Rehabilitation. As a result, impacts would be negligible. Because there would be no impacts greater than negligible, this topic is dismissed from analysis.

Museum Objects

Objects related to mining operations can be found at most mine sites, including the Keane Wonder Mine complex. These objects consist of equipment used in mining or personal objects used by the miners. The programmatic agreement developed with the California State Historic Preservation Officer requires the project to leave all potential museum objects in place where they are located and take care not to disturb them during mine safety installations. Because potential museum objects would not be impacted or added to the park collections at this time, there would be no impact to museum objects or collections. As a result, this topic is dismissed from further analysis.

WILDERNESS

There are no areas currently designated as wilderness in the Keane Wonder Mine complex. It is also unlikely that any lands would meet the criteria established in the Wilderness Act of 1964 (16 *United States Code* 1131, et seq.) – that the "imprint of man's work substantially unnoticeable" – because of existing development, historic structures, and a history of human occupation of the area. This impact topic is, therefore, dismissed from further analysis.

FLOODPLAINS

Abandoned mine lands safety installations would not be conducted in floodplains or wetlands and would not affect the functions and values of floodplains and wetlands. This impact topic is, therefore, dismissed from further analysis.

GEOLOGIC RESOURCES

Impacts to geologic resources would be limited to anchoring of mine safety installations and minor shaping of bedrock limited primarily to the dimensions of each mine opening. The small geological area affected would result in negligible adverse effects on geological resources. This impact topic is, therefore, dismissed from further analysis.

PRIME AND UNIQUE FARMLANDS

No prime and unique farmlands are located in areas affected by the proposed mine safety installations and the proposed project would not affect prime and unique farmlands. This impact topic is, therefore, dismissed from further analysis.

NATURAL SOUNDSCAPE

In accordance with *Management Policies 2006* (National Park Service 2006) and Director's Order 47: Soundscape Preservation and Noise Management (National Park Service 2000), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human sound. The proposed project would have negligible to minor short-term adverse impacts on soundscapes from construction equipment and vehicle noise, including the potential use of helicopters as a means to transport equipment into, and out of, the construction site on a temporary basis. These short-term activities would also affect visitor experience, special-status species, and wildlife. Potential impacts are described and evaluated under the visitor experience, special-status species, and wildlife impact topics, which have been retained for further analysis. Because short-term construction impacts on soundscapes do not exceed a minor threshold, and the short-term construction noise impacts to wildlife and visitor use and experience are described and evaluated under other impact topics, soundscapes was dismissed from further analysis as a separate impact topic.

INDIAN TRUST RESOURCES

Sacred sites are managed according to requirements of Executive Order 13007 and section 5.3.5.3.2 of *Management Policies 2006* (National Park Service 2006). The proposed project would not affect any sacred sites or Indian Trust Lands. This impact topic is, therefore, dismissed from further analysis.

AIR QUALITY

Emissions of particulates that could affect air quality, including visibility in the general vicinity of the park, would temporarily increase during construction from the use of vehicles on and off

paved roads, and from exhaust from gasoline- or diesel-powered vehicles and equipment. This equipment would also temporarily emit air pollutants. However, a typical mine safety installation would take only two to three days to complete. Mitigation measures described in more detail under alternative B would be employed to ensure that potential effects on air quality would be avoided and minimized. Because of the short-term, localized nature of the operation, mine safety installation activities would not affect the attainment status of the airshed that encompasses the Keane Wonder Mine complex and would not affect the airshed designation (Class II under the Prevention of Significant Deterioration program) at the park. Because the adverse impacts described above would not exceed a minor threshold, this impact topic is dismissed from further analysis.

CLIMATE CHANGE

Activities associated with mine safety installations would have a negligible effect on climate change through the emission of additional carbon dioxide and other potential greenhouse gases from construction activities and operations of gasoline-or diesel-powered vehicles. This impact topic is, therefore, dismissed from further analysis.

SOILS

The total footprint of the area of soil disturbed by the project (all components) would be limited primarily to the dimensions of each mine opening. Mine safety installations would have short-term, negligible adverse effects on soil during construction and operation. This impact topic is, therefore, dismissed from further analysis.

WATER RESOURCES

Aquatic resources are either absent or rare in areas that could be affected by abandoned mine lands safety installations. Soil disturbance and associated erosion of soil into adjacent dry or ephemeral-flow drainages during construction would result in short-term negligible adverse effects on water quality during wet weather (if that occurs). Mitigation measures described in more detail under alternative B would be employed to assure that potential associated effects on water quality and aquatic resources are avoided and minimized. This impact topic is, therefore, dismissed from further analysis.

WETLANDS

No wetlands would be affected by the proposed project. This impact topic is, therefore, dismissed from further analysis.

VEGETATION – NATIVE PLANT COMMUNITIES

Construction would be almost completely limited to the mine opening or to a very limited area associated with structural improvements. Construction would not involve planting of non-native species of plants and otherwise cause the spread of these species through management of sources of backfill soil and other measures. The project would, therefore, have short-term, negligible adverse effects on vegetation-native plant communities. This impact topic is, therefore, dismissed from further analysis.

SOCIOECONOMICS

The proposed project would provide jobs to contractors in local communities to construct the

local economy in communities in the vicinity of the park. This impact topic is, therefore, dismissed from further analysis.

NATURAL LIGHTSCAPE (NIGHT SKY)

The project would be constructed during daytime hours and have no adverse effects on natural lightscape quality. Similarly, the proposed abandoned mine lands safety structures would have no effects on natural lightscape (night sky). This impact topic is, therefore, dismissed from further analysis.

ENERGY CONSERVATION

The project would require a negligible amount of oil, gas, and electrical energy to construct the safety installations and new structural features. This impact topic is, therefore, dismissed from further analysis.

ENVIRONMENTAL JUSTICE

Impacts associated with mine safety installations would not disproportionately affect any minority or low-income population or community. This impact topic is, therefore, dismissed from further analysis.

PARK OPERATIONS

The project would have a short-term, negligible effect on park operations during construction of the abandoned mine lands safety structures. The project would have a minor, long-term, beneficial effect on park operations by eliminating the need to respond to safety issues associated with mine opening incidents. This impact topic is, therefore, dismissed from further analysis.

ALTERNATIVES

DESCRIPTION OF ALTERNATIVES

The National Park Service identified and evaluated two alternatives for mine safety installations at abandoned mine land sites at the Keane Wonder Mine complex.

Procedures for mitigating physical hazards at abandoned mine land sites are summarized in table 2. The information in table 2 is modified from *A Plan to Minimize the Impacts of Physical Safety Hazard Mitigation Treatments at Abandoned Historic Mines* (National Park Service no date). This and all other tables in this chapter are included at the end of this chapter.

Table 3 presents examples of typical mine openings and some of the factors that would be considered when determining what mine safety installation technique would be most appropriate. The table identifies many, but not all, possible combinations of safety installation techniques.

Table 4 presents a summary of the impacts associated with each of the impact topics for abandoned mine lands safety installations. Details of the analyses are presented in the environmental consequences section. Only adverse impacts are assigned an intensity threshold.

Table 5 presents a comparison of the environmental effects of Alternative A: No Action and Alternative B: Abandoned Mine Lands Safety Installations, for each impact topic. The impact assessments summarized in table 5 are based on the detailed analyses that follow in the "Affected Environment / Environmental Consequences" section. A determination of whether the alternative meets the purpose and need of the proposed action is also included in the last row of the table. Only adverse effects are assigned an impact intensity threshold. In cases where the effects of alternative B vary because of the different impacts associated with different mine safety installations techniques, the range of effects is presented.

ALTERNATIVE A: NO ACTION

In September 2008, the National Park Service closed the Keane Wonder Mine complex to all vehicular and foot access. Considerations that led to NPS closure of the area included unsafe mine openings, unstable ground, potential toxic waste, and collapsing structures associated with the Keane Wonder Mine and past gold extraction processes (National Park Service 2008a).

The no action alternative would continue existing management practices for abandoned mine land sites at the Keane Wonder Mine complex. Additional safety installations would be implemented as funding became available, but the timing and number of safety installations placed at openings during a specific period would vary according to funding availability. Existing safety installations at mine openings would be retained. These mine safety installations would be accomplished under a continuation of current management and would not be part of the proposed action.

The Keane Wonder Mine complex would remain closed to the public, and unsafe conditions would continue to exist at the site with unclosed mine openings. Mine openings with existing safety installations would continue to exist and would continue to provide long-term safety improvements for staff at those locations. Should the no action alternative be selected for implementation, the National Park Service would respond to future needs and conditions associated with abandoned mine land sites without making major actions or changes in the present course.

ALTERNATIVE B: ABANDONED MINE LANDS SAFETY INSTALLATIONS

Alternative B is the NPS' preferred alternative because it offers the highest degree of resource protection for wildlife and special-status species, while improving public health and safety, which is the primary purpose of the project. Additionally, a safer environment would enhance NPS operations because the need for incident response at abandoned mine openings would be reduced.

CONCEPTS AND FEATURES

The preferred alternative consists of installing safety installations at multiple abandoned mine openings at the Keane Wonder Mine complex. A formal inventory of mine openings with the park is currently underway and initial investigations estimate that there are about 55 mine openings in the complex. In addition, the safety installations that previously were installed in some mine openings may be upgraded.

Appendix A provides photographs of typical safety installation techniques that would be used and the types of openings that would be treated. Appendix C contains photographs of the physical characteristics, mine openings, and some of the existing treatments present at the Keane Wonder Mine complex.

The mine safety installation techniques can be grouped based on their similar effects. These groups of treatment techniques include:

- Grates;
- Fencing;
- Bat gates, culvert gates, and cupolas;
- Cable mesh nets and screens;
- Polyurethane foam installations covered with backfill;
- Backfill alone; and
- Combination applications of above methods to treat complex situations.

The number and types of treatment techniques vary according to site circumstances. For a simple mine safety installation situation, only one technique might be needed. For a complex site, several techniques may need to be combined. For example, a bat gate would be installed at an opening consisting of an adit and known to be used by bats, while a simple metal grate could be used at a similar opening not used by bats. Selection of treatment techniques for specific openings would be based on a number of factors, including physical features and conditions of the opening, types of structures present, safety hazards, presence or absence of bats, use of the mine by other wildlife such as owls, and presence and condition of historic features. The objective would be to select a set of techniques that would eliminate safety hazards for future visitors, while simultaneously protecting historical resources, special-status species, and other wildlife that use the mines.

The preferred alternative would provide a mechanism for treating abandoned mine openings at the Keane Wonder Mine complex over the long term, using proven, accepted techniques. Safety installations at abandoned mine openings would mitigate basic safety hazards at mine sites while simultaneously protecting special-status species and other wildlife that use the mines, as well as historic cultural resources.

PROPOSED MITIGATION MEASURES

During construction activities, mitigation measures would be included as part of the mine safety installation process to ensure that adverse environmental effects would be either avoided or minimized. The most appropriate mitigation measures to be employed at a given site would be determined by an evaluation of site-specific factors. Measures would be selected based on judgments of what measures would be most effective in avoiding or minimizing impacts. In the arid or semi-arid settings of most of the safety installation sites, mitigation measures would focus on preventing and controlling soil erosion and vegetation loss or damage. These actions would protect water quality and any associated aquatic communities in situations where a surface water body occurs next to activities involving disturbance of soil and plant communities.

The following mitigation measures would be employed as appropriate to control soil erosion and vegetation loss and to configure the land surface to discourage soil erosion after treatment activities were finished. Based on the small size of treatment sites and typical activities that would be involved, the following measures would be effective.

General Measures

- Construction limits would be delineated by the park prior to any construction activity. Workers would be instructed to avoid conducting activities and disturbing areas beyond the construction limits.
- All tools, equipment, barricades, signs, surplus materials, demolition debris and rubbish would be removed from the project work limits on project completion.
- Contractors would be required to properly maintain construction equipment and generators (for example, the mufflers) to minimize air emissions and noise from use of the equipment.
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily.
- Materials would be stored, used, and disposed of in a proper manner.
- A hazardous spill plan would be approved by the park prior to construction. This plan would state what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of vehicles and generators.
- Vehicles and equipment would be cleaned and pressure washed prior to entry into the park to prevent the introduction of non-native vegetation.
- Contain and remove all food waster and garbage immediately to prevent attraction by wildlife to the area and to the food waste.

Soil Erosion and Vegetation Loss

- Wait until just before beginning construction to clear vegetation and to disturb the soil.
- Minimize the area of bare soil in the approved work zone as much as possible.
- Maintain a buffer of natural vegetation around the work area to slow runoff and trap sediments.
- Consider phasing construction to minimize the extent of disturbed soils.
- Use existing roads and trails to access treatment locations to maximum extent practicable.
- Park vehicles and equipment and temporarily store materials on locations that are already devoid of vegetation and/or compacted from previous mine activities.

- If vegetation disturbance cannot be avoided and conditions warrant, reseed the disturbed area with a mixture of native, self-sustaining native plant species in accordance with known, successful local techniques.
- Ensure the final land form is stable, minimizes soil erosion, and is hydrologically compatible with the surrounding area.
- Provide slope and land form stability by reducing slope angles.

Water Quality and Aquatic Community Protection

These measures would be implemented only in rare circumstances because of the arid and semi-arid conditions in the park.

- Maintain a buffer zone between the construction activities and the edge of the water feature, a minimum separation distance of 100 feet is typically preferred.
- If rain is anticipated, install temporary silt fence between the construction activity and the water feature and remove the fence after the work is completed.
- In situations where a silt fence may not be adequate, create a temporary diversion or containment berm between the construction activity and the water feature to intercept and manage storm water runoff.
- Remove and reshape temporary containment berms once safety installation activities are completed.
- Restore any drainage channels that may have been altered by treatment activities to pre-disturbance shape, size, capacity, stability, and contours.

Visitor Experience

- Provide interpretation of mines to illustrate the facilities and techniques relied on to mine mineral resources and to provide a sense of the conditions encountered by miners.
- Minimize adverse visual experiences by using gates, fences, and other safety structures that are colored to resemble desert soils and vegetation. Design the structures to be low-profile or hidden from view. Allow the treatment structures to weather to resemble of old mine structural features.

Wildlife and Special-Status Species

- Time construction and other treatment activities to avoid or take place outside reproductive or sensitive portions of species' life cycles.
- Use designs in gates, fences, and other treatment techniques that allow bat and owl access to mines that are occupied by these species.
- Conduct bat and other wildlife surveys of openings to be treated, and select techniques that would ensure that wildlife access was maintained.
- Exclude wildlife prior to installation of closure that would prevent passage by wildlife.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with the criteria in section 101(b) of the National Environmental Policy Act, the alternative that best meets the following criteria must be identified as the environmentally preferred alternative:

Criterion 1: Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

Criterion 2: Ensure for all Americans, safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

Criterion 3: Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

Criterion 4: Preserve important historic, cultural, and natural aspects of national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;

Criterion 5: Achieve a balance between population and resource use which will permit high standards of living and wide sharing of life's amenities; and

Criterion 6: Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative A does not protect visitors and park staff from abandoned mine safety hazards or minimize potentially adverse effects on visitor experience, so it does not meet criteria 2, 3, and 5. Alternative A does not protect wildlife and special-status species from becoming trapped in open shafts, so it fails to fully meet criteria 1 and 4. It partially meets criterion 4 by preserving important historic and cultural aspects of national heritage, and maintaining an environment that supports a variety of individual choice. Regarding criterion 6, the disturbance and general lack of vegetation around most mine openings limits the ability of Alternative A to enhance the quality of renewable resources or approach the maximum attainable recycling of resources.

Alternative B protects visitors and park staff from abandoned mine safety hazards and minimizes potentially adverse effects on visitor experience, so it better meets criteria 2, 3, and 5. It also better meets criteria 1 and 4 by protecting wildlife and special-status species from being trapped in open shafts. While it preserves important historic, cultural, and natural aspects of national heritage and maintains an environment that supports diversity, it does not allow the same variety of individual choice provided in alternative A. Because there would be no change to the amount of disturbance or increase of vegetation around most mine openings, alternative B would not enhance the quality of renewable resources or approach the maximum attainable recycling of resources (criterion 6) any better than alternative A. Because alternative B would ensure for all Americans safe surroundings, provide a greater opportunity for achieving a wide range of beneficial uses of the environment without risk of health or safety, and achieve a balance between population and resource use that would permit high standards of living and wide sharing of life's amenities, alternative B is the environmentally preferred alternative.

The environmentally preferred alternative would provide a mechanism for treating abandoned mine openings at the Keane Wonder Mine complex over the long term, using proven, accepted techniques. Mine safety installations would mitigate safety hazards at mine sites while simultaneously protecting special-status species and other wildlife that use the mines, as well as historic cultural resources.

ALTERNATIVES CONSIDERED BUT DISMISSED

The installation of bat gates at all mine openings was considered as one alternative to improve public health and safety at mine openings. However, the universal application of bat gates was determined not to be a good allocation of resources for a number of reasons. The reasons include that in some cases an inordinately large gate would be required and could be infeasible and/or costly; a bat gate may not be suitable because of site configuration constraints; and, some mines do not contain bats and the use of bat gates would be an unnecessary and excessive use of materials and funds. As a result of the inefficient use of resources that would occur with the installation of bat gates at all openings, this alternative was dismissed from further consideration.

Additionally, the components of alternative B, consisting of a variety of abandoned mine safety installation techniques, would be considered in relation to a specific mine opening in deciding the best method to be used. When the variables are evaluated, including bat and wildlife use, the presence of historic cultural resources, and the physical nature of the mine opening, some techniques would be dismissed because they do not provide adequate public safety and resource protection.

Table 2
Procedures for Mitigating Physical Hazards at Abandoned Mine Land Sites (Continued)

Safety Installation Technique	Description	Typical Safety Installation Techniques
Bat gates and cupolas	Bat gates and cupolas are specially designed metal structures that allow bats access to a mine through slots of a specific width, typically between 5.75 and 6 inches. They are typically constructed of heavy-duty angle iron constituting an adaptation of the American Cave Conservation Association/Bat Conservation International, Inc. bat gate design (Vories and Throgmorton 2002). Strong recommendations from biologists, low materials cost, and relative ease of construction contributed to the selection and current incorporation of this design. One advantage of these installations is that bat gates and cupolas fitted with locking access panels guarantee future access to the mine features by biologists, geologists, and archeologists. Bat gates and cupolas are often designed to include access openings for other species of animals such as barn owls, if these species are known or suspected to inhabit a particular mine. In some cases, gates could be installed in culverts that would be placed in mine openings to enhance the physical integrity of mine openings that may be degrading.	
Cable mesh nets	Installation of safety cable nets was one of the earliest methods developed to restrict visitor access to mine openings. The design concept allowed visitor appreciation of the feature, provided for air passage in the opening, and allowed small wildlife passage. Safety nets of various designs can be compatible with historic structures because they can be readily recessed or inset in the mine opening to allow more suitable rock drilling conditions and render the installation less visible. They are no longer widely used where wildlife need continued access to the mine openings and are no longer preferable for installations where bats are present, because bats can have difficulty navigating through them. Cable mesh can also pull on structural elements that are loose or in bad condition and possibly hasten their deterioration.	

Table 2
Procedures for Mitigating Physical Hazards at Abandoned Mine Land Sites (Continued)

Safety Installation Technique	Description	Typical Safety Installation Techniques
Polyurethane foam plugs covered with backfill	Polyurethane foam plugs have closed mine sites in remote areas, sites with access restrictions, and sites that do not have sufficient backfill material. Because plugs are subject to ultraviolet light degradation and vandalism, they need to be protected (Burghardt 1994). Thus, they are typically installed a few feet below the collar of the shaft and are backfilled a several feet with soil or waste rock from the site. Polyurethane foam plugs have a considerable weight-bearing capacity. Polyurethane foam plugs are partially reversible installations because when necessary they can be removed; however, it is almost impossible to completely remove the foam, which adheres directly to the surrounding rock. If removal is attempted, some evidence of its use would always remain at the site. The photograph shows a shaft filled with foam and backfilled with local material.	
Backfilling alone	Backfilling may use either mechanical or manual earth-moving methods, depending on the size of the mine or prospect. It requires that sufficient backfill materials are present at the site, because material seldom would be imported. A need for future maintenance of historic mining features may preclude backfilling as an appropriate treatment method. If mechanized equipment is required, ingress, egress, and equipment operation may result in unacceptable environmental impacts. In front-country situations well above the water table, backfilling may be an appropriate treatment technique for trenches and prospects. The photograph shows an adit that was permanently closed using backfill.	
Combination applications of above methods to treat complex situations	Complex mine openings, including stopes, glory holes, and especially large openings, may require that combinations of safety installation techniques be employed to adequately protect visitors, allow wildlife access and provide safety. Photograph shows a combination of bat cupola, grate, and concrete base.	

Table 3
Typical Mine Opening Features with Factors Involved in Determining Mine Safety Installation Techniques

Typical Site Feature	Wildlife Use	Other Considerations	Treatment Technique (see appendix A and table 2 for photographs of these techniques)
Shaft opening with sloping and unstable slopes	Bats	None	Horizontal gate on new concrete footing and small bat cupola
Unstable timbers in opening, adit	No	Historical features	Vertical gate
Ladder leading into shaft, collapsing edges	No	Historical features	Horizontal gate
Shaft	Bat and barn owl use	None	Fence with owl perches
Adit (20 feet) with portal	Bats	Historic features with collapsing portal timbers	Repair/stabilize timbers and portal. May use culvert gate held in place with foam
Adit (200 feet) stable portal	Bat maternity colony and bighorn sheep use	Historic feature. Known public use	Install bat gate 10 feet in from the portal
Shaft 50 feet deep, collapsing	None	No timbers. Eroded to 20 feet wide	Foam plug and backfill
Open stope 80 feet by 10 feet, depth unknown	Many bats	Near road	Install bat compatible grate over steel framework
Decline (with timbers)	Unknown	Historic, considerable public use	Stabilize timbers and install bat gate inside
Open trench with decline 30 feet down.	No	Historic, near road	Install expanded metal mesh on steel frame in the trench and over deep area
Deep shaft with drifts at various levels.	Unknown	Historic water at 350 feet, opening in waste pile	Bat cupola on concrete footing
Decline 75 feet deep	Bobcat and pack rats, no bats	Historic, stable portal	Exclude bobcat and install steel grate

Note: This table represents some, but not all, possible combinations for treating a mine opening

Table 4
Mine Safety Installation Techniques and Impact Intensities Summary for Each Impact Topic

Safety Installation Technique	Public Health and Safety	Visitor Experience (1)	Special - Status Species	Wildlife
Fencing	Long-term, Beneficial	Long-term, minor and adverse	Long-term, negligible, and adverse	Long-term, negligible to minor and adverse, as well as long-term and beneficial
Polyurethane foam with backfill (2)	Long-term, Beneficial	Long-term, minor and adverse	Long-term, negligible to minor and adverse	Long-term, negligible and adverse
Bat gates, screens, nets, grates, or cupolas	Long-term, Beneficial	Long-term, minor and adverse	Long-term, negligible, and adverse as well as long-term and beneficial	Long-term, negligible to minor and adverse
Shallow backfill	Long-term, Beneficial	Long-term, minor and adverse	Negligible, short-term and adverse	Short-term, negligible and adverse
Combined methods	Long-term, Beneficial	Long-term, minor and adverse	Varies by opening	Varies by opening

Note: Additional details are provided in the respective environmental consequences sections.
(1) Would have an adverse effect on visitors who place a high value on visiting mine sites. Beneficial effect are associated with improved safety at treated mine sites. An intensity (negligible, minor, moderate, major) is not applied to beneficial effects.
(2) Only used at locations where bat, owl, or other wildlife uses of mine opening does not occur.

Table 5 Comparison of the Alternatives		
Impact Topic	**Alternative A: No Action**	**Alternative B: Abandoned Mine Lands Safety Installations**
Public health and safety	The no action alternative would have a long-term, moderate, adverse effect because the threat to visitor and staff safety from mine openings would remain. Cumulative impacts would be long-term, minor, and adverse.	Alternative B would have a long-term, beneficial effect on public health and safety by reducing risks caused by the abandoned mine openings. Cumulative impacts would be long-term and beneficial.
Visitor experience	Effects would be long-term, moderate, and adverse on the experience of visitors who place a high value on the ability to have open access to these sites. Effects on other park visitors would be negligible. Cumulative impacts would be long-term, minor, and adverse.	Alternative B would have a long-term, minor, adverse impact on the experience of some visitors because treatments would prevent them from having full access to the openings. Improved interpretation would provide a long-term, beneficial impact. Cumulative impacts would be long-term and beneficial for most visitors.
Special-status species	The no action alternative would have a long-term, negligible, adverse effect because of the continued low potential for human presence and associated disturbance in open mines that are used by bats. Cumulative effects of the no action alternative on bats would be long-term and beneficial.	Short-term, adverse, negligible to minor impacts on bats would be associated with construction of safety installations. The exclusion of humans from mines would have a beneficial effect on bats. Long-term, adverse, negligible to minor impacts could occur at mine openings that were permanently closed by foam plugs or backfill. Cumulative effects of alternative B on special-status species would be long-term and beneficial.
Wildlife	The impact of alternative A on wildlife populations would be a negligible, although individual animals would continue to be injured or killed by falling into mine features. Effects because of human presence and associated disturbance would be long-term, negligible, and adverse to wildlife populations. Cumulative impacts on wildlife would be long-term and beneficial.	Alternative B would have long-term, beneficial impacts because it would reduce the incidence of wildlife being trapped or killed from falling into vertical mine features, and because treatments would reduce human disturbances of wildlife habitats in mines. Short-term, adverse impacts would be construction related, and their intensity would be negligible to minor. Long-term, negligible to minor, adverse impacts would be associated with restricting wildlife access to areas they currently can use. Cumulative effects on wildlife would be long-term and beneficial.
Meets purpose and need	No, alternative A would not meet the purpose and need because risks to the public and park staff would continue to exist at the Keane Wonder Mine complex. These risks would contribute to the indefinite closure of the area to the public.	Yes, alternative B would meet the purpose and need because the safety installations at mine openings would eliminate the safety risks to visitors and staff at mine openings.

Note: Additional details are provided in the respective environmental consequences sections.

AFFECTED ENVIRONMENT / ENVIRONMENTAL CONSEQUENCES

This section describes the characteristics of the affected environment that could be affected by the proposed mine safety installations and the estimated environmental effects of the installations. This analysis is presented for each of the impact topics listed in table 1.

The affected environment discussion is followed by environmental consequences, or the impact assessment. The assessment is limited to key aspects of existing conditions that relate to potential adverse effects or conditions that are of potential concern. In addition, only those aspects of the existing conditions that relate directly to the impact conclusion or form the basis for the impact conclusion are described.

A variety of different mine safety installation techniques would be applied to abandoned mine land sites, depending on individual mine features. Because there are multiple sites in the Keane Wonder Mine complex, this environmental assessment provides a programmatic assessment of potential environmental effects based on typical safety installation techniques that would be applied based on different combinations of features (for example, adits with and without bats, vertical shafts with and without bats, and so forth). These were presented in table 3.

METHODS

The methods used to assess impacts of the mine safety installation techniques include:

- Impact intensity thresholds for each impact topic were defined and include negligible, minor, moderate, and major adverse impact definitions as well as a beneficial impact definition and terms of duration. Impact threshold definitions are provided for each of the five impact topics at the start of their respective environmental consequences section.
- Each alternative was evaluated for each impact topic using the threshold definitions to determine the intensity of effect. In the case of the multiple mine safety installation techniques associated with alternative B, the individual techniques were evaluated. As a result, the determinations of effect for alternative B sometimes resulted in a range of effects for the same impact topic, as the impacts of one technique may differ from another. Only adverse impacts were assigned an intensity modifier; beneficial effects are characterized only as resulting in a positive impact.
- Table 4 presented a summary of the range of impact intensities associated with each mine safety installations technique for each impact topic. Detailed analyses are presented in the environmental consequences section for each impact topic. Table 5 summarized and compared the impacts of the alternatives, as well as noting how well each alternative met the project purpose and need.
- Impact analyses are generic in that they assess the impacts associated with “scenarios” that illustrate the range of mine safety installation approaches that could be used.
- When a combination of mine safety installation techniques would produce a range of impact intensities (for example, negligible to minor impact), the highest impact intensity is used for descriptive and evaluation purposes. This ensures a conservative evaluation.

CUMULATIVE IMPACT ANALYSIS METHOD

The environmental assessment also includes an assessment of cumulative impacts. The Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative effects in the decision-making process for federal

projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 *Code of Federal Regulations* 1508.7). Cumulative effects are considered for both the no action and the preferred action alternatives, and are presented at the end of each impact topic discussion analysis.

Cumulative effects were determined by combining the estimated effects of the alternatives with the effects of other past, present, and reasonably foreseeable future actions relevant to mine safety installations at the Keane Wonder Mine complex. The following is a summary of past, present, and reasonably foreseeable actions taking place at the complex and in Death Valley National Park that would have a relationship to the proposed mine safety installations. The cumulative impact analyses in the environmental consequences section refer to the plans and projects described below as contributors to cumulative effects.

Other Abandoned Mine Lands Safety Installations

Several other mine safety installations have already been completed or are underway at Death Valley National Park, including mine safety installations in the Skidoo Mining District, Gem Mine area, Greenwater Valley, Eureka Mining area, 20 Mule Team and Gower Gulch area, and Titus Canyon area. Mine safety installations include bat gates, cupolas, mesh nets, and fencing.

Area Closure and Related Projects

In September 2008, the National Park Service closed the Keane Wonder Mine complex to all public vehicular and foot access. The closure includes areas from the junction of Keane Wonder Road and Beatty Cut-off Road east to Chloride City, and approximately 1 mile both north and south of Keane Wonder Mine. This includes the Keane Wonder Mine, Mill and spring, Cyty's Mill, and the Big Bell and King Midas mines. Considerations that led the National Park Service to close the area included unsafe mine openings, unstable ground, potential toxic waste, and collapsing structures associated with the Keane Wonder Mine and past gold extraction processes (National Park Service 2008a). This environmental assessment addresses the exposed mine openings and unstable ground associated with these openings.

The stability of the historic structures, including the tramway towers linking the upper and lower portions of the mine, will be addressed by the Keane Wonder Mine Aerial Tramway Stabilization project. Additionally, the National Park Service plans to sample and test waste present at the site to determine the presence and extent of any contamination. The National Park Service anticipates reopening this area to the public after these safety concerns have been addressed. As such, under alternative B, impact topics pertaining to public health and safety and visitor use were analyzed under the assumption that visitors would return to the Keane Wonder Mine complex.

Figure 5. Keane Wonder Mine Closure Area

Keane Wonder Mine Aerial Tramway Stabilization. The School of Engineering at the University of Vermont is collaborating with Death Valley National Park in a program of assessment, research, training, and stabilization of the aerial tramway structures at the Keane Wonder Mine. The National Park Service desires to repair structural damage to the 1.5-mile-long aerial tramway, and to that end has partnered with the University of Vermont in structural assessment, development of repair strategies, and repair implementation (University of Vermont 2009). Site work for the condition assessment was completed in the spring of 2009 and plans to commence the stabilization work are underway.

Contamination Remediation. The presence of mining-related contaminants is possible as a result of the previous mine operations and activities that took place at the Keane Wonder Mine. The presence and extent of possible contaminants is currently unknown. Death Valley National Park has plans to do sampling at the complex to identify what contaminants may be present and determine whether remediation is necessary. If contaminants are discovered at the complex a contamination remediation plan would be developed.

RESOURCE IMPAIRMENT

In addition to determining the environmental consequences of the no action and preferred alternatives, *Management Policies 2006* (National Park Service 2006) and Director's Order #12 and Handbook(National Park Service 2001) require analysis of potential effects to determine if actions would impair resources in the park.

An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would more likely constitute impairment where it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- Identified as a goal in the park's general management plan or other relevant National Park Service planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated (National Park Service 2006).

The potential for impairment was estimated by qualitatively applying the three criteria listed above as required by National Park Service guidelines and policies (National Park Service 2001 and 2006). Professional judgment and available information on the baseline conditions and features of the alternatives were relied on to determine whether there would be resource impairment to the parks cultural or natural resources. Public health and safety and visitor experience are not considered park resources and are therefore not analyzed for impairment.

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the National Park Service applies a standard that offers greater assurance that impairment will not occur. The National Park Service does this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable in a particular park's environment. Unlike impairment analysis, unacceptable impact determinations are made for all impact topics. For the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would:

- Be inconsistent with a park's purposes or values; or
- Impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process; or
- Create an unsafe or unhealthful environment for visitors or employees; or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values; or
- Unreasonably interfere with park programs or activities; or
    - An appropriate use; or
    - The atmosphere

PUBLIC HEALTH AND SAFETY

AFFECTED ENVIRONMENT

Death Valley National Park is responsible for maintaining safe conditions that protect the health and safety of employees and the public in the park. Statutory and regulatory provisions applicable to units of the National Park Service require the park to not only provide safe facilities, utilities, and grounds in the park, but also promote safety in park program and project operations (section 8.2.5 in *Management Policies 2006*). Under the establishment of the NPS Geologic Resources Division Abandoned Mine Land program in 1984, the National Park Service is conducting a comprehensive inventory of all abandoned mine land sites in the park to serve as the basis for future planning and reclamation program implementation. The program goals include elimination of physical safety hazards and hazardous materials; mitigation of adverse environmental impacts to park resources; protection of important wildlife habitat such as bat habitat; and the preservation of historic and cultural resources. Additionally, the U.S. Department of Interior Office of Inspector General Audit Report on Abandoned Mine Lands in the Department of Interior (Office of Inspector General 2008) identified the need to address abandoned mines and associated risks to visitors in the National Park Service.

Mine hazards identified by the National Park Service (National Park Service 2007) and present at the Keane Wonder Mine complex include the following:

- Vertical Mine Shafts – Keane Wonder Mine has numerous open shafts. Falling down vertical mine shafts is the most common cause of death and injury in abandoned mines (National Park Service 2007). Loose debris, hidden edges, and false floors can hide shafts.
- Deadly Gases and Oxygen Deficiency - Lethal concentrations of methane, carbon monoxide, carbon dioxide, and hydrogen sulfide can accumulate in underground passages. Pockets of still air with little or no oxygen can be encountered.
- Cave-Ins - Mines can cave in at any time. The effects of blasting and weathering destabilize once-competent bedrock through time.
- Unsafe Structures - Support timbers, ladders, cabins, pump jacks, tanks, and other related structures may seem safe but can easily crumble under a person's weight.
- Unstable Explosives - Unused or misfired explosives are deadly. Because old explosives become unstable, minimal vibrations from a touch or footfall can trigger an explosion.
- Water Hazards - Many abandoned mines become flooded. A shallow water table at lower Keane Wonder Mine has caused some shafts to fill with water. Shallow water can conceal sharp objects, drop-offs, and other hazards.
- Designed for the Short-Term - Mines were constructed and maintained to be safe only while they were in operation. When the miners departed, they often left shafts uncovered and removed the water pumping and ventilation systems. Support structures, timbers, and ore pillars were sometimes removed or left to rot.
- Rescues - Mine rescues are extremely hazardous. Mine rescue teams, despite their extensive training, are at risk every time they enter an abandoned mine. The tragic and unfortunate reality is that most mine rescues turn into body recoveries.

In 1984 a visitor fell 30 feet down an open mine shaft in the upper portion of the Keane Wonder Mine and died from massive head injuries (Office of Inspector General 2008). The 2008 Department of Interior Audit Report found that NPS' visitor literature advertised the abandoned site and the National Park Service had signs directing visitors to the area, which had a visitor parking lot. The National Park Service did install a steel net across the opening after the death at Keane Wonder Mine, but it had since been vandalized and other nearby openings had no fences or signs (Office of Inspector General 2008). Death Valley has no other reported fatalities or inju-

ries associated with mine openings (Manning 2009). Nonetheless, hazards at mine openings are well documented and there are likely incidents that go unreported.

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following threshold definitions of impact intensity are used in the analysis of effects on public health and safety:

Negligible: Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health or safety.

Minor: The effect would be detectable, but would not have an appreciable effect on public health and safety. If mitigation were needed, it would be relatively simple and likely successful.

Moderate: The effect would be readily apparent, and would result in substantial, noticeable effects on public health and safety on a local scale. Changes in rates of accidents or injuries could be measured. Mitigation measures would probably be necessary and would likely be successful.

Major: The effects would be readily apparent, and would result in substantial, noticeable effects on public health and safety in the park and in the two counties around the park. Effects could lead to changes in the rate of mortality. Extensive mitigation measures would be needed, and their success would not be assured.

Beneficial Effects: Beneficial effects would reduce the potential for accidents and limit hazard exposure.

Short-Term: Occurs only during project implementation.

Long-Term: Persists beyond the period of the project implementation.

Impacts of Alternative A: No Action

Under the no action alternative, the Keane Wonder Mine complex would continue to be closed to visitors. Additional safety installations would be implemented as funding became available, but the timing and number of openings to be addressed during a specific period would vary according to funding amounts and details. These safety installations would be accomplished under a continuation of current management and would not be part of the proposed action. Existing mine safety installations would be retained. Because of the current closed status of the complex, the likelihood of a mine-opening-related accident would be relatively low and would be restricted primarily to staff and those visitors who enter the area and mine openings despite the closure. The consequences of such accidents pose a risk from a health and safety perspective because of the magnitude of danger at mine openings, the remote location of the mine openings, and the risks associated with rescue. As a result, the no action alternative would have a long-term, moderate, adverse effect on public health and safety.

Cumulative Effects. The effects of past, present, and reasonably foreseeable future actions, including the projects identified in the section titled "Cumulative Impact Analysis Methods," would generally have beneficial effects on public health and safety, despite the closed status of the area. The other abandoned mine lands safety activities implemented in the past and expected to continue as funding becomes available would have beneficial effects on health and safety under the no action alternative. Additionally, the stabilization of the historic tramway and the contamination remediation, if necessary, at the complex would contribute to beneficial effects by reducing safety risks.

The relatively small incremental contribution of alternative A, which would not implement the large-scale safety installations proposed in alternative B, would combine with the effects of other plans and actions to result in a long-term, minor, adverse, cumulative effect.

Conclusions. Under the no action alternative, the threat to visitor safety would continue to be similar to existing conditions and would pose a long-term, moderate, adverse effect on public health and safety. There would be long-term, minor, adverse cumulative impacts, and alternative A would contribute a small adverse increment to cumulative impacts.

Impacts of Alternative B: Abandoned Mine Lands Safety Installations

Under alternative B, mine safety installations would be installed at the Keane Wonder Mine complex using a variety of techniques tailored to each mine site, based on the previously described considerations.

Details of the individual techniques are presented in the alternatives section. The following is a summary of the estimated effects of each treatment on public health and safety.

The proposed action would be limited to mine openings deemed to be unsafe and potentially dangerous by the National Park Service. Prior to implementation of a mine safety installation treatment, each mine would be evaluated to determine the stability of the opening and condition, and where possible, would be left intact to facilitate visitor understanding of the features and historical conditions.

Under the proposed action, mine safety installation techniques would be applied to additional abandoned mine openings. The objective of implementing these measures would be to prevent or minimize visitor access to open shafts, unstable adits, and/or other dangerous features. The treatments applied at a specific opening would be intended to protect visitors while maintaining the cultural and physical integrity of the site. Considerations for selecting the preferred safety installation method at a site would include visitor safety risk; geologic stability; method effectiveness; amount of public access and use; treatment cost; whether the opening is used by wildlife and bats; and existing strength and integrity of mine features such as timber framing and head frames.

All techniques would effectively prevent visitors from entering dangerous mine openings in different ways:

Fencing. Temporary fencing could be employed at mine openings scheduled to be addressed by one of the other available safety installation techniques. Temporary fencing would protect visitors from entering dangerous openings such as shafts or adits. The fences would be removed once the final mine safety installation technique was applied. Temporary fencing would represent a short-term, beneficial effect because safety risks would be reduced.

Permanent fences would permanently restrict access to mine openings, which would reduce risks to human health and safety over the long term and represent a beneficial effect.

Other Mine Safety Installation Techniques. Other opening mine safety installation techniques would include bat gates, nets, screens, grates, and cupolas, polyurethane foam installations covered with backfill, backfill alone, and combination applications of the above methods to treat complex situations. All of these measures would have similar beneficial effects on public health and safety in that they would result in permanent access restrictions to mine openings and would reduce risks to human health and safety. Because all the other techniques accomplish the same basic objective, they would all have similar effects on public health and safety. Mine safety installations would result in:

- Holes filled or barricaded that staff or visitors might otherwise stumble into;
- Decayed timbers that are barricaded or replaced that might otherwise lead to staff and visitor accidents if the timbers failed while being climbed on; and

- Barricaded openings to prevent staff and visitors from entering tunnels that might contain toxic gases or other hazards.

Alternative B would have a long-term, beneficial effect on public health and safety by reducing risks to human health and safety caused by the continued existence of openings in abandoned mines.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." The proposed stabilization of the historic tramway and the potential contamination remediation at the Keane Wonder Mine complex, combined with the mine safety installations, would improve visitor protection and allow for the complex to reopen to the public. Previous mine safety installations would contribute to beneficial effects by improving NPS visitor protection and by reducing safety risks at mine openings. Under alternative B, mine safety installations would benefit public health and safety because risks posed at mine openings would be decreased. The additional improvements to public health and safety associated with alternative B would incrementally add to safety at the complex and would grow over time as more mine safety treatments were installed. The effects of alternative B, combined with the effects of other plans and actions, would have a beneficial cumulative effect because all of the actions collectively would either directly or indirectly enhance public health and safety.

Conclusions. Alternative B would have a long-term, beneficial effect on public health and safety by reducing risks caused by the continued existence of abandoned mine openings. The effects of alternative B, combined with the effects of other plans and actions, would have a long-term, beneficial cumulative effect because all of the actions would either directly or indirectly enhance public health and safety. Alternative B would add a substantial and measurable beneficial increment to cumulative impacts.

VISITOR EXPERIENCE

AFFECTED ENVIRONMENT

Prior to the recent closure of the Keane Wonder Mine complex, the area attracted visitors curious about the Keane Wonder mining legacy. The remaining trails, mining features, and structures enabled visitors to experience a glimpse into one element of the park's historic past. Visitor use and experience in the complex was consistent with the park as a whole. The following excerpt is from the park's general management plan (National Park Service 2002):

> "Death Valley National Park has long provided recreational opportunities for people from all over the world. Its nearness to major population centers such as Los Angeles and Las Vegas, combined with major interstate highways, gives residents the opportunity for relatively easy access to many parts of the desert. Early miners and ranchers developed roads that today offer visitors a chance to drive into many remote locations where informal camping has traditionally occurred. The many roadless areas offer hikers the experience to explore. There are many cultural sites such as abandoned mining districts that many people love to visit. The land has many extremes and contrasts which people come to experience, such as the high summer temperatures. Most visitors come to the desert simply to see the outstanding scenery of this diverse landscape."

Ascending the Keane Wonder Mine trail to the upper mine area also enabled visitors to get above the valley floor and enjoy the dynamic scenery of the valley. According to the park's general management plan (National Park Service 2002), the park's scenic attributes include panoramas of salt flats, sand dunes, rugged canyons, and mountain ranges, and are enhanced by the relatively clean air and absence of large-scale developments.

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on visitor experience:

Negligible: Changes in visitor use and the quality or nature of the visitor experience would not occur as a result of mine safety installations. There would be no noticeable changes in visitor experience or in defined indicators of visitor satisfaction or behavior, which include the ability to participate in sightseeing, nature study, hiking, and visiting historic sites.

Minor: Changes in visitor experience would be small but detectable. Visitors could be aware of the effects, but the changes would not appreciably alter important characteristics of the visitor experience or visitor satisfaction.

Moderate: Some changes in important characteristics (including the ability to participate in sightseeing, nature study, hiking, and visiting historic sites) of the experience in the area as a result of mine safety installations would be readily apparent, or the number of visitors engaging in an activity or in the use of areas in the Keane Wonder Mine complex would be substantially altered in comparison to historical trends. Most visitors would be aware of changes, and many would be able to express an opinion regarding the difference. Visitor satisfaction would change as a result of the mine safety installation of mine openings.

Major: Changes in multiple important characteristics (including the ability to view and explore abandoned mine sites, and to participate in sightseeing, nature study, hiking, and visiting historic sites) of the desired experience as a result of mine safety installations would be readily appar-

ent. Most visitors would be aware of the effects and would likely express a strong opinion about the changes. Participation in desired experiences or in Keane Wonder Mine visitation would be considerably altered, and would result in substantial changes in the defined indicators of visitor satisfaction or behavior.

Beneficial Effects: Mine safety installations would have demonstrable beneficial effects on visitor experience, including, but not limited to, a better understanding of the historical conditions and demands associated with mining, the ability to view and explore abandoned mine sites, to view and experience scenery and wildlife, and to experience solitude or quiet.

Short-Term: Effects of mine safety installations on visitor enjoyment and recreational or educational opportunities would be associated with the construction period of the treatment. The effect would end concurrently with or shortly after the end of the construction period.

Long-Term: Effects of mine safety installations on visitor enjoyment and recreational or educational opportunities would be evident for a period exceeding five years.

Impacts of Alternative A: No Action

Under the no action alternative, additional mine safety installations would be implemented as funding became available, but the timing and number of openings to be treated during a specific period would vary according to funding amounts and details. These safety installations would occur under a continuation of current management and would not be part of the proposed action. Existing mine safety installations would be retained. The Keane Wonder Mine complex would continue to be closed to visitors, including those who place a high value on entering and investigating unclosed mines, and those that may choose to simply hike in the area and not go near the abandoned mines. The number of visitors interested in seeing open mine sites would increase as interest in these park features increases (Office of the Inspector General 2008). Because the complex would remain closed to visitors, the effects would be long-term, moderate, and adverse on visitors who wanted to recreate in the area of the Keane Wonder Mine complex. Effects on other park visitors would be negligible.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." The other abandoned mine lands safety activities implemented in the past and expected to continue as funding became available would have a long-term, minor, adverse effect on the experience of visitors who place a high value on the ability to have uncontrolled access to these sites, despite the danger to human safety. Although the Keane Wonder Mine complex would remain closed to visitors, the effects of the proposed stabilization of the historic tramway and contamination remediation would have cumulative beneficial effects on visitor experience because staff and visitor protection would improve while the mining landscape would be retained and available to provide visitor experiences. Cumulative effects from the past, current, and reasonably foreseeable future projects, when combined with the long-term, moderate, adverse impacts of this alternative, would result in long-term, minor, adverse, effects on visitor experience.

Conclusions. The no action alternative would have a long-term, moderate, adverse effect on the experience of visitors who place a high value on the ability to have open access to these sites, primarily because the complex would remain closed to the public. Effects on other park visitors would be negligible. Cumulative effects would be long-term, minor, and adverse.

Impacts of Alternative B: Abandoned Mine Lands Safety Installations

The impacts on visitor use and experience of installing mine safety treatments at the Keane Wonder Mine complex would vary, depending on the preferences and interests of individual users. Under the proposed action, most mine and mining camp features at the complex would

be left in place for visitors to enjoy and experience. There would be little or no change in the ability of visitors to participate in sightseeing, nature study, hiking, and viewing of historic sites.

The proposed action would be limited to mine openings that are deemed to be unsafe and potentially dangerous by the National Park Service. Prior to implementation of a mine safety installation, slope stability around each opening would be assessed and when needed, input would be obtained from geologists, mine engineers, and structural engineers to determine the most effective solution for installing an appropriate mine safety installation to accommodate unstable slopes in the safest manner. Where possible, features would be left intact to facilitate visitor understanding of the mine feature and historical conditions. At selected sites, structural integrity of historic structures would be preserved to enhance visitor understanding and appreciation of mine operations and working conditions.

Improved interpretation would be provided, which would provide visitors with the opportunity to learn more about the history of the site and the benefits provided by the safety installations to special-status species and other forms of wildlife. Improved interpretation would be a long-term, beneficial impact.

Under the proposed action, a variety of mine safety installation techniques would be applied to additional abandoned mine openings. The objective of implementing these measures would be to prevent or minimize visitor access to open shafts, unstable adits, and/or other dangerous features. The treatments applied at a specific opening are intended to protect visitor safety while maintaining the cultural and physical integrity of the site. Considerations for selecting the preferred treatment method at a given site include visitor safety risk, site geologic stability, method effectiveness, amount of public access and use, treatment cost, opening use by wildlife and bats, and existing strength and integrity of mine features such as timber framing and head frames.

All the techniques would effectively prevent visitors from entering dangerous mine openings in different ways but would still allow visitors the ability to participate in sightseeing, nature study/hiking, and visiting historic sites. Each type of mine safety installation technique would have the following additional types of effects on visitor experience:

Fencing. The physical appearance of a mine opening would be changed by the presence of permanent or temporary fences, as compared with the original mine openings. Visitors could still view mine openings from a relatively close distance, and would be able to view well into the depths of a mine opening, but would not be able to physically enter the feature. This would allow visitors to safely view and appreciate the historical values of the mines and surrounding mine camp or other historical features from a reasonably close distance. To minimize adverse visual effects on visitor experience caused by fencing, naturally colored fences and fence supports that match the desert soil and vegetation would be used, based on the location of the fence in relation to individual site features. Temporary and permanent fencing would have long-term, minor, adverse effects on visitor experience at the Keane Wonder Mine complex because these treatments would prevent some visitors from having full access to the openings.

Bat Gates, Screens, Grates, and Cupolas. These structures would change the visitor experience by altering the physical appearance of the mine opening by partially blocking or limiting the view into the opening. Placement of these types of structures outside an abandoned mine opening would also permanently alter the historical appearance of the feature. However, visitors would still be able to see into the interior areas of the mine features by looking through the approximately 6-inch openings in the bate gates, nets, or cupolas. These types of structures are highly visible to the public and are obviously modern changes that affect the physical appearance of the mining site. In situations where external frames or other structures are still intact, and where other features make it suitable, sunken bat gates would be employed. This would allow the external historical appearance of a mine opening to be preserved and provide a safe viewing experience for visitors. Because the historical structures are retained rather than removed or hidden, the visitor would still experience the nature and character of the mine camp

or mine site conditions. Even with safety installations in place, the visitor could still see and appreciate the miner's construction activities and techniques for mining minerals in the desert environment. In addition to these types of effects, bat gates, nets, and cupolas would allow visitors to learn about bat conservation, bat ecology, and management of bats. If a bate gate or cupola featured access openings for owls, visitors would be provided with an opportunity to learn about and appreciate other species and wildlife that use mine openings and caves.

Grates and screens have a smaller mesh diameter than bat gates or cupolas and would further restrict the visitor's view into a mine opening. The effects on visitor experience would otherwise be similar to those resulting from bat gates.

Bat gates, screens, nets, grates, and cupolas would have long-term, minor, adverse effects on visitor experience at the Keane Wonder Mine complex because these treatments would prevent some visitors from having full access to the openings.

Polyurethane Foam with Backfill. Foam plugs are typically used in areas where there is a high safety risk. Application of this treatment technique would result in complete filling of a mine opening with the foam and above that, several feet of dirt fill. This would permanently eliminate the visitor's view into the affected mine opening. Because the historical structures are hidden, the visitor would not be able to experience the nature and character of the mine opening. However, the visitor would still be able to appreciate the nature and character of the camp or mine site conditions. Polyurethane foam/backfill would have long-term, minor, adverse effects on visitor experience at the complex because these treatments would prevent some visitors from having full access to the openings.

Backfill Alone. The effect of backfill as a mine safety installation technique on visitor experience would be similar to those resulting from foam plugs. Backfill would have long-term, minor, adverse effects on visitor experience at the complex because these treatments would prevent some visitors from having full access to the sites.

Combination Applications. This approach would include using two or more methods to treat a mine opening. Combined techniques could include, for example, using a horizontal gate with a bat cupola to restrict human access to a mine shaft while allowing bat use of the mine opening. Similar to bat gates and cupolas, combined treatment structures are highly visible to the public and obviously modern changes that affect the physical appearance of the mining site. However, because the historical structures are retained rather than removed or hidden, the visitor can still experience the nature and character of the mine camp or mine site conditions. Similar to bat gates and cupolas, the visitor can still see and appreciate the miner's construction activities and techniques for mining minerals in the desert environment, even though some mine site features are affected by safety installation activities. Combined methods to treat complex situations would have long-term, minor, adverse effects on visitor experience at the complex because the combined treatments would prevent some visitors from having full access to the openings.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." The proposed stabilization of the historic tramway and the contamination remediation at the Keane Wonder Mine complex, combined with the mine safety installations, would improve visitor experience and allow for the area to reopen to the public, which would be perceived as a beneficial impact by most visitors. Visitors who value having open access to mine sites would experience long-term, minor, adverse effects from the cumulative actions because mine access opportunities continue to be lost on public lands.

Conclusions. Alternative B would have a long-term, minor, adverse impact on the experience of some visitors because treatments would prevent them from having full access to the mine openings. Improved interpretation would provide a long-term, beneficial impact. The effects of alternative B would substantially contribute to a cumulative, long-term, beneficial impact that would result from the ability to reopen the Keane Wonder Mine complex to visitors.

SPECIAL-STATUS SPECIES

AFFECTED ENVIRONMENT

Three animal species occurring in the main portion of Death Valley National Park are listed as endangered or threatened by the U. S. Fish and Wildlife Service. These species and their status at the Keane Wonder Mine complex are as follows (National Park Service 2008b):

- Desert tortoise (*Gopherus agassizii*): the threatened desert tortoise inhabits a variety of habitats from sandy flats to rocky foothills, including alluvial fans, washes, and canyons where suitable soil for den construction might be found. Desert tortoise habitat is not present at the Keane Wonder Mine complex.
- Southwestern willow flycatcher (*Empidonax traillii extimus*): the endangered southwestern willow flycatcher, a subspecies of the willow flycatcher, is found in riparian areas throughout the park. However, riparian areas do not occur at the Keane Wonder Mine complex.
- Least Bell's vireo (*Vireo bellii pusillus*) the endangered least Bell's vireo had historical habitat in Death Valley National Park. However, there is no habitat to support this species at the complex.

The park does not include any designated critical habitat for the desert tortoise, the least Bell's vireo, or the southwestern willow flycatcher.

Death Valley National Park contains two federally listed plant species, the Eureka Dunes evening primrose (*Oenothera californica* ssp. *eurekensis*) and Eureka Valley dunegrass (*Swallenia alexandrae*.) Neither of these species are known to occur at the complex (National Park Service 2002).

Five additional park species are listed as threatened, endangered, or species of concern by the State of California Department of Fish and Game and could potentially occur in Death Valley National Park. These species include Swainson's hawk (*Buteo swainsoni*), the peregrine falcon (*Falco peregrinus*), the bank swallow (*Riparia riparia*), the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and the Mojave ground squirrel (*Spermophilus mohavensis*). There are two confirmed sightings of a Mojave ground squirrel in the park, one in the northern portion of Panamint Valley and a second trapped at Lee Flat on the extreme western side of the park. None of these species have habitats that occur at the complex. Therefore, they would not be affected by any proposed mine safety installations.

In addition to a variety of small mammals, abandoned underground mines provide habitat for bats. Death Valley is home to 12 bat species that could potentially occur at the Keane Wonder Mine complex. A recent park survey indicates that seven of these species are present at sites throughout the park, including the complex. The remaining five species may potentially occur in abandoned underground mines, although there are currently no known occurrences. Of these 12 bat species, seven are listed as Species of Special Concern by the California Department of Fish and Game. All 12 bat species that use mine habitat in the park are addressed in this section because they use similar habitats and would be affected equally by any proposed mine safety installations.

Mines are important to bats because their natural roosting habitats have been greatly reduced in the past 100 years as a result of loss of traditional roost trees, "human disturbance of caves, cave commercialization, deforestation, and urban and agricultural developments (Tuttle and Taylor 1998). Bats have also lost traditional roosts in old tree hollows because of logging activities (Tuttle and Taylor 1998). Once a mine has been used by bats, they may also be so "instinctually committed to certain sites that they cannot change roosts in the time permitted by current rates of mine closure" (Tuttle and Taylor 1998).

Increasing numbers of bat populations are using abandoned mine workings as roosting sites (National Park Service no date). Abandoned mines at the Keane Wonder Mine complex and elsewhere provide habitat less likely to be disturbed by light, noise, and predators and as such, provide usable roosting areas for bat populations otherwise displaced from their natural sites. Mines are also used for social encounters and eating of prey. Although some sites tend to be used as either hibernacula or maternity roosts, bats use mines, especially complex mines, as both. The loss of any one of these types of sites can affect a multi-state region, eliminating many summer colonies of bats over thousands of square miles (Tuttle and Taylor 1998).

Table 6 identifies the special-status species and other bats with the potential to occur at the Keane Wonder Mine complex.

Table 6
Special-Status Species (and Non-Listed Bat Species) Potentially Occurring at Abandoned Mine Sites in the Keane Wonder Mine Complex

Common Name	Scientific Name	Status[1]	Designated Critical Habitat
California leaf-nosed bat	*Macrotus californicus*	SSC	None in Death Valley National Park
Yuma myotis	*Myotis yumanensi*	None	Not applicable for this species
Long-eared myotis	*Myotis evotis*	None	Not applicable for this species
Fringed myotis	*Myotis thysanodes*	None	Not applicable for this species
Long-legged myotis	*Myotis volans*	None	Not applicable for this species
California myotis	*Myotis californicus*	None	Not applicable for this species
Small-footed myotis	*Myotis ciliolabrum*	None	Not applicable for this species
Western parastrelle (canyon bat)	*Parastrellus hesperus*	None	Not applicable for this species
Big brown bat	*Eptesicus fuscus*	None	Not applicable for this species
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC	None in Death Valley National Park
Pallid bat	*Antrozous pallidus*	SSC	None in Death Valley National Park
Mexican free-tailed bat	*Tadarida brasiliensis*	None	Not applicable for this species

Key to status: SSC = California Species of Special Concern

[1]California Department of Fish and Game. 2009. Special Animals List. Available on the Internet: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf. July.

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on special-status species:

Negligible: Listed species and bats, regardless of their status, and their habitats would not be affected or the effects to an individual of a listed species or its designated critical habitat would be at or below the level of detection. Effects would not be measurable or of perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in U.S. Fish and Wildlife Service terms.

Minor: The action would result in detectable effects to an individual (or individuals) of a listed species and bats, regardless of their status, or their critical habitat, but the effects would not result in population-level changes with measurable long-term effects on species, habitats, or natural processes sustaining them. Minor effects would equate with a "may affect/not likely to adversely affect" determination in U.S. Fish and Wildlife Service terms.

Moderate: An action would result in detectable effects on individuals or population of a listed species and bats, regardless of their status, their critical habitat, or the natural processes sustaining them. Key ecosystem processes may experience disruptions that may result in population or habitat condition fluctuations that would be outside the range of natural variation. Moderate level adverse effects would equate with a "may affect / likely to adversely affect / adversely modify critical habitat" determination in U.S. Fish and Wildlife Service terms.

Major: Individuals or the population of a listed species and bats, regardless of their status, their critical habitat, or the natural processes sustaining them would be measurably affected. Key ecosystem processes might be permanently altered resulting in long-term changes in population numbers and permanently modifying critical habitat. Major adverse effects would equate with a "is likely to jeopardize the continued existence of a listed species / adversely modify critical habitat" determination in U.S. Fish and Wildlife Service terms.

Beneficial Effects: Beneficial effects are likely to protect or restore the abundance and distribution of special-status species and bats, regardless of their status. This could occur through increased survival, reproduction, or availability of habitat or required resources.

Short-term (state species and bats regardless of status): Effects last less than one year

Long-term (state species and bats regardless of status): Effects last longer than one year

Impacts of Alternative A: No Action

There are few undisturbed natural resources that support special-status wildlife species or their habitat at the Keane Wonder Mine complex. There is little or no existing vegetation at the openings, and soil at the mine opening sites has been disturbed, denuded of vegetation, and compacted by decades of use and visitation. Water is typically absent, but sometimes found in the form of standing water in abandoned mine shafts where the water table is high or intermittent immediately following rains. Typical habitat conditions are illustrated in figure 6. As a result of the conditions at the mine, the use of mine openings by special-status species is limited primarily to bat species. Open mines provide bats with a variety of habitat for roosting, security cover, and/or reproductive purposes.

Under the no action alternative, the complex would remain closed to visitors. Existing mine safety installations would be retained. Additional safety installations would be implemented as funding became available, but the timing and number of openings treated would depend on funding amounts.

The impact of alternative A on bat populations would be long-term, negligible and adverse. This would occur because of a continued low potential for human presence and associated disturbance in open mines that are used by bats for roosting, hibernation, or as maternity colonies, despite the current closure status at the Keane Wonder Mine complex.

Cumulative Effects. The effects of past, present, and reasonably foreseeable future actions, including the projects identified in the section titled "Cumulative Impact Analysis Methods," would generally have minor adverse effects on special-status species.

Under the no action alternative, other abandoned mine lands safety activities implemented in the past and expected to continue as funding becomes available would have both short-term, negligible to minor, adverse effects during construction, and long-term, beneficial effects on special-status species as a result of decreased human presence in the mines. Construction activities from the stabilization of the historic tramway and the contamination remediation activities at the Keane Wonder Mine complex would result in short-term, minor adverse impacts to special-status species. Contamination remediation would contribute to long-term, beneficial effects because habitat would be restored. Although the incremental effects of alternative A would be adverse, their negligible intensity would combine with the effects of other plans and actions to produce long-term, beneficial cumulative effect on special-status species.

Conclusions. The impact of alternative A on special-status species would be long-term, negligible and because of the continued low potential for human presence and associated disturbance in open mines that are used by bats for roosting, hibernation, or as maternity colonies. Cumulative effects of the no action alternative on bats would be long-term and beneficial. The no action alternative would add a negligible adverse increment to overall cumulative effects.

Impacts of Alternative B: Abandoned Mine Land Safety Installations

Under alternative B, additional mine safety installations would be implemented at the Keane Wonder Mine complex. Details of the individual techniques are presented in the alternatives section.

The analysis that follows is based on the assumption that the primary value of abandoned mines is the habitat provided inside the mines and that the terrestrial habitat in the immediate area outside the mine openings is typically highly disturbed. There is little or no existing vegetation that would be affected by any of the safety installation treatments at the openings, and soil at the mine opening sites has been disturbed, denuded of vegetation, and compacted by decades of use and visitation. Water is typically absent, although sometimes found in abandoned mine shafts where the water table is high or intermittent immediately following rains. Typical habitat conditions are illustrated in figure 6. As a result, the use of mine openings at the Keane Wonder Mine complex by special-status species is limited primarily to bat species.

Figure 6. Typical Habitat Conditions Found near Mine Openings.

For those bat species that use the adits, shafts, tunnels, and other mine features present at the Keane Wonder Mine complex, installation of mine safety installations can potentially restrict access to these habitat elements. Mitigation measures have been developed to minimize and offset impacts of restricting access to openings by special-status species and are included in the evaluations of each of the treatment categories below.

Fencing. Under alternative B, temporary and permanent fencing would be installed at selected mine openings at the Keane Wonder Mine complex to provide for improved staff and visitor safety. Fencing, whether temporary or permanent, serves as a barrier that prevents access to mine openings by park visitors and staff. As such, the constraints on special-status species access associated with fencing, particularly for bats, are not as rigorous as treatment methods that physically block an opening. Generally, fencing would be installed to restrict human access to

potentially dangerous vertical mine shafts, particularly those with steeply sloped entries that can act as funnels to draw unsuspecting visitors over the brink or to make visitors aware that a potentially dangerous situation is present. Fences would not affect bat access to shafts and, therefore, the impacts of fencing mine openings on special-status species would be negligible.

Bat Gates, Screens, Nets, Grates, and Cupolas. Bat gates, screens, nets, grates, and cupolas, can all be used to treat mine openings where bat use is documented or suspected. The impacts of mine safety installations on bats have been researched extensively (Vories and Throgmorton 2002; Sherwin *et al*. 2009), and the mine safety installation technique selected would rely on the findings of this research to minimize the effects on bats and other wildlife. Each mine opening to be treated would be evaluated using the bat inventory data collected by the National Park Service and the most appropriate mine safety installation technique would be selected to ensure this use is sustained with minimal adverse effects.

Potential adverse impacts on bats would be related to the selected mine safety installation technique, the number of bats using a particular opening, and whether the mine use is for roosting, hibernating, or maternity purposes. The type of structure selected would also determine the effects on bats. For example, grates and screens are fine mesh structures that do not allow passage of bats. The decision to install a grate or screen is based on numerous factors, including use of the mine by bats. A recently completed bat survey, completed by the National Park Service, would be consulted before any mine safety installations were installed at a particular mine opening. Grates and screens could be combined with other treatment techniques (for example, a grate atop a cupola) that allow bat access in the case of mines where bat use is substantial. This would minimize the possibility that the structures would adversely affect bats.

There could be short-term, adverse, impacts on bats (likely measured in terms of a few weeks at most) associated with construction of these types of treatments. Impacts associated with construction of the safety installations would be offset by timing the actions to take place outside reproductive or sensitive portions of species' life cycles.

The exclusion of humans from mines following treatment of openings would have a beneficial effect, as disturbance to roosting or hibernating bats would be eliminated. Beneficial effects for bats would also occur as a result of continuing access to the mine. Beneficial effects may include prevention of public use during maternity or hibernation times and potentially limiting the potential for introducing White Nose Syndrome (a fungal disease) to any bats using a feature with a bat-compatible safety installation. However, where data indicate potential presence of a partic

return and be trapped. To ensure no bats remain prior to closures on those openings where a presence of remaining individuals is unknown or suspected, an internal survey would be completed immediately prior to construction. Closures would be implemented outside the breeding seasons as another measure to ensure that no reproducing individuals were harmed. Early fall installations would best ensure a window for bats to find alternate hibernacula and give females a full spring season to locate alternate maternity sites (Sherwin *et al.* 2009). The application of a foam plug closure would be determined by the availability of a nearby mine opening where displaced bats could relocate. Similarly, all openings to be sealed with foam would be surveyed for any wildlife, and any species found would be removed prior to treating the opening. As a result, the adverse effects of foam plugging on bats and other species would range from negligible to minor and long-term.

Backfill Alone. Backfilling mine openings would be primarily used to treat shallow prospects or mine openings and to restore pre-construction contours around structures that have been stabilized. Such mine features and openings offer little suitable habitat for bats. As illustrated in photo 3 in appendix A, post-construction backfilled areas are indistinguishable from the surrounding terrain and pre-construction conditions. As a result, backfilling would have negligible short-term adverse effects on special-status species. There could also be some negligible and temporary disturbance associated with the presence of safety installation crews and equipment.

Combination Applications. Complex mine openings, including stopes, glory holes, and especially large openings, may require that combinations of treatment techniques be employed to adequately restrict future human access, and protect safety. Combined treatments can be evaluated by assessing the effects of each individual treatment and assigning an intensity of effect based on the method with the greatest impact. This ensures a conservative evaluation.

For example, if horizontal netting, in combination with a vertical bat gate, were installed over an extensive, angled, open stope, the adverse effect of the combined treatment methods on wildlife would be forecast as minor because of the combined impacts of the gate and netting.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." Construction activities from the stabilization of the historic tramway and the potential contamination remediation activities at the Keane Wonder Mine complex would result in short-term, negligible to minor, adverse impacts to special-status species. Alternative B would incrementally add both negligible adverse and beneficial effects to these other actions. The negligible short-term adverse effects would be similar to the disturbance effects of the other plans and actions.

The incremental long-term beneficial contribution of alternative B as a result of protecting bat roosting, hibernating, and maternity sites from human disturbance would outweigh the short-term adverse impacts. Potential contamination remediation would contribute to long-term beneficial effects as a result of habitat restoration. Cumulative effects of implementing alternative B in conjunction with other actions would be long-term and beneficial for special-status species.

Conclusions.

Short-term, negligible to minor, adverse impacts on bats would be associated with construction of safety installations. Thereafter, the exclusion of humans from mines that remained open to bats would have a beneficial effect on bats. Long-term, negligible to minor, adverse, impacts could occur at mine openings that were permanently closed by foam plugs or backfill. Cumulative effects of implementing alternative B in conjunction with other actions would be long-term and beneficial for special-status species Alternative B would add a negligible adverse increment and a beneficial increment to overall cumulative effects.

WILDLIFE

AFFECTED ENVIRONMENT

Death Valley National Park has a surprising variety of wildlife species but densities are relatively low as a result of limited habitat. The types of wildlife found in Death Valley generally vary with elevation and are typically associated with plant communities. Large browsing mammals are found in mid to upper elevations where vegetation is more abundant, while the lower sparsely vegetated elevations provide more support for reptiles and small mammals. Many species in the park are limited in distribution to areas with permanent or ephemeral water, while other taxa, such as bighorn sheep and some bat species, depend on water sources on an intermittent but routine basis.

The Keane Wonder Mine complex does not contain any aboveground, permanent water sources and, subsequently, does not provide permanent habitat for many species. Wildlife species inhabiting the complex are typical of species inhabiting extreme desert habitats in the region and include a variety of reptiles, birds, bats, and terrestrial small mammals. Reptiles with the potential to occur in the Keane Wonder Mine area include the collared lizard (*Crotaphytus collaris*), southern desert horned lizard (*Phrynosoma platyrhinos calidiarum*), western leaf-nosed snake (*Phyllorhynchus decurtatus perkinsi*), and great basin gopher snake (*Pituophis catenifer deserticola*). Common avian species in the Keane Wonder Mine area include the turkey vulture (*Cathartes aura*) and red-tailed hawk (*Buteo jamaicensis*). Death Valley and other valleys in the park lie on long north-south axes east of the Sierra Nevada range and migratory birds are often channeled through the park. Many bat species have come to rely on abandoned mines for habitat as a result of habitat loss from urban development, deforestation, and recreational exploitation of caves (Burghardt 2000). Because impact analysis to all bat species, with or without special status, would be identical, all bat species are evaluated under the special-status species impact topic. Bighorn sheep (*Ovis canadensis nelsoni*) also use habitat at the Keane Wonder Mine complex. A recent survey by the park detected several species using mine openings in the park. The most common species documented on NPS surveys were barn owls, Say's phoebes, speckled rattlesnakes, desert woodrats, deer mice, big horn sheep, and ring-tailed cats. Less common but also present in mines were swallows, great horned and burrowing owls, spotted and striped skunks, bobcats, turkey vultures, coyotes, and badgers (Brown 2009).

ENVIRONMENTAL CONSEQUENCES

Impact Criteria and Thresholds

The following definitions of impact intensity are used in the analysis of effects on Wildlife:

Negligible: Mine safety installations would have no perceptible or measurable impacts on wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community.

Minor: Mine safety installations would have perceptible or measurable impacts to wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. However, the effects on wildlife would not have any substantial change on populations, communities, or ecosystems and would be in the range of natural variation.

Moderate: Mine safety installations would have a perceptible or measurable impact to wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. The effects could result in changes in survival rates of individuals, changes in quality or quantity of habitat, and/or relocation of individuals from or to

other habitats. Although there could be a temporary effect on populations, communities, or ecosystems, the changes would be in the range of natural variation.

Major: Mine safety installations would have a substantial permanent impact on wildlife species, including their habitats, the natural processes sustaining them, or the assemblage of species comprising their community. The effects could threaten the continued existence of a species' population in the Keane Wonder Mine complex. Changes in quality or quantity of habitat and/or relocation of individuals from or to other habitats could be irreversible. There could be a substantial effect on populations, communities, or ecosystems, and the changes would be outside the range of natural variation.

Beneficial Effects: Mine safety installations would have positive effects on wildlife and wildlife habitat, including, but not limited to, metrics such as survival, reproduction rates, recruitment rates, or improvements in habitat or community conditions.

Short-Term: The changes would have effects lasting less than one year or one breeding cycle.

Long-Term: The changes would have effects lasting longer than one year or one breeding cycle

Impacts of Alternative A: No Action

There are few undisturbed natural resources that support wildlife or wildlife habitat at the Keane Wonder Mine complex. There is little or no existing vegetation at the openings and soils at the mine opening sites have been disturbed, denuded of vegetation, and compacted by decades of use and visitation. Water is typically absent, but sometimes found in the form of standing water in abandoned mine shafts where the water table is high or intermittent immediately following rains. Typical habitat conditions are illustrated in figure 6 (see the Special-Status Species section). As a result of the conditions at the mine, the use of mine openings by wildlife is limited primarily to a small number of individual birds, owls, small mammals and reptiles, big horn sheep, and ring-tailed cats. The open mines provide these wildlife species with shelter from the extreme desert conditions present at the complex.

Under the no action alternative, the Keane Wonder Mine complex would remain closed to visitors. Additional safety installations would be implemented as funding became available, but the timing and number of openings to be treated during a specific period would vary according to funding amounts and details and existing mine safety installations would be retained. These safety installations would be accomplished under a continuation of current management and would not be part of the proposed action.

Except for flight-based species, wildlife would continue to be at risk of falling into unsecured features and sustaining injury or death. While individuals would die, there would be a negligible impact on wildlife populations. Effects on wildlife because of the low potential for human presence and associated disturbance would remain similar to existing conditions and would be long-term, negligible, and adverse to wildlife populations.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." Under the no action alternative, other abandoned mine lands safety activities implemented in the past and expected to continue as funding becomes available would have short-term, negligible to minor, adverse effects during construction, and long-term, beneficial effects on wildlife as a result of restricting human and wildlife activities in the mines. Construction activities from the stabilization of the historic tramway and the contamination remediation activities at the complex would result in short-term, minor adverse impacts to wildlife. The potential contamination remediation would contribute to long-term, beneficial effects as a result of habitat restoration.

Other past, present, and reasonably foreseeable future actions, in addition to the impacts of the no action alternative, would result in long-term, beneficial cumulative effects on wildlife. The no action alternative would contribute a negligible increment to cumulative impacts.

Conclusions. The impact of alternative A on wildlife populations would be a negligible, because individual animals would continue to be injured or killed by falling into mine features. Effects because of human presence and associated disturbance would be long-term, negligible, and adverse to wildlife populations. Cumulative impacts on wildlife would be long-term and beneficial, and the no action alternative would contribute a negligible increment to cumulative impacts.

Impacts of Alternative B: Abandoned Mine Lands Safety Installations

Under alternative B, additional mine safety installations would be implemented in the park. Details of the individual techniques are presented in the alternatives section.

There are few undisturbed natural resources that support wildlife or wildlife habitat at the existing mine openings. There is little or no existing vegetation that would be affected by any of the treatments at the openings. Soil at the mine opening sites has been disturbed, denuded of vegetation, and compacted by decades of use and visitation. Water is typically absent, although sometimes found in abandoned mine shafts where the water table is high or intermittent immediately following rains. Typical habitat conditions are illustrated in figure 6 (see the Special-Status Species section).

As a result, wildlife use at the mine openings is limited primarily to a small number of individual birds, owls, small mammals and reptiles, and bighorn sheep, and ring-tailed cats. The open mines provide these wildlife species with shelter from the extreme desert conditions present at the Keane Wonder Mine complex.

For those wildlife species that use the adits, shafts, tunnels, and other mine features, safety installations can potentially restrict access to this habitat element. Mitigation measures have been developed to minimize and offset treatment impacts to wildlife and are included in the evaluations of each of the treatment categories below.

Fencing. Fencing, whether temporary or permanent, provides a barrier that prevents access to mine openings by park visitors and staff. As such, the constraints on wildlife access associated with fencing, particularly for birds, are not as rigorous as treatment methods that physically block or close an opening. Generally, fencing would be installed to restrict human access to potentially dangerous vertical mine shafts, particularly those with steeply sloped entries that can act as funnels to draw unsuspecting visitors over the brink or to make visitors aware that a potentially dangerous situation is present. Fences would not affect avian access to shafts.

Barn owls prefer to enter mine shaft entrances from a low approach angle (National Park Service no date) and barriers such as an 8-foot-high, chain-link fence present obstacles to owl access. This can be addressed by installing horizontal perches at the highest fence level and lower perches near the shaft opening (see photo 5, appendix A). This allows the owl to maintain a low approach angle to the shaft, land on the high perch, and move to the lower perch prior to entering the shaft.

Based on the steep vertical nature of most mine shafts being considered for treatment by fencing, wildlife using the opening would be restricted to those species that could easily enter and exit this environment without injury. Fencing is generally used on openings with steeply sloped entries that can act as funnels to draw unsuspecting visitors or wildlife to the brink. For those species that cannot easily climb or fly to safety, the impact of fencing steep and vertical mine openings would be beneficial.

Other fencing, permanent or temporary, could have variable lower heights (that is, not extend to the ground, but be low enough to restrict human entry) or it could involve simple wire strands, which would allow wildlife to go under or through the fence. The fence would enclose a small area in the immediate vicinity of the mine opening. Because of the small areas typically involved and the ability to design fencing with mitigation measures that accommodate wildlife, the im-

pacts of fencing treatments on wildlife that use the mine openings would be long-term, negligible to minor, and adverse.

Bat Gates, Screens, Nets, Grates, and Cupolas. Bat gates, screens, nets, grates, and cupolas can all be used to treat mine openings where wildlife use is documented or suspected to occur. The impacts of mine safety installation methods on bats and other wildlife have been researched extensively (Vories and Throgmorton 2002; Sherwin *et al*. 2009) and the mine safety installation methods selected would rely on the findings of this research to minimize the effects of installations on wildlife. Each mine opening to be treated would be evaluated using the inventory data collected by the National Park Service and the most appropriate safety installation method would be selected to ensure this use is sustained with minimal adverse effects. For those mines that provide habitat for larger species that cannot go under or through a barricade, such as bighorn sheep, the gate, grate, cupola, or net could be set farther into the mine feature, still allowing the species to enter a portion of the opening.

As a result of selecting a treatment method that would least affect wildlife access, the impact to wildlife from the installation of bat gates, nets, grates, and cupolas would be long-term, negligible to minor and adverse.

There could be short-term impacts (likely measured in terms of a few weeks) associated with construction of the safety installation. The exclusion of any human presence in the mines following treatment of openings would have a beneficial effect on wildlife as disturbance would be eliminated. Beneficial effects would occur for those wildlife species that could continue to access the mine. Wildlife, if present or suspected, would be considered when deciding which treatment method to use. Where data indicate the potential presence of a particular species, the treatment method selected could incorporate mitigation measures to accommodate the species and adverse impacts would be long-term and negligible to minor.

Polyurethane Foam. The use of polyurethane foam to close mine openings would be selected for locations where no wildlife use was documented or expected. The use of foam would completely close the opening and typically would be accompanied by earthen backfill to protect the foam from ultraviolet degradation and disguise its unnatural appearance, thus blocking access to a mine opening completely. The foam is inset a few feet inside the mine opening and then covered with several feet of backfill material and reshaped to match the local terrain contours as much as practicable. Installation is usually completed in one day. The decision to use foam would generally be based on the absence of wildlife, thus the impacts on wildlife, although long-term, would be negligible, because no regular species' use would be affected. The only potential impact would be the loss of the mine opening as a future potential habitat. In the event of uncertainty of wildlife use of a mine opening, the use of any technique that would completely eliminate access would only be implemented following steps to ensure the absence of wildlife at the time of construction. Closure actions would be taken following exclusion actions to evacuate wildlife. Implementing these approaches would result in long-term, negligible effects on wildlife.

Backfill. Backfilling mine openings would be primarily used to treat shallow prospects or mine openings, and to restore pre-construction contours around structures that have been stabilized. Such mine features and openings offer little suitable habitat for wildlife. As illustrated in appendix A, post-construction backfilled areas are indistinguishable from the surrounding terrain and pre-construction conditions. As a result, backfilling would have negligible short-term adverse effects on wildlife. There could also be some negligible and temporary disturbance associated with the presence of treatment crews and equipment.

Combination Applications. Complex mine openings, including stopes, glory holes, and especially large openings, may require that combinations of techniques be employed to adequately restrict human access and protect safety. Combined treatments can be evaluated by assessing the effects of each of the individual treatments and assigning an intensity of effect based on the method that has the greatest impact. This ensures a conservative evaluation.

For example, if horizontal netting, in combination with a vertical bat gate, were installed over an extensive, angled, open stope, the adverse effect of the combined treatment methods on wildlife would be forecast as long-term, minor and adverse because of the combined impacts of the gate and netting.

Cumulative Effects. Details about the other plans and projects contributing to cumulative effects were presented in the section titled "Cumulative Impact Analysis Method." Construction activities from the stabilization of the historic tramway and the potential contamination remediation activities at the Keane Wonder Mine complex would result in short-term, negligible to minor adverse impacts to wildlife. Alternative B would incrementally add negligible, short-term adverse effects and beneficial effects to these other actions. The negligible short-term adverse effects associated with alternative B would be similar to the disturbance effects of the other plans and actions.

The incremental long-term beneficial contribution of alternative B resulting from eliminating human disturbance in mine habitats with wildlife accessible mine safety installations would outweigh the adverse short-term impacts. Potential contamination remediation also would contribute to beneficial effects because habitat would be restored. Cumulative effects on wildlife would be long-term and beneficial, with Alternative B providing a minor contribution to these cumulative effects.

Conclusions. Alternative B would have long-term, beneficial impacts because it would reduce the incidence of wildlife being trapped or killed from falling into vertical mine features, and because treatments would reduce human disturbances of wildlife habitats in mines. Short-term, adverse impacts would be construction related, and their intensity would be negligible to minor. Long-term, negligible to minor, adverse impacts would be associated with restricting wildlife access to areas they currently can use. Cumulative effects on wildlife would be long-term and beneficial, with Alternative B providing a minor contribution to these cumulative effects.

CONCLUSIONS

The impact analysis identifies less than major impacts for all cultural and natural resources and values analyzed in this environmental assessment for both Alternative A: No Action, and Alternative B: Abandoned Mine Lands Safety Installations. For the reasons described in the impact analysis, neither alternative would result in impairment of park resources or values.

Because the previously described impacts (1) are consistent with Death Valley's purpose and values, (2) do not prevent the attainment of desired future conditions for natural and cultural resources, (3) do not create an unsafe environment, (4) do not diminish opportunities for future enjoyment of the park, and (5) do not unreasonably interfere with park programs or activities, an appropriate use, or concessioner or contractor operations, there would be no unacceptable impacts on natural or cultural resources and values under either Alternative A: No Action or Alternative B: Abandoned Mine Lands Safety Installations.

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CONSULTATION AND COORDINATION

LIST OF PERSONS, ORGANIZATIONS, AND AGENCIES CONTACTED

Scoping includes early input from any interested agency or any agency with jurisdiction by law or expertise. The National Park Service consulted with federal and state agencies responsible to protect and manage our natural and cultural resources. Initial responses are summarized below. National Park Service consultation letters and agency responses are included as appendix B of this document. The following agencies and organizations were notified of the proposed project by means of email.

Federal Agencies

Department of Agriculture
- U.S. Forest Service, Inyo National Forest
- U.S. Forest Service, San Bernardino National Forest

Department of the Interior
- Bureau of Land Management, California State Office
- Bureau of Land Management, Battle Mountain District
- Bureau of Land Management, Bishop Resource Area
- Bureau of Land Management, Tonopah Resource Area
- Bureau of Land Management, California Desert District
- Bureau of Land Management, Stateline Resources Area
- National Park Service, Mojave National Preserve
- National Park Service, Denver Service Center
- National Park Service, Pacific West Region
- U.S. Fish and Wildlife Service, Ash Meadows National Wildlife Refuge
- U.S. Fish and Wildlife Service, Field Office, Barstow
- U.S. Fish and Wildlife Service, Field Office, Ventura

Federal Interagency Communications Center

Federal Advisory Groups

Death Valley National Park Advisory Commission

State Agencies

California Department of Fish and Game

Organizations

Pahrump Paiute Tribe

Timbisha Shoshone Tribe

FEDERAL AGENCY CONSULTATION

U.S. Fish and Wildlife Service

In accordance with section 7 of the Endangered Species Act (16 *United States Code* 1531, et seq.), the National Park Service contacted the U.S. Fish and Wildlife Service by letter on October 13, 2009, to initiate consultation and request verification of the list of threatened and endangered species in the project area. The consultation letter and the U.S. Fish and Wildlife Service response are included in appendix B.

STATE AGENCY CONSULTATION

California State Historic Preservation Division

A Programmatic Agreement with the California State Historic Preservation Division was established defining a program for compliance with section 106 of the National Historic Preservation Act and setting forth a streamlined process where agreed-on criteria would be met and procedures would be followed in the installation of physical safety mitigation treatments at abandoned mine land sites. The National Park Service established guidelines, standards, and technical information applicable to the treatment of these physical hazards in ways that would, to the extent possible, minimize the impacts of such treatments on the historic fabric and historic character of non-archeological historic properties at these sites (see appendix B for a copy of this programmatic agreement).

TRIBAL CONSULTATION

In accordance with National Historic Preservation Act of 1966, as amended, regarding the Programmatic Agreement with the California State Historic Preservation Division, the National Park Service contacted the Timbisha Shoshone and Pahrump Paiute Tribes by letter on June 12, 2009, to initiate consultation and comment on the programmatic agreement and work plan. The consultation letters are included in appendix B.

SUMMARY OF PUBLIC SCOPING

Staff of the park and resource professionals of the National Park Service Denver Service Center team initiated internal scoping in a project review meeting in September 2009. On October 14-16, 2009, park and Denver Service Center team staff conducted an onsite survey and discussed issues and options.

A scoping notice was sent in late October 2009 in which the National Park Service proposed to complete an environmental assessment to analyze the effects of implementing mine safety installation methods to mitigate visitor and staff safety hazards at the Keane Wonder Mine complex in Death Valley National Park. The notice was sent to approximately 30 tribal, federal, and state departments and districts including the agencies and organization listed above. Comments were solicited until the scoping period ended in late November 2009. The notice was also posted to the park's Planning, Environment, and Public Comment project management database website for public review and comment.

One comment was received through the National Park Service Planning, Environment and Public Comment website. It expressed agreement with the intent to provide safety installations at some of the mine openings but opposition to the closure of the entire Keane Wonder Mine complex area.

LIST OF PREPARERS

The following individuals were responsible for preparation of this environmental assessment:

National Park Service

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Linda Manning	Wildlife Biologist	Death Valley National Park
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Margo Muhl Davis	Environmental Compliance and Cultural Resource Specialist	Denver Service Center
Victoria Wilkins	Environmental Compliance Specialist	Death Valley National Park

Parsons

Name	Title	Education/Responsibilities	Experience
Don Kellett	Project scientist	B.S., Wildlife Biology. Task manager and author of selected sections.	20 years
Sherrie Keenan	Senior technical writer/editor	B.A. Journalism. Responsible for document editing and quality control.	35 years
Alexa Miles	Senior scientist	B.A., Environmental Studies and M.S., Landscape Architecture; LEED AP. Responsible for document preparation and graphics.	5 years
Aaron Sidder	Environmental scientist	B.S. Environmental Science. Responsible for document preparation.	2 years
Bruce Snyder	Project manager	B.S., Biology, and M.S., Wildlife Biology. Responsible for project management and technical support in regulatory compliance and site restoration.	40 years

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Appendix A

Typical Abandoned Mine Safety Installation Techniques

Photographs of Typical Abandoned Mine Safety Installation Techniques

Photo 1. Bat cupola over a vertical shaft.

Photo 2. Barn owl opening and perch on bat cupola barricading a vertical shaft.

Photo 3. Metal grate barricading a vertical shaft.

Photo 4. Temporary fencing around a vertical shaft.

Photo 5. Example of a bat gate with passageway for desert tortoise or other small wildlife.

Photo 6. Cable mesh, covering a vertical shaft.

Photo 7. Permanent fencing around a trench mine with shafts and adits.

Photo 8. Bat gate over vertical shaft.

Photo 9. Trench mines with shafts enclosed by a permanent fence.

Photo 10. Metal grate over a vertical shaft.

Photo 11. Completed polyurethane foam plug closing a stope.

Photo 12. Metal grate barricading a vertical shaft.

Photo 13. Adit treated with a bat gate, concrete culvert and foam protection outside the culvert. Note minimal disturbance to surrounding area.

Photo 14. Recessed bat gate in a decline. Note minimal disturbance in area surrounding the opening, and preservation of features.

Photo 15. Shaft treated with combination grate, bat cupola and concrete footing.

Photo 16. Shaft treated with a recessed bat gate. Note undisturbed area surrounding opening.

Photo 17. Metal grate over vertical shaft

Photo 18. Adit barricaded with a bate gate.

Photo 19. Combination bat gate and grate over a vertical shaft.

Photo 20. Vertical shaft treated with bat gate.

Photo 21. Net barricade recessed in mine shaft.

Photo 22. Cable net mine treatment on a mine shaft.

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Appendix B

Consultation and Coordination

United States Department of the Interior
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Death Valley, California 92328
Tel: 760 786-3200
Fax: 760 786-3283

October 13, 2009

Mr. Carl Benz, Field Supervisor
U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

RE: *Scoping Notice – Mitigation of Safety Hazards at Abandoned Mine Lands Environmental*

As preliminary scoping for the EA has been initiated, we believe that eventual implementation of the project could affect endangered or threatened species, or their designated habitat. Therefore we are requesting any information your office may have regarding the presence of listed Federal threatened or endangered species, species proposed for listing, and existing or proposed critical habitats, which may be present within Death Valley National Park. This request is being made pursuant to Section 7 of the Endangered Species Act.

We look forward to your participation in this process and believe that it will help ensure that federally listed species are adequately considered and evaluated in the EA. In keeping with the requirements of Section 7 consultation and National Park Service policy, as soon as the EA is complete, we will send it to you for your review and comment.

We would appreciate any preliminary input you may have by November 13, 2009. If you have questions about the project or would like more information please call Ms. Linda Manning, (760) 786-3252 or email linda_manning@nps.gov.

Comments can be sent to:

Superintendent
ATTN: AML EA Comments
Death Valley National Park
P.O. Box 579
Death Valley, California 92328

Sincerely,

Sarah Craighead
Superintendent

PROGRAMMATIC AGREEMENT
BETWEEN
THE NATIONAL PARK SERVICE
(U.S. DEPARTMENT OF THE INTERIOR) AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
MITIGATION OF PHYSICAL SAFETY HAZARDS AT
HISTORIC ABANDONED MINERAL LANDS
WITHIN THE NATIONAL PARKS IN CALIFORNIA

WHEREAS, the National Park Service (NPS) proposes to complete 85 mine safety mitigation projects (the Undertaking) at park units within the State of California (including Mojave National Preserve, Death Valley National Park, Joshua Tree National Park, Point Reyes National Seashore, and Whiskeytown National Recreation Area) that may be funded under the American Recovery and Revitalization Act of 2009 with the intent of creating jobs for the American people; and

WHEREAS, the NPS has consulted with the California State Historic Preservation Officer (SHPO) pursuant to the 2008 Programmatic Agreement among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act; and,

WHEREAS, the operation, management, and administration of the National Park System entails undertakings that may affect historic properties (as defined in 36 CFR Part 800), which are therefore subject to review under Sections 106, 110(f), and 111(a) of the National Historic Preservation Act as amended (NHPA; 16 USC 470 *et seq.*) and the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800); and,

WHEREAS, the signature and implementation of the 2008 Programmatic Agreement (PA) does not preclude park-, Region-, or project-specific memoranda of agreement (MOA) or programmatic agreements negotiated for Section 106 purposes between the NPS and the California State Historic Preservation Officer (SHPO); and

WHEREAS, the Department of the Interior's Office of Inspector General issued a Final Audit Report: Abandoned Mine Lands in the Department of the Interior dated July 24, 2008 that identified numerous physical safety hazards at Abandoned Mineral Land (AML) sites in National Park Service units that pose a threat to the public and Park staff; and,

WHEREAS, the NPS has a qualified staff of cultural resource specialists who meet, or are under the direct supervision of a person or persons who meet, at a minimum, the appropriate qualifications set forth in the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-39) to carry out programs for cultural resource management; and

WHEREAS, the purpose of this Programmatic Agreement (PA) is to establish a program for compliance with Section 106 of the NHPA and set forth a streamlined process when agreed upon criteria are met and procedures are followed in the installation of physical safety mitigation treatments at AML sites; and

WHEREAS, the National Park Service has established guidelines, standards, and technical information applicable to the treatment of these physical hazards in ways that will, to the extent possible, minimize the impacts of such treatments on the historic fabric and historic character of non-archaeological historic properties at these sites (see Attachment A); and,

WHEREAS, each of the National Park units listed above contain historic properties of religious or cultural significance to a specific set of federally designated American Indian tribes; and

WHEREAS, each of the National Park units listed above may contain historic properties of religious or cultural significance to a specific set of non-designated American Indian tribes or organizations; and

WHEREAS, each of the National Park units listed above and those others interested in following the procedures defined in this agreement therefore have consulted with the specific sets of federally designated tribes and non-designated tribes and organizations affiliated with those parks regarding this agreement in accordance with 36 C.F.R. subsection 800.14(f) and have invited them to concur in this agreement; and

WHEREAS, the NPS has consulted with the SHPO on ways to ensure that individual actions of the Undertaking provide for management of California National Parks' historic properties according to the intent of The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716), NPS Policies and Guidelines, and Section 106 of the NHPA;

NOW, THEREFORE, the National Park Service and the California State Historic Preservation Officer agree that should the NPS proceed with the Undertaking, the NPS will ensure that the following stipulations are implemented to satisfy the NPS's Section 106 responsibilities for all individual actions related to the Undertaking:

STIPULATIONS

The NPS shall ensure that the following measures are carried out:

1. **Phasing of the Undertaking**

The NPS expects to pursue the Undertaking in phases, wherein safety treatments may be installed at one to several mines at the same or multiple park units. The NPS will have met its obligations under this agreement if it fulfills the requirements listed herein for

each individual phase, independently of future phases. Prior to the initiation of each phase of the undertaking, the NPS shall determine the area of potential effects (APE) for that phase. The APE shall include all areas directly affected by construction, including but not limited to staging and borrow areas and access roads for each. Unless otherwise stated, references to the APE mean the specific APE for a given phase of the Undertaking. The APE for each phase of the Undertaking will be confined to previously disturbed areas to the fullest extent possible.

2. Public Involvement

Upon advance planning and development of a new phase of the Undertaking, the NPS shall seek input from the public pursuant to 36 CFR § 800.2(d)(3) through use of the NPS Planning, Environment and Public Comment (PEPC) system. Both the public and we

for each phase
ject, its location,
vided by
not confidence.

each park's affiliated tribes have access to this system. The PEPC record
of the undertaking will identify the nature and extent of the proposed pro
and the results of inventory survey, if any. Any sensitive information pro
affiliated tribes to NPS units regarding the Undertaking will be held in st

3. Identification and Evaluation of Historic Properties

a. Historic Properties (non-archaeological)

found at AML.
onal Register of
e NPS will not
properties as

Although many of the non-archaeological historic properties that are
sites at NPS units in California have not been evaluated for their Nati
Historic Places (NRHP) eligibility, for purposes of this agreement, th
undertake full NRHP evaluations of these sites but shall treat all such
potentially eligible.

b. Archaeological Sites

iew its
resence of
led sites within
of exclusionary
ieological sites
owever, the
rey was
the APE, the
will protect any
uitable means.

Prior to initiation of each phase of the Undertaking, the NPS shall rev
Archaeological Site Management Inventory System records for the pr
archaeological sites within the APE for that phase. Previously record
the APE will be protected in situ during construction through the use
fencing or other measures. It is expected that few, if any, intact archa
will be found within the APE of each phase of the Undertaking. If, h
qualified cultural resources staff of any park determine that prior surv
inadequate to identify archaeological sites that may be present within
park will undertake that survey prior to initiation of construction and
newly discovered sites in situ through exclusionary fencing or other s

c. Inadvertent Discoveries

ed, construction
and determined
not feasible,

If during construction an archaeological site is inadvertently discover
shall be halted until a qualified NPS archaeologist has visited the site
how to best protect the cultural resources in situ. Where avoidance is

treatment will be carried out in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.

4. Assessment of Effects

a. The NPS shall at all times seek to avoid adverse effects on historic properties through project designs that minimize impacts on historic fabric and on the visual character of the cultural landscape to the extent possible while mitigating physical hazards to the public.

b. The standard mitigation treatments described in Attachment A to this agreement, due to their non-permanent and reversible nature, will be deemed to produce "No Adverse Effect" for purposes of this agreement.

5. Treatment of Adverse Effects

a. As soon as the NPS determines that a required alternative safety treatment will have an unavoidable and irreversible adverse effect on one or more historic properties that phase of the Undertaking shall be suspended and the NPS shall immediately notify the SHPO of the precise nature of the adverse effect and why it could not be avoided. The SHPO shall be afforded a period of 15 days to respond to the park point of contact and enter into consultation on the issue. If the SHPO does not respond within that time period, the project will resume on the assumption that the SHPO has no interest in further consultation.

b. Should any Native American burial sites, human remains, funerary objects, sacred objects, and/or objects of cultural patrimony be encountered, the NPS shall ensure they are treated with appropriate respect and according to federal law, including but not limited to the Native American Graves Protection and Repatriation Act (PL 101-601; hereinafter NAGPRA).

6. Installation and Documentation of Safety Mitigation Treatments

a. Installation of Safety Mitigation Treatments to Minimize Impacts

It is the expressed intent of this PA that the NPS will manage both evaluated and unevaluated historic mining structures as potentially eligible for listing on the National Register of Historic Places (except in cases where the mines are unquestionably less than 50 years of age). As such, the NPS will make every effort to minimize impacts to historic fabric and visual intrusions into historic mining landscapes when safety mitigation measures are undertaken. The methodology of choice for providing for the safety of visitors and staff at abandoned mines over 50 years of age is the installation of reversible safety features that will produce the least noticeable change or modification to the site. Whenever mine closure devices are installed at mine openings, steps will be taken to minimize impacts to any historic fabric that may still be in place, including the

mine workings. Safety devices will ideally be worked into and around historic structures such that their visual presence is minimized to the extent possible.

b. Documentation of Safety Mitigation Treatments

Any mine opening or other area that will receive AML safety work will be thoroughly photo-documented before and after the work is completed. The photographs will illustrate the historic construction/engineering features and techniques of the treated portions of each site as well as provide an overview depicting the setting of each feature within the mine site. Any identified biological issues that should be addressed would also be recorded as part of the survey data. The site location will be digitally recorded in the park's AML database. Such recording will, at a minimum provide the site location on a digital 7.5 minute USGS topographic map.

7. Reporting Requirements

Each National Park Service unit with AML sites will submit an annual report to the [illegible] The [illegible] reporting AML historic preservation treatments to date [illegible] photographs, a [illegible] report will at a minimum include overview and before and afte [illegible] leted, a discussion of [illegible] thorough discussion of the nature and extent of the work comp [illegible] ow they were [illegible] any archaeological sites found during survey of the APE and h [illegible] oject APE. If no [illegible] protected, and a map showing the location of the site and the p [illegible] mine safety treatment between the [illegible] No other consultation on the installation of the [illegible] he understanding that, to the extent [illegible] SHPO and the park unit will be required given t [illegible] itor and staff safety, impacts to [illegible] possible considering the need to provide for vis [illegible] es will be kept to a minimum. [illegible] historic fabric and the visual character of the sit [illegible]

8. Resolving Objections

[illegible] oject at any time, to the manner in [illegible] a. Should the SHPO, the Council, or the NPS ot [illegible] NPS will immediately notify the [illegible] which the terms of this PA are implemented, the [illegible] nd the Council submit comments on [illegible] SHPO and the Council, and request that SHPO a [illegible] NPS will take any [illegible] Council for no more than 30 days to resolve the objection. The N [illegible] comments provided by the SHPO into account.

[illegible] he consultation [illegible] If the NPS determines that the objection can be resolved within t [illegible] accordance with the [illegible] period, the NPS may authorize the disputed action to proceed in [illegible] terms of such resolution.

[illegible] mines that the [illegible] b. If at the end of the 30 day consultation period, the NPS deter [illegible] will forward all [illegible] objection cannot be resolved through such consultation, the NPS [illegible] R §800.2(b)(2). Any [illegible] documentation relevant to the objection to the Council per 36 CF [illegible]

comments provided by the Council within 30 days after its receipt of all relevant documentation will be taken into account by the NPS in reaching a final decision regarding the objection. The NPS will notify the SHPO, and the Council in writing of its final decision within 14 days after it is rendered. The NPS shall have the authority to make the final decision resolving the objection.

c. The NPS's responsibility to carry out all other actions under this PA that are not the subject of the objection will remain unchanged. The NPS may implement that portion of the Undertaking subject to objection under this stipulation after complying with subsection b. of this stipulation.

d. At any time during implementation of the terms of this PA, should an objection pertaining to the PA be raised by a member of the public, the NPS shall immediately notify the SHPO about the objection and take the objection into account. The SHPO and the Council may comment on the objection to the NPS. The NPS shall consult with the objecting party for no more than 30 days. Within 14 days following closure of consultation, the NPS will render a decision regarding the objection and notify all parties of its decision in writing. In reaching its final decision, the NPS will take into account all comments from the public regarding the objection. The NPS shall have sole

nd

the authority to make the final decision resolving the objection. Any dispute pertaining to the NRHP eligibility of historic properties or cultural resources covered by this PA will be addressed by the NPS per 36 CFR §800.4(c)(2).

9. Scope of Agreement

This Programmatic Agreement is limited in scope to those activities associated with the

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Undertaking and is entered into solely for that purpose. Nothing in this agreement sha limit an individual park from carrying out additional consultation with its affiliated tri if the park or those tribes consider it necessary and choose to do so.

10. Amendments

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Any party to this agreement may request that it be amended. The process of amending the agreement shall be the same as that exercised in creating the original agreement.

11. Failure to Carry Out the Agreement

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In the event the NPS does not carry out the terms of this agreement, the NPS will com with 36 CFR § 800.4 through 800.6 with regard to individual Undertakings covered by this agreement.

12. Review of the Agreement

d

a. On or before December 31 of each year until the NPS has completed its responsibilities under this programmatic agreement, the each NPS unit will prepare an provide to the SHPO an annual report describing how it is carrying out its

responsibilities. The park shall ensure that its annual report is made available for public and tribal inspection, that potentially interested members of the public and the park's affiliated tribes are made aware of its availability, and that interested members of the public are invited to provide comments to the SHPO as well as to the NPS. The SHPO may review the annual report and may provide comments to the individual parks and/or to Pacific West Regional Cultural Resources staff.

b. At the request of any party to this agreement, a meeting or conference will be held to facilitate review and comment or to resolve questions.

c. The SHPO may monitor activities carried out pursuant to this agreement, and the ACHP will review such activities if so requested. The NPS shall cooperate with the SHPO in carrying out their monitoring and review responsibilities.

day notice.
e parties will
mendments or
he NPS will
covered by this

13. Termination

Any party to this agreement may terminate it by providing a 30 calendar
excluding state and federal holidays, to the other parties provided that th
consult during the period prior to the termination to seek agreement on a
other actions that would avoid termination. In the event of termination,
comply with 36 CFR § 800.4 through 800.6 for individual undertakings
programmatic agreement.

14. Expiration

015, unless

This Programmatic Agreement will be null and void on September 30, 2
extended by the written agreement of the parties hereto.

SIGNATORY PARTIES

Execution and implementation of this Programmatic Agreement evidences that the NPS has satisfied its Section 106 responsibilities for all individual Undertakings covered by this agreement.

NATIONAL PARK SERVICE:

Jonathan B. Jarvis
Regional Director, Pacific West Region
National Park Service
Department of the Interior

Date: 8/11/09

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER:

M. Wayne Donaldson, FAIA
California State Historic Preservation Officer

Date: 18 AUG 2009

United States Department of the Interior
NATIONAL PARK SERVICE
Death Valley National Park
PO Box 579
Death Valley, California 92328

IN REPLY REFER TO
H4217

June 12, 2009

Richard Arnold
Tribal Chair
Pahrump Paiute Tribe
P.O. Box 3411
Pahrump, NV 89041

Dear Mr. Arnold:

The purpose of this letter is to initiate consultation with your Tribe in accordance with the National Historic Preservation Act of 1966, as amended (NHPA), regarding the enclosed draft "Programmatic Agreement between the National Park Service (US Department of the Interior) and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands within The National Parks in California" and the proposed undertaking to install safety treatments at eight abandoned mine sites within Death Valley National Park. The purpose of the Programmatic Agreement (PA) is to establish a streamlined process for the National Park Service (NPS) to meet its NHPA Section 106 requirements for abandoned mine land (AML) safety projects funded through the American Recovery and Reinvestment Act.

The PA has been developed in consultation with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP). The undertaking includes installation of gates, cable mesh, and other devices to reduce safety hazards to the public that exist at historic abandoned mines. The attached document, "A Plan to Minimize the Impacts of Physical Safety Hazard Mitigation Treatments at Abandoned Historic Mines" (Work Plan), provides descriptions of the types of mine hazards that need to be treated and the types of closures that may be installed to improve public safety. The work plan also discusses how mine closures can be designed to provide for continued use of the openings by wildlife (principally bats) and minimize impacts to these historic sites and the cultural resources that may be found near them. A list of the specific mines that are included in the project and brief descriptions of what we plan to do to improve public safety at the dangerous features found at each site are also provided for your review and comment.

We at Death Valley National Park would greatly appreciate your Tribe's review and comment on the dra PA and the Work Plan. Each National Park within California with proposed mine safety treatment projects is consulting with American Indian tribes culturally affiliated with their park lands concerning th PA and the Work Plan, simultaneous with this consultation. Tribal comments received by each park will be compiled and submitted for consideration and integrated into the final PA and Work Plan as appropriate. In the event of conflicting comments, consultation will continue to reach resolution. A fina copy of the executed PA along with a copy of the Work Plan will be sent to your Tribe for your information and use.

To keep the project on schedule, we respectfully request your Tribe's review and comment on the PA and the proposed Work Plan within 30 days of receipt. We are available to meet with the Tribe to discuss the PA and proposed undertaking at a time and location convenient to your Tribe. Should you have questions or comments concerning the PA or the proposed undertakings described in the Work Plan, or would like to schedule a meeting, please contact Leah Bonstead, Park Archeologist, at (760) 786-3232. We look forward to working with you on this important health and life safety project.

Sincerely yours,

Sarah Craighead
Superintendent

Enclosures: 4

- A Plan to Minimize the Impacts of Physical Safety Hazard Mitigation Treatments at Abandoned Historic Mines (23 pages)

- American Recovery and Reinvestment Act Abandoned Mine Lands projects at Death Valley National Park 2009-2010 (2 pages)

- American Recovery and Reinvestment Act Abandoned Mine Lands Projects—map (1 page)

- Draft: Programmatic Agreement Between the National Park Service and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands Within the National Parks in California (7 pages)

LBONSTEAD:mko\H4217_AML PA_Paiute Tribe-Arnold Letter 6.12.09

Sent via Certified Return Receipt Mail
Enclosures included with File Copy of Correspondence to Barbara Durham/Timbisha Tribe

bc: files
SO Corres files
RM: Bonstead, Archeologist
RM: Manning, Wildlife Biologist

United States Department of the Interior
NATIONAL PARK SERVICE
Death Valley National Park
PO Box 579
Death Valley, California 92328

IN REPLY REFER TO:
H4217

June 12, 2009

Barbara Durham
Tribal Historic Preservation Officer
Timbisha Shoshone Tribe
P.O. Box 206
Death Valley, CA 92328

Dear Ms. Durham:

The purpose of this letter is to initiate consultation with the Timbisha Shoshone in accordance with the National Historic Preservation Act of 1966, as amended (NHPA), regarding the enclosed draft "Programmatic Agreement between the National Park Service (US Department of the Interior) and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands within The National Parks In California" and the proposed undertaking to install safety treatments at eight abandoned mine sites within Death Valley National Park. The purpose of the Programmatic Agreement (PA) is to establish a streamlined process for the National Park Service (NPS) to meet its NHPA Section 106 requirements for abandoned mine land (AML) safety projects funded through the American Recovery and Reinvestment Act.

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We at Death Valley National Park would greatly appreciate your Tribe's review and comment on the draft PA and the Work Plan. Each National Park within California with proposed mine safety treatment projects is consulting with American Indian tribes culturally affiliated with their park lands concerning the PA and the Work Plan, simultaneous with this consultation. Tribal comments received by each park will be compiled and submitted for consideration and integrated into the final PA and Work Plan as appropriate. In the event of conflicting comments, consultation will continue to reach resolution. A final copy of the executed PA along with a copy of the Work Plan will be sent to the Timbisha Shoshone for your information and use.

To keep the project on schedule, we respectfully request your review and comment on the PA and the proposed Work Plan within 30 days of receipt. I realize that Death Valley and the Timbisha Shoshone have a consultation agreement in place allowing 45 days for the comment period, but in the interest of coordinating this project with others statewide, we would appreciate a shortened review period on this project. We are available to meet with the Tribe to discuss the PA and proposed undertaking at a time and location convenient to your Tribe. Should you have questions or comments concerning the PA or the proposed undertakings described in the Work Plan, or would like to schedule a meeting, please contact Leah Bonstead, Park Archeologist, at (760) 786-3232. We look forward to working with you on this important health and life safety project.

Sincerely yours,

Sarah Craighead
Superintendent

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LBONSTEAD:mko\H4217_AML PA_Timbisha Tribe-Durham Letter 6.12.09

Sent via Certified Return Receipt Mail
Enclosures included with File Copy of Correspondence to Barbara Durham/Timbisha Tribe

bc: files
SO Corres files
RM: Bonstead, Archeologist
RM: Manning, Wildlife Biologist

United States Department of the Interior
NATIONAL PARK SERVICE
Death Valley National Park
PO Box 579
Death Valley, California 92328

IN REPLY REFER TO
H4217

June 12, 2009

Joe Kennedy
Tribal Chair
Timbisha Shoshone Tribe
P.O. Box 206
Death Valley, CA 92328

Dear Mr. Kennedy:

The purpose of this letter is to initiate consultation with the Timbisha Shoshone in accordance with the National Historic Preservation Act of 1966, as amended (NHPA), regarding the enclosed draft "Programmatic Agreement between the National Park Service (US Department of the Interior) and the California State Historic Preservation Officer Regarding Mitigation of Physical Safety Hazards at Historic Abandoned Mineral Lands within The National Parks In California" and the proposed undertaking to install safety treatments at eight abandoned mine sites within Death Valley National Park. The purpose of the Programmatic Agreement (PA) is to establish a streamlined process for the National Park Service (NPS) to meet its NHPA Section 106 requirements for abandoned mine land (AML) safety projects funded through the American Recovery and Reinvestment Act.

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Sincerely yours,

Sarah Craighead
Superintendent

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LBONSTEAD:mko\H4217_AML PA_Timbisha Tribe-Kennedy Letter 6.12.09

Sent via Certified Return Receipt Mail
Enclosures included with File Copy of Correspondence to Barbara Durham/Timbisha Tribe

bc: files
SO Corres files
RM: Bonstead, Archeologist
RM: Manning, Wildlife Biologist

Photo 1. Open adit at lower Keane Wonder Mine with Danger sign.

Photo 2. Open adit on slope at lower Keane Wonder Mine.

Photo 3. Netted decline at lower Keane Wonder Mine, view to the W.

Photo 4. Interpretive sign at lower Keane Wonder Mine.

Photo 5. Netted shaft at lower Keane Wonder Mine, view to the W.

Photo 6. Mill at lower Keane Wonder Mine; view to the E.

Photo 7. Keane Wonder Mine area closure sign
at road turn-off of Beatty Cutoff Road.

Photo 8. Road closure sign at Keane Wonder Mine. View to the southwest.

Photo 9. Lower Keane access road and view of Death Valley, view to the NW.

Photo 10. Storage tank and tramway from lower Keane Wonder Mine. View to the E

Photo 11. Collapsed open adit at upper Keane Wonder Mine.

Photo 12. Open adit at upper Keane Wonder Mine; view to the N.

Photo 13. Open adit and tailings on slope at upper Keane Wonder Mine as viewed from Chloride Cliffs trail.

Photo 14. Open adit at upper Keane Wonder Mine.

Photo 15. Open adit, landscape, and mining structures at upper Keane Wonder Mine.

Photo 16. Open adit with wooden portal and door off of Chloride Cliff trail between upper and lower Keane Wonder Mine.

Photo 17. Open decline at upper Keane Wonder Mine.

Photo 18. Decline with land-bridge at upper Keane Wonder Mine.

Photo 19. Remaining water pipe and view of Chloride Cliff trail; view to the southwest.

Photo 20. Structural debris and danger sign at upper Keane Wonder Mine; view to the southwest.

Photo 21. Open shaft at upper Keane Wonder Mine.

Photo 22. Upper tramway terminal at Keane Wonder Mine.

Photo 23. Components of the tramway cable system at upper Keane Wonder Mine; view to the southwest.

Photo 24. Chloride Cliff trail to upper Keane Wonder Mine with danger sign; view to the west.

Photo 25. Tramway cable towers from the mill below to upper Keane Wonder Mine; view to the southwest.

Photo 26. Erosion on the Chloride Cliff visitor trail.

Photo 27. Mine claim marker at upper Keane Wonder Mine.

Photo 28. View of Death Valley from upper Keane Wonder Mine area; view to the southwest.

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

NPS 143/100736 January 2010

United States Department of the Interior ✧ National Park Service