

## **APPENDIX B: MINIMUM REQUIREMENTS ANALYSIS**

## GRCA MINIMUM REQUIREMENT ANALYSIS

### **PROPOSED ACTION: Narrowband/Digital Radio System Conversion Project**

GRCA Project Number (if applicable): **GRCA-06-0019**

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**DATE: May 18, 2007**

### **PART A: Is this action necessary to manage the area as wilderness?**

#### **DESCRIPTION OF PROPOSED ACTION:**

The proposed action is described in detail in the Environmental Assessment (EA) for this project dated May 2007. The action is a proposal to convert all radio communications at Grand Canyon National Park (GRCA) from wideband/analog to narrowband/digital technology to be in compliance with federal regulations and policies.

The park's radio system is the key to ensuring the communication that allows all park management activities to take place. However, there are currently several regions within the park where radio communications are unreliable or impossible. The proposed project will greatly improve the area of radio coverage in the park, as well as comply with laws and policies mandating conversion of all federal communications to narrowband/digital technology. The current equipment is also aging and becoming obsolete (e.g., several of the towers are showing signs of rust), so that repair/replacement of the existing equipment at most sites will soon be necessary even under the No Action Alternative.

The Preferred Alternative includes four primary radio repeater sites, three on the South Rim (Grand Canyon Village Emergency Services (EMS) Building, Hopi Point Fire Tower, and Desert View Ranger Station), and one on the North Rim (CC Hill). The proposal also includes five secondary sites: two inside the park on the North Rim (Mt. Emma and Kanabownits Fire Tower) and three outside the park (Paria, VT Ridge, and O'Leary Peak). All of the proposed sites except CC Hill and the Grand Canyon Village EMS Building have existing radio repeater equipment at the site. Several existing repeater sites would be replaced by proposed sites if the proposal is approved (i.e., Park Headquarters Building, Desert View Watchtower, Yavapai Observation Station).

The Mt. Emma site is within recommended wilderness in the park, and immediately adjacent to (about 40 feet from) the official 1938 Bench Mark which marks the park boundary as well as the summit of Mt. Emma (7698 feet). On the other side of the park boundary is a designated BLM wilderness area (Mt. Logan) within Grand Canyon-Parashant National Monument. The discussion regarding the park's recommended wilderness applies equally to the adjacent Mt. Logan Wilderness Area.

When a temporary repeater was installed at the current Mt. Emma site in 1983, the environmental clearance document prepared for it stated that it would be removed in a year. Whether it was actually removed at that time is unknown. In any case, the repeater at Mt. Emma was replaced in 1991 and has been operated and maintained at the current location since then. While the facilities are temporary, in the sense that they can be easily removed by helicopter and the site quickly restored to near-natural conditions, the fact that they have been there now for many years, and the fact that the proposal is for an indeterminate period of time, makes it apparent that the function at that location should be considered essentially permanent.

The Kanabownits and CC Hill sites are adjacent to recommended wilderness in the park, but are in areas excluded from wilderness, per the park's Final Wilderness Recommendation, 1993 Update.

## GRCA MINIMUM REQUIREMENT ANALYSIS

The Kanabownits site will only be used if it is determined after installation of the other sites that a gap in coverage exists that shows the need for in-kind replacement of the existing equipment at the Kanabownits site. If the Kanabownits site is determined to be necessary for adequate radio coverage, all of the existing radio equipment will be replaced with the new narrowband/digital equipment in the same places on the Kanabownits Fire Tower as the current equipment. The fire tower itself is not currently visible from the adjacent recommended wilderness until one is very close to the fire tower. Then it is the fire tower, and not the radio equipment, that is noticeable at that site. The CC Hill site is a large disturbed area on top of CC Hill. Due to the height and density of the surrounding forest vegetation, the tower and antennae at CC Hill are not expected to be visible from the adjacent recommended wilderness. Therefore, these sites adjacent to recommended wilderness will not affect the adjacent wilderness, and will not be addressed further in this document.

**1. Describe Special Provisions of Wilderness Legislation.** Is there a special provision in wilderness legislation (The Wilderness Act or others) that allows consideration of actions involving Section 4(c) uses?

**Cite law and section:**

No portion of Grand Canyon National Park has been designated as wilderness; therefore, no special wilderness legislative provisions apply.

Section 4(c) of the Wilderness Act states: “... *except as necessary for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no ... structure or installation within any such area.*” The analysis below determines that the radio repeater site at Mt. Emma is necessary for the administration of the area as wilderness.

**2. Describe Requirements of Other Legislation, Policy, and Guidance.** Does taking action conform to and implement relevant standards and guidelines and direction contained in other legislation, policy, management plans, species recovery plans, tribal government agreements, and/or other interagency agreements?

**Federal Agency Radio Requirements:**

The primary purpose of taking action is to comply with the **Omnibus Budget Reconciliation Act of 1993**, from which the National Telecommunications and Information Administration (NTIA) and the US Department of Commerce have directed conversion of all civilian federal radio users to a new technology known as narrowband. The transition to narrowband technology is intended to create more radio spectrum available to federal users so that public safety communications will meet emerging national privacy and security requirements.

A secondary purpose of the proposal is to greatly improve the radio communications capabilities in the park that are necessary to provide for public and employee health and safety, and to implement the NPS Organic Act (16 USC 1 *et seq.*) for almost all management activities in the park, including communications necessary to administer and manage the recommended wilderness areas of the park (over 90% of the park).

## GRCA MINIMUM REQUIREMENT ANALYSIS

### NPS Management Policies (2006): 6.3.10.1 Administrative Facilities:

*“Administrative facilities (for example, ..., radio and/or cellular telephone antennas, radio repeater sites, associated storage or support structures, ...) may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park’s wilderness management plan or other appropriate planning documents.”*

The radio repeater and associated tower, antennae and other equipment at Mt. Emma are necessary to carry out wilderness management objectives to protect wilderness resources and values, to manage wilderness visitation, and to provide adequate radio communications necessary for visitor and resource protection (e.g., ranger patrols), fire management activities, resource management activities (e.g., exotic species management, restoration of impacted sites, research, monitoring), activities related to management of the Colorado River, search and rescue, protection of cultural resources from vandalism, and endangered species management in the surrounding area. The proposed radio equipment at Mt. Emma are the minimum tool to provide the necessary communication capabilities needed to provide backcountry recreational opportunities in the surrounding part of the park consistent with resource protection and visitor safety.

There is no wilderness management plan for the park, but most of the recommended wilderness in the park is managed in accordance with the park’s 1988 **Backcountry Management Plan (BCMP)**. The goals for backcountry management in that plan include *“to provide and promote a variety of backcountry recreational opportunities for visitors consistent with resource protection and visitor safety which is consistent with applicable legislation and policies.”* The Mt. Emma site is in the Toroweap Valley use area (NM9), which is classified in the Threshold management zone under the 1988 BCMP. The management objective for structures allowed in the Threshold zone in the 1988 BCMP is *“Toilets, pack bars, ranger station only at Hermit Creek. Fire grates permitted at designated rim areas only. Temporary scientific structures and emergency communication facilities which are not normally visible and which do not leave permanent impacts.”* However, almost all visitation to the use area occurs along the primitive dirt road access to the Tuweep Ranger Station, the primitive campground and overlook at Toroweap Overlook, and the dirt road to Lava Falls Overlook. The Mt. Emma site receives very little visitation, and is about five miles from the nearest road. Although, as explained elsewhere in this analysis, the radio use of the Mt. Emma site has become an essentially permanent use of the site, the facilities are temporary in nature and can easily be removed, and the equipment will not normally be visible to users of the wilderness or of the frontcountry portions of the Tuweep area and the Grand Canyon-Parashant National Monument.

### Employee Backcountry Safety and Communications Requirements:

The park’s Standard Operating Procedures (SOPs) for backcountry safety and communication have recently been revised, and reflect a need for better communications (including check-in procedures) for employees in the park’s backcountry (most of which is recommended wilderness). The proposed radio conversion will greatly improve the park’s ability to meet the communication needs for backcountry work by its employees, which will facilitate park employees’ ability to perform the range of wilderness-related activities described above.

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| <b>3. Describe Options Outside of proposed wilderness.</b> Can this action be accomplished outside of the GRCA wilderness? [Wilderness Coordinator concur? ____] |
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☐ Yes      ☒ No Explain:

## GRCA MINIMUM REQUIREMENT ANALYSIS

According to the analysis conducted for this project by Motorola, there are no sites outside the recommended wilderness within the park, nor sites outside the park that would provide anything close to the radio coverage provided by the Mt. Emma site for administering the park's recommended wilderness in the surrounding area of the park. The analysis specifically looked at the Tuweep Ranger Station and Toroweap Overlook in the park, and Mt. Logan (site of a BLM repeater), Mt. Dellenbaugh (site of an NPS repeater) and Mt. Trumbull (currently no repeater) outside the park, and additional potential sites west of Mt. Emma. To gain communication coverage for administering the area similar to the coverage provided by the Mt. Emma site, multiple small repeater sites in the park's recommended wilderness at lower elevations nearer the canyon's rim would be required, which would create a much greater impact on park wilderness and on park visitors than the Mt. Emma site.

Mt. Emma is therefore a unique case. While there are sites outside the recommended wilderness in the eastern area of the park that can provide similar acreages of both rim and inner canyon radio coverage as Mt. Emma (e.g., the site proposed for CC Hill on the North Rim), this is the only site in the western area of the park that can provide such extensive radio coverage both above and below the rim.

**4. Describe how the action would contribute to the preservation of wilderness character:**  
How would the action contribute to the preservation of wilderness character as described by the components below?

**Untrammelled** (Wilderness is ideally unhindered and free from modern human control or manipulation):

The area of impact would include the repeater shelter/tower site and an associated helicopter landing site, which is within 50 feet of the repeater installation. All site visitation for replacement installation and future routine maintenance will be temporary, short-term, and using techniques to minimize ground disturbance and impact.

The repeater site itself is in a small clearing (less than 100 square feet) within 50 feet of the Bench Mark identifying the summit of Mt. Emma. The new repeater equipment will be placed by helicopter on rock pylons as close as possible to the existing repeater equipment. A small amount of vegetation trimming will be necessary near the repeater site to maintain the helicopter landing site for maintenance of the repeater. Vegetation would be trimmed (but not cleared) to maintain a height of no more than one foot at the landing site. The estimated impact of the helicopter landing site, including the helicopter footprint and rotor wash, is approximately 250 square feet. The impact of the helicopter is limited to the initial trips to the site to install the equipment, and subsequent maintenance trips which are expected to be rare, no more than two per year. No access roads, utility lines or permanent helipad would be constructed. The landing site would be identified by a GPS coordinate. The area was surveyed for archeological resources, and none were located. The landing site would be unmarked and unimproved except for trimming vegetation to maintain a height of one foot or less.

The design of the installation allows for sufficient anchoring and does not require that it be permanently affixed in the landscape. The total surface area that would be impacted by the installations is approximately 100 square feet of cleared area and 250 square feet of trimmed vegetation. The only invasive disturbance would be electrically grounding the equipment by burying wire into the ground. The grounding wires would be located within the 100 square foot cleared area, and be placed at a depth no more than 12 inches below ground surface.

## GRCA MINIMUM REQUIREMENT ANALYSIS

**Undeveloped** (Wilderness has minimal evidence of modern human occupation or modification):

While the small Mt. Emma site would show evidence of human development (i.e., shelter with attached tower, antennae, and solar panels), the use of this site would preclude the need to use multiple sites at lower elevations in the recommended wilderness to achieve similar radio coverage. The current 25 ft. tower and antennae are not visible to the naked eye from the Toroweap Valley, and are barely visible using binoculars. The proposed 40 ft. tower would be slightly more visible, but is still expected to be difficult to see even when using binoculars because the primary viewing location (Toroweap Overlook) would be more than five miles away.

People rarely hike or backpack on Mt. Emma. For anyone who does, the tower and antennae would be difficult to see until one was very close to the site, due to screening from vegetation on virtually all parts of the mountain, including its summit where the repeater would be located. However, the rare visitor who hikes to the summit of Mt. Emma would find the summit area occupied by a shelter with an attached tower, antennae and solar panels. Although the equipment at the site will be camouflaged as much as possible to blend in visually with the landscape, it is possible that such a hiker may intermittently see the tower/antennae through breaks in trees and shrubs from about a half-mile away.

**Natural** (Wilderness ecological systems are substantially free from the effects of human use, e.g. visitation and/or management activities)

Having adequate radio communications would greatly facilitate protection and restoration of natural resources and ecosystems in the wilderness area surrounding the Mt. Emma site. Only a small amount of ground disturbance would occur at the site to install the electrical grounding wires, and to gather stones for the shelter's anchor pylons. Vegetation trimming at the site would be the minimum necessary to maintain a safe helicopter landing site. If technology was to improve to the point where the site was not needed in the future, and the site abandoned, it would be difficult to locate after only a few years of not trimming the vegetation.

**Outstanding opportunities for solitude or a primitive and unconfined type of recreation**

(Wilderness provides opportunities for people to experience natural sights and sounds, solitude, risk, adventure and other attributes):

There will be noise impacts from the helicopter flights, but the number of flights will be minimized. There is little or no visitation at the repeater site. The tower and antennae will be difficult to see from most viewing locations, even with binoculars.

In contrast, having adequate radio communications in the area will greatly facilitate providing wilderness recreational opportunities in a manner that has the fewest impacts to wilderness character and values.

**5. Describe the effects to the public purposes of wilderness:** How would this action support the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation and historical use?

**Explain:**

This action is necessary to support the public purposes of recreation, scientific, education and conservation use in the area. With adequate radio communications, many administrative activities (e.g., search and rescue, research, monitoring, fire management) can take place with less time and

## GRCA MINIMUM REQUIREMENT ANALYSIS

impact, and more safety and effectiveness, than would occur in the area without adequate radio coverage.

### **PART A DECISION: *Is it necessary to take this action?***

☒ **Yes**      ☐ **No**

**Explain:**

This action is necessary to provide adequate radio communications to facilitate protection of resources and visitors in the surrounding wilderness and non-wilderness areas of the park and Grand Canyon-Parashant National Monument.

### **PART B: Determine the Minimum Tool - *HOW the action will be done***

**Description of alternative methods to accomplish the proposed action:** For each alternative, describe what methods and techniques will be used, when and where the action will take place, the general effects to the resources and wilderness character, and what mitigation measures are necessary.

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The EA analyzes two alternatives, the No Action Alternative (current conditions) and the Preferred Alternative. Detailed descriptions of the alternatives are in the chapter on Alternatives Considered in the EA. A number of other potential alternatives were considered and eliminated from detailed analysis; these are also described in the chapter on Alternatives Considered in the EA.

The impacts of the alternatives are detailed in the chapter on Environmental Consequences in the EA.

According to the analysis conducted for this project by Motorola, there are no sites outside the recommended wilderness in the park (e.g., Tuweep Ranger Station, Toroweap Overlook), nor sites outside the park (e.g., Mt. Trumbull, Mt. Logan and Mt. Dellenbaugh) that would provide anything close to the radio coverage provided by the Mt. Emma site for administering the park's recommended wilderness in the surrounding area of the park. The elevation of Mt. Emma, combined with its proximity to the canyon, make the site a crucial component to communications in the surrounding area of the park, on the rims, in the canyon, and along the river.

Total removal of all equipment from Mt. Emma is not in itself considered a viable alternative, since the park cannot adequately protect the resources and visitors in the surrounding area of the park without adequate communications. Therefore, the equipment would have to be replaced somewhere to provide similar communications coverage. It was determined that multiple repeater sites in the park's recommended wilderness at lower elevations nearer the canyon's rim would be required, which would be a greater impact on park resources and visitors, and wilderness resources and values, than maintaining a repeater at the Mt. Emma site. The current site at the summit of Mt. Emma is still considered the best site for radio coverage, as well as for the fewest impacts on park resources, including wilderness character and values.

The park and Motorola analysis also looked at satellite telephone and satellite radio technologies as a potential alternative to radio repeaters. The park currently employs such technologies as a supplement to the park's radio system, but has found (and the analysis confirmed) that the terrain of the canyon and the movement of the satellites often combine to make satellite technology less reliable

## GRCA MINIMUM REQUIREMENT ANALYSIS

than a good radio system. The analysis showed that satellite technology will continue to be valuable as a supplement to the park's radio system, but it will not in the foreseeable future be able to substitute for a good radio system with repeaters.

Radio equipment has been located at the Mt. Emma site since 1983, but it has always been considered temporary. The proposal is to locate upgraded radio equipment at that site for an indeterminate amount of time, but the equipment will be very easy to remove with very little trace of its presence. While vegetation would need to continue to be trimmed to provide a safe helicopter landing site next to the repeater tower, vegetation will not be removed and trimming will be done only the minimum amount to maintain a safe landing site. If the equipment was removed, with the growth of vegetation at the site, within a few years it would be very difficult to know that the equipment had been there. The most permanent impact at the site is a few stumps from past vegetation trimming. Because of that past trimming, no new trimming of large vegetation (> 2 inches branch or trunk diameter) will be needed. Therefore, the equipment and use of the site is not expected to leave permanent impacts.

Monitoring, mitigation and reporting requirements are described in detail in the EA.

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### **PART B DECISION: *What is the Minimum Tool?***

The Preferred Alternative is the minimum tool needed to provide the communications coverage necessary to adequately administer the area of the park surrounding Mt. Emma to protect the wilderness resources and values of the area, and to provide for wilderness visitor experiences in the area. The proposed project is the minimum required to provide an adequate radio repeater on the site. No permanent structures will be used, and the only digging or ground disturbance will be the minimum necessary to provide proper electrical grounding for the equipment. The entire facility will be free standing, portable and temporary in nature. The facility can be removed by helicopter at any time should technology or needs change.

No roads, trails, or visible intrusions other than the tower, antennae and shelter will be used. All equipment at the site will be painted to be camouflaged into the natural surroundings as well as possible. Although the equipment is expected to be at most barely visible from the surrounding wilderness and recommended wilderness areas, and the non-wilderness visitor viewpoints and camping area in Toroweap Valley, if after installation it is found that the structures are more visible or otherwise intrusive than the minor amount expected, the park commits to take additional measures to further camouflage the site.

As described in the analysis above, the Mt. Emma site is the best location for a radio repeater in the area, and the one site on Mt. Emma eliminates the need for multiple sites at lower elevations that would be needed to provide similar communications coverage for the area. Mt. Emma is a unique case. While there are sites outside the recommended wilderness in the eastern area of the park that can provide similar acreages of both rim and inner canyon radio coverage as Mt. Emma (e.g., the site proposed for CC Hill on the North Rim), this is the only site in the western area of the park that can provide such extensive radio coverage both above and below the rim.