



United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271
(559) 565-3341

IN REPLY REFER TO:

D30 (SEKI PMIS 59925)

February 23, 2004

Dear Friends of Sequoia and Kings Canyon National Parks:

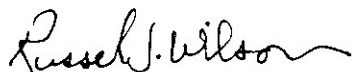
The National Park Service is proposing to upgrade the water storage and distribution system at the Ash Mountain headquarters and housing complex at Sequoia and Kings Canyon National Parks, Three Rivers, CA. The proposal includes replacing both existing water tanks at the Ash Mountain headquarters complex, replacing the Ash Mountain water distribution system, and installing a fire suppression system in the four main administration buildings: the fire control building, the warehouse, the maintenance facility, and the administrative offices and visitor center building. The proposal meets the Sequoia and Kings Canyon National Parks planning objective of providing an adequate water supply and distribution system for the Ash Mountain headquarters complex through the year 2018. Water supply and distribution is critical for domestic needs and fire fighting capabilities. Enclosed is an Environmental Assessment (EA) that details the National Park Service proposal. The EA is also available for public review on the internet at: www.nps.gov/seki/pphtml/documents.html

Two alternatives are described and their environmental consequences assessed. Alternative A is the no action alternative. Alternative B is the National Park Service's preferred alternative and the environmentally preferable alternative.

We welcome your input on the project and our efforts to avoid adverse effects on park resources. The public comment period closes 40 calendar days after the date at the top of this letter. If you wish to comment on the EA, you may mail comments to me at the address below or e-mail your comments to me at: SEKI_Superintendent@nps.gov. , please include the phrase "water system upgrade" at the top of your comments or in your e-mail subject line.

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Please address your comments to:

Richard Martin, Superintendent
Water System Upgrade EA
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, CA 93271


Richard H. Martin, Superintendent

Sequoia & Kings Canyon National Parks

National Park Service
U.S. Department of the Interior

Sequoia & Kings Canyon National Parks
California



Environmental Assessment

Replace Potable Water Tanks and Provide Fire Suppression at Park Headquarters
February 2004



ENVIRONMENTAL ASSESSMENT SEQUOIA AND KINGS CANYON NATIONAL PARKS

Prepared For:
National Park Service



Prepared By:
engineering-environmental Management, Inc.



Sequoia and Kings Canyon National Parks
California

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

**Environmental Assessment
Water Tank and Distribution System Replacement
Sequoia and Kings Canyon National Parks
Tulare County, California**

Summary

The National Park Service proposes to replace the water storage tank and water main system at the Ash Mountain headquarters complex. In addition, fire sprinkler systems would be installed in the four largest buildings: the administration / visitor center, the warehouse, the fire center building, and the maintenance shop. The water tank replacement is necessary because of structural and capacity problems with the existing tanks. Pipeline replacement would stop leakage and minimize maintenance and repairs. Sprinkler systems are necessary to minimize the amount of water storage needed for fire suppression. The upgrades would meet the Sequoia and Kings Canyon National Parks' planning objective of providing an adequate supply and distribution of both potable and fire suppression water for the current Ash Mountain headquarters complex through the year 2018.

The environmental assessment examines in detail two alternatives: no action and the National Park Service preferred alternative. The preferred alternative includes the construction of two 220,000-gallon concrete water storage tanks to replace the existing water storage tanks. The tanks would provide for increased water storage for potable water, as well as a reserve of 120,000 gallons for fire fighting. The pipeline distribution system from the tanks would also be replaced. Fire hydrants would be moved to locations that are easily accessible and located to maximize fire-fighting efficiencies. Overhead sprinkler systems would be installed in the four main administration buildings. Backflow control devices would be installed adjacent to each of the four buildings.

The preferred alternative would have no or negligible impacts on geology, soils, special-status species, air quality, water resources, water quality, archeological resources, cultural landscapes, ethnographic resources, museum objects, scenic values, soundscapes, night skies, recreational values / visitor experience, socio-economics, wilderness values, prime and unique farmland, land use, environmental justice, and Indian trust resources.

Short-term, localized, negligible, adverse effects would occur to park operations from construction activities associated with tank and water main replacement. Short-term, localized, minor, adverse impacts would occur to biotic communities (vegetation and wildlife) and health and safety. Both long-term, minor, adverse, and beneficial impacts to historic structures and districts would occur. Long-term, minor to moderate, beneficial impacts would occur to park operations and health and safety. There would be no long-term impacts to biotic communities.

Notes to Reviewers and Respondents

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

Please address comments to:

Superintendent; Sequoia and Kings Canyon National Parks; Attn: Water Tank Replacement Project; 47050
Generals Highway; Three Rivers, CA 93271

E-mail: seki_superintendent@nps.gov

SUMMARY

CONTENTS

ACRONYMS AND ABBREVIATIONS VII

INTRODUCTION 1

- Purpose and Need for Action 1
- Park Purpose, Significance, and Mission 1
 - Park Purpose 1
 - Park Significance 3
 - Park Mission 3
- Project Planning and Value Analysis 4
 - Previous Planning 4
 - Value Analysis 4
- Issues and Impact Topics 4
 - Issues 4
 - Derivation of Impact Topics 4
 - Impact Topics Selected for Detailed Analysis 5
 - Impact Topics Dismissed From Detailed Analysis 6

ALTERNATIVES 13

- Introduction 13
- Alternative 1: No-Action Alternative 13
- Alternative 2: Water Tank and Distribution System Replacement and Installation of a Fire Suppression System (Preferred Alternative) 13
 - Water Tank and Distribution System Replacement and Fire Suppression System Installation 14
 - Water Tanks 14
 - Water Distribution System 16
 - Fire Suppression System 18
 - General Construction Schedule and Costs 19
 - Staging Area 19
 - Mitigation Measures for the Preferred Alternative 19
 - Sustainability 23
- Environmentally Preferable Alternative 24
- Alternatives Considered but Dismissed 24
- Comparative Summary of No-Action and Preferred Alternatives 26
- Comparative Summary of Potential Environmental Impacts 27

AFFECTED ENVIRONMENT 29

- Location and General Description 29
 - Seismicity 31
 - Soil 32
 - Fire 32
- Biotic Communities 33
 - Vegetation 33
 - Wildlife 35
- Historic Structures and Districts 35
- Health and Safety 36
- Park Operations 37

CONTENTS

- Built Environment 37
- Maintenance 37

ENVIRONMENTAL CONSEQUENCES 39

- Methods of Assessing Impacts 39
- Methodology 39
 - Context, Duration and Intensity, and Type of Impact 39
- Methodologies 40
 - Impact Description 40
- Soils 40
- Vegetation 41
- Wildlife 42
- Cultural Resources 43
 - Impacts to Cultural Resources and Section 106 of the National Historic Preservation Act 43
- Historic Structures and Districts 44
- Public Health and Safety 45
- Park Operations 46
 - Direct versus Indirect Impacts 47
 - Cumulative Impacts 47
 - Impairment 48
- Environmental Consequences—Alternative 1: No Action 50
 - Soil 50
 - Vegetation 50
 - Wildlife 51
 - Historic Structures and Districts 52
 - Park Operations 53
 - Health and Safety 54
- Environmental Consequences—Alternative 2: Preferred Alternative 55
 - Soil 55
 - Vegetation 57
 - Wildlife 58
 - Historic Structures and Districts 59
 - Health and Safety 61
 - Park Operations 63

CONSULTATION AND COORDINATION 65

- Permit Requirements 65
- Consultation 65

BIBLIOGRAPHY 69

LIST OF PREPARERS 71

APPENDICES

- APPENDIX A: U.S. Fish and Wildlife Service Special-Status Species List
- APPENDIX B: Water Tank and Distribution Pipeline Corridor, 2003 Vegetation Survey
- APPENDIX C: Consultation and Coordination Letters

FIGURES

- Figure 1. Sequoia/Kings Canyon National Parks Location Map [NPS-DSC/Dec 03/102/20138] 2
- Figure 2. New Tank Location vs. Existing Tanks [NPS/DSC/102-20139] 15
- Figure 3. Water Main Route [NPS/DSC/102/20140] 17
- Figure 4. Inaccessible Fire Hydrant 18
- Figure 5. Administration Building 18
- Figure 6. Pipeline Would be Installed Beneath Civilian Conservation Corps Steps 23
- Figure 7. Water Treatment System Building 30
- Figure 8. Schematic of Existing System 30
- Figure 9. Visible Tank Cracks and Water Leakage 31
- Figure 10. Fire Photos from the 1930s 34

TABLES

- Table 1. Comparative Summary of Alternatives 26
- Table 2. Comparative Summary of Potential Environmental Impacts 27
- Table B-1. Water Tank and Distribution Pipeline Corridor 2003 Vegetation Survey 101

CONTENTS

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
km	Kilometer
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Act
NPS	National Park Service
NRHP	National Register of Historic Places
USC	United States Code

INTRODUCTION

PURPOSE AND NEED FOR ACTION

At Sequoia and Kings Canyon National Parks, Tulare County, California, the National Park Service (NPS) proposes to upgrade the water storage and distribution system and install sprinkler systems in the four Mission 66 buildings at the Ash Mountain headquarters and housing complex. Park operations at the Ash Mountain developed area are now being affected by an unreliable and limited source of water for domestic and fire flow needs; a source that is susceptible to failure and inadequate to serve and protect public facilities. A value analysis study was conducted on June 26, 2002. That study determined that the current 145,000-gallon water tank provides insufficient storage for both potable reserves and fire suppression storage based on standard recommended practice. The planning objective is to have sufficient potable water storage and fire suppression water storage to meet the needs of the Ash Mountain headquarters complex through 2018. Based on that value analysis study, sufficient potable storage is defined as three days of water at peak demand. Sufficient fire suppression water storage is based on National Fire Protection Association criteria.

This environmental assessment analyzes the proposed action and alternatives and their potential impacts on the environment and has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and its implementing regulations published by the Council on Environmental Quality (40 *Code of Federal Regulations* (CFR) 1500-1508), National Park Service Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*, and The National Historic Preservation Act of 1966 (as amended).

The process and documentation required for preparation of this environmental assessment would be used to comply with section 106 of the National Historic Preservation Act for archeological resources, in accordance with section 800.8(3)(c) of the Advisory Council on Historic Preservation's regulations (36 CFR Part 800). This document would be submitted to the California State Historic Preservation Office for review and comment.

PARK PURPOSE, SIGNIFICANCE, AND MISSION

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

Park Purpose

Park purpose statements are based on national park legislation, legislative history, and National Park Service policies. The statements reaffirm the reasons for which the national park was set aside as a unit of the national park system, and provide the foundation for national park management and use.

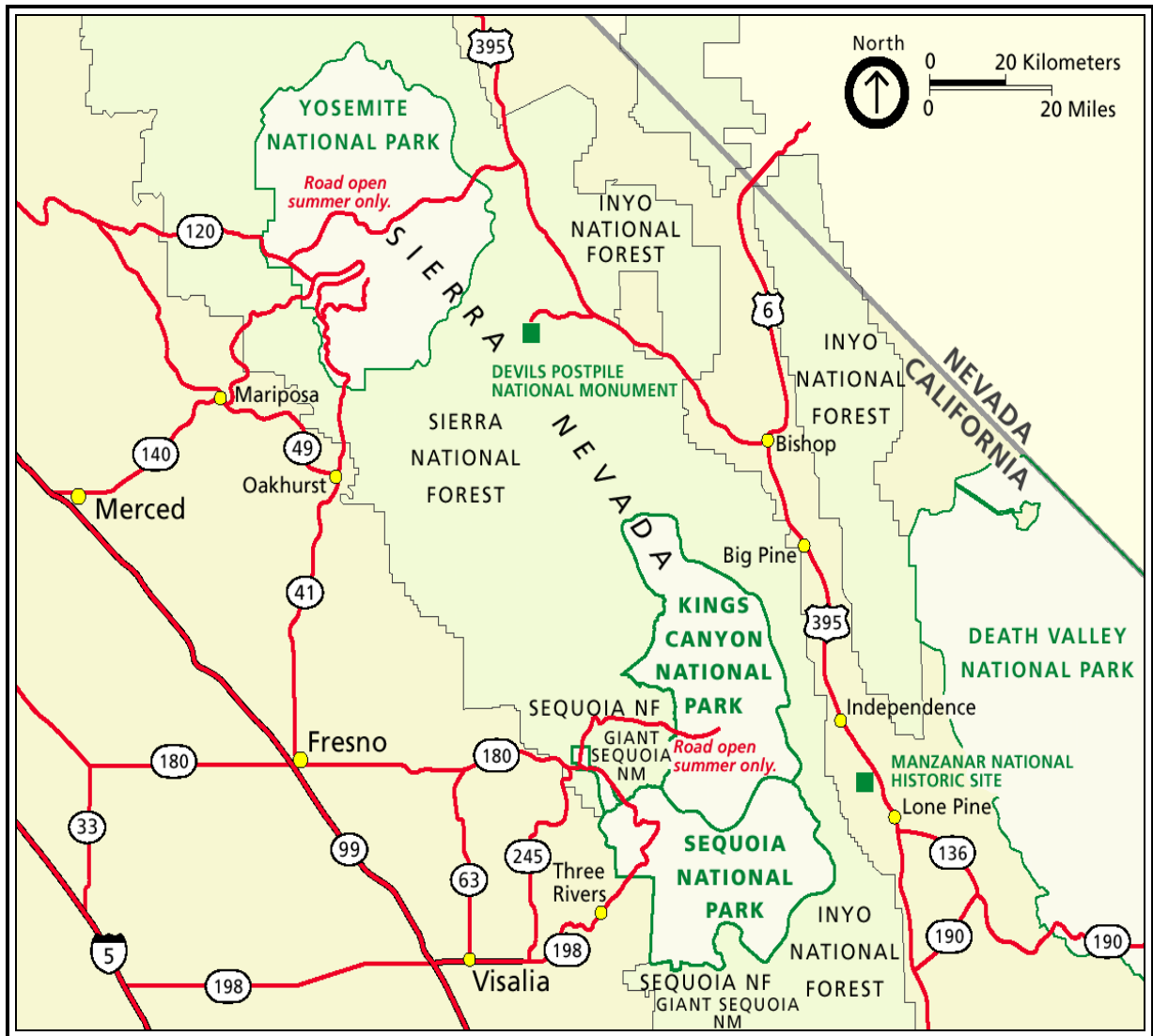


FIGURE 1. SEQUOIA/KINGS CANYON NATIONAL PARKS LOCATION MAP [NPS-DSC/DEC 03/102/20138]

The purpose of Sequoia and Kings Canyon National Parks is listed in the first newsletter for development of the *General Management Plan* in 1998, as follows:

The collective purpose of the two parks are to

- *Protect forever the greater Sierran ecosystem—including the sequoia groves and high Sierra regions of the park—and its natural evolution.*
- *Provide appropriate opportunities to present and future generations to experience and understand park resources and values.*
- *Protect and preserve significant cultural resources.*
- *Champion the values of national parks and wilderness (NPS 1998).*

Park Significance

Park significance statements capture the essence of the national park's importance to the natural and cultural heritage of the United States of America. Significance statements do not inventory park resources; rather, they describe the park's distinctiveness and help place the park within the regional, national, and international context. Defining park significance helps managers make decisions that preserve the resources and values necessary to accomplish the purpose of the national park.

Sequoia and Kings Canyon National Parks are significant because they have:

- the largest giant sequoia trees and groves in the world, including the world's largest tree—the General Sherman Tree
- an extraordinary continuum of ecosystems arrayed along the greatest vertical relief (1,370 to 14,495 feet elevation) of any protected area in the lower 48 states
- the highest, most rugged portion of the high Sierra, which is part of the largest contiguous alpine environment in the lower 48 states
- magnificent, deep, glacially carved canyons, including Kings Canyon, Tehipite Valley, and Kern Canyon
- the core of the largest area of contiguous designated wilderness in California, the second-largest in the lower 48 states
- the largest preserved southern Sierra foothills ecosystem
- almost 200 known marble caverns, many inhabited by endemic cave fauna
- a wide spectrum of prehistoric and historic sites documenting human adaptations in their historical settings throughout the Sierran environments (NPS 1998)

The parks contain resources of geological, biological, cultural, and sociological value. In addition to national park status, the two areas have also been designated as a unit of the International Biosphere Preserve Program, and 85% of the parks have been designated wilderness.

Park Mission

Park purpose describes the specific reason the park was established. Park significance is embodied in the distinctive features that make the park different from any other. Together, purpose and significance lead to a concise statement—the mission of the park. Park mission statements describe conditions that exist when the legislative intent for the park is being met. The mission of Sequoia and Kings Canyon National Parks is to protect forever the greater Sierran ecosystem—including the sequoia groves and high Sierra regions of the parks—and its natural evolution, and to provide appropriate opportunities to present and future generations to experience and understand park resources and values (NPS 1998).

PROJECT PLANNING AND VALUE ANALYSIS

Previous Planning

In 2002, the park began evaluating alternate water sources to supplement the limited supply of potable water and provide additional water for fire fighting needs. In January of 2002, three wells were drilled in an attempt to locate an adequate source of potable water. Of the three wells, only one had high yields of water, approaching 150-gallons per minute. That well was tested for water quality and discovered to have high levels of arsenic making it unsuitable for a potable water source. The remaining two wells were dry.

An alternate proposal to provide additional water storage for fire fighting needs and install fire suppression systems in the four main administration buildings was then evaluated and the proposed alternative discussed in this environmental assessment was developed from this alternate proposal.

Value Analysis

A value analysis was conducted for the Ash Mountain water supply and distribution system in June of 2002, to select the preferred alternative for the replacement of the existing potable water tanks. Six alternatives were evaluated as part of the value analysis study. The goals of the study were not to select a preferred alternative, but rather to develop preliminary performance criteria for designs, determine construction requirements, and determine probable construction cost ranges to meet park needs (NPS 2002). The alternatives examined as part of this study, but not selected, are discussed under the “Alternatives Considered But Dismissed” section.

ISSUES AND IMPACT TOPICS

Issues

Issues and concerns affecting this proposed action were identified from past National Park Service planning efforts and input from individuals and state and federal agencies. The major issues are conformance with the park’s Statement for Management and other park management documents, and the potential effects on geologic resources, seismicity, soils, biotic communities, historic structures and districts, health and safety, and park operations.

Derivation of Impact Topics

Specific impact topics were developed for discussion focus and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal law, regulations, and Executive Orders; *2001 NPS Management Policies*; and National Park Service knowledge of limited or easily impacted resources. A brief rationale for the

selection of each impact topic is given below, as well as a rationale for dismissing specific topics from further consideration.

Impact Topics Selected for Detailed Analysis

Seismicity

Seismic hazards in the area include the potential for seismic activity that would result in tank failure and subsequent possible flooding and disruption of public health and safety and disruption of park operations. Because public health and safety and park operations would be affected as the result of a seismic event, seismicity will be addressed in the impact topics of public health and safety and park operations in this environmental assessment.

Soils

The proposed action would include expansion of the tank area for the placement of the new, larger water tanks and trenching for placement of the waterline. Because the proposed action would include soil-disturbing activities, soils are addressed as an impact topic in this environmental assessment.

Biotic Communities (Vegetation and Wildlife)

NEPA is the basic national charter for protection of the environment. It requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions upon the environment. National Park Service policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (*NPS Management Policies 2001*). Because the alternatives have the potential to affect biotic communities, this topic is addressed in this environmental assessment.

Historic Structures and Districts

The National Historic Preservation Act (16 *United States Code* (USC) 470 *et seq.*), NEPA, National Park Service Organic Act, *NPS Management Policies* (2001), Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, including historic structures, either listed in or eligible to be listed in, the National Register of Historic Places (NRHP).

For the purposes of analysis in this environmental assessment, historic resources are those human-made sites, structures, features, or objects that date from the time of the arrival of Euro-Americans in approximately 1850, up until the middle of the 20th century (i.e., at least 50 years of age). Historic sites, by definition, can be of American Indian association, but are most often associated with Euro-American use and occupation. Aspects of all of the episodes of historic activity can be found in historic sites in the parks.

Portions of the Ash Mountain headquarters complex have been determined to be potentially eligible for the NRHP by park cultural resources staff (Burge 2003). There are historic buildings, structures, and features in the project area that are potentially eligible and eligible for listing in the NRHP as a historic district. Generals Highway was determined eligible for listing in the NRHP in 1992, as one of the finest, most scenic highways in mountain America. The first potentially eligible district consists of 1930s- to 1940s-era Civilian Conservation Corps constructed buildings and features. The second potentially eligible historic district is made up of buildings constructed during the Mission 66 era. Therefore, historic structures and districts are discussed in this environmental assessment.

Health and Safety

The no-action alternative could create a safety hazard if the existing tanks fail due to a seismic event or just through structural weakness and failure. The proposed action would minimize tank failure due to a seismic event.

The proposed action has the potential to disturb areas containing the soil-inhabiting fungus *Coccidioides immitis*. Disturbance of the soil could give rise to arthroconidia (spores), which, if inhaled, could cause an infection of the lungs called Valley Fever. Public safety and worker safety could potentially be affected by selection of either alternative; therefore, health and safety is addressed as an impact topic in this environmental assessment.

Park Operations

Park operations at the Ash Mountain developed area are now being affected by an unreliable and limited source of water for domestic and fire-flow needs; a source that is susceptible to failure and inadequate to serve and protect public facilities. Additionally, if the water tanks fail due to a seismic event, or just through structural weakness and failure, water would be unavailable until the system could be repaired. As a result, the Ash Mountain developed area, or portions thereof, could be closed for unknown periods of time in the event of water related failure. This would inconvenience visitors and disrupt park operations. The preferred alternative would improve the capacity and reliability for domestic water requirements and fire-flow needs for the Ash Mountain developed area. For these reasons, park operations could be affected by both the no-action and preferred alternatives. Therefore, park operations will be addressed as an impact topic in this environmental assessment.

Impact Topics Dismissed From Detailed Analysis

Geologic Resources

Geologic resources in the vicinity of the proposed action include karst topography and cave formations. Should proposed tank structures be located over shallow cave formations, there is a potential for collapse that would impact the cave formations as well as the stability of the tanks. A geotechnical investigation in the vicinity of the proposed tank locations drilled two borings to a depth of approximately 20 feet without encountering any voids. This information indicates that the tank structures would not be located over extensive cave formations and, therefore, would not impact such structures. This impact topic was dismissed.

Special-Status Species (Threatened, Endangered, Species of Concern, and Designated Critical Habitats)

The 1973 Endangered Species Act, as amended, requires an examination of impacts to all federally listed threatened or endangered species. National Park Service policy requires examination of the impacts to state-listed threatened or endangered species and federal candidate species.

In a letter dated January 2, 2003 (USFWS Reference No. #1-1-03-SP-0700) (appendix A), the U.S. Fish and Wildlife Service provided a list of special-status species that may be within the project area or depend on it for critical habitat.

Knowledgeable park natural resources staff conducted a literature search in park records and a field survey of the project site for listed species that may live in or depend on the project site for habitat. No such species were found. Should the preferred alternative be implemented, there would be no impacts to any listed special-status species or designated critical or essential habitats. Therefore, special-status species was dismissed as an impact topic in this document.

Air Quality

The 1963 Clean Air Act provides that the federal land manager (the assistant secretary for fish and wildlife and parks and the park superintendent) has an affirmative responsibility to protect the park's air quality-related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts. Section 118 of the 1963 Clean Air Act requires the park to meet all federal, state, and local air pollution standards. Section 176(c) of the 1963 Clean Air Act requires all federal activities and projects to conform to state air quality implementation plans to attain and maintain national ambient air quality standards. *NPS Management Policies (2001)* addresses the need to analyze potential impacts to air quality during park planning.

Sequoia and Kings Canyon National Parks are classified as Class I air quality areas under the Clean Air Act, as amended. The Clean Air Act also states that the federal land manager has an affirmative responsibility to protect the parks' air quality-related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts.

Should the preferred alternative be selected, local air quality would be temporarily affected by dust and vehicle emissions. Hauling material and operating equipment during the construction period would result in increased vehicle exhaust and emissions. Hydrocarbons, nitrogen oxide, and sulfur dioxide emissions would be rapidly dissipated by air drainage since air stagnation is rare at the project site.

Fugitive dust plumes from construction equipment would intermittently increase airborne particulates in the area near the project site, but loading rates are not expected to be considerable. To mitigate these effects, such activity would be coupled with water sprinkling to reduce dust.

There would be temporary increases in air pollution during construction of the project, primarily from operation of the construction equipment. To reduce construction equipment emissions, the park would apply appropriate mitigating measures, which limit idling of construction vehicles.

Overall, there would be a slight and temporary degradation of local air quality due to dust generated from construction activities and emissions from construction equipment. These effects would last only as long as construction occurred and the park's Class I air quality would not be affected by the proposal; impacts would be negligible and short term. Therefore, air quality was dismissed as an impact topic in this document.

Water Resources (Wetlands, Floodplains, and Wild and Scenic Rivers)

Executive Order 11988 (*Floodplain Management*) requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. Executive Order 11990 (*Protection of Wetlands*) requires an examination of the impacts to wetlands. The *2001 NPS Management Policies* (NPS 2001), Director's Order – 2: *Planning Guidelines*, and Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* provide guidelines for proposed actions in wetlands and floodplains.

There are no natural water resources, wetlands, or floodplains in the project area. The closest natural water course to this area is the Kaweah River, which is not a wild and scenic river, but has been deemed suitable as a recreational class river. Project activities will not impact the Kaweah River. Therefore, wetlands, floodplains, and wild and scenic rivers were dismissed as an impact topic in this environmental assessment.

Water Quality

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. *NPS Management Policies* (NPS 2001) provide direction for the preservation, use, and quality of water in national parks.

There are no water bodies in the vicinity of the project area. The amount of water withdrawn from all sources during the June through September season would be limited in future years to 5,017,000 gallons, the average withdrawn during the years 1998 to 2003. Since the project deals only with the storage and distribution of water, and the source and treatment of the water would remain the same under both the no-action and preferred alternatives, water quality was dismissed as an impact topic in this environmental assessment.

Archeological Resources

It is estimated that 5% of the parks' total acreage (approximately 43,000 acres) has been inventoried (surveyed) for the presence/absence of archeological resources. The known archeological resources span a time period of at least 3,000 to 5,000 years. These resources document prehistoric, ethnographic, historic, and even contemporary use of park areas.

In the vicinity of the proposed project, there are no known archeological sites. The area has been surveyed over the past several years for various construction projects and no resources have been found. Due to the previous level of ground disturbance, it is unlikely that archeological resources would be affected during the proposed project (Burge 2003). Therefore, archeological resources are not addressed as an impact topic in this environmental assessment.

Should previously unknown archeological resources be uncovered during construction, all work would immediately cease in the discovery area and the National Park Service would consult according to 36 CFR 800.11 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act (1990).

Cultural Landscapes

As described by Director's Order – 28: *Cultural Resource Management Guideline*, a cultural landscape is: "...a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions." There are no cultural landscapes identified in the immediate area of this project that could be affected by current project actions; therefore, cultural landscapes were dismissed as an impact topic.

Ethnographic Resources

The National Park Service defines ethnographic resources as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (Director's Order – 28: *Cultural Resource Management Guideline*, p.181). Ethnographic resources within the parks can include such things as the sites of historic villages or campsites, caves, rock art sites, traditional plant gathering areas, graves, landscapes, vistas, and other natural features (e.g., monoliths and promontories). Because no ethnographic resources are known to exist in or near the project area (Burge 2003), ethnographic resources were dismissed as an impact topic.

Museum Objects

The National Park Service defines a museum object as a material thing possessing functional, aesthetic, cultural, symbolic, and/or scientific value, usually moveable by nature or design (Director's Order – 28: *Cultural Resource Management Guideline* 1998). Collections are stored in the administration office in a space that currently meets curation standards (Burge 2003). The collections and the storage space would not be affected by the proposed project; therefore, this topic was dismissed as an impact topic.

Scenic Values, Natural Soundscapes, and Night Skies

Scenic values, natural soundscapes, and night skies could be affected by both the no-action and preferred alternative; however, the effects would be short term, localized, and negligible.

Should the preferred alternative be selected, most work would generally occur during the daylight hours, potentially extending into the evening hours only if a monolithic pour is needed for the new tank construction. Any lighting, such as security lighting at the tanks, would be directional and shielded to prevent intrusions into the night sky. Scenic values have already been disturbed in this area by the existing buildings, and construction related to the proposed project would be short term followed by site restoration. The water tanks would have design features (colored concrete, textured concrete, etc.) to soften their appearance. Native vegetation would be planted and cared for to provide screening as quickly as possible. The backflow control devices would be encased in structures finished to blend with the adjacent building. The backflow control device at the administration building would be located under the catwalk. The new tanks would be more visible than the existing tanks, but are located on a hillside where vegetation and buildings will also act to shield the structures. The area is not a high visitor use area and the tanks would not be of any measurable or perceptible consequence to the visitor experience. Construction-related noise would be mitigated through the use of state-of-the-art noise reduction technology on construction equipment to the maximum extent possible to minimize the amount of noise from construction activities and maintaining daylight work hours. Impacts to scenic values, natural soundscapes, and night skies would be negligible and short term. Therefore, scenic values, natural soundscapes, and night skies were dismissed as an impact topic in this environmental assessment.

Recreational Values / Visitor Experience and Understanding

Ash Mountain has been the headquarters complex for Sequoia and Kings Canyon National Parks since the 1920s, and includes administrative, maintenance, and permanent and seasonal housing structures for park staff. At least one of the existing water supply tanks serving this complex has been in place since the 1930s, and the tank locations are away from areas of the park frequented by visitors. The proposed replacement tanks would replace and be placed in the same location as the existing tanks, limiting disturbance to an area previously disturbed. The contractor would be required to maintain a three-day water supply to service the area. In addition, the replacement work would occur during the winter months when visitation is normally at its lowest levels. As a result, recreational values / visitor experience and understanding would not be affected by either the preferred or no-action alternatives. Therefore, recreational values / visitor experience and understanding was dismissed as an impact topic in this environmental assessment.

Socioeconomic Resources

The proposed action would not change local or regional land use or transportation, nor would it appreciably affect concessions operations, local businesses, or agencies. Implementation of the preferred alternative could provide a negligible beneficial impact to local economies due to minimal, short-term increases in employment opportunities for the construction work force and revenues for local businesses and government from construction activities and workers. Any benefit to the economy would be temporary (lasting only during construction) and negligible overall. Therefore, the socioeconomic environment was dismissed as an impact topic in this environmental assessment.

Wilderness Values

The Wilderness Act of 1964 “established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as ‘wilderness areas,’ and these would be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness.”

It is the policy of the National Park Service (*2001 NPS Management Policies*, Chapter 6: Wilderness Preservation and Management) to “take no action that would diminish the wilderness suitability of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions pertaining to lands qualifying as wilderness will be made in expectation of eventual wilderness designation.”

No impacts to wilderness values would be expected under the no-action alternative. Should the preferred alternative in this document be selected, construction at the Ash Mountain developed area would be approximately 0.6 mile from the nearest wilderness boundary; federally designated wilderness lands would be avoided during construction activities.

Construction activities at the project site would generate activity and noise that would not be perceptible in any wilderness area of the park. As a result, there would be no impacts to any park wilderness values should the preferred alternative be selected. Therefore, wilderness values was dismissed as an impact topic in this document.

Prime and Unique Farmland

In August 1980, the Council on Environmental Quality directed that federal agencies assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture’s Natural Resources Conservation Service as prime or unique. Prime or unique farmland is defined as soil which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. The proposed project is exempt from the requirements of the Farmland Protection Policy Act because there are no prime farmlands associated with the project area, and there are no potential impacts that would directly affect wetland areas associated with agriculture. Therefore, prime and unique farmlands were dismissed as an impact topic in this document.

Land Use

The Ash Mountain headquarters complex is located at the entrance to Sequoia National Park from the southwest, on Generals Highway. Kings Canyon National Park lies to the north of Sequoia National Park and both parks are bounded by the Sequoia National Forest and Giant Sequoia National Monument to the south and west, the Inyo National Forest to the south and east, and the Sierra National Forest to the north. Neither the no-action or preferred alternative would affect present or future park land use, or the uses of surrounding lands. Therefore, land use was dismissed as an impact topic in this environmental assessment.

Environmental Justice

Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Therefore, environmental justice was dismissed as an impact topic in this environmental assessment.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources in Sequoia and Kings Canyon National Parks. The lands comprising the parks are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic in this environmental assessment.

ALTERNATIVES

INTRODUCTION

The alternatives section describes two management alternatives for water storage and distribution facilities for the Ash Mountain developed area at Sequoia and Kings Canyon National Parks. Alternatives for this project were developed to resolve pertinent safety, visitor use, and management issues.

The no-action alternative describes the action of continuing the present management operation and condition, it does not imply or direct discontinuing the present action or removing existing uses, developments, or facilities. The no-action alternative provides a basis for comparing the management direction and environmental consequences of the preferred alternative. Should the no-action alternative be selected, the National Park Service would respond to future needs and conditions associated with water-related utilities at Ash Mountain without major actions or changes in course.

The preferred alternative presents the National Park Service proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. All actions described in the preferred alternative would be conducted in areas presently zoned for development as described in the 1971 *Master Plan*, Sequoia and Kings Canyon National Parks and the 1976 *Sequoia and Kings Canyon Statement for Management*. Additionally, all developments proposed would be in areas presently disturbed and with roads and other facilities serving visitors and park management needs.

Additional alternatives considered and dismissed from detailed analysis are also discussed in this section.

ALTERNATIVE 1: NO-ACTION ALTERNATIVE

The no-action alternative would be the continuation of existing conditions for water storage, distribution, supply, and fire suppression at the Ash Mountain headquarters complex. The existing water tank and distribution lines would continue to supply potable water for the complex and fire suppression. The no-action alternative does not preclude short-term, minor repair or improvement activities for the tanks and distribution system that would be a part of routine maintenance for continuing operation of the system.

ALTERNATIVE 2: WATER TANK AND DISTRIBUTION SYSTEM REPLACEMENT AND INSTALLATION OF A FIRE SUPPRESSION SYSTEM (PREFERRED ALTERNATIVE)

Alternative 2 is the National Park Service preferred alternative. The preferred alternative presents the National Park Service's proposed action and defines the rationale for the action in

terms of resource protection and management, visitor and operational use, and costs. Based on the value analysis study, the preferred alternative is the only alternative that would fulfill the stated purpose and resolve the need for providing an adequate supply and distribution of both potable and fire suppression water for the Ash Mountain headquarters complex through the year 2018. No growth is anticipated for the Ash Mountain headquarters complex and the preferred alternative provides for no additional supply of water, only sufficient storage to meet current needs.

Water Tank and Distribution System Replacement and Fire Suppression System Installation

Under the preferred alternative, both existing water tanks at the Ash Mountain headquarters complex would be replaced, the water distribution system would also be replaced, and a fire suppression system would be installed to serve the four main administration buildings: the fire control building, the warehouse, the maintenance facility, and the administrative offices and visitor center building.

Water Tanks

The two existing water tanks, with a combined capacity of 145,000 gallons, would be replaced with two tanks, each with a 220,000-gallon capacity for a total combined capacity of 440,000 gallons. The new tanks would meet the project objectives of providing three days capacity at maximum usage, plus 120,000 gallons of water for fire fighting capabilities. The new tanks would be of concrete construction and have a round shape. The new tanks would be placed in the same location as the existing structures, but because of size differences would occupy a larger footprint (figure 2). The top of the new tanks would be at the same elevation as the top of the old tanks in order to maintain the appropriate hydraulic head for inflows and outflows. The existing cutbank would not be disturbed so additional leveling for placement of the new tanks would occur primarily to the east. The tanks would not extend beyond the existing fence line located to the south of the present tanks.

Water would continue to flow by gravity to and from the tanks and the treatment plant would continue to treat the water prior to entering the tanks. The amount of chlorinating agent used per year is assumed to remain much the same or slightly less than the existing use. The water sources for the tanks would continue to contribute an average of 26,100 gallons per day from the surface water source and an average of 625 gallons per day from the groundwater well. The surface water source is used to provide the majority of water, and during peak demand periods, up to 107,200 gallons of water per day is withdrawn. The new tanks would increase the capacity for storage, not increase the amount of water withdrawn from the well or surface source.

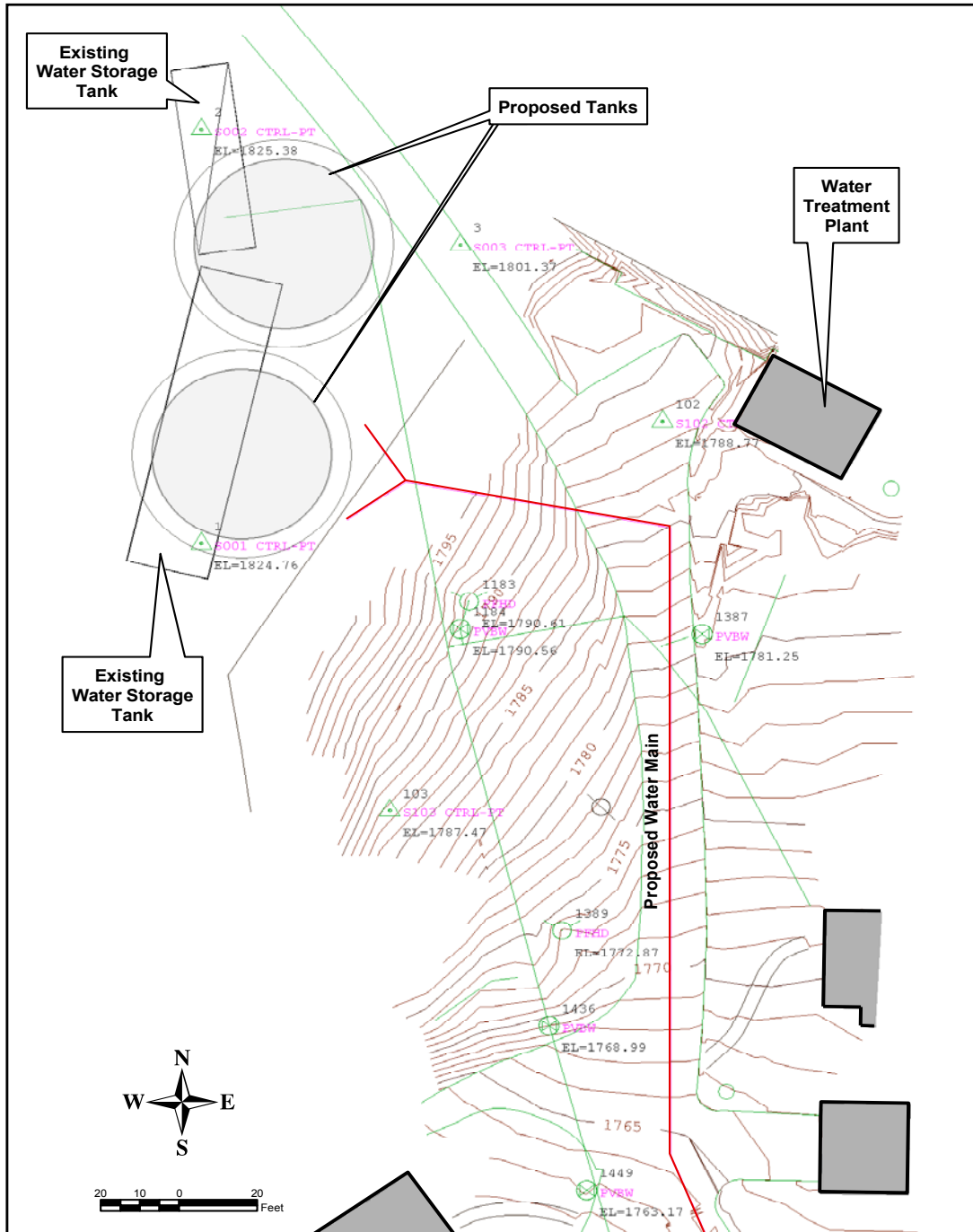


FIGURE 2. NEW TANK LOCATION VS. EXISTING TANKS [NPS/DSC/102-20139]

Following is a summary of current and proposed water storage and use requirements and tank sizing.

Current Tanks	Proposed Tanks
<p>Potable water: 26,100 gallons per day required on average 107,200 gallons per day maximum required Well provides 625 gallons per day Stream provides remainder</p>	<p>Potable water: 26,100 gallons per day required on average 107,200 gallons per day maximum required Well provides 625 gallons per day Stream provides remainder</p>
<p>Storage Available: 145,000 gallons in two tanks</p>	<p>Storage Available: 440,000 gallons in two tanks</p>
<p>Fire Fighting: Without sprinklers approximately 604,000 gallons of storage required</p>	<p>Fire Fighting: With sprinklers, approximately 120,000 gallons of storage required</p>
<p>Potable and Fire Fighting: Tanks do not contain enough storage capacity for more than one day of high use and no storage capacity for fire fighting requirements</p>	<p>Potable and Fire Fighting: Tanks contain sufficient capacity for fire fighting storage and three days of capacity at high use</p>

Water Distribution System

The existing cast iron pipeline distribution system would be abandoned in place and a new water main and service lines would be installed. The water main would be 12-inches in diameter with service line diameters based on water needs. The proposed alignment for the new water main is shown on figure 3. The water main would exit the tanks and be buried within the water tank access road right-of-way for approximately 350 feet. From that point, the water main would be routed over a hillside to the picnic area parking lot and would be buried within previously undisturbed natural ground.

At the picnic area parking lot, the water main would split to form a roughly circular system. One line would be placed to the southwest crossing beneath Generals Highway and along the access road to the back of the warehouse building. The other branch of the water main would be placed to the southeast around Foothills Visitor Center and main administration building. The water main would cross Generals Highway and follow the road around the visitor center and through the administration building parking lot, passing to the northeast side of the fire control building. The pipelines would merge in front of the maintenance building. The pipeline corridor would be no more than 40-feet wide.

The existing pipeline would be left in place, but cut off and capped in both directions.

Fire hydrants would be relocated along the water main route, as appropriate. Current fire hydrant locations are not always accessible or located close to where fire suppression may be necessary (figure 4). Several locations are not within road corridors or in close proximity to buildings.

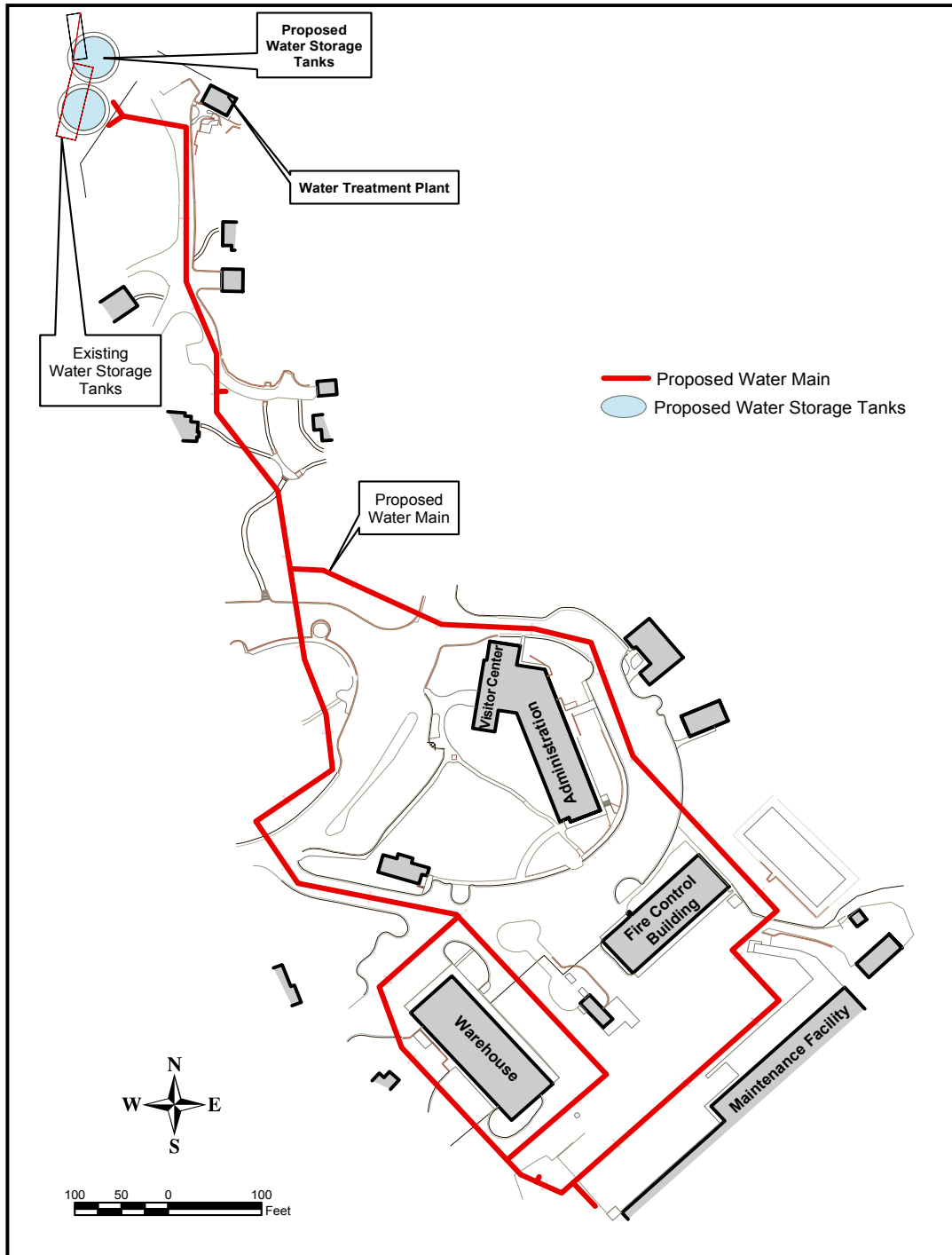


FIGURE 3. WATER MAIN ROUTE [NPS/DSC/102/20140]



FIGURE 4. INACCESSIBLE FIRE HYDRANT

Fire Suppression System

Sprinkler systems would be installed in the four Mission 66 buildings including the administration / Foothills Visitor Center building, fire control building, warehouse, and maintenance building. The fire suppression system would consist of overhead sprinklers placed at appropriate intervals within the buildings. Sprinklers would be located and installed to cause minimal disturbance to the interior of the buildings and to protect and preserve the historic nature of the buildings. A backflow control device would be installed adjacent to the main administration building. This device would be located near the northeast corner of the building and would be a stand-alone device with a single pipeline entering the building to minimize the intrusion on this Mission 66 building (figure 5).



FIGURE 5. ADMINISTRATION BUILDING

General Construction Schedule and Costs

Construction for this project is expected to last approximately 14 months, starting in 2004; however, construction could be delayed by weather conditions or other unexpected events. The water tank replacement project would begin in 2004, and would be scheduled for completion by the spring of 2005. The cost of this project is expected to be approximately \$1.4 million (gross 2003 dollars).

Staging Area

Two areas would be available for the staging of construction equipment, storage of supplies, and placement of temporary tanks. Both sites have been previously disturbed. One area lies adjacent to and slightly downhill of the existing water treatment plant. This area is the site of an old building that was removed and consists of a large flat area close to the existing water tanks. Another staging area would be located slightly lower on the hill within an area that has previously been used for a children's playground. Additional staging could occur in the existing yard/parking area of the warehouse and maintenance buildings, if necessary, for work in these areas.

Mitigation Measures for the Preferred Alternative

Mitigation measures are analyzed as part of the proposed action. These actions have been developed to lessen the adverse effects of the proposed action.

Throughout the project area, soils and vegetation are already impacted to a degree by various human and natural activities. Construction would take advantage of these previously disturbed areas wherever possible. Staging areas for materials and construction equipment storage and turnarounds at the project site would also take advantage of previously disturbed areas.

Prior to construction, the project areas, including temporary routes for construction traffic, would be identified and defined. This would help confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined.

Storing of hazardous materials and fueling of all machinery would only be conducted in park approved equipment staging areas. Any spills of hazardous materials, fuel, etc., would be immediately reported to the Sequoia and Kings Canyon National Parks hazardous materials coordinator and safety officer. Contingency plans for safely dealing with hazardous material spills would be submitted prior to project initiation. Spilled hazardous materials would be cleaned up immediately and would not be allowed to seep into the soil. Materials used for cleaning fuel spills and other hazardous materials would be available onsite. Some petrochemicals from construction equipment could seep into the soil; to minimize this potential, equipment would be checked frequently to identify and repair any leaks.

Excess material removed (i.e., water tank debris, rock, soil) would be disposed of at appropriate areas outside the park or stockpiled at park approved upland locations within the park to be used in future projects. Fill material needed beyond that produced from construction activities would be taken from park approved sources outside the park. If there is a need to import topsoil, such topsoil would be certified free of noxious plant species and imported from sources approved by park resource management staff.

The concrete batch plant would be located outside the park.

Soils within the project construction limits would be compacted and trampled by the presence of construction equipment and workers. Soils would be susceptible to erosion until revegetation takes place. Vegetation impacts and potential compaction and erosion of bare soils would be minimized by salvaging topsoil from all disturbed areas and storing in windrows adjacent to the disturbed areas. The use of salvaged topsoil would help preserve microorganisms and seeds of native plants. The topsoil would be respread in as near the original location as possible, and supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area. This would reduce construction scars and erosion.

Any trenching operations (i.e., installing buried utility lines) would use a rock saw, backhoe, and/or trencher. The pipeline corridor and associated trenching would be located along existing roadways for the most part. In undisturbed areas, the corridor and trenching would be located to minimize disturbance to established vegetation and avoid large diameter trees to the extent possible. Roots less than 6-inches in diameter would be given a clean straight cut to prevent root rot. When roots 6-inches in diameter and larger are encountered during trenching operations, they would be retained by hand-digging the trench beneath the root. As the trench is dug, the excavated material would be side-cast for storage adjacent to the disturbed area. After trenching is completed, bedding would be placed and compacted in the bottom of the trench and the pipe installed in the bedding. Backfilling and compaction would begin immediately after the pipe is placed into the trench, and the trench surface would be returned to preconstruction contours.

All trenching restoration operations would follow guidelines approved by park staff. These guidelines would minimize disturbance to soils and vegetation from construction activities, and would restore affected areas to their original form wherever possible. Excavated material would be windrowed in the construction zone. Although soil windrowed during construction is susceptible to some erosion, such erosion would be minimized by placing silt fencing, as required, adjacent to the excavated soil. Excavated soil would be windrowed only as long as it takes to dig the trench and install utility lines. Further, once construction is completed and disturbed surfaces recontoured, erosion mats or other erosion control measures would be used to protect bare, exposed soils from erosion until revegetation takes place. Efficient staging and careful machine work would be emphasized.

Other temporary impacts associated with construction would include the potential for increased soil erosion. Standard erosion control measures such as silt fences and/or sand bags could also be used to minimize any potential soil erosion. Silt fencing fabric would be inspected weekly or after every major storm. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid spillage.

In an effort to avoid introduction of non-native plant species, no hay bales would be used for erosion control. Hay often contains seeds of undesirable or harmful alien plant species. Therefore, on a case-by-case basis, the following materials may be used for any erosion control dams that may be necessary: rice straw, straws determined by the National Park Service to be weed-free (e.g., Coors barley straw or Arizona winter wheat straw), cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales.

Revegetation would occur with species native to the site using local genetic stock (collected within 500 feet elevation and within the Middle Fork of the Kaweah watershed). Native perennial grasses have deeper rooting zones than non-native annual grasses, and those deeper rooting zones would protect soils from erosion. Revegetation efforts would include reconstruction of the natural spacing, abundance, and diversity of native plant species. All disturbed areas would be restored as nearly as possible to preconstruction conditions shortly after construction activities are completed. The principal goal is to avoid interfering with natural processes.

In areas of established turf (picnic area, headquarters lawn), the revegetation would occur through salvage and replacement of the existing turf or reseeding with the same turf species. In turf areas, excavated material would be placed on filter fabric to avoid damaging adjacent turf.

Revegetated areas would be frequently monitored for revegetation success and to ensure that erosion is not occurring on the steeper slopes. Remedial actions would be implemented, as necessary, and could include installation of additional erosion control structures, reseeding and/or replanting areas, and controlling non-native species.

The invasion of non-native species would be controlled by the following methods:

- All wheeled or tracked equipment would be cleaned prior to entering the park to help prevent the spread of non-native species.
- All seeds and cover/mulch materials would be certified as weed free.

If any threatened/endangered animal or plant species or critical habitats are discovered within or adjacent to the project area during construction, consultation with the U.S. Fish and Wildlife Service would be initiated and appropriate mitigation measures would be implemented.

Construction activity would be coupled with water sprinkling to reduce fugitive dust plumes. Idling of construction vehicles would be limited to reduce construction equipment emissions. Most work would generally occur during the daylight hours, potentially extending into the evening hours only if a monolithic pour is needed for the new tank construction. Any lighting, such as security lighting at the tanks, would be directional and shielded to prevent intrusions into the night sky. The water tanks would have design features (colored concrete, textured concrete, etc.) to soften their appearance. Native vegetation would be planted and cared for to provide screening as quickly as possible. The backflow control devices would be encased in structures finished to blend with the adjacent building. The backflow control device at the administration building would be located under the catwalk. Construction-related noise would be mitigated through the use of state-of-the-art noise reduction technology on construction equipment to the maximum extent possible to minimize the amount of noise

from construction activities and maintaining daylight work hours. The amount of water withdrawn from all sources during the June through September season would be limited in future years to 5,017,000 gallons, the average withdrawn during the years 1998 to 2003. The replacement work would occur during the winter months.

Cultural Resources

Construction activities would be conducted in previously disturbed areas (e.g., along the existing waterline and Ash Mountain developed area) to the extent possible. Staging areas for construction vehicle and equipment storage would be located in previously disturbed areas and would be clearly identified in advance. Construction workers and supervisors would be informed of the special sensitivity of park values, regulations, and appropriate housekeeping. All contractors would be informed of the penalties for illegally collecting artifacts or intentionally damaging any archeological or historic property by construction crews. Construction workers and supervisors would be advised of the laws and guidelines and special sensitivity to ensure protection of cultural resources.

The water tank and water main replacement would occur adjacent to structures that comprise a historic district. The following steps would be taken to mitigate potential impacts to historic structures from construction activities.

- To prevent potential failure and flooding, the water tanks would be completely emptied before any work commences that could threaten the structural integrity of the tanks, prior to their removal.
- The pipeline corridor would be defined through the use of flagging, fencing, or other mechanisms prior to initiating any work on pipeline replacement.
- Augering or tunnel equipment would be used to allow pipeline placement under those areas such as sidewalks and rock walls that were constructed by the Civilian Conservation Corps and represent historic structures (figure 6). As an alternative, the contractor would be required to develop a photographic record of the site, number each stone, remove, and subsequently reconstruct the area in exactly the same location.

Should unknown archeological resources be uncovered during construction, work would be halted in the discovery area, the site secured, and Sequoia and Kings Canyon National Parks would consult with the California State Historic Preservation Office according to the National Park Service Servicewide Programmatic Agreement for section 106 compliance (1995), 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990. In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service would also notify and consult concerned tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project. Work could resume only after an appropriate mitigation strategy is developed in consultation with the California State Historic Preservation Office and after archeological clearances are obtained.

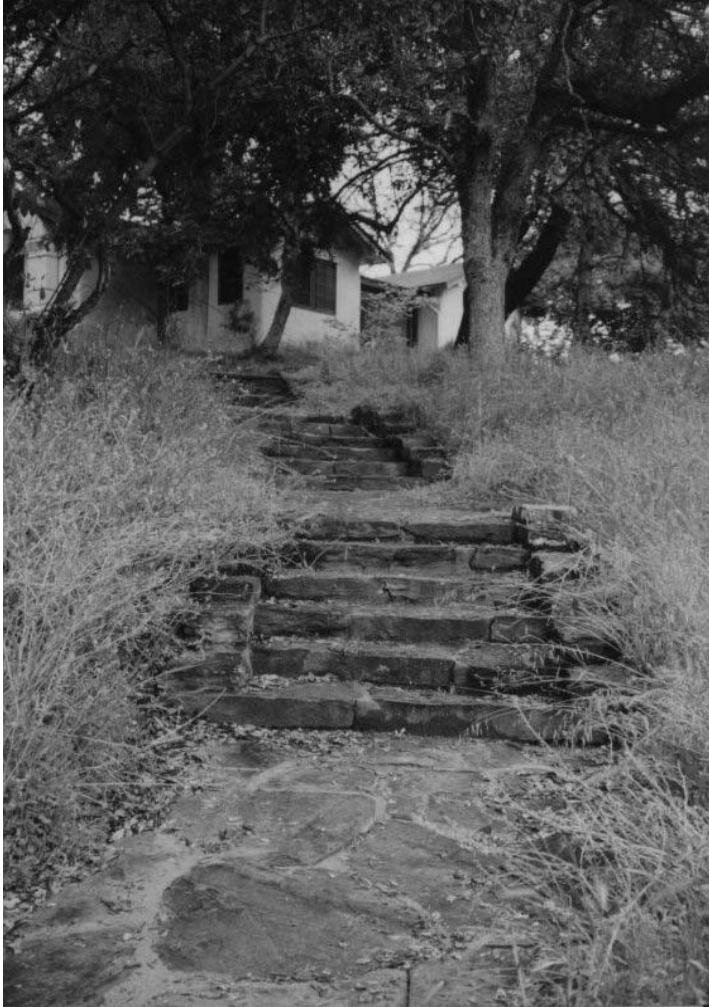


FIGURE 6. PIPELINE WOULD BE INSTALLED BENEATH CIVILIAN CONSERVATION CORPS STEPS

Park Operations

The contractor would be required to maintain a three-day supply of water for use by visitors, residents, and employees. The construction work would likely take place over the winter months when water use and visitor numbers are lower than during the summer. Work hours would typically be between 8:00 A.M. and 5:00 P.M., except under circumstances such as a monolithic pour that would require non-stop work until the pour had been completed. In-building sprinkler work would also occur after normal working hours to provide the least amount of disruption to park operations.

Sustainability

The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design National Park Service facilities to:

- minimize adverse effects on natural and cultural values
- reflect their environmental setting
- maintain and encourage biodiversity
- construct and retrofit facilities using energy-efficient materials and building techniques
- operate and maintain facilities to promote their sustainability
- illustrate and promote conservation principles and practices through the sustainable design and ecologically sensitive use

Essentially, sustainability is living within the environment with the least impact on the environment. The proposed action subscribes to and supports the practice of sustainable planning, design, and use of the Ash Mountain developed area and associated public and administrative facilities.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

According to Council on Environmental Quality regulations implementing NEPA, and the National Park Service NEPA guidelines (Director's Order – 12), an environmentally preferred alternative must be identified in an environmental assessment. In order for an alternative to be environmentally preferred, it must meet the criteria established in section 101(b) of NEPA and subsequently adopted by the National Park Service. An alternative must meet the following criteria to be considered an environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The no-action alternative does not meet some of the above criteria (Criteria 2, 3, and 4) because a tank failure or disruption of water supply would potentially create a safety risk and destroy structures that are part of a historic district. Further, tank and distribution pipeline leakage is not a wise use of water resources (Criteria 6). The environmentally preferred alternative in this environmental assessment is alternative 2, and would meet the following criteria:

- Criteria 1: preserve the environment for future generations
- Criteria 2: protect public health, safety, and welfare
- Criteria 3: protect employee safety and welfare
- Criteria 4: prevent loss of cultural resources
- Criteria 5: improve operations efficiency and sustainability
- Criteria 6: conserve water resources

In short, this alternative would preserve historic resources, minimize threats to public and employee safety, and improve day-to-day operations. In addition, implementation of the preferred alternative would also result in improvements in water conservation by replacing leaking tanks and pipes.

ALTERNATIVES CONSIDERED BUT DISMISSED

A number of alternatives were evaluated as part of the investigation into water supply, water storage, and fire fighting capabilities at the Ash Mountain headquarters complex, including

alternatives to the water supply, alternative storage, alternatives for replacement of the piping system, and alternatives for installation of a sprinkler system for the four main buildings. Although changes in one section of the system components affect changes to other sections of the system, the various alternatives were evaluated as parts of the system rather than as the whole system.

As previously discussed, alternatives for water supply included the potential for a source of groundwater for either fire fighting or potable water. Three wells were drilled, but none yielded good quality potable water at high enough flows to change the primary source of the water supply, so this alternative for the water supply was dismissed.

Separate sources for potable and non-potable water were also evaluated. In order to supply adequate volumes of both potable and non-potable water, separate tanks, treatment systems, and distribution systems would need to be developed and maintained. Limits on locations for water storage, as well as the costs in time and materials to maintain two separate systems, made this alternative impractical.

An alternative was evaluated that would not install sprinkler systems in the four main buildings; however, this would require storage of 604,000 gallons of additional water (designated for fire fighting only) to meet the requirements of the National Fire Protection Association (NFPA) regulations. Such storage would require additional storage tanks to be located and maintained and was dismissed due to the additional amount of water storage required.

Various size alternatives for the water tanks were also evaluated. It was common in earlier years to consume 60,000 to 100,000 gallons of water in a single day, with peaks sometimes higher than that. In large part, such high use was because it was typical to maintain non-native lawns and landscaping around most of the houses in the Ash Mountain headquarters complex. This practice has now been eliminated at virtually all the houses, saving an estimated 30,000 to 40,000 gallons per day during the summer. Based on the period 1998 to 2003, summertime water withdrawal (production) now averages 42,000 gallons per day, with occasional peaks of 70,000 to 90,000 gallons per day. Future potable water needs through 2018 are expected to remain much the same or slightly less than the existing potable water needs.

The issue of tank size was addressed in a value analysis study conducted on June 26, 2002. That study determined the appropriate storage reserves for both fire suppression and for potable use. Using NFPA criteria, it was determined that 120,000 gallons was required for fire suppression storage, assuming sprinkler systems were installed in the four largest buildings.

Average daily supply (production) is slightly more than average daily demand for even the summer months, resulting in a slight surplus of water on average. However, potable reserves are required for periods when the supply drops below average (drought), for peak demand increases above average, or circumstances where the supply source becomes contaminated.

Based on recommended standard practice, the value analysis study decided to provide a minimum of three days of peak demand. In July 1997, 107,200 gallons was produced in one day. For the purposes of this project, this day was determined to be representative of peak day

consumption. Providing three days’ storage at this rate would require approximately 320,000 gallons of storage.

Thus, the only tank size that would fulfill the stated purpose and resolve the need was 440,000 gallons—120,000 gallons for fire suppression storage and 320,000 gallons for potable storage.

COMPARATIVE SUMMARY OF NO-ACTION AND PREFERRED ALTERNATIVES

Table 1. Comparative Summary of Alternatives

No-Action Alternative	Preferred Alternative
<p>There would be no improvements to the existing water supply and fire suppression at the Ash Mountain headquarters complex. Sequoia and Kings Canyon National Parks would respond to future needs and conditions associated with the water supply and distribution system without major actions or changes from the present course. In the event of a fire, fire fighting capabilities would be based on the availability of water in the existing system.</p>	<p>To improve water storage, the two existing water tanks would be replaced with two larger tanks holding a combined capacity of 440,000 gallons. The new tanks would be of the same construction and in the same location, but they would occupy a larger footprint.</p> <p>The existing pipeline would be abandoned and a new water main would be installed following the alignment of the existing pipeline to the extent possible.</p> <p>Fire hydrants would be relocated along the water main, becoming more accessible for possible fire suppression needs.</p> <p>To improve fire suppression, sprinkler systems would be installed in the four Mission 66 buildings. Sprinklers would be placed overhead and at appropriate intervals, without intrusion on the historic nature of the building.</p>
<p><u>Meets Project Objectives?</u></p> <p>No. Continuing to use the existing tank system does not avoid the potential for affecting the visitor experience through a lack of potable water for visitor use, either through ongoing shortages based on inadequate storage capacity or through a failure of the tanks. Park employees working at Ash Mountain headquarters complex would also be affected by a lack of potable water. Tank failure could result in damage to historic buildings. The existing system would not provide adequate fire protection in the event of a building fire or wildfire in the Ash Mountain area. Park operations personnel would continue to respond to maintenance needs on a regular basis.</p>	<p><u>Meets Project Objectives?</u></p> <p>Yes. The new tank system would provide adequate capacity for potable water and fire suppression. The new tanks would be designed to minimize the potential for failure during seismic events.</p> <p>The relocation of fire hydrants, along with the installation of fire sprinklers in administrative buildings, would improve fire fighting capabilities.</p> <p>The installation of a new pipeline system would minimize the maintenance needs for park staff.</p>

COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Table 2. Comparative Summary of Potential Environmental Impacts

Impact Topics	No Action Alternative	Preferred Alternative
Soil	No additional impacts to soils would be expected from continued use of the tanks.	Short-term impacts to soil resources would be localized, minor, and adverse. Over the long term, soil resources would be restored to natural conditions and the long-term impacts would be negligible.
Biotic Communities (vegetation and wildlife)	There would be no new impacts to vegetation in the short term under the no-action alternative as there would be no changes to vegetation resources. The effects of tank failure on vegetation would be short term, localized, negligible, and adverse. There would be no new impacts to wildlife in the short term under the no-action alternative. The water release in the event of a tank failure would have a short-term, localized, negligible, adverse impact on wildlife in the path of the water.	Adverse impacts to vegetation would be local, short term, and minor. Over the long term, adverse impacts to vegetation would not be measurable as revegetation occurs. There would be potential localized, negligible to minor, adverse impacts to wildlife in the short term as a result of construction activities associated with the tank and water main replacement. Over the long term, upon completion of construction and reclamation, wildlife use in the area would return to pre-project conditions and the adverse impacts would not be measurable.
Historic Structures and Districts	No direct project-related impacts on historic structures and districts would occur. Structures would face potential long-term, minor to moderate, adverse impacts from fire and water tank failure.	The installation of new water tanks and water main lines would have long-term, minor, adverse impacts on the historical integrity of the Civilian Conservation Corps, Generals Highway, and Mission 66 historic districts. However, the fire protection provided by increased water storage capacity and installation of fire-suppression systems in the Mission 66 buildings would result in long-term, minor, beneficial impacts. An overall section 106 determination of no adverse effect is anticipated.
Health and Safety	The no-action alternative would not represent any change to health and safety in the short term; however, the potential impacts to health and safety from inadequate fire suppression represent a short- and long-term, minor to moderate, adverse impact to health and safety. The longer-term, local impacts from a failure of tanks through deterioration or a seismic event would be moderate and adverse.	Beneficial impacts to health and safety as a result of implementing the preferred alternative would be local and moderate in the long term. Adverse impacts of the preferred alternative to health and safety as a result of construction activity would be localized, short term, and minor. The potential health and safety impacts from release of spores during construction activities would be localized, short term, negligible, and adverse if the soils are water sprinkled during soil disturbing activities.
Park Operations	There would be no change in park operations under the no-action alternative; however, the existing condition constitutes a short- and long-term, minor to moderate, adverse impact to park maintenance operations. The impacts to park operations would be short term, localized, moderate and adverse in the event of tank failure due to geologic hazards.	Adverse impacts of the preferred alternative to park operations as a result of construction activity would be localized, short term, and negligible. Long-term, moderate, beneficial impacts would occur as a result of the completed project.

ALTERNATIVES

AFFECTED ENVIRONMENT

Detailed information on resources in Sequoia and Kings Canyon National Parks may be found in the park's 1971 *Master Plan* and the park's *Natural and Cultural Resources Management Plan*, Sequoia and Kings Canyon National Parks, December 1999 revision. A summary of the resources associated with this project follows.

LOCATION AND GENERAL DESCRIPTION

Sequoia and Kings Canyon National Parks are located in the eastern part of central California. Although established by separate acts of Congress, the two parks share miles of boundary and are managed jointly (NPS 2003c). Park headquarters at Ash Mountain is located 175 air miles (282 kilometers [km]) north of Los Angeles and 215 air miles (346 km) southeast of San Francisco. Both parks occupy the western slope of the Sierra Nevada mountain range. Combined acreage for the two parks is 865,952 acres (1,353-square miles).

The water tanks at the Ash Mountain headquarters complex were originally installed in the 1930s or 1940s. One tank is visible on a 1937 aerial photograph, but the exact date of construction for each tank is not known. The tanks serve as the water supply for the headquarters complex, including full-time residential and seasonal housing, offices / laboratories, the Foothills Visitor Center, the main warehouse facility, the fire operations building, and the main maintenance facility for Sequoia and Kings Canyon National Parks.

The water supply for the complex comes primarily from a perennial drainage to the northeast of the tanks. Based on the period 1998 to 2003, summertime water withdrawal averages 42,000 gallons per day, with occasional peaks of 70,000 to 90,000 gallons per day. When conditions warrant, withdrawal rates can be increased significantly higher. On one day in June 1998, 243,300 gallons were withdrawn in a single day. In the past, water has been withdrawn from the Kaweah River to meet demands, but changes in water rights and water quality regulations have necessitated that this practice be eliminated. A groundwater well supplements the spring system contributing an average of 625-gallons per day of water to the water supply system.

The water from the stream and well are piped to the water treatment plant for treatment prior to entering the concrete tanks (figure 7). The water treatment is achieved by passing the water through sand filters and adding sodium hypochlorite (NaOCl), a chlorinating agent. Once treated, the water is sent to the concrete tanks for storage. Figure 8 is a schematic of the water collection, storage, and distribution system.

The storage system consists of two, rectangular, fully enclosed concrete tanks, one with a capacity of approximately 100,000 gallons, and one with an approximate capacity of 45,000 gallons. The tanks are located on a hillside above the Ash Mountain headquarters complex. This area was leveled by cutting into the hillside and creating a flat area for placement. The downgradient side of the tanks is fenced with a 6-foot chain link fence. A locked gate protects access to the site.



FIGURE 7. WATER TREATMENT SYSTEM BUILDING

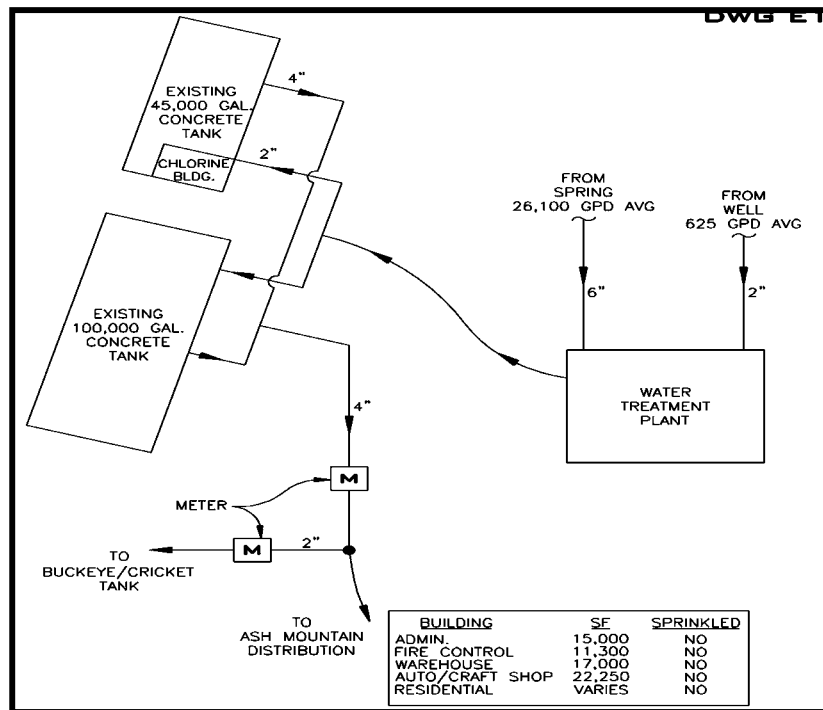


FIGURE 8. SCHEMATIC OF EXISTING SYSTEM

The water distribution system flows by gravity from the tanks. The pipeline is 4-inches in diameter and has service lines at the many withdrawal points to service existing buildings. Fire hydrants are located along the pipeline; however, hydrants are not conveniently located to assist in fire fighting.

The tanks and associated water distribution system are over 60-years old and have many problems. The tanks and distribution pipeline leak. The concrete tanks have visible cracks. Although the tanks were lined with a poly liner in the 1980s, some leakage continues through the larger visible cracks (figure 9). Frequent maintenance is required to fix pipe and valve breaks within the distribution system.



FIGURE 9. VISIBLE TANK CRACKS AND WATER LEAKAGE

Seismicity

The Ash Mountain headquarters complex lies in the foothills of the Sierra Nevada Mountain range. The Sierra Nevada range is considered a moderately active seismic area and earthquakes can and do occur in the area. The closest fault systems to the park are the Sierra Nevada fault system and the Owens Valley fault system. Both systems lie within 50 miles of the site with the Sierra Nevada fault system closer than the Owens Valley fault system. Recent earthquake activity has included a magnitude 2.3 earthquake that occurred on February 3,, 2004, with an

epicenter approximately 23 miles from Sequoia National Park (USGS 2003). The Ash Mountain area lies in Hazard Zone 4 of the seismic hazard ranking for structure designs in accordance with the Uniform Building Code. This hazard ranking indicates that the area has a high potential for an earthquake large enough in magnitude to cause structural damage.

A 1997 Rapid Visual Screening of Seismically Hazardous Buildings concluded that the water tanks represented a considerable risk for failure in a seismic event. If the tanks should fail, the Ash Mountain Visitor Center, headquarters, and housing area would be left without potable or fire suppression water. In addition, several permanent residences would be damaged or destroyed by the resulting wall of water, and visitor and employee safety could be at risk.

Soil

Soils within the project area have not been mapped. Soils are derived from the primarily metamorphic rocks of the area. The deepest soils occur in the valley bottoms and shallow slopes with steeper slopes holding a thinner soil layer.

Fire

From its designation in 1890 to the late 1960s, Sequoia and Kings Canyon National Parks practiced complete fire control, preventing natural and human-made fires from burning to the extent possible. Large fires did burn in the parks in 1926, 1948, 1960, and in the mid-1990s, but fires were largely suppressed. As a result, studies have shown that the suppression policies have promoted the development of a dense understory of living and dead vegetation for most of the parks' vegetated areas (NPS 2003b).

In 1968, the parks began a program of natural fire management rather than suppression and in 1969, the parks began prescribed burns.

The chaparral vegetation of the Ash Mountain area is dense and has not been recently disturbed by fire. These dense, highly flammable stands often reburn, limiting forest establishment and on mesic slopes, *Ceanothus* and *Arctostaphylos* species are often displaced by more competitive taxa such as *Quercus*, *Heteromeles*, *Prunus* and the like, which, if left undisturbed (by fire) long enough would form a self-replacing miniature sclerophyll woodland. However, on arid sites, *Ceanothus* and *Arctostaphylos* will persist for 100 years or more and continue to replenish the soils seed bank sufficiently to rejuvenate the stand after the inevitable fire (Keely 2000). One goal of the Sequoia and Kings Canyon National Parks fire management policy is to maintain the chaparral community at the park boundaries in a relatively early successional stage in which fires of any origin are less intense and more easily managed (NPS 2003b). However, in the developed area of the Ash Mountain headquarters complex, prescribed burns would represent a risk to public health and safety and vegetation control would more likely be implemented through thinning or other mechanical fuel reduction programs.

Wildfires could occur through natural or human-induced causes and would be difficult to contain. The current water tanks are undersized for summer season use. At maximum usage

there would be little water remaining for wildfire suppression. The current water storage capacity, combined with the marginal surface water source, requires seasonal water conservation during the hot, dry summers and creates inadequate fire suppression water reserves at a time when the threat of wildfires is greatest.

Buildings at the Ash Mountain headquarters complex are subject to potential fire risk, not only from wildfires, but also from electrical and chemical fires. Vegetation surrounds many of the buildings and wildfires could spread to the buildings at the Ash Mountain headquarters complex. The complex experienced a devastating fire in the 1930s that destroyed most of the buildings (figure 10).

The fire hydrants in the Ash Mountain headquarters complex are not conveniently located to aid in fire fighting. There is currently no fire suppression system within the four main administrative buildings at the complex, which are the administrative offices, warehouse facility, maintenance facility, and fire control building. The water tanks are out of compliance with NFPA regulations for structural fire exposure protection that require a minimum of 604,000 gallons of water be set aside for structural fire exposure protection based on fire fighting needs for the largest building without sprinkler systems. Even with sprinkler systems, the NFPA requirements are storage capacity of approximately 120,000 gallons, and can only be met with the existing tank system on days when the water usage does not exceed approximately 25,000 gallons.

BIOTIC COMMUNITIES

Vegetation

The vegetation of the area is primarily comprised of foothill chaparral and oak woodland zone vegetative types. Chaparral occurs on steep dry slopes around the Ash Mountain entrance and oak woodlands occur on the lower slopes of the Kaweah drainage in more moist areas. The chaparral is characterized by evergreen brushlands consisting predominantly of shrubs such as chamise (*Adenostoma fasciculatum*), white-leaf manzanita (*Arctostaphylos viscida*), mountain mahogany (*Cercocarpus betuloides*), and deerbrush (*Ceanothus cuneatus*) (NPS 1988).

In the project area, dominant trees typical of dry grassy slopes of the oak woodland are the deciduous blue oak (*Quercus douglasii*) and California buckeye (*Aesculus californica*) and the evergreen species, interior live oak (*Quercus wislizenii*). Dominant shrubs include white-leaf manzanita, western poison oak (*Toxicodendron diversilobum*), and the holly-leaf redberry (*Rhamnus ilicifolia*).

Grasses present include ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and soft chess (*Bromus hordeaceus*).

A survey completed in May 2003, lists 103 plant species within the tank area and pipeline corridor. Unlike most park vegetation, which is made up of plant species native to the region, the foothills zone is composed primarily of non-native annual grasses that were introduced to California during the mid-19th century and have subsequently become naturalized (NPS

1999). Of the 103 species identified during the vegetation survey, approximately 35 species are non-native. The complete list of species present onsite during the 2003 survey is included as appendix B (Haultain 2003).



FIGURE 10. FIRE PHOTOS FROM THE 1930S

Wildlife

The valley foothills support a rich diversity of resident and migratory wildlife species. Most of the species within the park range between vegetative zones and habitats and can be found within a large range in the parks. In all, the parks have recorded 69 species of mammals, 214 species of birds, 22 species of reptiles, and 11 species of amphibians within their boundaries (NPS 1988). The area of the Ash Mountain headquarters complex has more human population and activity than most other areas of the park. Wildlife use is mostly confined to those populations that are adapted to the presence of humans and human activity.

Rather than being confined to a single vegetation type, many species range among a variety of habitats. Mammals most frequently seen in the Ash Mountain area are mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), brush mouse (*Peromyscus boylii*), dusky-footed woodrat (*Neotoma fuscipes*), Botta's pocket gopher (*Thomomys bottae*), and California ground squirrel (*Spermophilus beecheyi*). Common birds in the area include scrub jay (*Aphelocoma coerulescens*), acorn woodpecker (*Melanerpes formicivorus*), oak titmouse (*Parus inornatus*), California quail (*Callipepla californica*), white-breasted nuthatch (*Sitta carolinensis*), bushtit (*Psaltriparus minimus*), and red-tailed hawk (*Buteo jamaicensis*). Reptiles frequently seen include western rattlesnake (*Crotalus viridis*), California kingsnake (*Lampropeltis getulus*), gopher snake (*Pituophis catenifer*), and aquatic garter snake (*Thamnophis atratus*). Common amphibians in the area include Pacific tree frogs (*Hyla regilla*), gregarious slender salamander (*Batrachoseps gregarious*), and California newt (*Taricha torosa*).

HISTORIC STRUCTURES AND DISTRICTS

One eligible and two potentially eligible historic districts exist within the project area. Generals Highway was determined eligible for listing in the NRHP in 1992 as one of the finest, most scenic highways in mountain America (NPS 1997). Features of Generals Highway that contribute to the district include rustic bridges, stone walls and culverts, and a parking area built or enhanced by the Civilian Conservation Corps during the 1930s. Generals Highway bisects Ash Mountain headquarters complex, and the proposed waterline would cross Generals Highway.

Two distinct eras of construction are evident within Ash Mountain and are being proposed as historic districts eligible for listing in the NRHP. The first district consists of the 1930s- to 1940s-era Civilian Conservation Corps constructed buildings and features. There are 16 potentially qualifying buildings within the headquarters complex, primarily residences and garages with at least two office buildings that would make up the district, including residence 97 and its garage, residence 15 and its garage, residence 14, residence 29 and its garage, residence 5 and its garage, residence 7 and its garage, the search and rescue cache, residence 9 and its garage, the research building, and the water lab (Burge 2003). Features include stone walls, sidewalks, curbs, water fountains, and stairs (see figure 5). The existing water tanks and pipeline were likely built during this period; however, the park cultural resource staff does not believe that the tanks have significance because they are ancillary to the district and not unique

in design (Burge 2003). The California State Historic Preservation Office has agreed with this determination (see appendix C).

The second potentially eligible historic district is made up of the buildings constructed during the Mission 66 era. Mission 66 was a major park improvements program from 1956 through 1966 to better serve visitors. The Mission 66 program encompassed hundreds of construction and renovation projects in many parks (Sellars 1997). There are four Mission 66 buildings within the Ash Mountain headquarters complex, including building A (visitor center / administrative offices), building B (warehouse and shipping), building C (fire control building), and building D (maintenance facility). In 2002, this complex was evaluated by the National Park Service for NRHP eligibility under the guidelines for structures less than 50 years of age. Final internal review of the resulting NRHP registration forms is pending. In the interim, all four Mission 66-era buildings will continue to be treated as potentially eligible for listing in the NRHP. This project would install fire suppression systems up to and within the four Mission 66 buildings.

HEALTH AND SAFETY

The Ash Mountain area is comprised of four main headquarters buildings (administration / visitor center, fire management, warehouse, and maintenance shops), several smaller operations buildings, and seasonal and permanent housing areas. The current amount of water storage is insufficient for both potable reserves and fire suppression storage based on NFPA recommended practice. None of the buildings in the Ash Mountain system are currently equipped with sprinkler systems for fire protection. Due to their size and the occupancy combustibility classification of their contents, the four headquarters buildings determine fire suppression flow requirements for the entire complex. The small capacity of the existing tanks currently provides fire reserves that are far below the volume recommended by the NFPA. The limited water storage capacity, combined with the marginal surface source, requires seasonal water conservation during the hot, dry summers and creates inadequate fire suppression water reserves at a time when the threat of wildfires is greatest.

Not only are the potable and fire reserves inadequate, the current structural condition of the storage tanks threatens the surrounding area. The tanks were identified as being in extremely poor condition and at risk for failure during a seismic event during the 1997 Rapid Visual Screening of Seismic Hazardous Buildings. Large external cracks are visible from the tank exterior, some of which are actively weeping. Failure of these tanks would result in the Foothills Visitor Center, headquarters, and housing area having no potable water, and water would be unavailable for structural or wildlands fire suppression. Additionally, several permanent quarters (many of which are part of a historic district) would be heavily damaged, if not destroyed, by the resulting wall of water that could create a safety hazard for visitors or employees in the path.

The proposed action has the potential to disturb areas containing the soil inhabiting fungus *Coccidioides immitis*. Disturbance of the soil could give rise to *arthroconidia* (spores), which, if inhaled, could cause an infection of the lungs called Valley Fever. Valley Fever (*Coccidioides immitis*) is a fungal spore present in soils in areas of low rainfall, high summer temperatures,

and moderate winter temperatures. These spores become airborne when the soil is disturbed by winds, construction, farming, and other activities. In susceptible people and animals, infection occurs when a spore is inhaled, causing symptoms similar to flu or pneumonia. Within the lung, the spore changes into a larger, multicellular structure called a spherule. The spherule grows and bursts, releasing endospores. These endospores again develop into spherules. However, Valley Fever is not a contagious disease.

PARK OPERATIONS

Built Environment

Sequoia and Kings Canyon National Parks receive an average of 1.5 million visitors each year. Ash Mountain has been the headquarters complex for Sequoia and Kings Canyon National Parks since the 1920s. The most recent visitor figures for the Foothills Entrance Station at the Ash Mountain headquarters complex indicate that approximately 180,000 of the 1.5 million annual visitors stop at the Foothills Visitor Center. This number has remained roughly the same since 1998 (NPS 2003c). In addition to the Foothills Visitor Center, the Ash Mountain headquarters complex includes National Park Service administrative offices, the museum collection, supply center and warehouse, maintenance shops, fire suppression operations, district/sub-district operational facilities, and employee housing. The complex has evolved over approximately the last 70 years to include the buildings that are there today.

Providing visitor enjoyment of Sequoia and Kings Canyon National Parks includes providing adequate water supply for toilets, drinking, and landscape irrigation during peak demand, drought, or power outages. In addition, the park operations facilities and seasonal and permanent employee housing require water for household uses, vehicle maintenance operations, and building fire suppression. The existing water system at Ash Mountain serves the entire Ash Mountain headquarters complex. On peak demand days, the system is operating in deficit, tapping into already insufficient fire-flow storage.

The future plans for the Ash Mountain headquarters complex are to essentially remain at the same or slightly less staffing and housing levels. More of the housing at the complex will become seasonal housing as permanent employee housing is eliminated within the park boundaries. Future potable water needs are expected to remain much the same or slightly less than the existing potable water needs (NPS 2002).

Maintenance

There are approximately one to three waterline failures and several valve problems each year in association with the Ash Mountain water system. The associated repairs cost several thousand dollars and require time from park maintenance staff to repair the problems. The repairs generally can be performed quickly, minimizing the potential inconvenience to employees and visitors from a lack of water. The interiors of the water tanks were lined in the 1980s, and since that time, although some leakage has continued, the tanks have experienced minimal overall problems requiring repair.

ENVIRONMENTAL CONSEQUENCES

METHODS OF ASSESSING IMPACTS

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

METHODOLOGY

Overall, the National Park Service based these impact analyses and conclusions on the review of existing literature and Sequoia and Kings Canyon National Parks studies, information provided by experts within the park and other agencies, professional judgments and park staff insights, the California State Historic Preservation Office, interested local American Indian tribes, and public input.

Context, Duration and Intensity, and Type of Impact

Context

The context of an impact is the setting within which impacts are analyzed such as the affected site or region. For the purposes of this environmental assessment, local impacts would occur at the immediate vicinity of the Ash Mountain headquarters complex. Regional impacts would affect a far larger area that could include a greater portion of Sequoia National Park and outlying areas.

Duration

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

Intensity

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

Type of Impact

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

METHODOLOGIES

The methods used to conduct the environmental impact analyses are presented in this section. The methods are described only for those resource topics carried forward in the environmental consequences discussion and are presented in the following order:

Natural Resources:	Geologic Resources, Soils, Vegetation, Wildlife
Cultural Resources:	Historic Structures and Districts
Social Resources:	Health and Safety and Park Operations (includes Seismicity)

Impact Description

Type, context, time, and intensity together determine the level of impact for an activity. In this document, potential impacts are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local, or even regional?), duration/time (are the effects short term, generally but not always lasting less than one year, or long term, generally but not always lasting more than one year?), and intensity (are the effects negligible, minor, moderate, or major?). Because definitions of intensity (negligible, minor, moderate, or major) and duration vary by impact topic, intensity and duration definitions are provided separately for each impact topic analyzed in this environmental assessment.

SOILS

All available information on soils potentially impacted should the preferred alternative be implemented was compiled. Predictions about short- and long-term site impacts were based on previous projects with similar soils and recent studies. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	Soils would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects to soils would be slight.
Minor	The effects to soils would be detectable. Effects to soil area would be small. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.
Moderate	The effect on soil would be readily apparent and result in a change to the soil character over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely be successful.
Major	The effect on soil would be readily apparent and substantially change the character of the soils over a large area in and out of the park. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

Soils impacts would be considered short term if the soils recovered in less than three years. Soil impacts would be considered long term if the soils take more than three years to recover.

VEGETATION

The National Park Service Organic Act, which directs parks to conserve natural resources, including vegetation, unimpaired for future generations, is interpreted by the agency to mean that native plant life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise, they are protected from harvest or harm by human activities. According to *2001 NPS Management Policies*, the restoration of native species is a high priority. Management goals for vegetation include maintaining components and processes of naturally evolving park ecosystems including natural abundance, diversity, and the ecological integrity of plants and animals. Information on vegetation expected to occur at Ash Mountain was taken from park documents and records.

Impacts to vegetation types or plant communities are typically focused on direct and indirect effects. These effects are evaluated and assessed in terms of duration, intensity, and type in site-specific and regional contexts. Two important parameters used to evaluate impact intensity on vegetation are: (1) the size and continuity of the plant community; and (2) the structure, productivity, diversity, integrity, and rarity of the plant community.

All available information on vegetation and vegetation communities potentially impacted in the Ash Mountain project area was compiled. Where possible, map locations of sensitive vegetation species, populations, and communities were identified and avoided. Predictions about short- and long-term site impacts were based on previous projects with similar vegetation and recent studies. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be on a small scale and no species of special concern would be affected.
Minor	The alternative would affect some individual native plants and would also affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective.
Moderate	The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected.
Major	The alternative would have a considerable effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.

Vegetation impacts would be considered short term if the vegetation takes less than three years to recover. Vegetation impacts would be considered long term if the vegetation takes more than three years to recover.

WILDLIFE

The National Park Service Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise, they are protected from harvest, harassment, or harm by human activities. According to *2001 NPS Management Policies*, the restoration of native species is a high priority (sec. 4.1). Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals. Information on wildlife expected to occur at Ash Mountain was taken from park documents and records. The park natural resource management staff, the U.S. Fish and Wildlife Service, and the California Department of Natural Resources also provided wildlife information.

The assessment of potential impacts on wildlife species typically focuses on project-related effects to habitat. This section provides an analysis of impacts to wildlife habitat and species based on the description of vegetation types. Impacts to wildlife species have been assessed in terms of changes in the amount and distribution of wildlife habitat, the size and connectivity of habitat, the integrity of the site (including past disturbance), the potential for habituation of wildlife to humans, and the relative importance of habitats.

The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
Minor	Impacts would be detectable, but they would not be expected to be outside the natural range of variability of native species' populations, their habitats, or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate	Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability. Key ecosystem processes might be disrupted. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Wildlife impacts would be considered short term if the wildlife takes less than one year to recover. Wildlife impacts would be considered long term if the wildlife takes more than one year to recover.

CULTURAL RESOURCES

Impacts to Cultural Resources and Section 106 of the National Historic Preservation Act

In this environmental assessment, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality that implement NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA and section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing section 106 of the National Historic Preservation Act (36 CFR Part 800, *Protection of Historic Properties*), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the NRHP; (3) applying the criteria of adverse effect to affected, NRHP eligible or listed cultural resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected NRHP listed or eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the NRHP, e.g., diminishing the integrity (or

the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

Council on Environmental Quality regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order – 12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect, as defined by section 106, is similarly reduced. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under section 106 may be mitigated, the effect remains adverse.

A section 106 summary is included in the impact analysis sections. The section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative) on NRHP eligible or listed cultural resources only, based on the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

HISTORIC STRUCTURES AND DISTRICTS

In order for a structure or building to be listed in the NRHP, it must be associated with an important historic context, i.e., possess significance—the meaning or value ascribed to the structure or building, *and* have integrity of those features necessary to convey its significance, i.e., location, design, setting, workmanship, materials, feeling, and association (see National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*).

Short-term effects are those lasting less than one year. Long-term effects are those lasting greater than one year or permanent.

Impact Intensity	Impact Type	Intensity Description
Negligible	Adverse or Beneficial	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be <i>no adverse effect</i> .
Minor	Adverse	Alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>no adverse effect</i> .
	Beneficial	Stabilization/preservation of features in accordance with <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995</i> . The determination of effect for section 106 would be <i>no adverse effect</i> .
Moderate	Adverse	Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>adverse effect</i> . A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.
	Beneficial	Rehabilitation of a structure in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995</i> . The determination of effect for section 106 would be <i>no adverse effect</i> .
Major	Adverse	Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>adverse effect</i> . Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
	Beneficial	Restoration of a structure in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995</i> . The determination of effect for section 106 would be <i>no adverse effect</i> .

PUBLIC HEALTH AND SAFETY

The impact assessment for health and safety focused on the number of potential individuals impacted and the severity of the impact.

The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	Public health and safety would not be affected, or the effects would be at the lowest 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 would likely be successful.
Moderate	The effects would be readily apparent and result in substantial, noticeable effects to public health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful.
Major	The effects would be readily apparent and result in substantial, noticeable effects to public health and safety on a regional scale. Extensive mitigation measures would be needed, and success would not be guaranteed.

Short-term public health and safety effects are those lasting for the duration of the project. Long-term public health and safety effects are those lasting longer than the duration of the project.

PARK OPERATIONS

Park operations, for the purpose of this analysis, refers to the quality and effectiveness of the infrastructure and the ability to maintain the infrastructure used in the operation of the park in order to adequately protect and preserve vital resources and provide for an effective visitor experience. This includes an analysis of the condition and usefulness of the facilities and developed features used to support the operations of the park. Facilities included in this project include the water storage and distribution system for the Ash Mountain headquarters complex.

Park staff with knowledge of these issues were members of the planning team that evaluated the impacts of each alternative. Impact analysis is based on the current description of park operations presented in the “Affected Environment” section of this document.

The impact assessment for park operations and facilities focuses on the effects on park operations that could occur in the event of a tank failure under the no-action alternative (alternative 1) or the changes in park operations as a result of tank and water main replacement under the preferred alternative (alternative 2), both during the performance of the project and following project completion. An alternative is assumed to have an impact, either adverse or beneficial, on park operations and facilities if it: (1) results in direct changes to park operations, facilities, or staffing requirements or policies associated with park operations; or (2) causes indirect effects on park operations, facilities, or staffing.

The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Description
Negligible	Park operations would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on park operations.
Minor	The effect would be detectable and would be of a magnitude that would not have an appreciable effect on park operations. If mitigation was needed to offset adverse effects, it would be simple and likely successful.
Moderate	The effects would be readily apparent and result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major	The effects would be readily apparent, result in a substantial change in park operation in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures needed to offset adverse effects would be extensive, and success could not be guaranteed.

Short-term effects to park operations last for the duration of the project. Long-term effects to park operations last longer than the duration of the project.

Direct versus Indirect Impacts

The following definitions of direct and indirect impacts are considered:

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

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

Cumulative Impacts

The Council on Environmental Quality describes a cumulative impact as follows (Regulation 1508.7):

A cumulative impact is 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts are those that could have an impact on a particular resource and are not limited to cumulative actions taking place within the national park or within the geographic area defined by the project limits. To determine potential cumulative impacts for this environmental assessment, projects within Sequoia National Park in the general region of the project, the Ash Mountain headquarters complex, and the Kaweah River basin in the vicinity of the project were identified. The cumulative projects identified included planning and development activities currently under implementation or planned for implementation in the

reasonably foreseeable future. These actions are evaluated in the impact analysis in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular natural, cultural, or social resource.

Projects and plans that were considered in the cumulative analysis included the following.

Past Actions

The following past actions could contribute to cumulative effects.

- Rehabilitation of Generals Highway within the Ash Mountain headquarters complex – Work on Generals Highway has been ongoing segment-by-segment for the last several years and should continue through 2010. Environmental assessments have been completed on the overall project and each segment of the work. The work on the highway in the area affected by the project has been completed and the current work is north of Ash Mountain headquarters complex.
- Restoration of Giant Forest within Sequoia National Park – From 1997 to 2002, the existing facilities within Giant Forest were removed and the forest restored. Approximately 282 buildings were demolished and 231 acres were reclaimed using native vegetation.
- Demolition of Residence 90 – This old residence in the Ash Mountain headquarters complex was demolished in the summer and early fall of 2003.

Current and Future Actions

Current actions and those projected for the future could also contribute to cumulative effects.

- Park infrastructure improvements – Work on upgrading the infrastructure of the park is ongoing and some of the work coincides with work on Generals Highway. There is a parkwide waterline upgrade and replacement. Primary utility lines are being upgraded along the highway and would include burial of the lines where possible and replacement of the overhead lines where burial is not possible.
- Sewage lagoons at Ash Mountain headquarters complex – Work on improving the sewage lagoons at Ash Mountain is ongoing. The lagoons would be lined with a hypalon plastic liner to minimize infiltration.

Impairment

In addition to determining the environmental consequences of the alternatives, National Park Service policy (NPS 2001: *Management Policies*, section 1.4) requires that potential effects be analyzed to determine whether or not proposed actions would impair the resources or values of the park.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. National Park Service managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on the resources and values. However, the laws do give the National Park Service the management discretion to allow impacts on the resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service this management discretion, that discretion is limited by the statutory requirement that the National Park Service must leave the resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of the resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact on any resource or value may constitute an impairment. An impact would be most likely to constitute an impairment if it affected a resource or value whose conservation would be:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- key to the natural or cultural integrity of the park or to opportunities to enjoy it
- identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents

The following process was used to determine whether the alternatives had the potential to impair park resources and values:

1. The park's enabling legislation, the park's *Master Plan*, the *Resource Management Plan*, and other relevant background materials were reviewed with regard to the park's purpose and significance, resource values, and resource management goals or desired future conditions.
2. Management objectives specific to resource protection goals at the park were identified.
3. Thresholds were established for each resource of concern to determine the context, intensity, and duration of impacts as defined above.
4. An analysis was conducted to determine if the magnitude of impact reached the level of "impairment" as defined by *NPS Management Policies*.

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

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE 1: NO ACTION

Soil

No new soil disturbing activities are proposed in association with the no-action alternative. The no-action alternative would not change the existing tanks or pipeline distribution system. No additional impacts to soils would be expected from continued use of the tanks.

Cumulative Impacts. Other past, present, and reasonably foreseeable projects in the area of the Ash Mountain headquarters complex that have the potential to affect soil resources include the restoration of previously disturbed areas at Giant Forest, park infrastructure improvements that include burial of certain utility lines, and demolition of Residence 90. The Giant Forest restoration and demolition of Residence 90 would restore soil resources in previously disturbed areas and would have a long-term, regional, minor to moderate, beneficial impact to soil resources. All construction projects, including restoration projects and infrastructure improvements, would have a short-term, minor, adverse impact to soil resources. The no-action alternative would not contribute to the overall cumulative impacts to soil resources from past, present, and reasonably foreseeable future actions; therefore, there would be no cumulative impacts.

Conclusion. There would be no impact to soil resources from continued use of the tank and pipeline distribution system. The no-action alternative would not contribute to the overall cumulative impacts to soil resources from past, present, and reasonably foreseeable future actions. The no-action alternative would not contribute to the overall cumulative impacts to soil resources from past, present, and reasonably foreseeable future actions; therefore, there would be no cumulative impacts under the no-action alternative.

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

Vegetation

There are no new vegetation disturbing activities associated with the water tanks and lines proposed in this no-action alternative. There would be no new impacts to vegetation in the short term under the no-action alternative as there would be no changes to vegetation resources. If the tanks fail, the resulting water release would damage grasses and smaller shrubs and trees by flattening the vegetation or pulling the vegetation out of the ground, and the breaking of branches and trunks in larger woody species. The effects of tank failure on vegetation would be short term, localized, negligible, and adverse.

Cumulative. Other past, present, and reasonably foreseeable projects in the area of the Ash Mountain headquarters complex that have the potential to affect vegetation include the restoration of Giant Forest, park infrastructure improvements that include burial of certain utility lines and demolition of Residence 90. The Giant Forest restoration and demolition of Residence 90 would restore vegetation in previously disturbed areas and would have a long-term, regional, moderate, beneficial impact to vegetation. All construction projects, including restoration projects and park infrastructure improvements, would have a regional, short-term, minor, adverse impact to vegetation with reclamation occurring after the burial of utility lines. The no-action alternative would not contribute to the overall cumulative impacts to vegetation from past, present, and reasonably foreseeable future actions; therefore, there would be no cumulative impacts. In the event of tank failure, the contributions to the overall short-term cumulative impacts to vegetation would be negligible and the overall cumulative impacts would be long term, moderate, and beneficial.

Conclusion. There would be no new impact to vegetation in the short term. However, if the tanks fail, the impacts would be short term, negligible, and adverse. There would be no cumulative impacts, except in the event of tank failure. In the event of tank failure, the contributions to the overall short-term cumulative impacts to vegetation would be negligible.

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

Wildlife

No new wildlife disturbing activities are proposed in association with this no-action alternative. There would be no new impacts to wildlife in the short term under the no-action alternative. If the tanks fail, the resulting water release would likely drown or fatally injure smaller, less mobile species in the path of the water. Once the possible water release has dissipated, there would be no further impacts to wildlife. The possible water release would have a short-term, localized, negligible, adverse impact on wildlife in the path of the water.

Cumulative Impacts. Other past, present, and reasonably foreseeable future projects that could impact wildlife include the work on upgrading the park infrastructure, rehabilitation of Generals Highway, restoration of Giant Forest, and to a lesser extent, the sewage lagoons improvements and demolition of Residence 90. Wildlife could be temporarily displaced by construction activities and some deaths of smaller, less mobile species could result from construction equipment or material movement. Impacts to wildlife from these projects would be regional, short term, negligible to minor, and adverse due to construction activities. Over the long term, construction activities would cease and construction equipment and activities would be removed. Areas that could be reclaimed would be reclaimed. The displaced wildlife would return to the construction areas and reclaimed sites. Some projects (Giant Forest restoration, demolition of Residence 90) would restore areas that have been impacted by human activity for many years. Overall, long-term, cumulative past, present, and reasonably foreseeable future impacts to wildlife would be regional, moderate, and beneficial. The no-

action alternative would not contribute to cumulative impacts unless there was a tank failure. If tank failure occurs, the no-action alternative would provide negligible additional impacts to wildlife and cumulative impacts to wildlife would be regional, short term, negligible, and adverse.

Conclusion. No new impacts to wildlife would occur under the no-action alternative unless the tanks fail. Tank failure would result in short-term, localized, negligible, adverse impacts to wildlife in the path of the water release. There would be no cumulative impacts under the no-action alternative unless there was a tank failure. If tank failure occurs the no-action alternative would provide negligible additional impacts to wildlife and cumulative impacts to wildlife would be regional, short term, negligible, and adverse.

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

Historic Structures and Districts

The no-action alternative would continue existing conditions. There would be no direct disturbance or effect on historic structures and districts within the proposed project area. However, the possibility for disturbance of and damage to cultural resources near the water tanks does exist. If the water tanks should fail, Residence 97 and its garage, Residence 15 and its garage, and Residence 14 could sustain flood damage or be destroyed. This constitutes a potential long-term, minor to moderate, adverse impact to historic structures and the historic district.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable future actions have affected and would continue to affect cultural resources in the park. Development, park maintenance, vandalism, theft, visitor use, and natural processes all pose a potential threat to resources. Past development has resulted in disturbance to, and loss of, some cultural resources. The Giant Forest Lodge and Giant Forest Village / Camp Kaweah historic districts were removed in 1998–1999 to restore the natural landscape. Impacts of their removal were mitigated as part of the Giant Forest Restoration Project. Alternative 1 would not contribute to cumulative effects on cultural resources within the project area. However, failure of the water tanks could result in water damage to one or a few, but not all, of the buildings and/or features within the historic districts. This would contribute to cumulative effects on cultural resources within the parks, and would be long term, adverse, and negligible to minor.

Conclusion. The no-action alternative would result in no direct disturbance or effect to historic structures and districts. Potential impacts associated with flooding caused by tank failure would be long term, adverse, and minor to moderate. Cumulative effects from tank failure would be long term, adverse, and negligible to minor.

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

Park Operations

The no-action alternative would continue with existing park operations requirements for maintenance and repair to the water tanks and distribution system. Under the no-action alternative, park maintenance staff would continue to respond to problems with the existing distribution system and would address structural fires and wildfires with existing water reserves. The lack of fire sprinklers in the four headquarters buildings would remain out of compliance with National Park Service policy. As the system continues to deteriorate, required maintenance would likely increase. There would be no change in park operations under the no-action alternative; however, the existing condition constitutes a short- and long-term, minor to moderate, adverse impact to park maintenance operations.

The site lies in a zone of high seismic activity (Seismic Zone 4) and the Rapid Visual Screening of Seismically Hazardous Buildings indicated that the tanks could fail during a seismic event. A tank failure would result in adverse impacts to park operations. All water would be lost for a short period of time until alternate sources of water could be located. Park maintenance staff would be required to locate and implement the alternate water source development as well as provide clean-up for the damage caused by the tank failure. Park operations at the Ash Mountain headquarters complex would likely be temporarily halted, reduced, or relocated until an alternate water source could be provided since no water would be available for routine sanitary requirements, fire suppression, or use in any applications associated with the vehicle maintenance shop. The impacts to park operations would be short term, localized, moderate and adverse in the event of tank failure due to geologic hazards.

Cumulative Impacts. Other past, present, and reasonably foreseeable future plans and projects taking place in the Ash Mountain headquarters complex and surrounding areas are aimed at various infrastructure upgrades (including utility line upgrades, a parkwide waterline upgrade and replacement, and sewage lagoon improvements at the Ash Mountain headquarters complex), rehabilitation of Generals Highway, restoration of Giant Forest, and demolition of Residence 90. These projects would include short-term requirements for shutdown of various systems such as power, as the upgraded systems are brought into use as well as requirements for park staff to oversee the various projects. The result would be potential short-term, regional, minor, adverse impacts to park operations during construction activities. Upon completion of the infrastructure improvements, there would be long-term, regional, moderate, beneficial impacts to park operations. The no-action alternative would have a local, short- and long-term, minor to moderate, adverse impact to park operations. The cumulative effects to park operations as a result of the no-action alternative of leaving the existing water tanks in place while upgrading other park infrastructure would be regional short term, minor to moderate, adverse, impacts and local, long-term, minor, adverse impacts.

Seismic events would not have the same impact on the past, present, and reasonably foreseeable future cumulative projects as predicted for the water tanks. A seismic event in the area is not expected to have major impacts on Generals Highway roadwork, improvements to park infrastructure, and improvements to the sewage lagoons. Park operations may be affected by a seismic event in the short term as some minor repairs to these projects may be necessary requiring temporary shutdowns and increased park maintenance staff attention; however, once these repairs have been completed, park operations would return to normal. Park operations, as they relate to these cumulative projects, may experience short-term, minor, adverse impacts due to the seismic event. The cumulative impacts due to potential seismic events, including a tank failure, would be local, short term, negligible to moderate, and adverse, primarily as a result of tank failure.

Conclusion. There would be no change in park operations under the no-action alternative; however, the existing condition constitutes a short- and long-term, minor to moderate, adverse impact to park maintenance operations. The impacts to park operations would be short term, localized, moderate and adverse in the event of tank failure. The cumulative effects to park operations as a result of the no-action alternative of leaving the existing water tanks in place while upgrading other park infrastructure would be a regional, short-term, minor to moderate, adverse, impact and local, long-term, minor, adverse impacts. The cumulative impacts due to potential seismic events, including a tank failure, would be local, short term, negligible to moderate, and adverse, primarily as a result of the tank failure.

Health and Safety

The no-action alternative would leave the existing concrete water storage tanks and distribution lines in place. Normal operating conditions would not provide an adequate supply for fire suppression, nor would it meet National Park Service requirements for fire protection. In the event of a fire, it is likely that the building or buildings in question could not be adequately protected and would be heavily damaged. The no-action alternative would not represent any change to health and safety in the short term; however, the potential impacts to health and safety from inadequate fire suppression represent a short- and long-term, minor to moderate, adverse impact to health and safety.

Over the long term, existing cracks accompanied by leaking water could eventually cause failure of the tank structure. In addition, the Rapid Visual Screening of Seismically Hazardous Buildings indicated that the tanks could fail during a seismic event. The site lies in a zone of high seismic activity (Seismic Zone 4). A tank failure caused either by deteriorating conditions or a seismic event would result in a loss of water to the Ash Mountain headquarters complex, potential damage to residences, and safety issues for employees or visitors in the path of the water. The short-term, local impacts from a failure of tanks through deterioration or a seismic event would be moderate and adverse.

Cumulative Impacts. In addition to the no-action alternative, other plans and ongoing projects taking place in the Ash Mountain headquarters complex and surrounding areas are aimed at various infrastructure upgrades. Completion of these projects would result in moderate, cumulative, long-term, beneficial impacts to health and safety in the park. These projects include the rehabilitation of Generals Highway, a parkwide waterline upgrade and

replacement, sewage lagoon improvements, and demolition of an old residence in the Ash Mountain headquarters complex. Adverse impacts to health and safety as a result of construction activity associated with these projects would be expected to be minor, localized, and short term, primarily characterized by periodic disruptions to traffic flow and local water and sewer service. Long-term impacts to health and safety would be regional, minor, and beneficial. The no-action alternative would provide minor to moderate contributions to the past, present, and reasonably foreseeable future impacts and the overall cumulative impacts to health and safety would be short and long term, minor to moderate, and adverse.

A seismic event in the area is not expected to have substantial health and safety impacts on the Generals Highway roadwork, restoration at Giant Forest, demolition of Residence 90, improvements to park infrastructure, and improvements to the sewage lagoons. These projects may experience some adverse impacts due to a seismic event such as short-term disruptions of service, but the regional impacts to health and safety would be short-term, negligible, and adverse. The cumulative impacts due to potential seismic events would be short term, negligible to moderate, and adverse, primarily as a result of tank failure.

Conclusion. The no-action alternative would not represent any change to health and safety in the short term; however, the potential impacts to health and safety from inadequate fire suppression represent a short- and long-term, minor to moderate, adverse impact to health and safety. The longer-term, local impacts from a failure of tanks through deterioration or a seismic event would be moderate and adverse. The no-action alternative would provide minor to moderate contributions to the past, present, and reasonably foreseeable future impacts and the overall cumulative impacts to health and safety would be short and long term, minor to moderate, and adverse. The cumulative impacts due to potential seismic events would be short term, negligible to moderate, and adverse, primarily as a result of tank failure.

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE 2: PREFERRED ALTERNATIVE

[NOTE: All measurements are approximate and would be refined during the final design process. The information presented below represents the maximum possible footprint, the actual footprint could be smaller.]

Soil

This alternative proposes to replace two water tanks, a distribution pipeline, service lines, and relocate fire hydrants. The two new replacement 220,000-gallon potable water storage tanks would be constructed of concrete and would occupy about 3,000-square feet of soil; the construction zone would radiate out 15 to 20 feet from the construction area. Much of the area where the tanks would be constructed was disturbed when the existing water tanks were constructed. Construction of the new tanks would take advantage of this previously disturbed area, but require a larger footprint. Soils at the tank location would be excavated to clear an area for the larger tanks. The total footprint area would be approximately 0.2 acre.

The new water main would be approximately 3,120 feet in length. Most of the pipeline would be placed in previously disturbed areas (approximately 2,440 feet) while the remainder (680 feet)

would be placed in areas not previously disturbed. Soils along the water main route would be excavated in a trench. The pipeline would be placed in the trench and the trench backfilled. Soils would be replaced in approximately the same location. The trench would be 3- to 5-feet in width and 3- to 5-feet in depth. All pipelines would have about 6 inches of bedding and 1 foot of select backfill over them. Detectable utility marking tape could be placed directly over all lines. Once the water lines were installed, the excavated material would be returned to the trenches, the trench surfaces returned to natural contours, and revegetated with species native to the site.

In addition to the project sites themselves, an additional area, the construction zone surrounding the project sites, would also be disturbed; soils would be compacted by equipment and exposed, and some vegetation would be removed. The water tanks are estimated to encompass an additional 0.3 acre of construction-related disturbance. Assuming a disturbance corridor for pipeline placement of a maximum of 40 feet, a total area of 3.0 acres would be disturbed for pipeline placement. An additional 0.5 acre would be required for staging areas for construction equipment and supplies. However, impacts on soils within these construction zones would be mitigated by confining staging areas to previously disturbed areas, defining the construction zones with construction tape or fencing, and installing soil erosion devices and measures as described in the "Mitigation Measures" section above. Additionally, efforts would be made to remove any non-native plant species presently established in the project areas.

Impacts on soils from construction include trampling, digging for foundations, and minor cuts and fills. Some soils would be covered with impermeable materials such as water tanks. Surface soil horizons would be altered, topsoil would be removed, and some soil would be compacted and compressed. These consequences would result in a localized decrease in soil permeability to water and air, alteration of soil regime, and an increase in localized runoff and channelization. Once construction would be complete, disturbed areas within the construction zone would be returned to natural conditions by scarification, which decompacts the soil and the site topography would be returned to its preconstruction contours as much as possible. Areas disturbed by construction would be revegetated. Revegetation would facilitate soil stability, help to reduce runoff, channelization, and erosion, and help the soil to restore itself to natural conditions.

An estimated 4.0 acres of soil could be impacted during construction activities. Short-term impacts to soil resources would be localized, minor, and adverse. Over the long term, soil resources would be restored to natural conditions and long-term impacts would be negligible.

Cumulative impacts. Other past, present, and reasonably foreseeable projects in the area of the Ash Mountain headquarters complex that have the potential to affect soil resources include the restoration of Giant Forest, park infrastructure improvements, which include burial of certain utility lines and demolition of Residence 90. The Giant Forest restoration and demolition of Residence 90 would restore soils resources in previously disturbed areas and would have a long-term, moderate, beneficial impact to soil resources. The park infrastructure improvements would have a short-term, minor, adverse impact to soils resources. The cumulative projects, in conjunction with the proposed alternative, would have a short-term, minor, adverse, and long-term, moderate, beneficial impact to soil resources.

Conclusion. Short-term impacts to soil resources would be localized, minor, and adverse. Over the long term, soil resources would be restored to natural conditions and the long-term impacts would be negligible. The cumulative projects, in conjunction with the proposed

alternative, would have a short-term, minor, adverse, and long-term, moderate, beneficial impact to soil resources.

Vegetation

Vegetation would be impacted by the short-term construction activities associated with the water tank and water main and service lines replacement. The water tanks would occupy the existing tank footprint, but this footprint would be enlarged to accommodate the larger tanks. The estimated total area of vegetation disturbance for the two tanks, including the construction zone, would be less than 0.5 acre. The pipeline corridor would be located in or along existing roadways for the most part; however, approximately 680 feet of the pipeline would be located in previously undisturbed areas. In undisturbed areas, the pipeline would be located to minimize disturbance to established vegetation and avoid large-diameter trees to the extent possible. Roots less than 6-inches in diameter would be given a clean straight cut to prevent root rot. When roots 6-inches in diameter and larger are encountered during trenching operations, they would be retained by hand-digging the trench beneath the root. The disturbance corridor would be a maximum of 40-feet wide for a total maximum disturbance area of approximately 1.0 acre. The actual trench would be much narrower (estimated 3- to 5-feet in width). Vegetation would be removed from the areas of disturbance. Topsoil would be salvaged and stockpiled adjacent to the disturbance area. Upon completion of placement of the new tanks and pipeline segments, the topsoil would be replaced and restoration would follow guidelines approved by park staff. Revegetation would occur with species native to the site using local genetic stock. Revegetation efforts would include reconstruction of the natural spacing, abundance, and diversity of native plant species. The areas of disturbance would be kept to the minimum necessary for safe working conditions. Impacts on vegetation within the construction zone would be mitigated by minimizing disturbance to large-diameter trees and revegetating with species native to the site as described above, and previously in the “Mitigation Measures” section. Adverse impacts to vegetation would be local, short term, and minor. Over the long term, adverse impacts to vegetation would not be measurable as revegetation occurs.

Cumulative. Other past, present, and reasonably foreseeable projects in the area of the Ash Mountain headquarters complex that have the potential to affect vegetation include the restoration of Giant Forest, park infrastructure improvements including burial of certain utility lines, and demolition of Residence 90. The construction activities associated with park infrastructure improvements and restoration actions would have short-term, minor, adverse impacts to vegetation while the construction work is ongoing. The preferred alternative would contribute minor additional impacts to these cumulative impacts. The past, present, and reasonably foreseeable future actions, in combination with the preferred alternative, would have short-term, minor, adverse impacts to vegetation.

Giant Forest restoration, which includes approximately 231 acres of reclamation and demolition of Residence 90, would restore native vegetation in previously disturbed areas and would have a long-term, moderate, beneficial impact to vegetation. Over the long term, construction activities would cease and disturbed areas would be revegetated. The past, present, and reasonably foreseeable future cumulative projects would have a long-term, moderate, beneficial impact to vegetation. However, the preferred alternative would not contribute to the

overall long-term, moderate, beneficial, cumulative impacts to vegetation from past, present, and reasonably foreseeable future actions.

Conclusion. Adverse impacts to vegetation from the preferred alternative would be local, short term, and minor. Over the long term, the adverse impacts to vegetation would not be measurable as revegetation occurs. The past, present, and reasonably foreseeable future cumulative projects, in conjunction with the preferred alternative, would have a long-term, moderate, beneficial impact to vegetation. However, the preferred alternative would not contribute to the overall long-term, moderate, beneficial, cumulative impacts to vegetation from past, present, and reasonably foreseeable future actions.

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

Wildlife

Loss of wildlife would be proportional to the amount of habitat lost. The existing water tank site and pipeline corridor have been previously affected through years of close association with maintenance vehicles and attendant human activity; many species of local wildlife in the area have probably become habituated to human activity, noise, and traffic. Some species may have been permanently displaced. During the daytime, larger wildlife would probably avoid the construction zone to a certain extent during construction. Some wildlife, such as Beechy ground squirrels and scrubjays might even be attracted to this area. During construction, some small animals such as rodents may be killed or forced to relocate to areas outside the construction zone. Overall, populations of affected species might be slightly and temporarily reduced during construction, but no permanent negative effects on wildlife would be anticipated.

There would be potential localized, negligible to minor, adverse impacts to wildlife in the short term as a result of construction activities associated with the tank and water main replacement. Over the long term, upon completion of construction and reclamation, wildlife usage in the area would return to pre-project conditions and the adverse impacts would not be measurable.

Cumulative Impacts. Other past, present, and reasonably foreseeable future projects that could impact wildlife include the work on upgrading the park infrastructure, rehabilitation of Generals Highway, restoration of Giant Forest, and to a lesser extent, the sewage lagoons improvements and demolition of Residence 90. Wildlife could be temporarily displaced by construction activities and some deaths could result from construction equipment or material movement. Impacts to wildlife from these past, present, and reasonably foreseeable future projects would be short term, negligible to minor, and adverse due to the construction activities. The preferred alternative would provide negligible to minor contributions to the cumulative impacts. The overall past, present, and reasonably foreseeable future actions in association with the preferred alternative would cause short-term, negligible to minor, adverse impacts to wildlife.

Over the long term, construction activities would cease and construction equipment and activities would be removed. Areas that could be reclaimed would be reclaimed. The displaced wildlife would return to the construction areas and reclaimed sites. Some projects (Giant Forest restoration, demolition of Residence 90) would restore areas that have been impacted by human activity for many years. Overall, long-term cumulative past, present, and reasonably foreseeable future impacts to wildlife would be moderate and beneficial. The preferred alternative would not contribute to the long-term, moderate, beneficial impacts from past, present, and reasonably foreseeable future actions.

Conclusion. There would be potential localized, negligible to minor, adverse impacts to wildlife in the short term as a result of construction activities associated with the tank and water main replacement. Over the long term, upon completion of construction and reclamation, wildlife usage in the area would return to pre-project conditions and the adverse impacts would not be measurable. The preferred alternative would provide negligible to minor contributions to the cumulative impacts. The overall past, present, and reasonably foreseeable future actions, in association with the preferred alternative, would cause short-term, negligible to minor, adverse impacts to wildlife. Overall, long-term cumulative past, present, and reasonably foreseeable future impacts to wildlife would be moderate and beneficial. The preferred alternative would not contribute to the long-term, moderate, beneficial impacts from past, present, and reasonably foreseeable future actions.

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

Historic Structures and Districts

The preferred alternative has the potential to affect historic structures and districts in two ways. First, is the installation of the tanks and water main within all three of the historic district boundaries. The second is the installation of the fire suppression system to and in the Mission 66 buildings.

The installation of the new water main and water tanks would not alter the topography, vegetation, circulation features, spatial organization, or land-use patterns of the historic district once construction is complete. In addition, any visual, audible, and atmospheric intrusions associated with construction would be temporary, adverse, and negligible, lasting only as long as construction. The overall integrity of the potential Civilian Conservation Corps and Mission 66 historic districts would remain largely unaffected by project actions. However, alteration of these districts by the introduction of new constructed elements (water tanks, main lines, and fire suppression systems) would have a long-term, minor, adverse impact.

The pipeline would cross Generals Highway. The asphalt in the roadway would be cut, removed, and replaced. However, the asphalt is not a historic feature of the Generals Highway historic district. The new pipeline would be routed under or avoid historic features such as stone walls, curbs, and the water fountain resulting in no effect to historic features of the

Generals Highway historic district. Where rerouting is not possible, the contractor may choose to develop a photographic record, number each stone, and move the feature for pipeline replacement, followed by reconstruction in exactly the same location.

The new tanks would be larger than the existing tanks, but constructed in the same location as the existing tanks. The new tanks would look similar to the old tanks, but because of size differences would occupy a larger footprint. There are no plans to cut into the side hill for additional room, so the tanks would extend outward (to the east) and require some fill placement. The characteristics of the old and new tanks would be similar (e.g., gravity flow, inlet, and outlet points, etc.).

Fire suppression, including interior sprinklers and exterior back-flow prevention devices, would be installed to building A (administration), building B (warehouse and shipping), building C (fire control building), and building D (maintenance shops). Installation of fire suppression systems would be carried out in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (with *Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995*) in a fashion that minimizes loss or alteration of character-defining historic fabric and features. The standards for rehabilitation provide a degree of latitude to sensitively introduce repairs, alterations, and/or additions (e.g., fire suppression systems) in order to achieve efficient contemporary use of historic properties while better ensuring their long-term preservation. However, these alterations and additions must not adversely affect the historic integrity of the property, or compromise attributes contributing to the property's eligibility for the NRHP.

The standards recommend that to the extent possible, new pipes and ducts be concealed in wall cavities or ceilings provided that installation minimizes loss or alteration of character-defining features and historic building material. The route pipes would be installed in concealed spaces (drop ceilings in administration building and office spaces) where possible, and exposed in some structures and units (maintenance shop and fire station). Back-flow devices would be removable and adjacent to, not attached to, the buildings. The fire suppression system would afford the buildings better protection and would have a long-term, beneficial, minor effect on the structures at Ash Mountain.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and would continue to affect cultural resources in the parks. Development, park maintenance, vandalism, theft, visitor use, and natural processes all pose a potential threat to resources. Past development has resulted in disturbance to, and loss of, some cultural resources. The Giant Forest Lodge and Giant Forest Village / Camp Kaweah historic districts were removed in 1998–1999 to restore the natural landscape. Adverse impacts of their removal were mitigated as part of the Giant Forest Restoration Project. Historic American Buildings Survey / Historic American Engineering Record documentation was completed for the reconstruction of Generals Highway in the late 1990s. Alternative 2, in association with the past, present, and reasonably foreseeable future projects, would have long-term, minor, beneficial, cumulative effects on cultural resources within the project area and the parks.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined there would be no adverse effect to the Civilian Conservation Corps, Mission 66, and Generals Highway historic

districts. The overall integrity and character-defining features of these historic districts would be retained. The California State Historic Preservation Office has concurred with the National Park Service finding of no adverse effect (see appendix C).

Conclusion. Under alternative 2, installation of new water tanks and water main lines would have long-term, minor, adverse impacts on the historical integrity of the Civilian Conservation Corps, Generals Highway, and Mission 66 historic districts. However, the fire protection provided by increased water storage capacity and installation of fire-suppression systems in the Mission 66 buildings would result in long-term, minor, beneficial impacts on the historic districts. Adverse impacts during construction would be short term, adverse, and negligible. The preferred alternative, in association with past, present, and reasonably foreseeable future projects, would have minor, long-term, beneficial, cumulative impacts to historic structures and districts. The California State Historic Preservation Office has concurred with the National Park Service on an overall section 106 determination of no adverse effect.

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

Health and Safety

The preferred alternative would remove the existing concrete water storage tanks and distribution lines, replacing them with higher capacity tanks and lines, as well as providing fire suppression sprinklers in the headquarters buildings. The existing water system at Ash Mountain serves the entire Ash Mountain headquarters complex. The water sources that feed the Ash Mountain system also feed the Buckeye system. The current amount of water storage is insufficient for both potable reserves and fire suppression storage based on standard recommended practice. The added capacity of the new tanks would provide fire reserves meeting the volume recommended by the NFPA, provide for three days of water storage for domestic uses at the maximum usage figures recorded by the park, and minimize the current need for seasonal water conservation. Use of circular concrete tanks would provide the safest and most reliable water storage. The new tanks would be designed to withstand seismic events without failure and associated impacts to health and safety as a result of tank failure.

Replacing the existing water mains that are at the end of their design life would eliminate the loss of considerable quantities of treated potable water due to leaks in the distribution system. The addition of fire sprinklers in the four headquarters buildings would bring them into compliance with National Park Service policy. The firefighting capabilities for wildfires and structural fires would be enhanced through the additional storage capacity. Beneficial impacts to health and safety as a result of implementing the preferred alternative would be local and moderate in the long term.

Normal park operations would continue throughout the duration of this project, and construction would be in the off-season when fewer visitors are present and water demand is

less. All construction activity would be conducted during daylight hours, with the exception of the possible need for extended hours into the night in the event of a monolithic pour of the new concrete storage tanks. Providing necessary reserves in two tanks would allow for cleaning and maintenance of the tanks while keeping the system in operation. Adverse impacts of the preferred alternative to health and safety as a result of construction activity would be localized, short term, and minor.

The proposed construction activities could cause the release of spores of the soil inhabiting fungus *Coccidioides immitis*. Inhalation of the spores could result in Valley Fever. Mitigation through water sprinkling of the soil would reduce the likelihood of inhalation. The potential health and safety impacts from release of the spores during construction activities would be localized, short term, negligible, and adverse if the soils were sprinkled with water during soil disturbing activities.

Cumulative Impacts. Other past, present, and reasonably foreseeable future projects taking place in the Ash Mountain headquarters complex include the rehabilitation of Generals Highway, a parkwide waterline upgrade and replacement, sewage lagoon improvements, and demolition of an old residence in the Ash Mountain headquarters complex. Adverse impacts to health and safety as a result of construction activity associated with these projects would be expected to be minor, localized, and short term, primarily characterized by periodic disruptions to traffic flow and local water/sewer service. Long-term impacts to health and safety would be regional, minor, and beneficial. The preferred alternative would contribute to these cumulative activities. The short-term, construction-related impacts to health and safety as a result of the no-action alternative in combination with the other past, present, and reasonably foreseeable future projects would be minor, localized, and adverse. Long-term benefits to health and safety from the preferred alternative and the cumulative projects would be local and minor to moderate.

Conclusion. The preferred alternative would bring the park into compliance with National Park Service and NFPA policies and seismic codes and eliminate the potential dangers of fire damage, failure, flooding, and erosion imposed by the inadequate capacities and poor condition of the existing system. The preferred alternative would eliminate losses in potable water due to leaks in the existing distribution system. The preferred alternative would eliminate losses in potable water due to leaks in the existing distribution system and the need for seasonal conservation. The preferred alternative would provide storage and piping capacities adequate to demand, as well as available reserves for structural and wildlands fire suppression, resulting in moderate, long-term, beneficial impacts to health and safety. Adverse impacts to health and safety as a result of construction activities would be localized, short term, and minor. Beneficial impacts to health and safety as a result of implementing the preferred alternative would be local and moderate in the long term.

The short-term, construction-related impacts to health and safety as a result of the preferred alternative, in combination with the other past, present, and reasonably foreseeable future projects, would be minor, localized, and adverse. Long-term benefits to health and safety from the preferred alternative and the cumulative projects would be local and minor to moderate.

Park Operations

The existing water system at Ash Mountain serves the entire Ash Mountain headquarters complex. The preferred alternative would replace the existing concrete water storage tanks and distribution lines in the Ash Mountain headquarters complex and add fire suppression sprinklers to the headquarters buildings. Lower ongoing maintenance costs would be expected with the removal and replacement of the existing leaking tanks and waterlines that are at the end of their design life. The preferred alternative would eliminate losses in potable water due to leaks in the existing distribution system and provide storage and piping capacities adequate to demand, as well as available reserves for structural and wildlands fire suppression. Additionally, the proposed improvements would bring the park into compliance with National Park Service and NFPA policies and seismic codes. The new tanks would be designed to withstand seismic events without failure, eliminating potential impacts to park operations as a result of loss of water to the Ash Mountain headquarters complex, although minor repairs could be expected. Implementation of the preferred alternative would result in minor to moderate, long-term, beneficial impacts to park operations.

Normal park operations would continue throughout the duration of this project, and construction would likely be in the off-season when water demands are less. Most of the work is expected to occur during daylight hours; however, some nighttime work would be required in the event of a monolithic pour for the concrete of the new tanks. (Monolithic pours are continuous pours that could not be interrupted once they begin and could stretch into nighttime hours.) Installation of the fire suppression system could occur during the evening and nighttime hours as the sprinkler system installation would be disruptive in offices and other active work areas during a normal 8:00 A.M. to 5:00 P.M. work day.

The long design life and ease of repair associated with new concrete tanks would allow for more efficient operations and a considerable decrease in maintenance costs. Providing necessary reserves in two tanks would allow for cleaning and maintenance of the tanks while keeping the system in operation. Additionally, by locating the new tanks at the existing tank site, proximity to the water treatment plant would facilitate access and travel time by park maintenance staff. Design to withstand seismic events would eliminate the potential for complete loss of water at the Ash Mountain headquarters complex and likely require only short-term minor repairs. Adverse impacts of the preferred alternative to park operations as a result of construction activity would be localized, short term, and negligible.

Cumulative Impacts. Other past, present, and reasonably foreseeable future plans and projects taking place at the Ash Mountain headquarters complex and surrounding areas are aimed at various infrastructure upgrades (including utility line upgrades, a parkwide waterline upgrade and replacement, and sewage lagoon improvements at the Ash Mountain headquarters complex), rehabilitation of Generals Highway, restoration of Giant Forest, and demolition of Residence 90. These projects would include short-term requirements for shutdown of various systems (such as power) as the upgraded systems are brought into use as well as requirements for park staff to oversee the various projects. The result would be potential short-term, regional, minor, adverse impacts to park operations during construction activities. Upon completion of the infrastructure improvements, there would be long-term, regional, moderate, beneficial impacts to park operations. The cumulative short-term effects to

park operations as a result of the preferred alternative, in combination with the other past, present, and reasonably foreseeable future projects, would be minor and adverse. The preferred alternative would contribute negligibly to the cumulative impacts. Long-term impacts of the preferred alternative, in combination with the other past, present, and reasonably foreseeable future projects, would be moderate and beneficial, with the preferred alternative providing minor to moderate contributions to the long-term beneficial impacts.

Seismic events could have short-term, minor, adverse impacts to cumulative projects. The new water tanks would be designed to withstand impacts from seismic events. The seismic events could cause the need for minor clean-up and repair, but would not result in tank failure. Minor repairs to the cumulative projects, including the water tanks and water main, may be necessary requiring temporary shutdowns and increased park maintenance staff attention. However, once these repairs have been completed, park operations would return to normal. Impacts from seismic events would be short term, negligible to minor, and adverse.

Conclusion. The preferred alternative would bring the park into compliance with National Park Service and NFPA policies and seismic codes and eliminate the potential dangers of fire damage, failure, flooding, and erosion imposed by the inadequate capacities and poor condition of the existing system. Potable water storage capacity would increase and ongoing maintenance costs to the park would decrease, resulting in moderate, long-term, beneficial impacts to park operations. Adverse impacts to park operations resulting from construction activities would be localized, short term, and negligible. The cumulative short-term effects to park operations as a result of the preferred alternative, in combination with the other past, present, and reasonably foreseeable future projects, would be minor and adverse. Long-term impacts of the preferred alternative, in combination with the other past, present, and reasonably foreseeable future projects, would be moderate and beneficial. Impacts from seismic events would be short term, negligible to minor, and adverse.

CONSULTATION AND COORDINATION

PERMIT REQUIREMENTS

For the no-action alternative, no permits would be required.

Prior to implementation, the National Park Service preferred alternative would require permits from:

- California Water Resources Control Board – Construction Activities Storm Water General Permit for construction related disturbances, including replacement of existing features for areas of one acre or larger.
- San Joaquin Valley Air Pollution Control District – Development of a Dust Control Plan in accordance with Rule 8021, Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities, as well as permits to operate all applicable portable equipment (over 50 brake horsepower) or Portable Equipment Registrations for the equipment.

CONSULTATION

The National Park Service has conducted consultation with the U.S. Fish and Wildlife Service on the potential threatened and endangered species and species of concern that may be present in the project area. The species list received from the U.S. Fish and Wildlife Service is included in appendix A. None of the species listed are expected to be adversely impacted by the project alternatives.

The National Park Service conducted consultation with the California State Historic Preservation Office on the one existing and two potential historic districts in the project vicinity. The California State Historic Preservation Office concurred with the National Park Service finding of no adverse effect.

Other agencies and organizations contacted for information, or that assisted in identifying important issues, developing alternatives, or that will be given an opportunity to review and comment on this environmental assessment include the following:

Federal Agencies

Sequoia National Forest
Sequoia National Forest, Hume Lake District
Sierra National Forest
U.S. Fish and Wildlife Service
U.S. Forest Service

U.S. Geological Survey, Biological Resources Division, Western Ecological Research Center

State and Local Agencies and Individuals of California

California Department of Fish and Game
California Department of Forestry
California Department of Forestry and Fire Protection
Fresno County Board of Supervisors
Tulare County Board of Supervisors
Senator Barbara Boxer
Assemblyman Mike Briggs
The Honorable Cal Dooley
Senator Dianne Feinstein
Senator William J. "Pete" Knight
Senator Charles Poochigian
The Honorable George Radanovich
Mr. Bill Sanders, District One Supervisor, Tulare County

American Indian Tribes, Organizations, and Individuals

Big Pine Paiute Tribe of the Owens Valley
Big Sandy Rancheria of Mono Indians
California Native American Heritage Commission
Cold Springs Rancheria of Mono Indians
Dunlap Band of Mono Indians
Fort Independence Indian Community of Paiute Indians
Kern Valley Indian Community
North Fork Rancheria of Mono Indians
Paiute – Shoshone Indians of the Bishop Community
Santa Rosa Rancheria
Sierra Foothill Waksachi Tribe
Table Mountain Rancheria
Tule River Indian Reservation
Wukchumni Tribal Council

Other Groups and Organizations

California Preservation Foundation
Center for Biological Diversity, California and Pacific Office
Fresno Audubon Society
Friends of the Earth
Mineral King District Association
National Audubon Society
National Parks and Conservation Association
The Nature Conservancy, California Field Office
Sequoia Forest Alliance
Sierra Club

Sierra Club, Kern-Kaweah Chapter
Sierra Club, Sacramento Field Office
Sierra Forest Products
Tulare County Audubon Society
The Wildlife Society, San Joaquin Valley Chapter
The Wilderness Society
Wilsonia Village, Inc.

BIBLIOGRAPHY

Burge, Thomas

- 2003 Personal Communication with Tom Burge. Sequoia and Kings Canyon National Parks.

Haultain, Sylvia

- 2003 Vegetation Survey of Water Tank and Pipeline Replacement Corridor. May 2003.

Keeley, J.E.

- 2000 Chaparral in M.G. Barbour and W.D. Billings (eds). *North American Terrestrial Vegetation*, 2nd edition. Cambridge University Press.

National Park Service

- 1971 Master Plan, Sequoia and Kings Canyon National Parks.
- 1988 Draft Environmental Assessment, Generals Highway Road Improvements, Sequoia and Kings Canyon National Parks, September 1988.
- 1997 Generals Highway Road Reconstruction – Phase III Environmental Assessment. Sequoia National Park. February 1997.
- 1998 Sequoia and Kings Canyon General Management Plan, Newsletter 1, Winter 1998.
- 1999 Natural and Cultural Resources Management Plan. Sequoia and Kings Canyon National Parks. December.
- 2001 National Park Service Management Policies. Acquired online at: <http://www.nps.gov/policy/mp/policies.html>
- 2002 Value Analysis Study, PMIS 59925/Pkg 221 Replace Water Tanks and Drill Well at Park Headquarters. Sequoia and Kings Canyon National Park, Management Services Group. Denver Service Center. June 2002.
- 2003a Draft Environmental Assessment for Sequoia and Kings Canyon National Parks Fire Management Plan. April.
- 2003b Draft Fire and Fuels Management Plan. Sequoia and Kings Canyon National Parks. April.
- 2003c Sequoia and Kings Canyon Web site. Accessed at <http://www.nps.gov/seki/index.htm>.

BIBLIOGRAPHY

NatureServeExplorer

- 2003 Plant and animal resource information accessed online at:
<http://www.natureserve.org/explorer>

San Joaquin Valley Air Pollution Control District

- 2003 About the District. Acquired online at:
http://www.valleyair.org/General_info/aboutdist.htm

Sellars, Richard W.

- 1997 *Preserving Nature in the National Parks: A History*. Yale University Press. New Haven, CT.

U.S. Fish and Wildlife Service (USFWS)

- 2003 Letter from Chief, Endangered Species Section. Species List to Install 450,000 Gallon Water Tank and Associated Water Lines in Ash Mountain Area of Sequoia National Park, Tulare County, CA. January 2, 2003.

U.S. Geological Survey (USGS)

- 2003 Earthquake information accessed online at: <http://earthquake.usgs.gov>

LIST OF PREPARERS

This environmental assessment was prepared by engineering-environmental Management, Inc., under the direction of the National Park Service. Sequoia and Kings Canyon National Parks' staff provided invaluable assistance in the development and technical review of this environmental assessment. National Park Service staff who provided information include:

Jack Vance, Facility Manager
Tom Burge, Archeologist
Paul Pfenninger, District Interpreter
Harold Werner, Wildlife Ecologist
Paul Schwarz, Public Health Sanitarian
Peggy Williams, Concessions Management Specialist
Bill Tweed, Chief of Interpretation
Annie Esperanza, Air Resources Specialist
Sylvia Haultain, Plant Ecologist
Jennifer Akin, Plant Ecologist

The preparers of this document are listed below:

Anne Baldridge, Environmental Conservation/Planning Project Manager
M.B.A. Finance and Accounting
B.S. Geology
Years of Experience: 20

Jayne Aaron, Cultural Resources Program Manager/Environmental Planner
M.A. Environmental Policy and Management
B.A. Environmental Design
Years of Experience: 12

Brian Davis
B.S. Landscape Architecture and Land Use Planning
Years of Experience: 20

Sarah Boyes
B.S. Biology
Years of Experience: 1

Wanda Gray Lafferty, Technical Publications Specialist
Two years undergraduate studies
Years of Experience: 26

LIST OF PREPARERS

APPENDIX A
U.S. FISH AND WILDLIFE SERVICE SPECIAL-STATUS SPECIES LIST



United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9700

N1621

June 7, 2002

Mr. Wayne White
Field Supervisor
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Dear Mr. White:

We are planning to install a 450,000 gallon water tank and associated water lines in the Ash Mountain area of Sequoia National Park, Tulare County. We are requesting a list of listed and sensitive species that may be present. The habitat is blue oak woodland. The approximate center of the project area is at latitude 36° 29' 27.45", longitude -118° 49' 30.67" (UTM Coordinates: Zone 11, easting 336514, northing 4039752) and extends outward about 700 feet in all directions.

Please send the list to Jack Vance, Sequoia and Kings Canyon National Parks, 47050 Generals Highway, Three Rivers, California 93271. If there are any questions, please contact Harold Werner, our wildlife ecologist, at (559) 565-3123.

Sincerely,

/s/Richard H. Martin

Richard H. Martin
Superintendent

DSC RECORD GBY Y

RECEIVED

JAN 14 2003

DSC-PM

RECEIVED
JAN 6 2003
SEQUOIA AND KINGS CANYON NP



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W2605
Sacramento, California 95825

In Reply Refer To:
1-1-03-SP-0700

January 2, 2003

Handwritten notes: Xcomp, PI, SEKI 201

Memorandum

To: Richard Martin, Superintendent,
United States Department of the Interior
National Park Service
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9700

From: Chief, Endangered Species Division,
Sacramento Fish and Wildlife Office,
Fish and Wildlife Service, Sacramento, California

Subject: Species List To Install 450,000 gallon Water Tank and
Associated Water Lines in Ash Mountain Area of Sequoia
National Park, Tulare County, California

We are sending the enclosed list in response to your November 13, 2002, request for information about endangered and threatened species (Attachment A). This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide species lists under section 7(c) of the Endangered Species Act of 1973, as amended (Act).

The animal species on the Enclosure A quad list are those species we believe may occur within, or be affected by projects within, the following USGS quads, where your project is planned:

Case Mountain 332A and Giant Forest 354D.

Any plants on the quad list are ones that have actually been observed in the project quad(s). Plants may occur in a quad without having been observed there. Therefore we

have included a species list for the whole county in which your project occurs. We recommend that you survey for any relevant plants shown on this list.

Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them. Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.

Executive Order 13186, January 17, 2001, directs Federal agencies to take specific steps to conserve migratory birds. *Species of Concern* (see below) are specifically included in this Executive Order. (The Order can be found at www.nara.gov/fedreg/eo.html) Birds are shown on our species lists regardless of whether they are resident or migratory. *Relevant birds on the county list should be considered regardless of whether they appear on a quad list.*

If a species has been listed as threatened or endangered by the State of California, but not by us nor by the National Marine Fisheries Service, it will appear on your list as a Species of Concern. *However you must contact the California Department of Fish and Game for official information about these species.* Call (916) 322-2493 or write Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814.

Some of the species listed in Enclosure A may not be affected by the proposed action. A trained biologist or botanist, familiar with the habitat requirements of the listed species, should determine whether these species or habitats suitable for them may be affected. For plants, we recommend using the enclosed Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species (Enclosure C).

Some pertinent information concerning the distribution, life history, habitat requirements, and published references for the listed species is available upon request. This information may be helpful in preparing the biological assessment for this project, if one is required. Please see Enclosure B for a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative.

Formal consultation, under 50 CFR § 402.14, should be initiated if you determine that a listed species may be affected by the proposed project. If you determine that a proposed species may be adversely affected, you should consider requesting a conference with our

office under 50 CFR § 402.10. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office.

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as *critical habitat*. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal. Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, this will be noted on the species list. Maps and boundary descriptions of the critical habitat may be found in the *Federal Register*. The information is also reprinted in the *Code of Federal Regulations* (50.CFR 17.95).

Candidate species are being reviewed for possible listing. Contact our office if your *biological assessment* reveals any candidate species that might be adversely affected. Although they currently have no protection under the Endangered Species Act, one or more of them could be proposed and listed before your project is completed. By considering them from the beginning, you could avoid problems later.

Your list may contain a section called *Species of Concern*. This term includes former *category 2 candidate species* and other plants and animals of concern to the Service and other Federal, State and private conservation agencies and organizations. Some of these species may become candidate species in the future.

If the proposed project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by the U.S. Army Corps of Engineers (Corps), a Corps permit will be required, under section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act. Impacts to wetland habitats require site specific mitigation and monitoring. You may request a copy of the Service's General Mitigation and Monitoring Guidelines or submit a detailed description of the proposed impacts for specific comments and recommendations. If you have any questions regarding wetlands, contact Mark Littlefield at (916) 414-6580.

Please contact Pete Epanchin or Tammy Duke at (916) 414-6600, if you have any questions about the attached list or your responsibilities under the Endangered Species Act. For the fastest response to species list requests, address them to the attention of Species Lists at this address. You may fax requests to 414-6712 or 414-6713. You may also email them to harry_mossman@fws.gov.

Sincerely,



by/

Jan C. Knight
Chief, Endangered Species Division

Attachments

ATTACHMENT A
 Endangered and Threatened Species that May Occur in
 or be Affected by Projects in the Selected Quads Listed Below
 Reference File No. 03-SP-0700
**Install 450,000 gallon Water Tank and associated Water Lines in Ash
 Mountain Area of Sequoia National Park Tulare County California**
 December 31, 2002

QUAD: 332A CASE MOUNTAIN

Listed Species

Birds

- California condor, *Gymnogyps californianus* (E)
- bald eagle, *Haliaeetus leucocephalus* (T)

Amphibians

- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- California red-legged frog, *Rana aurora draytonii* (T)

Fish

- delta smelt, *Hypomesus transpacificus* (T)
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)

Plants

- Springville clarkia, *Clarkia springvillensis* (T)

Species of Concern

Mammals

- Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
- spotted bat, *Euderma maculatum* (SC)
- greater western mastiff-bat, *Eumops perotis californicus* (SC)
- Pacific fisher, *Martes pennanti pacifica* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- fringed myotis bat, *Myotis thysanodes* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- Southern grasshopper mouse, *Onychomys torridus ramona* (SC)
- Sierra Nevada red fox, *Vulpes vulpes necator* (CA)

Birds

- northern goshawk, *Accipiter gentilis* (SC)
- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- short-eared owl, *Asio flammeus* (SC)

western burrowing owl, *Athene cunicularia hypugaea* (SC)
 oak titmouse, *Baeolophus inornatus* (SLC)
 Costa's hummingbird, *Calypte costae* (SC)
 Lawrence's goldfinch, *Carduelis lawrencei* (SC)
 Vaux's swift, *Chaetura vauxi* (SC)
 black tern, *Chlidonias niger* (SC)
 black swift, *Cypseloides niger* (SC)
 hermit warbler, *Dendroica occidentalis* (SC)
 little willow flycatcher, *Empidonax traillii brewsteri* (CA)
 American peregrine falcon, *Falco peregrinus anatum* (D)
 loggerhead shrike, *Lanius ludovicianus* (SC)
 Lewis' woodpecker, *Melanerpes lewis* (SC)
 long-billed curlew, *Numenius americanus* (SC)
 white-headed woodpecker, *Picoides albolarvatus* (SLC)
 rufous hummingbird, *Selasphorus rufus* (SC)
 Brewer's sparrow, *Spizella breweri* (SC)
 California spotted owl, *Strix occidentalis occidentalis* (SC)
 California thrasher, *Toxostoma redivivum* (SC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
 southwestern pond turtle, *Clemmys marmorata pallida* (SC)
 California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

Mount Lyell salamander, *Hydromantes platycephalus* (SC)
 foothill yellow-legged frog, *Rana boylei* (SC)
 mountain yellow-legged frog, *Rana muscosa* (SC)

Fish

longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

American dipper, *Cinclus mexicanus* (SLC)
 moestan blister beetle, *Lytta moesta* (SC)

Plants

Kaweah brodiaea, *Brodiaea insignis* (CA)
 Shirley Meadows mariposa lily (=star-tulip), *Calochortus westonii* (SC)
 Pierpoint Springs liveforever (=dudleya), *Dudleya cymosa ssp. costafolia* (SC)
 mouse buckwheat, *Eriogonum nudum var. murinum* (SC)

Reference File No. 03-SP-0700

Page 3

Sequoia gooseberry, *Ribes tularense* (SLC)

QUAD: 354D GIANT FOREST

Listed Species**Birds**California condor, *Gymnogyps californianus* (E)bald eagle, *Haliaeetus leucocephalus* (T)**Amphibians**valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)California red-legged frog, *Rana aurora draytonii* (T)**Fish**delta smelt, *Hypomesus transpacificus* (T)Sacramento splittail, *Pogonichthys macrolepidotus* (T)**Species of Concern****Mammals**spotted bat, *Euderma maculatum* (SC)greater western mastiff-bat, *Eumops perotis californicus* (SC)American (=pine) marten, *Martes americana* (SC)Pacific fisher, *Martes pennanti pacifica* (SC)small-footed myotis bat, *Myotis ciliolabrum* (SC)long-eared myotis bat, *Myotis evotis* (SC)fringed myotis bat, *Myotis thysanodes* (SC)long-legged myotis bat, *Myotis volans* (SC)Yuma myotis bat, *Myotis yumanensis* (SC)Sierra Nevada red fox, *Vulpes vulpes necator* (CA)**Birds**northern goshawk, *Accipiter gentilis* (SC)grasshopper sparrow, *Ammodramus savannarum* (SC)short-eared owl, *Asio flammeus* (SC)oak titmouse, *Baeolophus inornatus* (SLC)Costa's hummingbird, *Calypte costae* (SC)Lawrence's goldfinch, *Carduelis lawrencei* (SC)Vaux's swift, *Chaetura vauxi* (SC)black tern, *Chlidonias niger* (SC)black swift, *Cypseloides niger* (SC)little willow flycatcher, *Empidonax traillii brewsteri* (CA)American peregrine falcon, *Falco peregrinus anatum* (D)

- Lewis' woodpecker, *Melanerpes lewis* (SC)
- long-billed curlew, *Numenius americanus* (SC)
- white-headed woodpecker, *Picoides albolarvatus* (SLC)
- rufous hummingbird, *Selasphorus rufus* (SC)
- Brewer's sparrow, *Spizella breweri* (SC)
- California spotted owl, *Strix occidentalis occidentalis* (SC)
- California thrasher, *Toxostoma redivivum* (SC)

Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- southwestern pond turtle, *Clemmys marmorata pallida* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

- Mount Lyell salamander, *Hydromantes platycephalus* (SC)
- foothill yellow-legged frog, *Rana boylei* (SC)
- mountain yellow-legged frog, *Rana muscosa* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

Fish

- longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

- American dipper, *Cinclus mexicanus* (SLC)
- moestan blister beetle, *Lytta moesta* (SC)

Plants

- mouse buckwheat, *Eriogonum nudum var. murinum* (SC)
- Sequoia gooseberry, *Ribes tularense* (SLC)

KEY:

(E)	<i>Endangered</i>	Listed (in the Federal Register) as being in danger of extinction.
(T)	<i>Threatened</i>	Listed as likely to become endangered within the foreseeable future.
(P)	<i>Proposed</i>	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(PX)	<i>Proposed Critical Habitat</i>	Proposed as an area essential to the conservation of the species.
(C)	<i>Candidate</i>	Candidate to become a <i>proposed</i> species.
(SC)	<i>Species of Concern</i>	May be endangered or threatened. Not enough biological information has been gathered to support listing at this time.
(SLC)	<i>Species of Local Concern</i>	Species of local or regional concern or conservation significance.
(MB)	<i>Migratory Bird</i>	Migratory bird
NMFS	NMFS species	Under the jurisdiction of the National Marine Fisheries Service. Contact them directly.
(D)	<i>Delisted</i>	Delisted. Status to be monitored for 5 years.
(CA)	<i>State-Listed</i>	Listed as threatened or endangered by the State of California.
(*)	<i>Extirpated</i>	Possibly extirpated from this quad.
(**)	<i>Extinct</i>	Possibly extinct.
	<i>Critical Habitat</i>	Area essential to the conservation of a species.

ATTACHMENT A
Endangered and Threatened Species that May Occur in or be Affected by
PROJECTS IN TULARE COUNTY
Reference File No. 03-SP-0700
Install 450,000 gallon Water Tank and associated Water Lines in Ash Mountain Area of
Sequoia National Park Tulare County California
December 31, 2002

Listed Species

Mammals

- giant kangaroo rat, *Dipodomys ingens* (E)
- Fresno kangaroo rat, *Dipodomys nitratoides exilis* (E)
- Tipton kangaroo rat, *Dipodomys nitratoides nitratoides* (E)
- Sierra Nevada (=California) bighorn sheep, *Ovis canadensis californiana* (E)
- San Joaquin kit fox, *Vulpes macrotis mutica* (E)

Birds

- ~~California condor, *Gymnogyps californianus* (E)~~
- Critical habitat, California condor, *Gymnogyps californianus* (E)
- bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

- blunt-nosed leopard lizard, *Gambelia (=Crotaphytus) sila* (E)
- giant garter snake, *Thamnophis gigas* (T)

Amphibians

- California tiger salamander, *Ambystoma californiense* (C/E)
- valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)
- California red-legged frog, *Rana aurora draytonii* (T)

Fish

- Critical habitat, little Kern golden trout, *Oncorhynchus (=Salmo) aquabonita whitei* (T)
- Little Kern golden trout, *Oncorhynchus (=Salmo) aquabonita whitei* (T)
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)
- delta smelt, *Hypomesus transpacificus* (T) *

Invertebrates

- vernal pool tadpole shrimp, *Lepidurus packardii* (E)

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

Plants

Keck's checker-mallow (=checkerbloom), *Sidalcea keckii* (E)

Hoover's spurge, *Chamaesyce hooveri* (T)

Springville clarkia, *Clarkia springvillensis* (T)

Hoover's eriastrum (= woolly-star), *Eriastrum hooveri* (T)

San Joaquin adobe sunburst, *Pseudobahia peirsonii* (T)

California jewelflower, *Caulanthus californicus* (E) *

San Joaquin woolly-threads, *Monolopia congdonii* (= *Lembertia congdonii*) (E) *

Greene's tuctoria (=Orcutt grass), *Tuctoria greenei* (E) *

San Joaquin Valley Orcutt grass, *Orcuttia inaequalis* (T) *

Proposed Species

Birds

mountain plover, *Charadrius montanus* (PT)

Invertebrates

Critical habitat, vernal pool invertebrates, See *Federal Register* 67:59883 (PX)

Plants

Critical habitat, vernal pool plants, See *Federal Register* 67:59883 (PX)

critical habitat, Keck's checker-mallow, *Sidalcea keckii* (PX)

Candidate Species

Birds

Western yellow-billed cuckoo, *Coccyzus americanus occidentalis* (C) *

Plants

Ramshaw sand-verbena, *Abronia alpina* (C)

Species of Concern

Mammals

San Joaquin (=Nelson's) antelope squirrel, *Ammospermophilus nelsoni* (CA)

Sierra Nevada red fox, *Vulpes vulpes necator* (CA)

pale Townsend's big-eared bat, *Corynorhinus (=Plecotus) townsendii pallescens* (SC)

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

short-nosed kangaroo rat, *Dipodomys nitratoides brevinasus* (SC)

spotted bat, *Euderma maculatum* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

American (=pine) marten, *Martes americana* (SC)

Pacific fisher, *Martes pennanti pacifica* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

Southern grasshopper mouse, *Onychomys torridus ramona* (SC)

Tulare grasshopper mouse, *Onychomys torridus tularensis* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Birds

little willow flycatcher, *Empidonax traillii brewsteri* (CA)

greater sandhill crane, *Grus canadensis tabida* (CA)

bank swallow, *Riparia riparia* (CA)

Aleutian Canada goose, *Branta canadensis leucopareia* (D)

American peregrine falcon, *Falco peregrinus anatum* (D)

northern goshawk, *Accipiter gentilis* (SC)

tricolored blackbird, *Agelaius tricolor* (SC)

grasshopper sparrow, *Ammodramus savannarum* (SC)

Bell's sage sparrow, *Amphispiza belli-belli* (SC)

short-eared owl, *Asio flammeus* (SC)

western burrowing owl, *Athene cunicularia hypugaea* (SC)

American bittern, *Botaurus lentiginosus* (SC)

ferruginous hawk, *Buteo regalis* (SC)
 Costa's hummingbird, *Calypte costae* (SC)
 Lawrence's goldfinch, *Carduelis lawrencei* (SC)
 Vaux's swift, *Chaetura vauxi* (SC)
 black tern, *Chlidonias niger* (SC)
 olive-sided flycatcher, *Contopus cooperi* (SC)
 black swift, *Cypseloides niger* (SC)
 hermit warbler, *Dendroica occidentalis* (SC)
 white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
 common loon, *Gavia immer* (SC)
 least bittern, western, *Ixobrychus exilis hesperis* (SC)
 loggerhead shrike, *Lanius ludovicianus* (SC)
 Lewis' woodpecker, *Melanerpes lewis* (SC)
 long-billed curlew, *Numenius americanus* (SC)
 white-faced ibis, *Plegadis chihi* (SC)
 rufous hummingbird, *Selasphorus rufus* (SC)
 Brewer's sparrow, *Spizella breweri* (SC)
 California spotted owl, *Strix occidentalis occidentalis* (SC)
 San Joaquin LeConte's thrasher, *Toxostoma lecontei macmillanorum* (SC)
 California thrasher, *Toxostoma redivivum* (SC)
 oak titmouse, *Baeolophus inornatus* (SLC)
 white-headed woodpecker, *Picoides albolarvatus* (SLC)
 Nuttall's woodpecker, *Picoides nuttallii* (SLC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
 southwestern pond turtle, *Clemmys marmorata pallida* (SC)
 San Joaquin coachwhip (=whipsnake), *Masticophis flagellum ruddocki* (SC)
 California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

- Kern Canyon slender salamander, *Batrachoseps simatus* (CA)
- relictual slender salamander, *Batrachoseps relictus* (=pacificus) (SC)
- yellow-blotched ensatina, *Ensatina eschscholtzii croceator* (SC)
- Mount Lyell salamander, *Hydromantes platycephalus* (SC)
- foothill yellow-legged frog, *Rana boylei* (SC)
- mountain yellow-legged frog, *Rana muscosa* (SC)
- western spadefoot toad, *Spea hammondi* (SC)

Fish

- Kern brook lamprey, *Lampetra hubbsi* (SC)
- Volcano Creek golden trout, *Oncorhynchus* (=Salmo) *mykiss aquabonita* (SC)
- Kern River rainbow trout, *Oncorhynchus* (=Salmo) *mykiss gilberti* (SC)

Invertebrates

- San Joaquin tiger beetle, *Cicindela tranquebarica* ssp. (SC)
- Denning's cryptic caddisfly, *Cryptochia denningi* (SC)
- Kings Canyon cryptochian caddisfly, *Cryptochia excella* (SC)
- California linderiella fairy shrimp, *Linderiella occidentalis* (SC)
- Hopping's blister beetle, *Lytta hoppingi* (SC)
- moestan blister beetle, *Lytta moesta* (SC)
- molestan blister beetle, *Lytta molesta* (SC)
- Morrison's blister beetle, *Lytta morrisoni* (SC)
- San Emigdio blue butterfly, *Plebulina emigdionis* (SC)
- American dipper, *Cinclus mexicanus* (SLC)

Plants

- Kaweah brodiaea, *Brodiaea insignis* (CA)
- Greenhorn adobe-lily, *Fritillaria striata* (CA)
- Bodie Hills rock cress, *Arabis bodiensis* (SC)
- heartscale, *Atriplex cordulata* (SC)

brittlescale, *Atriplex depressa* (SC)
 vernal pool (=persistent-fruited, Sacramento) saltbush (=smallscale, saltscale), *Atriplex persistens* (SC)
 scalloped moonwort, *Botrychium crenulatum* (SC)
 alkali mariposa lily, *Calochortus striatus* (SC)
 Shirley Meadows mariposa lily (=star-tulip), *Calochortus westonii* (SC)
 Piute cypress, *Cupressus nevadensis* (SC)
 Ewan's larkspur, *Delphinium hansenii* ssp. *ewanianum* (SC)
 recurved larkspur, *Delphinium recurvatum* (SC)
 Pierpoint Springs liveforever (=dudleya), *Dudleya cymosa* ssp. *costafolia* (SC)
 Kern River daisy, *Erigeron multiceps* (SC)
 mouse buckwheat, *Eriogonum nudum* var. *murinum* (SC)
 Twisselmann's buckwheat, *Eriogonum twisselmannii* (SC)
 spiny-sepaled coyote-thistle (=button-celery), *Eryngium spinosepalum* (SC)
 Yosemite lewisia, *Lewisia disepala* (SC)
 DeDecker's (=Father Crowley's) lupine, *Lupinus padre-crowleyi* (=L. *dedeckerae*) (SC)
 calico monkeyflower, *Mimulus pictus* (SC)
 flax-like monardella, *Monardella linoidea* ssp. *oblonga* (SC)
 little mousetail, *Myosurus minimus* ssp. *apus* (SC)
 Piute Mountains navarretia, *Navarretia setiloba* (SC)
 Twisselmann's nemacladus, *Nemacladus twisselmannii* (SC)
 Charlotte's phacelia, *Phacelia nashiana* (SC)
 Nine Mile Canyon phacelia, *Phacelia novemmillensis* (SC)
 alpine streptanthus (=jewel-flower), *Streptanthus gracilis* (SC)
 Kern Plateau milk-vetch, *Astragalus lentiginosus* var. *kernensis* (SLC)
 Earlimart orache (=erectstem saltbush), *Atriplex erecticaulis* (SLC)
 subtle orache, *Atriplex subtilis* (SLC)
 Kaweah Lakes fawn-lily, *Erythronium grandiflorum* ssp. *pusaterii* (SLC)

Tulare (=Kern Plateau) horkelia, *Horkelia tularensis* (SLC)
 short-leaved hulsea (=shortleaf alpinegold), *Hulsea brevifolia* (SLC)
 field ivesia (=field mousetail), *Ivesia campestris* (SLC)
 Madera linanthus, *Linanthus serrulatus* (SLC)
 purple mountain-parsley, *Oreonana purpurascens* (SLC)
 aromatic canyon gooseberry, *Ribes menziesii var ixoderme* (SLC)
 Sequoia gooseberry, *Ribes tularense* (SLC)
 San Joaquin spearscale (=saltbush), *Atriplex joaquiniana* (SC) *
 lesser saltscale, *Atriplex minuscula* (SC) *

KEY:

(E)	<i>Endangered</i>	Listed (in the Federal Register) as being in danger of extinction.
(T)	<i>Threatened</i>	Listed as likely to become endangered within the foreseeable future.
(P)	<i>Proposed</i>	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(PX)	<i>Proposed Critical Habitat</i>	Proposed as an area essential to the conservation of the species.
(C)	<i>Candidate</i>	Candidate to become a <i>proposed</i> species.
(SC)	<i>Species of Concern</i>	Other species of concern to the Service.
(SLC)	<i>Species of Local Concern</i>	Species of local or regional concern or conservation significance.
(D)	<i>Delisted</i>	Delisted. Status to be monitored for 5 years.
(CA)	<i>State-Listed</i>	Listed as threatened or endangered by the State of California.
NMFS	NMFS species	Under the jurisdiction of the National Marine Fisheries Service. Contact them directly.
*	<i>Extirpated</i>	Possibly extirpated from the area.
**	<i>Extinct</i>	Possibly extinct
	<i>Critical Habitat</i>	Area essential to the conservation of a species.

Attachment B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER
SECTIONS 7(a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) Consultation/Conference

Requires: (1) federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species; (2) Consultation with FWS when a federal action may affect a listed endangered or threatened species to insure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after determining the action may affect a listed species; and (3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) Biological Assessment-Major Construction Activity¹

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action² on listed and proposed species. The process begins with a Federal agency requesting from FWS a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA: an on-site inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat is present; a review of literature and scientific data to determine

¹A construction project (or other undertaking having similar physical impacts) which is a major federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332(2)C).

²"Effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.

species' distribution, habitat needs, and other biological requirement; interviews with experts, including those within FWS, State conservation departments, universities and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of indirect effects of the proposal on the species and its habitat; an analysis of alternative actions considered.

The BA should document the results, including a discussion of study methods used, and problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the BA should be forwarded to our office.

Attachment C

GUIDELINES FOR CONDUCTING AND REPORTING BOTANICAL INVENTORIES
FOR FEDERALLY LISTED, PROPOSED AND CANDIDATE PLANTS

(September 23, 1996)

These guidelines describe protocols for conducting botanical inventories for federally listed, proposed and candidate plants, and describe minimum standards for reporting results. The Service will use, in part, the information outlined below in determining whether the project under consideration may affect any listed, proposed or candidate plants, and in determining the direct, indirect, and cumulative effects.

Field inventories should be conducted in a manner that will locate listed, proposed, or candidate species (target species) that may be present. The entire project area requires a botanical inventory, except developed agricultural lands. The field investigator(s) should:

1. Conduct inventories at the appropriate times of year when target species are present and identifiable. Inventories will include all potential habitats. Multiple site visits during a field season may be necessary to make observations during the appropriate phenological stage of all target species.
2. If available, use a regional or local reference population to obtain a visual image of the target species and associated habitat(s). If access to reference populations(s) is not available, investigators should study specimens from local herbaria.
3. List every species observed and compile a comprehensive list of vascular plants for the entire project site. Vascular plants need to be identified to a taxonomic level which allows rarity to be determined.
4. Report results of botanical field inventories that include:
 - a. a description of the biological setting, including plant community, topography, soils, potential habitat of target species, and an evaluation of environmental conditions, such as timing or quantity of rainfall, which may influence the performance and expression of target species
 - b. a map of project location showing scale, orientation, project boundaries, parcel size, and map quadrangle name
 - c. survey dates and survey methodology(ies)

- d. if a reference population is available, provide a written narrative describing the target species reference population(s) used, and date(s) when observations were made
 - e. a comprehensive list of all vascular plants occurring on the project site for each habitat type
 - f. current and historic land uses of the habitat(s) and degree of site alteration
 - g. presence of target species off-site on adjacent parcels, if known.
 - h. an assessment of the biological significance or ecological quality of the project site in a local and regional context
5. If target species is(are) found, report results that additionally include:
- a. a map showing federally listed, proposed and candidate species distribution as they relate to the proposed project
 - b. if target species is (are) associated with wetlands, a description of the direction and integrity of flow of surface hydrology. If target species is (are) affected by adjacent off-site hydrological influences, describe these factors.
 - c. the target species phenology and microhabitat, an estimate of the number of individuals of each target species per unit area; identify areas of high, medium and low density of target species over the project site, and provide acres of occupied habitat of target species. Investigators could provide color slides, photos or color copies of photos of target species or representative habitats to support information or descriptions contained in reports.
 - d. the degree of impact(s), if any, of the proposed project as it relates to the potential unoccupied habitat of target habitat.
6. Document findings of target species by completing California Native Species Field Survey Form(s) and submit form(s) to the Natural Diversity Data Base. Documentation of determinations and/or voucher specimens may be useful in cases of taxonomic ambiguities, habitat or range extensions.
7. Report as an addendum to the original survey, any change in abundance and distribution of target plants in subsequent years. Project sites with inventories older than 3 years from the current date of project proposal submission will likely need additional survey. Investigators need to assess whether an

additional survey(s) is (are) needed.

8. Adverse conditions may prevent investigator(s) from determining presence or identifying some target species in potential habitat(s) of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any year. An additional botanical inventory(ies) in a subsequent year(s) may be required if adverse conditions occur in a potential habitat(s). Investigator(s) may need to discuss such conditions.

9. Guidance from California Department of Fish and Game (CDFG) regarding plant and plant community surveys can be found in *Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities, 1984*. Please contact the CDFG Regional Office for questions regarding the CDFG guidelines and for assistance in determining any applicable State regulatory requirements.

APPENDIX B
WATER TANK AND DISTRIBUTION PIPELINE CORRIDOR
2003 VEGETATION SURVEY

Table B-1. Water Tank and Distribution Pipeline Corridor 2003 Vegetation Survey

Family	Genus and Species	Common Name	Native / Non-Native
Hippocastanaceae	<i>Aesculus californica</i> (Spach) Nutt.	California buckeye	Native
Poaceae	<i>Agrostis exarata</i> Trin.	spike bent	Native
Boraginaceae	<i>Amsinckia menziesii</i> (Lehm.) Nelson & J.F. Macbr. var. <i>intermedia</i> (Fischer & C. Meyer) Ganders	rancher's fire weed	Native
Ericaceae	<i>Arctostaphylos viscida</i> C. Parry	whiteleaf manzanita	Native
Asclepiadaceae	<i>Asclepias eriocarpa</i> Benth.	kotolo	Native
Poaceae	<i>Avena fatua</i> L.	wild oat	Non-Native
Poaceae	<i>Bromus arenarius</i> Labill.	Australian chess	Non-Native
Poaceae	<i>Bromus diandrus</i> Roth.	rippgut grass	Non-Native
Liliaceae	<i>Brodiaea elegans</i> Hoover ssp. <i>elegans</i>	harvest brodiaea	Native
Liliaceae	<i>Triteleia ixioides</i> (S. Watson) E. Greene ssp. <i>anilina</i> (E. Greene) L. Lenz	golden brodiaea	Native
Poaceae	<i>Bromus hordeaceus</i> L.	soft chess	Non-Native
Brassicaceae	<i>Brassica nigra</i> (L.) Koch	black mustard	Non-Native
Poaceae	<i>Bromus sterilis</i> L.	poverty brome	Non-Native
Liliaceae	<i>Dichelostemma volubile</i> (Kellogg) A.A. Heller	snake lilly	Native
Liliaceae	<i>Calochortus amoenus</i> E. Greene	rosy fairy lantern	Native
Calycanthaceae	<i>Calycanthus occidentalis</i> Hook. & Arn.	spicebush	Native
Asteraceae	<i>Carduus pycnocephalus</i> L.	Italian thistle	Non-Native
Liliaceae	<i>Calochortus venustus</i> Benth.	butterfly mariposa lilly	Native
Rosaceae	<i>Cercocarpus betuloides</i> Torrey & A. Gray	birchleaf mountain mahogany	Native
Rhamnaceae	<i>Ceanothus cuneatus</i> (Hook.) Nutt.	buck brush	Native
Asteraceae	<i>Centaurea melitensis</i> L.	tocolote	Non-Native
Fabaceae	<i>Cercis occidentalis</i> Torrey	redbud	Native
Polygonaceae	<i>Chorizanthe membranacea</i> Benth.	pink spineflower	Native
Asteraceae	<i>Cirsium occidentale</i> (Nutt.) Jepson var. <i>californicum</i> (A. Gray) Keil & C. Turner	California thistle	Native
Ranunculaceae	<i>Clematis lasiantha</i> Nutt.	pipestems	Native
Onagraceae	<i>Clarkia purpurea</i> (Curtis) Nelson & J.F. Macbr. ssp. <i>quadrivulnera</i> (Douglas) Harlan Lewis & M. Lewis	four-spot	Native
Onagraceae	<i>Clarkia unguiculata</i> Lindley		Native
Asteraceae	<i>Conyza canadensis</i> (L.) Cronq.	horseweed	Native
Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	bermuda grass	Non-Native
Datisceae	<i>Datisca glomerata</i> (C. Presl) Baillon	durango root	Native
Apiaceae	<i>Daucus pusillus</i> Michaux	rattlesnake weed	Native
Liliaceae	<i>Dichelostemma capitatum</i> Alph. Wood	blue dicks	Native
Poaceae	<i>Elymus glaucus</i> Buckley ssp. <i>glaucus</i>	blue wildrye	Native
Geraniaceae	<i>Erodium botrys</i> (Cav.) Bertol	long-beaked filaree	Non-Native
Hydrophyllaceae	<i>Eriodictyon californicum</i> (Hook. & Arn.) Torrey	yerba santa	Native
Geraniaceae	<i>Erodium cicutarium</i> (L.) L'Her	red-stemmed filaree	Non-Native
Poaceae	<i>Festuca pratensis</i> Hudson	meadow fescue	Non-Native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Benth var. <i>ciliata</i> (Beal) Lonard & Gould	small fescue	Native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Benth var. <i>pauciflora</i> (Beal) Lonard & Gould		Native

Table B-1. Water Tank and Distribution Pipeline Corridor 2003 Vegetation Survey

Family	Genus and Species	Common Name	Native / Non-Native
Asteraceae	<i>Micropus californicus</i> Fisher & C. Meyer	slender cottonweed	Native
Fagaceae	<i>Quercus douglasii</i> Hook. & Arn.	blue oak	Native
Fagaceae	<i>Quercus wislizenii</i> A.DC. var. <i>wislizenii</i>	interior live oak	Native
Asteraceae	<i>Rafinesquia californica</i> Nutt.	California chickory	Native
Rhamnaceae	<i>Rhamnus ilicifolia</i> Kellogg	holly-leaf redberry	Native
Anacardiaceae	<i>Rhus trilobata</i> Torrey & A. Gray	skunkbrush	Native
Oleaceae	<i>Fraxinus dipetala</i> Hook. & Arn.	California ash	Native
Rubiaceae	<i>Galium aparine</i> L.	goose grass	Native
Rubiaceae	<i>Galium parisiense</i> L.	wall bedstraw	Non-Native
Polemoniaceae	<i>Gilia tricolor</i> Benth. ssp. <i>tricolor</i>	bird's eyes	Native
Asteraceae	<i>Gnaphalium californicum</i> DC.	ladies' cottonrose	Native
Asteraceae	<i>Holocarpha heermannii</i> (E. Greene) Keck	Heerman's tarweed	Native
Asteraceae	<i>Hypochaeris glabra</i> L.	smooth cat's ear	Non-Native
Juncaceae	<i>Juncus bufonius</i> L. var. <i>bufonius</i>	toad rush	Native
Scrophulariaceae	<i>Keckiella breviflora</i> (Lindley) Straw var. <i>breviflora</i>	gaping beard-tounge	Native
Polemoniaceae	<i>Linanthus ciliatus</i> (Benth.) E. Greene	whisker brush	Native
Fabaceae	<i>Lotus strigosus</i> (Nutt.) E. Greene	strigose bird's-foot trefoil	Native
Fabaceae	<i>Lotus wrangelianus</i> Fischer & C. Meyer	Chile lotus	Native
Poaceae	<i>Lolium temulentum</i> L.	darnel	Non-Native
Fabaceae	<i>Lupinus albifrons</i> Benth. var. <i>albifrons</i>	silver lupine	Native
Fabaceae	<i>Lupinus bicolor</i> Lindley	miniature lupine	Native
Fabaceae	<i>Lupinus microcarpus</i> Sims var. <i>microcarpus</i>	chick lupine	Native
Asteraceae	<i>Madia elegans</i> Lindley ssp. <i>vernalis</i> Keck	common madia	Native
Cucurbitaceae	<i>Marah horridus</i> (Congdon) Dunn	Sierra manroot	Native
Poaceae	<i>Melica californica</i> Scribner var. <i>nevadensis</i> Boyle	California melic	Native
Fabaceae	<i>Melilotus indica</i> (L.) All.	sourclover	Non-Native
Fabaceae	<i>Medicago polymorpha</i> L.	California burclover	Non-Native
Scrophulariaceae	<i>Castilleja lineariloba</i> (Benth.) Chuang & Heckard	pallid owl's clover	Native
Oxalidaceae	<i>Oxalis pes-caprae</i> L.	Bermuda buttercup	Non-Native
Pteridaceae	<i>Pellaea andromedifolia</i> (Kaulf.) Fee	coffee fern	Native
Rosaceae	<i>Heteromeles arbutifolia</i> (Lindley) Roemer	toyon	Native
Hydrophyllaceae	<i>Phacelia cicutaria</i> E. Greene var. <i>cicutaria</i>	caterpillar phacelia	Native
Pteridaceae	<i>Pentagramma triangularis</i> (Kaulf.) G. Yatskievych, M.D. Windham & E. Wollenweber ssp. <i>triangularis</i>	goldenback fern	Native
Boraginaceae	<i>Plagiobothrys nothofulvus</i> (A. Gray) A. Gray	popcornflower	Native
Poaceae	<i>Poa secunda</i> Presl ssp. <i>secunda</i>	one-sided bluegrass	Native
Asteraceae	<i>Pseudobahia heermannii</i> (Durand) Rydb.	Heerman's sunburst	Native
Polygonaceae	<i>Pterostegia drymarioides</i> Fischer & C. Meyer	woodland pterostegia	Native
Apiaceae	<i>Sanicula crassicaulis</i> DC.	pacific sanicle	Native
Asteraceae	<i>Senecio vulgaris</i> L.	old-man-in-the-spring	Non-Native
Caryophyllaceae	<i>Silene gallica</i> L.	common catchfly	Non-Native
Caryophyllaceae	<i>Stellaria media</i> (L.) Villars	common chickweed	Non-Native
Apiaceae	<i>Torilis arvensis</i> (Hudson) Link		Non-Native
Anacardiaceae	<i>Toxicodendron diversilobum</i> (Torrey & A. Gray) E. Greene	western poison oak	Native
Fabaceae	<i>Trifolium ciliolatum</i> Benth.	tree clover	Native

Table B-1. Water Tank and Distribution Pipeline Corridor 2003 Vegetation Survey

Family	Genus and Species	Common Name	Native / Non-Native
Fabaceae	Trifolium microcephalum Pursh	small-headed clover	Native
Fabaceae	Trifolium campestre Shreber	hop clover	Non-Native
Fabaceae	Trifolium willdenovii Sprengel	tomcat clover	Native
Scrophulariaceae	Veronica arvensis L.	corn speedwell	Non-Native
Apocynaceae	Vinca major L.	greater periwinkle	Non-Native
Fabaceae	Vicia sativa L.	common vetch	Non-Native
Liliaceae	Yucca whipplei Torrey	our Lord's candle	Native
Poaceae	Avena barbata Link	slender wild oat	Non-Native
Geraniaceae	Geranium molle L.	dove's foot geranium	Non-Native
Asteraceae	Sonchus asper (L.) Hill ssp. asper	prickly sow thistle	Non-Native
Fabaceae	Trifolium dubium Sibth.	little hop clover	Non-Native
Poaceae	Nassella pulchra (A. Hitchc.) Barkworth	purple needlegrass	Native
Oxalidaceae	Oxalis corniculata L.		Non-Native
Fabaceae	Spartium junceum L.	Spanish broom	Non-Native
Poaceae	Hordeum murinum L. ssp. murinum		Non-Native
Pinaceae	Pinus sabiniana Douglas	gray pine	Non-Native
Vitaceae	Parthenocissus vitacea (Knerr) Hitchc.	woodbine	Native
Portulacaceae	Claytonia parviflora Hook. ssp. grandiflora John M. Miller & Chambers		Native
Fabaceae	Lotus humistratus E. Greene		Native
Scrophulariaceae	Veronica hederifolia L.		Non-Native

APPENDIX C
CALIFORNIA STATE HISTORIC PRESERVATION OFFICE CONCURRENCE

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov

SEP 24



30 August, 2003

Reply To: NPS021206A

Richard H. Martin, Superintendent
National Park Service
Kings Canyon National Park
Sequoia National Park
Three Rivers, California 93271-9700

Re: Determinations of Eligibility and Effect for Water Tank Replacement/ Provide Fire Suppression Project
(Package 221)

Dear Mr. Martin:

Thank you for your July 17, 2003 letter responding to my request for more information. You have done this, and are consulting with me, in order to comply with Section 106 of the National Historic Preservation Act, and its implementing regulations codified at 36 CFR Part 800.

The National Park Service (NPS) proposes to demolish and replace two failing water storage tanks and install fire suppression sprinkler systems (project/undertaking) at the Ash Mountain Headquarters Complex in Sequoia National Park in Tulare County. NPS has found that the proposed project will have no adverse effect on National Register eligible or listed properties and is seeking my review and comment on this NPS finding.

In response to my December 16, 2002 request, you are submitting additional information in the form of:

1. An Area of Potential Effect (APE) for the proposed project and
2. An evaluation of potentially significant resources entitled "Replace Potable Water Tanks and Provide Fire Suppression at Park Headquarters, Ash Mountain, Sequoia National Park" by Cultural Resources Specialist Thomas L. Burge (June 2003).

The APE contains approximately 5 acres, including all the areas of direct impact (the old and new buried water lines), the two water tanks subject to demolition, a portion of one historic linear feature (the General's Highway), 8 buildings, and some CCC-era rock walls.

NPS has conducted an historic survey that evaluated the buildings and grounds located within the project APE. This study stated that the APE has been the subject of a variety of systematic pedestrian surface surveys in the past three decades with the result of no known prehistoric sites or features present or recorded.

Since the mid-1990s, internal park discussions have identified a potential multiple property National Register district within the Ash Mountain Developed Area. While not yet formally defined or reviewed, the potentially eligible "Ash Mountain Historic District (AMHD)" remains a working concept that is supported by park management. The district is viewed as being associated with early 20th century residential development at Ash Mountain as the development related to the overall evolution of the Sequoia Park headquarters complex. A variety of buildings and stone features are viewed as contributing resources to the district and have been managed internally as potentially eligible for the National Register (NR). NPS reports that to date, perennial funding and time constraints have prevented preparation of a formal National Register registration package. I infer that such constraints, other circumstances, and the NPS decision-making process have evidently not prevented development and prospective implementation of the undertaking.

One building, Ash Mountain Residence #14, is located within the APE and is viewed as contributing to the potential National Register district. Four buildings, Ash Mountain Residences #97 and #15 and Ash Mountain Garages #289 and #101 are located adjacent to the areas of direct impact and are also considered contributors to the potentially eligible AMHD. NPS has also identified eleven other residences and garages that are viewed as contributing to the AMHD, but these buildings are not located within this project's APE and were not summarized in the study for this undertaking. Buildings that are located within the project APE and that have been determined not to contribute to the AMHD include Ash Mountain Residences #63 and #95. The Ash Mountain Gas Station (Building #168) is

Richard H. Martin
August 30, 2003
Page 2 of 2

considered individually eligible, but is not regarded as a contributor to the AMHD. The rock work located within the headquarters complex, including steps, curbs, and low walls are considered to be contributing features to the potential NR district and will be protected by NPS.

Additionally, NPS has identified four buildings that were constructed from 1963 to 1964 that form the "Ash Mountain Mission 66 Administration Complex. The complex is comprised of the Administration/ Foothills Visitor Center, the Warehouse, Fire Control Building, and the Vehicles and General Shops. All of these buildings show the "Park Modern" architecture of the Mission 66 Program. In 2002, NPS evaluated this complex for NR eligibility under the guidelines for buildings less than 50 years of age, applying eligibility criteria A and C. Final internal review of the resulting NR Registration forms is pending. In the interim, all four Mission 66-era buildings will continue to be treated as potentially eligible for listing in the NR.

NPS has determined that the two water tanks are not eligible for the NR, individually, or as contributors to a potentially eligible historic district. They consist of unfinished, poured concrete walls of a type and design common for utility systems of the early/mid-20th century. They have been patched and retrofitted with a poly liner and do not meet any of the National Register eligibility criteria. A segment of the General's Highway is located within the APE, and was determined eligible under Criteria A and C, by consensus, on October 21, 1992 (NPS911022A).

NPS states that the extant water tanks and associated distribution system are not eligible for the NR, and that the existing water lines will be disconnected, capped, and abandoned in place to minimize subsurface disturbances. The replacement lines will be placed within the previously disturbed rights-of-way and will be monitored by qualified Cultural Resources staff. Additionally, NPS states that the lateral water lines will be extended into the four Mission 66 administration complex buildings. Small diameter openings will be drilled into the exterior wall of each building, but the impacts will be negligible and will not adversely affect any of the qualities that may qualify them for the NR. The subsequent installation of the overhead sprinkler systems would involve the placement of pipelines and sprinkler heads within existing drop-ceilings, or in some cases, across open beamed ceilings in a manner that would not remove or conceal extant historic building materials or surfaces. NPS states that *The Secretary's Standards for the Rehabilitation of Historic Buildings* will be followed. NPS requests my formal review and comment on their determination of no adverse effect pursuant to 36 CFR800.5.

I have reviewed the information provided and conclude that the APE was adequately defined. I do not object to an NPS finding of no adverse effect on properties considered prospectively NR eligible for purposes of this undertaking.

Thank you for considering historic properties during project planning. If you have any questions, please contact Andrea Galvin of my staff at (916) 653-4533 or at agalv@ohp.parks.ca.gov.

Sincerely,



Dr. Knox Mellon
State Historic Preservation Officer



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.

Publication services were provided by engineering-environmental Management, Inc.
NPS D-508/12/03

