



Environmental Assessment/Assessment of Effect

Construct Wireless Telecommunication Facility atop Park Ridge in Kings Canyon National Park

May 2009



ENVIRONMENTAL ASSESSMENT/ ASSESSMENT OF EFFECT

Construct Wireless Telecommunication Facility atop Park

Prepared For:
National Park Service



Prepared By:
Denver Service Center

Sequoia and Kings Canyon National Parks
California

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

**Environmental Assessment/Assessment of Effect
Construct Wireless Telecommunication Facility atop Park Ridge
in Kings Canyon National Park**

**Sequoia and Kings Canyon National Parks
Tulare County, California**

Summary

The National Park Service (NPS) is considering issuing a right-of-way permit to Verizon Wireless for the construction of a wireless telecommunications tower and support structures atop Park Ridge within Kings Canyon National Park, Tulare County, California. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands.

The purpose of the unmanned facility would be to provide year-round service to the area, 24 hours per day, except during brief maintenance intervals. The tower would provide comprehensive wireless communications and wireless internet coverage along a portion of the Generals Highway and along State Highway 180 in the vicinity of Grant Grove. The tower would also provide coverage to Grant Grove Village and Wilsonia in Kings Canyon National Park, and to some remote areas within the parks and surrounding Sequoia National Forest. Reception could be affected in some incidental locations by dense forest growth, buildings, or other structures and features that might obstruct the broadcast signal.

Facility equipment would include an 80-foot-tall monopole tower with panel antennas and microwave dishes. Ground radio equipment and associated air conditioning units would be stored in a prefabricated shelter. An emergency backup generator, powered by propane fuel, would be located in an enclosure next to the shelter. Power to the facility would be upgraded to accommodate Verizon wireless 200-amp single phase power requirements. The power upgrade would require replacing an existing electric transformer with an appropriately designed transformer.

The proposed project would impact approximately 1,308 square feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. The disturbance would remove manzanita and chinquapin shrubs. A staging area of approximately 10 feet by 10 feet would be established in coordination with the park. All materials and equipment would be used and stored solely within the tower construction area and the established staging area during construction of the tower. The staging area would not be used for materials or equipment storage after construction was complete. An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is estimated that construction would take approximately two months.

Current structures on Park Ridge include: two concrete block structures containing NPS and US Forest Service (USFS) communications equipment with power generators; a 20-foot fire lookout tower; two 40-foot lattice towers with NPS and USFS telecommunications equipment; and a 30-foot tower on the NPS communications building supporting a passive reflector used for landline service operated by Verizon California.

Notes to Reviewers and Respondents

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

Please address comments to: Superintendent; Sequoia National Park; Attn: Verizon Wireless Project; Sequoia and Kings Canyon National Parks; 47050 Generals Highway, Three Rivers, CA 93271.

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INTRODUCTION

The National Park Service (NPS) is considering issuing a right-of-way permit to Verizon Wireless for the construction of a wireless telecommunications tower and support structures atop Park Ridge within Kings Canyon National Park, Tulare County, California. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands. This environmental assessment analyzes potential impacts associated with the proposed action and a no-action alternative.

In June 2007 Verizon Wireless submitted an application to the NPS for the construction, operation, and maintenance of a wireless telecommunications facility on Park Ridge. The components of the telecommunication facility would include an 80-foot-tall monopole tower with antennas, a prefabricated single-story building beside the tower for equipment storage, and a stand-by generator. The unmanned facility would provide service to the area residents and businesses year-round, 24 hours per day.

Park Ridge is used as a telecommunications site for Sequoia and Kings Canyon National Parks. Current structures on Park Ridge include:

- 20-foot-tall fire lookout tower
- 10 foot by 10 foot concrete block structure containing NPS communications equipment and a back-up power generator
- 30-foot-tall tower atop the NPS communications equipment building, containing a Verizon California passive reflector used for landline service
- 40-foot tall lattice tower with NPS telecommunications transmission equipment
- 8 foot by 8 foot concrete block structure belonging to the United States Forest Service (USFS), containing USFS radio equipment and a back-up power generator
- 40-foot-tall lattice tower with USFS radio transmission equipment

Both the USFS and Verizon California structures are installations which are managed under permit by the NPS. The location proposed for the 80-foot-tall Verizon tower is illustrated in figure 1.

PURPOSE FOR THE ACTION

The purpose of the proposed action, the issuance of the right-of-way permit, would be to ensure installation of the proposed telecommunications tower and support structure in a manner that does not conflict with federal laws, NPS and park mission, purpose, policies and regulations, and current operations at the proposed location.

The proposed project would provide wireless communication and wireless internet coverage along a portion of the Generals Highway and along State Highway 180 in the vicinity of Grant Grove. The tower would also provide coverage to Grant Grove Village and Wilsonia in Kings Canyon National Park, and to some remote areas within the park and the surrounding Sequoia National Forest.

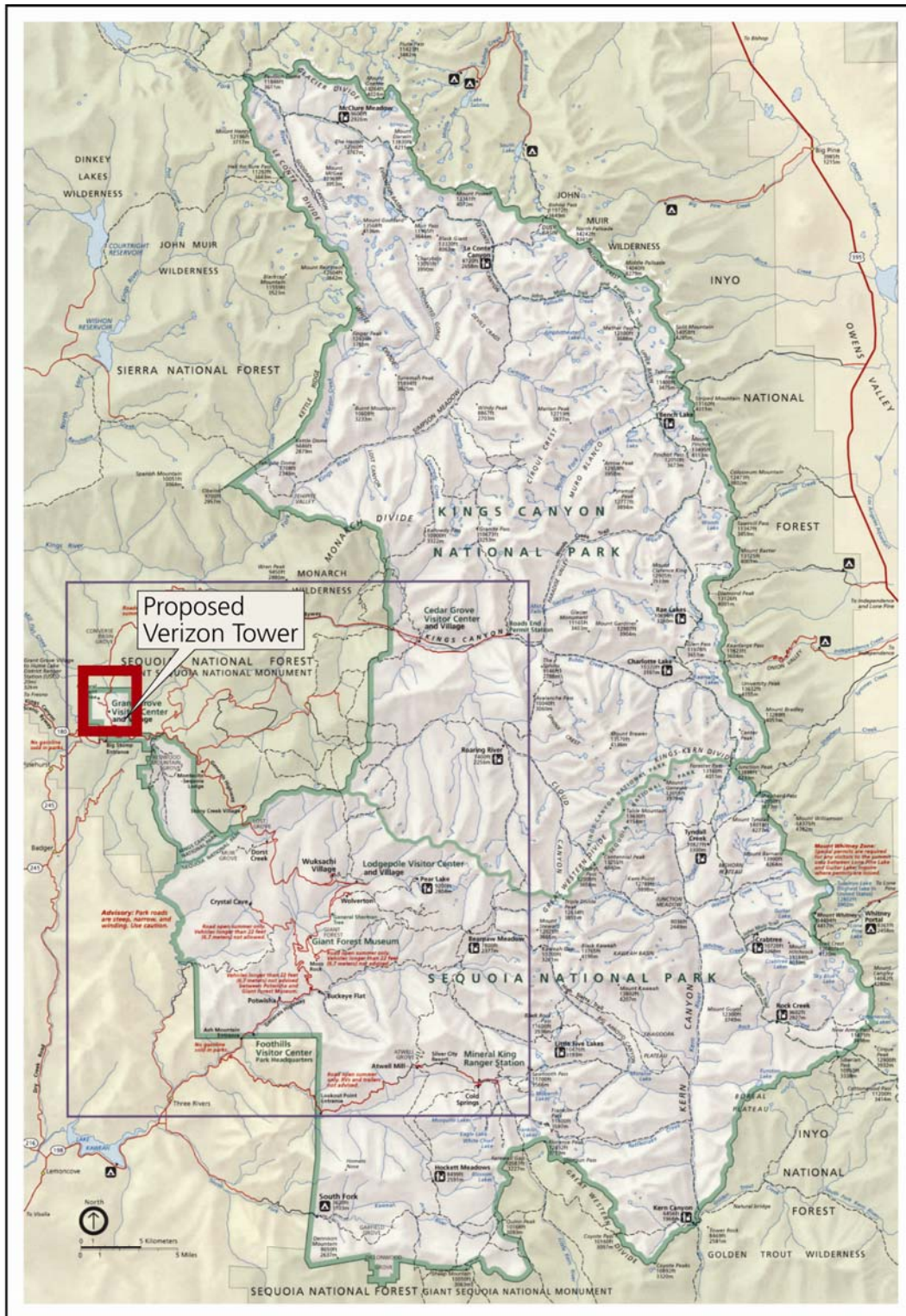


Figure 1: Project Location Map;
Construct Verizon Wireless
Telecommunication Facility

Sequoia and Kings
Canyon National Parks

National Park Service
U.S. Dept. of the Interior

DSC Dec. 2008 102/20155

NEED FOR THE ACTION

The need for the proposed action is to address the application by Verizon Wireless for a right-of-way permit, in compliance with the Telecommunications Act of 1996 and NPS Director's Order 53. A communications tower is needed to remedy a deficit in wireless telecommunications or wireless internet service along the Highway 180 corridor within the park, or along the Generals Highway, or elsewhere in the park and the surrounding national forest.

PARK PURPOSE, SIGNIFICANCE, AND MISSION

An essential part of the planning process is to understand the purpose, significance, and mission of the park for which this Environmental Assessment/Assessment of Effect (EA/AoE) is being prepared.

Park Purpose

Sequoia National Park was established as the nation's second national park on September 25, 1890, with the purpose of preserving the giant sequoias (*Sequoiadendron giganteum*). General Grant National Park was established a week later, also with the purpose of preserving the giant sequoias. Kings Canyon National Park was established by Congress in 1940 and includes the area that was General Grant National Park. The purposes of the parks are the reasons why Congress established the area as part of the national park system. The purpose statements are basic to all other assumptions about the parks and the ways in which the parks should be used and managed. As defined by park managers, the following are the purposes of Sequoia and Kings Canyon National Parks, which incorporate the mission statement:

- 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.

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 park 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 special and unique places 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 Sierran foothills ecosystem
- almost 200 known marble caverns, many inhabited by cave wildlife that is found nowhere else
- a wide spectrum of prehistoric and historic sites documenting human adaptations in their historic settings throughout the Sierran environments

Sequoia and Kings Canyon National Parks have been designated as an international biosphere reserve, a program under the United Nations Educational, Scientific, and Cultural Organization that recognizes resources with worldwide importance. While this designation does not grant any form of control or ownership to the international body, it underscores the exceptional and singular qualities of the parks.

Park Mission

Park purpose describes the specific reason the park was established. Park significance is 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 based on the mission of the NPS, as defined by Congress in the 1916 Organic Act: *to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.* The following mission statement for Sequoia and Kings Canyon National Parks may be found in the parks' final general management plan (NPS, 2006): *The mission of Sequoia and Kings Canyon 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.*

PROJECT BACKGROUND, PREVIOUS PLANNING, AND SCOPING

An Application for Transportation and Utility Systems and Facilities on Federal Lands was submitted in spring of 2007 by the Sacramento Valley Limited Partnership, d/b/a Verizon Wireless. The application requested a right-of-way for construction of an 80-foot-tall lattice tower and associated support structures and equipment on Park Ridge, and access to that site. The authorized agent acting for Verizon Wireless was identified in that application as Complete Wireless Consulting, Inc. In June 2007 Complete Wireless Consulting, Inc. contacted Sequoia and Kings Canyon National Parks by mail, requesting consideration of the Verizon Wireless application. Verizon Wireless and the park pursued investigation and consideration of potential sites for a wireless communications tower through September 2008. On October 29, 2008 employees of Verizon Wireless, Complete Wireless Consulting, and NPS met at Grant Grove Village in the park, to initiate the preparation of an environmental assessment to consider the potential impacts of constructing a tower and associated facilities on Park Ridge.

Previous Planning

Administratively, Sequoia and Kings Canyon National Parks are managed as one unit. According to their enabling legislations, both parks are managed as natural areas, with preservation of resources and wilderness character as their primary purposes. They operate under the direction of the General Management Plan (2006) (GMP), which acknowledges that communications facilities such as radio repeaters and microwave equipment are currently located in natural areas, as well as in lands classified as in high density recreation areas.

Scoping

To begin the planning process, staff of Sequoia and Kings Canyon National Parks and resource professionals of the NPS Denver Service Center (DSC), conducted internal scoping. Scoping included a site visit by the DSC, Park staff, and agents for Verizon Wireless in October 2008. The site visit initiated the processes for meeting the requirements of the National Environmental Policy Act of 1969 (NEPA) and Section 106 of the National Historic Preservation Act, (NHPA).

To fulfill the requirements identified in NEPA and Section 106, the NPS has additional guidance in Director's Order 12 (DO-12) that states each park unit will complete an Environmental Screening Form (ESF) when there is a federal undertaking at the park. The Director's Order requires that an interdisciplinary team of park resource professionals complete the ESF, provide mitigation measures for the undertaking, and make recommendations to the park superintendent. The ESF also identifies the appropriate NEPA pathway for analyzing resource impacts. In this case an EA was identified as the appropriate NEPA pathway. An AoE, which requires consultation with the California SHPO (CA SHPO), was identified as the appropriate pathway under Section 106.

A press release (Appendix A) initiating scoping and describing the proposed action was issued on December 17, 2008. The CA SHPO was sent a scoping letter on December 17, 2008, and American Indian groups traditionally associated with the parks were also sent scoping letters (Appendix B) on December 17, 2008. Comments were solicited until the scoping period ended in January 2009. Eight comments were received on the internet. Of those, four opposed the proposed construction of a communication tower on Park Ridge and three supported the proposal. One commenter indicated that there would be both benefits and disadvantages to constructing a communication tower on Park Ridge. In accordance with *Director's Order #53: Special Park Uses*, April 2000, a Federal Register Notice (v.74, n.61, pp.14819-20) was published in April 2009, advising of the proposed project and the availability of the environmental assessment. The public and appropriate federal and state agencies will also have an opportunity to review and comment on this EA/AoE.

ISSUES AND IMPACT TOPICS

Issues

Issues are problems or concerns that initiated the need for federal action or may result from the action itself. Issues and concerns affecting this plan were identified from past NPS planning efforts; in meetings with Park managers, interested citizens, and input from other state and federal agencies. The primary issues are:

- scenic values: the potential for impact to the expansive views, and varieties of visual experiences;

- natural resources: the proposed action with its associated construction activities could have various effects on natural resources, such as soil, wildlife, vegetation, and air quality;
- safety concerns: particularly with park staff and vendors who access Park Ridge; and
- visitor use and experience: the effects of expanded telecommunications capabilities

Derivation of Impact Topics

Specific impact topics were developed for discussion/analysis and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and Executive Orders; *NPS Management Policies 2006*; and NPS knowledge of limited or easily impacted resources. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Impact Topics Selected for Detailed Analysis

Vegetation

NEPA calls for an examination of the impacts on all components of affected ecosystems. NEPA requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid and minimize any possible adverse effects of their actions upon the environment. NPS 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 2006, page 51*).

The preferred alternative has potential for introducing non-native plant species transported by construction equipment and construction materials. Ground disturbance would occur on approximately 1,308 square feet of previously undisturbed land, creating favorable conditions for the spread of invasive non-native plants that are already in the parks. Best management practices are listed in the mitigation table and would be incorporated as part of the proposed project, reducing the level of impacts to native vegetation.

The undisturbed lands in the area proposed for construction of the Verizon Wireless communications tower are densely covered with native vegetation, predominantly manzanita and chinquapin. Because the preferred alternative would impact native vegetation on previously undisturbed land, the topic is discussed in detail in this EA/AoE.

Visitor Experience

Visitor experience would be affected by noise and other construction activities if a Verizon Wireless transmission tower were constructed atop Park Ridge. Vehicles associated with construction would travel park roads and pass through the Grant Grove area. Visitors on the Park Ridge Trail would be more directly affected by construction activities and by the sight of a new tower. The visitor experience would also be affected by the availability of cellular telephone services and wireless internet access if a communications tower were erected. Therefore, this topic is addressed in detail in the EA/AoE.

Scenic Resources

Visitors come to the parks primarily to experience the scenic beauty of the mountains, streams and rivers, giant sequoia trees, and other natural scenic resources. Park roads climb over 5,000 feet from chaparral and oak-studded foothills to the sequoia groves in mixed-conifer forest. Trails provide access to the foothills, forest, and the high-alpine wilderness. The scenic

resources experienced from the roads and trails include expansive views of the foothills, mountains, and deep canyons.

Scenic resources in the Grant Grove area would be affected by construction of a communications tower on Park Ridge. Therefore, this topic is addressed in detail in this EA/AoE.

Health and Safety

The NPS is concerned about the safety of visitors to its parks and will cooperate with proposals to enhance visitor safety as long as those proposals do not result in a derogation of NPS resources or conflict with the current or planned use of NPS property. The NPS *Management Policies 2006* state that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. The policies also state, “While recognizing that there are limitations on its capability to totally eliminate all hazards, the NPS and its concessionaires, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees” (sec. 8.2.5.1). Further, the NPS will strive to protect human life and provide for injury-free visits (sec. 8.2.5).

Reference Manual, Special Park Uses, Appendix 5, Exhibit 6, (RM-53), April 2000 sets forth the procedures applicable to permitting wireless telecommunication facility sites in units of the National Park System. The manual directs NPS to consider the safety of the visiting public as a factor when reviewing wireless telecommunication facility applications. Public safety, in this context, refers to telephonic access to emergency law enforcement and public safety services. Health and safety will be addressed in detail in this EA/AoE to assess the impacts of a new wireless communication tower.

Impact Topics Dismissed from Detailed Analysis

Special Status Species

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. Park staff have reviewed the most current list of Federally and State Listed Endangered and Threatened Animals and Plants of California from the online databases at: http://www.fws.gov/sacramento/es/spp_lists/species_list_instructions.htm, and <http://www.dfg.ca.gov/about/wildlife.html>, and have concluded that no Special Status Species animals would be impacted in the proposed project area. In the Park Ridge area there is no habitat suitable for the federal or state listed or candidate fish or amphibian species.

The California condor (*Gymnogyps californianus*) is a federally listed species that uses open ridges and has been observed in the area in the past. There are four records of sightings from Park Ridge from 1961 to 1971 (Werner, pers. comm. 2009). Currently condors do not occur in the area, but it is possible that they could return, as condor restoration efforts progress. Historically, condors have roosted on Blue Ridge, in the Sequoia National Forest south of Park Ridge. An unused fire lookout tower and radio towers are situated atop Blue Ridge.

A federal candidate species, the Pacific fisher (*Martes pennanti*) has been observed in the general area, but fishers are shy solitary animals, that typically avoid large open areas. The open ridge top area proposed for construction of the Verizon Wireless tower is intermittently visited by staff maintaining the existing structures there. The open disturbed area, with occasional human presence, currently provides only marginal habitat for fishers.

The California state species of concern include the black swift (*Cypseloides niger*), peregrine falcon (*Falco peregrinus anatum*), Swainson's hawk (*Buteo swainsonii*), great gray owl (*Strix nebulo*), and California spotted owl (*Strix occidentalis occidentalis*). The area does not provide suitable nesting habitat for the black swift or peregrine falcon, though they may occasionally fly over the area. Swainson's hawk is a rare visitor to the area. Great gray owls inhabit mature conifer forests adjacent to open wet meadows, and require areas with large trees and a dense covering canopy. The area proposed for the Verizon Wireless tower does not provide suitable habitat. California spotted owls also require mature forests with a closed canopy of mature trees. The area proposed for the tower does not provide suitable habitat.

Another state species of concern, the wolverine (*Gulo gulo*), could occur in the area. It likes open country, but it is rare and has such a large home range that activities on Park Ridge would not have an impact on the species viability. Reports of wolverines occasionally come from much more remote locations along the crest of the Sierra Nevada, but not near Park Ridge (Werner, pers. comm. 2009).

A plant survey of the proposed project area was completed by park staff in May 2008. No plants of Special Status Species were identified at that time. No impacts to Special Status Species are anticipated; therefore, this impact topic has been dismissed from further analysis in this EA/AoE.

Wetlands

Executive Order 11990 (*Protection of Wetlands*) requires an examination of impacts to wetlands, and the *NPS Management Policies 2006* and Director's Order 77-1 provide guidelines for proposed actions within wetlands. A jurisdictional wetland is an area that meets the criteria established by the US Army Corps of Engineers for Wetlands (as set forth in their Wetlands Delineation Manual). In addition, the NPS classifies wetlands based on the U.S. Fish and Wildlife Service (USFWS) Classification of Wetlands and Deepwater Habitats of the United States, commonly referred to as the Cowardin classification system (Cowardin et al. 1979). There are no jurisdictional or NPS-defined wetlands within the proposed project area; therefore, wetlands have been dismissed from further analysis in this EA/AoE.

Floodplains

Executive Order 11988, "Floodplain Management," requires an examination of impacts to floodplains and potential risk involved in placing facilities within floodplains. *NPS Management Policies 2006*, Director's Order #77-2, "Floodplain Management," and Director's Order #12, "Conservation Planning, Environmental Impact Analysis, and Decision-making," provide guidelines for proposals in floodplains. *NPS Management Policies 2006* provides direction for the preservation, use, and quality of water in national parks. There are no floodplains within the proposed project area; therefore, floodplains have been dismissed from further analysis in this EA/AoE.

Park Operations

All construction work related to a new transmission tower would be completed by Verizon Wireless employees and contractors. All service and maintenance work on a new transmission tower and associated facilities would be conducted by Verizon Wireless employees and contractors. Neither alternative considered in this EA/AoE would alter park operations; therefore, park operations have been dismissed from further analysis in this EA/AoE.

Soils/Geologic Resources

The area of excavation would be approximately 30 feet x 30 feet for the tower, and 12 feet x 30 feet for the shelter. The proposed project would impact approximately 1,308 square feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. The matting foundation would minimize removal of soil and rock. The exact removal quantities would be determined by a soils investigation, which has not yet been conducted. Concrete foundations would be placed for the tower and service building. The disturbance would require excavation of soil and rock. An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is anticipated that no additional excavation of the access road would be necessary for either construction activities or subsequent maintenance of the new telecommunications facility. Excavation of soil and rock would have a long-term, minor, adverse impact on soils and geologic resources. Because impacts would be no greater than minor, soils/geologic resources have been dismissed from further analysis in this EA/AoE.

Wildlife

With the preferred alternative, increased noise from equipment and increased human activities during construction of a wireless transmission tower and its associated facilities would cause short-term, minor, adverse impacts to wildlife species; however, those impacts would be temporary, and wildlife use in the immediate area would resume after construction was complete. If night work was conducted and adverse impacts to species were observed because of that work, construction activities would be restricted to daylight hours.

Mitigation measures, including education of construction workers to prevent feeding of wildlife and to properly store food in bear-proof containers would be implemented, as is currently enforced with park visitors. With those mitigations, the preferred alternative would be expected to have short-term and long-term, minor, adverse impacts on wildlife.

If a wireless transmission tower were erected, maintenance personnel would visit the site at regular intervals, but visits would be brief, and disturbance to wildlife would be short-term and negligible. Night-time visits by maintenance staff would not be conducted, except in cases of extreme urgency. Wildlife would acclimate to the new sounds and maintenance schedules over time.

During construction, some wildlife, particularly small mammals, would be temporarily displaced or killed. Larger animals, such as deer, would likely avoid the site during construction. Construction of a wireless transmission tower and its associated facilities would require the permanent removal of approximately 1,308 square feet of wildlife habitat. That habitat consists primarily of mixed dominance manzanita and chinquapin shrublands, a typical and widespread plant assemblage of the upper mixed-conifer zone. Loss of the habitat would not be expected to threaten the continued existence of any species in the parks. The impact of that loss would be long-term, minor, and adverse. There would be no impacts from the no action alternative. Neither alternative considered in this EA/AoE would have impacts on wildlife that would be greater than minor. Because the overall impacts to wildlife would be no greater than minor, wildlife has been dismissed from further analysis in this EA/AoE.

Air Quality

The 1977 amendment to the Clean Air Act, (42 U.S.C. 7401 *et seq.*), requires federal land managers to protect park air quality, while the *NPS Management Policies 2006* address the need to analyze air quality during park planning. Sequoia and Kings Canyon National Parks were designated Class I under the 1963 Clean Air Act, as amended. A Class I area is subject to the most stringent

regulations of any designation. Class I areas must not exceed the maximum allowable increment over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the 1963 Clean Air Act. Further, the 1963 Clean Air Act provides that the federal land manager (the Assistant Secretary for Fish and Wildlife and Parks and the Park Superintendent) have 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. Section 118 of the 1963 Clean Air Act requires the parks to meet all federal, state, and local air pollution standards.

Park Ridge, the proposed site for construction of a wireless transmission tower, falls within the San Joaquin Valley Air Pollution Control District (Ratliff, et al. 2005). During the parks' GMP process in 2006 the air district was extreme non-attainment for ozone (1 hour) and serious non-attainment for particulate matter (PM₁₀). This air district is susceptible to air pollution given its climate, topography, and human activities. Since then, the EPA has redesignated the San Joaquin Valley to attainment of the PM₁₀ standard (San Joaquin Valley Air Pollution Control District [SJVAPCD] 2008). Even though the ozone (1 hour) standard was revoked on June 15, 2005, the Valley has experienced an overall improvement in 1-hour ozone since 1997. Seventeen out of the 21 of the Valley's air monitoring sites, including the monitoring site located in Sequoia and Kings Canyon National Parks, are in attainment of the 1-hour ozone National Ambient Air Quality Standards (NAAQS) (SJVAPCD 2008).

Area (non-point) sources are the major contributor of air pollutants in the district. Area sources include cars, trucks, farm equipment, and other agricultural activities. Most of the air pollution found in the parks originates outside park boundaries. However, emissions from construction equipment would produce particulate matter (PM), nitrogen oxides (NO_x), and hydrocarbons, precursors to the formation of ozone.

During construction the contractor would be required to implement dust control mitigation procedures to reduce the particulate matter. Additional mitigation measures that would be implemented include allowing construction vehicles to idle up to but not exceeding 5 minutes when parked.

According to the website <http://airnow.gov>, a cross-agency federal government website developed to provide the public with easy access to national air quality information, from May to October 2008 ozone levels (8-hour Air Quality Index [AQI]) in Sequoia and Kings Canyon National Parks, did not exceed a 1-50 AQI (Good) rating, with the exception of July when the ozone levels rose to 51-100 (Moderate). The PM_{2.5} levels (24-hour AQI), which measure fine particles 2.5 micrometers in size or less, did not exceed a 1-50 AQI (Good) rating with the exception of July, September, and October when the PM_{2.5} levels rose to 51-100 (Moderate). An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level the U.S. Environmental Protection Agency (USEPA) has set to protect public health.

Overall, there would be a slight short-term degradation of local air quality due to dust generated from construction activities and emissions from construction equipment, resulting in negligible adverse impacts. Those effects would last only as long as construction activities occurred. The impact on the parks' Class I air quality would be negligible. Based on the AQI from 2008, the slight increase in particulate matter and emissions from this project would not be likely to exceed NAAQS for either of the pollutants of concern, ozone or PM_{2.5}. There would be no long-term, adverse impacts to air quality from implementing either the no action or the preferred

alternative. Therefore, the impact topic of air quality was dismissed from further analysis in this EA/AoE.

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, and to enhance the quality of water resources and prevent, control, and abate water pollution. The NPS Management Policies 2006 provide direction for the preservation, use, and quality of water originating, flowing through, or adjacent to park boundaries. The NPS seeks to restore, maintain, and enhance the quality of all surface and ground waters within the parks consistent with the Federal Water Pollution Control Act (1972), as amended, and other applicable federal, state, and local laws and regulations. Park Ridge is in the Marble Fork Kaweah and the North Fork Kaweah watersheds.

The proposed project would require excavation and cut and fill actions, therefore, silt screens or other methods of erosion and sedimentation control would be implemented to reduce potential impacts to water quality. Surface restoration and revegetation of disturbed land would reduce soil erosion and minimize the potential for long term impacts. No water would be removed from any drainage for this proposed project. Water would not be diverted from surface waters. With the mitigation measures that would be implemented, there would be little potential for adverse impacts to the watersheds and water quality. Because mitigation measures described above would reduce the level of impact to negligible, water quality was dismissed from further analysis in this EA/AoE.

Soundscapes

In accordance with *NPS Management Policies 2006* and Director's Order – 47: *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable vary among NPS units, and potentially throughout each park unit. Construction activities would be relatively isolated atop Park Ridge, and noise associated with construction would be short-term, minor, and adverse. Therefore, soundscapes were dismissed from further analysis in this EA/AoE.

Night Sky

Sequoia and Kings Canyon National Parks offer opportunities to experience the night sky free from artificial light, one of a number of dwindling places where this is possible. The GMP (2006) states, "Efforts should be undertaken to ensure that light pollution from inside the parks does not erode this value."

The experience of the night sky would not be affected by construction of an 80 -foot-tall tower atop Park Ridge. There are no lights on the towers currently in place on Park Ridge, and lights would not be required on an 80-foot-tall tower if it were constructed there. A Determination of No Hazard to Air Navigation was issued by the Federal Aviation Administration (FAA) on April 10, 2009 , and advised that "...marking and lighting are not necessary for aviation safety." The FAA Determination is included in this document as Appendix C. Because there would be

no impacts on the appearance and experience of the night sky, that topic was dismissed from further analysis in this EA/AoE.

Prime and Unique Farmland

In 1980 the Council on Environmental Quality (CEQ) directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the United States Department of Agriculture, Natural Resources Conservation Service. Prime or unique farmland is defined as soil which produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. As identified by park staff, there are no prime or unique farmlands associated with the proposed project area; therefore, this topic was dismissed from further analysis in this EA/AoE.

Environmental Justice

Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 1994), requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative under consideration would have disproportionate impacts on the health or environment of minority or low-income populations or communities as defined in the Environmental Protection Agency's *Draft Environmental Justice Implementation Plan* (1996). The alternatives would affect all populations equally. Environmental justice was, therefore, dismissed from further analysis in this EA/AoE.

Wilderness

In accordance with *NPS Management Policies 2006*, in evaluating environmental impacts, the National Park Service will take into account (1) wilderness characteristics and values, including the primeval character and influence of the wilderness; (2) the preservation of natural conditions (including the lack of man-made noise); and (3) assurances that there will be outstanding opportunities for solitude, that the public will be provided with a primitive and unconfined type of recreational experience, and that wilderness will be preserved and used in an unimpaired condition. Interagency cooperation and coordination will facilitate efforts for establishing agency and interagency consistency in wilderness management techniques.

On September 28, 1984, the Sequoia – Kings Canyon Wilderness was established as federally designated wilderness, encompassing approximately 723,000 acres, or about 83.5% of the parks. Through Congressional action, additional lands within the parks have been designated as wilderness, for a total of 807,962 acres currently designated as wilderness, or about 93.3% of the parks. Other lands within the parks are also managed as wilderness, although they are not officially designated as such. In total, 837,962 acres, or 96.8% of the lands within the parks are managed as wilderness.

The wilderness acreage within the parks, when combined with the adjacent wildernesses in the neighboring Inyo, Sequoia, and Sierra National Forests are the second largest continuous wilderness in the lower 48 states totaling nearly 2,240,000 acres. The parks and national forests have continued to manage these areas to preserve wilderness characteristics per regulation and policy.

The proposed project area is not within a wilderness area. Visitors in some wilderness areas in the parks would be able to see Park Ridge, but it would be difficult to discern an 80-foot-tall tower there. U.S. Forest Service managers in the adjacent national forests have advised that an 80-foot-tall tower on Park Ridge would not be visible from wilderness areas. Although it

would be visible from Giant Sequoia National Monument, it would not be readily visible from areas that are frequently visited. The impact would be minor, because any change in the wilderness character and associated values would be small and highly localized; therefore, wilderness was dismissed from further analysis in this EA/AoE.

Socioeconomic/Gateway Communities

The community of Visalia has partnered with the parks and developed a shuttle system that brings park visitors staying in the valley up to the parks through the Ash Mountain Entrance where the shuttle users are transferred to an internal NPS shuttle system at Giant Forest. The majority of seasonal employment for projects, especially construction related projects in the parks also comes from the surrounding communities and the San Joaquin or Central Valley. The duration of construction activity for the preferred alternative is no more than two months. A parcel of private land near Hume Lake that was considered but dismissed as a possible tower location would remain available for private development. Neither the no action nor the preferred alternative would have an impact greater than negligible on the local or regional employment levels or economy or the Visalia shuttle system. Any construction employment would be short term and beneficial during the construction period. Since the socioeconomic/gateway community impact is tied directly to employment and visitors spending time and money in these communities and the overall impacts are negligible or less, socioeconomic/gateway communities were dismissed from further analysis in this EA/AoE.

Archeological Resources

Archeological surveys of the Park Ridge site have been conducted in recent years by park staff in association with other park activities and studies, such as investigations prior to prescribed burns. No archeological resources have been identified in the area. As a precaution, park staff would monitor ground disturbing activities during construction activities. In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3002) of 1990 would be followed. Because there would be no known impacts to archeological resources, this impact topic has been dismissed from further analysis in this EA/AoE.

Historic structures

Surveys of the Park Ridge site have been conducted in recent years by park staff in association with other park activities and studies, such as investigations prior to prescribed burns. No historic structures have been identified in the area. Because there would be no impact to historic structures, this impact topic has been dismissed from further analysis in this EA/AoE.

Ethnographic Resources

Ethnographic resources are defined by the NPS as any “site, subsistence, or other significance in the cultural system of a group traditionally associated with it” (Director’s Order – 28). There are ten affiliated American Indian tribes traditionally associated with Sequoia and Kings Canyon National Parks. The tribal contacts were sent an informational letter on December 16, 2008, describing the proposed project, requesting comments. There were no comments received from the tribes consulted. Each tribe will also receive copies of this EA/AoE for their review and comment. If subsequent issues or concerns are identified, appropriate consultations would be undertaken. According to NPS professional staff and the GMP there are no known ethnographic landscapes or resources within the parks eligible or listed in the National Register of Historic Places (NRHP). Consequently, no adverse impacts are anticipated and appropriate steps would be taken to protect any human remains, funerary

objects, sacred objects, or objects of cultural patrimony inadvertently discovered during project construction. Therefore, ethnographic resources were dismissed from further analysis in this EA/AoE.

Museum Objects

Museum collections include historic artifacts, natural specimens, and archival and manuscript material. They may be threatened by fire, vandalism, natural disasters, and careless acts. The preservation of museum collections is an ongoing process of preventative conservation, supplemented by conservation treatment when necessary. The primary goal is preservation of artifacts in as stable condition as possible to prevent damage and minimize deterioration. Professional staff at the parks have indicated that the proposed activities on Park Ridge would not require additional curatorial services or increase the number of museum objects at the parks; therefore, museum objects were dismissed from further analysis in this EA/AoE.

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 at 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 from further analysis in this EA/AoE.

Cultural Landscapes

According to the NPS's Cultural Resource Management Guideline (Director's Order – 28), 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 by both physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values. Park cultural resources staff have advised that Park Ridge and the area that would be impacted by construction of a Verizon Wireless communications tower have not been identified as a cultural landscape, or as contributing features to a cultural landscape. Therefore, cultural landscapes were dismissed from further analysis in this EA/AoE.

ALTERNATIVES

The alternatives section describes two alternatives for the proposal to construct a new wireless telecommunications tower on Park Ridge in Kings Canyon National Park, a no-action alternative and the preferred alternative.

The no action alternative consists of the continuation of current management practices. 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, a new telecommunications tower would not be installed on Park Ridge and wireless telecommunications in the park and surrounding areas would remain unchanged.

The preferred alternative is the proposed action, and defines the rationale for the action in terms of facilities management, resource protection and management, visitor experience and park operations, costs, and other applicable factors.

Additional alternatives considered and dismissed from detailed analysis are also discussed in this section. Table 1, found at the end of this section, presents impacts of each alternative for comparative purposes along with a concise summary of each alternative's potential environmental effects. Table 2, an alternatives comparison table, compares and contrasts each alternative, including the degree to which each alternative accomplishes the purpose and fulfills the needs identified in the Purpose and Need section.

ALTERNATIVE 1: NO ACTION ALTERNATIVE

The no action alternative would be the continuation of existing conditions for Park Ridge and for wireless communications services in the park and surrounding areas. The NPS would not issue a right-of-way permit to Verizon Wireless to construct a wireless telecommunications tower and associated facilities.

The existing Very High Frequency (VHF) park radio system would continue to provide wireless communication for park staff throughout Sequoia and Kings Canyon National Parks. Reliable telephone service throughout the parks would be limited to existing telephone lines. Cellular telephone service within the parks would not be expanded to cover Grant Grove, and sections of Highway 180 in the vicinity of the parks would remain without service.

ALTERNATIVE 2: PREFERRED ALTERNATIVE

The NPS would issue a right-of-way permit to Verizon Wireless for the construction of a wireless telecommunications tower and support structures atop Park Ridge within Kings Canyon National Park. Verizon Wireless would construct, operate, and maintain a wireless communications facility on Park Ridge at an elevation of approximately 7,540 feet above sea level. The purpose of the unmanned facility would provide year-round service to the area, 24 hours per day, except during brief maintenance intervals. The tower would provide comprehensive wireless communications and wireless internet coverage along a portion of the Generals Highway and along State Highway 180 in the vicinity of Grant Grove. The tower would also provide coverage to Grant Grove Village and Wilsonia in Kings Canyon National Park, and to some remote areas within the parks and surrounding Sequoia National Forest. Reception could be affected in some incidental locations by dense forest growth, buildings, or other structures and features that might obstruct the broadcast signal.

Facility equipment would include an 80-foot-tall monopole tower with panel antennas and microwave dishes. It is anticipated that a tower height of 80 feet would be sufficient to position the antennas above the foliage of the trees surrounding the proposed tower site. The tower would be painted in a manner designed to make it as unobtrusive as is reasonably possible. There would be no lights on the tower.

Ground radio equipment and associated air conditioning units would be stored in a prefabricated shelter approximately 12 feet x 20 feet in size. An emergency backup generator, powered by propane fuel, would be situated next to the shelter. The combined length of the shelter and an enclosure for the generator would be approximately 34 feet. A propane tank of around 500 gallons would also be installed on site to operate the generator. The generator would be operated for approximately 30 minutes per week for maintenance purposes, and during power outages and disasters.

Power to the facility would be upgraded to accommodate Verizon wireless 200-amp single phase power requirements by replacing an existing electric transformer with an appropriately designed transformer. The appearance of the replacement transformer would be similar or identical to the existing one. Power lines from the existing power pole to the prefabricated equipment shelter would be buried. An ice bridge would be installed for utility connections (coaxial cable from the antennae to the shelter).

The area of excavation would be approximately 30 feet x 30 feet for the tower, and 12 feet x 34 feet for the shelter and generator enclosure. The proposed project would impact approximately 1,308 square feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. Concrete foundations would be placed for the tower and service building. The disturbance would remove manzanita and chinquapin shrubs.

It is estimated that construction would take approximately two months. Crew size would range from approximately 2 to 10 individuals. Construction of the proposed project would require the use of a backhoe, crane, and concrete pump.

An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is anticipated that no additional excavation of the access road would be necessary for either construction activities or subsequent maintenance of the new telecommunications facility.

Figures 2, 3, and 4 depict the location of the proposed communications tower and site conditions at that location on Park Ridge. The design of the proposed tower and facilities is depicted in figure 5. Figure 6 depicts the existing service area for Verizon Wireless. Figure 7 depicts the areas that would be served by a new Verizon Wireless tower on Park Ridge. Design drawings depicting the location and layout of the proposed tower and facilities are included with this document as Appendix D.

Staging Area

A staging area of approximately 10 feet by 10 feet would be established in coordination with the park. All materials and equipment would be used and stored solely within the tower construction area and the established staging area during construction of the tower. The staging area would not be used for materials or equipment storage after construction was complete.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with DO-12, the NPS is required to identify the “environmentally preferred alternative” in all environmental documents, including EAs. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that “[t]he environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of NEPA, which considers:

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

The no action alternative is not the environmentally preferred alternative, because it would not provide visitors, employees, travelers and residents in surrounding areas with cellular telephone and wireless internet accessibility, thereby increasing their safety and sense of personal security, and improving their recreational experience (criteria 2, 3, and 5 are not met as well as under the preferred alternative)

The environmentally preferred alternative in this EA/AoE is the preferred alternative, because it protects public and employee health, safety, and welfare by providing reliable wireless communications services for park visitors and employees, public health and safety officers, emergency response teams, and residents and travelers in the surrounding area (criteria 2, 3, and 5).

ALTERNATIVES CONSIDERED BUT DISMISSED

Other alternatives and options were considered during the planning stages and scope development for this project. Alternatives considered, but dismissed, and the reasoning for their dismissal, are discussed here.

The alternative of locating a Verizon Wireless facility on a parcel of private land outside of the parks’ boundaries, along the Highway 180 corridor near Sequoia Lake, was considered. That property is situated approximately 1,500 feet lower than Park Ridge and is too far west of the required transmission area, and would not provide a suitable transmission range. Because it would not adequately fulfill the purpose and meet the needs of the proposed action, this alternative was dismissed from further consideration in this EA/AoE.

A parcel of private land near Hume Lake was considered as an alternative. That property is situated approximately 1,250 feet lower than Park Ridge and is too far east of the required transmission area, and would not provide a suitable transmission range. Because it would not adequately fulfill the purpose and meet the needs of the proposed action, this alternative was dismissed from further consideration in this EA/AoE. \

A site atop Big Baldy Ridge at an elevation of approximately 8,200 feet was considered as an alternative. Big Baldy is approximately 5 miles southeast of Grant Grove. Verizon Wireless advised that transmissions from the Big Baldy site would not cover Grant Grove Village and other areas in its vicinity. Because it would not adequately fulfill the purpose and meet the needs of the proposed action, this alternative was dismissed from further consideration in this EA/AoE.

The possibility of co-locating a transmission tower on an existing water tank was considered as an alternative. The existing water tank is located approximately 1.25 miles to the northwest of the proposed facility, approximately 0.5 mile west of the Grant Grove Visitor Center. That location is approximately 500 feet lower than Park Ridge, and would provide roughly one third of the coverage. That would not provide a suitable transmission range. Because it would not adequately fulfill the purpose and meet the needs of the proposed action, this alternative was dismissed from further consideration in this EA/AoE.

The alternative of situating a Verizon Wireless transmission tower on another location atop Park Ridge was considered. That location is west of the site of the preferred alternative and of the existing structures there. Access to that location would require building a 50 foot-long access road across previously undisturbed land. Removal of a number of trees from the site would also be necessary, and the terrain of that location would require more excavation of soil and rock than at the site of the preferred alternative. Because of its greater adverse impacts to park resources, that alternative was dismissed from further consideration.

The alternative of constructing a 60-foot or a 70-foot-tall Verizon Wireless tower instead of an 80-foot-tall tower was considered. Verizon Wireless has advised that transmissions to and from a tower of either of those heights would be obstructed by surrounding trees. The proposed Verizon Wireless communications tower would operate with transmission signals between 806 and 960 megahertz, transmission frequencies which are susceptible to interference and must have antennas set above the foliage to be effective.

As the frequency of AM/FM radio and cellular signals increases, signal attenuation increases. The higher the frequency, the more the signal is affected by vegetation. While AM radio signals are sent at 535 kilohertz to 1.7 megahertz, and FM radios transmit signals at 88 megahertz to 108 megahertz, Verizon Wireless cellular signals operate between 750 megahertz and 1950 megahertz, depending on the area license. Those higher frequencies are much more susceptible to interference than the AM/FM radio signals and must set above the foliage to be effective. Telecommunications staff at the park have confirmed that transmission signals in a frequency range between 806 and 960 megahertz would be obstructed by foliage, with a reduction in signal strength.

Removing trees to accommodate a 60 or 70-foot tower, combined with the same disturbances that would occur with construction of a taller tower, would increase the adverse impacts on wildlife habitat and native vegetation. Tree removal would also adversely impact scenic resources by eliminating trees that help screen existing structures on Park Ridge from view.

Because of its greater adverse impacts to park resources, that alternative was dismissed from further consideration.

The alternative of constructing a 100 foot-tall or a 120 foot-tall Verizon Wireless tower instead of an 80-foot-tall tower was considered. Verizon Wireless advised that the additional areas that would be covered by a 100 foot or 120 foot-tall tower would be primarily remote back-country territory seldom visited by wireless communication users. The increased visibility of a taller tower would have a greater adverse impact on the parks' scenic resources. The increased service area provided by a 100 foot or 120 foot-tall tower would benefit few wireless communications users, while creating a greater adverse impact on park resources. Because of its greater adverse impacts to park resources, that alternative was dismissed from further consideration.

Table1. Impacts of Each Alternative

Potential Environmental Impacts		
Impact Topic	Alternative 1, No Action	Alternative 2, Preferred Alternative
Vegetation	Alternative 1 would have no impact on vegetation. There would be no cumulative impacts. There would be no impairment of the parks' resources or values or unacceptable impacts to park resources or values.	Alternative 2 would have a long-term, minor, adverse impact on vegetation. Cumulative impacts would be long-term, moderate, and adverse. There would be no impairment of the parks' resources or values or unacceptable impacts on the parks' resources or values.
Visitor Experience	Alternative 1 would have no impact on visitor experience. There would be no cumulative impacts on visitor experience.	Alternative 2, the preferred alternative, would have short and long-term, negligible, adverse impacts, long-term, minor, adverse impacts, and long-term beneficial impacts on visitor experience. The cumulative impacts of alternative 2 would be short-term and long-term, minor, adverse, and long-term beneficial.
Scenic Resources	Alternative 1 would have no impact on scenic resources, and there would be no cumulative impact. Alternative 1 would not impair park resources and values or have unacceptable impacts on park resources and values.	Alternative 2 would have short-term and long-term, minor, adverse impacts on scenic resources. Cumulative impacts would be short-term and long-term, moderate, and adverse. Alternative 2 would not impair park resources and values or have unacceptable impacts on park resources and values.
Health and Safety	Alternative 1 would have no impact on health and safety, and there would be no cumulative impacts.	Alternative 2 would have long-term, negligible, adverse impacts, short-term, minor, adverse impacts, and long-term beneficial impacts on health and safety. Cumulative impacts would be long-term, negligible, adverse, short-term, minor, adverse, and long-term beneficial.

Table2. Comparative Summary of No action and Preferred Alternatives

Summary of No Action Alternative	Summary of Preferred Alternative
The no action alternative would be the continuation of existing conditions for Park Ridge and for wireless	The unmanned facility would provide year-round service to the area, 24 hours per day, except during

Summary of No Action Alternative	Summary of Preferred Alternative
<p>communications services in the park and surrounding areas. The NPS would not issue a right-of-way permit to Verizon Wireless to construct a wireless telecommunications tower and associated facilities. The existing park radio system would provide wireless radio communication for park staff throughout Sequoia and Kings Canyon National Parks. Reliable telephone service throughout the parks would be limited to existing land based telephone lines. There would be no cellular telephone service within the parks.</p> <p><u>Meets project objectives?</u></p> <p>No. Without the issuance of a right-of-way permit, Verizon Wireless would not provide cellular telephone service and wireless internet service within the park and the surrounding areas. There would be no remedy for the existing deficit in wireless telecommunications along the Highway 180 corridor, within the parks, along the Generals Highway, or elsewhere in the parks and the surrounding national forest.</p>	<p>brief maintenance intervals. The tower would provide comprehensive wireless communications and wireless internet coverage along a portion of the Generals Highway and along State Highway 180 in the vicinity of Grant Grove. The tower would also provide coverage to Grant Grove Village and Wilsonia in Kings Canyon National Park, and to some remote areas within the parks and surrounding Sequoia National Forest. Reception could be affected in some incidental locations by dense forest growth, buildings, or other structures and features that might obstruct the broadcast signal.</p> <p>Facility equipment would include an 80-foot-tall monopole tower with panel antennas and microwave dishes. Ground radio equipment and associated air conditioning units would be stored in a prefabricated shelter. An emergency backup generator, powered by propane fuel, would be located in an enclosure next to the shelter. Power to the facility would be upgraded to accommodate Verizon wireless 200-amp single phase power requirements. The power upgrade would require replacing an existing electric transformer with an appropriately designed transformer.</p> <p>The proposed project would impact approximately 1,308 square feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. The disturbance would remove manzanita and chinquapin shrubs. A staging area of approximately 10 feet by 10 feet would be established in coordination with the park. All materials and equipment would be used and stored solely within the tower construction area and the established staging area during construction of the tower. The staging area would not be used for materials or equipment storage after construction was complete. An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is estimated that construction would take approximately two months.</p> <p><u>Meets project objectives?</u></p> <p>Yes. Issuance of a right-of-way permit to Verizon Wireless would ensure the installation of a telecommunications tower and support facilities in a manner that does not conflict with federal laws, NPS and park mission, purpose, policies, and regulations, and current operations at the proposed location. It would meet the need for wireless telecommunications along the Highway 180 corridor, within the parks, along the Generals Highway, or elsewhere in the parks and the surrounding national forest.</p>



Figure 2; Position of proposed communications tower on Park Ridge. Red line is access road to the site. Blue square is proposed tower location.



Figure 3; View from the proposed Verizon Wireless communications tower site toward existing facilities on Park Ridge



Figure 4; View from existing facilities on Park Ridge toward the proposed Verizon Wireless communications tower site

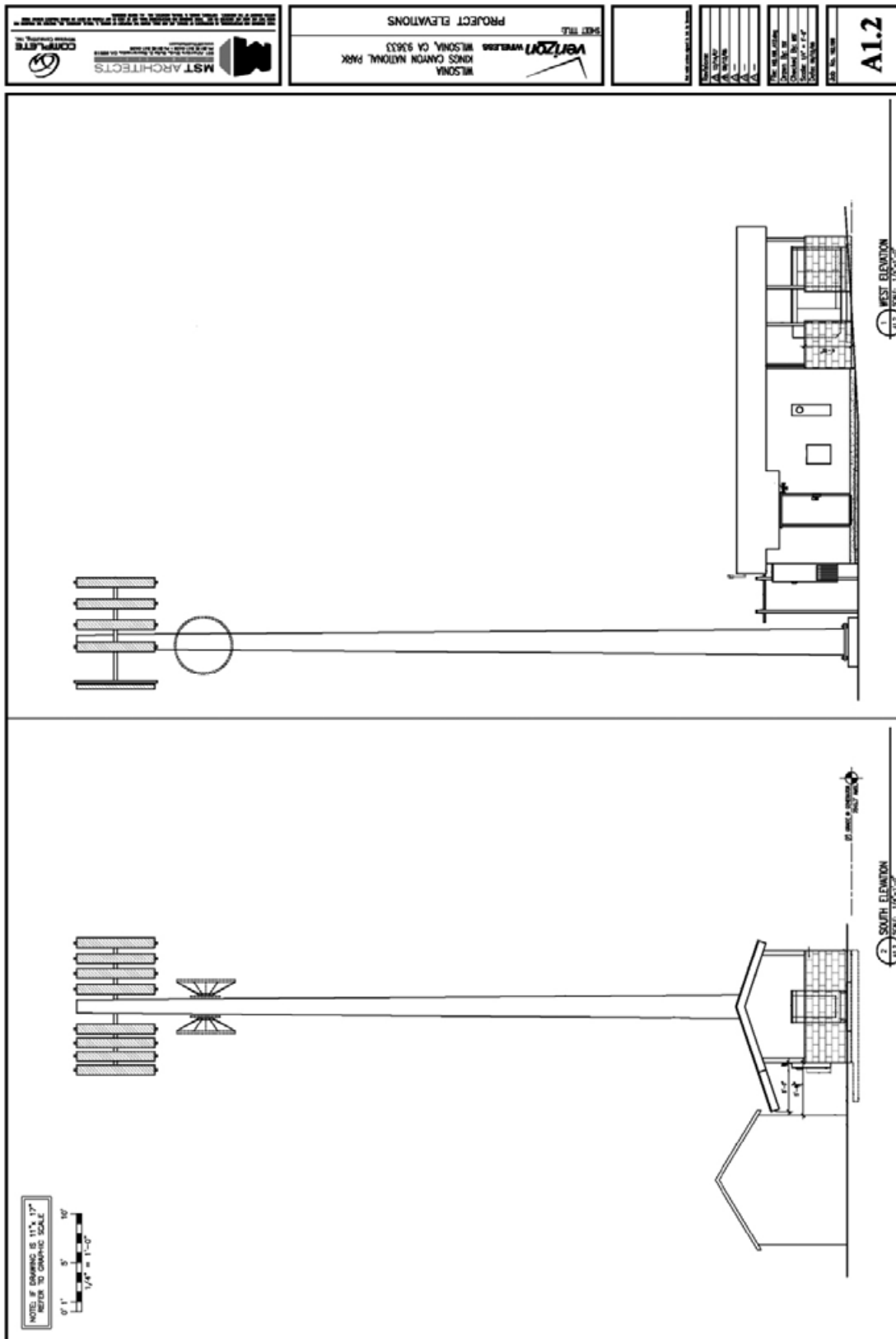


Figure 5; Views of the proposed transmission tower and associated facilities

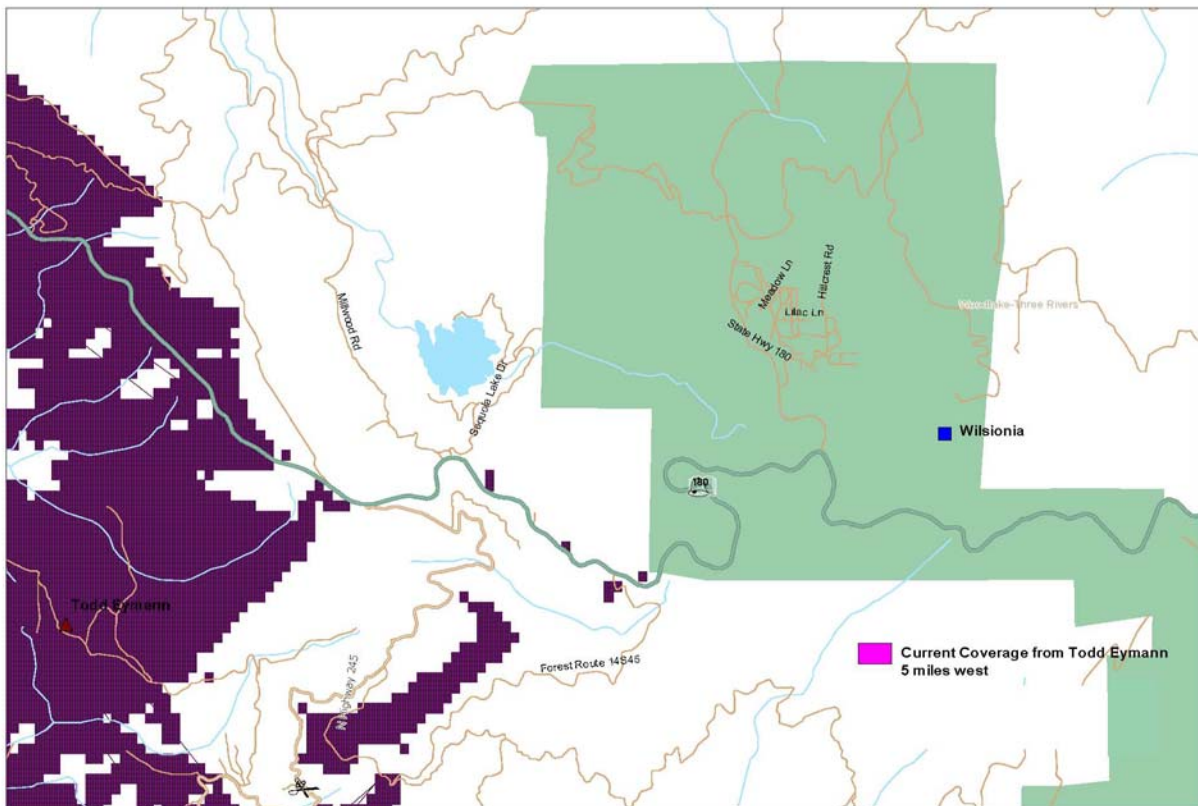


Figure 6; The purple coloring depicts areas currently served by Verizon Wireless.

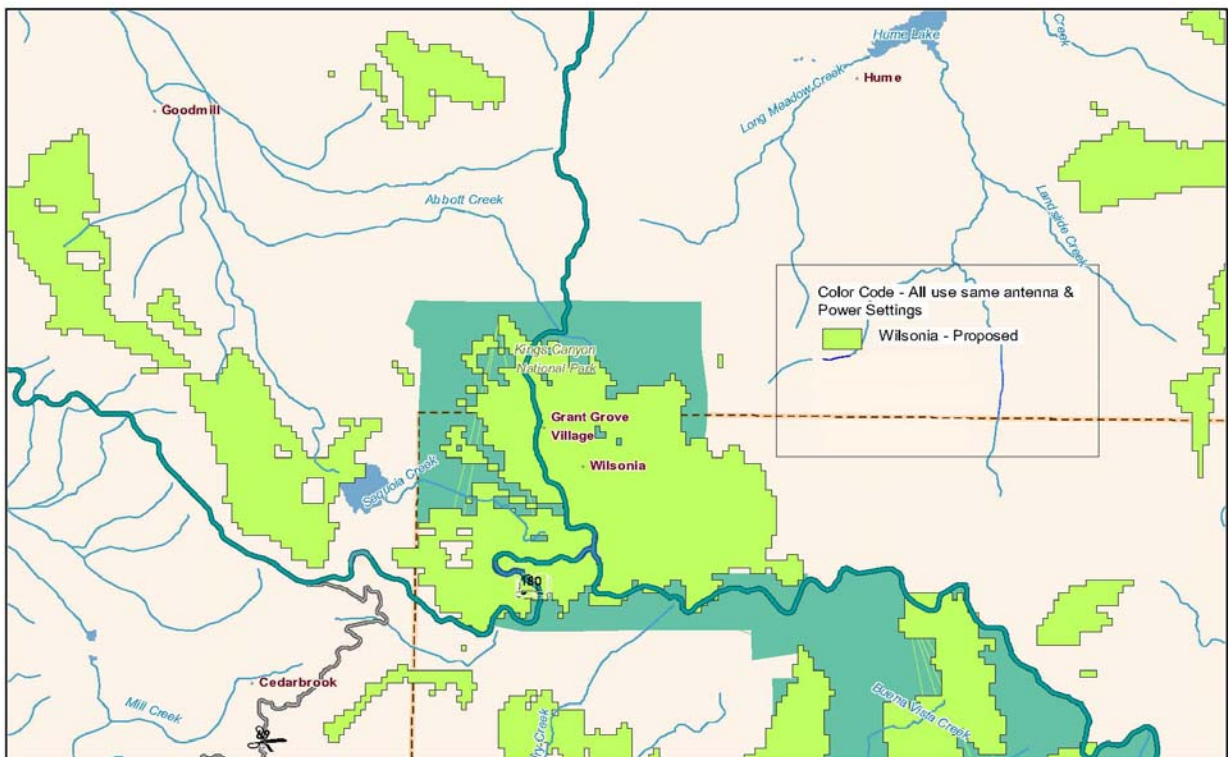


Figure 7; The light green coloring depicts areas that would be served by an 80-foot-tall Verizon Wireless tower atop Park Ridge.

MITIGATION MEASURES

Mitigation measures are presented as part of the preferred alternative. These actions have been developed to lessen the adverse effects of the action alternative.

General Measures

- The NPS project manager is responsible for ensuring that the project remains within the construction limits and parameters established in the compliance documents and that mitigation measures are properly implemented.
- Construction zones outside of the existing disturbed area would be identified and fenced with construction tape or some similar material prior to any construction activity. The fencing would define the construction limits and confine activity to the minimum area required for construction.
- All protection measures would be clearly stated in the construction specifications/special construction requirements, and workers would be instructed to avoid conducting activities beyond the construction limits as defined by the construction fencing or similar material. This could include necessary temporary structures such as erosion control fencing.
- All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from NPS property upon project completion. Any road and off-road surfaces damaged due to work on the project would be repaired to original condition as much as is feasible. All demolition debris would be removed from the project site, including all visible concrete and metal pieces.
- Contractors would be required to properly maintain construction equipment (i.e., mufflers) to minimize noise from use of the equipment.
- A hazardous spill plan would be in place, stating what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials, etc.
- All equipment on the project would be maintained in a clean and well-functioning state to avoid or minimize contamination from automotive fluids. All equipment would be checked daily.
- Best management practices for drainage and sediment control, as identified in the contractor's Stormwater Pollution Prevention Plan, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. Use of Best Management Practices in the project area for drainage area protection would include all or some of the following actions, depending on site-specific requirements:
 - keeping disturbed areas as small as practical to minimize exposed soil and the potential for erosion;
 - locating waste and excess excavated materials outside of drainages to avoid sedimentation;
 - installing silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing

erosion-control measures around the perimeter of stockpiled fill material) prior to construction;

- conducting regular site inspections during the construction period to ensure that erosion-control measures were properly installed and are functioning effectively; and
- storing, using, and disposing of chemicals, fuels, and other toxic materials in a proper manner

Vegetation

- Before construction would begin, a qualified plant ecologist would survey the project site to look for non-native species of concern which could be in the area. If any of these species were found, mitigation measures to reduce or eliminate impacts by these plants would be implemented under direction of the parks' restoration and alien plant ecologist.
- Approved staging areas would be surveyed for invasive non-native plants.
- A revegetation plan approved by NPS would be developed for disturbances outside of the footprint of the tower and its facilities.
- Ground surface treatment would include grading to natural contours if necessary, replacing topsoil, and, where necessary, seeding, and planting.
- Reclaimed areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary, as outlined in the revegetation plan developed by the NPS.
- Remedial actions would include installation of erosion-control structures, reseeding, topsoil placement, and/or replanting the area, and controlling non-native plant species with herbicide.
- In an effort to avoid introduction of non-native/noxious plant species, no hay bales would be used during revegetation or for temporary erosion control.
- When trenching for utilities, the operator would make every effort to detect the presence of tree roots prior to damaging them.
 - When a root is detected, it would be hand excavated 2 feet around it to reveal its full extent prior to resuming excavation with equipment.
 - All live roots 6 inches diameter or larger in the entire excavated area shall be retained and remain undamaged. Roots that are to be retained shall be covered with wet burlaps until the excavation is backfilled. Roots between 2 inches and 6 inches diameter shall be given a clean straight cut on the exposed end with a saw prior to backfilling.
- Best Management Practices would include:
 - Minimize soil disturbance.
 - Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering the parks. Construction equipment would be inspected by NPS staff

- prior to entering the parks to ensure compliance with cleanliness requirements and inadequately cleaned equipment would be rejected
- Limit vehicle parking to existing roadways, access routes, or the designated staging area.
 - Limit disturbance - no machinery or equipment should access areas outside the construction limits, which would also include the tower construction area, staging area, and existing roadways or access routes.
 - The contractor would submit to the contracting officer (CO) a list of proposed sources for import materials 30 calendar days in advance of importing material.
 - The list shall also include the end use and any temporary storage requirements of those materials.
 - Natural Resources staff would inspect sources of materials that pose a risk, either by their end use or storage requirements, of allowing invasive non-native plants (also known as noxious weeds) to establish in the park. Supplier would certify the material doesn't contain non-native plants.
 - At the discretion of the CO, potentially contaminated materials may be accepted if mitigating measures are implemented. Mitigation might include stripping the top 12 inches of source material, requiring fresh material stored less than 1 month, or sterilizing the material.
 - Contaminated materials that contain fines and have an end-use on the surface, and cannot otherwise be mitigated, would require sterilization before importing to the park.
 - Import material shall be shipped directly from the source to the park without intermediary storage or staging.
 - Sources of rock, sand, gravel, earth, soil, or other imported natural material would be inspected for invasive non-native plants prior to acceptance.
 - Shipping vessels would be covered to prevent spillage or blowing of their contents while in transit.
 - Materials would also be transported and stored such that they would not acquire invasive non-native plant seeds from adjacent vegetation.
 - Construction materials would be inspected for soil and plant parts. Dirty materials would be cleaned with pressure washing or other means. Construction materials that could acquire seeds from surrounding areas would be covered.
 - Obtain any needed fill, rock, or additional topsoil from the project area, if possible. If not possible, obtain weed-free sources from NPS approved sources outside the parks.
 - Initiate revegetation of disturbed sites immediately following construction activities.
 - Monitor disturbed areas for up to three years following construction to identify growth of noxious weeds or non-native vegetation. Treatment of non-native vegetation would be completed in accordance with NPS-13, *Integrated Pest Management Guidelines*.
- To maximize vegetation restoration efforts after completion of construction activities, the following measures would be implemented:

- Litter and duff would be removed from project areas and stored for later replacement over topsoil.
- Topsoil would be removed from areas of construction, stored, and replaced at the end of the project. The topsoil would be spread in as near the original location as possible.
- Native vegetation removed during construction would be replanted wherever it is feasible.

Wildlife

- The clearing limits (construction limits) would be clearly marked or flagged prior to construction to limit disturbance to wildlife habitat.
- If night work was conducted and adverse impacts to species were observed because of that work, construction activities would be restricted to daylight hours.
- Feeding or approaching wildlife would be prohibited.
- Any wildlife collisions would be reported to park personnel.
- A litter control program would be implemented during construction to eliminate the accumulation of trash. All food would be stored in bear-proof containers except when it is being consumed. Food stored in vehicles would be in bear proof containers. Spilled food would be cleaned up.
- Park biologist or ranger would be notified if bears loiter in area or if fisher sightings occur.

Air Quality

- Dust control would occur as needed on active work areas where soil or fine particles are exposed.
- The contractor would not leave vehicles idling for more than five minutes when parked or not in use.
- Concrete plants would be located outside Sequoia and Kings Canyon National Parks. Small quantities of concrete may be stored for a short term only at the designated staging areas.
- Construction debris would be hauled from the parks to an appropriate disposal location.

Water Quality

- At all cut and fill areas, erosion and sedimentation control, such as silt fencing, would be implemented to minimize impacts to water quality.
- Surface restoration and revegetation of disturbed soils would be implemented to minimize long term soil erosion.
- Water needed for construction and dust control would come from the existing developed water systems within the parks and would not be diverted from surface waters.

Soils/Geologic Resources

- Blasting would be allowed in clearly identified areas, if necessary, and an appropriate blasting plan would be established and strictly enforced
- Erosion and sediment control would be required (see “General Measures”).
- Topsoil would be removed from areas of construction and stored for later reclamation use. The topsoil would be redistributed as near the original location as possible and

supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area.

Visitor Experience

- Visitors would be notified when construction would occur and information would be posted in neighboring communities, on the park website, and at visitor centers.

Cultural Resources

- Should unknown archeological resources be uncovered during construction, work would be halted in the discovery area, the site secured, and the appropriate Sequoia and Kings Canyon National Parks staff would consult with the CA SHPO and affiliated tribes, if necessary, according to 36 CFR 800.13 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).
- In compliance with the NAGPRA, the NPS would also notify and consult concerned American Indian tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project.
- Archeological specimens found within the construction area would be removed only by the NPS or their designated representatives.
- Contractor-selected, noncommercial areas outside of the project limits, including but not limited to material sources, disposal sites, waste areas, haul roads, and staging areas, would not encroach upon sites listed or eligible for listing in the NRHP. Written proof satisfactory to the NPS and the CA SHPO shall document, for compliance with Section 106, that no historic properties would be affected because:
 - there are no historic resources present or
 - there is no effect to historic properties present.

Health and Safety

- Visitors and NPS staff (other than project participants) would not be allowed to access the construction site. Emergency vehicles would be allowed on site if needed.

General Construction Schedule and Costs

It is anticipated that construction of the Verizon Wireless communications tower and its associated facilities would take place during the summer of 2009. It is possible that unanticipated delays could postpone construction until spring of 2010. There would be no cost to the National Park Service or to the Federal Government. All costs would be borne by Verizon Wireless.

AFFECTED ENVIRONMENT

Detailed information on the natural, cultural, and human resources at Sequoia and Kings Canyon National Parks may be found in the final general management plan (NPS, 2006). A summary of the resources that may be impacted from the proposed project are described below.

LOCATION AND GENERAL DESCRIPTION OF THE PARKS

Sequoia and Kings Canyon National Parks are located in south-central California. Sequoia National Park was established by Congress on September 25, 1890, to preserve the natural resources of the area with special emphasis on the unique groves of giant sequoia that occur on the west slope of the Sierra Nevada mountains. General Grant National Park was established a week later, also with the purpose of preserving the giant sequoias. Grant Grove and Park Ridge are within that original General Grant National Park. Kings Canyon National Park was established by Congress in 1940 and includes the area that was General Grant National Park. Sequoia and Kings Canyon National Parks contain the most notable and extensive giant sequoia groves in the world, as well as a very scenic part of the Sierra Nevada Mountains, including 14,495-foot Mount Whitney, the highest mountain in the contiguous United States.

The parks are within easy driving distance of two major metropolitan regions of California, approximately 240 miles north of Los Angeles and 240 miles southeast of San Francisco, as well as the major cities in the Central Valley. Fresno is about 55 miles west of the Big Stump entrance to Kings Canyon National Park on Highway 180, and Visalia is about 35 miles west of the Ash Mountain entrance to Sequoia NP on Highway 198. These cities are easily reached from Los Angeles and San Francisco by freeway and are connected to the parks' entrances by 2-lane paved state highways. As each highway approaches the parks they become more narrow and winding as an effective transition between the high speed roads in the Central Valley and the narrow, mountainous, low-speed roads in the parks. Yosemite National Park is due north of Sequoia and Kings Canyon National Parks, and Death Valley National Park is due east. No road crosses the Sierra Nevada Mountains within Sequoia and Kings Canyon National Parks.

Approximately 1.6 million recreational visitors came to Sequoia and Kings Canyon National Parks in 2007. In the past 30 years annual visitation has fluctuated between a low of 1.4 million in 2000 to a high of 2.2 million in 1987 and 1991 (BRW, Inc., and Lee Engineering, 1999). Visitors to Sequoia and Kings Canyon National Parks come primarily from within a 200-300 mile radius of the parks; this includes both the San Francisco and Los Angeles metropolitan areas. The primary mode of transportation to the parks is the private automobile. As a result, visitation tends to be weekend oriented, peaking on extended weekends in the summer. Weather plays a major role in setting the seasonal visitation patterns. July and August are the peak months, with visitation dropping off dramatically during the winter months. About 80 % of annual visitation occurs in the six-month period of May through October. Entrance to the parks is approximately equal at both the Ash Mountain entrance in Sequoia National Park and the Big Stump entrance in Kings Canyon National Park.

VEGETATION

In May 2008, park staff conducted a plant survey of the site proposed for construction of the Verizon communications tower. In summary, the survey identified no sensitive habitats and no rare plant species in the proposed project area. The report did note that not all plant species were in identifiable condition and the presence of additional species cannot be ruled out.

The Park Ridge communications site is located on a ridge top at an elevation of 7,500 feet (2,300 meters). Soils are derived from granitic parent materials and are generally shallow, coarse, and rapidly drained. Vegetation observed includes mixed dominance shrublands of greenleaf manzanita and chinquapin, as well as woodlands comprised of Jeffrey pine, sugar pine, red fir, and white fir. These are typical and widespread plant assemblages of the upper mixed-conifer zone. Figure 8 depicts the vegetation at the site.

Sixteen taxa were observed within the areas surrounding the communications site (Table 3). Nomenclature follows Hickman (1993). None of the species observed are state- or federal-listed, and none are recognized as rare by the California Native Plant Society.

Table 3: Listing of Observed Plant Species

Results		
Family	Species	Common Name
Poaceae	Achnatherum sp.	needlegrass
Liliaceae	Allium sp.	onion
Apocynaceae	Apocynum androsaemifolium	bitter dogbane
Asteraceae	Hieracium horridum	shaggy hawkweed
Caprifoliaceae	Symphoricarpos mollis	creeping snowberry
Ericaceae	Arctostaphylos patula	greenleaf manzanita
Fagaceae	Chrysolepis sempervirens	bush chinquapin
Grossulariaceae	Ribes roezlii var. roezlii	Sierra gooseberry
Pinaceae	Abies concolor	white fir
Pinaceae	Abies magnifica var. magnifica	California red fir
Pinaceae	Pinus jeffreyi	jeffrey pine
Pinaceae	Pinus lambertiana	sugar pine
Polemoniaceae	Phlox diffusa	spreading phlox
Portulacaceae	Calyptridium monospermum	oneseed pussypaws
Rhamnaceae	Ceanothus cordulatus	mountain whitethorn
Scrophulariaceae	Penstemon newberryi var. newberryi	mountain pride



Figure 8; Looking northeast toward the proposed Verizon tower site and at the vegetation on the site. Trees in the background would remain to screen the tower.

VISITOR EXPERIENCE

Visitor experiences in the parks include many different elements – the character of the parks, the visitation patterns, educational and recreational opportunities, and visitor services.

The park character is comprised of a combination of the setting, natural and built environments, and the human activities that are associated with it. At Sequoia and Kings Canyon National Parks, including the Grant Grove area, there are three types of character – rustic, basic, and traditional. Rustic refers to the character and quality of the built environment. Visitors continue to enjoy park facilities and site elements evoking the CCC era. New public use facilities continue this rustic heritage that used natural materials such as wood and large rough stone work.

The basic character of the parks includes the setting and customary or historical activities, such as hiking, camping, lodging, backcountry use, and scenic driving. Hiking trails include a trail from the Grant Grove area to the fire lookout tower on Park Ridge. Other established activities include cave tours, winter recreation, water play, and fishing. Backcountry use permits are required so that use can be dispersed and documented.

Traditional patterns of use date from the 1890s through the 1960s. Hiking, riding stock animals, and driving are the three primary ways that visitors enjoy the parks.

Annual visitation has fluctuated over the last two decades, reaching a high of 2.2 million visitors in 1987 and 1991. Visitation in 2000 was the lowest at approximately 1.4 million. In 2006, visitation levels reached 1.5 million for Sequoia and Kings Canyon National Parks combined, with approximately 575,000 of those visitors in Kings Canyon National Park. Visitation is seasonal with most visits occurring in the summer months. Winter use depends on the weather and snow conditions with the lowest visitation in December, January, and February. Front country areas (about 2.5% of the parks' total area) receive around 98% of visitor use, with the backcountry receiving the remaining 2%. A visitor survey was conducted in March and May 1998. The results indicated that 45% of the visitors were day use visitors staying on average 4.5 hours (BRW, Inc., and Lee Engineering, 1999). About 14.6% of the visitors stayed two days and 14% three days. About 25% of all visitors stayed four days or longer.

Recreational fishing primarily takes place in the Marble and Middle Forks of the Kaweah River and the South Fork of the Kings River. Fishing is highly regulated, but it is not supported by any facilities.

Within the two parks there are over 110 miles of front country trails, including about 16 miles of paved trails. There are about 842 miles of back country trails. In the Grant Grove area there are 13 trailheads. The parks' elevation ranges from 1,300 feet to 14,495 feet. August is the most popular month for backcountry use. The trailhead closest to the proposed project area is the Park Ridge Trail. The trail ascends Park Ridge, ending at Panoramic Point at the base of the fire lookout tower adjacent to the site proposed for construction of the Verizon Wireless tower. The trail receives low to moderate use during the summer months, and very little use during the winter.

Cross-country skiing, snow play, snowshoeing, and sledding are popular winter activities for regional visitors, especially at Wolverton and Grant Grove. Cross-country skis and snowshoes can be rented at Wuksachi and cross-country ski lessons are provided at Lodgepole.

Snowmobiles are allowed on private roads for use by inholders to access their property and on some public roads during seasonal snow closures for permit holders attempting to access their recreational cabins.

Visitor services in the Grant Grove area include picnic areas and three campgrounds. Grant Grove village has lodging that ranges from rustic to modern, a restaurant, a market, a gift shop, the Kings Canyon Visitor Center, and a park ranger contact station.

SCENIC RESOURCES

Park Ridge, the site proposed for construction of the Verizon Wireless communications tower, overlooks Grant Grove. The scenic resources of the Grant Grove area include several vista points, including Kings Canyon Overlook, Panoramic Point, and the Park Ridge hiking trail. The trail and overlooks provide impressive views of the Kings Canyon; a magnificent, deep, glacially carved canyon. They also provide views of the valleys and high-mountain peaks to the east of Grant Grove. The wilderness areas of Kings Canyon National Park, the Sierra National Forest, and the Sequoia National Forest can also be seen, including the most rugged portion of the high Sierra and one of the largest contiguous alpine environments in the lower 48 states.

The scenic resources of the Grant Grove area also include the old-growth giant sequoia trees, among the largest living things on earth. Sequoias exist only along the western slopes of the southern Sierra Nevada, between 5,000 and 7,000 feet in elevation. Western dogwood, azaleas, manzanita, and other flowering plants are also part of the sequoia grove ecosystem. The mixed-conifer forests that cloak those mid-range slopes are remarkably diverse. Intermixed with the scattered groves of giant sequoia are Ponderosa pine, incense-cedar, white fir, and sugar pine. Many of the trees are tremendously tall, and form some of the most extensive stands of old-growth coniferous forest that remain in the world.

HEALTH AND SAFETY

There is currently no cellular telephone service in the Grant Grove area, or along the Highway 180 corridor in the vicinity of the parks. Cellular service reception is very intermittent and unreliable on Generals Highway in the vicinity of Grant Grove. Telephone service is limited to land line telephones in NPS offices and concessionaire businesses, and in private homes in the small community of Wilsonia. Limited public pay phone service is available in Grant Grove Village. Park staff can readily communicate throughout most of the parks by using park band

radios, although those capabilities are limited in some remote back country locations. Emergency response personnel can be summoned by contacting NPS personnel directly or by using a land line telephone where they are available.

There are currently three broadcast/reception towers atop Park Ridge, from 20 feet to 40 feet tall, and two small service and equipment buildings. The towers are closely adjacent to the Park Ridge fire lookout, a wooden cabin shelter atop a 20 foot tall tower. The towers transmit television signals, UHF and VHF radio signals for NPS communications throughout the parks, and amateur radio (often referred to as “ham radio”) signals. The broadcast frequency bands are as high as 900 megahertz (MHz).

ENVIRONMENTAL CONSEQUENCES

Introduction

This section describes the potential environmental consequences associated with the no action and 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 NPS policy, resource impairment is explained and then assessed for each impact topic and alternative. Subsequent subsections in this section are organized by impact topic, first for the no action alternative and then for the preferred alternative.

METHODOLOGY

Overall, the NPS based these impact analyses and conclusions on the review of existing literature and Sequoia and Kings Canyon National Parks studies, information provided by experts at the parks and in other agencies, professional judgments and park staff insights, and public input.

Context, Duration and Intensity, and Type of Impact

Potential impacts (direct, indirect, and cumulative effects) are described in terms of type (beneficial or adverse), context (site-specific, local, or even regional), duration (short term, long term, or permanent), and intensity (negligible, minor, moderate, or major). Because definitions of intensity and duration vary by impact topic, intensity definitions and duration are provided separately for each impact topic analyzed in this EA/AoE.

Context

Context is the setting within which an impact may occur, such as local, parkwide, or regional. The CEQ requires that impact analyses include discussions of context. For this EA/AoE, local impacts would occur within the general vicinity of Park Ridge, while parkwide impacts would affect a greater portion of the parks, and regional impacts would extend outside the boundaries of the parks.

Duration

The duration of an impact is the time period for which the impacts are evident and are expressed as short term or long term. A short term impact would be temporary in duration and would be associated with road construction activities, 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 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 is 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.

Direct versus Indirect Impacts

Both direct and indirect impacts are analyzed, consistent with CEQ regulations (40 CFR 1502.16 and DO-12). The following definitions of direct and indirect impacts are used during analysis but not specifically identified in the environmental analysis:

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

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

CUMULATIVE EFFECTS

The CEQ regulations, which implement NEPA (1969) (42 USC 4321 *et seq.*), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the no action alternative.

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Sequoia and Kings Canyon National Parks and, if applicable, the surrounding region.

The following projects were considered in the cumulative impact analysis:

Past and Current Actions

- **Buck Rock Lookout.** A small fire lookout building and associated radio transmittal towers sit atop Buck Rock at an elevation of approximately 8,500 feet. The lookout is approximately 5 miles east of Grant Grove.
- **Big Baldy Television Relay Tower.** A television transmission relay tower is situated near the summit of Big Baldy, at an elevation of approximately 8,200 feet. Big Baldy is approximately 5 miles southeast of Grant Grove.
- **Eshom Point Radio Tower.** A radio transmission tower and a service structure are situated near the summit of Eshom Point, at an elevation of approximately 5,100 feet. Eshom Point is approximately 6 miles south of Grant Grove.
- **Delilah Lookout.** A fire lookout tower is situated atop a ridge at an elevation of approximately 5,100 feet. The tower is approximately 10 miles northwest of Grant Grove.
- **Generals Highway Cut Slope Repair Route 10(7A).** The project removed unstable rock and stabilized the remaining portions of the cut slope above the roadway at mile 0.8 as measured from the southwest park boundary. Stabilization was accomplished by excavating and removing additional soil and rock so that the finished slope was less than the destabilized slope. The project was completed in 2006.
- **Generals Highway Halstead Meadow Erosion Repair.** The project stabilized a failing section of Generals Highway from hydrologic action caused from the outfall at two 36" metal culverts in the Red Fir sub-district, specifically Halstead Meadow, of Sequoia National Park. Approximately 400 cubic yards of rock and earthen fill were placed in a

25' deep chasm formed from the culverts discharge. During the project the creek flow was diverted to existing culverts approximately 100-feet north of the chasm.

- **Giant Forest Development Area Removal.** A 1980 Development Concept Plan (NPS 1980) and the 1996 Interim Management Plan (NPS 1996) called for removing concession and NPS facilities from the Giant Forest and relocating them to Wuksachi. During 1998–99 hundreds of structures in two historic districts were removed in accordance with an agreement with the CA SHPO. The project has also included removal of hundreds of concession lodging buildings, roads, and 18 parking lots. Historic buildings that are being adaptively reused include the market, which is now the Giant Forest Museum (opened in 2002) and the Beetle Rock Assembly Hall, which is being reused as a community building and education center. Other historic buildings (ranger residence and restrooms) have been rehabilitated. Museum exhibits, waysides, and trail centers have been built. Area trails are being improved and comfort stations replaced. Replacement parking is located outside the Giant Forest, and visitation to the area would depend on a shuttle system to be developed over the next several years. Utility system replacements have occurred in Giant Forest to bring aging systems up to state standards.
- **Construction of the Wuksachi, Clover Creek, and Red Fir Development Areas.** Facilities were constructed in the 1980s and 1990s in a red fir forest to replace those removed from Giant Forest, based on the 1980 Development Concept Plan (NPS 1980). Recent NPS facilities include the Red Fir maintenance building, wastewater treatment plant, seasonal housing, bathhouse for concession use, road system, utilities, permanent staff housing, parking lots, propane fuel area / distribution system, and a firehouse. Concession facilities already built include three lodges with 102 rooms, a restaurant/store/administration building, a bathhouse, and staff cabins. Concession contracts call for 312 additional lodging units plus employee housing.
- **Reconstruction of the Crescent Meadow / Moro Rock Road.** This repaving project was recently completed.
- **Lodgepole and Grant Grove - Replace Water Distribution Systems.** The 2008 project consists of reconstructing major components of the water distribution systems in the Grant Grove and Lodgepole areas of the parks, which involves all work associated with removal and replacement of approximately 33,100 linear feet of water line ranging in size from $\frac{3}{4}$ " to 10" in diameter. Work includes excavation, demolition and disposal of old piping and valves, installation of new piping, valves and appurtenances, backfill and compaction, and revegetation of areas disturbed by construction activities.
- **Generals Highway Rehabilitate Route 10(1 – 6).** The reconstruction of the historic Generals Highway has been going on since the 1980s, starting near Three Rivers. This project is being phased over many years. Work has been completed from Ash Mountain to Big Fern Springs. The section from Big Fern Springs to Amphitheater Point was recently completed in 2007. The section from Deer Ridge to Wolverton Road would be reconstructed as soon as funds become available.
- **Rehabilitation of the Lodgepole Campground.** Campgrounds are being gradually renovated throughout the parks. At Lodgepole campsites are being renovated in

phases. Sites within the 100-year floodplain are being relocated out of the floodplain, and an internal circulation system is likely to be redesigned.

- **Existing Structures on Park Ridge.** Park Ridge is a designated telecommunications site for Sequoia and Kings Canyon National Parks. Current structures on Park Ridge include:
 - 20 foot tall fire lookout tower
 - 10 foot by 10 foot concrete block structure containing NPS communications equipment and a back-up power generator
 - 30 foot tall tower atop the NPS communications equipment building, containing a Verizon California passive reflector used for landline service
 - 40 foot tall lattice tower with NPS telecommunications transmission equipment
 - 8 foot by 8 foot concrete block structure belonging to the USFS, containing USFS radio equipment and a back-up power generator
 - 40 foot tall lattice tower with USFS radio transmission equipment

Future Actions

- **Verizon Tower at Dunlap.** Verizon Wireless is considering the future construction of a communication tower near the community of Dunlap, approximately 4 miles west of Grant Grove. An exact location and design have not been selected, but such a tower would be situated near the Highway 180 corridor, to serve the greatest number of users. The design of such a tower would be similar to that proposed for construction atop Park Ridge.
- **Rehabilitate 10.7 km of Generals Highway.** Rehabilitate 10.7 km of the historic Generals Highway between Deer Ridge Pullout and Wolverton Road intersection. Work would entail replacing guardrails, retaining walls, cut walls, drainage structures, base material, and asphalt. The existing grade and alignment would be retained as much as possible. Existing signing and interpretive waysides would be upgraded and replaced as necessary. Revegetation would occur where disturbed areas were adjacent to the road. This project would most likely be phased over several years with an unknown start year.
- **Replace Cedar Grove Bridge in the Cedar Grove District of Kings Canyon National Park.** This bridge leads from Kings Canyon Highway (180) to the Cedar Grove Village. The bridge is a two span 142' x 27' steel stringer structure with a laminated timber deck. The substructure consists of reinforced concrete walls on spread footings. This structure is in poor condition and must be replaced due to the deficient condition, volume of traffic, and reduced load capacity. The original design of the bridge had a Normal Traffic Rating of 15 tons; however due to degradation, a limit of 9 tons has been assigned. The railing does not meet safety and design standards. The estimated remaining life was determined to be 7 years in 1989.
- **Replace Wolverton Corrals.** The project would develop a plan to offer pack station facilities in the Wolverton area. The pack station would serve the needs of stock animals used by the NPS for trail maintenance, a concession packer, as well as private pack stock users.

- **Replace Big Stump Entrance Station.** A new entrance station would be constructed to serve the Kings Canyon entry point into Sequoia/Kings Canyon National Parks and Giant Sequoia National Monument. The proposed facility would replace an antiquated station with numerous safety issues and minimal visitor services. It would feature kiosks, bulk storage space, administrative fee collection space, employee restroom, and emergency generator room. The site footprint would accommodate present and projected traffic volume with a three lane entry way and two lane exit way for traffic flow.
- **Restoration of Big Meadow.** A watershed improvement project on the Hume Lake District of Sequoia National Forest would restore 6,100 ft of degraded stream.

IMPAIRMENT OF SEQUOIA AND KINGS CANYON NATIONAL PARKS RESOURCES OR VALUES

In addition to determining the environmental consequences of the preferred and other alternatives, the *NPS Management Policies 2006* and DO-12, require analysis of potential effects to determine if actions would impair Sequoia and Kings Canyon National Parks resources.

The fundamental purpose of the national park system, established by the 1916 Organic Act and reaffirmed by the 1970 General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park and monument resources and values. However, the laws do give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. That discretion is limited by statutory requirements that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. However, an impact would more likely constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park
- identified as a goal in the Sequoia and Kings Canyon National Parks final general management plan or other relevant NPS planning documents

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

UNACCEPTABLE IMPACTS

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

- be inconsistent with a park's purposes or values, or
- impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- create an unsafe or unhealthful environment for visitors or employees, or
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- unreasonably interfere with park programs or activities, or
 - an appropriate use, or
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
 - NPS concessioner or contractor operations or services

A determination on unacceptable impacts is made in the conclusion statement of each impact topics for each alternative in the "Environmental Consequences" section.

ENVIRONMENTAL ANALYSIS

Vegetation

Available information on vegetation and vegetative communities potentially impacted in the Park Ridge area was compiled from a plant survey that was completed by park staff in May 2008. Predictions about short- and long-term site impacts were based on previous projects with similar vegetation. The thresholds of change for the intensity of an impact are defined as follows:

- **Negligible:** The impact for native vegetation would be at the lower levels of detection or not measurable. Non-native species would be unlikely to be introduced and the few that might be would not survive.
- **Minor:** The impact to native vegetation would be detectable and could affect the abundance or distribution of individuals in a localized area, but it would not affect the viability of the local population or overall community size, structure, or composition. Non-native species might be introduced.
- **Moderate:** The impact would be clearly detectable and could have an appreciable effect on the resource. This would include impacts that affect the abundance or distribution of local populations, but not the viability of the regional population. Localized changes to community size, structure, or composition and ecological processes could occur. Non-native species might be introduced.

- **Major:** The impact would be severely adverse or exceptionally beneficial. Impacts would have a substantial, highly noticeable, or widespread influence, affecting the abundance or distribution of a local or regional population to the extent that the population would not likely recover (adverse) or would return to a sustainable level (beneficial). Community size, structure, or composition and ecological processes would be highly altered, and landscape level changes could be expected. Non-native species would almost certainly be introduced.

Short term – temporary, and would be associated with construction activities, as well as the period of site restoration.

Long term – occurs during and continues after the construction and site restoration period.

Alternative 1: No Action

Alternative 1 would maintain the proposed project area in its current state and would leave the existing plant communities undisturbed. Park staff and other authorized staff would continue to access Park Ridge, to service the existing structures and facilities there. The ongoing routine of maintenance and repairs and the ongoing program for control of invasive plants would continue. Vegetation displaced by such routine maintenance and repairs would provide conditions favorable for the establishment of invasive exotic plants, but such impacts would be mitigated by existing control measures.

Because the existing plant communities would remain in place, and the potential for encroachment by invasive exotic plants would be the same as anticipated under the existing maintenance and management regimen, alternative 1 would have no impact on vegetation.

Cumulative Impacts. Alternative 1 would have no impact on vegetation. Therefore, there would be no cumulative effects.

Impairment of Park Resources and Values and Unacceptable Impacts. Because there would be no major adverse impacts to a resource or value, there would be no impairment of park resources and values. There would be no unacceptable impacts to park resources and values.

Conclusion. Alternative 1 would have no impact on vegetation. There would be no cumulative impacts. There would be no impairment of the parks' resources or values or unacceptable impacts to park resources or values.

Alternative 2: Preferred Alternative

Alternative 2 would have a long-term minor adverse impact on vegetation. Vegetation, predominantly manzanita and chinquapin, would be removed from approximately 1,308 square feet of previously undisturbed land. There are no trees on the site proposed for tower construction. Disturbance of soils and displacement of vegetation by construction activities would provide conditions favorable for the establishment of invasive exotic plants, but the impacts would be mitigated by control measures, such as a revegetation plan, restricting construction activities to specified areas, and other measures identified in Mitigation Measures section of this EA/AoE.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects, such as other mountain top towers, as well as roadway-related and infrastructure projects have impacted or have the potential to impact vegetation by affecting the abundance and distribution of local vegetation populations. The impact of these projects is moderate, adverse, and long-term. The

long-term, moderate, adverse impacts of the past, present, and reasonably foreseeable future actions, in combination with the long-term, minor, adverse impacts from alternative 2, would result in long-term, moderate, adverse cumulative impacts on vegetation.

Impairment of Park Resources and Values and Unacceptable Impacts. Because there would be no major adverse impacts to a resource or value, there would be no impairment of park resources and values. There would be no unacceptable impacts to park resources and values.

Conclusion. Alternative 2 would have a long-term, minor, adverse impact on vegetation. Cumulative impacts would be long-term, moderate, and adverse. There would be no impairment of the parks' resources or values or unacceptable impacts on the parks' resources or values.

Visitor Experience

NPS Management Policies 2006 state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all national parks and that the NPS is committed to providing appropriate, high-quality opportunities for people to enjoy the parks.

Part of the purpose of Sequoia and Kings Canyon National Parks is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the parks' management goals is to ensure that visitors safely enjoy, and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

Scoping input and observation of visitation patterns, combined with an assessment of what is available to visitors under current management were used to estimate the effects of the actions in the various alternatives of this document. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources and objectives presented in the park significance statements. The thresholds of change for the intensity of an impact to visitor experience are defined as follows:

- **Negligible:** Visitors would likely be barely aware of the effects associated with the alternative. The changes would not occur in primary resource areas, or would affect few visitors. Visitor access to the resource would not be hindered.
- **Minor:** Changes in visitor use and/or experience would be detectable, but the changes would be slight. The impact would not occur in primary resource areas, or would affect a low percentage of visitors. Visitors would be aware of the effects, but the changes would not appreciably limit or enhance critical experiences fundamental to the park's mandate.
- **Moderate:** Changes in visitor use and/or experience would be clearly detectable and appreciably affect visitor experiences. The impact would occur in primary resource areas, or affect a high percentage of visitors. Characteristics critical to the desired experience would be changed, or the number of participants in an activity would be altered. Changes to experiences fundamental to the park's mandate would be apparent.
- **Major:** Changes in visitor use and/or experience would be readily apparent, severely adverse or exceptionally beneficial, would occur in primary resource areas, and would affect the majority of visitors. Visitor access to resources would be significantly

impeded. Multiple critical characteristics of the desired experience would be eliminated or detracted from, or would be created or greatly enhanced. Action would fail to meet the park's mandate.

Short term – temporary, and would be associated with construction activities, as well as the period of site restoration.

Long term – occurs during and continues after the construction period.

Alternative 1: No Action

The visitor experience would be unchanged by the no action alternative. The character of the park, the visitation patterns, educational and recreation opportunities, and visitor services would remain as they are.

Cumulative Impacts. Alternative 1 would have no effect on the visitor experience. Therefore, there would be no cumulative impacts.

Conclusion. Alternative 1 would have no impact on visitor experience. There would be no cumulative impacts on visitor experience.

Alternative 2: Preferred Alternative

Park Ridge Trail users within sight of the Verizon Wireless tower would see it alongside three other communications towers, a fire lookout tower, and associated service buildings. The impact on those visitors' experience created by a new 80-foot-tall tower would be long-term, minor, and adverse. The number of visitors hiking the Park Ridge Trail to the vicinity of the lookout tower and other towers is not known.

Visitors in some more distant parts of the parks would be able to see Park Ridge, but it would be difficult to discern an 80-foot-tall tower there. Managers of the adjacent national forests have advised that the tower would not be visible from wilderness areas, and although it would be visible from the Giant Sequoia National Monument, it would only be readily visible from locations that are infrequently visited. The impact on the visitor experience would be long-term, negligible, and adverse. Photographs depicting representative views of Park Ridge from areas outside of the Grant Grove area are included in this EA as part of the discussion of scenic resources. Those photographs are presented as figure 9 and figure 10.

There would also be short term, negligible, adverse impacts to visitor experience if a communications tower were built on Park Ridge. Vehicles required for constructing the necessary facilities and erecting the tower would pass through a part of the Sequoia National Forest, and would travel park roads enroute to and from the construction site. Their passage would impede traffic and detract from the natural woodland experience most visitors anticipate in the parks and the national forests. Construction equipment would also travel through Grant Grove Village during construction, disrupting the quiet relaxed atmosphere usually found there. Such intrusions would occur infrequently and only during the anticipated two-month construction period. Aside from the vehicles transporting the workers, the only construction-related vehicles anticipated would be a backhoe, a crane, concrete trucks, and a concrete pump.

Relatively few park visitors would be affected by construction-related impacts in the Grant Grove area during the anticipated two-month summer construction period. Figures from the National Park Service Public Use Statistics Office indicate that in 2008, approximately 2.8% of

visitors to Sequoia and Kings Canyon National Parks stayed overnight at Grant Grove during July and August, the two busiest months of the year.

Construction impacts in the proposed project area on Park Ridge, such as noise, dust, and vehicle exhaust, would have very little impact on visitors. Park Ridge is 900 feet to 1,000 feet higher in elevation and at least one mile away from Grant Grove Village and the nearby campgrounds and sequoia groves. Dense forest covers the slopes between the ridge and those attractions.

Visitors on the Park Ridge Trail while construction was underway would be more directly and forcefully impacted, depending upon their proximity to the construction activities. However, the great majority of visitors in the Grant Grove area do not hike the Park Ridge Trail, and overall, the impact level would be negligible.

A one or two-member maintenance crew would regularly service the communications tower equipment after construction was complete. Their passage to and from the site would likely go unnoticed by visitors in the parks and national forest.

The basic character of the parks and national forests, which includes rustic settings and traditional activities, would be unaffected by the Verizon Wireless tower, but the cellular telephone services and wireless internet access provided by the tower would create an increased sense of security and convenience for visitors who would use those services. That would have a long-term beneficial impact on visitor experience.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects that have impacted or have the potential to impact visitor experience include other communication towers, as well as roadway-related and infrastructure projects. Those projects have or would affect the ability of park staff to meet the visitors' needs and preserve and protect the park resources that create the visitor experience. Previously constructed towers provide radio communications for staff throughout the parks and national forests, benefiting the visitor experience by providing increased safety and more efficient management. Roadway and infrastructure projects create short-term adverse impacts with their associated noise and inconvenience, but in the long-term they benefit visitors with increased safety, comfort, and convenience. The cumulative impacts of those actions have short-term and long-term, minor, adverse impacts, and long-term beneficial impacts. The overall effects of the past, present, and reasonably foreseeable future actions, in combination with the short and long-term negligible to minor, adverse effects, and long-term, beneficial impacts from alternative 2, would result in short-term and long-term, minor, adverse impacts, and long-term beneficial impacts on visitor experience.

Conclusion. Alternative 2, the preferred alternative, would have short and long-term, negligible, adverse impacts. It would also have long-term, minor, adverse impacts and long-term beneficial impacts on visitor experience. The cumulative impacts of alternative 2 would be short-term and long-term, minor, and adverse. There would also be long-term beneficial cumulative impacts.

Scenic Resources

The NPS Organic Act of 1916 directs, in part, “[The National Park Service] shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same.....” The intent of the Sequoia

and Kings Canyon Parks enabling legislation was to assure the preservation “....of the outstanding natural and scenic features of the area....” The parks’ 1994 Natural and Cultural Resources Management Plan says “....the preeminent value of all of the parks’ resources is that they remain relatively unaffected by modern humans.” Those directives provided guidance for the assessment of the impacts to scenic resources. Impact intensities are defined as follows:

- **Negligible:** The impact would be barely detectable, would occur outside of primary resource areas and would affect few visitors.
- **Minor:** The impact would be slight but detectable, would occur outside of primary resource areas and would affect few visitors.
- **Moderate:** The impact would be readily apparent, would occur in primary resource areas and would affect many visitors and could have an appreciable effect on scenic resources.
- **Major:** The impact would be severely adverse or exceptionally beneficial, would occur in primary resource areas and would affect the majority of visitors.

Short term – temporary, and would be associated with construction activities, as well as the period of site restoration.

Long term – occurs during and continues after the construction period.

Alternative 1: No Action

Scenic resources would be unaffected by alternative 1. There would be no Verizon Wireless communications tower constructed on Park Ridge. Viewsapes that include Park Ridge would be unchanged.

Cumulative Impacts. Alternative 1 would have no impact on scenic resources. There would be no cumulative impacts on scenic resources.

Impairment of Park Resources and Values and Unacceptable Impacts. Because there would be no major adverse impacts to a resource or value, there would be no impairment of park resources and values. There would be no unacceptable impacts to park resources and values.

Conclusion. Alternative 1 would have no impact on scenic resources, and there would be no cumulative impact. Alternative 1 would not impair park resources and values or have unacceptable impacts on park resources and values.

Alternative 2: Preferred Alternative

Alternative 2 would have short-term, minor, adverse impacts on scenic resources as a result of construction activity. Heavy equipment would come and go through the proposed project area during construction, and there would be other activities that would adversely impact scenic resources: exposed soil and trenches required for foundations, removal of vegetation, exposed soil, concrete, lumber and other materials, and the ongoing movement of people and equipment in the construction zone. Those adverse impacts would last as long as construction occurred.

Alternative 2 would also have a long-term, minor, adverse impact on scenic resources. At the request of park staff, Verizon Wireless provided photographic simulations (photosimulations) of the likely appearance of an 80-foot tower on Park Ridge. Those photographs are included in

this document as figures 9 and 10. Park staff have indicated that the photosimulations appropriately represent views that would be likely to include Park Ridge.

Because of the rugged terrain, Park Ridge is not readily visible from most locations in the parks and adjacent national forests, and the paint scheme for the tower would be designed to reduce its visibility. Visitors in some more distant parts of the parks and national forests would be able to see Park Ridge, but it would be difficult to discern an 80-foot-tall tower there. Park Ridge is not a prominent feature in most park or national forest views, and at the viewpoints where Park Ridge would be visible, it would be distant enough that the Verizon Wireless tower, as well as existing towers, would not be noticeable. On the Buena Vista Peak Trail in the vicinity of Kings Canyon Overlook, Park Ridge is visible from a distance of approximately 2.75 miles, as depicted in figure 10. At that distance the tower would be inconspicuous; the impact would be detectable, but slight. National forest managers examined topographic maps and photosimulations, and advised that the tower would not be visible from wilderness areas or in frequently visited areas in the Sequoia National Monument.

Few visitors in the Grant Grove area would be able to see an 80-foot-tall tower atop Park Ridge. The heavily forested slopes of the intervening land would screen the tower from the view of visitors in Grant Grove Village, and the nearby campgrounds and sequoia groves. Trees immediately adjacent to the tower site would be left standing, helping to screen the view of visitors on the Park Ridge Trail.

The new 80-foot-tall tower would be immediately adjacent to Panoramic Point, and would be visible to visitors approaching Panoramic Point via the Park Ridge Trail. There its visual impact would be moderated by the presence of three existing communications towers and their service facilities, as well as a fire lookout tower. As an addition to an array of existing towers, the Verizon tower would not have an appreciable effect on scenic resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future projects that have impacted or have the potential to impact scenic resources include other communication towers, fire lookout towers, and roadway and infrastructure construction projects. Those projects have affected or would affect the scenic resources of the parks and national forests with short-term and long-term, moderate, adverse impacts. The overall effects of the past, present, and reasonably foreseeable future actions, in combination with the short-term and long-term minor, adverse impacts of alternative 2, would result in short-term and long-term, moderate, adverse impacts on scenic resources.

Impairment of Park Resources and Values and Unacceptable Impacts. Because there would be no major adverse impacts to a resource or value, there would be no impairment of park resources and values. There would be no unacceptable impacts on park resources and values.

Conclusion. Alternative 2 would have short-term and long-term, minor, adverse impacts on scenic resources. Cumulative impacts would be short-term and long-term, moderate, and adverse. Alternative 2 would not impair park resources and values or have unacceptable impacts on park resources and values.

Health and Safety

The NPS is committed to providing appropriate, high-quality opportunities for visitors and employees to enjoy the parks in a safe and healthful environment. Further, the NPS will strive to protect human life and provide for injury-free visits. Human health and safety concerns

associated with wireless telecommunication include the ability of cellular phone users to contact emergency response services and exposure to radiofrequency electromagnetic fields. Impact intensities are defined as follows:

- **Negligible:** The effects would be at the lowest levels of detection and would not have an appreciable effect on the 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 – impacts would occur during facility construction, typically 1 to 3 months.

Long term – impacts would occur throughout the life of the facility, taking into consideration operation and maintenance of the facility.

Alternative 1: No Action

Health and safety levels and resources would not be affected by alternative 1. There would be no Verizon Wireless communications tower constructed on Park Ridge. Telephone service would remain limited to land line telephones, including pay phones. Park band radios would remain available to Park staff for communication throughout most of the parks. Limitations on communication capabilities would remain for some remote back country locations. Assistance from emergency response personnel would be available by contacting NPS personnel directly or by using land line telephones. There would be no change to potential exposure to radiofrequency electromagnetic fields.

Cumulative Impacts. Alternative 1 would have no impact on health and safety. Therefore, there would be no cumulative impacts.

Conclusion. Alternative 1 would have no impact on health and safety, and there would be no cumulative impacts.

Alternative 2: Preferred Alternative

Alternative 2 would have long-term beneficial impacts on health and safety. Cellular telephone service within the parks and surrounding areas would increase capabilities for rapid contact with emergency response and law enforcement personnel.

Alternative 2 would have a negligible, long-term, adverse impact on the exposure of visitors or park staff to radiofrequency electromagnetic fields (RF). The proposed wireless transmission tower would have three directional transmission antennae, each approximately 8 feet tall, atop a single central 80-foot tall pole (monopole). Each antenna would transmit with an effective radiated power of up to 550 watts within a bandwidth of approximately 806 to 960 MHz. Two microwave dishes, each 6 feet in diameter, would be installed on the monopole at a height of 67 feet above ground. An illustration of the monopole and its antennae is presented in figure 5 of this document.

Persons with the greatest potential exposure to RF emissions would be personnel in the fire lookout tower on Park Ridge. The maximum potential RF exposure for personnel in the fire lookout tower (approximately 20 feet above ground level) would be less than 2.9 microwatts per square centimeter, which is less than one half of one percent of the public safety standard set by the U.S. Federal Communications Commission (FCC).

The two microwave dishes would not contribute to any additional exposure to visitors or park staff. Transmission energy from the dishes would be confined to a fairly tight beam emitted at the elevation of the dishes, and parallel to the ground. With the dishes mounted at 67 feet above ground, the transmission beams would be at least 30 feet above anyone in the tower, and would not affect anyone at ground level.

An analysis of the potential health and safety impacts of RF emissions from the proposed tower was completed by Health and Medical Physics Consulting, in Sacramento, California. The report concludes that the proposed wireless facility would be a low-power device, and that exposure to personnel in the fire lookout tower would be more than 200 times lower than the FCC public exposure standards. The report further points out that the FCC maximum allowable exposure levels are set at a threshold 50 times below a level believed to pose a potential threat to human health. Therefore, the potential exposure levels from a transmission tower such as that proposed for Park Ridge would be 10,000 times lower than a level that would pose a health risk to humans. The analytical report is included with this EA/AoE as Appendix E.

Alternative 2 would have short-term, minor, adverse impacts on health and safety as a result of construction activity. Heavy equipment would operate in and around the proposed project area during construction, creating hazards from overhead activities, the possibility of collisions, and other construction-related hazards from the movement of people and equipment in and around the construction zone. Those adverse impacts would last as long as construction occurred.

Cumulative Impacts. Past and present projects that have impacted or have the potential to impact health and safety by affecting access to emergency services and potential exposure to RF emissions include other wireless communication towers. Communications towers are in place in numerous locations throughout the park and the surrounding area. In combination, they have a beneficial impact on the access to emergency services.

The effect of existing wireless communications towers on potential exposure to RF emissions does not extend beyond each individual tower site, where there would be long-term, negligible, adverse impacts.

There are no other known future plans for additional wireless communications towers.

The overall long-term, negligible, adverse effects and long-term beneficial effects of the past and present actions, in combination with the long-term, negligible, adverse impacts, short-term minor adverse impacts, and long-term beneficial impacts of alternative 2 would result in long-term, negligible, adverse impacts, short-term minor adverse, and long-term beneficial impacts on health and safety.

Conclusion. Alternative 2 would have long-term, negligible, adverse impacts, short-term, minor, adverse impacts, and long-term beneficial impacts on health and safety. Cumulative impacts would be long-term, negligible, adverse, short-term, minor, adverse, and long-term beneficial.

Methodology for assessing impacts to cultural resources

Potential impacts (direct, indirect, and cumulative effects) are described in terms of type (beneficial or adverse), context (site-specific, local, or even regional), duration (short term, long term, or permanent), and intensity (negligible, minor, moderate, or major). Because definitions of intensity and duration vary by impact topic, intensity definitions and duration are provided separately for each impact topic analyzed in this EA/AoE.

Impacts to Cultural Resources and Section 106 of the NHPA: In this EA/AoE discussions of impacts to cultural resources are among those impact topics dismissed from detailed analysis. Those briefer impact analyses are intended, however, to comply with the requirements of both NEPA and Section 106 of the NHPA. In accordance with the ACHP's regulations implementing Section 106 of the NHPA (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, National Register eligible or listed cultural resources; and (4) considering ways to avoid, minimize or mitigate adverse effects.

CEQ regulations and DO-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. Surveys of the site have been conducted by park staff, and no archeological resources, historic or prehistoric structures, or ethnographic resources have been observed there. In the Mitigation Measures section of this EA/AoE measures have been identified for handling and protecting any unknown archeological resources, according to 36 CFR 800.13 and provisions of NAGPRA. In accordance with Section 106 of the NHPA, the NPS has concluded that there would be no historic properties affected by the implementation of the preferred alternative discussed in this EA/AoE.

Figure 9

July 25, 2007

Photosimulation of view from Quail Flats. No portion of the site will be visible from this area.

Specific viewpoint requested by National Parks.



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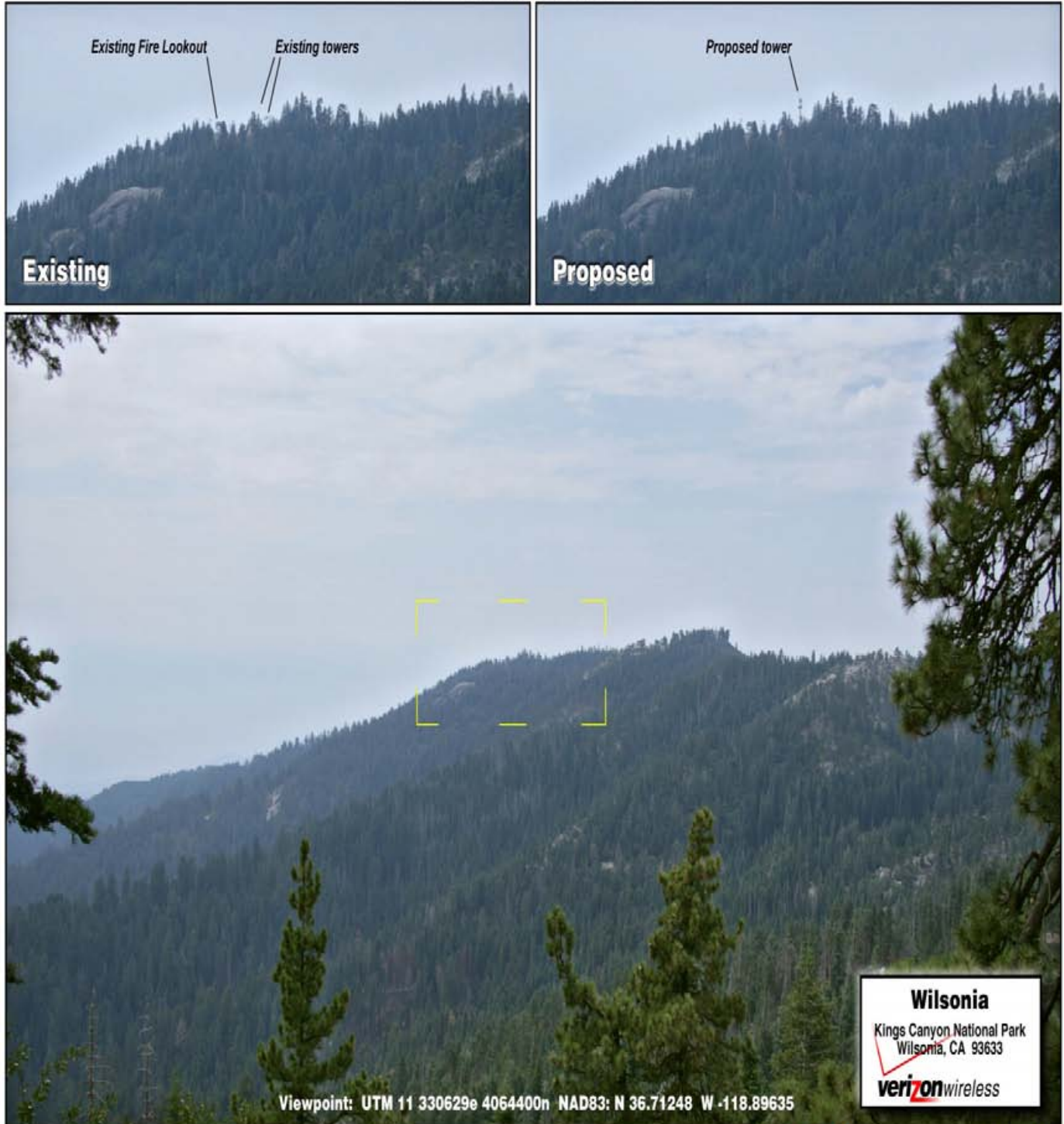
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Figure 10

July 25, 2007

Photosimulation of view looking west northwest from Buena Vista Trail.

Specific viewpoint requested by National Parks.



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CONSULTATION AND COORDINATION

A press release initiating public scoping and describing the proposed action was issued on December 17, 2008 (Appendix A). Comments were solicited during a public scoping period. Eight comments were received on the internet. Of those, four opposed the proposed construction of a communication tower on Park Ridge and three supported the proposal. One commenter indicated that there would be both benefits and disadvantages to constructing a communication tower on Park Ridge. In accordance with *Director's Order #53: Special Park Uses*, April 2000, a Federal Register Notice was published in March 2009, advising of the proposed project and the availability of the environmental assessment. The public and appropriate federal and state agencies will also have an opportunity to review and comment on this EA/AoE.

The undertakings described in this document are subject to Section 106, as amended in 1992 (16 USC 470 *et seq.*). Project scoping letters were sent to the CA SHPO, to the Advisory Council on Historic Preservation, and to the parks' 10 affiliated tribes on December 17, 2008. An example of the letters sent to the CA SHPO, the Advisory Council, and the affiliated tribes is presented in Appendix B - Consultation and Coordination. A copy of this EA/AoE will be sent to the CA SHPO on during public review of the document.

In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*), it is the responsibility of the federal agency proposing the action (in this case the NPS) to determine whether the proposed action would adversely affect any listed species or designated critical habitat. After consulting internet sources and with species experts, it was determined that no listed species or their critical habitats would be adversely affected by either alternative. On April 21, 2009 the park mailed consultation letters to the U.S. Fish and Wildlife Service and to the California Department of Fish and Game. The letters described the proposed project and requested concurrence on the park staff conclusion that no federally listed or candidate species would be impacted in the proposed project area. The consultation letters are included in this document as Appendix F.

LIST OF PREPARERS

This EA/AoE was prepared by the NPS Denver Service Center. Sequoia and Kings Canyon National Parks staff provided invaluable assistance in the development and technical review of this EA/AoE. NPS staff that provided information include:

Sequoia and Kings Canyon National Parks

John Austin – Natural Resource Specialist
Tom Burge – Archeologist
Athena Demetry – Restoration Ecologist
Annie Esperanza – Air Resources Specialist
Gregg Fauth – Wilderness Coordinator
Sylvia Haultain – Plant Ecologist
Ned Kelleher – District Ranger
Valerie Pillsbury – Interpretation Specialist
Jim Purvis – Regional Telecommunications Manager
Brit Rosso – Fire Management Officer
Christine Smith – NEPA Compliance
Mike Sorenson – Safety and Occupational Health Manager
Harold Werner – Wildlife Ecologist

National Park Service – Denver Service Center

Cam Hugie – Project Manager
Darin Thacker – Project Specialist
Steven Hoffman – Natural Resource Specialist
Jeri DeYoung – Environmental Compliance Specialist

Complete Wireless Consulting/Verizon Wireless

Crystal Wood – Project Manager
Bob Schroeder – Project Foreman

REFERENCES

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Burge, T. (Sequoia and Kings Canyon National Parks)

- 2008 Review notes about archeological resources per review of the project environmental screening form, November 2008.

Demetry, A. (Sequoia and Kings Canyon National Parks)

- 2008 Review notes about non-native plant species per review of the project environmental screening form, November 2008.

Werner, H. (Sequoia and Kings Canyon National Parks)

- 2008 Review notes about status of special concern species with the project area, per review of the project environmental screening form, November 2008.

California Department of Fish and Game

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Environmental Protection Agency

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APPENDIX A

NATIONAL PARK SERVICE PRESS RELEASE



National Park Service
U.S. Department of the Interior

Office of the Superintendent
47050 Generals Highway
Three Rivers, CA 93271-9651

(559) 565-3341 phone
(559) 565-3730 fax
<http://www.nps.gov/seki>

Sequoia and Kings Canyon National Parks Scoping Notice

For Immediate Release – December 17, 2008

Contact Christine Smith: (559) 565-3105

The National Park Service is Requesting Comments from the Public for a Proposed Wireless Tower in Kings Canyon National Park

The National Park Service (NPS) is preparing an Environmental Assessment (EA) for the proposed construction of an eighty foot cellular tower on Park Ridge near Grant Grove within Kings Canyon National Park. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands. The EA will address alternatives in compliance with the Telecommunications Act of 1996 and NPS Reference Manual 53, for the proposed development including a no action alternative which would not permit construction of a wireless tower.

The National Park Service is soliciting input from organizations, agencies, and individuals as part of the scoping process. The purpose of scoping is to identify the range of issues to be addressed in the EA as well as potential alternatives for the project. The public is invited to direct concerns or comments regarding this project to the Park in writing by sending an e-mail to seki_planning@nps.gov, or through the NPS Planning, Environment and Public Comment (PEPC) website at <http://parkplanning.nps.gov/seki>, or mailed to: Sequoia and Kings Canyon National Parks, Planning and Compliance Office, 47050 Generals Highway, Three Rivers, CA 93271-9651. Please include the phrase "Wireless Tower" at the top of your comment or in your e-mail subject line.

Scoping comments are requested by January 21, 2009. Once the scoping period concludes, all comments submitted will be considered, and a range of alternatives will be developed. The public, agencies, and other interested parties will have an opportunity to review and comment on the range of alternatives before they are finalized.

Before including an address, phone number, email address or other personal identifying information in your comment, you should be aware that your entire comment including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. Anonymous comments will not be accepted.

NEPA PROCESS AND TIMELINE

Anticipated Project Milestones (include):

- | | | | |
|----------------------------|---------------|------------------------------------|---------------|
| • Project Initiation: | May 2008 | • Publication in Federal Register: | February 2009 |
| • Analysis & Consultation: | August 2008 | • Public Review of EA: | March 2009 |
| • Public Scoping: | December 2008 | • Final Decision Document: | May 2009 |
| • EA Preparation: | January 2009 | | |

EXPERIENCE YOUR AMERICA

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

Background for the Proposed Wireless Tower in Kings Canyon National Park

Current Conditions on Park Ridge

Park Ridge is an established telecommunications site for Sequoia and Kings Canyon National Parks. Current structures on Park Ridge include:



Telecommunications equipment on Park Ridge NPS photo archive

- a 20' fire lookout tower
- a 10'x10' concrete block structure containing NPS communications equipment and back up power generator
- a 40' lattice tower with NPS telecommunications transmission equipment
- a 30' tower on top of the NPS communications equipment building, containing a passive reflector used for landline service operated by Verizon California
- an 8'x8' concrete block structure belonging to the United States Forest Service and containing USFS radio equipment and backup power generator
- a 40' lattice tower with USFS radio transmission equipment

Note: Both the USFS and Verizon California structures are installations which are managed under permit by the NPS.

Proposed Additions to Park Ridge

Verizon Wireless has submitted an application to the NPS proposing the construction of an eighty foot tower on Park Ridge in Kings Canyon National Park, in order to achieve their coverage objective which includes a portion of the Generals Highway and Highway 180 in the vicinity of the Grant Grove area.

The proposed issuance of a right-of-way permit by the NPS to Verizon Wireless would include an 80 foot tall monopole tower with panel antennas and microwave dishes. Ground radio equipment, associated air conditioning units and an emergency backup generator powered by propane fuel, stored in a prefabricated shelter approximately 12 feet x 30 feet in size. A 500 gallon propane tank would be installed on site to operate the generator.

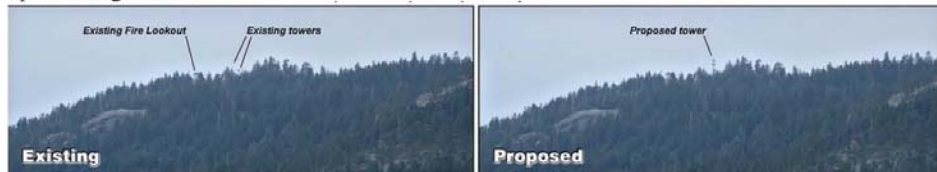


Photo Simulation of view from Buena Vista trail provided by Verizon Wireless.

The project would impact approximately 25 feet x 58 feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. Concrete foundations would be placed for the tower and service building. The disturbance would remove manzanita and chinquapin shrubs.

An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is anticipated that no additional excavation of the access road would be necessary for either construction activities or subsequent maintenance of the new telecommunications facility.

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APPENDIX B

EXAMPLE OF THE CONSULTATION AND COORDINATION LETTER SENT TO THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND THE TEN AFFILIATED TRIBES

Consultation and coordination letters were mailed to the following recipients:

**Milford W. Donaldson, State Historic Preservation Officer
Kelly Yasaitis Fanizzo, JD, Program Analyst, Advisory Council on Historic Preservation
Richard Wilder, Fort Independence Paiute Indians
Greg Shipman, Bishop Indian Tribal Council
Connie Lewis, Big Sandy Rancheria of Mono Indians
Neil Peyron, Tule River Indian Reservation
Jessica Bacoch, Big Pine Paiute Tribe of Owens Valley
Jennifer Philley, Cold Springs Rancheria of Mono Indians
Delores Roberts, North Fork Rancheria of Mono Indians
Mike Sisco, Santa Rosa Rancheria
Rachel A. Joseph, Paiute-Shoshone of Lone Pine
Leanne Walker-Grant, Table Mountain Rancheria
RoseAnn Dominguez, Sierra Foothill Wuksachi Tribe
Tina Williams, Cold Springs Rancheria of Mono Indians**



United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341



IN REPLY REFER TO:

H4217 (SEKI)

December 16, 2008

Milford W. Donaldson, State Historic Preservation Officer
Office of Historic Preservation, Department of Parks and Recreation
P.O. Box 942896
Sacramento, California 94296-0001

Dear Mr. Donaldson:

The National Park Service (NPS) is preparing an Environmental Assessment (EA) for the proposed construction of an eighty foot cellular tower on Park Ridge near Grant Grove within Kings Canyon National Park. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands. The EA will address alternatives in compliance with the Telecommunications Act of 1996 and NPS Reference Manual 53, for the proposed development including a no action alternative which would not permit construction of a wireless tower.

Verizon Wireless has submitted an application to the NPS proposing the construction of an eighty foot tower on Park Ridge in Kings Canyon National Park, in order to achieve their coverage objective which includes a portion of the Generals Highway and Highway 180 in the vicinity of the Grant Grove area.

Park Ridge is an established telecommunications site for Sequoia and Kings Canyon National Parks. Current structures on Park Ridge include: a 20' fire lookout tower; a 10'x10' concrete block structure containing NPS communications equipment and back up power generator; a 40' lattice tower with NPS telecommunications transmission equipment; a 30' tower on top of the NPS communications equipment building, containing a passive reflector used for landline service operated by Verizon California; an 8'x8' concrete block structure belonging to the United States Forest Service and containing radio equipment and backup power generator; and a 40' lattice tower with USFS radio transmission equipment.

The proposed issuance of a right-of-way permit by the NPS to Verizon Wireless would include an 80 foot tall monopole tower with panel antennas and microwave dishes. Ground radio equipment, associated air conditioning units and an emergency backup generator powered by propane fuel, stored in a prefabricated shelter approximately 12 feet x 30 feet in size. A 500 gallon propane tank would be installed on site to operate the generator.



The project would impact approximately 25 feet x 58 feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. Concrete foundations would be placed for the tower and service building. The disturbance would remove manzanita and chinquapin shrubs.

An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is anticipated that no additional excavation of the access road would be necessary for either construction activities or subsequent maintenance of the new telecommunications facility.

The NPS is planning to use the National Environmental Policy Act (NEPA) process to also address National Historic Preservation Act (NHPA) section 106 needs, as outlined in 36 CFR 800.8. This letter is being sent to provide your office with advance notification of the NPS's intent to use the NEPA process for the preparation of an Environmental Assessment (EA) to comply with the project's section 106 requirements. In accordance with 36 CFR 800.8(a)(3)(c), we are also notifying the Advisory Council on Historic Preservation (ACHP) by copy of this letter.

We look forward to working with you as we proceed with our environmental planning. Please do not hesitate to contact us if you have any initial concerns or comments regarding the proposed project. Cultural Resources Specialist, Tom Burge, can be reached directly at (559) 565-3139 if you have any questions regarding this proposed project. Thank you for your assistance with the matter.

Sincerely,



Craig C. Axtell
Superintendent

cc:

Kelly Yasaitis Fanizzo, JD, Program Analyst
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

APPENDIX C

FEDERAL AVIATION ADMINISTRATION DETERMINATION OF NO HAZARD TO AIR NAVIGATION



Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2009-AWP-1599-OE

Issued Date: 04/10/2009

Stephen Smith
Complete Wireless Consulting
2009 V Street
Sacramento, CA 95818

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower Verizon Wireless - Wilsonia (173515)
Location:	Wilsonia, CA
Latitude:	36-43-30.51N NAD 83
Longitude:	118-56-35.89W
Heights:	84 feet above ground level (AGL) 7628 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking and/or lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 10/10/2010 unless:

- (a) extended, revised or terminated by the issuing office.
- (b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (817) 838-1993. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2009-AWP-1599-OE.

Signature Control No: 628500-109059610

(DNE)

Joan Tengowski
Technician

Attachment(s)
Frequency Data

Frequency Data for ASN 2009-AWP-1599-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

APPENDIX D

SITE PLANS FOR PROPOSED VERIZON WIRELESS COMMUNICATIONS TOWER ON PARK RIDGE

GENERAL NOTES

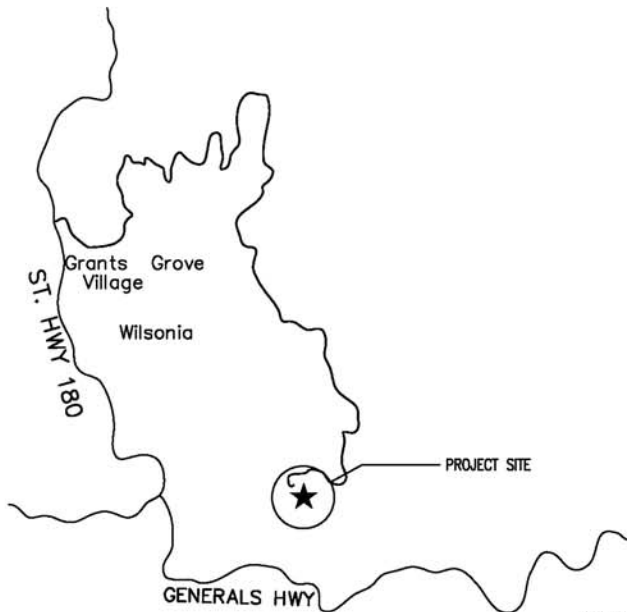
1. DRAWINGS ARE NOT TO BE SCALED. WRITTEN DIMENSIONS TAKE PRECEDENCE, AND THIS SET OF PLANS IS INTENDED TO BE USED FOR DIAGRAMMATIC PURPOSES ONLY, UNLESS NOTED OTHERWISE. THE GENERAL CONTRACTOR'S SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ANYTHING ELSE DEEMED NECESSARY TO COMPLETE INSTALLATIONS AS DESCRIBED HEREIN.
2. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS INVOLVED SHALL VISIT THE JOB SITE AND FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THE PROPOSED PROJECT, WITH THE CONSTRUCTION AND CONTRACT DOCUMENTS, FIELD CONDITIONS AND CONFIRM THAT THE PROJECT MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY ERRORS, OMISSIONS, OR DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ ENGINEER.
3. THE GENERAL CONTRACTOR SHALL RECEIVE WRITTEN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
4. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
5. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
6. ALL WORK PERFORMED ON PROJECT AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL OBEY ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK.
7. GENERAL CONTRACTOR SHALL PROVIDE AT THE PROJECT SITE A FULL SET OF CONSTRUCTION DOCUMENTS UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
8. THE STRUCTURAL COMPONENTS OF THIS PROJECT SITE/FACILITY ARE NOT TO BE ALTERED BY THIS CONSTRUCTION PROJECT UNLESS NOTED OTHERWISE.
9. DETAILS HEREIN ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB CONDITIONS OR SITUATIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE SCOPE OF WORK.
10. SEAL PENETRATIONS THROUGH FIRE-RATED AREAS WITH U.L. LISTED OR FIRE MARSHALL APPROVED MATERIALS IF APPLICABLE TO THIS FACILITY AND OR PROJECT SITE.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO THE CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. CONTRACTOR SHALL SEE TO IT THAT GENERAL WORK AREA IS KEPT CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE ARCHITECTS/ENGINEERS HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. CONTRACTORS BIDDING THE JOB ARE NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS. THE BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE ARCHITECT/ENGINEER OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED OTHERWISE.

DIRECTIONS

- FROM VERIZON OFFICE @ 2785 MITCHELL DR., WALNUT CREEK, CA 94598
1. START OUT GOING SOUTHWEST ON MITCHELL DRIVE TOWARD N WISSET LN.
 2. TURN LEFT ONTO N WISSET LN.
 3. TURN RIGHT ONTO YONACIO VALLEY RD.
 4. MERGE ONTO I-680 S VIA THE RAMP ON THE LEFT TOWARD SAN JOSE.
 5. MERGE ONTO I-680 E TOWARD STOCKTON.
 6. KEEP LEFT TO TAKE I-205 E TOWARD TRACY / STOCKTON.
 7. MERGE ONTO I-5 NORTH.
 8. MERGE ONTO CA-120 E VIA EXIT 461 TOWARD MANTICA / SONORA.
 9. MERGE ONTO CA-99 SOUTH TOWARD MODOSTO / FRESNO / LOS ANGELES.
 10. TAKE THE CA-180 EXIT - EXIT 133- TOWARD KINGS CANYON / MENDOTA / AIRPORT.
 11. MERGE ONTO CA-180 E. VIA EXIT 133B ON THE LEFT TOWARD KINGS CANYON / AIRPORT.
 12. TAKE THE CLOVIS AVE. EXIT-EXIT 63.
 13. TURN RIGHT ONTO N CLOVIS AVE. / CA-180 E.
 14. TURN LEFT ONTO CA-180 E. / E. CANYON RD. CONTINUE TO FOLLOW CA-180 E.
 15. TURN LEFT ONTO CA-180.
 16. STAY STRAIGHT TO GO ONTO GENERALS HWY.
 17. TURN RIGHT @ GRANTS VILLAGE, FOLLOW RD. APPROX. 1.68 MILES (ROAD WILL TURN INTO A DIRT ROAD).
 18. END AT SITE, APPROX. 2 MILES TO TOP OF PARK RIDGE.



WILSONIA
KINGS CANYON NATIONAL PARK
WILSONIA, CA 93633
APN: 001-070-026
PROJECT #: 2006181847
LOCATION #: 173515



WILSONIA, CA

VICINITY MAP

PROJECT DIRECTORY

ARCHITECT:
MANUEL S. TSHILAS
MST ARCHITECTS, INC.
801 ALHAMBRA BLVD., SUITE 2
SACRAMENTO, CA 95816
916-505-3811
mstarchitects.com

OWNER:
VERIZON WIRELESS
255 PARKSHORE DRIVE
FOLSOM, CA 95630

LANDSCAPE:
NATIONAL PARK SERVICE
47050 GENERALS HWY.
THREE RIVERS, CA 93270

CONSTRUCTION MANAGER:
BOB SCHROEDER
COMPLETE WIRELESS CONSULTING
9300 TECH CENTER DRIVE, SUITE 190
SACRAMENTO, CA 95828
916-622-4653
bschroeder@completwireless.net

APPROVALS

LEASING: _____ DATE: _____
ZONING: _____ DATE: _____
RF ENGINEER: _____ DATE: _____
CONSTRUCTION (COW): _____ DATE: _____
CONSTRUCTION (CWC): _____ DATE: _____
EQUIPMENT ENGINEER: _____ DATE: _____
OWNER: _____ DATE: _____

PROJECT SUMMARY

PROPERTY INFORMATION
LAT.: N39° 43' 30.21" NAD 83
LONG.: W118° 56' 35.82" NAD 83
LAT.: N39° 43' 30.40" NAD 27
LONG.: W118° 56' 32.44" NAD 27
ASSESSOR'S PARCEL NUMBER: 001-070-026
JURISDICTION: FRESNO COUNTY
OCCUPANCY: S-2
TYPE OF CONSTRUCTION: V-N
ZONING: NATIONAL PARK

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

1. CALIFORNIA ADMINISTRATIVE CODE (INCL. TITLE 24 & 25)
2. 2007 CALIFORNIA BUILDING CODE
3. 2007 CALIFORNIA MECHANICAL CODE
4. 2007 CALIFORNIA PLUMBING CODE
5. 2007 CALIFORNIA ELECTRICAL CODE
6. 2007 CALIFORNIA FIRE CODE
7. LOCAL COUNTY OR CITY ORDINANCES

ACCESSIBILITY REQUIREMENTS:
THIS FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH THE 2007 CALIFORNIA BUILDING CODE.

PROJECT DESCRIPTION

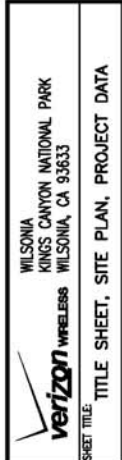
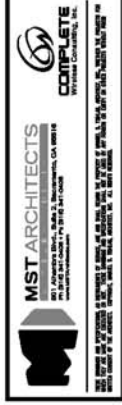
PROPOSED VERIZON WIRELESS COMMUNICATIONS FACILITY IN AN IRREGULAR 1454 SQUARE FOOT LEASE AREA INCLUDING: 11'-6"x33'-6" EQUIPMENT SHELTER WITH STANDBY GAS GENERATOR ENCLOSURE, LIQUID PROPANE TANK ON A 5'-0"x10'-0" CONCRETE EQUIPMENT PAD, POWER AND TELCO TO SITE, & AN 80'-0" TALL MONOPOLE WITH (3) ANTENNA SECTORS - (4) PROPOSED ANTENNAS PER SECTOR & (2) FUTURE 6'-0" MICROWAVE DISHES

PROJECT MILESTONES

09/05/07	/ 90% ZONING DOCUMENTS
11/14/07	/ 100% ZONING DOCUMENTS
12/14/07	/ REVISION 1
03/15/08	/ REVISION 2
03/06/08	/ REVISION 3
---	/ 90% CONSTRUCTION DOCUMENTS
---	/ 100% CONSTRUCTION DOCUMENTS

INDEX OF DRAWINGS

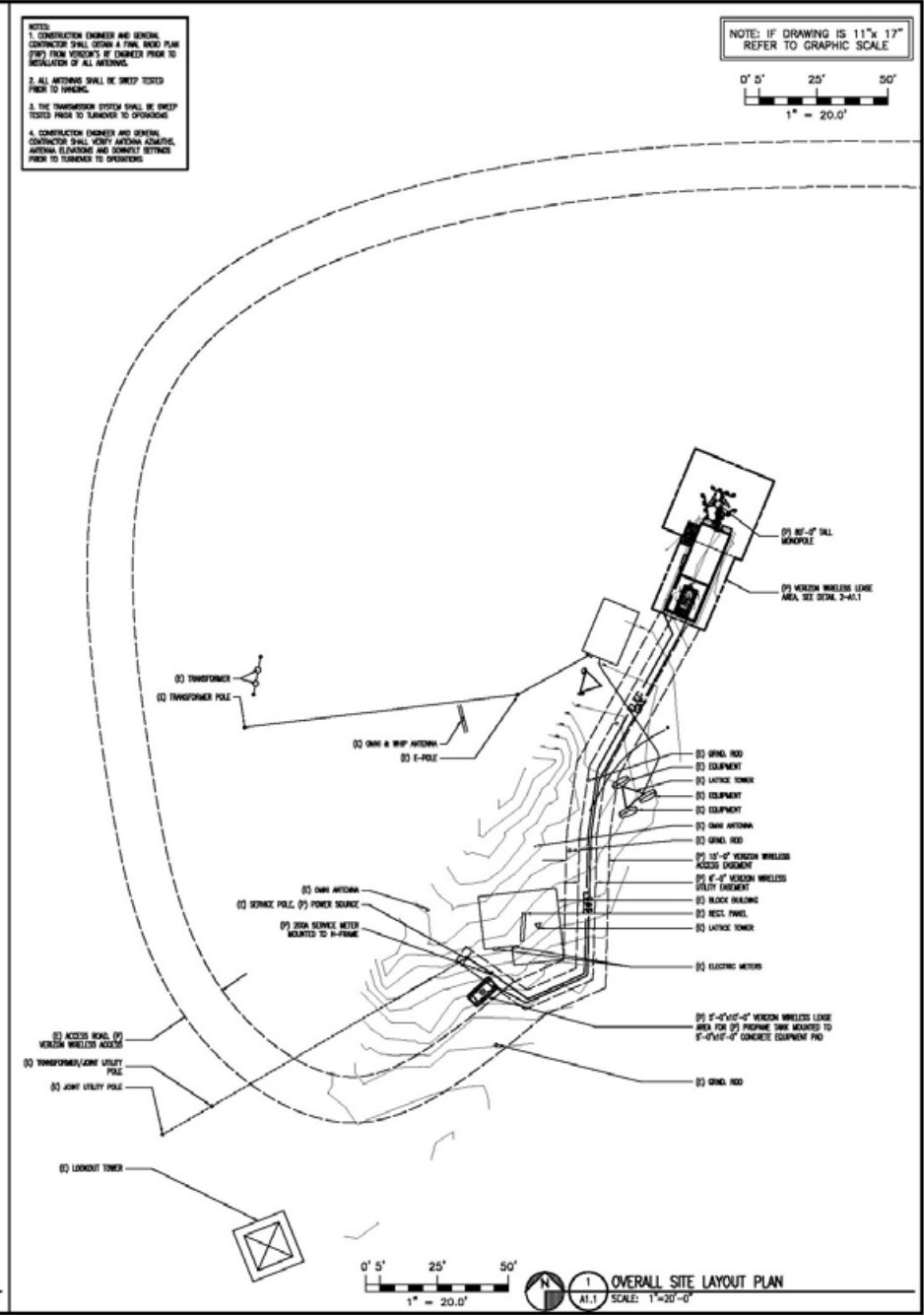
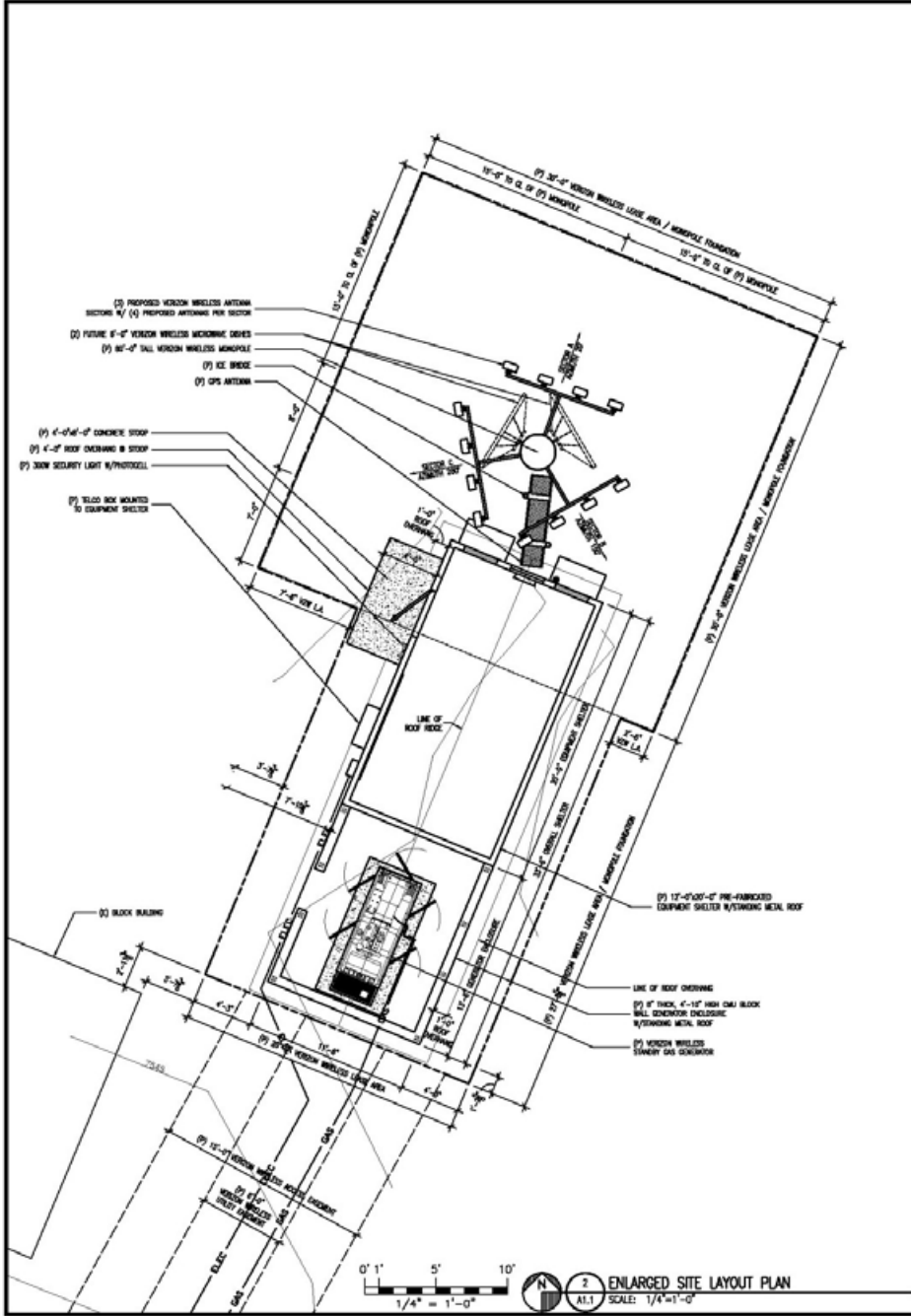
ZONING	1	T1.1	TITLE SHEET, SITE PLAN, PROJECT DATA
DOCUMENTS	2	C.1	CIVIL SURVEY SHEET
	3	A1.1	EQUIPMENT LAYOUT PLANS
	4	A1.2	PROJECT ELEVATIONS



Revisions:
A 12/14/07
A 04/12/08
A 03/06/08
A ---
File: 183.184.T1.dwg
Drawn By: MTT
Checked By: MTT
Scale: as shown
Date: 03/06/08

Job No. 183.184

T1.1



MST ARCHITECTS
101 LAUREL STREET, SUITE 200
WILSONA, CA 93633
TEL: 916.438.1111
WWW.MSTARCHITECTS.COM

WILSONA
KINGS CANYON NATIONAL PARK
WILSONA, CA 93633
verizon WIRELESS
EQUIPMENT LAYOUT PLANS

SHEET TITLE:

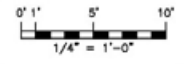
Rev/Issued:
A 12/14/17
A 04/12/18
A 05/04/18
A 06/04/18

Drawn By: MST
Checked By: MST
Scale: AS SHOWN
Notes: 05/04/18

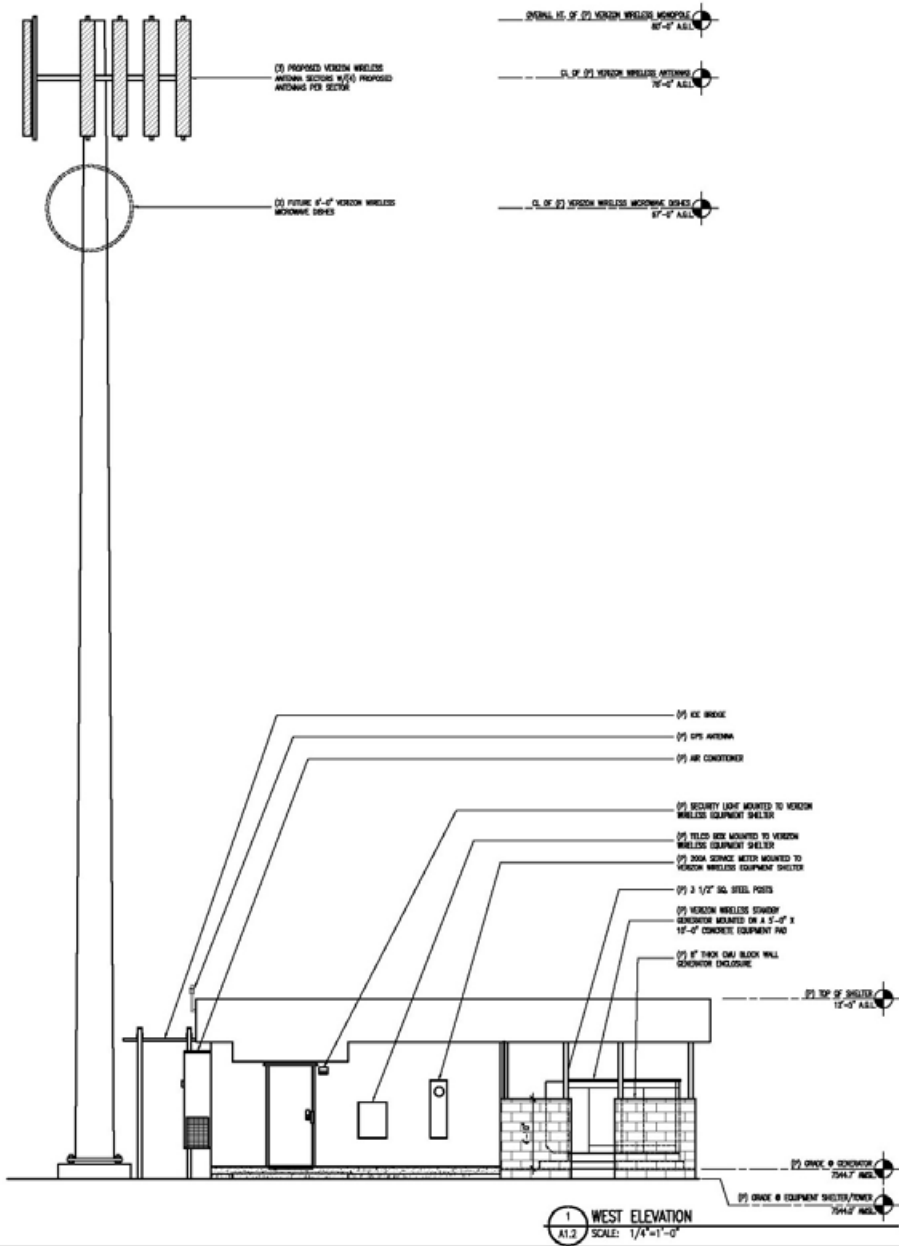
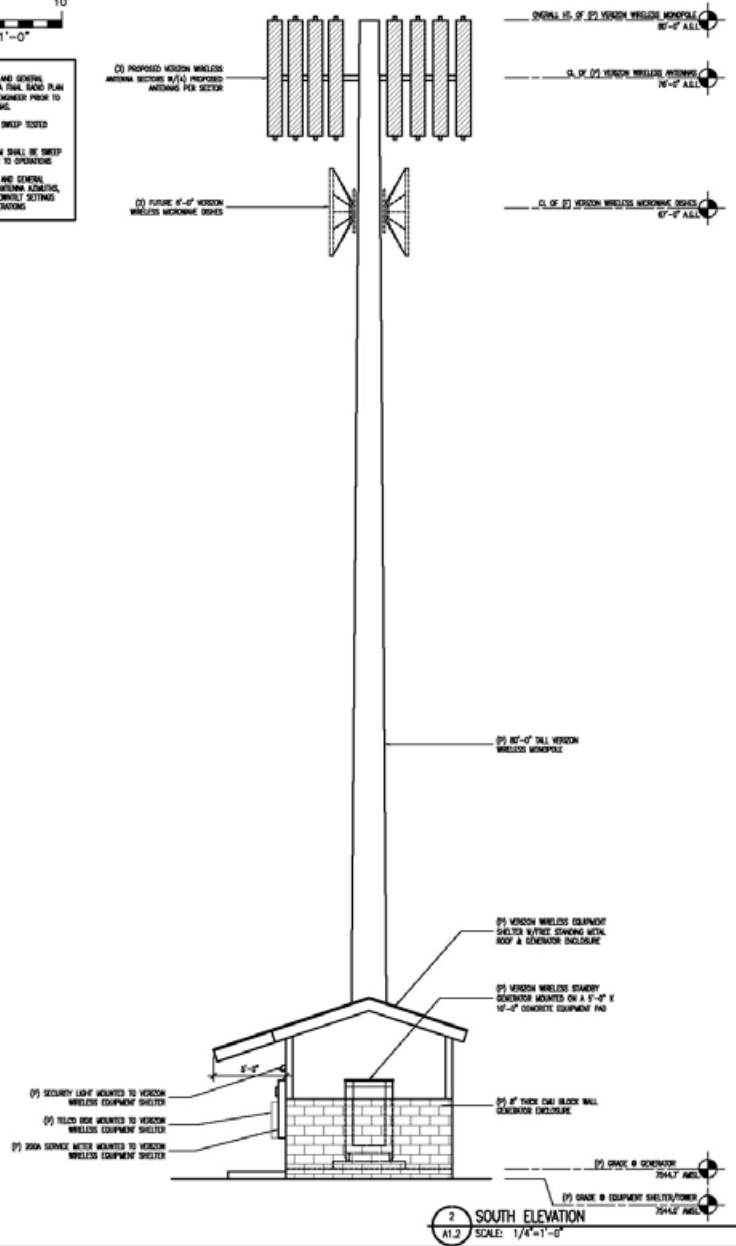
Job No. 161108

A1.1

NOTE: IF DRAWING IS 11" x 17"
REFER TO GRAPHIC SCALE



- NOTES:
1. CONSTRUCTION ENGINEER AND GENERAL CONTRACTOR SHALL OBTAIN A FINAL RADIO PLAN (FRP) FROM VERIZON PRIOR TO INSTALLATION OF ALL ANTENNAS.
 2. ALL ANTENNAS SHALL BE SWEEP TESTED PRIOR TO HANDING.
 3. THE TRANSMISSION SYSTEM SHALL BE SWEEP TESTED PRIOR TO TURNING TO OPERATIONS.
 4. CONSTRUCTION ENGINEER AND GENERAL CONTRACTOR SHALL VERIFY ANTENNA LOCATIONS, ANTENNA ELEVATIONS AND DOWNSHIFT SETTINGS PRIOR TO TURNING TO OPERATIONS.



MST ARCHITECTS
101 W. 10TH STREET, SUITE 100
WILSONIA, CA 93633
TEL: 916.438.1111
WWW.MSTARCHITECTS.COM

WILSONIA
KINGS CANYON NATIONAL PARK
WILSONIA, CA 93633
PROJECT ELEVATIONS

DATE: 01/14/15
DRAWN BY: BJC
CHECKED BY: BJC
SCALE: 1/4" = 1'-0"
JOB NO. 141108

A1.2

APPENDIX E

REPORT ON THE MAXIMUM POTENTIAL RADIOFREQUENCY POWER DENSITY FROM THE PROPOSED VERIZON WIRELESS TELECOMMUNICATIONS SITE

JERROLD T. BUSHBERG Ph.D., DABMP, DABSNM

.HEALTH AND MEDICAL PHYSICS CONSULTING.

7784 Oak Bay Circle Sacramento, CA 95831

(800) 760-8414—jbushberg@hampc.com

January 29, 2009

Crystal D. Wood

Complete Wireless Consulting

2009 V Street

Sacramento, CA 95818

Introduction

At your request, I have reviewed the technical specifications and calculated the maximum radiofrequency, (RF), power density from the proposed Verizon Wireless (VW) wireless telecommunications site, (referenced as Wilsonia), to be located in Kings Canyon National Park, Wilsonia, CA as depicted in attachment one. This study specifically addresses compliance with the Federal Communications Commission, (FCC), public exposure RF safety standard and the maximum potential RF exposure to park personnel manning a look-out station located near the proposed Verizon Wireless facility.

This proposed VW telecommunication site will utilize directional transmit panel antennae configured in three (3) sectors. The antennae are planned to be mounted to a monopole, with their center at least 76 feet above grade directed at 20 (sector A), 150 (sector B) and 260 (sector C) degrees true north. The antennas specified are CSS Inc. model # SA15-78 and Andrew Inc. model # LBV-4515LS-VTM for all sectors. Technical specifications of these antennae are provided in attachment two. The sectorized antennas are designed to transmit with an effective radiated power (ERP) of up to 550 watts per sector within a bandwidth between approximately 806 and 960 MHz (Cellular frequencies). The future addition of two six foot microwave dishes at 67 feet above grade will not contribute to any additional exposure to park personnel in that the input power to these dishes is very low (i.e., typically a few watts). In addition the transmission energy is confined to a fairly tight beam emitted at the elevation of the dish and parallel to the ground (i.e., ~37 feet above the top of look-out tower relative to the dish elevation), and the direction of transmission is pointed away from the look-out tower.

Calculation Methodology, Results & Recommendations

Calculations were made in accordance with the recommendations contained in the Federal Communications Commission, Office of Engineering and Technology Bulletin 65 (edition 97-01, page 24, equation 10) entitled "Evaluating Compliance with FCC-Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." Several assumptions were made in order to provide the most conservative or "worse case" projections of power densities. Calculations were made assuming that the maximum ERP was all from the antenna, (LBV-4515LS-VTM), that resulted in the highest potential exposure to personnel manning the look-out station. All channels were assumed to be operating simultaneously at their maximum design effective radiated power. Attenuation (weakening) of the 2 signal that would result from surrounding foliage or buildings was ignored. Buildings can reduce the signal strength by a factor of 10 (i.e., 10 dB) or more depending upon the construction material. The ground or other surfaces were considered to be perfect reflectors (which they are not) and the RF energy was assumed to

overlap and interact constructively at all locations (which they would not) thereby resulting in the calculation of the maximum potential exposure. In fact, the accumulations of all these very conservative assumptions will significantly overestimate the actual exposures that would typically be expected from such a facility. However, this method is a prudent approach that errs on the side of safety.

The maximum potential RF exposure to park personnel manning the look-out station was calculated to be less than $2.9 \text{ } \mu\text{W}/\text{cm}^2$ (i.e., 0.5 % of the FCC public safety standard). Exposure details are shown in appendix A. A sign conforming to with ANSI C95.2 color, symbol and content, and other markings as appropriate, should be placed close to the antennas with appropriate contact information in order to alert maintenance or other workers approaching the antenna to the presence of RF transmissions and to take precautions to avoid exposures in excess of FCC limits.

RF Safety Standards

The two most widely recognized standards for protection against RF field exposure are those published by the American National Standards Institute (ANSI) C95.1 and the National Council on Radiation Protection and measurement (NCRP) report #86.

The NCRP is a private, congressionally chartered institution with the charge to provide expert analysis of a variety of issues (especially health and safety recommendations) on radiations of all forms. The scientific analyses of the NCRP are held in high esteem in the scientific and regulatory community both nationally and internationally. In fact, the vast majority of the radiological health regulations currently in existence can trace their origin, in some way, to the recommendations of the NCRP.

All RF exposure standards are frequency-specific, in recognition of the differential absorption of RF energy as a function of frequency. The most restrictive exposure levels in the standards are associated with those frequencies that are most readily absorbed in humans. Maximum absorption occurs at approximately 80 MHz in adults. The NCRP maximum allowable continuous occupational exposure at this frequency is $1,000 \text{ } \mu\text{W}/\text{cm}^2$. This compares to $2,933 \text{ } \mu\text{W}/\text{cm}^2$ at cellular frequencies and $5,000 \text{ } \mu\text{W}/\text{cm}^2$ at PCS frequencies that are absorbed much less efficiently than exposures in the VHF TV band.

The traditional NCRP philosophy of providing a higher standard of protection for members of the general population compared to occupationally exposed individuals, prompted a two-tiered safety standard by which levels of allowable exposure were substantially reduced for "uncontrolled " (e.g., public) and continuous exposures. This measure was taken to account for the fact that workers in an industrial environment are typically exposed no more than eight hours a day while members of the general population in proximity to a source of RF radiation may be exposed continuously. This additional protection factor also provides a greater margin of safety for children, the infirmed, aged, or others who might be more sensitive to RF exposure. After several years of evaluating the national and international scientific and biomedical literature, the members of the NCRP scientific committee selected 931 publications in the peer-reviewed scientific literature on which to base their recommendations. The current

NCRP recommendations limit continuous public exposure at cellular frequencies (e.g., ~ 820MHz) to 550 :W/cm² and to 1,000 :W/cm² at PCS frequencies (~1,900 MHz).

The 1992 ANSI standard was developed by Scientific Coordinating Committee 28 (SCC 28) under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). This standard, entitled "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991), was issued in April 1992 and subsequently adopted by ANSI. A revision of this standard (C95.1-2005) was completed in October 2005 by SCC 39- the IEEE International Committee on Electromagnetic Safety. Their recommendations are similar to the NCRP recommendation for the maximum permissible exposure (MPE) to the public at cellular and PCS frequencies (410 :W/cm² and 950 :W/cm² for continuous exposure at 820 MHz and 1,900 MHz respectively) and incorporates the convention of providing for a greater margin of safety for public as compared with occupational exposure. Higher whole body exposures are allowed for brief periods provided that no 30 minute time-weighted average exposure exceeds these aforementioned limits.

On August 9, 1996, the FCC established a RF exposure standard that is a hybrid of the current ANSI and NCRP standards. The maximum permissible exposure values used to assess environmental exposures are those of the NCRP (i.e., maximum public continuous exposure at cellular and PCS frequencies of 550 :W/cm² and 1,000 :W/cm² respectively). The FCC issued these standards in order to address its responsibilities under the National Environmental Policy Act (NEPA) to consider whether its actions will "significantly affect the quality of the human environment." In as far as there was no other standard issued by a federal agency such as the Environmental Protection Agency (EPA), the FCC utilized their rulemaking procedure to consider which standards should be adopted. The FCC received thousands of pages of comments over a three-year review period from a variety of sources including the public, academia, federal health and safety agencies (e.g., EPA & FDA) and the telecommunications industry. The FCC gave special consideration to the recommendations by the federal health agencies because of their special responsibility for protecting the public health and safety. In fact, the maximum permissible exposure (MPE) values in the FCC standard are those recommended by EPA and FDA. The FCC standard incorporates various elements of the 1992 ANSI and NCRP standards which were chosen because they are widely accepted and technically supportable. There are a variety of other exposure guidelines and standards set by other national and international organizations and governments, most of which are similar to the current ANSI/IEEE or NCRP standard, figure one.

The FCC standards "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation" (Report and Order FCC 96-326) adopted the ANSI/IEEE definitions for controlled and uncontrolled environments. In order to use the higher exposure levels associated with a controlled environment, RF exposures must be occupationally related (e.g., wireless company RF technicians) and they must be aware of and have sufficient knowledge to control their exposure. All other environmental areas are considered uncontrolled (e.g., public) for which the stricter (i.e., lower) environmental exposure limits apply. All carriers were required to be in compliance with the new FCC RF exposure standards for new telecommunications facilities by October 15, 1997. These standards applied retroactively for existing telecommunications facilities on September 1, 2000.

The task for the physical, biological, and medical scientists that evaluate health implications of the RF data base has been to identify those RF field conditions that can produce harmful biological effects. No panel of experts can guarantee safe levels of exposure because safety is a null concept, and negatives are not susceptible to proof. What a dispassionate scientific assessment can offer is the presumption of safety when RF-field conditions do not give rise to a demonstrable harmful effect.

Summary & Conclusions

This proposed wireless facility as specified above will be in full compliance with FCC RF public safety standards. Wireless PCS and Cellular transmitters, by design and operation, are low-power devices. Even under maximal exposure conditions in which all the channels from all antennas are operating at full power, the maximum RF exposures to park personnel manning a look-out station was calculated to be less than 2.9 W/cm^2 (i.e., 0.5 % of the FCC public safety standard). This maximum exposure is more than 200 times lower than the FCC public exposure standards for these frequencies. A chart of the electromagnetic spectrum and a comparison of RF power densities from various common sources is presented in figures two and three respectively in order to place exposures from wireless telecommunications systems in perspective.

It is important to realize that the FCC maximum allowable exposures are not set at a threshold between safety and known hazard but rather at 50 times below a level that the majority of the scientific community believes may pose a health risk to human populations. Thus the previously mentioned maximum exposure from the site represent a "safety margin" from this threshold of potentially adverse health effects of more than 10,000 times.

Given the low levels of radiofrequency fields that would be generated from this facility, and given the evidence on biological effects in a large data base, there is no scientific basis to conclude that harmful effects will attend the utilization of the proposed wireless telecommunications facility. This conclusion is supported by a large numbers of scientists that have participated in safety standard-setting activities in the United States who are overwhelmingly agreed that RF radiation exposure below the FCC exposure limits has no demonstrably harmful effects on humans.

These findings are based on my professional evaluation of the scientific issues related to the health and safety of non-ionizing electromagnetic radiation and my analysis of the technical specification as provided by VW. The opinions expressed herein are based on my professional judgment and are not intended to necessarily represent the views of any other organization or institution. Please contact me if you require any additional information.

Sincerely,

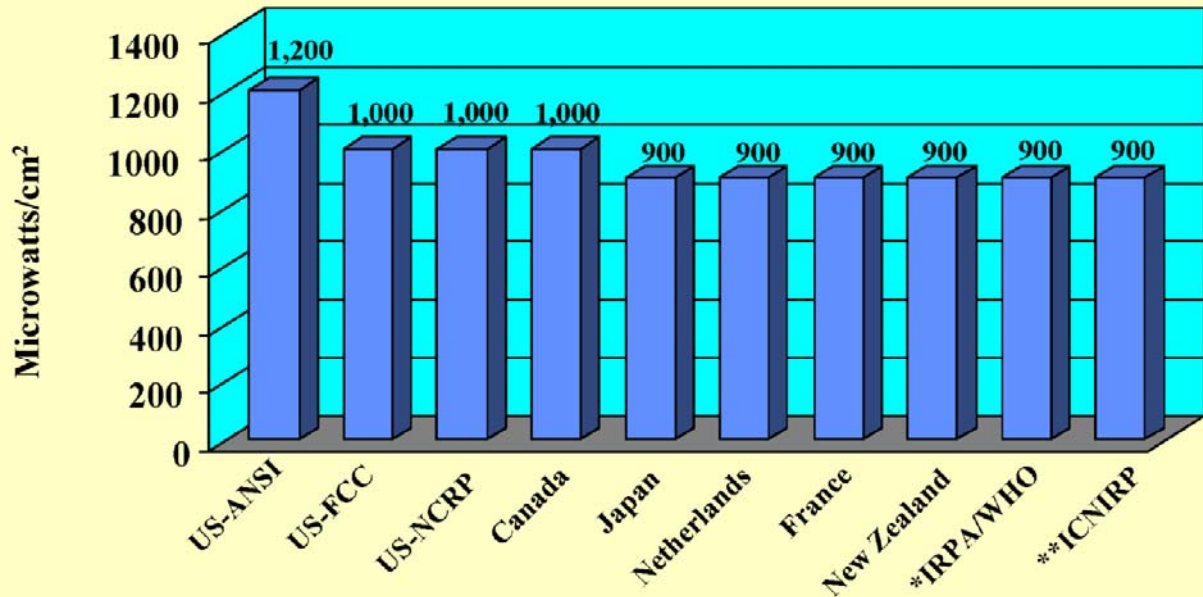
Jerrold T. Bushberg Ph.D., DABMP, DABSNM

Diplomate, American Board of Medical Physics (DABMP)

Diplomate, American Board of Science in Nuclear Medicine (DABSNM)

Enclosures: Figures 1-3; Attachments 1, 2; Appendix A, and Statement of Experience.

Public Safety Exposure Standards at PCS (~1,800 MHz) Frequencies



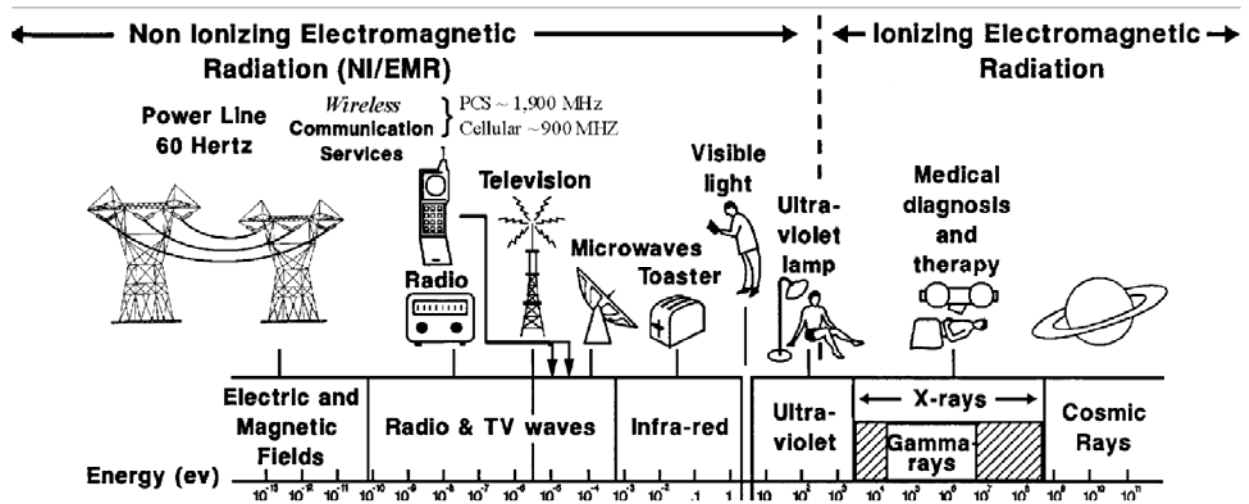
*International Radiation Protection Association (IRPA)/ World Health Organization Environmental Health (WHO) Public Safety Exposure Standard (1993). Members of the Scientific Committee were from:

• Australia	• Canada	• France	• Germany	• Hungary
• Italy	• Poland	• Russia	• United Kingdom	• United States

**International Commission on Non-Ionizing Radiation Protection Public Safety Exposure Standard (1998). Members of the Scientific Committee were from:

• Australia	• Sweden	• France	• Germany	• Hungary	• Finland
• Italy	• Poland	• Austria	• United Kingdom	• United States	• Japan

Figure 1



The Electromagnetic Spectrum

Figure 2

Typical Exposure from Various Radio Frequency / Microwave Sources

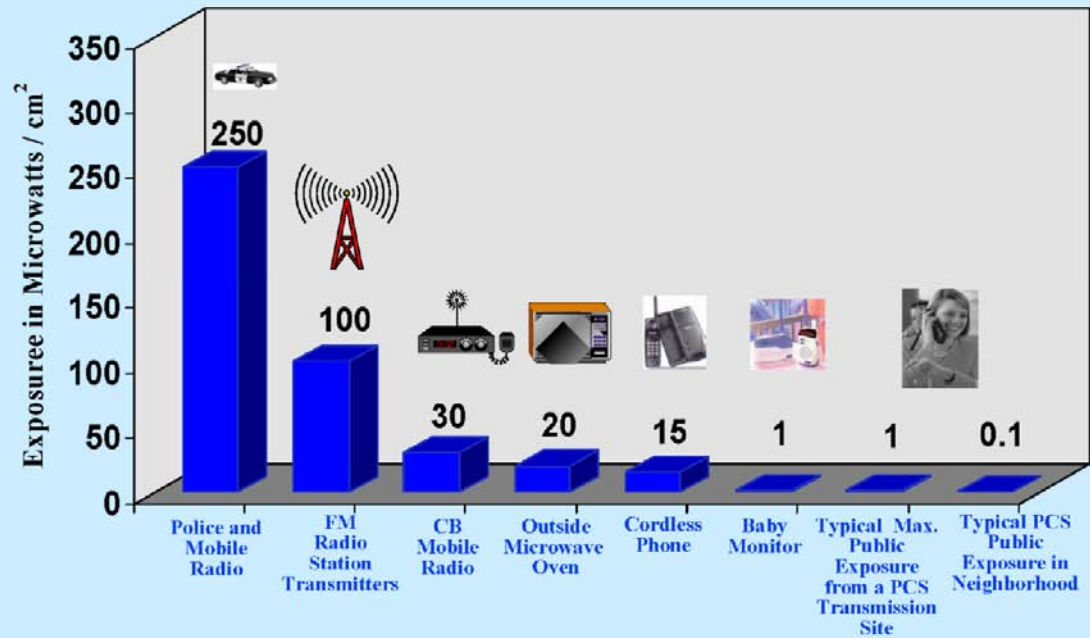


Figure 3

Attachment 1

Site Specifications

Note: This Attachment 1 is identical to Appendix D in this environmental assessment/assessment of effect (EA/A0E). Therefore, this Attachment 1 is not included here. View Appendix D to see the contents of Attachment 1.

Attachment 2

Antenna Specifications



Directing our energies for you.

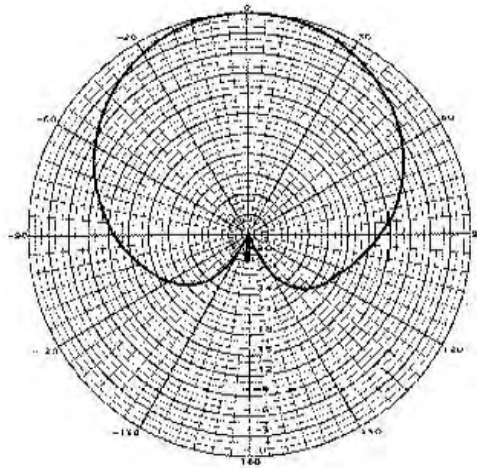
Stripline Array SA15-78

78 degree Azimuth Beam and 15.4 dBd Gain

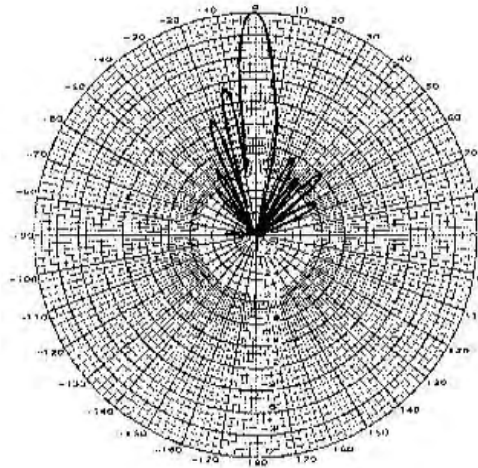
- Vertically Polarized
- Stripline Feed Eliminates Internal Cabling Network
- Anti-Corrosion Design for Superb IM Performance
- Equalized Aerodynamic Design



Azimuth Beam: 78 degree



Elevation Beam: 8 degree



CSS Antenna, Inc. 2206-D Lakeside Blvd., Edgewood, MD 21040, Tel: 410-612-0080 Fax: 410-612-0336
www.cssantenna.com



Directing our energies for you.

Stripline Array SA15-78

Electrical Specifications

Frequency Range	806-900 MHz
Gain	15.4 dBd
Electrical Downtilt Options	0, 2 or 4 Degrees
VSWR	1.40:1 Maximum
Front-to-Back at Horizon	> 27 dB
Upper Side Lobe Suppression	< -22 dB
Elevation Beam (3-dB Points)	8 Degrees
Azimuth Beam (3-dB Points)	78 Degrees
Polarization	Vertical
Impedance	50 Ohms
Power Input Rating	500 CW
Intermodulation Specification	<-110dBm at 2x10W

Mechanical Specifications

Input Connector (female)	Back Mounted 7/16 DIN or N-Type (Silver Finish)
Antenna Dimensions	96.4 x 14.5 x 9 Inches
Antenna Weight	43.5 lbs
Bracket Weight	10.5 lbs
Lightning Protection	Direct Ground
RF Distribution	Silver Plated Brass
Radome	Ultra High-Strength Luran
Weatherability	UV Stabilized, ASTM D1925
Radome Water Absorption	ASTM D570, 0.45%
Environmental	MIL-STD-810E
Wind Survival	120 mph
Front Wind Load at 100 mph	254 lbs
Front Flat Plate Equivalent	5.18 sq-ft. (c=2)
Mounting Brackets	Fits 2.5 to 3 Inch Schedule 40 Pipe
Mechanical Downtilt Range	0-6 Degrees in 1 Degree Increments
Clamps/Bolts	Hot Dip Galvanized Steel/Stainless Steel

Ordering Information

<u>Model</u>	<u>Options</u>
SA15-78-xD	7/16 DIN Connector, x=Electrical Downtilt in Degrees (0, 2 or 4)
SA15-78-xN	N-Type Connector, x=Electrical Downtilt in Degrees (0, 2 or 4)

*CSS Antenna, Inc.
Tel: 410-612-0080 Fax: 410-612-0336
www.cssantenna.com*

Product Specifications



LBV-4515LS-VTM

Directed Dipole™ Antenna, 806–960 MHz, 45° horizontal beamwidth, RET compatible variable electrical tilt



- Excellent azimuth roll-off, reducing sector-to-sector interference and soft hand-offs
- Fully compatible with Andrew remote electrical tilt system
- Excellent upper sidelobe suppression
- Low profile for ease of zoning approval

CHARACTERISTICS

General Specifications

Antenna Type	Directed Dipole™
Brand	Teletilt®
Operating Frequency Band	806 – 960 MHz

Electrical Specifications

Frequency Band, MHz	806–896	870–960
Beam width, Horizontal, degrees	45	43
Gain, dBd	14.2	14.7
Gain, dBi	16.3	16.8
Beamwidth, Vertical, degrees	17.5	16.5
Beam Tilt, degrees	0–15	0–15
Upper Sidelobe Suppression (USLS), typical, dB	22	22
Front-to-Back Ratio at 180°, dB	37	40
VSWR Return Loss, db	1.4:1 15.6	1.4:1 15.6
Intermodulation Products, 3rd Order, 2 x 20 W, dBc	-150	-150
Input Power, maximum, watts	300	300
Polarization	Vertical	Vertical
Impedance, ohms	50	50
Lightning Protection	dc Ground	dc Ground

From North America, toll free
Telephone: 1-800-255-1479
Fax: 1-800-349-5444

Outside North America
Telephone: +1-708-873-2307
Fax: +1-779-435-8579

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12/4/2008

Product Specifications

LBV4515LS-VTM



Mechanical Specifications

Color	Light gray
Connector Interface	7-16 DIN Female
Connector Location	Bottom
Connector Quantity	1
Wind Loading, maximum	516.0 N @ 100 mph 116.0 lbf @ 100 mph
Wind Speed, maximum	241.4 km/h 150.0 mph

Dimensions

Depth	213.4 mm 8.4 in
Length	1239.5 mm 48.8 in
Width	375.9 mm 14.8 in
Net Weight	9.1 kg 20.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LBV-4515LS-R2M
RET System	Teletilt®

Included Products



DB5083

DownTilt Mounting Kit for 4.5 in (114.3 mm) OD round members



DB380

Pipe Mounting Kit for 4.5 in (114.3 mm) OD round members

From North America, toll free
Telephone: 1-800-255-1479
Fax: 1-800-349-5444

Outside North America
Telephone: +1-708-873-2307
Fax: +1-779-435-8579

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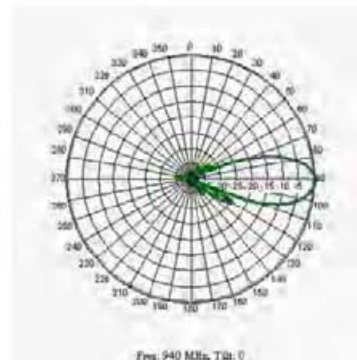
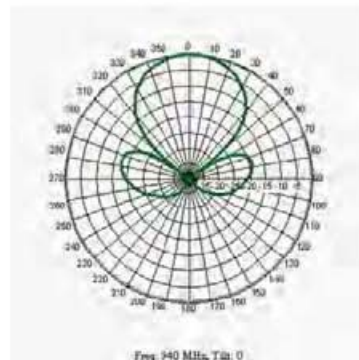
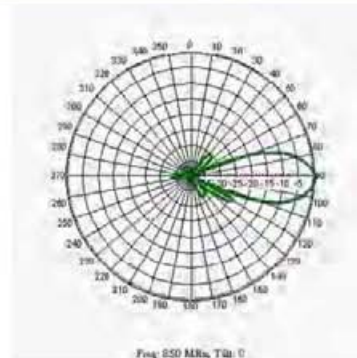
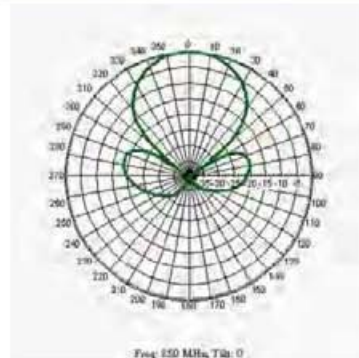
Product Specifications

LBV-4515LSVTM



Horizontal Pattern

Vertical Pattern



From North America, toll free
Telephone: 1-800-255-1479
Fax: 1-800-349-5444

Outside North America
Telephone: +1-708-873-2307
Fax: +1-770-435-8579

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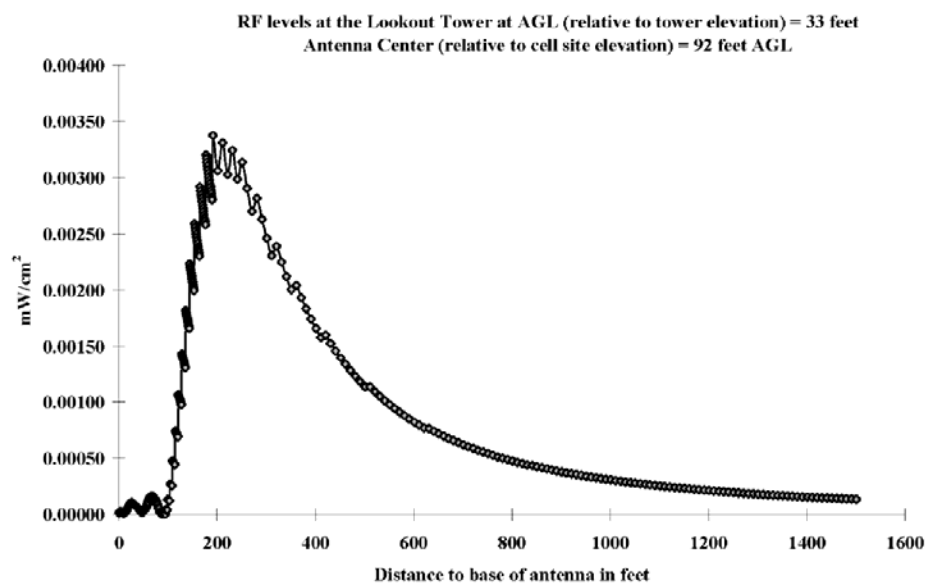
Report Appendix A

Andrew Inc. Model LBV-4515LS-VTM

Exposure Calculation at the Lookout Tower at 33 ft AGL (relative to tower elevation)

Antenna Center 76 ft AGL (relative to cell site elevation)

ERP 550 Watts (Cellular)



Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base Depress angle Antenna gain dB from max ERP Prop dist in cm Act ERP in mW Level mW/cm² Percent of FCC STD

0	90.000	-25.52	-39.72	1341.12	58.6628	0.00002	0.00294
1	88.698	-24.41	-38.61	1341.47	75.7465	0.00002	0.00380
2	87.397	-23.87	-38.07	1342.50	85.7754	0.00002	0.00429
3	86.100	-23.75	-37.95	1344.23	88.1785	0.00003	0.00440
4	84.808	-23.61	-37.81	1348.65	91.0673	0.00003	0.00453
5	83.517	-23.87	-38.07	1349.75	85.7754	0.00002	0.00424
6	82.235	-23.86	-38.06	1353.53	85.9731	0.00002	0.00423
7	80.961	-24.73	-38.93	1357.99	70.3660	0.00002	0.00344
8	79.695	-25.17	-39.37	1363.11	63.5862	0.00002	0.00309
9	78.440	-25.68	-39.88	1368.89	56.5409	0.00002	0.00272
10	77.196	-25.74	-39.94	1375.32	55.7651	0.00002	0.00266
11	75.964	-25.43	-39.63	1382.39	59.8912	0.00002	0.00283
12	74.745	-25.05	-39.25	1390.10	65.3676	0.00002	0.00305
13	73.540	-24.47	-38.67	1398.43	74.7072	0.00002	0.00344
14	72.350	-23.56	-37.76	1407.37	92.1219	0.00002	0.00419
15	71.175	-22.66	-36.86	1416.91	113.3346	0.00003	0.00509
16	70.017	-21.71	-35.91	1427.04	141.0466	0.00004	0.00624
17	68.875	-19.85	-34.05	1437.74	216.4525	0.00005	0.00944
18	67.751	-19.26	-33.46	1449.00	247.9492	0.00006	0.01065
19	66.644	-18.61	-32.81	1460.82	287.9802	0.00007	0.01217
20	65.556	-18.08	-32.28	1473.16	325.3589	0.00008	0.01352
21	64.486	-17.6	-31.8	1486.04	363.3814	0.00009	0.01484
22	63.435	-17.14	-31.34	1499.42	403.9826	0.00009	0.01620
23	62.403	-16.78	-30.98	1513.29	438.8971	0.00010	0.01728
24	61.390	-16.63	-30.83	1527.65	454.3209	0.00010	0.01755
25	60.396	-16.43	-30.63	1542.48	475.7324	0.00010	0.01803
26	59.421	-16.28	-30.48	1557.76	492.4506	0.00011	0.01830
27	58.465	-16.33	-30.53	1573.49	486.8136	0.00010	0.01773
28	57.529	-16.43	-30.63	1589.64	475.7324	0.00010	0.01697
29	56.611	-16.47	-30.67	1606.21	471.3708	0.00010	0.01647
30	55.713	-16.47	-30.67	1623.19	471.3708	0.00009	0.01613
31	54.834	-16.55	-30.75	1640.55	462.7673	0.00009	0.01550

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
32	53.973	-16.68	-30.88	1658.29	449.1203	0.00009	0.01473
33	53.130	-16.68	-30.88	1676.40	449.1203	0.00008	0.01441
34	52.308	-16.85	-31.05	1694.86	431.8796	0.00008	0.01356
35	51.499	-17.01	-31.21	1713.67	416.2581	0.00007	0.01278
36	50.711	-17.28	-31.48	1732.81	391.1674	0.00007	0.01175
37	49.939	-17.5	-31.7	1752.27	371.8456	0.00006	0.01092
38	49.185	-17.5	-31.7	1772.04	371.8456	0.00006	0.01068
39	48.447	-17.96	-32.16	1792.11	334.4743	0.00005	0.00939
40	47.726	-18.52	-32.72	1812.47	294.0104	0.00005	0.00807
41	47.021	-18.52	-32.72	1833.11	294.0104	0.00005	0.00789
42	46.332	-19.19	-33.39	1854.03	251.9780	0.00004	0.00661
43	45.659	-19.9	-34.1	1875.20	213.9748	0.00003	0.00549
44	45.000	-19.9	-34.1	1896.63	213.9748	0.00003	0.00536
45	44.358	-20.6	-34.8	1918.30	182.1221	0.00003	0.00446
46	43.727	-21.1	-35.3	1940.21	162.3165	0.00002	0.00389
47	43.112	-21.1	-35.3	1962.35	162.3165	0.00002	0.00380
48	42.510	-21	-35.2	1984.71	166.0973	0.00002	0.00380
49	41.923	-20.06	-34.26	2007.29	206.2352	0.00003	0.00461
50	41.348	-20.06	-34.26	2030.07	206.2352	0.00003	0.00451
51	40.786	-18.68	-32.88	2053.05	283.3758	0.00004	0.00606
52	40.236	-18.68	-32.88	2076.22	283.3758	0.00003	0.00593
53	39.699	-17.01	-31.21	2099.58	416.2581	0.00005	0.00851
54	39.174	-17.01	-31.21	2123.12	416.2581	0.00005	0.00833
55	38.660	-15.52	-29.72	2146.84	586.6279	0.00007	0.01148
56	38.157	-15.52	-29.72	2170.72	586.6279	0.00006	0.01122
57	37.666	-14.1	-28.3	2194.77	813.5096	0.00009	0.01523
58	37.185	-14.1	-28.3	2218.98	813.5096	0.00009	0.01490
59	36.714	-12.9	-27.1	2243.34	1072.4145	0.00011	0.01921
60	36.254	-12.9	-27.1	2267.84	1072.4145	0.00011	0.01880
61	35.803	-11.83	-26.03	2292.49	1372.0271	0.00014	0.02354
62	35.362	-11.83	-26.03	2317.28	1372.0271	0.00013	0.02304
63	34.931	-11.1	-25.3	2342.21	1623.1651	0.00015	0.02668
64	34.509	-11.1	-25.3	2367.26	1623.1651	0.00015	0.02611
65	34.095	-11.1	-25.3	2392.44	1623.1651	0.00015	0.02557
66	33.690	-10.61	-24.81	2417.74	1817.0325	0.00016	0.02803

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
67	33.294	-10.61	-24.81	2443.16	1817.0325	0.00016	0.02745
68	32.905	-10.34	-24.54	2468.69	1933.5824	0.00017	0.02861
69	32.525	-10.34	-24.54	2494.34	1933.5824	0.00016	0.02802
70	32.152	-10.34	-24.54	2520.09	1933.5824	0.00016	0.02745
71	31.787	-10.49	-24.69	2545.95	1867.9390	0.00015	0.02598
72	31.430	-10.49	-24.69	2571.91	1867.9390	0.00015	0.02546
73	31.079	-10.49	-24.69	2597.96	1867.9390	0.00014	0.02495
74	30.735	-10.98	-25.18	2624.11	1668.6402	0.00013	0.02185
75	30.399	-10.98	-25.18	2650.36	1668.6402	0.00012	0.02142
76	30.069	-10.98	-25.18	2676.69	1668.6402	0.00012	0.02100
77	29.745	-12.01	-26.21	2703.11	1316.3237	0.00009	0.01624
78	29.427	-12.01	-26.21	2729.62	1316.3237	0.00009	0.01593
79	29.116	-12.01	-26.21	2756.21	1316.3237	0.00009	0.01562
80	28.811	-13.85	-28.05	2782.88	861.7131	0.00008	0.01003
81	28.511	-13.85	-28.05	2809.62	861.7131	0.00006	0.00984
82	28.217	-13.85	-28.05	2836.44	861.7131	0.00006	0.00966
83	27.929	-17.56	-31.76	2863.34	366.7437	0.00002	0.00403
84	27.646	-17.56	-31.76	2890.30	366.7437	0.00002	0.00396
85	27.368	-17.56	-31.76	2917.34	366.7437	0.00002	0.00389
86	27.096	-17.56	-31.76	2944.44	366.7437	0.00002	0.00381
87	26.828	-24.98	-39.18	2971.60	66.4298	0.00000	0.00068
88	26.565	-24.98	-39.18	2998.84	66.4298	0.00000	0.00067
89	26.307	-24.98	-39.18	3026.13	66.4298	0.00000	0.00065
90	26.053	-24.98	-39.18	3053.48	66.4298	0.00000	0.00064
91	25.805	-23.81	-38.01	3080.89	86.9686	0.00000	0.00083
92	25.560	-23.81	-38.01	3108.36	86.9686	0.00000	0.00081
93	25.320	-23.81	-38.01	3135.89	86.9686	0.00000	0.00080
94	25.084	-23.81	-38.01	3163.47	86.9686	0.00000	0.00078
95	24.852	-13.77	-27.97	3191.10	877.7335	0.00004	0.00777
96	24.624	-13.77	-27.97	3218.78	877.7335	0.00004	0.00764
97	24.399	-13.77	-27.97	3246.51	877.7335	0.00004	0.00751
98	24.179	-13.77	-27.97	3274.30	877.7335	0.00004	0.00738
99	23.962	-8.79	-22.99	3302.13	2762.8842	0.00013	0.02284
100	23.749	-8.79	-22.99	3330.00	2762.8842	0.00013	0.02246
101	23.540	-8.79	-22.99	3357.92	2762.8842	0.00013	0.02209
102	23.334	-8.79	-22.99	3385.89	2762.8842	0.00013	0.02173
103	23.131	-8.79	-22.99	3413.90	2762.8842	0.00012	0.02137

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
104	22.932	-5.3	-19.5	3441.95	6171.1015	0.00027	0.04696
105	22.736	-5.3	-19.5	3470.04	6171.1015	0.00027	0.04621
106	22.543	-5.3	-19.5	3498.17	6171.1015	0.00026	0.04547
107	22.353	-5.3	-19.5	3526.34	6171.1015	0.00026	0.04474
108	22.166	-5.3	-19.5	3554.55	6171.1015	0.00025	0.04404
109	21.982	-2.49	-16.69	3582.79	11785.8983	0.00048	0.08278
110	21.801	-2.49	-16.69	3611.08	11785.8983	0.00047	0.08149
111	21.623	-2.49	-16.69	3639.39	11785.8983	0.00046	0.08023
112	21.448	-2.49	-16.69	3667.75	11785.8983	0.00046	0.07899
113	21.275	-2.49	-16.69	3696.13	11785.8983	0.00045	0.07778
114	21.105	-2.49	-16.69	3724.55	11785.8983	0.00044	0.07660
115	20.937	-0.18	-14.38	3753.00	20061.4671	0.00074	0.12842
116	20.772	-0.18	-14.38	3781.49	20061.4671	0.00073	0.12649
117	20.610	-0.18	-14.38	3810.00	20061.4671	0.00072	0.12460
118	20.450	-0.18	-14.38	3838.54	20061.4671	0.00071	0.12276
119	20.292	-0.18	-14.38	3867.12	20061.4671	0.00070	0.12095
120	20.136	-0.18	-14.38	3895.72	20061.4671	0.00069	0.11918
121	19.983	1.77	-12.43	3924.35	31431.3250	0.00107	0.18401
122	19.832	1.77	-12.43	3953.01	31431.3250	0.00105	0.18135
123	19.683	1.77	-12.43	3981.70	31431.3250	0.00103	0.17875
124	19.537	1.77	-12.43	4010.41	31431.3250	0.00102	0.17620
125	19.392	1.77	-12.43	4039.15	31431.3250	0.00101	0.17370
126	19.250	1.77	-12.43	4067.91	31431.3250	0.00099	0.17125
127	19.109	1.77	-12.43	4096.70	31431.3250	0.00098	0.16885
128	18.970	3.5	-10.7	4125.51	46812.5921	0.00144	0.24798
129	18.834	3.5	-10.7	4154.35	46812.5921	0.00142	0.24455
130	18.699	3.5	-10.7	4183.21	46812.5921	0.00140	0.24119
131	18.566	3.5	-10.7	4212.09	46812.5921	0.00138	0.23789
132	18.435	3.5	-10.7	4240.99	46812.5921	0.00136	0.23466
133	18.306	3.5	-10.7	4269.92	46812.5921	0.00134	0.23149
134	18.178	3.5	-10.7	4298.87	46812.5921	0.00132	0.22839
135	18.052	3.5	-10.7	4327.84	46812.5921	0.00130	0.22534
136	17.928	5.01	-9.19	4356.83	66276.9767	0.00182	0.31480
137	17.805	5.01	-9.19	4385.84	66276.9767	0.00180	0.31065
138	17.684	5.01	-9.19	4414.87	66276.9767	0.00178	0.30658
139	17.565	5.01	-9.19	4443.92	66276.9767	0.00175	0.30258
140	17.447	5.01	-9.19	4472.99	66276.9767	0.00173	0.29866
141	17.331	5.01	-9.19	4502.07	66276.9767	0.00171	0.29482
142	17.216	5.01	-9.19	4531.18	66276.9767	0.00169	0.29104
143	17.103	5.01	-9.19	4560.30	66276.9767	0.00166	0.28734
144	16.991	6.35	-7.85	4589.44	90232.4375	0.00224	0.38624

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
145	16.880	6.35	-7.85	4618.60	90232.4375	0.00221	0.38138
146	16.771	6.35	-7.85	4647.78	90232.4375	0.00218	0.37661
147	16.663	6.35	-7.85	4676.97	90232.4375	0.00215	0.37192
148	16.557	6.35	-7.85	4706.18	90232.4375	0.00213	0.36732
149	16.452	6.35	-7.85	4735.40	90232.4375	0.00210	0.36280
150	16.348	6.35	-7.85	4764.64	90232.4375	0.00207	0.35836
151	16.246	6.35	-7.85	4793.89	90232.4375	0.00205	0.35400
152	16.144	6.35	-7.85	4823.17	90232.4375	0.00202	0.34971
153	16.044	6.35	-7.85	4852.45	90232.4375	0.00200	0.34551
154	15.945	7.53	-6.67	4881.75	118402.9954	0.00259	0.44795
155	15.848	7.53	-6.67	4911.06	118402.9954	0.00256	0.44262
156	15.751	7.53	-6.67	4940.39	118402.9954	0.00253	0.43738
157	15.656	7.53	-6.67	4969.74	118402.9954	0.00250	0.43223
158	15.562	7.53	-6.67	4999.09	118402.9954	0.00247	0.42717
159	15.468	7.53	-6.67	5028.46	118402.9954	0.00244	0.42219
160	15.376	7.53	-6.67	5057.84	118402.9954	0.00242	0.41730
161	15.285	7.53	-6.67	5087.24	118402.9954	0.00239	0.41249
162	15.195	7.53	-6.67	5116.65	118402.9954	0.00236	0.40776
163	15.106	7.53	-6.67	5146.07	118402.9954	0.00233	0.40311
164	15.018	7.53	-6.67	5175.50	118402.9954	0.00231	0.39854
165	14.931	8.6	-5.6	5204.95	151482.5787	0.00292	0.50413
166	14.845	8.6	-5.6	5234.40	151482.5787	0.00289	0.49848
167	14.760	8.6	-5.6	5263.87	151482.5787	0.00285	0.49291
168	14.676	8.6	-5.6	5293.35	151482.5787	0.00282	0.48744
169	14.593	8.6	-5.6	5322.84	151482.5787	0.00279	0.48205
170	14.511	8.6	-5.6	5352.34	151482.5787	0.00276	0.47675
171	14.430	8.6	-5.6	5381.86	151482.5787	0.00273	0.47153
172	14.349	8.6	-5.6	5411.38	151482.5787	0.00270	0.46640
173	14.270	8.6	-5.6	5440.91	151482.5787	0.00267	0.46135
174	14.191	8.6	-5.6	5470.46	151482.5787	0.00264	0.45638
175	14.113	8.6	-5.6	5500.01	151482.5787	0.00261	0.45149
176	14.036	8.6	-5.6	5529.58	151482.5787	0.00259	0.44668
177	13.960	9.58	-4.62	5559.15	189829.0566	0.00321	0.55381
178	13.885	9.58	-4.62	5588.74	189829.0566	0.00317	0.54796
179	13.810	9.58	-4.62	5618.33	189829.0566	0.00314	0.54220
180	13.736	9.58	-4.62	5647.94	189829.0566	0.00311	0.53654
181	13.663	9.58	-4.62	5677.55	189829.0566	0.00307	0.53095
182	13.591	9.58	-4.62	5707.17	189829.0566	0.00304	0.52546
183	13.519	9.58	-4.62	5736.80	189829.0566	0.00301	0.52004
184	13.449	9.58	-4.62	5766.44	189829.0566	0.00298	0.51471
185	13.379	9.58	-4.62	5796.09	189829.0566	0.00295	0.50946

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
186	13.309	9.58	-4.62	5825.75	189829.0566	0.00292	0.50428
187	13.241	9.58	-4.62	5855.41	189829.0566	0.00289	0.49919
188	13.173	9.58	-4.62	5885.09	189829.0566	0.00286	0.49417
189	13.105	9.58	-4.62	5914.77	189829.0566	0.00283	0.48922
190	13.039	9.58	-4.62	5944.46	189829.0566	0.00280	0.48434
191	12.973	10.43	-3.77	5974.16	230867.4412	0.00338	0.58321
201	12.348	10.43	-3.77	6271.55	230867.4412	0.00306	0.52921
211	11.779	11.17	-3.03	6569.62	273755.3967	0.00331	0.57187
221	11.260	11.17	-3.03	6868.29	273755.3967	0.00303	0.52322
231	10.784	11.84	-2.36	7167.47	319420.4296	0.00325	0.56059
241	10.347	11.84	-2.36	7467.10	319420.4296	0.00299	0.51650
251	9.943	12.39	-1.81	7767.14	362545.6424	0.00314	0.54182
261	9.569	12.39	-1.81	8067.53	362545.6424	0.00291	0.50222
271	9.222	12.39	-1.81	8368.25	362545.6424	0.00270	0.46678
281	8.899	12.88	-1.32	8669.24	405847.3266	0.00282	0.48687
291	8.598	12.88	-1.32	8970.50	405847.3266	0.00263	0.45472
301	8.317	12.88	-1.32	9271.98	405847.3266	0.00246	0.42563
311	8.053	12.88	-1.32	9573.68	405847.3266	0.00231	0.39923
321	7.805	13.3	-0.9	9875.57	447056.7839	0.00239	0.41329
331	7.572	13.3	-0.9	10177.63	447056.7839	0.00225	0.38912
341	7.352	13.3	-0.9	10479.85	447056.7839	0.00212	0.36700
351	7.145	13.3	-0.9	10782.21	447056.7839	0.00201	0.34671
361	6.949	13.62	-0.58	11084.71	481241.0764	0.00204	0.35313
371	6.764	13.62	-0.58	11387.33	481241.0764	0.00194	0.33461
381	6.588	13.62	-0.58	11690.06	481241.0764	0.00184	0.31750
391	6.421	13.62	-0.58	11992.90	481241.0764	0.00175	0.30167
401	6.262	13.62	-0.58	12295.84	481241.0764	0.00166	0.28699
411	6.111	13.62	-0.58	12598.86	481241.0764	0.00158	0.27335
421	5.966	13.88	-0.32	12901.97	510931.5127	0.00160	0.27674
431	5.829	13.88	-0.32	13205.16	510931.5127	0.00153	0.26417
441	5.698	13.88	-0.32	13508.42	510931.5127	0.00146	0.25245
451	5.572	13.88	-0.32	13811.75	510931.5127	0.00140	0.24148
461	5.452	13.88	-0.32	14115.14	510931.5127	0.00134	0.23121
471	5.337	13.88	-0.32	14418.59	510931.5127	0.00128	0.22158
481	5.227	13.88	-0.32	14722.09	510931.5127	0.00123	0.21254
491	5.121	13.88	-0.32	15025.65	510931.5127	0.00118	0.20404
501	5.019	13.88	-0.32	15329.26	510931.5127	0.00114	0.19604
511	4.921	14.05	-0.15	15632.91	531327.9834	0.00113	0.19602
521	4.827	14.05	-0.15	15936.61	531327.9834	0.00109	0.18862
531	4.737	14.05	-0.15	16240.35	531327.9834	0.00105	0.18163
541	4.650	14.05	-0.15	16544.13	531327.9834	0.00101	0.17502

Ant AGL 44 Max gain: 14.2 Max exposure: 0.0029 mW/cm²

Max ERP: 550 Ant type: Andrew LBV-4515LS-VTM Feet from site: 256

RF Exposure Level

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
551	4.566	14.05	-0.15	16847.94	531327.9834	0.00098	0.16877
561	4.485	14.05	-0.15	17151.79	531327.9834	0.00094	0.16284
571	4.406	14.05	-0.15	17455.68	531327.9834	0.00091	0.15722
581	4.331	14.05	-0.15	17759.59	531327.9834	0.00088	0.15188
591	4.258	14.05	-0.15	18063.53	531327.9834	0.00085	0.14682
601	4.187	14.05	-0.15	18367.51	531327.9834	0.00082	0.14200
611	4.119	14.05	-0.15	18671.51	531327.9834	0.00080	0.13741
621	4.053	14.05	-0.15	18975.53	531327.9834	0.00077	0.13304
631	3.989	14.16	-0.04	19279.58	544957.5697	0.00077	0.13219
641	3.927	14.16	-0.04	19583.65	544957.5697	0.00074	0.12811
651	3.867	14.16	-0.04	19887.75	544957.5697	0.00072	0.12422
661	3.808	14.16	-0.04	20191.87	544957.5697	0.00070	0.12051
671	3.752	14.16	-0.04	20496.00	544957.5697	0.00068	0.11696
681	3.697	14.16	-0.04	20800.16	544957.5697	0.00066	0.11357
691	3.643	14.16	-0.04	21104.34	544957.5697	0.00064	0.11032
701	3.592	14.16	-0.04	21408.53	544957.5697	0.00062	0.10720
711	3.541	14.16	-0.04	21712.74	544957.5697	0.00060	0.10422
721	3.492	14.16	-0.04	22016.96	544957.5697	0.00059	0.10136
731	3.445	14.16	-0.04	22321.21	544957.5697	0.00057	0.09861
741	3.398	14.16	-0.04	22625.46	544957.5697	0.00056	0.09598
751	3.353	14.16	-0.04	22929.73	544957.5697	0.00054	0.09345
761	3.309	14.16	-0.04	23234.02	544957.5697	0.00053	0.09102
771	3.266	14.16	-0.04	23538.32	544957.5697	0.00051	0.08868
781	3.225	14.16	-0.04	23842.63	544957.5697	0.00050	0.08643
791	3.184	14.16	-0.04	24146.95	544957.5697	0.00049	0.08427
801	3.144	14.16	-0.04	24451.29	544957.5697	0.00048	0.08218
811	3.105	14.16	-0.04	24755.63	544957.5697	0.00046	0.08017
821	3.068	14.16	-0.04	25059.99	544957.5697	0.00045	0.07824
831	3.031	14.16	-0.04	25364.36	544957.5697	0.00044	0.07637
841	2.995	14.2	0	25668.74	550000.0000	0.00044	0.07526
851	2.960	14.2	0	25973.13	550000.0000	0.00043	0.07351
861	2.925	14.2	0	26277.53	550000.0000	0.00042	0.07181
871	2.892	14.2	0	26581.93	550000.0000	0.00041	0.07018
881	2.859	14.2	0	26886.35	550000.0000	0.00040	0.06860
891	2.827	14.2	0	27190.77	550000.0000	0.00039	0.06707
901	2.796	14.2	0	27495.21	550000.0000	0.00038	0.06559
911	2.765	14.2	0	27799.65	550000.0000	0.00037	0.06417
921	2.735	14.2	0	28104.10	550000.0000	0.00036	0.06278
931	2.706	14.2	0	28408.55	550000.0000	0.00036	0.06144
941	2.677	14.2	0	28713.02	550000.0000	0.00035	0.06015
951	2.649	14.2	0	29017.49	550000.0000	0.00034	0.05889

STATEMENT OF EXPERIENCE
Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM
(800) 760-8414 jbushberg@hampc.com

Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. In addition, Dr. Bushberg has extensive experience and lectures on several related topics including medical physics, radiation protection, (ionizing and non-ionizing), radiation biology, the science of risk assessment and effective risk communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University was on various aspects of the biological effects of microwave radiation. He has maintained a strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections and RF & ELF environmental field measurements of numerous transmission facilities in order to determine their compliance with FCC and other safety regulations. The consultation services provided by Dr. Bushberg are based on his professional judgement as an independent scientist, however they are not intended to necessarily represent the views of any other organization.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of nonionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of nonionizing electromagnetic radiation. Dr. Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurement's (NCRP). He is also a Scientific Vice-President of the NCRP, a member of the NCRP Board of Directors and chairs its committee on Radiation Protection in Medicine. In addition, Dr. Bushberg is a member of NCRP's scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based in large part on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of responsibility the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg is also a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the Federal Communications Commission.

Dr. Bushberg is a full member of the Bioelectromagnetics Society, the Health Physics Society and the Radiation Research Society. Dr. Bushberg received both a Masters of Science and Ph.D. from the Department of Bionucleonics at Purdue University. Dr. Bushberg is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to California, Dr. Bushberg was on the faculty of Yale University School of Medicine.

APPENDIX F

**CONSULTATION LETTERS SENT TO THE U.S. FISH AND WILDLIFE SERVICE AND
THE CALIFORNIA DEPARTMENT OF FISH AND GAME**



COPY

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341



IN REPLY REFER TO:

L7615

April 21, 2009

California Department of Fish and Game
Attn: Lisa Gymer, Environmental Scientist
1234 East Shaw Avenue
Fresno, California 93710

Dear Ms. Gymer,

The National Park Service (NPS) is considering issuing a right-of-way permit to Verizon Wireless for the construction of a wireless telecommunications tower and support structures atop Park Ridge within Kings Canyon National Park, Fresno and Tulare Counties, California. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands.

Park staff have concluded that no federally listed or candidate species would be impacted in the proposed project area. We are requesting concurrence on this, and/or suggested mitigation measures to take in the completion of this proposed project.

In this analysis park staff reviewed the most current list of federally listed animals and plants of California on: http://www.fws.gov/sacramento/es/spp_lists/species_list_instructions.htm. The website provided a list of species that could be found in the areas illustrated in the U.S. Geological Survey topographic map: General Grant Grove Quadrangle, California. That list includes: the valley elderberry longhorn beetle, *Desmocerus californicus dimorphus*, the California red-legged frog, *Rana aurora draytonii*, the California condor, *Gymnogyps californianus*; and candidate species: mountain yellow-legged frog, *Rana muscosa*, and fisher, *Martes pennant*. In the Park Ridge area there is no habitat suitable for the listed or candidate insect, fish, or amphibian species.

In order to meet project schedules, I would appreciate your response to this letter at, Sequoia and Kings Canyon National Parks, Attn: Management Assistant, 47050 Generals Highway, Three Rivers, CA 93271 by May 22, 2009. If you have any questions or comments please inquire by phone with Christine Smith at 559 565 3105.

This letter will serve as a record that the NPS is initiating informal consultation with your agency.

Area and Project Details

Current structures on Park Ridge include: two concrete block structures containing NPS and US Forest Service (USFS) communications equipment with power generators; a 20-foot fire lookout tower; two 40-foot lattice towers with NPS and USFS telecommunications equipment; and a 30-foot tower on the NPS

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communications building supporting a passive reflector used for landline service operated by Verizon California.

Equipment for the proposed facility would include an 80-foot-tall monopole tower with panel antennas and microwave dishes. Ground radio equipment and associated air conditioning units would be stored in a prefabricated shelter. An emergency backup generator, powered by propane fuel, would be located in an enclosure next to the shelter.

The proposed project would impact approximately 1,308 square feet of previously undisturbed land, leveling the surface and/or covering the surface with a matting foundation. The disturbance would remove manzanita and chinquapin shrubs. A staging area of approximately 10 feet by 10 feet would be established in coordination with the park. All materials and equipment would be used and stored solely within the tower construction area and the established staging area during construction of the tower. The staging area would not be used for materials or equipment storage after construction was complete. An access road is already in place to service the fire lookout tower and other telecommunications facilities that currently exist at Park Ridge. It is estimated that construction would take approximately two months.

Construction of a wireless communications tower would not create changes in water quality or quantity. Changes in air quality would be temporary, localized, and slight, and would occur only during the period of construction. Changes in lighting would be localized and temporary, occurring only during construction. Increased noise from equipment and increased human activities during construction of a wireless transmission tower would cause minor impacts to wildlife species; however, those impacts would be temporary.

A back-up generator would operate only in the case of a power outage, or briefly during maintenance visits. Maintenance personnel would visit the site at regular intervals, but visits would be brief, and disturbance to wildlife would be negligible. Night-time visits by maintenance staff would not be conducted, except in cases of extreme urgency.

We appreciate your continuing assistance with National Park Service projects.

Sincerely,



Craig C. Axtell
Superintendent

Enclosure:

Map illustrating the project area. The relevant U.S. Geological Survey 7.5 minute series topographic map is *General Grant Grove Quadrangle*.

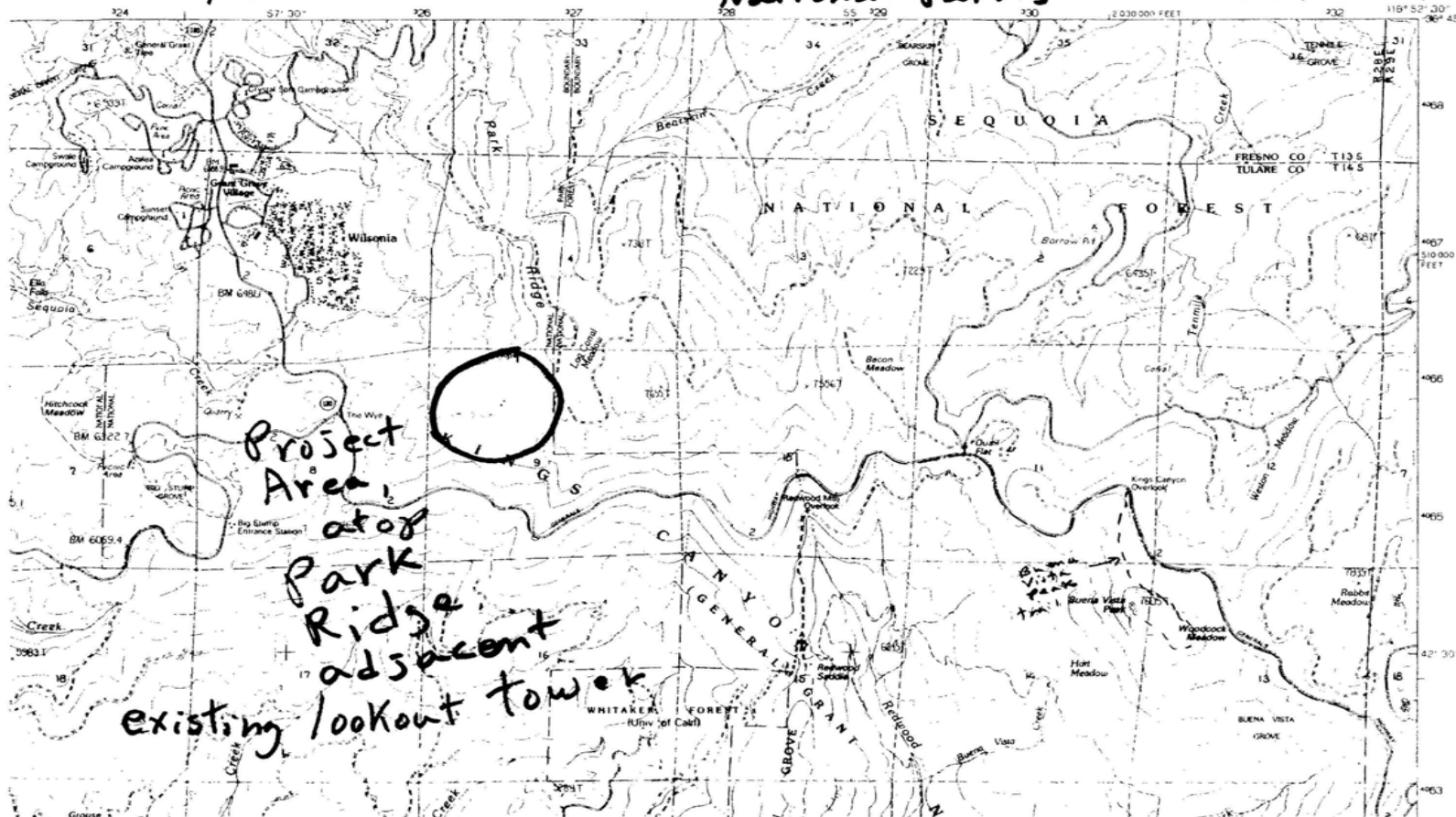
OF THE INTERIOR
CAL SURVEY

Verizon Cell Tower

National Park Service

Sequoia +
Kings Canyon
National Parks

GENERAL GRANT GROVE QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES (TOPOGRAPHIC)





COPY

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341



IN REPLY REFER TO:

L7615

April 21, 2009

Sacramento Fish and Wildlife Office
Attn: Ecological Services
2800 Cottage Way, Room W-2605
Sacramento, California 95825

Dear Ecological Services Representative,

Reference: Sequoia & Kings Canyon National Parks,
PEPC Project Number: 20416, Construct Wireless Telecommunication Facility atop
Park Ridge in Kings Canyon National Park

Subject: Federally Listed Threatened and Endangered Species

The National Park Service (NPS) is considering issuing a right-of-way permit to Verizon Wireless for the construction of a wireless telecommunications tower and support structures atop Park Ridge within Kings Canyon National Park, Fresno and Tulare Counties, California. The NPS is required by the Telecommunications Act of 1996 to consider all applications for the installation of cellular equipment on NPS lands.

Park staff have concluded that no federally listed or candidate species would be impacted in the proposed project area. We are requesting concurrence on this, and/or suggested mitigation measures to take in the completion of this proposed project.

In this analysis park staff reviewed the most current list of federally listed animals and plants of California on: http://www.fws.gov/sacramento/es/spp_lists/species_list_instructions.htm. The website provided a list of species that could be found in the areas illustrated in the U.S. Geological Survey topographic map: General Grant Grove Quadrangle, California. That list includes: the valley elderberry longhorn beetle, *Desmocerus californicus dimorphus*, the California red-legged frog, *Rana aurora draytonii*, the California condor, *Gymnogyps californianus*; and candidate species: mountain yellow-legged frog, *Rana muscosa*, and fisher, *Martes pennant*. In the Park Ridge area there is no habitat suitable for the listed or candidate insect, fish, or amphibian species.

In order to meet project schedules, I would appreciate your response to this letter at, Sequoia and Kings Canyon National Parks, Attn: Management Assistant, 47050 Generals Highway, Three Rivers, CA 93271 by May 22, 2009. If you have any questions or comments please inquire by phone with Christine Smith at 559 565 3105.

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This letter will serve as a record that the NPS is initiating informal consultation with your agency pursuant to the requirements of the 1973 Endangered Species Act, as amended and 2006 NPS *Management Policies*.

Area and Project Details

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Equipment for the proposed facility would include an 80-foot-tall monopole tower with panel antennas and microwave dishes. Ground radio equipment and associated air conditioning units would be stored in a prefabricated shelter. An emergency backup generator, powered by propane fuel, would be located in an enclosure next to the shelter.

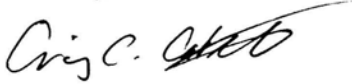
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Sincerely,



Craig C. Axtell
Superintendent

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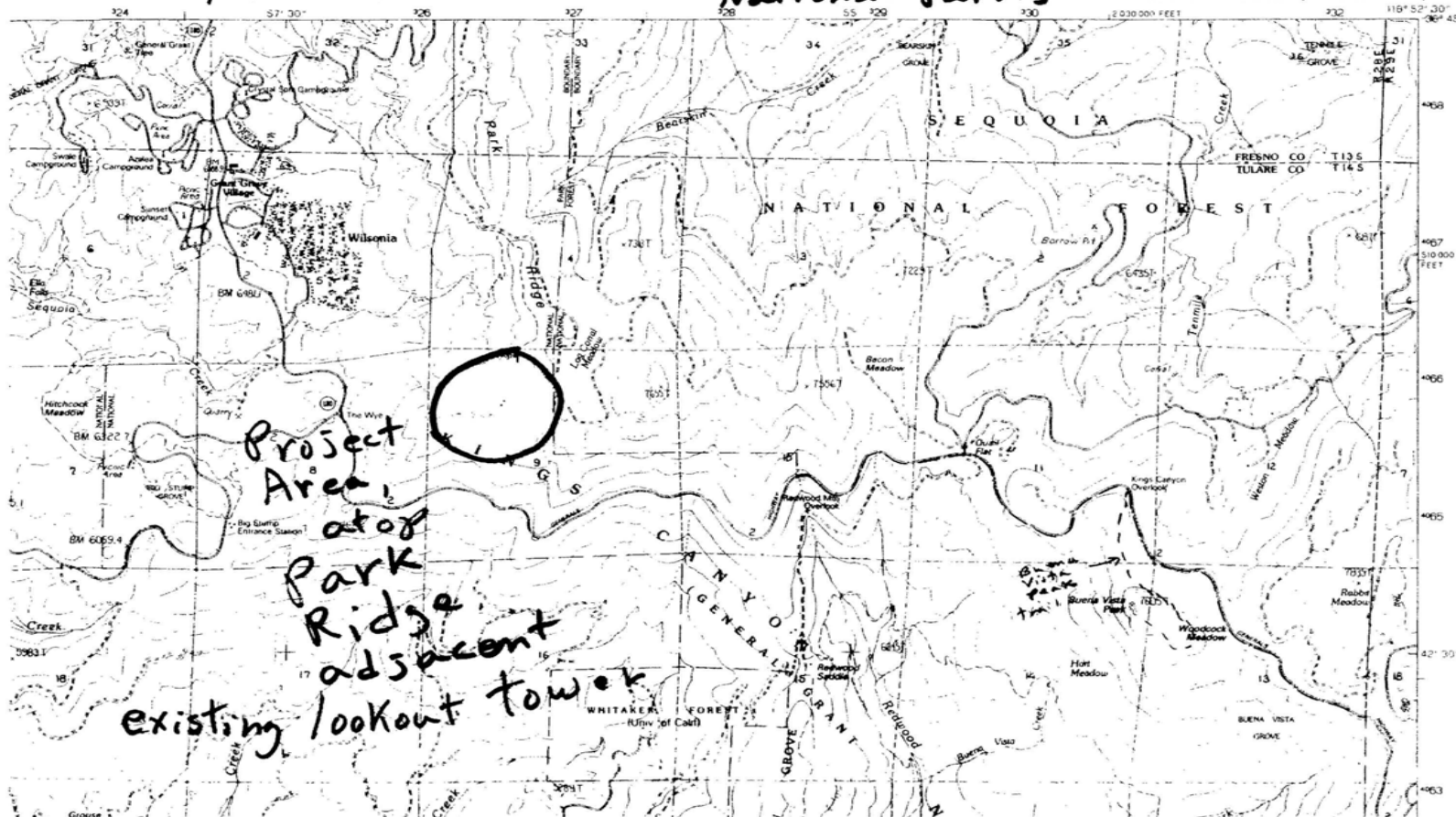
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As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting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

NPS D592 May 2009

United States Department of the Interior ✧ National Park Service