National Park Service
U.S. Department of the Interior

Coronado National Memorial
Arizona

FINDING OF NO SIGNIFICANT IMPACT
Tower (TCA-SON-062) Installation at Coronado National Memorial

Recommended:

Allen S Etheridge 12/21/2016

Allen S. Etheridge — Date
Superintendent, Coronado National Memorial

Approved:

Sue E Masica 12/22/16

Sue E. Masica — Date
Regional Director, Intermountain Region, National Park Service

INTRODUCTION

In September 2008, in compliance with the National Environmental Policy Act (NEPA), U.S. Customs and Border Protection (CBP) prepared the *Proposed SBInet Tucson West Project Ajo, Tucson, Casa Grande, Nogales, and Sonoita Stations Areas of Operation, U.S. Border Patrol, Tucson Sector, Arizona Environmental Assessment* (EA) to examine alternative actions and environmental impacts associated with the proposed project to install towers as part of the SBInet Tucson West Project - Ajo, Tucson, Casa Grande, Nogales, and Sonoita Stations Areas of Operation (AOR), U.S. Border Patrol Tucson Sector, Arizona. CBP approved a FONSI on September 17, 2008, governing implementation of their actions.

The project is needed in order to:

1. Detect illegal entries into the U.S.
2. Identify and classify these entries to determine the level of threat involved.
3. Efficiently and effectively respond to these entries.
4. Bring each event to an appropriate law enforcement resolution.

The purpose of the proposed project is to employ technological infrastructure with the ability to provide a more efficient and effective means of assessing border activities including: rapid detection, accurate characterization of the potential threat, coordinated tracking, and deployment of appropriate resources in the apprehension of those involved in illegal border crossings. This project will allow CBP to establish and maintain operational control of the U.S. border along approximately 81 miles of border in the Tucson Sector, encompassing border zones within the AOR of Tucson, Nogales, Sonoita, Ajo, and Casa Grande stations.

The purpose of this Finding of No Significant Impact (FONSI) is to formally adopt the 2008 EA and to specifically document the decision by the NPS to issue a Special Use Permit (SUP) to CBP for the construction of Tower TCA-SON-062 at Montezuma Pass in Coronado National Memorial. This SUP will not authorize operation and maintenance of the tower. Pending completion of the Right of Way (ROW) permit application process by CBP, the NPS will issue CBP a ROW to implement operations and maintenance for the next 10 years. This ROW will be issued pending further consultation between CBP and the U.S. Fish and Wildlife Service (USFWS), on effects of maintenance and operations to the Jaguar critical habitat and the yellow-billed cuckoo (see below for more information on USFWS consultation).

The NPS has determined that the EA complies with all NEPA-related requirements applicable to the NPS. Therefore, the NPS adopts the EA without recirculating it (40 CFR 1506.3, 43 CFR 46.320). The statements and conclusions reached in this FONSI are based on documentation and analysis provided in the EA, the Biological Opinion (BO [AESO/SE 22410-2008-F-0373]) issued by the USFWS, subsequent information and analyses completed after publication of the original 2008 EA, and the associated decision file. This FONSI only applies to Tower TCA-SON-062 at Montezuma Pass in Coronado National Memorial. This FONSI does not constrain actions which may be taken by the Lead Agency on other lands.

SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION

Of the two management alternatives evaluated in the EA, the proposed action and the no-action alternative, the NPS has selected the proposed action alternative for implementation as it applies to Tower

TCA-SON-062 in Coronado National Memorial. Under this Selected Alternative, the NPS will issue an SUP to CBP for the construction of Tower TCA-SON-062 at Montezuma Pass in Coronado National Memorial.

The description below of the tower in Coronado National Memorial is based on the 2008 EA, as well as subsequent information provided to the NPS by CBP on December 9, 2016. The subsequent information provided by CBP included additional detail on construction design and timing, as well as the permanent impact area of Tower TCA-SON-062. All additional details are within the project scope described and analyzed in the 2008 EA. During construction, no new roads will be built within the park. The 2008 EA also called for relocation of the restroom at Montezuma Pass adjacent to the proposed tower construction in an area which has been previously heavily disturbed; this action has already taken place.

Construction

All work will be confined to a 100' x 100' temporary construction area with the final fenced tower site approximately 48' x 50' when completed. The entire project area has been previously heavily disturbed. The tower will be surrounded by a 9' chain link security fence with barbed wire. The tower will be 100' tall and will rely on generator-solar power, with a propane generator. Associated equipment will include the self-standing tower (SST) with lattice construction, a solar array, emergency power generator, tower control unit, and propane tank. Liquid propane tanks will be mounted on concrete pads which will be pre-formed, delivered to each site, and anchored every six feet. Each generator will be in an enclosure and will have a spill containment basin with a volume five times that of the total engine fluids. The site foundation will include 3 concrete piers, and the design will include a self-standing tower and lattice construction.

Dimensions of the equipment are as follows:

Solar Array: 30'W x 23'L x 14.4'H
Generator: 4.5'W x 9'L x 5'H
Propane Tank: 4.5'W x 15'L x 4.25'H

Ground disturbance will consist of three rock anchor foundations for the tower foundation, three low side posts and three high side posts for the solar array foundation. The rock anchor foundations will be installed at a depth of 24', the high side posts will be installed at a depth of approximately 60", and the low side posts will be installed at a depth of approximately 25".

If tower facility lighting is deemed necessary due to CBP operational needs for security, CBP will install infrared lighting, but will ensure the lighting complies with the USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers.* Following this guidance will reduce night-time atmospheric lighting and the potential adverse effects of nighttime lighting to migratory bird and nocturnal flying species and astronomical observatories. Any infrared lighting installed on the proposed towers will be compatible with night vision goggle usage. When the tower sites are lighted for CBP security purposes then lighting will utilize low sodium bulbs, be shielded to avoid illumination outside the footprint of the tower site, and when possible, be activated by motion detectors.

Portable sanitary facilities will be provided during construction activities, and licensed contractors will collect and dispose of waste products. Disposal contractors will use only established roads to transport

equipment and supplies, and all waste will be disposed of in compliance with federal, state, and local regulations, in accordance with contractors' permits.

Work at the site is requested starting January 3, 2017 through November 30, 2017, with the following actions estimated to be completed by April 30, 2017:

- Tower foundation (excavation and preparation of tower foundation site, pouring concrete, strip forms and backfill)
- Solar array foundation (excavation and preparation of solar array foundation, pouring concrete, strip forms and backfill)
- Grounding and conduit installation (trenching and/or drilling, placement of grounding material, filling trenches)
- Equipment Pad installation (excavation and preparation of equipment pad foundation, pouring concrete, strip forms and backfill)
- Tower erection (shipping of tower sections to site, erecting tower, installing fencing)

Activities from May 1, 2017 to November 30, 2017 include:

- Sensor package and communication system mounting on towers
- Power system installation (installation of solar array and generator)

Figure 1: Contractor Construction Schedule

Task Name	Start	Finish
TCA-SON-0062	**1/3/17**	**5/25/17**
Site Preparation	**1/10/17**	**1/11/17**
Install SWPP	**1/10/17**	**1/11/17**
Tower Erection	**1/11/17**	**4/11/17**
Site Foundations	**1/11/17**	**2/23/17**
Mount Tower Control Unit	**4/10/17**	**4/10/17**
Sensor Package	**3/6/17**	**5/23/17**
Camera Alignment at TSC	**5/23/17**	**5/23/17**
Sensor Package Mounted	**5/24/17**	**5/24/17**
Radar Mounted and Aligned	**5/24/17**	**5/24/17**
Camera Suite Mounted	**5/24/17**	**5/24/17**
RF Communications	**3/29/17**	**3/31/17**

Task Name	Start	Finish
Installation and Align Antennas	**3/30/17**	**3/31/17**

Operation

Tower operation will begin after construction work is completed, pending CBP's consultation with the USFWS regarding the yellow-billed cuckoo and jaguar critical habitat and issuance of a ROW permit from the NPS.

The tower equipment will utilize radio wave and microwave communication links to transmit data from the sensor sites to the CBP Sonoita Station.

Generators will be used as back-up energy sources for the tower. Generators are expected to operate twice per day, for one to three hours for each start. Run times will be shorter on sunny days.

Maintenance

Maintenance of tower TCA-SON-062 will occur on a regular basis. Maintenance of the tower will include a bi-monthly delivery of propane to the site to refuel the tower's propane tank. Delivery vehicles will use established roads and will follow all posted speed limits and traffic laws.

Rationale

The Proposed Action was chosen as the Selected Alternative, because it best meets the project purpose and need. It provides CBP with 24-hour coverage of a large area along the border. It is more efficient to install this technology than to station large amounts of CBP agents along the border 24-hours of the day. The tower will allow CBP agents in the Sonoita station to receive information and relay it to agents in the field. The technology is more effective than aerial technology under adverse weather conditions.

The project will implement a number of resource protection measures to minimize potential adverse impacts. These measures are provided in full in Appendix A of this decision document. The NPS commits to enforcing the mitigation measures and monitoring the effectiveness of the mitigation measures.

FINDING OF NO SIGNIFICANT IMPACT

CEQ regulations at 40 CFR Section 1508.27 identify ten criteria for determining whether the Selected Alternative will have a significant effect on the human environment. The NPS reviewed each of these criteria, given the environmental impacts described in the 2008 EA, as well as a subsequent analysis completed by the NPS in 2016, and determined there will be no significant direct, indirect, or cumulative impacts under any of the criteria. The discussion that follows summarizes the impacts and rationale for this determination as specifically related to the impacts of construction, operation, and maintenance of Tower TCA-SON-062 on federally listed threatened or endangered species and critical habitat; state-listed species of special concern; the park viewshed; cultural resources; vegetation; night skies; and soundscapes. These are all topics for which the NPS completed additional analyses. The 2008 EA (pages

65-170), also included analyses supporting a finding of no significant impact for land use; geology and soils; hydrology and groundwater; surface water and waters of the U.S.; floodplains; air quality; radio frequency environment; utilities and infrastructure; roadways/traffic; hazardous materials; socioeconomics; environmental justice and protection of children; and sustainability and greening.

Federally Listed Threatened or Endangered Species and Critical Habitat

Based on the impact analysis contained in the 2008 EA (pages 105-128), the 2008 BO (pages 10-136), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on federally listed threatened or endangered species or critical habitat.

CBP provided the USFWS with a draft EA on June 4, 2008, and a Biological Assessment (BA) for the original proposed action alternative on June 19, 2008. On Sept. 4, 2008, the USFWS issued a Biological Opinion (BO [AESO/SE 22410-2008-F-0373]) concluding that tower construction may affect and is likely to adversely affect the Mexican spotted owl (*Strix occidentalis lucida*) and critical habitat, the jaguar (*Panthera onca*), and the lesser long-nosed bat (*Leptonycteris yerbabuenae*). The NPS has reviewed and concurs with this determination. CBP will follow all conservation measures identified in the BO from USFWS (Consultation #22410-F-2008-0373) and in the 2008 FONSI to mitigate effects to these species, which include disturbance due to light and noise, and disorientation and heating from electromagnetic radiation, increased collision potential, increased potential for vehicle impacts, and potential habitat degradation.

Since 2008, the USFWS has officially designated critical habitat for the jaguar, as well as listed the western DPS of the yellow-billed cuckoo as threatened. Coronado National Memorial falls within the critical habitat for the jaguar, and yellow-billed cuckoos have been documented within the park.

In a letter to the USFWS dated October 15, 2014, CBP determined that tower construction will have no effect on the yellow-billed cuckoo or jaguar critical habitat. The USFWS has not concurred with this determination, however. In correspondence to CBP dated November 9, 2016, the USFWS stated, "While FWS acknowledges CBP's 'no effect' determination for the Tucson West Tower Project, we believe that there is the potential for adverse effects to species already considered in the 2008 Tucson West Tower BO and to species and critical habitat for species that have recently been listed under the Endangered Species Act as a result of the ongoing operations of the Tucson West towers and the Border Patrol operations associated with the towers…Prior to these new Tucson West towers becoming operational, we strongly recommend that CBP reinitiate the 2008 Tucson Tower Project section 7 consultation to address the potential effects of operation of the towers, as well as Border Patrol operations associated with the towers, on listed species and critical habitats."

The NPS recognizes the determinations made by the FWS in their September 4, 2008 BO, and also recognizes that construction activities may affect, but are not likely to adversely affect, the yellow-billed cuckoo and jaguar critical habitat within the park. This determination was made on the condition that CBP and those acting on their behalf will adhere to stipulations designed to mitigate potential impacts. CBP has agreed to these measures.

Based on the USFWS 2016 comments above related to tower operations, the NPS has strongly recommended CBP reinitiate consultation for the Tucson West project prior to the tower within the park becoming operational and prior to taking any future maintenance actions. The NPS will issue CBP a

ROW to implement operations and maintenance, pending further consultation between CBP and the USFWS on effects of maintenance and operations to the Jaguar critical habitat and the yellow-billed cuckoo.

General Impacts to Federally Listed Species

This section describes general impacts to federally listed species. Additional, species-specific details on these impacts are provided below. The action area consists of a 100' x 100' previously-disturbed area at Montezuma Pass in Coronado National Memorial. In general, direct effects of the Selected Alternative on federally listed threatened or endangered species include degradation or loss of potential habitat as a result of tower site construction and operation. The tower will have a permanent footprint of 48' x 50'.

Tower equipment will use radio waves and microwaves during operation. There will be no effect from electromagnetic (EM) fields during construction of the tower; however, it has the potential to adversely affect federally-listed species during operations. Direct, adverse effects to federally-listed species, including disorientation and an increase in body temperature, could occur from interacting with electromagnetic (EM) fields associated with radar equipment operation.

Construction vehicles will utilize park roads; however, all large construction equipment, including cement trucks, will enter the park from the west; Montezuma Pass is located on the western boundary of the park. During operation and maintenance of the tower, vehicles will travel park roads to deliver propane on a bi-monthly basis. Vehicle traffic in the park could potentially injure or result in the death of listed species; however, chances of being struck by construction and maintenance vehicles will not change from existing conditions, because of the relatively small amount of new project-related traffic compared to the annual existing traffic levels of approximately 50,000 vehicles.

Tower lighting could impact avian and wildlife species by acting as either an attractant or deterrent. However, if tower facility lighting is deemed necessary for security due to CBP operational needs, infrared lighting could be installed and would follow the USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* to reduce night-time atmospheric lighting and the potential adverse effects of nighttime lighting on these species.

Other indirect effects resulting from the SBInet Tucson West project will be primarily limited to changes in illegal crosser (IC) activity and subsequent CBP interdiction and apprehension efforts. As the level of deterrence increases within areas affected by the Selected Alternative, IC activity is likely to shift to areas where the level of deterrence is lower. Mitigation activities, including monitoring of lesser long-nosed bat and Mexican spotted owl populations within the park, will determine whether or not shifts in IC traffic are occurring in areas utilized by these species. If this occurs, CBP will work with USFWS and park staff to ensure effects are mitigated.

Overall, the above effects to listed species will be avoided or minimized to less-adverse levels through the implementation of standard mitigation measures such as muffling of construction equipment, down-shielding of tower lighting, the training of construction project managers, use of biological monitors, and efforts to minimize the spread of invasive species. With mitigation measures in place, these effects, including cumulative effects, will not be significant to any species.

Figure 2. Threatened, endangered, candidate/proposed species with the potential to occur within the action area and critical habitat. The USFWS species list was obtained 12/20/16 and reviewed. Species/critical habitat not having the potential to occur were excluded from further review with a no effect determination with the below rationale. All excluded species have never been documented within park boundaries.

Status codes: E= federally listed endangered, T= federally listed threatened, P= federally proposed for listing, C= federal candidate for listing, CH=designated critical habitat, and EXPN= experimental population, non-essential
Exclusion Rationale Codes: ODR= outside known distributional range of the species, HAB=no habitat present in action area, ELE= outside of elevational range of species, and SEA= species not expected to occur during the season of project work.

Species Common and Scientific Name	Status	Potential to Occur	Critical Habitat	Rationale for Exclusion	Habitat Description and Range in the Action Area
Amphibians and Reptiles					
Chiricahua Leopard Frog (*Rana chiricahuensis*)	T	Yes	No	HAB	Permanent waters in ponds, tanks, cienegas (wet meadows), and small streams provide habitat. Where water is not permanent, adult frogs may persist but reproduction is likely not successful. Habitats with a variety of plants, depths, in-water structure, and other complexities are desired.
Sonoran Tiger Salamander (*Ambystoma tigrinum stebbinsi*)	E	Yes	No	HAB	Currently, most available habitats are cattle tanks that were developed over the last century and replaced the natural pools, cienegas and springs in the San Rafael Valley, rodent burrows, rotted logs, and other moist cover sites that are near water sources. Aquatic habitats are needed from January through June for breeding.
Birds					
Mexican Spotted Owl (*Strix occidentalis lucida*)	T	Yes	Yes	Included	Spotted owls are residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components.
Northern Aplomado Falcon (*Falco femoralis septentrionalis*)	EXPN	Yes	No	Listed wherever found, except where listed as an experimental population.	Habitat is variable throughout the species range and includes palm and oak savannahs, various desert grassland associations, and open pine woodlands. Within these variations, the essential habitat elements appear to be open terrain with scattered trees, relatively low ground cover, an abundance of insects and small to medium-sized birds, and a supply of nest sites.
Southwestern Willow Flycatcher *(Empidonax traillii extimus*)	E	Yes	No	HAB	For nesting, requires dense riparian habitats (cottonwood/willow and tamarisk vegetation).

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Exclusion Rationale Codes: ODR= outside known distributional range of the species, HAB=no habitat present in action area, ELE= outside of elevational range of species, and SEA= species not expected to occur during the season of project work.

Species Common and Scientific Name	Status	Potential to Occur	Critical Habitat	Rationale for Exclusion	Habitat Description and Range in the Action Area
Yellow-billed cuckoo (*Coccyzus americanus*)	T	Yes	No	Included	Yellow-billed Cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes.
Mammals					
Jaguar (*Panthera onca*)	E	Yes	Yes	Included	In the northern portion of the range, found in thornscrub, desertscrub, and grasslands. Vegetation communities used in Arizona range from Sonoran desertscrub at lower elevations to sub-alpine mixed conifer in the mountain ranges.
Lesser long-nosed bat (*Leptonycteris yerbabuenae*)	E	Yes	No	Included	Requires caves and mines for roost sites and access to healthy stands of saguaro cactus and paniculate agaves for foraging.
Ocelot (*Leopardus (=felis) pardalis*)	E	Yes	No	Included	The ocelot uses a wide range of habitats throughout its range.
Flowering Plants					
Huachuca water-umbel (*Lilaeopsis schaffneriana var. recurva*)	E	Yes	No	HAB	*Lilaeopsis schaffneriana ssp. recurva* is restricted to cienegas, rivers, streams, and springs in permanently wet (or nearly so) muddy or silty substrates with some organic content. The taxon is generally found in shallow and slow-flowing waters that are relatively stable, or in active stream channels containing refugial sites where the plants can escape the effect of scouring floods.
Wright's Marsh Thistle (*Cirsium wrightii*)	C	Yes	No	HAB	Wetlands, wet meadow habitats
Reptiles					
Northern Mexican Gartersnake (*Thamnophis eques megalops*)	T	Yes	No	HAB	The northern Mexican gartersnake is considered a riparian obligate (restricted to riparian areas when not engaged in dispersal behavior) and occurs chiefly in the following general habitat types: (1) Source-area wetlands [e.g., cienegas (mid-elevation wetlands with highly organic, reducing (basic, or alkaline) soils), stock tanks (small earthen impoundment), etc.]; (2) large river

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Exclusion Rationale Codes: ODR= outside known distributional range of the species, HAB=no habitat present in action area, ELE= outside of elevational range of species, and SEA= species not expected to occur during the season of project work.

Species Common and Scientific Name	Status	Potential to Occur	Critical Habitat	Rationale for Exclusion	Habitat Description and Range in the Action Area
					riparian woodlands and forests; and (3) streamside gallery forests (as defined by well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass).

Jaguar (*Panthera onca)* and Critical Habitat

As of December 2016, there has been one confirmed jaguar sighting in Huachuca Mountains near the boundary of Coronado National Memorial in the Coronado National Forest. This individual has also been observed on Fort Huachuca. This individual was not observed within Memorial boundaries; however, it will likely enter the park to utilize habitat.

The Selected Alternative may result in degradation of jaguar critical habitat and disturbance to jaguars. Patrol activity associated with the towers and possible increased illegal activity in areas outside the detection capabilities of the towers may result in degradation of vegetation that may provide cover to jaguars and their prey and may disturb jaguars, causing changes in their habitat use and movement patterns.

Construction, operations, and maintenance activities associated with the Selected Alternative may result in increased disturbance to jaguars. Human activity, elevated noise levels (from vehicles, generators, and other equipment), and lights associated with tower construction and operations could possibly deter jaguar use of or movement through the area. Studies have shown that jaguars selectively use areas away from human influence (Monroy- Vichis et al. 2007, Zarza et al. 2007).

Further, disturbed ground will be susceptible to colonization by invasive non-native plants such as Lehmann lovegrass (*Eragrostis lehmanniana*). Non-native species may outcompete native species and may also carry fire better or burn hotter than native plants, which could also degrade jaguar habitat.

Disturbance to jaguars and their habitats can result in associated behavioral changes, such as increased energetic expenditures, and altered pattern of use of habitat and movement corridors. These could lead to decreased dispersal opportunities; decreased home range size; increased inter- and intra-specific competition; increased difficulty meeting energetic needs; etc. Jaguars may attempt to avoid activities associated with the tower, which may cause them to travel longer distances. Extra travel will require jaguars to expend additional energy and increase the potential for encounters with humans, vehicles, and other stresses.

Though activities associated with the Selected Alternative could be detrimental to jaguars, mitigation measures will minimize and help offset disturbance to jaguars and degradation of their critical habitat, as described below.

The tower site has been cleared of vegetation, and no new vegetation loss will occur during construction, operation, or maintenance of the tower. The habitat loss is only 48' x 50' in size, which is small in the context of the amount of habitat available to jaguars in the action area (see Environmental Baseline in the 2008 BO, pages 68-71, for a summary of jaguar habitat in the action area). In addition, CBP will monitor for and remove all invasive species found in the project area after tower construction is complete to ensure that other areas of critical habitat are not affected by invasive species.

Even though construction activity and noise may cause jaguars to avoid the construction area, the impacts will be limited in duration, occurring from January through November 2017. It is estimated that temporary or short-term noise levels resulting from use of heavy equipment and generators will not exceed 53 dBA at 1,000 ft beyond the source. However, the potential adverse noise effects associated with heavy equipment and generators will be 65dBA or greater within a smaller radius of 500 ft, which may cause jaguars to avoid this area.

Noise associated with operation of the tower includes nighttime generator, air conditioner, and air blower noise (the generator will operate about three hours per day). Impacts from this noise will not exceed 55 dBA at a distance of 165' beyond the tower; therefore, noise-related impacts from tower operation will not be significant. In addition, jaguars have large home ranges. Individual jaguar home ranges vary from 28 to 40 km^2 (11 to 15 mi^2) in Belize (Rabinowitz and Nottingham, 1986) and from 25 to 60 km^2 (10 to 25 mi^2) for females in the dry and wet seasons, respectively, in Jalisco, Mexico (Núñez et al. 2002). The average home range of radio-collared male jaguars in Venezuela was 49 and 78 km2 (19 to 30 mi2) (Brown and López González 2001:60).

Due to the vast amount of equally suitable habitat surrounding the tower site, the potential for noise-related effects to result in significant changes in behavior such that the health of individual jaguars will be affected is unlikely. Operational related noise, any required maintenance, and post-construction monitoring will have similar effects, but will be more limited in extent and duration. Due to the limited duration and limited area over which these effects will occur relative to the assumed range of the jaguar, the effects will not be significantly adverse. Implementation of mitigation measures identified during the ESA Section 7 consultation with USFWS (see Appendix A), will minimize the effects of noise, light, and human presence during construction and operation.

Cumulative Impacts- Jaguar and Critical Habitat

Past, present, and reasonably foreseeable future actions that have impacted jaguars and their critical habitat include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss and fragmentation of jaguar habitat. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on jaguars. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on jaguars will include effects of construction and operational noise and lighting leading to jaguars avoiding the area. When the effects of tower construction are combined with other past, present, and reasonably

foreseeable future impacts, the total cumulative impact on jaguars and their critical habitat will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Impacts to the Ocelot (*Leopardis (=felis) pardalis*)

An ocelot was photographed in 2012 in the Huachuca Mountains, approximately 4 miles away from Coronado National Memorial. Impacts to the ocelot will be similar to the jaguar (see previous section, pages 10-11 of this document). Ocelots have never been detected within park boundaries, and the park is not located within critical habitat for the ocelot, as none has been designated.

Impacts to ocelots include potential degradation of habitat due to increased illegal activity in areas outside the detection capabilities of the towers causing changes in their habitat use and movement patterns; avoidance of the tower area due to construction-related noise.

However, due to the vast amount of equally suitable habitat surrounding the tower site, the potential for noise-related effects to result in significant changes in behavior such that the health of individual ocelots will be affected is unlikely. Operational related noise, any required maintenance, and post-construction monitoring will have similar effects, but will be more limited in extent and duration. Due to the limited duration and limited area over which these effects will occur relative to the assumed range of the ocelot, the effects will not be significantly adverse. Implementation of mitigation measures will minimize the effects of noise, light, and human presence during construction and operation.

Cumulative Impacts- Ocelot

Past, present, and reasonably foreseeable future actions that have impacted ocelots include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss and fragmentation of ocelot habitat. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on ocelots. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on ocelots will include effects of construction and operational noise and lighting leading to ocelots avoiding the area. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on jaguars and their critical habitat will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Impacts to the Lesser Long-nosed Bat (*Leptonycteris yerbabuenae)*

A colony of lesser long-nosed bats resides within the State of Texas Mine at Coronado National Memorial from July through September each year. The mine is a post-maternity roost for the bats, who feed on agave nectar while in the park. Bat counts in the roost have decreased over the past two decades, dropping from more than 20,000 in the 1990s to 4,000 in recent years (Westland Resources & AZGFD, 2013).

Short-term, direct effects of construction, operation, and maintenance activities on the bat or its habitats (including the State of Texas Mine, foraging areas, and areas in-between the mine and foraging areas), include disturbance from temporary noise associated with construction equipment and disturbance from artificial lights used if nighttime construction occurs. Long-term, direct effects include disturbance of bats and habitat from operational noise associated with towers (including communication components and generators), disturbance associated with security lighting, and increased risks of collisions with tower structures. Long-term, indirect effects include an increase of non-native invasive plants associated with disturbance of native habitats.

Noise will be associated with construction activities, construction equipment, construction vehicles, and generators needed to operate the towers. Noise may disturb bats in the roost or affect their behavior entering or leaving the roost (U.S. Fish and Wildlife Service 2007b). The threshold for noise disturbance that results in behavioral disturbance or abandonment of the roost is unknown and likely varies significantly based on distance to the roost, volume and frequency of the noise, and the pattern of the noise (continuous, intermittent, occasional, or sporadic). Construction noise will occur during the period that lesser long-nosed bats are present in the State of Texas Mine (approximately July 15 through September 30).

Construction noise will attenuate to below 55 dBA beyond about 1,000' from the source. There is no tower or road construction planned closer than 0.25 mi from known bat roosts; therefore tower and road construction noise is not expected to disturb bats at those roosts. Because of the distance of the tower sites from known the State of Texas Mine (0.8 mile), noise from the proposed action is not expected to disturb bats at those roosts.

Noise associated with operation of the tower includes nighttime generator, air conditioner, and air blower noise (the generator will operate about three hours per day). Impacts from this noise will not exceed 55 dBA at a distance of 165' beyond the tower; therefore, noise-related impacts from tower operation will not be significant.

Foraging plants such as agave have been documented near or at the tower site; therefore nighttime noise could disturb foraging bats that are immediately adjacent to those tower sites. Nighttime noise could also disturb bats traveling from roosts to forage habitat. However, the tower is not located within an area of high agave density; therefore, bats will not be expected to spend large amounts of time foraging in this area.

Lights may be neededfor nighttime construction, or for security at the towers. Limited information is available on the effects of lights on bat behavior or habitat use. However, information for other animal species indicates that artificial lighting that shines into a habitat area may alter normal behavior patterns (foraging, vocalizations), and increase the risk of predation (Rich and Longcore, 2006). The safe distance between high-intensity light sources and maternity or summer roost sites is unknown. Disturbances such as noise and light can result in the abandonment of the young (U.S. Fish and Wildlife Service 2007b). Activities outside the roost, but in close proximity, that allow noise or light may intrude into the roost may also result in stress to the resident bats.

To mitigate these effects, daytime construction will be prioritized for tower TCA-SON-062. If nighttime work is necessary, construction mitigations require that lights will be shielded to direct light only onto the work site and the area necessary to ensure the safety of the workers, only the minimum foot candles

needed will be used, and the number of lights will be minimized. Any light extending beyond the construction or maintenance area will be no greater than 1.5 foot candles. In addition, security lighting for on-ground facilities and equipment will be down-shielded to keep light within the boundaries of the site.

Tower construction will not occur closer than 0.25 mi from known bat roosts; therefore, light associated with tower construction and operation is not expected to reach and disturb bats at those roosts. However, foraging plants are documented near or at tower sites; therefore lights associated with nighttime construction could disturb foraging bats. Disturbance is expected to be minimal because any light beyond the construction area is restricted to 1.5 foot candles.

Mortality or injury of lesser long-nosed bats could also occur due to collisions with tower TCA-SON-062. Bat collisions have been documented at television towers, communication towers, buildings, and powerlines (Johnson, 2002). Bats that locate their prey via echolocation may have the ability to navigate through barriers such as towers (Johnson, 2002). Foraging height and weather can also increase collision risk. Lesser long-nosed bats are fast-flying (Sahley *et al.* 1993), but the USFWS has hypothesized that their life history may render them less capable echolocators than insectivorous bats. As such, individuals may be susceptible to collisions with towers, which will likely be fatal in most cases (U.S. Fish and Wildlife Service 2007c). All the towers have the potential to cause a collision risk for lesser long-nosed bats within the project area. However, the SST lattice design of the tower will have no guy wires, decreasing the collision risk for lesser long-nosed bats, and the tower is not expected to result in a significant loss of bats within the park. In addition, CBP will monitor the site for bat collisions. If lesser long-nosed bats are found dead or injured at the base of towers, CBP will work with USFWS to reduce the likelihood of future mortalities and injury.

Tower TCA-SON-062 will act as a localized barrier to lesser long-nosed bats, which will increase flight time and thus energy needs.

Activities that directly or indirectly promote invasion or increased density of non-native grasses, particularly Lehmann lovegrass, may result in increased fire frequency or intensity, reduced densities of Palmer's agave, and thus reduced forage resources for the lesser long-nosed bat. Many nonnative plants, such as Lehmann lovegrass, carry fire better and often burn hotter than the native plants (Bock and Bock 2002, Esque and Schwalbe, 2002). As a result, the Selected Alternative has the potential to reduce recruitment of forage plant species and increase fire frequency and intensity via spread of nonnative plants. No agave plants are expected to be removed during construction, maintenance, or operations of Tower TCA-SON-062. However, the mitigations state that removed plants a) will be salvaged and transplanted if plants are small, a significant portion of the roots are salvaged, and plants are watered and monitored or b) will be replaced at a 2:1 ratio.

The electromagnetic (EM) fields associated with radar equipment may affect lesser long-nosed bats by causing increased surface body and deep body temperatures. This can occur if bats are exposed for prolonged periods, and can also result in bats avoiding foraging areas. Studies have shown that bat activity is reduced in habitats exposed to electromagnetic radiation when compared to sites with no such detectable radiation (Nicholls and Racey, 2007). Lesser long-nosed bats are particularly susceptible to EM field strengths greater than 2 volts/meter (Nicholls and Racey, 2007). The tower will produce an EM field greater than 2 volts/meter; therefore, it has been determined that the Selected Alternative may affect and is likely to adversely affect lesser long-nosed bat. However, the tower is not located within an area

with a high density of agave plants that bats will prioritize for foraging, so effects will not be significant to the population.

Mitigation measures outlined in Section 5.0 of the EA and conservation measures developed during Section 7 consultation (see Appendix A) will reduce the potential for the above impacts to lesser long-nosed bats. The design of the tower and minimal lighting will reduce impacts from possible collision and light effects. Eradication of invasive species will help ensure native agave populations remain intact. CBP will monitor the population for adverse effects. CBP will follow all stipulations and mitigations outlined in the SUP. These stipulations require monitoring roosts for direct or indirect effects of the action for five years. Monitoring will include performing surveys for bat carcasses near the tower, as well as bat telemetry studies. If any adverse effects are documented on the population, CBP will work with the USFWS to mitigate these effects. CBP will also install Hobo data loggers in the State of Texas Mine to detect changes in temperature, humidity, and other environmental conditions.

Cumulative Effects- Lesser Long-nosed Bat

Past, present, and reasonably foreseeable future actions that have impacted lesser long-nosed bats include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss of lesser long-nosed bat foraging habitat. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on lesser long-nosed bats. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on lesser long-nosed bats include effects of construction and operational noise and lighting causing bats to avoid the area and impacting their roost, EM fields impacting bat body temperature, and increased collision potential. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on lesser long-nosed bats will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Impacts to the Mexican Spotted Owl (*Strix occidentalis lucida)* and Critical Habitat

Mexican spotted owls reside within Coronado National Memorial, and the park is located within designated critical habitat for this species. One Protected Activity Center (PAC), Joe's Canyon PAC, is located within the Memorial. Tower site TAC-SON-062 is located within this PAC. Surveys for this species have not been performed since 2003; however, an owl was photographed on 12-30-15 within Coronado Cave, confirming the continued presence of this species within the park.

Construction activity at Montezuma Pass may disturb nearby owls. Owls react to noise disturbances by changing behavior and/or flushing from their perches (Delaney et al. 1999a; Swarthout and Steidl 2001, 2003). These behavioral responses may alter nesting and roosting activities, thus increasing vulnerability to predators and heat-related stress. Variables such as distance to and frequency of a noise disturbance, habitat type, topography, and sound source may influence spotted owl responses (Delaney and Grubb 2004). For example, noises close to nests are likely to be more disruptive than those far from nests (Delaney et al. 1999a) and noise disturbances close (96 m [315 ft]) to owl nests may have affected prey delivery rates (Delaney et al., 1999b).

Also with respect to distance and noise levels, Delaney et al. (1999a) determined that the proportion of owls flushing was negatively related to distance (owls flushed more often to closer sounds) and positively related to noise level (owls flushed more often to louder sounds). Pater et al. (2009) quantified this in part by determining that noises ≥80 dBO (i.e., decibels weighted for middle sound frequencies where owl hearing is the most sensitive), had a greater than 0.60 probability of causing an owl to flush. This noise level (80 dBO) is roughly equivalent to 69 dBA (i.e., decibels weighted for human hearing) or approximately twice as loud as ordinary conversation.

It is estimated that temporary or short-term noise levels resulting from use of heavy equipment during construction will not exceed 53 dBA at 1,000' beyond the source. However, the potential adverse noise effects associated with heavy equipment and generators will be 65dBA or greater within a smaller radius of 500 ft, which may cause Mexican spotted owls to avoid this area.

In general, the Memorial, including caves where owls commonly perch, is frequented by visitors and the lack of response by owls to these visitors indicates they are accustomed to a higher level of human activity. Therefore, the tower's presence is unlikely to add any substantial disturbance over and above that caused by visitors, at least during the day.

Because owls are active at night when it is difficult or impossible to see other owls, audio communication is a critical component of the owl's social system (Frid and Dill 2002; e.g., territorial defense, pair bonding and maintenance, feeding nestlings, and post-fledging activities). Further, owls depend heavily on sound to locate and capture prey in near darkness (Payne 1971, Martin 1986, Norberg 1987).

There is also the potential for increased noise due to the consistent sounds of the generator and tower equipment to impact spotted owl nocturnal breeding and foraging habits. At night, the tower will emit generator, air conditioner, and air blower noise (the generator will operate about three hours per day). At 165 ft, the noise from the generator will be about 55 dBA.

The Mexican Spotted Owl Recovery Plan (USFWS, 2012) states that breeding season restrictions should be considered if noise levels are estimated to exceed 69 dBA (~80 dBO) [owl-weighted noise level, Delaney et al. 1999a] more than twice per hour or for more than an hour within 50 m (165 ft) of nesting sites (if known) or within entire PACs if nesting sites are not known. The consistent noise from the generator (55 dbA at 165 ft) will likely cause owls to avoid the area. However, since the area is a high-visitor use area, owls likely already avoid it and have never been known to use the area for nesting; therefore, breeding owls will not likely be affected.

Mitigation measures such as muffling construction equipment (presented in Section 5.0 of the EA) will reduce or minimize potential impacts to Mexican spotted owl from increased noise levels. Noise reduction will accomplished through proper placement of facilities and use of noise dampening equipment (e.g., hospital-grade mufflers, electric pump motors) as well as other techniques. In addition, daytime construction will be prioritized in order to avoid additional effects to owls, who are nocturnal. While located within the PAC, the construction site is a disturbed area which owls likely avoid and have never been known to use for nesting. The construction sound impacts will impact the owls, however, this site and the surrounding area are not likely nest locations for MSOs within the park.

In addition, mitigation measures call for an on-site biologist to monitor construction activities occurring during the MSO breeding season, as well as surveys of the park's population performed by a qualified biologist.

Other impacts include the fact that birds are known to collide with towers and tower guy wires. The potential for Mexican spotted owls to be killed or injured as a result of collisions is unknown, but they are agile flyers that negotiate dense forests and aerial mazes of branches. The likelihood of collisions with tower TCA-SON-062 is low. There will no guy wires on the tower.

MSOs will be adversely affected by the construction sounds, however, due to the fact that the construction is occurring on a previously-disturbed site, unlikely to be used for nesting, and mitigations will decrease sound levels and monitor the population in the park, the impacts will not be significant. In addition, no vegetation will be removed during construction, therefore, the effects to MSO critical habitat will not be significantly adverse.

Cumulative Effects- Mexican Spotted Owl and Critical Habitat

Past, present, and reasonably foreseeable future actions that have impacted Mexican spotted owls and their critical habitat include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss of Mexican spotted owl nesting habitat as well as increased potential for noise to affect owl behavior and breeding. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on Mexican spotted owls. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on Mexican spotted owls include effects of construction and operational noise causing owls to avoid the area or flush, impacting their foraging and breeding behavior, and increased collision potential. Tower nighttime lighting may also act as an avian attractant. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on Mexican spotted owls and Critical Habitat will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Impacts to the Yellow Billed Cuckoo (*Coccyzus americanus*)

The Yellow-billed cuckoo is a migratory bird species which is present in Arizona during the spring and summer for breeding. Yellow-billed cuckoos utilize riparian habitat as their primary breeding grounds. Coronado National Memorial is not located within critical habitat for this species; however, yellow-billed cuckoos have been sighted within the park. In addition, it is possible for these migratory birds to fly over the tower site at Montezuma Pass during their migration.

The impacts to yellow-billed cuckoos from the tower include collision. Migratory birds can collide with guy wires, resulting in injury or death; however, the design of tower TCA-SON-062 does not include guy wires, negating this risk.

Other adverse effects such as disorientation of passing birds by electromagnetic radiation are also of concern. Though there will be no effect from electromagnetic (EM) field on yellow-billed cuckoos due to

construction, the EM fields associated with radar equipment operations may disorient birds, thus increasing the potential for collisions (Nichols and Racey 2007). Past studies on effects of communication towers were noted by Robert Beason (1999) during the 1999 Workshop on Avian Mortality at Communication Towers (Evans and Manville 2000). During this workshop, Beason (1999) noted that most research on radio frequency (RF) signals produced by communication towers have no general disorientation effects on migratory birds. However, more research is needed to better understand the effects of RF energy on the avian brain. Though greater research is required to have a better understanding of the effects of RF energy on the avian brain, the potential effects on passing birds is expected to be negligible as well. Any disorientating effect, if experienced, will be short-term and will occur only at close distances from the antennas.

Furthermore, tower construction will adhere to the USFWS interim guidelines and FAA guidelines designed to reduce impacts to migratory birds such limiting heights of towers (USFWS 2000). Therefore, the tower construction is not anticipated to have a significant impact to the sustainability yellow-billed cuckoos in the park. Mitigation measures as outlined in Section 5 will ensure there will be no significant impacts on migratory birds.

Cumulative Effects- Yellow-billed Cuckoo

Past, present, and reasonably foreseeable future actions that have impacted yellow-billed cuckoos include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss of yellow-billed cuckoo breeding habitat as well as increased potential for disorientation from electromagnetic radiation. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on yellow-billed cuckoos. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on yellow-billed cuckoos include effects of disorientation caused by electromagnetic radiation, and increased collision potential. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on yellow-billed cuckoos will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

State Wildlife Species of Special Concern

Based on the impact analysis contained in the 2008 EA (pages 105-128), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on state listed wildlife species or species of special concern. Table 3-14 on page 120 of the 2008 EA lists these species. The only two species on this list which have been confirmed at Coronado National Memorial are the American peregrine falcon (*Falco peregrinus anatum*) and the northern goshawk (*Accipiter gentilis*). The potential for impact to habitat of these species was characterized as low in the 2008 EA. The NPS agrees with this determination due to the fact that no vegetation will be removed during this project. In addition, these species likely already avoid the project area due to the high presence of vehicles and visitors at the site.

Cumulative Effects- State Wildlife Species of Special Concern

Past, present, and reasonably foreseeable future actions that have impacted the peregrine falcon and northern goshawk include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss of peregrine falcon and northern goshawk habitat, as well as increased potential for disorientation of these bird species from electromagnetic radiation. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on the peregrine falcon and northern goshawk. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on these species include effects of disorientation caused by electromagnetic radiation, and increased collision potential. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on peregrine falcons and northern goshawks will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Viewshed

Based on the impact analysis contained in the 2008 EA (pages 153-156, 182-183), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts the park's viewshed.

The impacts of tower TCA-SON-062 on aesthetic quality of the area will be minor to moderate as the area is developed for tourism and includes a rest area and bathroom facility. Tower TCN-SON-062 is located within the Coronado National Memorial visitor overlook parking lot, and this location will be the most unobtrusive for park visitors, since the overlook location was placed according to NPS guidelines to result in minimum intrusion on the visual qualities of the park according to the NPS Management Policies.

In the 2014 Coronado National Memorial Foundation Document, Expansive Views of the Border Region are listed as one of the park's fundamental resources and values (FRVs). These FRVs are essential to achieving the purpose of the park and maintaining its significance. Expansive views of the US-Mexico international border, Montezuma Canyon, the San Pedro River Valley, and the San Rafael Valley are a key component of the visitor experience at Coronado National Memorial. A series of overlooks along the park's scenic road as well as Montezuma Pass allow visitors to enjoy these spectacular views and contemplate the rugged landscape that the Coronado Expedition may have traversed nearly 500 years ago.

The enabling legislation for Coronado National Memorial emphasizes the need for protecting the views of the Coronado Expedition's route along the San Pedro River as the primary mission of the memorial. Any use of memorial's lands for telecommunication infrastructure can occur only if it will not impact the memorial's ability to accomplish its mission of preserving these historic views.

Tower TCA-SON-062 will impact the natural scenery and views provided by the park to visitors. The tower will be visible from approximately 37% of the park and will disrupt natural scenery. Views of the surrounding valley are integral to the park's founding mission. The tower will make these views more difficult to obtain. However, these effects are mitigated by the fact that the location of the tower at Montezuma Pass allows visitors to face outwards from the tower and experience the viewshed the park was founded upon.

Cumulative Effects- Viewshed

Past, present, and reasonably foreseeable future actions that have impacted the park viewshed include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges, and construction of housing and other buildings in the San Pedro River Valley (Hereford, AZ) area. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the degradation of the viewshed from Montezuma Pass. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on the park's viewshed. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on the park's viewshed include the visibility of the tower from approximately 37% of the park, and an increased difficulty in viewing the panoramic viewshed upon which the park was founded. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on the park's viewshed will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Vegetation

Based on the impact analysis contained in the 2008 EA (pages 105-128), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts to vegetation. The tower will be built within Madrean evergreen woodland habitat, which is locally and regionally abundant. Tower construction plans do not include the removal of any vegetation. Therefore, the Selected Alternative will not cause the loss of any unique habitat, and will not have significant adverse impacts to vegetation communities. All actions within Coronado National Memorial will occur within previously-disturbed areas, so there will be no vegetation impacted.

Cumulative Effects- Vegetation

Past, present, and reasonably foreseeable future actions that have impacted Madrean evergreen woodland habitat include the construction of other technological and tactical infrastructure by CBP, including the international border fence and other towers in the Coronado National Forest in the Huachuca Mountains and other nearby mountain ranges. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in the loss of Madrean evergreen woodland habitat. Collectively, all of these actions have had and will continue to have adverse cumulative impacts on this habitat. As previously described in this FONSI, there will be no direct and indirect impacts of the construction of tower TCA-SON-062 on this habitat. The area is previously-disturbed, and has already been cleared of vegetation. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on Madrean evergreen woodland habitat will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will not contribute to the cumulative impacts that are already occurring.

Cultural Resources

Based on the impact analysis contained in the 2008 EA (pages 129-131), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on cultural resources.

The tower construction area of potential effect (APE) is in a previously heavily-disturbed area within Montezuma Pass parking lot, and cultural material encountered as a result of the construction activities will be out of primary context and lack scientific integrity. In the event of accidental encounter with previously undiscovered archaeological resources or historic structures occur, the activity will cease immediately, and consultation will occur.

The potential exists for historic structures such as culverts constructed by the Civilian Conservation Corps in the 1930s to be damaged by construction-related traffic. Due to this potential effect, all vehicle traffic, including cement trucks, will enter the park from the west during construction of tower TCA-SON-062, thus avoiding travel over the culverts.

The proposed undertaking and mitigations are deemed to be an appropriate balance between historic preservation and national security, pursuant to the National Programmatic Agreement between SHPO and NPS (2008). Accordingly, the National Park Service has determined that this project, as proposed and stipulated, will have No Adverse Effect on historic properties in Coronado National Memorial, known or otherwise, pursuant to 36 CFR 800.5. Additionally, the undertaking is in alignment with criteria for streamlined review (III.B) as eligible under Health and Safety Activities (III.C.4b). Consultation occurred through correspondence dated October 27, 2016, and the Arizona State Historic Preservation Office (SHPO) provided a finding of "no adverse effect" on historic properties on November 21, 2016.

Cumulative Effects- Cultural Resources

Past, present, and reasonably foreseeable future actions, including the construction of other technological and tactical infrastructure by CBP, such as the international border fence and tower in the grasslands of Coronado National Memorial, have not impacted the park's cultural resources. Compliance was performed on all projects, and impacts to cultural resources were avoided. In summary, the impacts of past, present, and reasonably foreseeable future actions have not impacted cultural resources within the park. As previously described in this FONSI, any direct and indirect impacts of the construction of tower TCA-SON-062 on the park's cultural resources will be avoided through routing construction equipment to enter the park from the USFS land to the west. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, there will be no cumulative impact on the park's cultural resources.

Soils

Based on the impact analysis contained in the 2008 EA (pages 76-83), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on soils.

The Selected Alternative involves soil disturbance up to 24' in depth at the tower site for tower TCA-SON-062. During construction activities, any holes or excavations for either perimeter fence posts or tower, will impact an area no larger than approximately 38 square feet for the three piers on the larger SST, and will not substantially alter soils in the project area. Each pier will be no deeper than approximately 24' below ground surface. All road repair or improvements will occur on existing roads with previously-disturbed soils.

Ground disturbance will consist of three rock anchor foundations for the tower foundation, three low side posts and three high side posts for the solar array foundation. The rock anchor foundations will be installed at a depth of 24', the high side posts will be installed at a depth of approximately 60", and the low side posts will be installed at a depth of approximately 25". The generator will be in an enclosure and will have a spill containment basin with a volume five times that of the total engine fluids.

All solid and hazardous wastes and materials, including universal waste (such as batteries, fluorescent light bulbs, etc.), will be handled in accordance with applicable Federal and state laws and guidelines governing these items.

During construction, the potential exists for petroleum, oil, and lubricants (POL) contamination at the construction site due to storage of POL material for maintenance and refueling of vehicles and fuel storage tanks. However, these activities will include primary and secondary containment measures. Clean-up materials (e.g., oil mops) will be maintained at each site for appropriate spill response and cleanup in case a spill occurs. Drip pans will be provided for the power generators and other stationary equipment to capture any POL that is accidentally spilled during maintenance activities or leaks from equipment. To ensure, oil pollution prevention, a SPCCP will be in place prior to the start of construction.

Cumulative Effects- Soils

Past, present, and reasonably foreseeable future actions that have impacted soils include the construction of other technological and tactical infrastructure by CBP, including the international border fence. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in erosion and accretion issues in the park. Collectively, all of these actions have had and will continue to have adverse impacts on park soils. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on this habitat are not significant, as the area is previously-disturbed, and the tower will not affect water flow or lead to erosion. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on soils will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Night Skies

Based on the impact analysis contained in the 2008 EA (pages 105-128), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on night skies.

If nighttime construction becomes necessary its use will be minimized and the lights will be shielded and follow county ordinances to the greatest extent practicable.

It is not necessary to install FAA- required lighting on towers below 200 ft. tall. Tower TCA-SON-062 will be 100 ft. tall and will not require FAA lighting. Additionally, when tower facility lighting is deemed necessary due to CBP operational needs, such as the installation of infrared lighting, USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* will be implemented to reduce night-time atmospheric lighting and the potential adverse effects of nighttime lighting to migratory bird and nocturnal flying species and astronomical observatories. Any infrared lighting installed on the proposed towers will be compatible with night vision goggle usage. When the

tower sites are lighted for CBP security purposes then lighting will utilize low sodium bulbs, be shielded to avoid illumination outside the footprint of the tower site, and when possible, be activated by motion detectors.

Cumulative Effects- Night Skies

Past, present, and reasonably foreseeable future actions that have impacted night skies include the construction of CBP towers, fences, and buildings with lighting, as well as population growth leading to increased light pollution in Hereford, Sierra Vista, and Nogales, AZ, as well as the city of Cananea in Sonora, Mexico. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in an increase of light pollution in the park. Collectively, all of these actions have had and will continue to have adverse impacts on night skies. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on night skies are not significant, as lighting will be shielded, daytime construction will be prioritized, and the tower height does not require FAA lighting. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on night skies will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

Soundscapes

Based on the impact analysis contained in the 2008 EA (pages 137-139), the 2008 BO (pages 10-136), as well as additional analysis conducted by the NPS in 2016, there will be no significant impacts on soundscapes.

It is estimated that temporary or short-term noise levels resulting from use of heavy equipment and generators will not exceed 53 dBA at 1,000 ft. beyond the construction site at Montezuma Pass. However, the potential adverse noise effects associated with heavy equipment and generators will be 65dBA or greater within a smaller radius of 500 ft. It is assumed that noise will be generated from construction activities for the entire duration of construction. Typical construction noise levels will decrease as the distance increases from the source. An additional temporary source of noise will be associated with construction vehicle traffic.

Each tower will be equipped with a back-up generator which will be operated on a routine basis to ensure operability. Noise associated with the generators is expected to be a long-term intermittent noise and will attenuate to below 55 dBA in 165 ft.

Assuming the highest-impact scenario of 81 dBA and, the noise model projected that noise levels of 81 dBA from the construction equipment will have to travel 300 feet before they will attenuate to acceptable levels of 65 dBA. To achieve an attenuation of 81 dBA to a normally unacceptable level of 75 dBA, the distance from the noise source to the receptor is 100 feet. In summary, construction equipment noise emissions will have to travel 300 feet to attenuate to normally acceptable levels of 65 dBA.

The Selected Alternative tower sites analyzed in the EA are located in rural areas with no residential noise receptors nearby or with no sensitive residential noise receptors within 1,000 feet. Elevated noise levels will also have the potential to impact wildlife and protected species. Sensitive receptors within National

Park land, who occupy land on which serenity and quiet are of significance, require less than a maximum noise threshold of 57 dBA (23 CFR 772 Table 1).

Construction-related effects to soundscapes will last from January through November 2017. These effects will be short-term and will not permanently impact the natural soundscape of the park. Mitigations, including muffling equipment and monitoring will ensure that affects to park resources are not significant.

Cumulative Effects- Soundscapes

Past, present, and reasonably foreseeable future actions that have impacted park soundscapes include the presence of CBP vehicles in the park, as well as increased park visitation due to the NPS Centennial. In summary, the impacts of past, present, and reasonably foreseeable future actions have resulted in increased human-caused noise within the park. Collectively, all of these actions have had and will continue to have adverse impacts on park soundscapes. As previously described in this FONSI, the direct and indirect impacts of the construction of tower TCA-SON-062 on soundscapes are not significant, as construction mufflers will be used, construction noises are temporary, and tower operation noise will attenuate to acceptable levels within 165 ft., and will be intermittent. When the effects of tower construction are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on soundscapes will continue to be adverse. The incremental impacts of construction of tower TCA-SON-062 will contribute slightly to, but will not substantially change, the impacts that are already occurring.

CONCLUSION

As described above, the selected alternative does not constitute an action meeting the criteria that normally requires preparation of an environmental impact statement (EIS). The selected alternative will not have a significant effect on the human environment in accordance with Section 102(2)(c) of NEPA.

Based on the foregoing, it has been determined that an EIS is not required for this project and, thus, will not be prepared.

Appendix A
Mitigation Measures

The following is a complete list of all mitigations that will be incorporated into the above-referenced project. Mitigations are outlined in the 2008 EA and the BO issued by the USFWS. Requisite mitigations have been modified and refined with stipulations related to the specific natural and cultural resources found within Coronado National Memorial

Air Quality

1. Mitigation measures will be incorporated to ensure that fugitive dust emission levels do not rise above the minimum threshold as required per 40 CFR 51.853(b)(1). Measures will include dust suppression methods such as road watering to minimize airborne particulate matter created during construction activities.

2. Standard construction BMPs such as routine watering of the construction site as well as access roads to the site will be used to control fugitive dust and thereby assist in limiting potential particulate matter greater than 10 microns (PM-10) excursions during the construction phase of the proposed project.

3. All construction equipment and vehicles will be required to be maintained in good operating condition to minimize exhaust emissions.

Night Sky

1. To reduce the illumination of the night sky and ambient lighting, CBP will follow USFWS (2000) Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers to reduce potential adverse effects of nighttime lighting to migratory bird and nocturnal flying species, and astronomical observatories. Any infrared lighting installed on the proposed towers will be compatible with night vision goggle usage. The tower site lighting proposed for CBP security purposes will: utilize low sodium bulbs, be shielded to avoid illumination outside the footprint of the tower site, and when possible, be activated by motion detectors. Additionally, Pima County lighting ordinances will be utilized to the greatest extent possible.

2. If nighttime construction becomes necessary its use will be minimized and the lights will be shielded and follow light ordinances.

3. If it is necessary for the tower to be lighted with FAA lighting for CBP operational need, such as infrared lighting, then USFWS (2000) Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers will be implemented to reduce night-time atmospheric lighting and the potential adverse effects of nighttime lighting to migratory birds, nocturnal flying species, and nearby astronomical observatories. Lighting will be necessary for CBP security purposes within the tower perimeter; these lights will utilize low sodium bulbs, be shielded to avoid

illumination outside the footprint of the tower site, and when possible, be activated by motion detectors. Such security lights will be similar to a residential porch light and will be situated on the equipment shelter

4. CBP security lighting at facilities will be designed to minimize light pollution beyond the designated security zone while achieving light levels needed for operational purposes. Because directed lighting for security zones can extend ambient light levels well over 900 ft. away from the source, the effects of lighting extend beyond the immediate area. Security lights will not shine onto habitat areas at a level greater than 1.5 foot-candles. All lights will be shielded from the top to prevent uplighting. If CBP construction or maintenance activities continue at night, all lights will be shielded to direct light only onto the work site and the area necessary to ensure the safety of the workers, the minimum foot-candles needed will be used, and the number of lights will be minimized. Any light extending beyond the construction or maintenance area will be no greater than 1.5 foot candles.

Construction Waste and Hazardous Materials

1. CBP will ensure that all construction will follow DHS management directive 5100 for waste management. BMPs will be implemented as standard operating procedures during all construction activities, and will include proper handling, storage, and/or disposal of hazardous and/or regulated materials. To minimize potential impacts from hazardous and regulated materials, all fuels, waste oils and solvents will be collected and stored in tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls capable of containing the volume of the largest container stored therein.

2. A CBP-approved spill protection plan will be developed and implemented at construction and maintenance sites to ensure that any toxic substances are properly handled and that escape into the environment is prevented. Agency standard protocols will be used. The refueling of machinery will be completed in accordance with accepted industry and regulatory guidelines, and all vehicles will have drip pans during storage to contain minor spills and drips. Although it is unlikely that a major spill will occur, any spill of reportable quantities will be contained immediately within an earthen dike, and the application of an absorbent (e.g., granular, pillow, sock, etc.) will be used to absorb and contain the spill. To ensure, oil pollution prevention, a SPCCP will be in place prior to the start of construction activities and all personnel will be briefed on the implementation and responsibilities of this plan as is typical in CBP/SBI projects. All spills will be reported to the designated USBP point of contact for the project. Furthermore, a spill of any petroleum liquids (e.g., fuel) or material listed in 40 CFR 302 Table 302.4 of a reportable quantity must be cleaned up and reported to the appropriate Federal and state agencies.

3. All waste oil and solvents will be recycled. All non-recyclable hazardous and regulated wastes will be collected, characterized, labeled, stored, transported, and disposed of in accordance with all applicable Federal, state, and local regulations, including proper waste manifesting procedures.

4. Solid waste receptacles will be maintained at construction staging areas. Non-hazardous solid waste (trash and waste construction materials) will be collected and deposited in one-site receptacles. Solid waste will be collected and disposed of by a local waste disposal contractor. To eliminate attracting predators of protected animals, CBP will dispose of all food related trash items such as wrappers, cans, bottles, and food scraps in closed containers and remove them daily from the project site. Waste water is water used for project purposes that is contaminated with construction materials or from cleaning equipment and thus carries oils or other toxic materials or other contaminants as defined in state regulations. CBP will store waste water in closed containers on site until removed for disposal. Concrete wash water will not be dumped on the ground, but is to be collected and moved offsite for disposal. This wash water is toxic to aquatic life.

5. Disposal of used batteries or other small quantities of hazardous waste will be handled, managed, maintained, stored, and disposed of in accordance with applicable Federal and state rules and regulations for the management, storage, and disposal of hazardous materials, hazardous waste and universal waste. Additionally, to the extent practicable, all batteries will be recycled, locally.

6. When handling of hazardous and regulated materials does occur, CBP will collect and store all fuels, waste oils and solvents in clearly labeled tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls capable of containing the volume of the largest container stored therein.

7. During construction, the potential exists for POL contamination at the construction site due to storage of POL material for maintenance and refueling of vehicles and fuel storage tanks. However, these activities will include primary and secondary containment measures. Clean-up materials (e.g., oil mops) will be maintained at each site for appropriate spill response and cleanup in case an accidental spill occurs. Drip pans will be provided for the power generators and other stationary equipment to capture any POL that is accidentally spilled during maintenance activities or leaks from equipment. To ensure, oil pollution prevention, a SPCCP will be in place prior to the start of construction activities.

8. Portable sanitary facilities will be provided during construction activities and waste products will be collected and disposed of by licensed contractors. Disposal contractors will use only established roads to transport equipment and supplies, and all waste will be disposed of in compliance with Federal, state, and local regulations, in accordance with contractors' permits.

9. CBP will contain nonhazardous waste materials and other discarded materials, such as construction waste until removed from the construction and maintenance sites. This will assist in keeping the project area and surroundings free of litter and reduce the amount of disturbed area needed for waste storage.

Viewshed

1. In order to mitigate effects on the park's viewshed, CBP will camouflage the tower, its instrumentation, and other components to the greatest possible extent without impeding tower operation. Camouflage may consist of paint in appropriate colors matching the surrounding environment, or other noninvasive methods. CBP will consult with the park's resource management staff for guidance and approval before implementing procedures to camouflage the tower.

2. All tower components and instrumentation will be positioned to minimize surface reflection to the west. The main visitor access road to Montezuma Pass, Montezuma Canyon Road, runs in an east-west direction through the park. Minimizing reflection from western-facing elements of the tower will mitigate impacts to the viewshed in the afternoon and evening.

Wildfire

1. To ensure that wildfire concerns are accounted for in the EA, an area beyond the 50- x 50-foot or 80- x 80-foot tower site footprint but no further than the 100- x 100-foot construction footprint will be maintained as a fire buffer. The fire buffer will be maintained free of vegetation. CBP will develop a Fire Management Plan as part of tower construction and in coordination with the landowner and/or land management agency.

Electromagnetic Spectrum

1. As part of the overall spectrum management process, the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) have developed radio rules and regulations to help ensure that the various radio services operate in a compatible manner in the same environment without unacceptable levels of radio frequency interference and emissions (U.S. Department of Commerce 2008). While the communication systems and the frequencies in which they will be operated are considered law enforcement sensitive and cannot be provided to the public, compliance with FCC and NTIA regulations will be required, and will ensure that recognized safety guidelines are not exceeded. All frequencies used by CBP will be coordinated through the FCC and NTIA as required in 40 CFR Part 2 Sections 2.103 Federal Use of non-Federal Frequencies and Section 2.107 Radio Astronomy. Additionally, transmitters and sensors associated with the SBInet Tucson West project will operate below 30 GHz.

2. With the implementation of the Preferred Alternative, the 54 towers equipped with radio wave and microwave communication systems, as well as radar equipment, will be installed for use by CBP in maintaining a secure border. As with any RF transmitter, all of these systems will emit RF energy and EM radiation; therefore, a potential for adverse effects could occur. However, any adverse effects to human safety and wildlife will likely be negligible due to the minimal exposure limits associated with both the type of equipment used and the elevated locations in which they will be positioned on the

towers. The tower sites will also be fenced for security, making exposure to RF emitting equipment even less likely.

3. All frequencies used by CBP will be coordinated through the FCC and NTIA as required by NTIA regulations. Additionally, transmitters and sensors associated with the SBInet Tucson West project will operate below 30 GHz. Therefore, the RF environment created by the installation, operation and maintenance of the communication and radar systems on the proposed towers will not result in significant adverse impacts to observatories, human safety or the natural and biological environment.

4. The potential to exceed MPE limits of RF energy such as those described by Kelly (1999) are far outside the capability limits of data and communications systems in the Preferred Alternative. Furthermore, communication and radar systems installed on the proposed towers will be a minimum of 20 feet off the ground and will not exceed the safe operating distance for these systems (i.e., 17 feet). Thus, maintenance and operational personnel working within the secure tower site will not be exposed to any RF energy that exceeds MPE limits set by the FCC.

Sustainability

1. In accordance with EO 13423 - Strengthening Federal Environmental, Energy, and Transportation Management (72 FR 3919 [2007]), CBP will incorporate practices in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient and sustainable manner in support of their mission. CBP implements practices throughout the agency to: 1) improve energy efficiency and reduce greenhouse emissions, 2) implement renewable energy projects, 3) reduce water consumption, 4) incorporate sustainable environmental practices such as recycling and the purchase of recycled-content products, and 5) reduce the quantity of toxic and hazardous materials used and disposed of by the agency. Additionally, new facility construction will comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Memorandum of Understanding. DHS will also reduce total consumption of petroleum products as set forth in the EO and use environmentally sound practices with respect to the purchase and disposition of electronic equipment.

Human Health and Safety

1. CBP will clearly demarcate the perimeter of all areas to be disturbed during construction or maintenance activities using flagging or temporary construction fence, and no disturbance outside that perimeter will be authorized.

Rare, Threatened & Endangered Species

1. CBP will develop (in coordination with FWS) a training plan regarding Trust Resources for construction personnel. At a minimum, the program will include the following topics: occurrence of the listed and sensitive species in the area, their general ecology, sensitivity of the species to human

activities, legal protection afforded these species, penalties for violations of Federal and State laws, reporting requirements, and project features designed to reduce the impacts to these species and promote continued successful occupation of the project area environs. Included in this program will be color photos of the listed species, which will be shown to the employees. CBP will provide maps of federally listed species habitats. Following the education program, the photos will be posted in the contractor and resident engineer office, where they will remain through the duration of the project. The selected construction manager will be responsible for ensuring that employees are aware of the listed species.

2. CBP will provide a designated biological monitor on site during the work activities for all construction and maintenance projects in federally listed species habitats. The biological monitor will be in charge of implementing and documenting construction-related BMPs as designed for the project to reduce the potential for adverse effects to the species or their habitats. CBP will use the reports from the biological monitor will be used for development of the post-construction report. The designated biological monitor will notify the construction manager of any activities that may harm or harass an individual of a federally listed species. Upon such notification, the construction manager will temporarily suspend all subject activities and notify the Contracting Officer, the Administrative Contracting Officer, and the Contracting Officer's Representative of the suspense so that the key personnel may be notified, apprised of the situation, and the potential conflict resolved.

3. Where, based on species location maps and/or results of surveys, individuals of a federally listed species could be present on or near the project site, CBP will have a designated, qualified biological monitor (a person having experience with the species involved and if the task requires handling or species surveys, appropriate Federal and state permits) to be present during the activity to protect individuals of the species from harm. Duties of the biological monitor will include ensuring that activities stay within designated project areas, evaluating the response of individuals that come near the project site, and implementing the appropriate BMP. See previous BMP above for biological monitoring procedures. For some species, there may only be a seasonal need for the biological monitor to be present. This category includes at least the following species for those roads and towers near occupied habitat: Mexican spotted owl, Chiricahua leopard frog, lesser long-nosed bat.

4. If an individual of a federally listed species is found in the designated project area and is in danger of being harmed (e.g. in path of vehicles or foot traffic), work will cease in the area of the species until either a qualified biological monitor can safely remove the individual, or it moves away on its own. Individual animals found in the project area in danger of being harmed will be relocated by a CBP biologist to a nearby safe location in accordance with accepted species handling protocols in Federal and state permits.

Jaguar

Coronado National Memorial is within Designated Critical Habitat for the Jaguar. In addition, as of December 2016, a jaguar has been confirmed in Huachuca Mountains in the Coronado National Forest and on Fort Huachuca. This individual was not observed within Memorial boundaries, however, will likely utilize the park as habitat.

1. CBP will mediate or mitigate the effects of construction and maintenance activities on jaguar survival and mortality where possible (Section III.B.3) (Jaguar Recovery Outline) in consultation with USFWS and NPS.
2. All CBP vehicles, construction-related vehicles, and contractor vehicles will follow speed limits and traffic laws when traveling through the park and all drivers will exhibit responsible driving behavior.
3. CBP will conduct monitoring to document and assess construction and maintenance related impacts of jaguar beginning once tower construction is completed and continuing for five years after the towers are fully operational.
    - Monitoring will include systematic jaguar searches, use of wildlife cameras and other sensing equipment to assess and verify jaguar presence and potential impacts derived from tower operation.
    - If Jaguar occupancy is documented, CBP will
        - Immediately notify FWS and NPS in writing.
        - Work with FWS and NPS to develop site-specific measures to reduce potential impacts.
        - Continue monitoring beyond the five years until tower operations are longer having an adverse effect. Information gained from monitoring will be used to develop protocols to reduce impact to these species and their habitat. CBP will ensure monitoring associated with the Preferred Alternative will be incorporated into an annual report for a minimum of five years.

4. Monitoring will be conducted by an experienced and federally-permitted wildlife biologist.

Mexican Spotted Owl

1. The time period between November 30th and February 28th will be prioritized for construction of Tower TCA-SON-062 to avoid adversely affecting Mexican spotted owls during the nesting and breeding season. CBP may conduct maintenance activities for facilities at any time; however, for major work on roads or fences where significant amount of equipment will be required, the September to February period is preferred.

2. If construction or clearing activities are scheduled during breeding seasons (March 1 through August 31); surveys will be performed within the Joe's Canyon Protected Activity Center (PAC) to identify active nests.
    - Surveys will be performed by a qualified, experienced, state- and federally-permitted biologist.
    - Surveys will be performed according to USFWS protocols.

- If construction activities will result in the take of a migratory bird; then coordination with the USFWS, Federal Aviation Administration (FAA), and Arizona Game and Fish Department (AGFD) will be required and applicable permits will be obtained prior to construction or clearing activities.

3. CBP will monitor construction activities for towers, new roads, and road improvements, between March 1 and August 31, which are closer than 0.25 mile to an owl PAC. Construction activities will be monitored by a qualified biologist provided by CBP.

4. The TCA-SON-062 tower is located within the Joe's Canyon PAC. Construction and post-construction activities involving land clearing have associated high-intensity noise and high-intensity artificial light components.
   - Construction activities related to roads, fences, security zones, surveillance sites, and other facilities will adhere to Conservation Best Management Practices (BMPs) for Mexican spotted owl habitat and PACs. This also includes the indirect effects of increased human access to the roosts.

5. CBP will develop an MOU with the NPS to conduct spotted owl monitoring, with PAC locations provided by USFWS.

6. CBP will complete a Mexican spotted owl monitoring and mitigation plan within six months of the date of this project's biological opinion for review and approval by NPS and USFWS. This monitoring and mitigation plan will include:
   - Methods to determine effects
   - Potential corrective actions to be taken (e.g., road closures, fencing, gating, site restoration)
   - Schedules for monitoring and mitigation
   - Schedule and content of annual reports

7. CBP will monitor affected Mexican spotted owl Protected Activity Center (PAC) (Joe's Canyon) annually for three years (field seasons) from the date construction is completed and towers are fully operational.
   - Surveyors should conduct four complete surveys during each breeding season.
   - A complete survey can be a combination of a pre-call (daytime reconnaissance of habitat to be night called), a nighttime calling survey, and, if owls are detected, a daytime follow-up survey.
   - If owls are not detected during daytime calling, night calling must be completed.
   - However, if owls are located during a pre-call, night calling of the survey area is not required. Surveyors might want to conduct additional surveys if there is evidence that additional owls remain undetected in the area.
   - The four complete surveys must be spread out over the breeding season (1 March – 31 August) by following one of three recommended scheduling scenarios:

- Conduct two to four surveys during 1 March - 30 June, with no more than one survey in March.
- Complete all surveys by 31 August, with no more than one of the four required surveys conducted during each of the months of July and August. If additional surveys are added (e.g., more than the recommended four surveys), more than one complete survey could be completed in August.
- Allow at least five full days between surveys.
- Surveyors will follow all park safety protocols.

8. Implementation of the monitoring and mitigation plan will begin once approved by USFWS and NPS, and mitigation will be completed within three years from the date construction is completed and tower is fully operational. CBP will complete an annual report for a minimum of three years that summarizes the implementation of the Preferred Alternative, monitoring results, mitigation progress, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.

9. Monitoring will be conducted by an experienced and state- and federally-permitted spotted owl surveyor.

- According to FWS standards, surveyors must have knowledge of official FWS protocols and the ability to identify owls visually and vocally, determine sex and age of owls, imitate vocal calls of the owls if not utilizing a tape recording of the calls, and identify other local raptor species. Orienteering skills, including use of map, compass, and/or Global Positioning System (GPS) units, are essential.

10. CBP may conduct maintenance activities for facilities at any time; however, for major work on roads or fences where significant amount of equipment will be required, the September to February period is preferred.

Lesser long-nosed bat

1. The time period between November 1st and June 30th will be prioritized for construction of Tower TCA-SON-062 to avoid adversely affecting lesser long-nosed bats. The State of Texas Mine within Coronado National Memorial is used as a post-maternity roost for endangered lesser long-nosed bats from July through October each year.

2. The State of Texas (SOT) mine roost is located 0.8 mile from the proposed TCA-SON-062 tower, and between 1 and 5 miles from the TCA-SON-060 and 61 construction sites. Construction and post-construction activities involving land clearing have associated high-intensity noise and high-intensity artificial light components.

- Construction activities related to roads, fences, security zones, surveillance sites, and other facilities will adhere to Conservation Best Management Practices (BMPs) for the post-maternity roost for lesser long-nosed bats at State of Texas mine. This also includes the indirect effects of increased human access to the roosts.

3. During construction or post-construction activities in or within one mile of State of Texas Mine (or such distance that noise, light, or other effects reach the habitat), a construction monitor will be present on site and will have authority to halt construction at any time the appropriate Conservation BMPS are not being properly implemented as agreed upon.

4. CBP will replace agaves and columnar cacti removed for construction at a 2:1 ratio. Seed to grow plants will be collected from the park. Seedlings will be grown for at least two years before planting to increases chances of survival. CBP will work with NPS to determine location for replacement plants. CBP will water plants according to site conditions to ensure survival. CBP will monitor annually for survival for five years and will replace dead or dying plants.

5. CBP will conduct annual bat surveys at bat roosts within one mile of TCA-SON-062 for two years from the date tower is fully operational. CBP will compare results with previous years' surveys.
    - If negative effects of the Preferred Alternative are documented, CBP will take corrective action (e.g. gating, signing, and fencing) and will continue to survey annually until negative effects are no longer detected.
        - Negative effects are defined by the park as any effects which lead to a decrease in the number of bats utilizing the SOT mine roost, or any effects which lessen the quality of life or health of any bats
    - The Coronado National Memorial has collected years of pre-tower bat surveys using a standardized protocol. This same protocol will be used for future bat surveys at State of Texas Mine.
        - At least three surveys will be conducted throughout the season (July-October) by lesser long-nosed bat experts Sandy Wolf and Dave Dalton, who have performed the surveys in previous years using specialized equipment. If these individuals are not available to perform monitoring, qualified biologists with bat experience, as well as federal and state permits for working with lesser long-nosed bats, will be hired. Biologists will follow all park safety protocols.

6. CBP will install Hobo data loggers between December 2016 and June 2017 in lesser long-nosed bat roosts most prone to human use, including the SOT Mine, to detect changes in temperature, humidity, and dew point. These loggers will be in place for at least five years following tower operation. CBP will take corrective actions in coordination with FWS and NPS if such effects are detected. This may include road closures, gating, signing, fencing, etc.
    - HOBO loggers take a reading every 15 minutes and data is usually collected from each logger once a month using a data shuttle.
    - Logging every 15 minutes, these loggers can last about 7 months before memory is full.
    - Every two and a half years the batteries should be replaced on loggers. One logger will be placed at each entrance, and at least two will be spread out inside.

7. CBP will hire qualified biologist(s) with current federal and state permits to telemeter 15 bats per year at State of Texas Mine in early August and will track bats through mid-October. Biologists will telemeter up to five bats at a time; transmitters have a two to three week lifespan. If negative effects are found in foraging or roosting areas as a result of this Preferred Alternative, CBP will take corrective action. This may include road closures, gating, signing, fencing, etc.

   - Negative effects are defined by the park as any effects which lead to a decrease in the number of bats utilizing the SOT mine roost, or any effects which lessen the quality of life or health of any bats.

8. CBP will conduct monitoring to document and assess tower-related mortality of lesser long-nosed bats beginning once tower construction is completed and continuing for five years after the towers are fully operational. Monitoring will include:

   - Systematic lesser long-nosed bat searches and use of radar, GPS, infrared, thermal imagery, and/or acoustical monitoring equipment to assess and verify bat movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.
   - Monitoring will occur during the time period between July and September when bats are occupying the SOT roost.
     - Monitoring must occur at least monthly throughout this time period.
   - Monitoring will occur in the morning hours directly after sunrise to minimize the loss of any potential bat carcasses to scavengers.
   - Monitoring will be performed by qualified biologists with current federal and state permits.
   - If lesser long-nosed bat mortality is documented at tower or wind turbine sites, CBP will:
     - a) Immediately notify FWS and NPS in writing.
     - b) Work with FWS and NPS to develop site-specific measures to reduce that mortality.
     - c) Continue monitoring beyond the five years until mortality is no longer occurring.
   - Information gained from monitoring will be used to develop tower retrofits to reduce lesser long-nosed bat mortality, if collisions are documented. CBP will incorporate the bat mortality monitoring associated with the Preferred Alternative into an annual report for a minimum of five years.

9. Where improved or new roads may increase human use of SOT Mine occupied by lesser long-nosed bats, CBP will prevent access through gating, fencing, other physical barriers, etc. Close coordination with FWS and NPS will be necessary, as the design and season of installation is critical to ensure bat gates benefit lesser long-nosed bats.

   - As of 2016, the SOT mine has been gated. Currently, the NPS operates a Buckeye live-feed camera at the SOT mine site. CBP will work with NPS and use images from this camera to monitor human use of the SOT mine area due to shifts in the location of illegal activity (IA) traffic.
     - If IA traffic increases, CBP will diligently work to deter IA traffic from this area during the critical time between July and October when bats roost in the SOT mine.

10. Construction activities for towers, new roads, and road improvements that are within one mile of a bat roost (or such distance that noise, light, or other effects reach the habitat) and occur between May 1 and September 30 will be monitored by a qualified biologist with authority to halt construction at any time the appropriate Conservation Best Management Practices are not being properly implemented as agreed to. In some years, bats may arrive earlier and leave later in the year than the May to September time frame. For summer roosts, this will be July through October. Any occurrences and/or disturbances of lesser long-nosed bats will be documented and mitigated. CBP may perform maintenance activities for facilities at any time; however, for major work on roads or fences where significant amount of equipment will be required, the October to April period is the minimum period for avoidance.

11. CBP will prepare a lesser long-nosed bat monitoring and mitigation plan for review and approval by landowners and/or land management agencies and USFWS that includes bat telemetry study plan, bat roosts to be surveyed, roosts to be monitored for effects, survey and monitoring schedule, roosts to be protected, method of roost protection, schedule for roost protection completion, tower site monitoring methods, potential corrective actions at tower or roost sites if effects are detected, number of agave and cacti salvaged and transplanted or to be mitigated, and annual report content and schedule. CBP will complete the plan, in coordination with landowners and/or management agencies and USFWS, within six months of the date of this project's Biological Opinion.

12. CBP will conduct a telemetry study to locate bat roosts and foraging areas used by those bats found in the vicinity of towers. This study will be conducted for five years. If occupied mines or caves are found within a mile of towers, they will be monitored with Hobo data loggers. CBP will telemeter 15 bats per year in early August and will track bats through mid-October. CBP will telemeter up to five bats at a time; transmitters have a two to three week lifespan. CBP will hire five field biologists to conduct the study. If negative effects are found in foraging or roosting areas as a result of this Preferred Alternative, CBP will take corrective action. This may include road closures, gating, signing, fencing, etc.

Viewshed

1. In order to mitigate effects on the park's viewshed, CBP will camouflage the tower, its instrumentation, and other components to the greatest possible extent without impeding tower operation. Camouflage can consist of paint in appropriate colors matching the surrounding environment, or other noninvasive methods. CBP will consult with the park's resource management staff for guidance and approval before implementing procedures to camouflage the tower.

2. All tower components and instrumentation will be positioned to minimize surface reflection to the west. Montezuma Canyon Road runs in an east-west direction through the park, and minimizing reflection from western-facing elements of the tower will minimize these impacts to the viewshed in the afternoon and evening.

Soils, Topography, Geology

1. CBP will confine vehicular traffic associated with construction activities to established roads (with the exception of new roads being constructed). CBP's road maintenance shall avoid making wind rows with the soils once grading activities are completed, and any excess soils will be used on-site to raise and shape the tower site and/or road surface. CBP will avoid or minimize the potential for entrapment of surface flows within the roadbed due to grading. CBP will minimize the depth of any pits created so animals do not become trapped.

2. Vehicular traffic associated with the tower and access road construction activities and operational support activities will remain on established roads to the maximum extent practicable.

3. Site rehabilitation will include re-vegetating or the distribution of organic and geological materials (i.e., boulders and rocks) over the disturbed area to reduce erosion while allowing the area to naturally vegetate. CBP will obtain materials such as gravel or topsoil from existing developed or previously used sources, not from undisturbed areas adjacent to the project area.

4. CBP will use disturbed areas or areas that will be used later in the construction period for staging, parking, and equipment storage

5. Within the designated disturbance area, CBP will minimize the area to be disturbed by limiting deliveries of materials and equipment to only those needed for effective project implementation. Within the designated disturbance area, CBP will limit grading or topsoil removal to areas where this activity is needed to provide the ground conditions for construction or maintenance activities. Minimizing disturbance to soils will enhance the ability to restore the disturbed area after the project is complete.

6. For placement of in-ground monitoring or sensor arrays, CBP will limit ground disturbance to existing disturbed areas, and use of hand tools will be used. CBP will avoid cacti and agave during the placement of in-ground monitoring. No cacti or agaves will be removed.
7. Areas with highly erodible soils will be given special consideration when designing the proposed project towers and access roads to ensure incorporation of various erosion control techniques such as, straw bales, silt fencing, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion. Additionally, erosion control measures and appropriate best management practices (BMP), as required and outlined in the Stormwater Pollution Prevention Plan (SWPPP) and engineering designs, will be implemented before, during, and after construction activities.

8. CBP will develop and implement a stormwater management plan (SWMP). Erosion control measures and appropriate BMPs, as required and promulgated through the SWMP and engineering designs, will be implemented before, during, and after soil disturbing activities. Areas with highly erodible soils will be given special consideration when preparing the SWMP to ensure incorporation of various erosion control techniques such as straw bales, silt fencing, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion.

Soundscapes

1. During the construction phase, short-term noise impacts are anticipated. All applicable Occupational Safety and Health Administration regulations and requirements will be followed. On-site activities will be restricted to daylight hours to the greatest extent practicable although night-time construction could occur if CBP schedules are constrained. Construction equipment will possess properly working mufflers and will be kept properly tuned to reduce backfires. Implementation of these measures will reduce the expected short-term noise impacts to an insignificant level in and around tower construction sites.

2. Prior to the start of construction, CBP will coordinate with BANWR and NPS on the issuance of special use permits during the 10 to 60 day construction period for the proposed tower locations in these sensitive areas. The proposed towers will not require the use of auger drills but will require the use of conventional construction equipment, which produces noise emissions up to 81 dBA. The proposed tower sites have the potential to expose sensitive receptors to emissions that are normally unacceptable at the urban installation sites. Table 3-17 describes noise emission levels for construction equipment which range from 76 dBA to 84 dBA (Federal Highway Administration [FHWA] 2007).

3. CBP will minimize noise levels for day or night construction and maintenance using mufflers. All generators will be in baffle boxes (a sound-resistant box that is placed over or around a 20 generator), have an attached muffler, or use other noise-abatement methods in accordance with industry standards.

Vegetation

1. CBP will document any establishment of non-native plants and will implement appropriate control measures. CBP will remove invasive plants that appear on the tower sites. Removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. Herbicides can be used according to label directions if they are not toxic to Federally-listed species that may be in the area. Training to identify non-native invasive plants will be provided for CBP personnel or contractors as necessary. Construction equipment will be cleaned at the temporary staging areas, in accordance with BMPs, prior to entering and departing the project corridor to minimize the spread and establishment of non-native invasive plant species. CBP will control noxious weeds using approved herbicides.

2. Native seeds or plants, which are compatible with the enhancement of protected species, will be used to the extent practicable, as required under Section 7(a)(1) of the ESA, to revegetate staging areas and other temporarily disturbed areas.

3. CBP will prepare a site restoration plan, to be approved by FWS. This site restoration plan will be funded in the third quarter of fiscal year 2009 and will provide an achievement goal to be met by the restoration activity. If seeding with native plants is identified as appropriate, seeding will take place at the proper season, and with seeds from nearby stocks if available. It is understood that some sites cannot be restored, and the project planning documents will acknowledge this.

4. Rehabilitation conducted by CBP will include re-vegetating or the distribution of organic and geological materials (i.e., boulders and rocks) over the disturbed area to reduce erosion while allowing the area to naturally vegetate. Native seeds or plants, which are compatible with the enhancement of protected species, will be used to revegetate staging areas and other temporarily disturbed areas. Native seed mix will be reviewed by a qualified botanist as part of project planning. In addition, organic material will be collected and stockpiled during construction to be used for erosion control after construction while the areas naturally re-vegetate. Materials used for on-site erosion control will be free of non-native plant seeds and other plant parts to limit potential for infestation. Because natural materials cannot be certified as completely weed-free, CBP will follow up with the use of such materials by monitoring the rehabilitated site.

5. CBP will use materials free of non-native plant seeds and other plant parts to limit potential for infestation for on-site erosion control in uninfested native habitats. Since natural materials cannot be certified as completely weed-free, if such materials are used, there will be follow-up monitoring to document establishment of non-native plants and appropriate control measures will be implemented for a period of time to be determined in the site restoration plan. CBP fill material brought in from outside the project area will be identified as to source location and will be weed free.

6. CBP will conduct follow-up monitoring for those projects that use natural materials. The purpose is to document establishment of non-native plants, appropriate control measures implemented, and results of implementation.

Water Quality & Hydrology

1. CBP will implement a strategy, to offset its agencies' use of groundwater for construction and maintenance of towers, on a gallon-for-gallon basis, within the Sierra Vista subwatershed. This strategy will include, but is not limited to, the Upper San Pedro Partnership and/or its member agencies. CBP will use water for construction from wells at the discretion of the landowner (depending on water rights). If local groundwater pumping is an adverse effect to aquatic, marsh, or riparian dwelling federally listed species, treated water from outside the immediate area will be

utilized. CBP storage tanks containing untreated water will be of a size that if a rainfall event were to occur, the tank (assuming open), will not be overtopped and cause a release of water into the adjacent drainages. Water storage on the project area will be in onground containers located on upland areas not in washes. CBP pumps, hoses, tanks and other water storage devices will be cleaned and disinfected with a 10% bleach solution at an appropriate facility and before use at another site (this water is not to enter any surface water area). If a new water source is used that is not from a treated or groundwater source, the equipment will require additional cleaning. This is important to kill any residual disease organisms or early life stages of invasive species that may affect local populations of federally listed species.

2. All fuels, waste oils, and solvents will be collected and stored in tanks or drums within secondary containment areas consisting of an impervious floor and bermed sidewalls capable of holding the volume of the largest container stored therein. The refueling of machinery will be completed following accepted guidelines, and all vehicles will have drip pans during storage to contain minor spills and drips. No refueling or storage will take place within 100 feet of drainages.

3. Standard construction procedures will be implemented to minimize potential for erosion and sedimentation during construction. All work shall cease during heavy rains and will not resume until conditions are suitable for the movement of equipment and material.

4. A Construction Stormwater General Permit will be obtained prior to construction, and this will require approval of a site-specific SWPPP and Notice of Intent (NOI). A site-specific SPCCP will also be in place prior to the start of construction. Other environmental design measures will be implemented such as straw bales, silt fencing, aggregate materials, wetting compounds, and re-vegetation with native plant species, where possible, to decrease erosion and sedimentation.

5. Prior to the start of construction activities, the construction contractor will review the most up-to-date version of the Arizona Department of Environmental Quality (ADEQ) 305(b) and 303(d) report. Additionally, road repair or improvement activities in wash or drainage crossings shall not impede the flow of affected water courses.

Wildlife - Birds

1. If construction or clearing activities are scheduled during nesting seasons (February 15 through August 31); surveys will be performed to identify active nests. If construction activities will result in the take of a migratory bird; then coordination with the USFWS, Federal Aviation Administration (FAA), and Arizona Game and Fish Department (AGFD) will be required and applicable permits will be obtained prior to construction or clearing activities.

2. Another mitigation measure that will be considered is to schedule all construction activities outside nesting seasons negating the requirement for nesting bird surveys. The proposed sensor and

communication towers will also comply with USFWS guidelines for reducing fatal bird strikes on communication towers to the greatest extent practicable. Guidelines recommend co-locating new antennae arrays on existing towers whenever possible and to build towers as short as possible, without guy wires or lighting, and use white strobe lights whenever lights are necessary for aviation safety.

3. CBP will avoid or minimize the potential for entrapment of surface flows within the roadbed due to grading. CBP will minimize the depth of any pits created so animals do not become trapped.

4. Tower construction will adhere to the USFWS (2000) interim guidelines and FAA guidelines designed to reduce impacts to migratory birds such as installation of white or red strobe lights and limiting heights of towers. Unless otherwise required by the FAA, CBP will use only white (preferable) or red strobe lights at night, and these will be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. CBP will not use solid red or pulsating red warning lights at night as they appear to attract night-migrating birds at a much higher rate than white strobe lights. CBP will use security lighting for on-ground facilities and equipment that is down-shielded to keep light within the boundaries of the site.

5. CBP will minimize bird perching and nesting opportunities for new towers. Where feasible, CBP will place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds and bats. CBP will use recommendations of the APLIC (1994, 1996) for any required above-ground lines, transformers, or conductors. CBP will use raptor protective devices on above ground wires.

Wildlife - General

CBP will minimize the number of vehicles traveling to and from the project site and the number of trips per day to reduce the likelihood of disturbing animals in the area or injuring an animal on the road. CBP construction speed limits will not exceed 35 mph on major unpaved roads (graded with ditches on both sides) and 25 mph on all other unpaved roads. Night time travel speeds will not exceed 25 mph, and may be less based on visibility and other safety considerations. Construction at night will be minimized.

Reporting

For construction and maintenance projects that involve land-disturbing activities (e.g., fences, towers, stations, facilities), CBP will provide a report to the FWS within three months of project completion detailing the BMPs that were implemented, how well the BMPs worked, ways that BMPs could be improved for either protection of species and habitats or implementation efficiency, and any federally listed species observed at or near the project site. Implementation of the restoration plan and any follow-up monitoring will be included. CBP will provide a form-based report generated from documentation requirements of the Act for each specific project to ensure compliance. This report will be part of the project management plan.

Cultural Resources

The APE is in a previously heavily disturbed area within Montezuma Pass parking lot, and cultural material encountered as a result of the construction activities will be out of primary context. Known historic properties will not be adversely affected as a result of the proposed undertaking, and if project proponents adhere to the following stipulations: 1) cultural resource monitoring for NRHP-eligible sites adjacent to the access roads and compound areas will be conducted during construction. Archaeologists will also provide in-field awareness training to construction personnel to ensure avoidance; 2) all construction activities will be confined to previously heavily disturbed areas, and within area which have been previously inventoried for cultural resources; 3) during construction, no new roads will be built within the Memorial; 4) If any cultural material is discovered during construction, the land manager will be notified immediately and all activities halted in that area until a qualified archaeologist assesses the cultural remains, and develops a historic properties treatment plan in consultation with SHPO: 5) No collection of natural or cultural resources; 6) No disturbance or otherwise alteration of any stone features; 7) No alteration or defacing of historic structures, and 7) CCC culverts on the road will be avoided. 8) During construction, all construction traffic, including cement trucks, will enter the park from the west.

Appendix B
Non-Impairment Determination

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior and the National Park Service (NPS) to manage units "to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (54 U.S.C. 100101). NPS *Management Policies 2006*, Section 1.4.4, explains the prohibition on impairment of park resources and values:

> "While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them."

An action constitutes impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values" (NPS 2006, Section 1.4.5). To determine impairment, the NPS must evaluate the "particular resources and values that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact on any park resource or value may constitute impairment, but an impact will be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance (NPS 2006, Section 1.4.5).

Fundamental resources and values for Coronado National Memorial are identified in the enabling legislation for the park, the Foundation for Planning and Management Statement, and the Long Range Interpretive Plan. Based on a review of these documents, the fundamental resources and values for Coronado National Memorial come from the park's April 2015 Foundation Document Resources that were carried forward for detailed analysis in the EA and are considered necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; are key to the natural or cultural integrity of the park; and/or are identified as a goal in relevant NPS planning documents include: Expansive Views of the Border Region, Native Flora and Fauna of the Madrean Sky Island Ecosystem, Cultural Resources, and Coronado Cave and Karst Topography. Accordingly, a non-impairment determination is made for each of these resources. Non-impairment determinations are not necessary for human health and safety or visitor use and experience because impairment findings relate back to park

resources and values, and these impact topics are not generally considered park resources or values according to the Organic Act.

This non-impairment determination has been prepared for the Selected Alternative, as described in the Finding of No Significant Impact for the *Proposed SBInet Tucson West Project Ajo, Tucson, Casa Grande, Nogales, and Sonoita Stations Areas of Operation, U.S. Border Patrol, Tucson Sector, Arizona Environmental Assessment.*

Expansive Views of the Border Region

Expansive views of the US-Mexico international border, Montezuma Canyon, the San Pedro River Valley, and San Rafael Valley are a key component of the visitor experience at Coronado National Memorial. Overlooks throughout the park allow visitors to enjoy these spectacular views and contemplate the rugged landscape that the Coronado Expedition may have traversed nearly 500 years ago. While Francisco Vásquez de Coronado's exploration of the remote northwest frontier of Mexico did not achieve its goal of finding the Seven Cities of Gold, Coronado National Memorial commemorates the lasting impact of the expedition in what is now part of the southwestern United States. The expedition opened the doors to the clash of southwestern cultures. Resultant influences are still reflected and felt in southwest cultures today.

The enabling legislation for Coronado National Memorial emphasizes the need for protecting the views of the Coronado Expedition's route along the San Pedro River as the primary mission of the memorial. Any use of memorial's lands for telecommunication infrastructure can occur only if it will not impact the memorial's ability to accomplish its mission of preserving these historic views.

Tower TCA-SON-062 will impact the natural scenery and views provided by the park to visitors. The tower will be visible from approximately 37% of the park and will disrupt natural scenery. Views of the surrounding valley are integral to the park's founding mission. The tower will make these views more difficult to obtain.

However, these effects are mitigated by the fact that the location of the tower at Montezuma Pass allows visitors to face outwards from the tower and experience the viewshed the park was founded upon. Visitors will be able to achieve views of the San Pedro River Valley by looking east from Montezuma Pass. While looking east, the tower will not be within visitors' field of vision. In addition, visitors will also be able to look north and west without the tower in their field of vision. Views to the south will be impacted, but only from the parking lot and picnic area location. Visitors can climb the trail to Coronado Peak, only 0.4 mile from the parking lot at Montezuma Pass, to receive panoramic, uninterrupted views to the south. Due to these considerations, tower TCA-SON-062 will not impair the expansive views of the border region provided by the park.

Native Flora and Fauna of the Madrean Sky Island Ecosystem

Also known as the "Sky Island region," the Madrean Archipelago of northwestern Mexico and southern Arizona is one of the world's premier biodiversity hotspots. Located within this region in the Huachuca Mountains, Coronado National Memorial's ecosystem is remarkably diverse for its modest size. Influenced by subtropical moisture that typically precipitates during two distinct rainy seasons, the park supports approximately 650 species of plants. Thousands of invertebrate species inhabit the park,

including hundreds of species of bees alone. An interesting collection of mammals also live in the park, including endangered bats, native cats, and coatimundis. Many of these species live near the very northern limit of their range. Several of these species are listed on the Endangered Species List as Threatened and Endangered. These species include: Jaguar and Critical Habitat, Mexican Spotted Owl and Critical Habitat, Lesser long-nosed bat, Ocelet, and the Yellow-billed cuckoo. In addition, Arizona State Species of Special Concern inhabit that park, including the peregrine falcon and northern goshawk.

Construction of tower TCA-SON-062 will result in a temporary increase of noise and human-related activity within Coronado National Memorial. Impacts from construction equipment will occur from January 2017 through November 2017. These effects include increased noise disturbance, an increased presence of vehicles in the park, and an increase in lighting in the park if nighttime construction occurs.

Noise will affect wildlife by causing individuals to avoid the area, expending energy in the process. It may also cause flushing behavior and affect species' breeding behaviors. Construction vehicles in the park may strike wildlife, and lighting may cause wildlife to avoid the tower site, and may disorient some species.

However, construction noise will attenuate to below 53 dBA at approximately 1,000 ft. from the source. Construction-related noise will be temporary, and will only occur from January through November 2017. Mufflers will be used on construction equipment to lessen the noise produced by this equipment. After operation of the tower begins, the generator will produce noise not exceeding 55 dBA, at a distance of 165 ft beyond the tower. Within a radius of approximately 165 ft beyond the tower, noise levels may impact wildlife. However, wildlife likely avoid this area due to the fact that it is heavily frequented by visitors. Due to mitigations for construction-related noise and the relatively small radius of impact due to operational noise, native flora and fauna will not be impaired due to these impacts.

The tower will be 100 ft. tall, and will not require FAA lighting. In addition, nighttime construction will be avoided if possible to reduce the effects to park wildlife. CBP will follow USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* to reduce potential adverse effects of nighttime lighting to migratory bird and nocturnal flying species. Any infrared lighting installed on the proposed towers will be compatible with night vision goggle usage. The tower site lighting used to secure the site will utilize low sodium bulbs, be shielded to avoid illumination outside the 48' x 50' tower site, and when possible, be activated by motion detectors. Due to these mitigations, tower lighting will not impair park flora and fauna.

The tower will utilize radio waves and micowaves for communication once in operation. This electromagnetic radiation may disorient migratory species and have thermal effects on bats. However, these effects will be localized to the area directly surrounding the tower, and will not occur near any known bat roosts or forage areas.

The tower proposes a collision risk for flying species. However, the SST lattice construction of the tower will not utilize guy wires, minimizing the risk for collision.

The tower site has been previously-disturbed, and has already been cleared; therefore, no vegetation will be removed during tower construction. If invasive species are introduced through construction disturbance, CBP will take action to monitor and remove these species to ensure native vegetation communities, which provide habitat and forage to park wildlife, are not impaired.

Muffling of construction equipment to reduce noise production, the temporary nature of construction noise, the limited radius of operational noise in wildlife habitat, mitigations to reduce nighttime tower lighting, tower design, and mitigations to eradicate invasive species will ensure that native flora and fauna of the Madrean Sky Island Ecosystem are not impaired.

Cultural Resources

Coronado National Memorial protects a unique concentration of pristine archaic-aged human occupation sites in southeast Arizona. Archaeological sites within the park contain evidence spanning early, middle, and late archaic periods, including the transition from the late archaic to early agricultural periods. More recent sites relate to mining and ranching that took place after settlement by Europeans. There are 58 mine sites, including ruins of the Doredor Mining Claim, as well as grave sites related to mining and ranching activity. Along the park's southern edge stand three stone monuments, erected during the 1890s by the United States government to formally delineate the international boundary. The park also contains a number of structures that were built by the Civilian Conservation Corps prior to the monument's establishment, including Motezuma Pass Roads and culverts.

No archaeological sites, mine sites, grave sites, or boundary markers occur within the footprint of construction activities. However, historic culverts constructed by the Civilian Conservation Corps may be damaged by construction-related traffic. Due to this potential, all construction equipment, including cement trucks, will enter the park from the west. This will avoid impacts to any historic structures. With these stipulations in place, historic properties will not be impaired as a result of tower construction.

Tribal and Arizona State Historic Preservation Office (SHPO) occurred through correspondence dated October 27, 2016, and the SHPO provided a finding of "no adverse effect" on historic properties on November 21, 2016.

The tower construction will occur in a previously-disturbed area within Montezuma Pass parking lot. Any cultural material encountered as a result of soil disturbance due to construction activities will be out of primary context and lack scientific integrity. In the event of accidental discovery of archaeological resources or historic structures, the activity will cease immediately, and consultation with park resource management staff will occur to prevent any impairment of park cultural resources.

Due to the project location, mitigations to avoid impacts to historic culverts, and stipulations to avoid impacts to previously-undiscovered archeological resources, park cultural resources will not be impaired due to the construction of tower TCA-SON-062.

Coronado Cave and Karst Topograpy

Coronado Cave is one of the most widely known caves in southeast Arizona and is open to public access without a guide. Housed within limestone that was formed during the Upper Paleozoic era (approximately 250 to 300 24 million years ago), the cave contains formations such as stalagmites, scalloped rocks, flowstone, and rimstone dams. Coronado Cave's unique microclimate provides a home for a diverse community of insects and small animals. Within this community are beetles, millipedes, spiders, crickets, coatimundis, ringtails, and bats- some of which use the cave only occasionally. Other caves formed within limestone deposits are recorded within the park.

Construction of tower TCA-SON-062 will not affect Coronado Cave or Karst Topography. Coronado Cave is located approximately 1.5 miles from the tower site. Karst topography is interspersed throughout the monument. The tower site is located in a previously-disturbed area, and soil disturbance up to 24' deep will occur. However, no known karst features or caves are located within the footprint of the tower construction. Due to the location of the tower, Coronado Cave and Karst Topography will not be impaired.

Conclusion

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the selected alternative. The NPS has determined that implementation of the Selected Action will not constitute an impairment of the resources or values of Coronado National Memorial. This conclusion is based on consideration of the park's purpose and significance, a thorough analysis of the environmental impacts described in the 2008 EA, 2008 BO, 2016 FONSI, comments provided by the public and others, and the professional judgment of the decision maker guided by the direction of NPS *Management Policies 2006*.

Appendix C – References

Most material in this document regarding effects to resources has been taken from the 2008 EA, and 2008 BO referenced earlier in the document.

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